TU Delft

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Technical report

Maeslant barrier

Alternative solution for the upgrading of the Maeslant barrier

Jonas Riteco (4167759)

16. January 2017

Prof. Dr. Ir. Jonkman, S.N.
Ir. Molenaar, W.F.

Research project
Fallsemester 2016

Cover
Closed Maeslant Barrier, Bird's eye view
Source: Beeldbank Rijkswaterstaat
`https://beeldbank.rws.nl/MediaObject/Details/Luchtfoto_van_de_gesloten_Maeslantkering_in_de_nieuwe_Waterweg_nabij_Hoek_van_Holland_158813`
Date: 17.10.2016

Preface

I am an exchange student from the Swiss Federal Institute of Technology in Zürich (ETH). Part of the master program at the ETH is writing an additional thesis in each study direction you are following. This is therefore the report to my project for hydraulic engineering. The goal of this thesis is to demonstrate the ability to use all the knowledge gathered in the last years and to perform research at an academic level.

The aim of this research is to investigate alternative solutions for the upgrading of the Maeslant barrier. Based on the experience about the Ramspol barrier an alternative design with an inflatable rubber barrier is worked out.

I like to use the opportunity to thank my supervisor ir. Wilfred Molenaar for his support.

Jonas Riteco,

Delft, January 2017

Abstract

The Maeslant barrier was the final piece of the Delta works which protects a large area of the Netherlands. However the present barrier seems to fulfil his function, several Dutch experts have doubts about the system. However the discussion on the Maeslant barrier not being safe enough refers mostly to future scenarios. Experts expect that the barrier already will not provide enough protection from storm surges as of 2070.
The goal of this research is to investigate an alternative solution for the upgrading of the existing Maeslant barrier in order to make it more reliable for the future. The two functional requirements that all future solutions must fulfil are assuring enough safety against storm surges and providing enough navigation space for ships. The new waterway has to be accessible at any time during normal conditions. For the hydraulic boundary conditions future water levels are taken into account by implying the most extreme Deltascenario steem.

In a variant study four different designs are worked out. Design A introduces a solution with navigation locks. This solution closes of the new waterway entirely which can be an advantage for safety reasons but also a disadvantage in terms of navigation. The second design consist of an inflatable rubber barrier like the Ramspol barrier. The mode of operation and in terms of maintenance the inflatable barrier has a lot of advantages, two of the biggest disadvantages are however the tension forces and stresses in the membrane and the fact that the dimensions exceed the largest inflatable rubber barrier by the triple. Design C consist of a new barrier with tumble gates either hydraulic or pneumatic. This design was already introduced as one of the alternatives for the existing Maeslant barrier. However these kind of gates are straightforward and simple the disadvantage is that large movable parts are placed under water which makes maintenance work laboured and expensive. The last design consists of several rising sector gates as it has already been built at the Thames in the UK. The dimensions would be in the same range and therefore a lot of the experience could be used for the design. This design however leads to fixed structures within the water way which are a hindrance for navigation. The inflatable barrier is worked out in more detail.

After taking a closer look at the biggest inflatable barrier in the world, the Ramspol barrier in the Netherlands, working out general information on inflatable barriers provides the basics for the design of the new Maeslant barrier. Because of the positive experience at the Ramspol barrier a combination of water and air was chosen to be the filling material. A purely air filled barrier leads to high tension forces in the membrane that exceed the bearing capacity. By using factors between the crest-height and the base width of the clamping lines and the crest-height and the circumferential length of the membrane based on the Ramspol barrier, the initial parameters for the new Maeslant barrier could be calculated using a crest-height of 22 meters. From that an iterative calculation process using a excel spread sheet calculates the shape, the internal air pressure and tension force in the membrane. First results than lead to an inflatable rubber barrier with a crest-height of 22.55 m, an internal air pressure of 0.6 bar and a tension force of 730 kN/m^2. Optimizing the structure leady to a final design with a smaller base width, slightly longer circumferential length, lower tension force and internal air pressure and a higher crest-height.
Using the calculated tension force the horizontal and vertical clamping forces are calculated and can be used to design the clamping lines and the foundation. The foundation also includes the bottom recess where the membrane is stored in the deflated situation. The membrane fits exactly over the ribs created by conveyors to facilitate the horizontal transport. The membrane will then be held in place by applying an under-pressure in the membrane.

Contents

1 Introduction

1.1 Problem description

The Netherlands are protected against flooding by a sophisticated system of barriers, dams and other hydraulic structures. To protect Nord Holland and the city of Amsterdam in 1927 the start of Holland's first extreme engineering project of the modern era began, the Afsluitdijk. The north was now protected but in the south the North Sea could still flood a very large part of the country. After the major flood of 1953 the Delta Works was initiated. The Delta Works is the largest flood protection project in the world which consists of a number of surge barriers and a considerable length of dams. This project is updated each year in which the strategy for the future is stated. The current strategy for the Dordrecht and the Rhine mouth is to maintain the current situation with the Maeslant barrier and strengthening of the existing dikes.

The Maeslant barrier is a storm surge barrier in the province South Holland (Zuid-Holland). The barrier is located in the new waterway as shown below in figure 1 and consists of two movable arms that close of the waterway in case of a storm surge. The whole system is fully autonomous. The Maeslant barrier was the final piece of the Delta works and is part of the Europortbarrier.

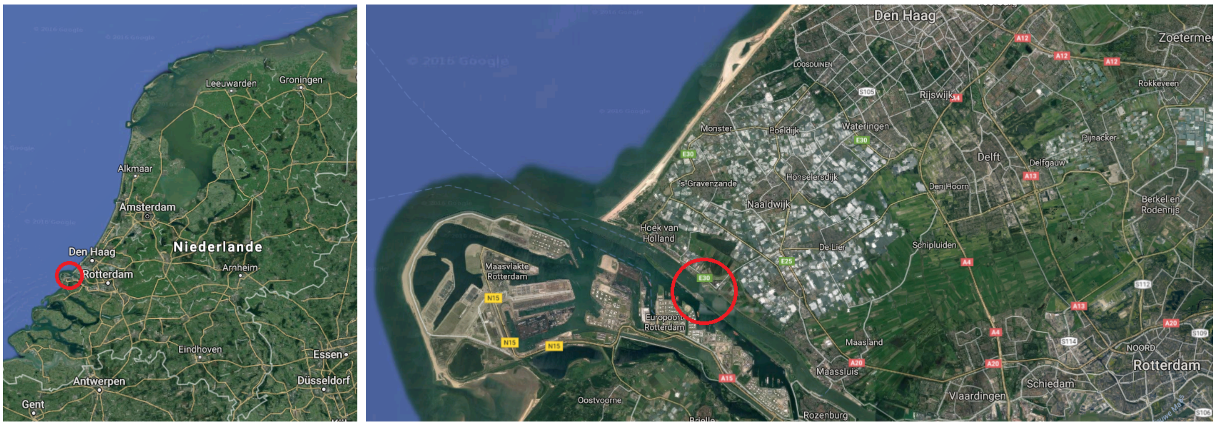


Figure 1: Location of existing Maeslant barrier

However the present barrier seems to fulfil his function, several Dutch experts put this strategy in question for different reasons:

- The closure reliability of the Maeslant barrier is not high enough. Its probability of failure is 1/100 per closure
- The barrier is not resistant against a negative head of more than 2.5 m. Problems will be caused in a situation of a closed barrier and a high water discharge from the Rhine and the Meuse.
- It is expected that the barrier will have to close more often in the near future due to the sea level rise. This is primarily a problem for navigation on the new waterway.
- The storm surge barrier is not suitable to manage the problems regarding the irrigation and drinking water. In case of low water in the river, the intrusion of saltwater could endanger the fresh water supply.

1.2 Objectives

The goal of this research project is to investigate an alternative solution for the upgrading of the Maeslant barrier, in order to make it more reliable for the future. The main tasks of this research project are to investigate the current situation with the Maeslant barrier and work out the shortcomings. Based on that information the requirements of an alternative concept are defined including the main dimensions. This project will include the following aspects:

- Introduction into the existing Maeslant barrier with working principles and shortcomings
- Determination of the requirements of the alternative concepts and functions
- Work out different designs
- Investigate one design in more detail

1.3 Project outline

Preliminary investigation aspects on the existing Maeslant barrier will be presented in chapter 2. That chapter is divided into the classification of the barrier, the alternative designs and the performance of the existing barrier and the last section explains what is wrong with the current design.

Based on the aspects explained in chapter 2 in chapter 3 will list four different alternative designs. First the specific functional requirements and boundary conditions for navigation and hydraulics are given, before presenting designs A to D. At the end of this chapter an evaluation of the four designs is presented including the election of the option further to be elaborated.

The design chosen in chapter 2 is worked out in more detail in chapter 4. First a case study on the biggest inflatable barrier in the world, the Ramspol barrier, is conducted. After that more general information about the design of inflatable barriers concerning loads and dimensions is determined. This knowledge can than be used for the upscaling of the new Maeslant barrier.

This report ends with a conclusion as well as several recommendations for further research on inflatable barriers and the improvement of the Maeslant barrier.

2 Analysis of existing Maeslant barrier

2.1 Classification

The Maeslant barrier is a storm surge barrier located in the province of South Holland. The barrier consists of two movable parts that can be placed into the new waterway in case of a threatening storm surge. It is a fully automated system that works on behalf of the Decision and Support System (BOS – Beslis en Ondersteunend Systeem). That system decides on itself if it will be necessary to close the barrier or not [28] [29]. The barrier is therefore to be allocated to the movable barriers and within that it belongs to the surge barriers. Storm surge barriers have two opposing primary functions, namely retaining water and allowing passing of ships and/or water. The functions are generally not fulfilled at the same time. The need to maintain the tidal movement in the estuary for environmental reasons led to the construction of a movable storm surge barrier instead of a closed dam and navigation locks.

The Maeslant barrier is part of the greater project called Delta Works, which is a series of hydraulic projects in the south-west of the Netherlands to protect a large area including the port of Rotterdam from the North Sea. The area protected by the barrier includes around 1 million people. Figure 2 shows a cross section of the existing Maeslant barrier including the dimensions of the retaining wall.

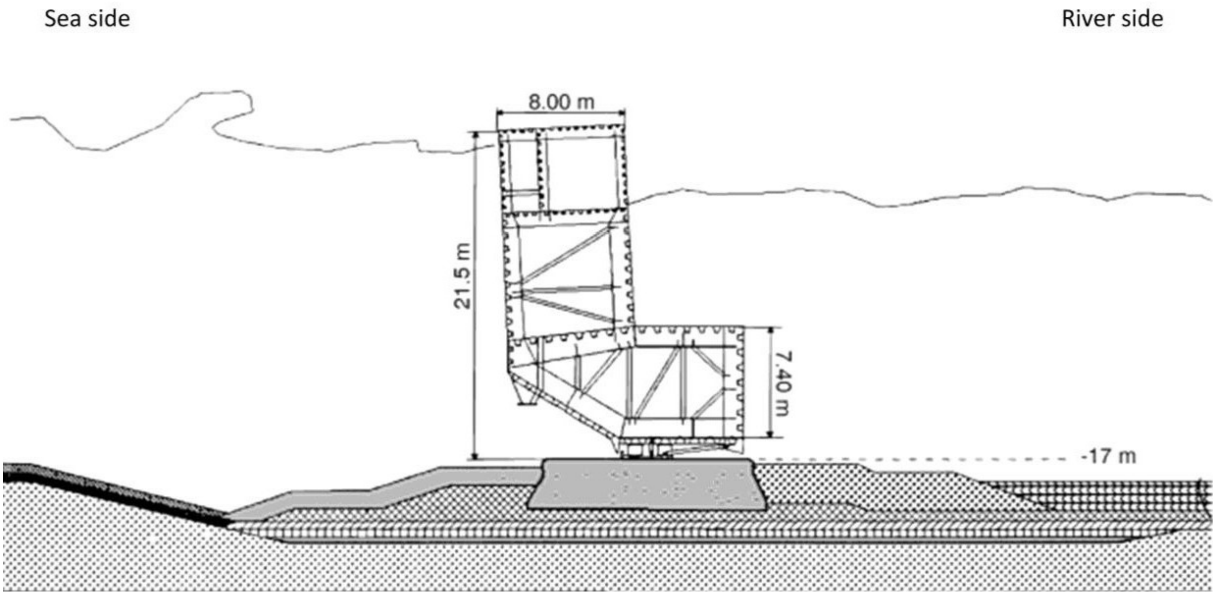


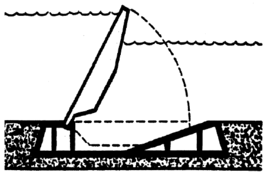
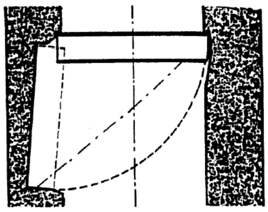
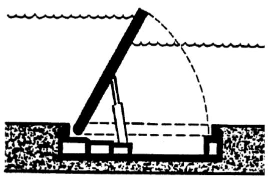
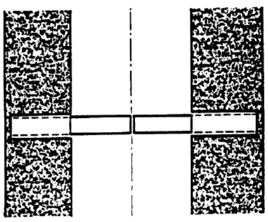
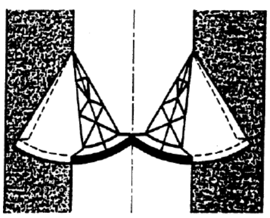
Figure 2: Cross-section of existing Maeslant barrier

2.2 Alternative gate design

In 1987 an investigation was ordered to determine whether a storm surge barrier in combination with only minimal raising of dikes would be a possible alternative for continued strengthening of dikes [28]. Results showed that it was possible and in the same year six possible designs were presented [36] as shown in table 1 below.
All six designs had different advantages and disadvantages. Due to the easy inspection and

maintenance as well as for the safety of the gates the floating gates were chosen to be the best option.

Table 1: Alternative gate designs

Design	Schematics	Advantages	Disadvantages
Pneumatic tumble gate		- Straightforward - Reliable parallel systems (14 valves) - simple construction	- Sensitive to "negative head" - Silting-up of valves and buoyancy chambers - underwater maintenace
Segment gate		- Barrier can be closed even in extreme,flood current - Simple construction systems using,proven hydraulic and offshore engineering	- Opened gates vulnerable to collision. - Silting-up of gate buoyancy chambers - Chambers cannot be emptied for,maintenance - Gate has to plough through sediment,deposits
Boat-gate		- Insensitive to silting-up - No hinged, sliding, rotating etc.,parts under water (reliability and ease of maintenance)	- Process control of gate closure not easy - Design loads difficult to define (has,direct impact on closing process control)
Hydraulic tumble gate		- 24 independent valves (risk of failure,very small) - Requires little space	- Valves, caissons and bottom protection, underdimensioned - Complex foundation technology required - Akward maintenance - Silting-up of valves
Sliding gate		- Gates well protected when open - gates easily accessible in drained,docks - simple construction system, technology, well proven in practice	- Interference with navigation during construction - Over-dimensioned - The most expensive solution
Floating sector gate		- Gates well protected when open - Easily inspection and maintenance in, drained gate docks - Well balanced design	- Entire reaction to be passed point, wise on the hinge foundation

2.3 Performance

The failure probability of closure of the barrier is 1/109 according to official numbers (determined in October 2011 [28]) however there are several publications that emanate from a higher probability of failure [16]. In 2006 several news agencies reported that the barrier is less safe than expected. In response to the problems identified several measures were determined to bring the barrier up to the required safety level. Until 2009 all necessary measures were conducted and it was reported that the probability of failure is now higher than 1/100 per closure. The measures included a series of improvements of technology, organization and staffing [28]. The Maeslant barrier was first closed in (near-) storm conditions on 8 and 9 November 2007. The barrier normally closes when the predicted water level in Rotterdam is 3.00 m above NAP. Since the probability of closure is low (once every seven to ten years on average), the decision was made to lower the closure level to 2.60 m above NAP for 2007 only. That level was reached that year and the barrier had to come in action. After that the closure level was again set back to 3.00 m above NAP. Since then the barrier never closed although critical situations appeared in 2012, 2013 and 2014. This closure at lower closure level is called verification closure to test the barrier in an actual storm situation [28].
On 1 October 2016, Rijkswaterstaat lowered the official closing levels of the Europoort barrier again. The barrier will close at 2.60 m above NAP at Rotterdam and/or 2.30 m above NAP at Dordrecht. This means that it is likely that Rijkswaterstaat will carry out the verification closure for storm conditions either this year or the next. After the trial closure has been conducted, the official closing levels will be reinstated [26].

2.4 What is wrong with the barrier?

What is wrong with the Maeslant barrier is not an easy question to answer. To start it must be said that at the moment there is nothing wrong with the Maeslant barrier as the yearly functioning closures show. The failure probability is lower than 1 in 100 closures which is sufficient according to the Water Act (water wet)[15]. At the moment there are no convincing arguments that justify changes of the barrier on a large scale.
However the discussions on the Maeslant barrier not being safe enough refers mostly to future scenarios. The barrier was put in operation in 1997 and designed for 100 years. Experts expect that the barrier already will not provide enough protection from storm surges in 2070. This is based on a reports from van Waveren et al. [9] and Spaargaren et al. [8]
In 2015 the probability that the barrier has to close was one time within five years. For 2100 the expected rise in sea level is around 0.85 m which has a normative influence on the water level in Rotterdam and Dordrecht. Therefore it is expected that then the probability of closure will on average be five times per year. This also means that the probability of failure per closure is 25 times higher than nowadays and the influence on navigation on the New Waterway is too much [15].
Furthermore there is one more problem to consider. The intrusion of saltwater in the New Waterway and the waterbodies behind the Maeslant barrier. In times that the river discharge of the Rhine and the Meuse is very low the pressuring North Sea pushes the salt water inland and endangers the drinking water supply and increases the salinization of the land.
In the current Water Act there are no standards defined for b-barriers however there is a maximum probability of failure defined in the test obligations (WTI – Wettelijk Toetsinstrumentarium). Currently there is a revision of the Water Act going on which will include the b-barriers. This will lead to the fact that then the Maeslant barrier will not be safe enough anymore and improvement needs to be conducted [25].

3 Variant study

3.1 Introduction

To be able to meet the higher safety standards in the future it is absolutely necessary to start planning an alternative solution sufficiently early. The Maeslant barrier was planned to defy the storm surges for a service life of 100 years. However people already talk to decommission the world's largest robot between 2050 and 2070. At that time the Maeslant barrier either needs to be updated or, more likely, an alternative solution will be built. In the first subsection first the general boundary conditions which are indispensable for all alternatives are presented. After that, subsections 3.3 till 3.6 show four different alternatives.

The assumption was made that closing of the New Waterway with the Maeslant barrier is still undesired in the future because of the enormous economic effects on the port of Rotterdam and the surroundings. However, with the construction of the second "Maasvlakte" many port activities are placed at the sea side of the Maeslant barrier. The economic effect of closure of this barrier will decrease. Therefore also an alternative with a full closing of the new waterway is presented in subsection 3.3.

3.2 Boundary conditions

The following general boundary conditions are applicable for all of the following alternatives. This subsection not only considers the general conditions but also explains the functional requirements, hydraulic boundary conditions and boundary conditions for navigation.

3.2.1 General boundary conditions

There are four general conditions that apply to all future designs of the storm surge barrier replacing the Maeslant barrier. At first it is necessary that the capacity in navigation of the New Waterway during construction of the new barrier remains basically the same. There should be no or very little impact on navigation during that stage. Furthermore it is indispensable to define a minimum safety level and a maximum probability of failure for the new barrier. This however might be given by the new Water Act which is still in revision. All irreplaceable parts of the new barrier besides need to be designed for a minimal life-time of 100 years and therefore the safety-level needs to be guaranteed for that span of time. All elements that are replaceable are to be designed in such a way that replacing them can easily be conducted.

3.2.2 Functional requirements

Storm surge barriers have two opposing primary functions as already mentioned above. The functions are generally not fulfilled at the same time. The most important function is to assure enough safety against storm surges. In the Netherlands this means that they have to withstand floods that appear once in 10'000 years. The second primary function is allowing passing of ships. The New Waterway has to be accessible at any time or when the movable barriers are open for the ascribed CEMT and Panamax class explained later on. Also vessels with exceptional sizes have to be able to pass the waterway occasionally. Furthermore the guaranteed draught on the waterway should not change and stay at 17 meters. Two more functions need to be considered to the functional requirements which are the discharge of water, ice and sediments and the indemnification of saltwater not infiltrating more into the inland waterways. The latter requirement does not apply for all designs since this function is mostly not available for movable barriers.

3.2.3 Hydraulic boundary conditions

For the hydraulic boundary conditions it is necessary to distinguish between the water level seaside and the water level inland side. For the water level at the seaside several effects as storm surge, waves, tide, seiches and sea level rise need to be taken into account. At this moment the governing water level for a storm surge has a probability of exceedance of 1 in 10'000 years for the existing Maeslant barrier. The wave height is 6.95 meter for the mouth of the new waterway, which is located more westwards. The wave conditions are considerably smaller at the structure itself and are therefore not taken into account in the further design. The tidal effects are include in the storm surge levels. Seiches are oscillatory water level rises which can have a period from a few minutes to a few hours and can have a large influence on the hydraulic loads. One important effect that needs to be taken into account especially for designs in the future and structures with life-times of 100 years is the sea level rise. The estimated sea level rise until the year 2100 can be found in the Deltasenarios where the most extreme scenario is called steem (stoom) [30]. For this scenario a sea level rise of 85 cm is taken into account.

The inland water level mainly depends on the discharges of the rivers Rhine and Meuse. The discharges can be looked up in the report “Variant Landelijke Samenhang” [19]. For the Rhine the design value is 18'000 m^3/s and for the Meuse the discharge is 4'600 m^3/s. This leads to a water level on the inland side of the barrier of 2.90 m + NAP.

3.2.4 Navigation boundary conditions

For the navigation boundary conditions it is necessary to distinguish between seagoing and inland vessels. For seagoing vessels the New Panamax class applies since there are cruise ships which fall under that category. The New Panamax class defines ships that can pass through the Panama Canal. The dimensions of the New Panamax class are defined as follows [35]:

$L * W * D = 366m * 49m * 15.2m$

For inland vessels the New Waterway is classified within the CEMT-Class VIb [31]. The dimensions of the CEMT-Class are listed below in table 2. Since the New Waterway is also used for recreational navigation for which there is also a classification. The waterway is classified with AZM and the dimensions for that class are shown below in table 3.

Table 2: CEMT-classification

CEMT-Class	Description	Length [m]	Beam [m]	Depth [m]	Weight [ton]	Minimal bridge Height [m]
VI b	Push towing 2 x 2 convoy	185-195	22.8	2.50-4.50	6'400-12'000	7.0-9.1

Table 3: Recreatievaart-classification

Recreatievaart-Class	Length [m]	Beam [m]	Draught [m]	Ship height [m]	Bridge height [m]
AZM	15.0	4.25	2.10	30.0	30.0

3.3 Design A - navigation locks

3.3.1 Introduction

A navigation lock (or just lock) is a civil structure used for raising and lowering boats, ships and other watercraft between stretches of water of different levels on waterways, canals and rivers. Down below the navigation lock complex of the North Sea Canal is shown in figure 3. Since these structures close of the waterway entirely, most of the times it is necessary to install a dewatering system. The locks need to be able to give access to the port of Rotterdam even for the big container ships of the new Panamax class (dimensions of ship that can pass the new Panama Canal).

Not all ships that pass the New Waterway are considered to belong to the new Panamax class. And since it is more efficient to transport smaller ships with smaller locks it is necessary to design multiple locks with different dimensions. Inland going vessels in Europe are classified with the CEMT classification. The New Waterway belongs to the CEMT-class VIb, as mentioned above in the boundary conditions for navigation. Lock dimensions should meet the dimensions of that CEMT-class.

To be able to evaluate the number of locks needed for each class, research needs to be done on current navigation on the new waterway. This data than can be upscaled to possible future navigation demand since the alternative solution for the Maeslant barrier will need to be realized way in the future.

3.3.2 Mode of operation

There is no specific mode of operation that differs from the usual locks already working. The basic principle is very easy. For a downstream traveling ship the boat enters the lock chambers, the doors get shut behind the boat. Once the doors are closed the sluice gates are raised opening pipes between the lock and the canal. The water than empties out of lock due to the difference in water pressure. While emptying, the difference in water level across the upstream and downstream gates holds the upstream gates shut. After the water level in the lock is equal to the water level downstream, the lock doors can be opened and the ship can resume his travels.

The special thing about theses locks is the frequency they will have to deal with. Every six minutes a ship passes through the new waterway and needs to use one of the locks accordingly. This means that all locks have to work as fast as possible but should still be efficient. The research on this issue goes hand in hand with the research for the number of locks needed.

3.3.3 Specific boundary conditions

- At least 4 fields
- Approximately 25 m deep
- The depth of the navigation channel should not change and is set to 17 m below NAP
- All irreplaceable parts of the locks need to be designed for a minimal life-time of 100 years
- All hydraulic boundary conditions mentioned above need to be considered
- Functional requirements:
  - Making navigation possible
    - The waterway has to be accessible at any time or when the movable barriers are opened, for the ascribed CEMT class
    - Also vessels with exceptional sizes have to be able to pass the waterway
    - The guaranteed draught on the waterway should not change and stay at 17 meters below Amsterdam Ordnance Datum (NAP)
  - Assuring enough safety against flooding
    - Withstand floods that appear 1:10'000 years
  - Discharge of water, ice and sediment
  - Ensure that saltwater is not infiltrating more into the inland waterways
    - Preserve the irrigation and drinking water upstream from the barrier

3.3.4 Advantages and disadvantages

+ Low maintenance costs
+ The waterway is permanently closed off → the safety of the port is guaranteed
+ Ensure that saltwater is not infiltrating more into the inland waterways
– Waterway is completely closed off
– Navigation is slowed down because of locks, ships need to stop and accelerate again
– Dewatering system is needed to be able to pump water from one to the other side

Figure 3: The navigation lock komplex at the North Sea Canal [6]

3.4 Design B - inflatable rubber barrier

3.4.1 Introduction

An inflatable rubber barrier or weir consists of some kind of foundation structure, abutments, a rubber membrane and a filler e.g. air or/and water. The rubber membrane is clamped to the foundation structure on the bottom and on both ends to the abutments. In case of a threatening storm surge, the rubber membrane can be filled with water or/and air and therefore closes of the waterway.

The biggest realized inflatable rubber barrier is the Storm Surge Barrier Ramspol in Holland. There the barrier consists of three sections, each 75 m long, 13 m wide and with a design height of 8.35 m. The New Waterway however needs a considerably longer and higher barrier. The biggest issue in designing a rubber membrane with these dimensions is the peak stresses that occur because of folds in the membrane in the inflated state. The challenge is now to come up with a new design to reduce peak stresses to make an inflatable rubber barrier possible with the now existing materials.

In the following table 4 an upscaling from the Ramspol barrier is done to the dimensions of the Maeslant barrier. According to a previous report of Marjolein van Breukelen, a master student at the TU Delft, it is already possible to handle peak stresses of 2850 kN/m with today's materials. However this is not cost efficient.

Table 4: Upscaling of forces inflatable barriers

Parameter	**Ramspol**	**Maeslant**	**Scaling factor**
Length [m]	75	500	6.67
Height [m]	8.35	25	3.0
Tension [kN/m]	200	600 (200*3.0)	
Peak stresses [kN/m]	950	2850 (600*4.75)	
Factor design forces	4.75	4.75	

The report of van Breukelen also gives a rough cost estimation. According to her calculations it should be possible to build a rubber barrier at the site of the Maeslant barrier for 900 million Euro. The biggest issue here is the life span of the rubber membrane.

3.4.2 Mode of operation

In the introduction a brief explanation of the mode of operation was already made, here we are going a little more into detail. As mentioned above the rubber membrane is clamped to the foundation structure, this can be done either on one side only or on two sides. For a system that needs to withstand both forces from a storm surge and from de discharge of the rivers Rhine and Meuse it is more convenient to use the two-sided method. The rubber membrane can be filled with air, water or a combination of both. However the air filled dam is by far the most commonly used. A large part of the deformation capacity and force transfer is related to the filler. In case of designing an inflatable storm surge barrier research needs to be done to find the most suitable filler. Therefore the mode of operation is also strongly related to the filler. The general concept however is to start filling the rubber membrane in case of a possible storm surge with the elected filler. The membrane starts to rise and eventually closes of the waterway since it is clamped to the foundation structure and on both sides to the abutments. During normal water conditions the rubber membrane is stored in the bottom recess.

Once the rubber barrier is filled and the waterway is closed of, navigation will not be possible any more. Only after deflating the barrier ships can again pass through the New Waterway. This type of barrier therefore is part of the "usually open, occasionally closed" concept.

3.4.3 Specific boundary conditions

- Approximately 500 m wide
- Approximately 25 m deep
- The depth of the navigation channel should not change and is set to 17 m below NAP
- Life expectancy of the rubber membrane should be at least 25 years
- All irreplaceable parts of the barrier need to be designed for a minimal life-time of 100 years
- All hydraulic boundary conditions mentioned in section 3.2.3 need to be considered
- Functional requirements:
    - Making navigation possible
        - The waterway has to be accessible at any time or when the movable barriers are opened, for the ascribed CEMT class
        - Also vessels with exceptional sizes have to be able to pass the waterway
        - The guaranteed draught on the waterway should not change and stay at 17 meters below Amsterdam Ordnance Datum (NAP)
    - Assuring enough safety against flooding
        - Withstand floods that appear 1:10’000 years
    - Discharge of water, ice and sediment

3.4.4 Advantages and disadvantages

+ Easy to realize
+ Nearly no maintenance necessary
+ Relatively low costs
+ Convenient barring concept
+ No direct movable parts
+ Part of “usually open occasionally closed” concept
+ Opening will be wider than it is today
+ It is probably easy to adjust this system to changed safety-levels and weights
– High tension forces and stresses in the membrane
– Complicated storage of the membrane
– Still needs a lot of research
– Vulnerable to vandalism in inflated state
– Vulnerable to damage due to floating objects
– Part of “usually open occasionally closed” concept (no holding back of saltwater at state of low water in the rivers)
– If maintenance is necessary it needs to be conducted under water

Figure 4: The inflatable rubber barrier at Ramspol [5]

3.5 Design C - tumble gate

3.5.1 Introduction

The design of a hydraulic or pneumatic tumble gate was already presented as one of the alternative designs for the existing Maeslant barrier. Tumble gate barriers consist of a container that forms the liftable gate, a foundation that can store the gate under water when there is no immediate threat of a storm surge, and a system that can lift the gate from the foundation to a closed position.

These kind of gates are in general straightforward and simple constructions and therefore very reliable. However there are two main aspects that need to be carefully considered during the design stage. The first aspect is the underwater maintenance that can have a major impact on the total cost of the project. The second reason is the silting up of the valves in both closed and open stage.

3.5.2 Mode of operation

As already mentioned above it is possible to rise the gates either pneumatic or with a hydraulic system. The pneumatic system uses pressurized air to lift the gate doors and the hydraulic system uses a hydraulic press to push the gate from the foundation in its nearly upright position. For the hydraulic system even more components need to be installed under water which increases maintenance work and therefore also the costs.

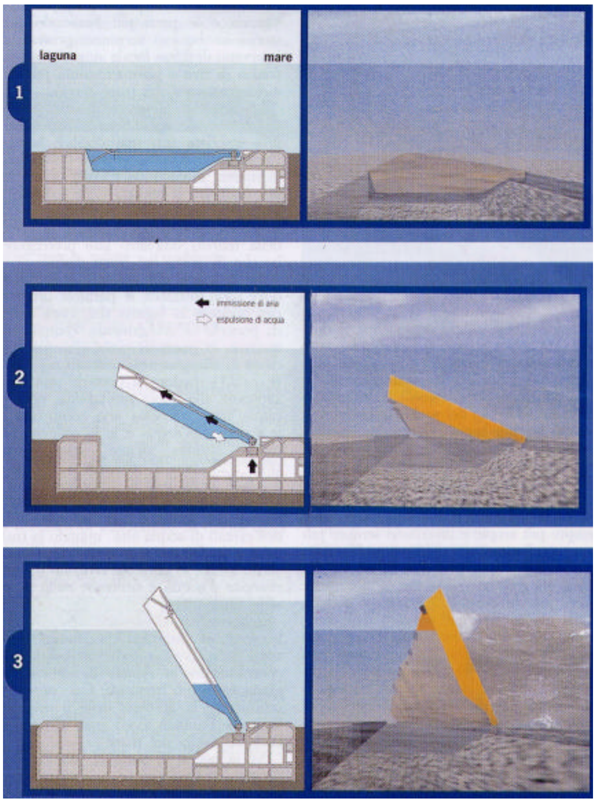


Figure 5: The MO.S.E. system for the defence of Venice [38]

3.5.3 Specific boundary conditions

- Approximately 500 m wide
- Approximately 25 m deep
- The depth of the navigation channel should not change and is set to 17 m below NAP
- All irreplaceable parts of the barrier need to be designed for a minimal life-time of 100 years
- All hydraulic boundary conditions mentioned above need to be considered
- Functional requirements:
  - Making navigation possible
    - The waterway has to be accessible at any time or when the movable barriers are opened, for the ascribed CEMT class
    - Also vessels with exceptional sizes have to be able to pass the waterway
    - The guaranteed draught on the waterway should not change and stay at 17 meters below Amsterdam Ordnance Datum (NAP)
  - Assuring enough safety against flooding
    - Withstand floods that appear 1:10'000 years
  - Discharge of water, ice and sediment

3.5.4 Advantages and disadvantages

+ Straightforward
+ Reliable parallel systems (multiple gates)
+ Simple construction
+ Construction has little impact on navigation

- + Part of “usually open occasionally closed” concept
- + The opening of the New Waterway could be wider than today
- – Sensitive to negative head
- – Silting up of the valves and buoyancy chambers
- – Underwater maintenance
- – Part of “usually open occasionally closed” concept
- – Gates have a width of around 20 m which leads to 25 gates for a waterway with of 500 m

3.6 Design D - rising sector gate

3.6.1 Introduction

Basically, the Barrier is a series of separate movable gates positioned end-to-end across the river. Each gate is pivoted and supported between concrete piers that house the operating machinery and control equipment. Closing the Barrier seals off the new waterway from the sea. When not in use, the rising sector gates rest, out of sight, in curved recessed concrete cills in the riverbed, allowing free passage of river traffic through the openings between the piers. If a dangerously high storm surge threatens, the rising sector gates are moved up through about 90° from their riverbed position. The gates thus form a continuous steel wall facing the sea ready to stem the storm surge. Further rotation of the gates to the horizontal maintenance position renders them accessible for routine maintenance.

3.6.2 Mode of operation

The introduction already explained the basic concept of the rising sector gate. The closing and opening mechanism mostly consists of hydraulic pressures that are situated inside the piers in the water. Like this, every sector gate has two pressures which gives a redundancy but also allows to smaller design of the hydraulic system.

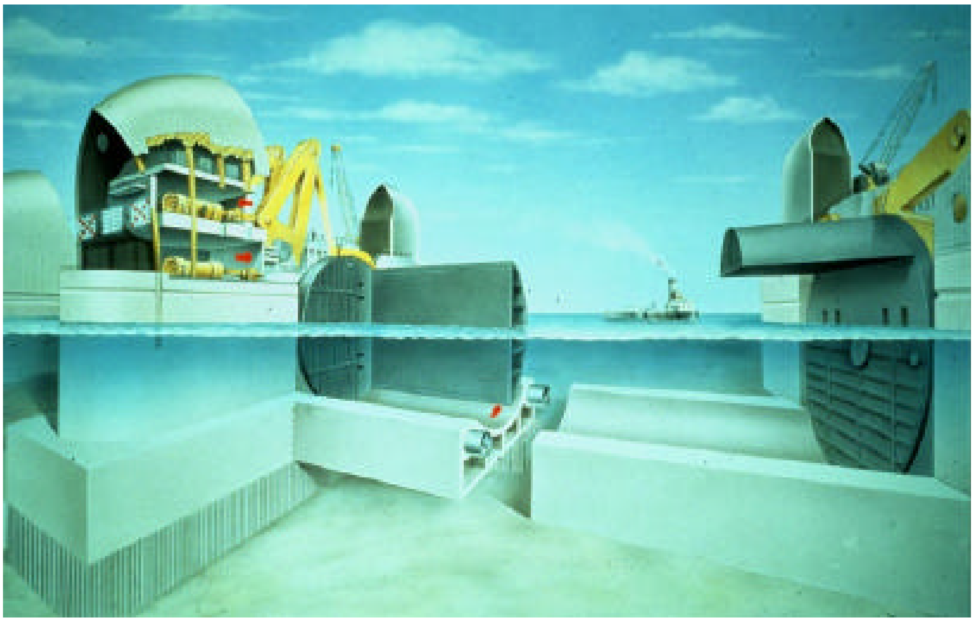


Figure 6: The Thames Barrier flood defence London [39]

3.6.3 Specific boundary conditions

- Approximately 500 m wide
- At least 4 fields
- Approximately 25 m deep
- The depth of the navigation channel should not change and is set to 17 m below NAP
- All irreplaceable parts of the barrier need to be designed for a minimal life-time of 100 years
- All hydraulic boundary conditions mentioned above need to be considered
- Functional requirements:
  - Making navigation possible
    - The waterway has to be accessible at any time or when the movable barriers are opened, for the ascribed CEMT class
    - Also vessels with exceptional sizes have to be able to pass the waterway
    - The guaranteed draught on the waterway should not change and stay at 17 meters below Amsterdam Ordnance Datum (NAP)
  - Assuring enough safety against flooding
    - Withstand floods that appear 1:10'000 years
  - Discharge of water, ice and sediment
  - Ensure that saltwater is not infiltrating more into the inland waterways
    - Preserve the irrigation and drinking water upstream from the barrier

3.6.4 Advantages and disadvantages

+ Quick operation as they move in an arc
+ The entire water load is transferred radially through the arms to the pivots which gives reduced hoist capacity
+ Gives an unobstructed passage for movement of river traffic
+ Torsionally rigid to allow operation from one side
+ Easy to build without influencing navigation too much
+ Part of "usually open occasionally closed" concept
+ Opening will be wider than it is today
– A recess is required in the floor for the gate to occupy which could be a problem where there is high silt content
– Fixed structures within the waterway
– Internal confined space for maintenance
– Curved fabrication requires an assembly jig
– Negative head could be a problem
– Maintenance closes of the field for navigation

3.7 Evaluation

Apart from upgrading the existing barrier the four options given above are all possible future solutions. However only the navigation lock design takes all functional requirements into account given in subsection 3.2.2. All other options are not suitable for the functional requirement of not letting salt water infiltrating the inland waterways in case of low discharge levels from the rivers Rhine and Meuse. For this project this requirement is set to nice-to-have and can therefore be neglected in the evaluation.

Taking previous studies at the TU Delft into account the navigation lock has already been introduced several times and therefore no new solution can be presented within this report. The tumble gate design has three major disadvantages with silting up of the valves, sensitivity to negative heads and the underwater maintenance. The advantages of the structure don't make up for the disadvantages and therefore also design C is not considered to be the best option. The rising sector gate seems to be a very good solution with a lot of advantages compared to the other solutions. Since silting up of the bottom recess is a real problem in the New Waterway a solution with storage of the main retaining structure at the bottom of the waterway might not be the best solution. Furthermore fixed structures are needed within the waterway which decreases safety on the New Waterway. The inflatable rubber barrier also is stored at a bottom recess but since it is closed structure no silting up of the storage can occur. Maintenance work of the membrane can be done from the inside so there are no high costs for under water work. The biggest point that needs to be considered is that the dimensions of an inflatable barrier in the New Waterway are around three times bigger than ever realised. The following table 5 shows a simple multi criteria analysis of the four designs according to aspects discussed before.

Table 5: Multi Criteria Analysis for the four designs

Criteria:	**Design A:**	**Design B:**	**Design C:**	**Design D:**
Maintenance	+	+	- -	-
Hindrance during construction	0	0	0	0
Adaptability	-	+	-	-
Knowledge	0	-	0	0
Sensitivity to negative head	+	+	-	-
Complexity	+	+	+	-
Vulnerability to external impacts	+	-	0	0
Hindrance during operation	-	+	+	+
Silting up of the structure	0	0	-	0
Result	**+2**	**+3**	**-3**	**-3**

This table leads to the solution with an inflatable rubber barrier which is chosen to be analysed on a higher level in this report.

4 Inflatable rubber barrier

In the last chapter the inflatable rubber barrier was chosen to be analysed in more detail. To do so it is advisable to take a look at rubber barriers that are already in service to get to know the difficulties they had to deal with. The biggest inflatable barrier is the storm surge barrier Ramspol in the Netherlands. In this chapter therefore first a case study of the Ramspol barrier is conducted and after gathering some general information in section 4.2, section 4.3 presents an upscaling from the Ramspol barrier to the dimensions of the New Waterway is.

4.1 Case study Ramspol

The reason for the design of a new barrier to protect the province Overijssel in the east of the Netherlands were the extreme high water levels in 1995. These height water levels were fed by two sources: first a high discharge of the river “Vecht” and second because of wind set-up from the “IJselmeer” (lake IJsel). Therefore a new type of storm surge barrier was designed to protect the hinterland from flooding, namely a rubber inflatable barrier. Inflatable rubber structures already have been designed before but manly as weirs and not in the scale needed for the Ramspol barrier. The barrier consist of three inflatable, nylon-reinforced rubber dams, each 80 m long, 13 m wide and with a design height of 8.35 m. These dimensions made the Ramspol barrier the largest inflatable barrier in the world.

The most important reasons for building an inflatable barrier were that the barrier had to be able to withstand hydraulic loads in both directions, navigation is only obstructed in closed conditions, the barrier integrates well into the surroundings and it is relatively low-cost [11]. The barrier closes fully automatic if the water level is 0.50 m above NAP, however there is always personnel on site to monitor the process and to be able to intervene in case of error [23]. The pumping stations are located in the abutments

4.1.1 Substructures

As mentioned in the introduction, the barrier consists of three inflatable rubber parts. These are connected to the surrounding structures by means of abutments and clamped to the bottom of the waterway. In case of high water levels the barrier must be closed which is done by powering the pumps to fill the tube. After the storm surge has passed, the barrier needs to be deflated again and stored in the recess structure on the bottom of the waterway. The structure can be categorised into four main subsystems, namely:

1. Filling mechanisms and material
2. Rubber membrane
3. Recess structure
4. Foundation

Filling mechanisms and material
Inflatable barriers can be filled with either air or water or, like the barrier of Ramspol, a combination of air and water. The main advantages of this system are that for closure only air

compressors and for opening only water pumps are required. The water flows in without using pumps because of the head difference. The water inside remains in open condition with the upstream water at any time which makes the barrier a self-regulating system. Like this a relatively high crest height can be reached. This however results in larger tension forces in the membrane compared to only water filled barriers which is the main disadvantage of the combined filling material [3].

The most important difference between the two systems is the internal pressure gradient. The air filled barrier has a constant internal pressure, the water filled system however experiences hydrostatic pressures. Figure 7 illustrates the difference with a barrier surrounded by stationary water. Therefore the water filled barrier will have a circular and the air filled barrier a more upright shape.

As the water level reaches +0.50 m NAP the barrier is closed. The closure procedure is than started by opening the water pipes, which stand in open connection with the upstream water level. The water flows into the space under the membrane and starts to lift it. At the same time air is blown in from the top of both abutments. The increased air pressure causes the membrane to lift further. Water keeps flowing inside because of the difference in water levels. The barrier behaves as a horizontal closure (a water filled barrier would close vertically) [3]. The pressure will increase automatically to the required level of 0.44 bar due to the increase of the water level inside the membrane [11]. During deflation the air valves are immediately opened after starting the water pumps. The structure slowly starts to deflate and in the middle a V-notch is formed. Water than starts flowing over the barrier again and after a while the membrane is stored in the bottom recess [11].

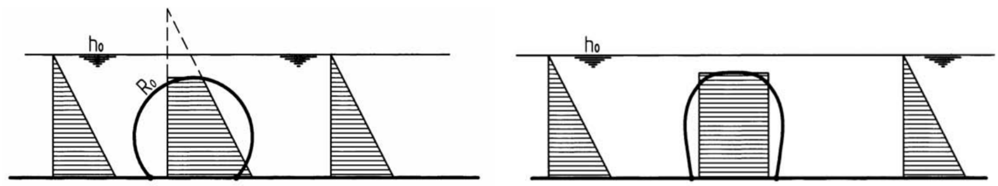


Figure 7: Differece between water filled (L) and air filled (R) system[4]

Rubber membrane

The membrane of the barrier must have a high enough resistance against static and dynamic forces as well as a sufficiently large fatigue resistance level. In addition the membrane also needs to be sufficiently flexible in order to clamp it to the foundation and the abutments and to store the membrane in a bottom recess [3].

The membrane forces of the Ramspol barrier are larger than the forces on most existing rubber weirs. Therefore no ordinary proven material was applicable. After scale model tests with different materials the material for the membrane was chosen to be a so called PA6 (Polyamid 6, Nylon) in combination with rubber as matrix material. This material is widely used and has a relatively large strength. The final design consisted of a rubber body reinforced with Nylon fabrics. The rubber body consists of two thick layers of Nylon fabric and four smaller layers of Nylon fabric for the forces in warp and longitudinal direction.

The average initial strength of the membrane in the direction of the circumferential is approximately 1’900 kN/m. After fatigue loading, ageing and relaxation from prestresses, the strength of the membrane was circa 970 kN/m. The material properties in warp and longitudinal direction differ quit a lot. The initial strength in longitudinal direction is 450 kN/m. Also the strain stiffness EA of the membrane in longitudinal direction of the barrier is considerably lower (3'200 kN/m) than the strain stiffness in circumference direction (5'700 kN/m). The lifetime of the membrane is minimal 25 years [21].

Recess structure

The forces consisting of hydraulic loads due to the hydraulic load need to be transferred from the membrane to the concrete structure of the foundation. A clamping system is introduced to attach the membrane onto the concrete bedding. This clamping system has a second function namely to make the membrane water and air tight. The basic principle is that the membrane is clutched between two plates, mostly steel, and connected to the concrete with bolts [27]. The bottom part of the clamp has ribs on top to increase the friction between the upper part of the clamp and the membrane. This also prevents the membrane of slipping in case of great tensile forces [24]. A different clamp is needed for the abutment part to reduce stress concentrations in the membrane; a clamp which is waved in two directions. The first wave direction is in the load direction, the other wave is than in longitudinal direction of the membrane [21].

After deflation of the rubber barrier, the fabric lays horizontally on the river bed and needs to be hidden away into the bottom recess. In order to facilitate the horizontal transport of the membrane roller conveyors can be arranged in the bottom recess [4]. In its deflated position, the membrane lies over the ribs and can be stabilized with a negative pressure under the membrane. The membrane must be stored in a way that there is no working surface for currents.

The membrane also has to be connected to the abutments. The requirements for this connection are very high since the membrane must be able to deform freely and leakage is unacceptable. The membrane at the Ramspol barrier was therefore connected to an inclined plane of 45° [3]. This shape of the abutment leads to enlargement of the membrane in longitudinal direction. This enlargement will cause folds in the membrane in the deflated state. Folds increase the probability of a leakage and can also be the cause for deflation problems of the barrier [21].

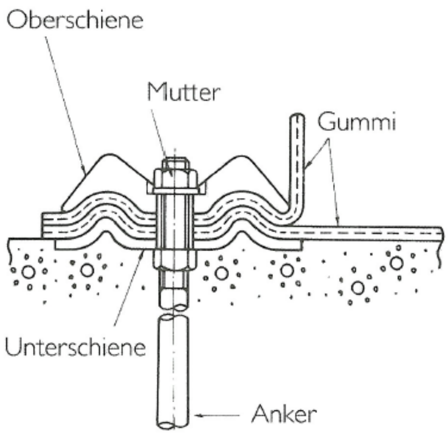


Figure 8: Waveclamp [27]

Foundation

The membrane needs to be clamped onto a concrete floor, which is in connection to the foundation. Due to the weak soft soil, a pile foundation was needed to prevent settlements. The dimensions and the configuration of the foundation depends on the load analysis.

4.1.2 Hydrodynamic and load conditions

Because of its great capacity of deformation and the way of transferring the forces down to the foundation an inflatable barrier is a special construction. Not only does the shape change with different loads acting on it, also the stiffness changes depending on the internal pressure and external loads [4]. Therefore it is necessary to distinguish the load conditions. Considering the static loads will give an insight in the equilibrium form of the structure. The behaviour of the barrier furthermore depends on various dynamic loads that need to be considered [2].

Static loads

The static loads are best explained in the situation of a closed barrier with stationary water on both sides. The response of the barrier heavily depends on the fill material and conditions. The phenomena are illustrated in figure 9 below. Starting point for a broader statically analysis is the horizontal equilibrium the hydrostatic water pressure on the outside and the internal air and/or water pressure. Where the water filled part of the barrier is in contact with the external water the barrier forms a circular arc. This also accounts for an air filled barrier in contact with the external air pressure. For all other static conditions the barrier forms a transition arc. To be able to upscale the static loads a more detailed statically analysis will be conducted later on.

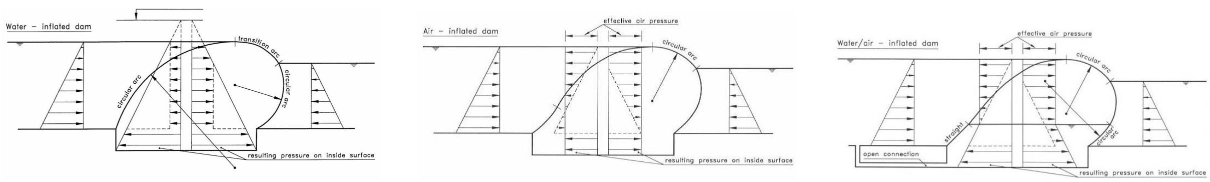


Figure 9: Different pressure curves for water filled (L), air filled (M) and air-water filled (R) [4].

Dynamic loads

Whenever the external load condition changes, the internal pressure, the shape of the barrier, the membrane forces and the contour of the barrier will adapt to it. This means the barrier deforms in function of time when it is dynamically loaded. The dynamic forces are due to wind waves, sloshing and currents. The factors which influence the dynamic behaviour of the barrier are [4]:

- The dead weight of the membrane
- The stiffness of the fabric
- The mass of the internal water
- The internal pressure head
- The incoming waves

Overflow

In case of overflow due to extreme wave heights in combination with the storm surge the barrier will behave as a weir. The overtopping water follows the circular shape of the barrier till deep into the downstream water level. The downward faced flow causes turbulences and can lead to the need of installation of a bed protection or a stilling basin in extreme conditions [4].

Wave loads

During storm conditions, when the barrier is closed, the wind generates waves which cause a dynamic load on the structure. Since wave loads are time dependent and bound to the local wave climate the barrier will deform along the pressure variation [2].

Sloshing

The water filled barrier has an internal free water surface. Dynamic loads on the structure can lead to internal vibrations with the possibility of creating an internal standing wave. This phenomenon is called sloshing of the barrier and should be avoided. The oscillation occurs when the eigenfrequency of the water inside the barrier is close to the eigenfrequency of the external dynamic wave loading [2]

4.1.3 Experience with the Ramspol barrier

In general it can be said that the barrier works according to the requirements made at the beginning of the project. During the filling and the emptying of the barrier no overpressure occurs and therefor the stiffness is very low. The low stiffness did until this day (2005) not lead to any unintentional responses such as rattling and vibrating in the membrane.
In the closed condition the barrier has to withstand great wind wave loads however this was accounted for and the barrier reacts as designed.
After deflation of the rubber barrier, the fabric lays horizontally on the river bed and needs to be hidden away into the bottom recess. In order to facilitate the horizontal transport of the membrane roller conveyors can be arranged in the bottom recess. Several deflations of the barrier have shown that the systems works as designed however ships should only pass over the recess when the membrane is fully stored. Another point is that the friction in the rollers should not increase much over time otherwise the correct storing of the membrane will not work properly.
The regulation of the barrier is fully automated which lead to a couple of problems in the past. The biggest problem is the water level variation around +0.50 m NAP in which the barrier has to close and open several times in a short time period. It is possible that the barrier is opening and the water level reaches +0.50 m NAP. In this case the barrier first needs to fully open before it can close again and manual intervention is not possible.
Other positive aspects are that the lifetime of the membrane is probably more than the designed 25 years and that maintenance cost have been very low so far [4].

4.2 General theory for inflatable barriers

To be able to use the design values form the Ramspol barrier and upscale them for the new Maeslant barrier it is necessary to take a more detailed look at filling material, crest height, and force transfer as well as the different load conditions and their reactions.

4.2.1 Crest height

According to the master thesis of Marjolein van Breukelen it is hard to find any general guidelines for the design of inflatable barriers [21]. Since the cost of the membrane has a major impact on the overall cost of the project the goal is to minimize the dimensions of the membrane. A good indicator for the amount of membrane needed per unit width of the barrier is the product of the membrane force T (see subsection 4.2.5) and the circumferential length L. The membrane force determines the thickness and the amount of reinforcement needed for the membrane. The product of those factors results in the amount of membrane needed.

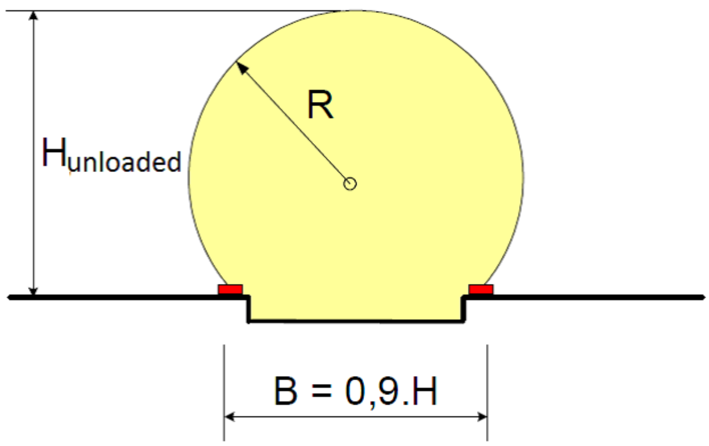


Figure 10: Two sided clamped inflatable dam [4]

The circumferential length of the membrane depends on the shape of the barrier and therefore also on the filling material. For an air filled barrier the minimal circumferential length for a certain unloaded crest height is achieved by applying 0.9 times the crest height as base width. With external loading of the air filled barrier, the crest height will increase, this means that the ignition crest height $H_{unloaded}$ can be chosen lower than the design crest height H. Water filled or water-air filled barriers require a larger circumferential length of the membrane to reach the same crest height. The circumferential length L can be calculated by multiplying the unloaded height with a factor of 2.76 [4].

4.2.2 Filler and filling mechanism

As already briefly explained in subsection 4.1.1 an inflatable barrier can be filled with air, water or a combination of both. The air filled dam is the most common used rubber barrier and covers almost 90 % of inflatable dams in Europe [21]. The force transfer and the deformation capacity of the barrier are strongly related to the filler. The stiffness of the inflatable barrier has a direct correlation with the differential pressure which again depends on the filler. The design of the barrier is significantly intertwined with the choice of the filler. The selection of the filler is often accompanied with the following aspects [4]:

1. The speed of opening and closing of the barrier in relation to the required pump capacity
2. The desired crest height of the barrier, the circumferential length and the required internal pressure to reach this crest height
3. The magnitude of forces that occur in the membrane and on the foundation depending on internal pressure, external load and dead weight of the membrane
4. The degree of stability of the barrier
5. The influence of the compressibility of the filler on the stiffness and the dynamic behaviour of the inflatable dam
6. Are there effects on the barrier as a result of moving of the internal water
7. Specific weather conditions like freezing
8. Durability of the membrane due to the filler
9. Degree of fluctuating loads (including wave and tidal loading)

Related to the aspects above the following table compares the three different filling materials air, water and the combination of both. According to this table the combined system turns out to be the best solution.

Table 6: Advantages and disadvantages of filling material [4][21]

Aspect:	**Filler: Water**	**Filler: Air**	**Filler: Water & air**	**Explanation**
1	−	+	0	Air is relatively easy to pump into the barrier. Water however requires way more energy. For a combined system the water can flow into the barrier due to gravity force after first pumping a little air in it. For deflation however the water needs to be pumped out.
2	-	−	+	For air filled barriers the internal pressure has to be increased to withstand the external hydraulic pressure. For a water filled barrier the internal pressure can be lower. However a water filled barrier needs a larger circumferential length. The combined filler allows to keep the differential pressure to a minimum.
3	-	−	+	For an air filled barrier the tension is high due to high internal pressure, the dead weight however is low. The tensions for a water filled barrier are lower but the dead weight much higher. The combined system is in between.
4	-	−	-	A water filled dam could move along with waves. An air filled dam has the tendency to V-notching. The combined system lies in between the two singular fillers.
5	+	-	++	For the combination of water and air this is adjustable due to the ability to increase the internal air pressure
6	0	0	-	No water no water movement. The water filled system is full of water so no internal movement can occur. The combined filler can lead to internal wave creating, the system is however damped and the effects are therefore minor.
7	-	+	-	Theoretically water could freeze which would lead to loss of flexibility of the barrier. Due to a great rise in temperature the air pressure might increase.
8	0	0	0	Aggressive salts can be a problem for the membrane. The effect is the same for all fillers.
9	0	0	+	A water filled dam could move along with waves. The combined system is more stable and can withstand several load combinations.
Result:	**-4**	**-2**	**+2**	

4.2.3 Force transfer

In case the inflatable barrier is uniformly loaded in longitudinal direction and the characteristics are constant the baring of loads stays in plane of the cross section. There is no transfer of loads in longitudinal direction to a neighbouring cross section. The load will be transferred in circumferential direction of the barrier to the clamping lines at the foundation. In case of non-uniform loading the loads will also be transferred in longitudinal direction. An in plane load transfer is shown in figure 11.

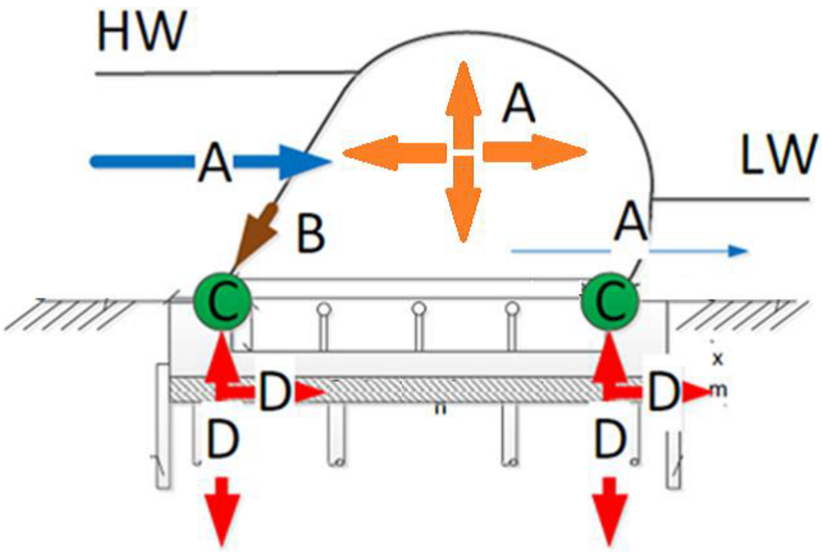


Figure 11: Load transfer inflatable rubber barrier clamped at two sides[21]

- A: Load due to the difference in water levels (head) and to the internal pressure of the filler
- B: The load due to the pressure difference (p) is transferred to the two clamping lines as a tension force in the membrane
- C: The clamping line transfers the membrane force to the foundation
- D: The forces in the clamping lines are distributed over the construction via the foundation floor and if present transferred to the pile foundation

For the transfer of the forces into the ground a couple of aspects related to the filler need to be considered. With a water filled barrier a great pressure is exerted on the foundation floor and the foundation piles due to the weight of the water. This can be an advantage in case of uplift forces under the foundation but also could be considered a disadvantage in case of a soil with weak ground layers. For the latter an air filled barrier might be better which however might then need tension piles.

The membrane force T is the result of the external load and the internal pressure. To keep the membrane force small the pressure difference p needs to be minimized. For a water-air filled barrier figure 12 shows internal pressures and external loads as well as the resulting pressure difference p.

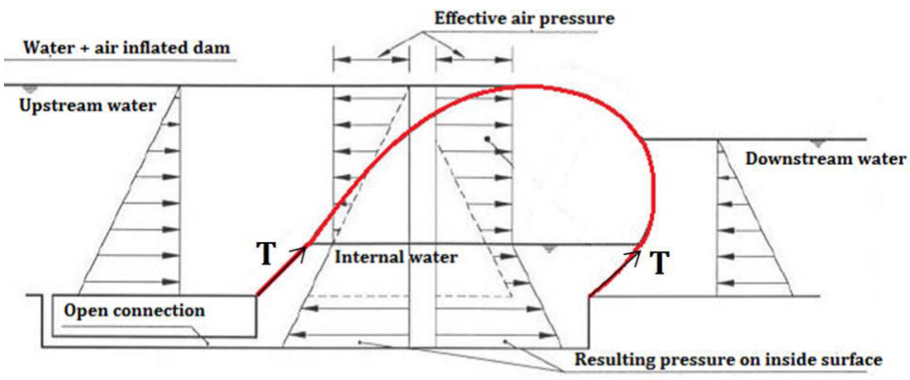


Figure 12: Acting forces on water-air filled rubber barrier [21]

For a two-sided clamped inflatable rubber barrier, the distribution of the horizontal load due to the difference in water levels ($H = 1/2 \cdot \rho \cdot g \cdot (h_1^2 - h_2^2)$) over both clamping lines is determined by the angle ϕ between the membrane and the horizontal. This situation is displayed below in figure 13.

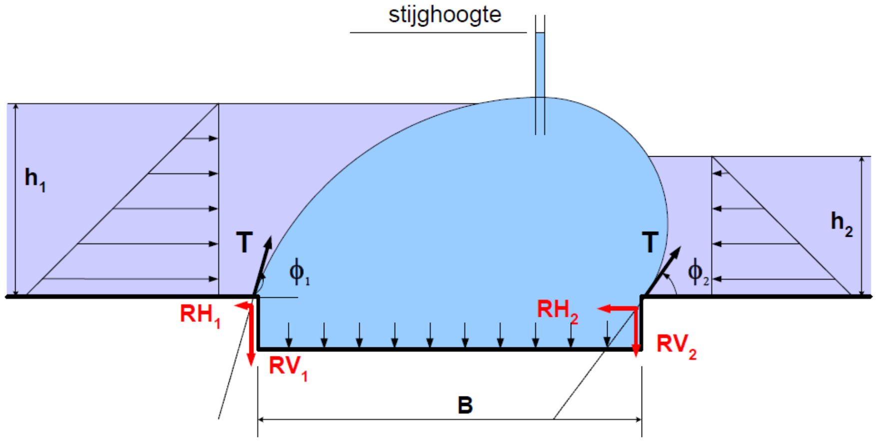


Figure 13: Load distribution over both clamping lines [4]

The horizontal and vertical component of the clamping forces as indicated in figure 13 can be calculated as follows:

$RH = -T \cdot cos(\phi)$
$RV = -T \cdot sin(\phi)$

The main part of the horizontal load H is transferred to the clamping line with the smallest angle ϕ. Depending on the shape of the barrier this can be on either side of the barrier. In an air filled dam with not too much internal pressure, the angle ϕ_1 is smaller than the angel ϕ_2 and so the main part of the horizontal load is transferred to the upstream clamping line. For a water filled dam the angel ϕ_1 is larger than the angel ϕ_2.

The horizontal equilibrium leads to:

$$H = -(RH_1 + RH_2) = T(cos\phi_1 + cos\phi_2)$$

Because of the over pressure inside the barrier the resulting forces at the clamping are always tension forces. The distribution of the horizontal load as prescribed above can be influenced by the internal pressure: the higher the internal pressure is set, the stiffer the barrier and the less the barrier is tilted by the given loads. Therefore the angles get greater and the distribution variates [4].

4.2.4 Pressure gradient of an inflatable rubber barrier

In subsection 4.1.2 it was already briefly discussed that the pressure gradient is related to the filling material used. This section will discuss the pressure gradient for the three main fillers.

Water filled inflatable rubber barrier

The piezometric head in the barrier is a constant quantity and the internal pressure is hydrostatic. Figure 14 shows that there is a constant resulting pressure at the place where there is internal and external water. This leads to a circular shape of the barrier in case the dead weight is neglected. The sections not in contact with the outside water have a non-circular transition arc shape.

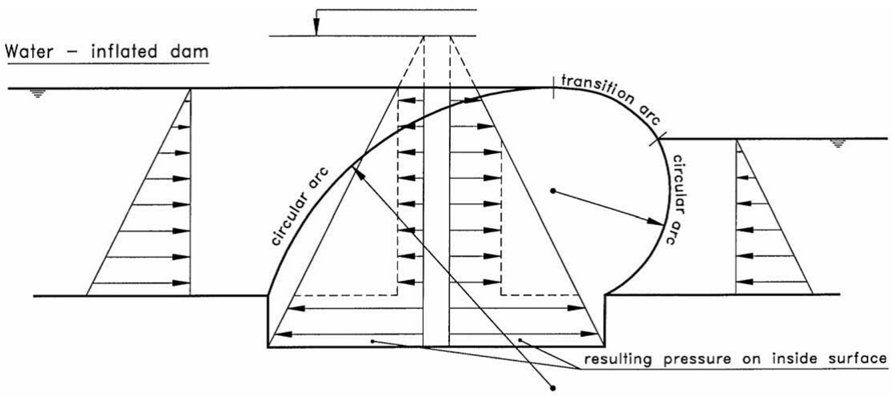


Figure 14: Pressure water filled inflatable rubber barrier [4].

Air filled inflatable rubber barrier

The internal pressure is constant in a air filled rubber barrier. The resulting pressure on the membrane now is constant on the section of the barrier in contact with the external air. This is shown below in figure 15. This again leads to a circular shape of the barrier. At the sections of the barrier in contact with water the resulting pressure is linear and the shape is non-circular again. The curvature of the dam is directed inwards at the sections where the outside water pressure is greater than the effective internal pressure.

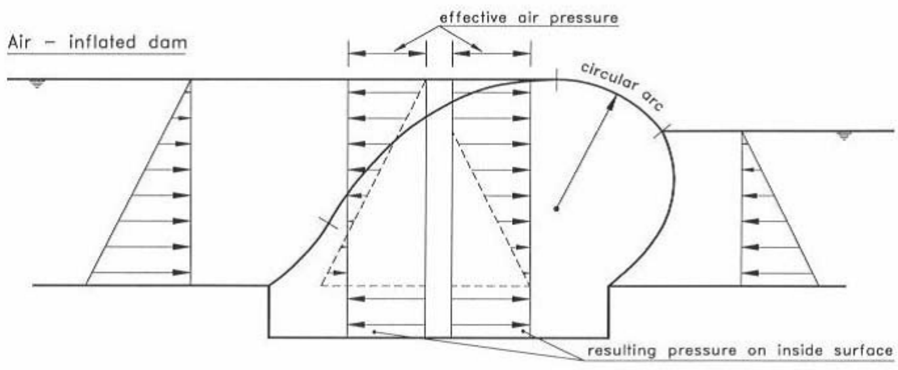


Figure 15: Pressure air filled inflatable rubber barrier [4].

Water-air filled inflatable rubber barrier

The pressure gradient for a water-air filled barrier is more complicated (see figure 16). At the section of the barrier where no resulting pressure exists (see left bottom corner in figure 16) the barrier has a linear shape in case the dead weight is neglected. Circular shapes result at sections where either there is both, internal and external, air or water. For a water-air filled barrier the constant air pressure needs to be added to the hydrostatic pressure of the water. The internal water can be in open connection with the water upstream. The internal water level is limited by the minimum air pressure needed so no sagging will occur in the membrane.

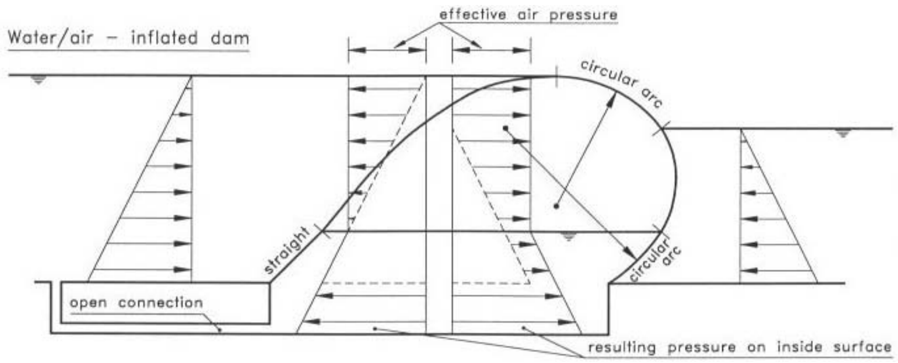


Figure 16: Pressure water-air filled inflatable rubber barrier [4].

4.2.5 Hydrodynamic and load conditions

Static Analysis

To be able to use the Information about the Ramspol barrier to upscale for the Maeslant barrier it is important to understand how the membrane forces behave. Because the force in longitudinal direction is very small in comparison to the force transfer in normal direction only forces in circumferential direction are analysed. Inflatable rubber barriers can be analysed by the “Classical Form Finding” technique according to the book on Structural Design-Special structures by J.L. Coenders [18]. This technique is based on the “form follows force” principle. This means that the shape of the inflatable barrier depends on the forces acting on it. The internal and external forces acting on a cylindrical and on two sides clamped barrier are shown in figure 17.

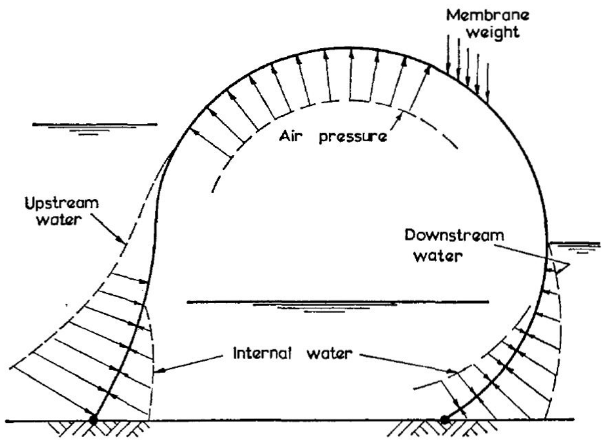


Figure 17: Internal and external loading on a membrane dam [10]

The main theory behind the numerical analysis of an inflatable rubber barrier has been published by various experts; in particular H. B. Harrison, 1970 [10] and R. D. Parbery, 1978 [32]. Looking at a cross-sectional element of the membrane with a linear load in longitudinal direction the equilibrium can be shown. This can be done because the membrane transfers the tension force over the entire length of the two clamping lines. Each element immediately receives a deformation with an equilibrium between internal pressure, external loads, the dead weight of the membrane and the axial membrane forces [4]. The principle is shown in figure 18.

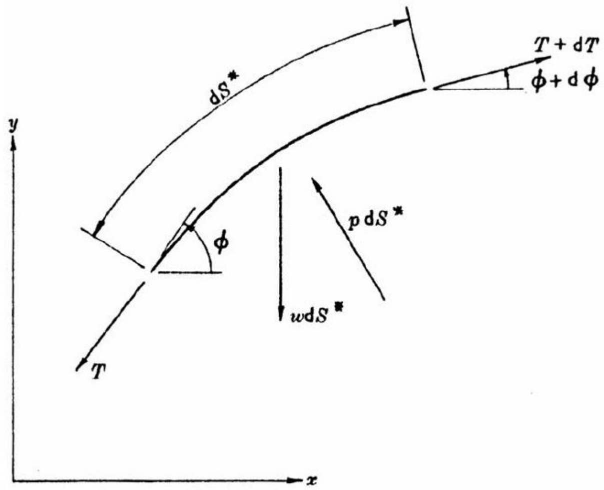


Figure 18: Forces on an element with length dS* [4]

The static equilibrium in one element with an unloaded length dS and a loaded length dS* (S = coordinate in circumferential direction of the membrane) is described for the limiting case of dS* $\rightarrow$ 0 [4].

Tangential equilibrium: $(T + dT) \cdot cos(d\phi) = T + w \cdot dS * \cdot sin(\phi)$
Since $d\phi$ is very small $\rightarrow cos(d\phi) \approx 1$.
This leads to $dT = w \cdot dS * \cdot (\phi)$

Radial equilibrium: $p \cdot dS * + (T + dT) \cdot sin(d\phi) = w \cdot dS * \cdot cos(\phi)$
Since $d\phi$ is very small $\rightarrow sin(d\phi) \approx d\phi$ and $d\phi \cdot dT \approx 0$.
This leads to $p \cdot dS * - w \cdot dS * \cdot cos(\phi) = -T \cdot d\phi$

With:
T = membrane force in axial direction (N)
w = force due to dead weight of the membrane (N/m)
p = resulting pressure on the membrane (N/m)

From the tangential equilibrium (circumferential direction) of the element it follows that by neglecting the force due to dead weight of the membrane w, dT becomes zero. Therefore the membrane force T in circumferential direction is constant. From that the radial equilibrium becomes:

$$p \cdot dS* = -T \cdot d\phi$$

In case of uniform material the extension of the membrane in circumferential direction is given by the stress-strain relation according to Hooke's law:

$$\frac{dS*}{dS} = \frac{1}{E} \cdot (\frac{T}{t}) + 1$$

Where t is the thickness of the membrane and E the young's modulus in circumferential direction.

The curvature κ of the membrane is given by the following equation:

$$\kappa = \frac{1}{R} = -\frac{d\phi}{dS*} = \frac{(p - w \cdot cos\phi)}{T}$$

(A positive curvature means a deformation of the membrane in outward direction)

Furthermore:
dx/dS* = cosϕ
dy/dS* = sinϕ

The geometrical boundary conditions are:
S = 0: $\rightarrow$ x = 0, y = 0
S = L: $\rightarrow$ x = B, y = 0
(L = circumferential length of membrane in unloaded condition, B = horizontal distance between the clamping lines)

With the above set of equations and conditions, the shape and the membrane force T of an inflatable dam can be calculated, provided that the resulting pressure p as a function of S is known and also the dead weight w of the membrane. The calculation is bound to an iterative process [4].

For the scale enlargement of an inflatable dam it is important to know what the influence is of a larger dam (higher crest) on the membrane forces. Dorreman [17] has studied what the influence is on the membrane force is due to the variation of internal pressure, water levels external and internal, base width and membrane length. The conclusion of that study can be summarized as follows:

- A larger width of the base increases the membrane force
- A larger length of the membrane increases the membrane force
- A larger internal pressure causes larger membrane forces
- A larger external load causes smaller membrane forces

In the study of Dorreman the parameters were variated individually, what happens if two or more parameters are changed at the same time needs further analysis.

Dynamic Analysis

In case of dynamic loads both external loads and internal pressures of the inflatable rubber barrier change as a function of time. As a result, the membrane moves and deforms as a function of time and place. Also the membrane force is subject to variation in time and place in circumferential direction and does not remain constant [21].

The dynamical analysis primary deals with the dynamical equilibrium between the loads variating in time, the inert forces, damping and elastic forces. Static and dead weight loads do not play a role in the dynamic analysis however they are still responsible for the shape of the barrier at the moment that a dynamic load acts.

The membrane force T_0 as a result of a static pressure p (p can be variable along the circumference of the membrane) is constant in circumferential direction when dead-weight is neglected. The membrane force T as a result of the dynamic pressure q varies, as well as the dynamic pressure q itself as a function of time and positon along the circumference of the membrane. The dynamic pressure q includes both external loads as hydrodynamic forces (interaction forces) [4].

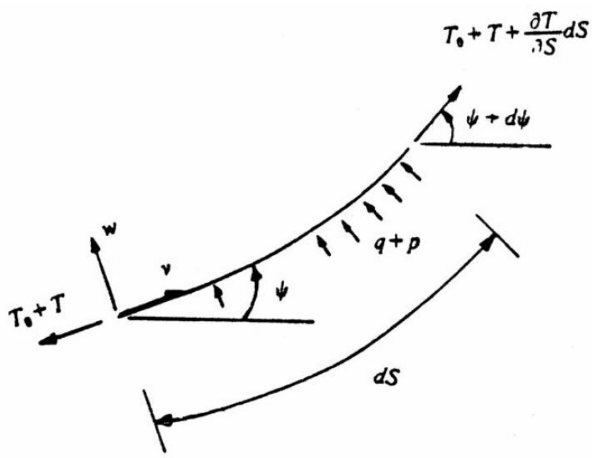


Figure 19: Dynamic equilibrium of an element of a cylindrical membrane [4]

According to figure 19 the tangential and radial equilibrium can be written as:

Tangential equilibrium: $\mu \cdot dS \cdot \frac{\partial^2 v}{\partial t^2} = (T_0 + T + \frac{\partial T}{\partial S} \cdot dS) \cdot cos(d\phi) - (T_0 + T)$
Since $d\phi$ is very small $\rightarrow cos(d\phi) \approx 1$.
This leads to $\mu \cdot \frac{\partial^2 v}{\delta t^2} = \frac{\partial T}{\partial S}$

Radial equilibrium: $\mu \cdot dS \cdot \frac{\partial^2 w}{\partial t^2} = (T_0 + T + \frac{\partial T}{\partial S} \cdot dS) \cdot sin(\frac{d\phi}{2}) + (T_0 + T) \cdot sin(\frac{d\phi}{2}) + (q+p) \cdot dS$
Since $d\phi$ is very small $\rightarrow sin(\frac{d\phi}{2}) \approx \frac{d\phi}{2}$
This leads to $\mu \cdot \frac{\partial^2 w}{\partial t^2} = T_0 \cdot \frac{\partial \phi}{\partial S} + T \cdot \frac{\partial \phi}{\partial S} + (q+p)$

With:
T_0 = membrane force for static load p (N)
T = membrane force for dynamic load q (N)
q = resulting dynamic pressure on the membrane (N/m)

p = resulting static pressure on the membrane (N/m)
μ = mass of the membrane (kg/m)

4.3 Upscaling Maeslant barrier

In this section the information and knowledge gathered above is used to make a design for the dimensions of the Measlant barrier. First the filler and the crest-height will be discussed, taking the chosen values aspects about the fabric will be discussed in subsection 4.3.5. With known forces that need to be transferred the abutments and after that the foundation can be designed. At the end of this section also other aspect to be considered are explained and designed. The Ramspol barrier is still taken as a reference object but due to different boundary conditions several parameters of the new Maeslant barrier deviate. The new Maeslant barrier has a greater crest-height, a larger horizontal distance between the two clamping lines and therefore also a greater circumferential length of the membrane. Also the internal pressure is a little higher. The following two tables give the difference in boundary conditions and dimensions in relation to the Ramspol barrier.

4.3.1 Filler

In subsection 4.2.2 the water-air filled inflatable barrier was considered the best system. The filler is chosen to be a combination of water and air because due to the high internal pressure and the following high tension force in the membrane an air filled barrier was not possible. For the Ramspol barrier this system was applied with success and therefore the water-air filled barrier will be adopted in the same way for the new Maeslant barrier.

The advantages of a the water-air filled barrier are:

- The inflatable barrier is during wave loads stiffer than a completely air filled barrier
- During retaining the present water in the barrier has a positive effect on the weight of the foundation since the tension forces are smaller
- The closing procedure only needs air compressors since the water is flowing in naturally inward
- Since the interior of the barrier is in open connection with the upstream water, the shape and the pressure of the inflatable barrier fits itself to the changing water levels
- Deflating the barrier only needs water pumps, the air is pressed out of the barrier due to the external water pressure

4.3.2 Loads

The different external loads acting on the inflatable membrane for the new Maeslant barrier will be discussed here. To be considered are the hydrostatic load, wave load and wind load.

Hydrostatic water pressure

The hydrostatic water pressure can be calculated with the following formula:

$$1/2 \cdot \rho \cdot g \cdot h^2$$

Table 7: Upstream and downstream water pressure

Parameter	Ramspol barrier	New Maeslant Barrier
Upstream water pressure	$1/2 \cdot \rho \cdot g \cdot 8.2^2 = 330\,kN/m$	$1/2 \cdot \rho \cdot g \cdot 22^2 = 2'374\,kN/m$
Downstream water pressure	$1/2 \cdot \rho \cdot g \cdot 3.6^2 = 64\,kN/m$	$1/2 \cdot \rho \cdot g \cdot 18^2 = 1'589\,kN/m$

Wave load

Waves cause an additional pressure on the membrane which is variable over time. This pressure depends on the wave height and the wave number of incoming waves. For the first design of the new Maeslant barrier the wave loads are neglected.

Wind load

Van Breukelen calculated the wind load for the Ramspol barrier to be $2\,kN/m^2$ and $8.8\,kN/m$ [21]. These loads are negligible in comparison to the static water loads acting on the membrane. From this the assumption is made that wind load is also negligible for the new Maeslant barrier. For this reason the wind loads are not included during the design of the new Maeslant barrier.

Negative head

As the barrier is symmetrical, with two clamping lines, it is able to retain water from both sides. This means that the barrier can retain the same negative head as the head calculated from the storm surge on the sea side of the barrier. The only difference is that the inside water level is no longer connected to the upstream water anymore, but has a connection to the downstream water level at the North Sea. Since the internal air pressure is adjustable within certain boundaries this causes no problems.

4.3.3 Membrane force calculations

In subsection 4.2.1 formulas were given to make a first calculation of the needed dimensions of the barrier. Theses formulas however are for air filled barriers only and cannot be applied here. The responding proportions for a water-air filled barrier can be derived from the Ramspol barrier. The following relations are applicable [4]:

$L = 2.96 \cdot H$
$B = 1.59 \cdot H$

In which H is the crest height of the barrier, L the circumferential length of the membrane and B the width between the two clamping lines. This leads to the following dimensions for the new Maeslant barrier:

$L = 2.96 \cdot 22\,m = 65.1\,m$
$B = 1.59 \cdot 22\,m = 35.0\,m$

With the information given in subsection 4.2.3 it is possible to get a good first estimation of the membrane force by using the horizontal equilibrium.

$H = 1/2 \cdot \rho \cdot g \cdot (h_1^2 - h_2^2)$

$H = -(RH_1 + RH_2) = T(cos\phi_1 + cos\phi_2)$

These two equations lead to:

$T = \frac{1/2 \cdot \rho \cdot g \cdot (h_1^2 - h_2^2)}{cos\phi_1 + cos\phi_2}$

By assuming that the angles of the membrane are the same for the new Maeslant barrier and the Ramspol barrier one can find multiplication factor for the membrane force with the following relations [20]:

$T_{new\,Maeslant} = \nu \cdot T_{Ramspol}$

$\nu = \frac{h^2_{1,new\,Maeslant} - h^2_{2,new\,Maeslant}}{h^2_{1,Ramspol} - h^2_{2,Ramspol}}$

Based on this theory the following table gives the membrane force of the Ramspol barrier [4] and the expected membrane force for the new Measlant barrier.

Table 8: First estimation of membrane force

Parameter	Ramspol barrier	New Maeslant Barrier
h_1	8.2 m	22.0 m
h_2	3.6 m	18.0 m
$h_1^2 - h_2^2$	54.28 m^2	160 m^2
ν	-	2.95
T	200 kN	590 kN

4.3.4 Crest-height

With the initial parameters for the width between the clamping lines and the circumferential length of the membrane made in subsection 4.3.3 and the spread sheet made by Arjan Dirkmaat a first calculation of the crest-height can be made [1]. The spread sheet was validated by using the parameters of the Ramspol barrier given in table 9 below. For comparison the initial conditions for the Bolivar Roads barrier, designed by Marjolein van Breukelen, are included in table 9 as well. The membrane force calculated by the spread sheet was 201.33 kN/m and the actual calculations of the Ramspol barrier showed a membrane force of 200 kN/m. Therefore, it is concluded that the spread sheet approach is valid to use for the membrane force calculation.

Table 9: Parameters of the Ramspol and initial parameters of the new Maeslant barrier [21]

Parameter	Ramspol barrier	New Maeslant Barrier	Bolivar Roads
Inflatable barrier height [H]	8.2 m	22.0 m	19.0 m
Base width [B]	13 m	35 m	31.8 m
Circumferential membrane length [L]	24.3 m	65.1 m	59.2 m
Internal air pressure (P_{air})	37.3 kN/m^2	59.7 kN/m^2	58.0 kN/m^2
Internal water level [h]	3.77 m	17.0 m	13.2 m
Upstream water pressure [P_{ext}]	281 kN/m	2'374 kN/m	1'815 kN/m
Downstream water pressure [P_{ext}]	90 kN/m	1'589 kN/m	724 kN/m

To be able to calculate the equilibrium per element length dS a distinction has to be made between the different loadings of the elements. Figure 20 shows the different loading cases that can occur in a water-air filled inflatable rubber barrier, whereas table 10 gives the pressure formulas for the different locations.

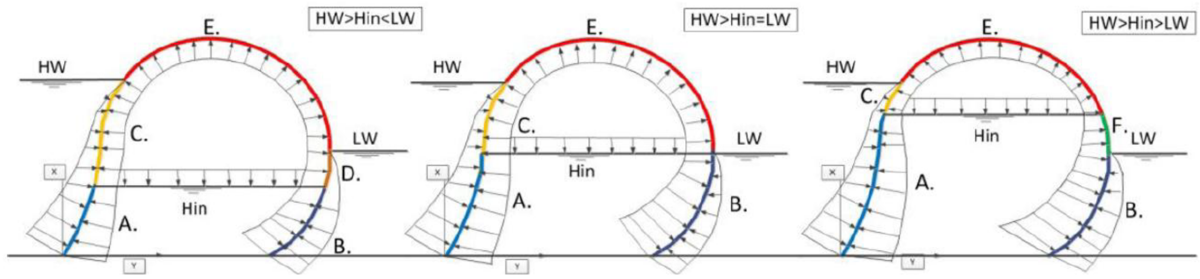


Figure 20: Occurring load situation along the length of the membrane [21]

Table 10: Applying pressure equations along length of membrane [17]

Location	External pressure	Internal pressure	Resulting pressure p
A + B	water	water	$\rho_w \cdot g \cdot (H + h - H_w)$
C + D	water	air	$\rho_w \cdot g \cdot (H - H_w + y_i + \Delta s \cdot sin(\alpha/2))$
E	air	air	$\rho_w \cdot g \cdot H$
F	air	water	$\rho_w \cdot g \cdot (H + h - y_i - \Delta s \cdot sin(\alpha/2))$

Using the given formulas above the spread sheet first calculates the angle of the membrane using the resulting pressure for each element depending on its location and dividing it by the initial tension force. That equation is derived from the radial equilibrium given in subsection 4.2.5

$$p \cdot dS* = -T \cdot d\phi \quad \rightarrow \quad d\phi = \frac{p \cdot dS}{T}$$

The next step is to calculate the resulting pressure inside the barrier using the internal air and water pressures:

$$P_{in} = \frac{dP \cdot g}{10} + \rho_w \cdot g \cdot (H_{in} - Y_{coordinate})$$

Using the internal pressure and the hydrostatic water pressures up- and downstream the pressure difference ΔP for each element of length dS can be calculated depending on its position.

With the resulting pressure difference ΔP and the angle of each element the horizontal and vertical forces can be calculated using the following equations:

$$F_{horizontal} = sin(\phi) \cdot (dS \cdot b) \cdot \Delta P$$
$$F_{vertical} = cos(\phi) \cdot (dS \cdot b) \cdot \Delta P$$

In which b is the width of the barrier you are looking at, in this case b is set to 1 meter. From the horizontal and vertical equilibrium in each element the Tension force follows with:

$$T = \sqrt{F_{horizontal}^2 + F_{vertical}^2}$$

Finding the optimal shape of the rubber barrier and its resulting horizontal and vertical forces is coupled to an iterative process which can be solved by the use of the solver in the spread sheet. The solution is found when the total deviation of the initial tension force and the calculated tension force is zero. For the initial calculation the internal water level is set to 17 meters. In this initial state the membrane force is calculated to be 723.5 kN/m'. The calculations can be seen below in figure 22. The total deviation is zero and the calculated crest-height is 22.55 meters. With the tension force it is now possible to calculate the horizontal and vertical reaction forces at the clamping lines.

Considering the start of the membrane in point A and the end in point B the reaction forces are calculated as follows:

$R_{H,A} = T \cdot cos(\phi_A) = 723.54\,kN/m \cdot cos(54.7°) = 423.5\,kN/m$
$R_{V,A} = T \cdot sin(\phi_A) = 723.54\,kN/m \cdot sin(54.7°) = 586.6\,kN/m$
$R_{H,B} = -T \cdot cos(\phi_B) = -723.54\,kN/m \cdot cos(239.5°) = 369.1\,kN/m$
$R_{V,B} = -T \cdot sin(\phi_B) = -723.54\,kN/m \cdot sin(239.5°) = 622.3\,kN/m$

Using these values it is now possible to design the clamps at the start and the end of the inflatable rubber barrier. A more detailed calculation for the last element of the membrane in point B for the initial conditions is given in appendix A.

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	35.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	5.97	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N

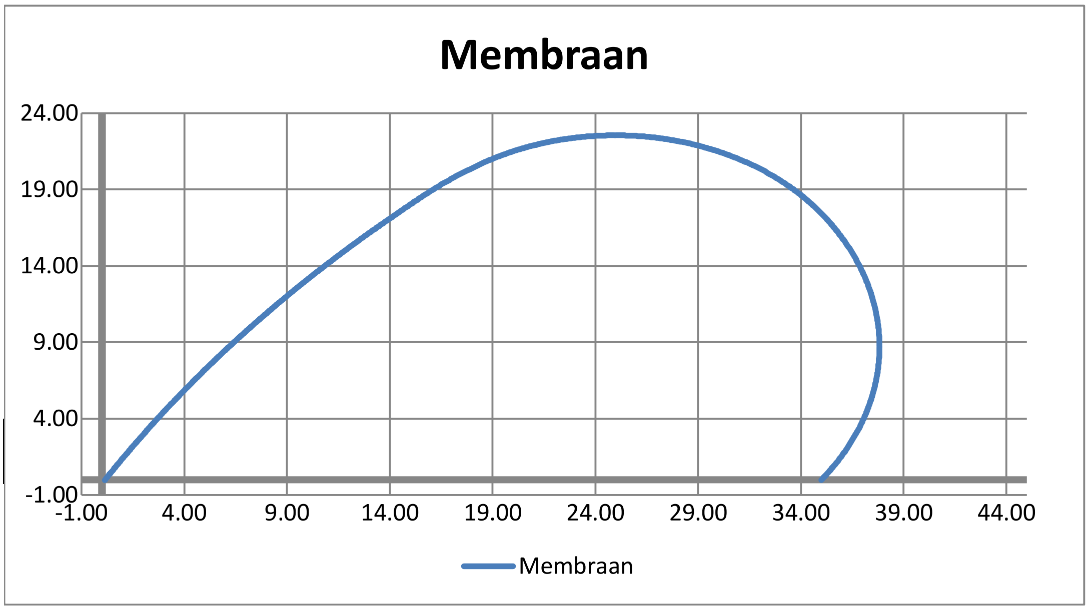


Figure 21: Crest-height calculations with initial parameters - Input

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN
Belasting per klemlijn op basis van trek				
	Punt B	Punt A	totaal	
RH	369.1	423.5	792.6	kN
RV	622.3	586.6	1`209.0	kN
Verschil verval en horizontal klemlijn		1%	7.78	kN

Berekende waardes				
Tenstion		T	723.54	kN/m2
			723542	N
Eind hoek	ϕB	h1	4.18	Rad
			239.3	Graden
			59.3	Graden
Start hoek	ϕA	h2	0.95	Rad
			54.2	Graden

Volumes	m3	%
Water	522.55	86.48%
Lucht	81.71	13.52%
Totaal	604.26	

Coordinaten	X	Y
Maxima	37.83	22.55
Vast punt 1	-	-
Vast punt 2	35.00	-
Onnauwkeurigheid	0.14	-0.02
	0.14	0.00
Onnauwkeurigheid	1.45	0.06
Totaal	0.06	
Factor		0.55
Ybij X max	-	
X bij Y max		24.96

Afwijkingen	m	%
Hbalg	1.45	
X	0.14	0.40%
Y	0.02	0.10%
Hverval	7.78	6.60%
Totaal		0.50%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure 22: Crest-height calculations with initial parameters - Output

After the initial parameter have been set and a possible solution was achieved an optimization can be conducted by changing parameters. The goal is to reach the lowest tension force in the membrane with a minimum crest height of 22 meters. The first optimization is conducted by decreasing the base width which leads to a higher crest-height.

Table 11: Membrane force and crest-height due to smaller base width

New Maeslant barrier	**B= 34.5 m**	**B= 34.0 m**	**B= 33.0 m**	**B= 32.0 m**	**B= 31.0 m**	**B= 30.0 m**
Crest-height [m]	22.62	22.72	22.91	23.07	23.10	23.28
Membrane force [kN/m']	711.30	710.07	709.87	708.04	652.12	669.40
Air pressure [kN/m^2]	0.59	0.59	0.59	0.60	0.57	0.58

From the table above it becomes clear that a base width of 31.0 meters is the best option. The second approach for optimization is to decrease the circumferential length of the membrane which will lead to a decrease in crest-height. For this optimization the base width is already set to 31.0 meters.

Table 12: Membrane force and crest-height due to smaller membrane length

New Maeslant barrier	**L= 67.0 m**	**L= 66.0 m**	**L= 65.5 m**	**L= 65.0 m**	**L= 64.5 m**	**L= 64.0 m**	**L= 63.5 m**
Crest-height [m]	24.23	23.57	23.33	23.12	22.89	22.62	22.38
Membrane force [kN/m']	748.8	664.6	667.6	680.5	689.2	691.4	694.13
Air pressure [kN/m^2]	0.6	0.57	0.57	0.59	0.60	0.59	0.60

This approach leads to a minimal tension force of 664.6 kN/m' with a base width B of 31 meters and a circumferential length of the membrane L of 66.0 meters. Using however the excel solver with variable internal air pressure, membrane length and base width, the optimized rubber barrier has the following parameters:

- Base width: B = 30.58 m
- Membrane length: L = 65.90 m
- Tension force: T = 651.5 kN/m'
- Internal air pressure: P_{in} = 56.3 kN/m^2
- Crest-height: H = 23.54 m

The crest-height is higher than the required height of 22 meters which gives an additional safety for dynamic loads which are not included in the calculations. All calculations of the optimization can be found in the appendix B. Below in figures 23 and 24 the final design is shown with the design crest-height and the relevant water levels.

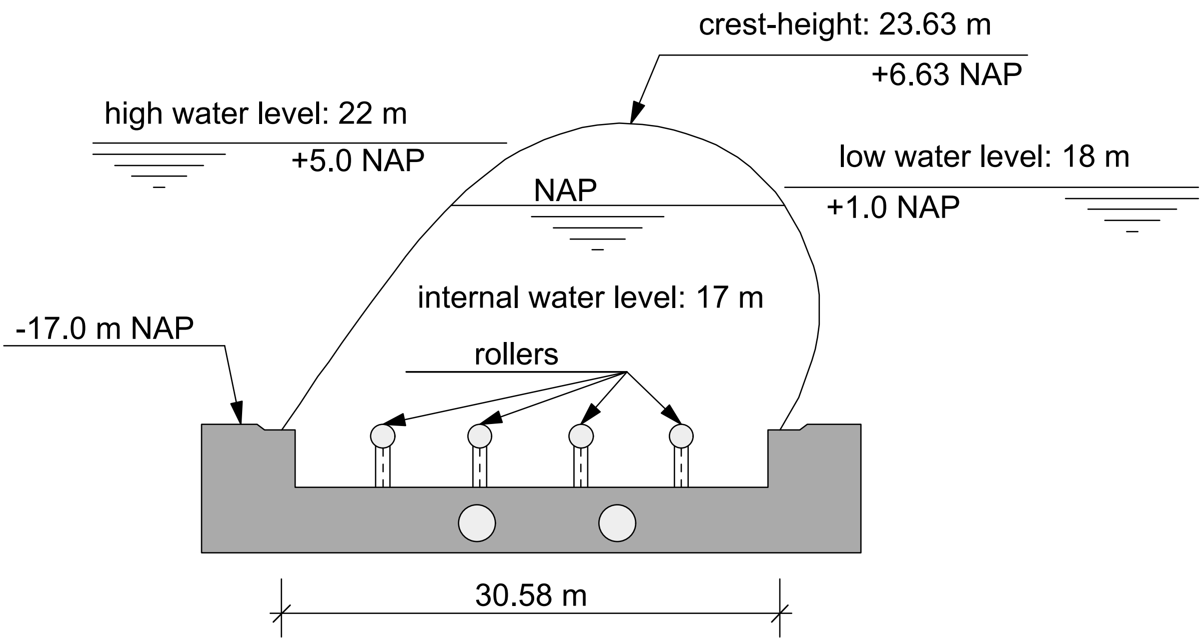


Figure 23: Final design of the inflatable rubber barrier

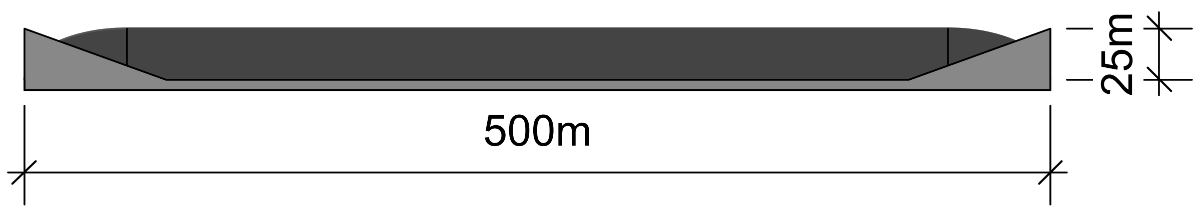


Figure 24: Possible inflatable rubber barrier in the new waterway

An additional advantage of the new inflatable barrier is the increase of cross-section of the new waterway which can be used for navigation. The additional cross-section is shown in dark blue in figure 25 below.

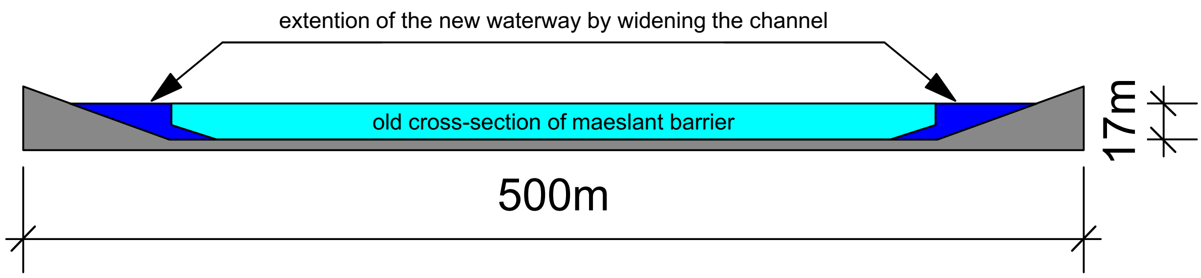


Figure 25: Cross-section comparison between old Maeslant and new inflatable rubber barrier

Marjolijn van Breukelen already made a sketch for an inflatable barrier on the site of the existing Maeslant barrier which she presented at the "waterbouwdag" in 2014. A possible design could look like shown below in figure 26

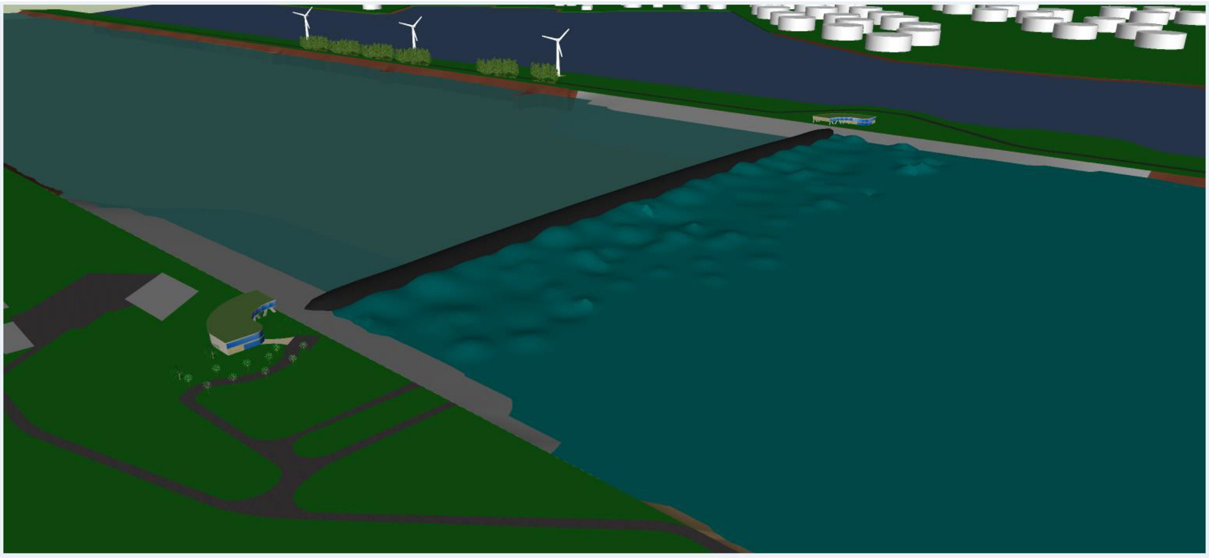


Figure 26: Possible design sketch of new inflatable rubber barrier [22]

4.3.5 Fabric

The membrane of the barrier should be strong enough to resist both static and dynamic forces and must have a sufficient fatigue resistance level. Additionally the membrane needs a sufficient flexibility for clamping and storing. In general inflatable barriers are mad of a rubber coated fabric with a thickness between 10 and 20 mm with a high enough resistance against UV rays, water and oil. Normally the membrane is made of nylon reinforced rubber. However the reinforcement does not only make the membrane stronger but also stiffer. The main direction of reinforcement is in circumferential direction because of the main load transfer to the clamping lines [21].

For the Ramspol barrier the membrane material had to comply with a number of design requirements. These terms are most generally expressed as follows:

– It had to be water- and airtight under considerable pressures
– It had to be strong enough – statically and in terms of fatigue
– It had to be elastic and give a stable gate shape under all conditions
– It had to be durable, ensuring long term service

According to the Japanese design practice, the actual fabric strength should be eight times as high as the tension in the middle section of the barrier [37].

Due to increased forces in the rubber body, the design for the new Maeslant barrier cannot be based on the proven materials for existing dams or the Ramspol barrier. It is necessary to conduct tests and experiments with different types of materials and reinforcements.

Test on the fabric of the Ramspol barrier have shown that after fatigue loading, ageing and relaxation from prestresses the strength of the membrane was nearly cut in half. However the strength was still at around 970 kN/m [21]. This means that it is possible to fabricate a membrane that will resist the forces of the new Maeslant barrier.

4.3.6 Abutments

To be able to connect the membrane of the inflatable barrier to the abutments an overlength of the membrane is necessary in two directions:

- The dimensions of the membrane must be sufficient to store the membrane properly in the recesses at the bottom and the abutments
- To prevent load transfer in longitudinal direction at the transitions to the abutments the membrane must have enough freedom of movement.

This overlength of the membrane causes folds and therefore peak stresses that are higher than the strength of the membrane. This is because of the uneven load distribution to the clamping lines. To overcome this problem a smaller slope angle of the abutments should be considered since this leads to a longer clamping length which decreases the overlength of the membrane. To reduce the overlength even more a circular clamping line could be applied at the top of the abutment. The connection of the membrane to the abutment than forms a half ellipsoid.

One big disadvantage of the ellipsoid clamping at the abutment is water leakage over the abutments due to the low connection point at the end face of the barrier. Since the existing Maeslant barrier also has leakage due to a gap between the two gates this should not be a problem here [21]. This means that it is even possible to design an inflatable barrier without any abutments which has the advantage that there will be none or just small folds in the membrane. In the case that the barrier is inactive and stored in the bottom recess it is completely invisible.

4.3.7 Bottom recess structure

In open stage when the inflatable barrier is deflated the membrane needs to either lie flat and stable on the river bed or be stored in a bottom recess structure. If the membrane is not stored properly danger in ship collision or flow blockage can occur. Collision occurred at the Ramspol barrier but lead to no damage of the membrane. In case of a collision at the new waterway the membrane will definitely be damaged due to the bigger ships passing. The flap that can occur is shown below in figure 27. Experience with the Ramspol barrier shows that flaps of around 30-60 cm occur. Since the bottom recess for the new Maeslant barrier is at -17 m NAP and the maximum draft of the design vessel is 15.2 m, the risk of collision with the flap is low but still existent.

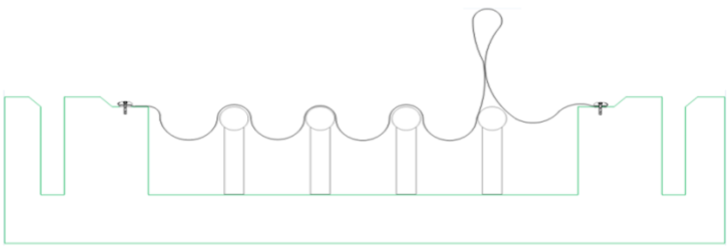


Figure 27: Cross-section of bottom recess with flap [21]

To facilitate the horizontal transport of the membrane roller conveyors can be arranged in the bottom recess. In the deflated case the membrane than fits exactly over the ribs created by the conveyors and will be held in place by using an under-pressure. The storing process can be divided into three major phases as shown in figure 28. First the barrier is deflated and the membrane lies flat on the bottom. Than the sheet is sucked due to underpressure into the first trench at the downstream side. After that redistribution across the recess takes place until the membrane fits perfectly over the ribs.

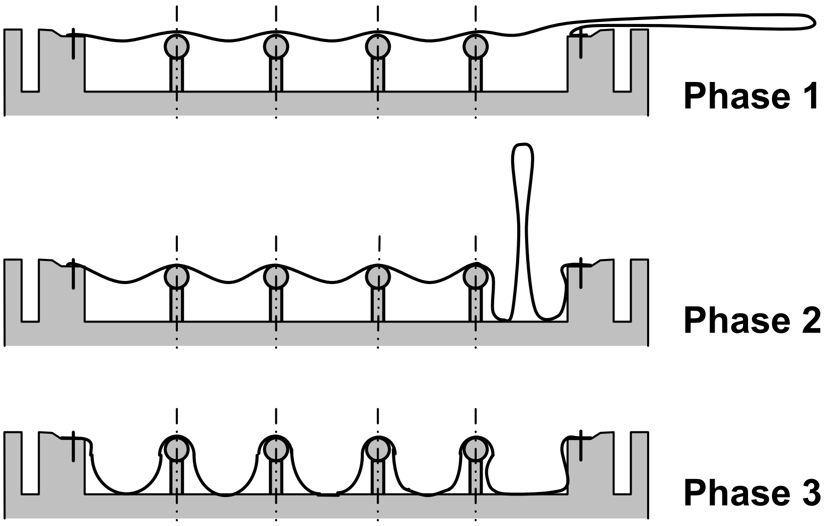


Figure 28: Cross-section of bottom recess phases 1 - 3 [37]

It is necessary to keep the friction between the bottom and the membrane as low as possible so moving in transversal direction is possible without strong friction forces. In practice it appears regularly that the membrane at the Ramspol barrier is unevenly distributed over the rollers and a flap occurs. In order to improve the storage it is possible to deflate the barrier in several stages called pressure management [21].

Figure 29 shows another possible storage concept consisting of a bottom recess with cover plates. This was already executed for the inflatable Weespertrekvaart barrier in Amsterdam. This solution however might not be suitable for the new Maeslant barrier because the cover plates with a length of around 15 meters would be too heavy to lift by inflation.

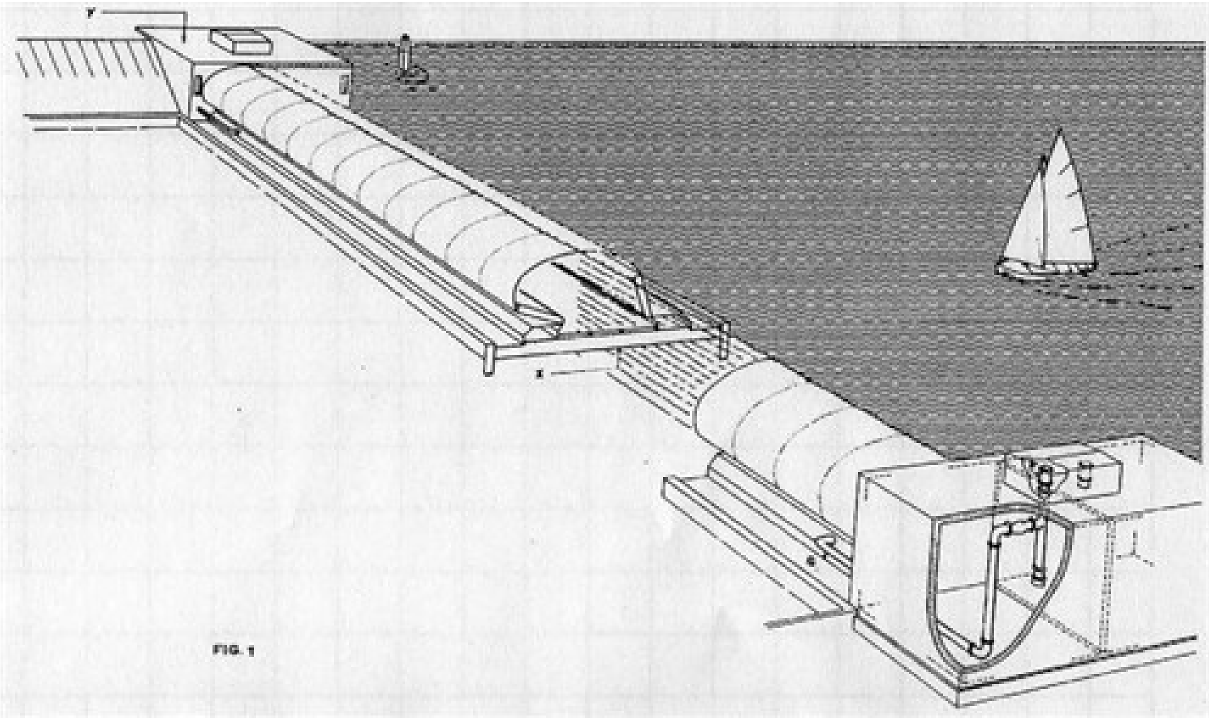


Figure 29: Inflatable rubber barrier Weespertrekvaart [34]

The conclusion is that the system with a bottom recess and rollers might be the best solution however it needs some improvement regarding the friction forces. Marjolein van Breukelen introduced a bottom recess with several small rollers. That might reduce the friction force however leads to more movable parts inside the barrier which is not preferred [21]. Also the friction in the rollers should not increase over time which also leads to the fact that a solution with more rollers is not feasible. To find a good solution to store the membrane and prevent the occurrence of flaps scale model tests with different solutions should be conducted.

4.3.8 Foundation

Normally an inflatable rubber barrier consists of a bottom recess discussed above and a foundation structure, either deep or shallow. In a first step a shallow foundation would be designed. This means that the bottom recess and a thin concrete floor would form the foundation. In case that structure is not stable enough it can be extended to a deep foundation with a pile structure as it was also applied for the Ramspol barrier. One possible solution with foundation piles is shown below in figure 30. The cases that need to be checked are static stability, dynamic stability due to waves from ship passing, settlement, buoyancy and geotechnical failure mechanisms like slip circles and piping. Piles will always be necessary in case of weak soil layers which cannot support the foundation structure. The piles will also be necessary in case buoyancy becomes a problem, however than the piles become tension piles.

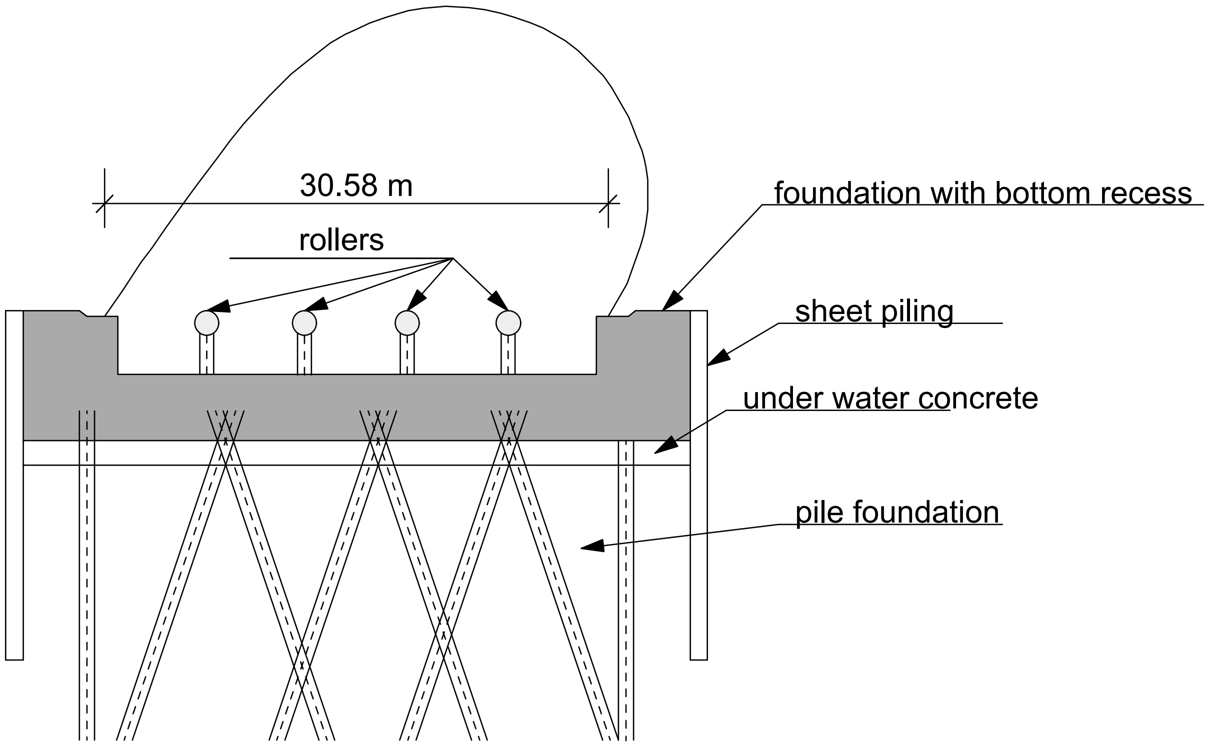


Figure 30: Possible foundation structure with piles

4.3.9 Bed protection

Because high flow velocities occur during closure at the existing Maeslant barrier a huge bed protection with several filter levels was constructed. Since the concept with an inflatable rubber barrier increases the flow area the flow velocities will decrease. For a first design it can be said that no bed protection is necessary but to in a next step flow velocity calculations will be necessary to review this statement.

4.3.10 Maintenance

Since rubber does not corrode and also does not need any painting the need for maintenance of rubber dams and barriers is minimal. However damage of the barrier can still occur due to vandalism or flood borne debris, especially sharp object. The maintenance will primary consist of periodic inspections and routine maintenance.

If maintenance becomes necessary, in principle maintenance work can be conducted from the in- and/or outside. Preferably the work is done from the inside of the barrier. To be able to do so the barrier has to be filled with air only. This causes several problems. Maintenance would be conducted during summer and normal conditions meaning that the water levels are the same on both sides of the barrier. With a water height of 18 meters the pressure on the membrane from the water load on top is 1.8 bar. This means that at least 2.8 bar is needed to lift the membrane from the floor considering the atmospheric pressure action on the water as well.

After the barrier has been totally filled with air the pressure can be reduced to the hydrostatic pressure action at the bottom of the barrier. This is however still 1.8 bar meaning that the internal pressure can only be reduced to 1.8 bar to make sure the barrier stays inflated. The internal pressure exceeds the atmospheric pressure by 0.8 bar meaning that there is an overpressure present in which the work would have to be done. This is in general not a problem but some extra restrictions for the maintenance team apply like a maximum working time under overpressure. The entrance to the barrier consists of a room for pressure equalization. Since the barrier has a height up to 24 meters appropriate equipment like a lifting platform has to be able to fit through the entrance.

Another problem that might occur is buoyancy of the recess structure. This problem however can be contained by installing tension piles underneath the foundation.

Filling the barrier with air leads to large vertical forces on the clamping lines. These high tension forces lead to large shear stresses and bending moments in the recess structure. To reduce the bending moments a counteracting force should be present at the clamping lines. This can either be done again by the tension piles which are probably needed anyway for the buoyancy problem or by applying a load on top of the recess structure during maintenance.

If maintenance work is to be done from the outside this can either be done by divers which is expensive for greater maintenance work or by placing a sort of cofferdam around the barrier to work in a dry environment. The cofferdam could also be a good solution to load the recess structure to reduce the bending moments mentioned before. This however might also be very expensive and only be efficient if greater maintenance has to be done or for the replacement of the membrane.

Small punctures can be repaired using a sealing plug and small surface damage is to be repaired by using self-vulcanizing rubber. Small and large area damage however need a more sophisticated solution. Here the damage has to be covered with a reinforced patch that overlaps for a certain amount the damaged area. The possible damages and repair solutions for the rubber membrane are illustrated below in figure 31. In case there is such great damage that it is not possible anymore to inflate the barrier with air a temporary repair has to be conducted under water from the outside. After that it should again be possible to inflate the barrier and proper repair the rupture in the membrane. Even larger damage could ask for replacement of the whole membrane. Therefore a spare membrane should always be in stock and ready to use. For the replacement of the membrane it is probably the best solution to use the above mentioned cofferdam.

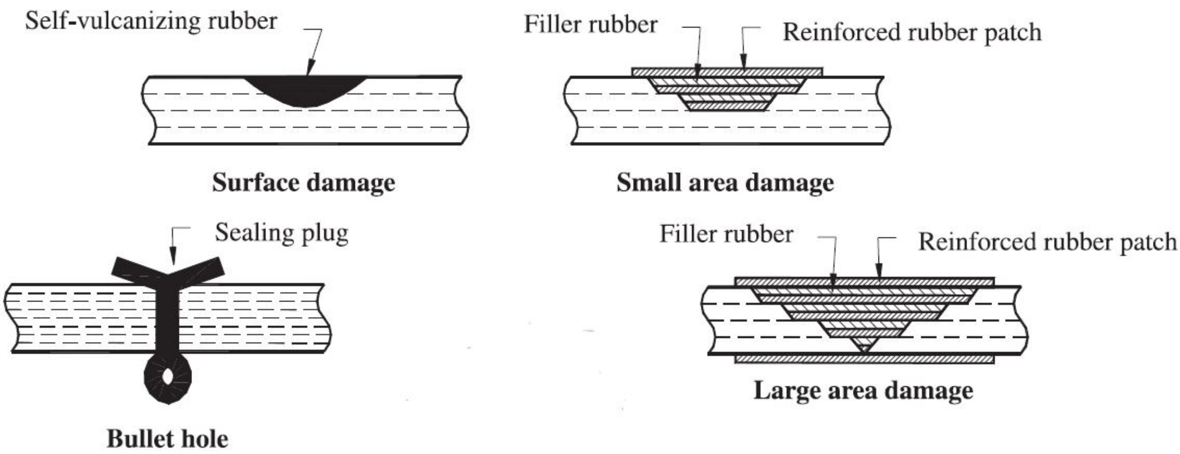


Figure 31: Possible repair techniques for different types of damage of the membrane [41]

After doing maintenance work from inside the rubber barrier it has to be made sure that really no tools and garbage is left behind because this would lead to malfunctioning of the barrier, the membrane storage and eventually lead again to damage. Also the behaviour of the membrane can be influenced by the repair patches, especially the storage behaviour of the membrane. Research has to be done on the effects of repair patches on the deflating and storage procedure.

As part of the maintenance plan periodic test closures should be conducted. It is advised to do this every year well before the storm season starts to make sure there is enough time for repair and adjustments before the barrier has to be ready for possible storm surges.

5 Conclusion and recommendations

This chapter is split in two. First the conclusions of this study are presented regarding the different designs and the inflatable barrier. The second section treats several recommendations on the topic of alternative solutions for the Maeslant barrier.

5.1 Conclusion

In this research project four alternative solutions for the upgrading of the existing Maeslant barrier were presented, a solution with a navigation lock, an inflatable barrier, a tumble gate and a rising sector gate. The design of an inflatable rubber barrier is investigated in more detail. An evaluation on the different designs was already given in section 3.7. All mentioned designs are possible future solutions for the upgrading of the Measlant barrier. For the designs of navigation locks, tumble gate and rising sector gate reference objects can be found with similar dimensions. For the inflatable rubber barrier however the dimensions needed at the sight of the Maeslant barrier are around three times greater than ever realised with such a system. This however also leads to an interesting challenge and therefore the solution with an inflatable rubber barrier was chosen to be analysed on a higher level in this report. Following the most important advantages and disadvantages are listed.

5.1.1 Advantages

The advantages of the inflatable rubber barrier are manifold, some of the most important are given below.

- **Stiffness:** Due to the fact that inflatable rubber barriers move relatively strong with incoming waves the waves in front of the barrier are less high and lower loads appear as for rigid constructions.
- **Span:** In case of uniform loading in longitudinal direction and uniform geometric and strength properties the hydraulic load is evenly distributed leading to no restrictions to the possible span of an inflatable barrier
- **Maintenance:** Because no movable parts are placed under water and a durable rubber fabric less maintenance in comparison with traditional barriers is needed.
- **Environmental impact:** Visual pollution is low in the deflated situation and the disturbance of water flow is minime due to the fact that no constructions are placed within the pathway of the water.
- **Dead-weight:** The low dead-weight is advantageous in case of weak soil layers.
- **Fillers:** Because air and water are always present at a storm surge barrier these are the most efficient fillers however other fillers would be possible.
- **Adaptability:** In case the foundation is robust enough it might be possible just to exchange the membrane to achieve sufficient safety in the case of higher water levels.

5.1.2 Disadvantages

The inflatable barrier does however not only have advantages but also several disadvantages that need to be considered.

- **Lack of knowledge about dimensions:** There is less information and experience available on the design of inflatable rubber barriers. The largest inflatable barrier today (2016) is still the Ramspol barrier in the Netherlands.

– **Fold formation:** The shape of the abutments can lead to folds in the membrane which increase the probability of leakage and can cause deflation problems. Folds also occurs by storing the membrane in the bottom recess. Flaps can than cause accidents with passing ships.
– **Peak stresses:** Peak stresses occur mostly around the abutments due to its design. The main problem is the uneven distribution of normal forces.
– **Resonance / sloshing:** It is possible that when the incoming wave frequency is close to the natural frequency of the barrier a strong resonance occurs. Sloshing can occur in air-water filled barriers where the internal water is brought into wave-like motion.
– **Position under water:** An inflatable rubber barrier is situated below water which can be a disadvantage for maintenance and inspection. However most of this can also be done from the inside of the barrier.

Following from this list of positive and negative points on inflatable barriers and the information worked out in this report it can be concluded that it is feasible to design a inflatable rubber barrier for the new waterway.

The first calculations on tension force in the membrane lead to the conclusion that these can be transferred to the foundation with existing rubber materials. The filler is chosen to be a combination of water and air because due to the high internal pressure and the following high tension force in the membrane an air filled barrier was not possible. The critical aspects in the design are than peak stresses in the membrane due to folds. Due to that the design membrane force can be way higher than the static force. Another problematic aspect is the storage of the membrane in the deflated situation. By incorrect storing it is possible that flaps appear which can lead to collision with ships.

5.2 Recommendations

Within this research no finite element modelling has been performe. For further analysis of an inflatable rubber barrier at the sight of the existing Maeslant barrier, it is important to perform finite element modelings in order to determine the exact forces appearing in the membrane.

Till this moment only 2D calculations have been performed, the load transfer however also appears in longitudinal direction of the barrier. Furthermore the dead weight of the membrane was neglected and also dynamic loads were not considered in the first calculations. To determine more accurate values for the forces in the membrane all the above mentioned aspects need to be included. In this report it was mentioned that peak stresses can occur, however these were not specified. Since peak stresses can determine the feasibility of such a barrier, in a next step they should be considered.

The next step would be to specify the conditions in more detail and higher accuracy to be able to take the design of the inflatable rubber barrier to the next level.

List of Figures

List of Tables

Bibliography

[1] Arjan Dirkmaat: *Afstudeeronderzoek - Voorlopig Ontwerp Balgkering "Het Spui"*, Utrecht University, Utrecht (2011)

[2] Bas Horsten: *Additional Thesis - The Design of Inflatable Hydraulic Structures*, Delft University of Technology, Delft (2015)

[3] Bas Reedijk: *Conference Paper - Case study inflatable storm surge barrier Ramspol*, ResearchGate, Delft (1999)

[4] Bouwdienst Rijkswaterstaat en WL|Delft Hydraulics: *Hydraulische aspecten van balgstuwen en balgkeringen*, Rijkswaterstaat (2005)

[5] BoxBarrier: *Wasser als Wasserwehr*, Retrieved from http://www.boxbarrier.com/de/ber-uns/innovative-projekte/item35, (December 20, 2016)

[6] De Ingenieur: *Sluit de Nieuwe Waterweg af*, Retrieved from https://www.deingenieur.nl/artikel/sluit-de-nieuwe-waterweg-af, (December 20, 2016)

[7] F. van der Ziel: *Movable water barrier for the 21st century*, Delft University of Technology, Delft (2009)

[8] Frank Spaargaren et al.: *Verslag gesprek met Frank Spaargaren d.d. 5 oktober 2015*, Hoogheemraadschap van Delftland, (2015)

[9] Harold van Waveren et al.: *The Climate Proofness of "the Netherlands Water Country" - "Tipping points" in water policy and management*, Deltares, Delft (2009)

[10] H. B. Harrison: *The analysis and behaviour of inflatable membrane dams under static loading*, Proceedings of the Institution of Civil Engineers, 45:661-676 (1970)

[11] ing. S.J. Eijgenraam: *De balgstuwkering bij Ramspol*, Cement 7, Gouda (2000)

[12] ir. Wilfred F. Molenaar e.a.: *Hydraulic Structures - Lecture notes on Locks*, Delft University of Technology, Delft (2011)

[13] ir. Wilfred F. Molenaar: *Lecture notes to Hydraulic Structures*, Delft University of Technology, Delft (2009)

[14] ir. Wilfred F. Molenaar, ing. Mark Z. Voorendt: *Manual Hydraulic Structures*, Delft University of Technology, Delft (2016)

[15] ir. F. Spaargaren, Prof. ir. K. d'Angremond, ir. A.J. Hoekstra, ir. J.H. van Oorschot, ing. C.J. Vroege, Prof. drs. ir. H. Vrijling: *Presentation Afslutibare waterkeringen in de Rijnmond*, Retrieved from Hoogheemraadschap van Delftland: https//www.hhdelfland.nl, (October 16, 2016)

[16] Jan Friso Groote, Chris Verhoef: *Hoe betrouwbaar is de Maeslantkering?*, Automatisering Gids #14, (2006)

[17] Joost Dorreman: *Balgstuwen gevuld met lucht en/of water - Eindrapport*, Delft University of Technology, Delft (1997)

[18] J.L. Coenders: *Structural Design - Special Structures*, Delft University of Technology, Delft (2008)

[19] J.W. Stijnen, T. Botterhuis: *Variant Landelijke Samenhang - MHW- en HBN-berekeningen Deltamodel*, Rijkswaterstaat WVL (2014)

[20] Kaj van der Valk: *Life Cycle Costs: a comparison between inflatable and traditional barriers*, Delft University of Technology, Delft (2014)

[21] Marjolein van Breukelen: *Improvement and scale enlargement of the inflatable rubber barrier concept*, Delft University of Technology, Delft (2013)

[22] Marjolein van Breukelen: *Presentatie: De vernieuwde balgkering (Waterbouwdag 2014)*, Delft University of Technology, Delft (2014)

[23] Michel de Reus: *Tien jaar inspectie en onderhoud afgerond - Balgstuwkering Ramspol*, Civiele Techniek, 5/6, (2013)

[24] Muramatsu: *United States Patent - Mounting member and flexible membrane dam*, Bridgestone Corporation (2002)

[25] Organisations: Infrastructuur en Milieu: *memorie van toelichting wijziging van de Waterwet (nieuwe normering primaire waterkeringen*, Retrieved from https://www.internetconsultatie.nl, (October 16, 2016)

[26] Port of Rotterdam: *Possible verification closure of the Europoort barrier during the next storm season*, Retrieved from https://www.portofrotterdam.com/en/news-and-press-releases/possible-verification-closure-of-the-europoort-barrier-during-the-next-storm, (October 16, 2016)

[27] Prof. Dr. Robert Boes: *Wasserbau II - Vorlesungsmanuskript*, Federal Institute of Technology Zürich, Zürich (2015)

[28] Rijkswaterstaat: *Basic documentation Maeslant Barrier, Base Module 1*, Ministry of Infrastructure and Environment (2012)

[29] Rijkswaterstaat: *Basic documentation Maeslant Barrier, Base Module 2*, Ministry of Infrastructure and Environment (2012)

[30] Rijkswaterstaat: *Deltaprogramma - Deltascenario's*, Ministerie van Infrastructuur en Milieu, Ministerie van Economische Zaken, Landbouw en Innovatie (2011)

[31] Rijkswaterstaat: *Scheepvaartinformatie Hoofdvaarweegen*, Ministerie van Verkeer en Waterstaat (2009)

[32] R. D. Parbery: *Factors affecting the membrane dam inflated by air pressure*, Proceedings of the Institution of Civil Engineers, 65:645-654 (1978)

[33] Siebe Dorrepaal: *Closure of the New Waterwas - An adaptive and innovative design for a navigation lock in Rotterdam*, Delft University of Technology, Delft (2016)

[34] Waterschap amstel gooi en vecht: *Balgstuw Weespertrekvaart*, Retrieved from https://www.agv.nl/verantwoordelijkheden/watererfgoed/sluizen/balstuw-weespertrekvaart/, (December 7, 2016)

[35] Wikipedia: *Panamax*, https://en.wikipedia.org, (October 16, 2016)

[36] Workin Group 26 InCom: *Design of Movable Weirs and Storm Surge Barriers*, PIANC General Secretariat, Belgium (2006)

[37] Working Group 26 InCom: *Ramspol Barrier Project Review*, PIANC General Secretariat, Belgium (2006)

[38] Working Group 26 InCom: *The MO.S.E. system for the defence of Venice and its Lagoon from high tides - Giovanni Perillo*, PIANC General Secretariat, Belgium (2006)

[39] Working Group 26 InCom: *Thames Storm Surge Barrier (UK) - David Wilkes*, PIANC General Secretariat, Belgium (2006)

[40] Workin Group 106 InCom: *Innovations in navigation lock design*, PIANC General Secretariat, Belgium (2009)

[41] X.Q. Zhang et al.: *Construction, operation, and maintenance of rubber dams*, Canadian Journal of Civil Engineering (NRC Canada), Canada (2002)

Technical report - Appendix

Maeslant Barrier

Alternative solution for the upgrading of the Maeslant barrier

Jonas Riteco (4167759)

16. January 2017

Prof. Dr. Ir. Jonkman, S.N.
Ir. Molenaar, W.F.

Research project
Fallsemester 2016

Cover
Closed Maeslant Barrier, Bird's eye view
Source: Beeldbank Rijkswaterstaat
`https://beeldbank.rws.nl/MediaObject/Details/Luchtfoto_van_de_gesloten_Maeslantkering_in_de_nieuwe_Waterweg_nabij_Hoek_van_Holland_158813`
Date: 17.10.2016

Contents appendix

Appendix A: Initial calculations

With the initial parameters for the width between the clamping lines and the circumferential length of the membrane made in subsection 4.3.3 and the spread sheet made by Arjan Dirkmaat a first calculation of the crest-height can be made. The initial conditions for the calculation are given below in table A.1.

Table A.1.: Parameters of the Ramspol and initial parameters of the new Maeslant barrier

Parameter	Ramspol barrier	New Maeslant Barrier
Inflatable barrier height [H]	8.2 m	22.0 m
Base width [B]	13 m	35 m
Circumferential membrane length [L]	24.3 m	65.1 m
Internal air pressure (P_{air})	37.3 kN/m^2	59.7 kN/m^2
Internal water level [h]	3.77 m	17.0 m
Upstream water pressure [P_{ext}]	281 kN/m	2'374 kN/m
Downstream water pressure [P_{ext}]	90 kN/m	1'589 kN/m

To be able to calculate the equilibrium per element length dS a distinction has to be made between the different loadings of the elements. Figure A.1 shows the different loading cases that can occur in a water-air filled inflatable rubber barrier, whereas table A.2 gives the pressure formulas for the different locations.

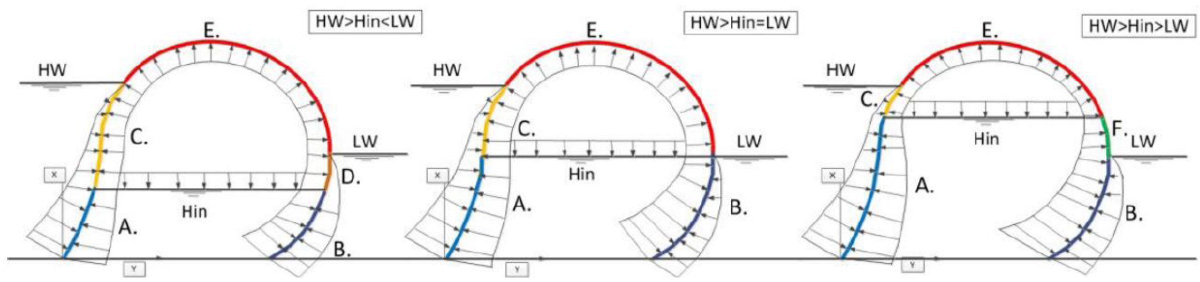


Figure A.1.: Occurring load situation along the length of the membrane

Table A.2.: Applying pressure equations along length of membrane

Location	External pressure	Internal pressure	Resulting pressure p
A + B	water	water	$\rho_w \cdot g \cdot (H + h - H_w)$
C + D	water	air	$\rho_w \cdot g \cdot (H - H_w + y_i + \Delta s \cdot sin(\alpha/2))$
E	air	air	$\rho_w \cdot g \cdot H$
F	air	water	$\rho_w \cdot g \cdot (H + h - y_i - \Delta s \cdot sin(\alpha/2))$

Using the given formulas above the spread sheet first calculates the angle of the membrane using the resulting pressure for each element depending on its location and dividing it by the initial tension force. That equation is derived from the radial equilibrium given in subsection 4.2.5.

$p \cdot dS* = -T \cdot d\phi \quad \rightarrow \quad d\phi = \frac{p \cdot dS}{T}$

$dS = \frac{L_{min}}{n} = \frac{65.1\,m}{1000} = 0.0651\,m$

$T = 723542\,N$

Taking the initial conditions, the pressure P and tension force T, the angle $d\phi_B$ in the last element (end of the membrane) results to:

$d\phi_B = \frac{p \cdot dS}{T} = \frac{\rho \cdot g \cdot (H + (H_{internal} - Y_{coordinate}) - (H_{lowater} - Y_{coordinate})) \cdot dS}{T}$

$= \frac{1000 \frac{kg}{m^3} \cdot 9.81 \frac{m}{s^2} \cdot (5.97\,m + (17\,m - 0) - (18\,m - 0)) \cdot 0.0651\,m}{723542} = 0.004384\,rad \quad \rightarrow \quad 0.25°$

The next step is to calculate the resulting pressure inside the barrier using the internal air and water pressures:

$P_{in,B} = \frac{dP \cdot g}{10} + \rho_w \cdot g \cdot (H_{in} - Y_{coordinate}) = \frac{0.59671\,bar \cdot 9.81 \frac{m}{s^2}}{10} + 1000 \frac{kg}{m^3} \cdot 9.81 \frac{m}{s^2} \cdot (17\,m - 0) \cdot \frac{1}{100'000}$

$P_{in,B} = 2.253\,bar$

Using the internal pressure and the hydrostatic water pressures up- and downstream the pressure difference ΔP for each element of length dS can be calculated depending on its position. For the last element on the low water side the pressure difference is:

$\Delta P_B = P_{in,B} - P_{LW,B} = 2.253\,bar - \rho \cdot g \cdot H_{LW,B} = 2.253\,bar - \frac{1000 \frac{kg}{m^3} \cdot 9.81 \frac{m}{s^2} \cdot 18\,m}{100'000} = 0.4872\,bar$

With the resulting pressure difference ΔP_B and an initial angle of the last element of $\phi = 0.94\,rad$, $\phi = 54.17°$ respectively the horizontal and vertical forces can be calculated using the following equations in which b is the width of the barrier you are looking at, in this case b is set to 1 meter:

$F_{horizontal,B} = sin(\phi) \cdot (dS \cdot b) \cdot \Delta P = sin(54.17°) \cdot (0.0651\,m \cdot 1\,m) \cdot 0.4872\,bar = 2.57\,kN$
$F_{vertical,B} = cos(\phi) \cdot (dS \cdot b) \cdot \Delta P = cos(54.17°) \cdot (0.0651\,m \cdot 1\,m) \cdot 0.4872\,bar = 1.86\,kN$

From the horizontal and vertical equilibrium in each element the Tension force follows with:

$T_B = \sqrt{F^2_{horizontal,B} + F^2_{vertical,B}} = \sqrt{(2.57\,kN)^2 + (1.86\,kN)^2} = 3.17\,kN$

Doing these calculations for each small element of length dS by adding the difference in angle $d\phi_i$ to the angle ϕ results in horizontal and vertical forces for each element. The sum of these forces than lead to the final horizontal and vertical forces that need to be clamped. The sum of all tension forces from each element lead to the total tension force T.

Finding the optimal shape of the rubber barrier and its resulting horizontal and vertical forces is coupled to an iterative process which can be solved by the use of the solver in the spread sheet. The solution is found when the total deviation of the initial tension force and the calculated tension force is zero. For the initial calculation the internal water level is set to 17 meters. In this initial state the membrane force is calculated to be 723.5 kN/m'. The calculations can be seen below in figure A.2. The total deviation is zero and the calculated crest-height is 22.55 meters. With the tension force it is now possible to calculate the horizontal and vertical reaction forces at the clamping lines.

Considering the start of the membrane in point A and the end in point A the reaction forces are calculated as follows:

$$R_{H,A} = T \cdot cos(\phi_A) = 723.54\,kN/m \cdot cos(54.7°) = 423.5\,kN/m$$
$$R_{V,A} = T \cdot sin(\phi_A) = 723.54\,kN/m \cdot sin(54.7°) = 586.6\,kN/m$$
$$R_{H,B} = -T \cdot cos(\phi_B) = -723.54\,kN/m \cdot cos(239.5°) = 369.1\,kN/m$$
$$R_{V,B} = -T \cdot sin(\phi_B) = -723.54\,kN/m \cdot sin(239.5°) = 622.3\,kN/m$$

$$T_{total,B} = \sqrt{R_{H,B}^2 + R_{V,B}^2} = \sqrt{(369.1\,kN)^2 + (622.3\,kN)^2} = 723.5\,kN$$
$$T_{total,A} = \sqrt{R_{H,A}^2 + R_{V,A}^2} = \sqrt{(423.5\,kN)^2 + (586.6\,kN)^2} = 723.5\,kN$$

The in- and output of the spread sheet is given below in figure A.2 and the table on the following pages.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17 m Water hoogte balg
0.596713 bar Luchtdruk
35 m Breedte tussen klemlijnen
65.1 m Lengte membraan

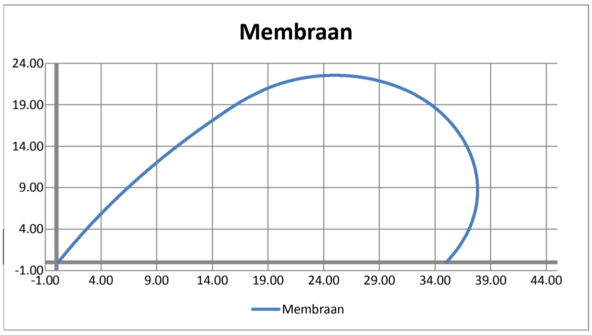
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	35.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	5.97	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**

Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	369.1	423.5	792.6	**kN**
RV	622.3	586.6	1`209.0	**kN**
Verschil verval en horizontal klemlijn		1%	7.78	kN

Berekende waardes				
Tenstion		T	723.54	kN/m2
			723542	N
Eind hoek	ϕB	h1	4.18	Rad
			239.3	Graden
			59.3	Graden
Start hoek	ϕA	h2	0.95	Rad
			54.2	Graden

Volumes	m3	%
Water	522.55	86.48%
Lucht	81.71	13.52%
Totaal	604.26	

Coordinaten	X	Y
Maxima	37.83	22.55
Vast punt 1	-	-
Vast punt 2	35.00	-
Onnauwkeurigheid	0.14	-0.02
	0.14	0.00
Onnauwkeurigheid	1.45	0.06
Totaal	0.06	
Factor		0.55
Ybij X max	-	
X bij Y max		24.96

Afwijkingen	m	%
Hbalg	1.45	
X	0.14	0.40%
Y	0.02	0.10%
Hverval	7.78	6.60%
Totaal		0.50%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure A.2.: Crest-height calculations with initial parameters

Element	Coordinaten X coördinaat	Y coördinaat	ln S	Uitkomsten dS 1 Dhoek HW-WW	2 DHoek HW-WL	3 Dhoek LL	4 Dhoek LW-WW	5 dHoek LW-LW	6 dHoek LW-WL	Volumes Water	af deel B	Lucht	af deel B
1	35.00	0.00	0.07	-	-	-	0.004384	-	-	Dubbel	-	Dubbel	-
2	35.04	0.05	0.13	-	-	-	0.004384	-	-	Dubbel	0.001006	Dubbel	-
3	35.08	0.11	0.20	-	-	-	0.004384	-	-	Dubbel	0.003002	Dubbel	-
4	35.11	0.16	0.26	-	-	-	0.004384	-	-	Dubbel	0.004980	Dubbel	-
5	35.15	0.21	0.33	-	-	-	0.004384	-	-	Dubbel	0.006939	Dubbel	-
6	35.19	0.27	0.39	-	-	-	0.004384	-	-	Dubbel	0.008879	Dubbel	-
7	35.23	0.32	0.46	-	-	-	0.004384	-	-	Dubbel	0.010800	Dubbel	-
8	35.26	0.37	0.52	-	-	-	0.004384	-	-	Dubbel	0.012702	Dubbel	-
9	35.30	0.43	0.59	-	-	-	0.004384	-	-	Dubbel	0.014584	Dubbel	-
10	35.33	0.48	0.65	-	-	-	0.004384	-	-	Dubbel	0.016446	Dubbel	-
11	35.37	0.54	0.72	-	-	-	0.004384	-	-	Dubbel	0.018288	Dubbel	-
12	35.41	0.59	0.78	-	-	-	0.004384	-	-	Dubbel	0.020109	Dubbel	-
13	35.44	0.64	0.85	-	-	-	0.004384	-	-	Dubbel	0.021910	Dubbel	-
14	35.48	0.70	0.91	-	-	-	0.004384	-	-	Dubbel	0.023689	Dubbel	-
15	35.51	0.75	0.98	-	-	-	0.004384	-	-	Dubbel	0.025448	Dubbel	-
16	35.55	0.81	1.04	-	-	-	0.004384	-	-	Dubbel	0.027185	Dubbel	-
17	35.58	0.86	1.11	-	-	-	0.004384	-	-	Dubbel	0.028900	Dubbel	-
18	35.62	0.92	1.17	-	-	-	0.004384	-	-	Dubbel	0.030593	Dubbel	-
19	35.65	0.97	1.24	-	-	-	0.004384	-	-	Dubbel	0.032264	Dubbel	-
20	35.68	1.03	1.30	-	-	-	0.004384	-	-	Dubbel	0.033912	Dubbel	-
21	35.72	1.09	1.37	-	-	-	0.004384	-	-	Dubbel	0.035538	Dubbel	-
22	35.75	1.14	1.43	-	-	-	0.004384	-	-	Dubbel	0.037140	Dubbel	-
23	35.78	1.20	1.50	-	-	-	0.004384	-	-	Dubbel	0.038720	Dubbel	-
24	35.82	1.25	1.56	-	-	-	0.004384	-	-	Dubbel	0.040276	Dubbel	-
25	35.85	1.31	1.63	-	-	-	0.004384	-	-	Dubbel	0.041808	Dubbel	-
26	35.88	1.37	1.69	-	-	-	0.004384	-	-	Dubbel	0.043316	Dubbel	-
27	35.91	1.42	1.76	-	-	-	0.004384	-	-	Dubbel	0.044800	Dubbel	-
28	35.95	1.48	1.82	-	-	-	0.004384	-	-	Dubbel	0.046259	Dubbel	-
29	35.98	1.54	1.89	-	-	-	0.004384	-	-	Dubbel	0.047694	Dubbel	-
30	36.01	1.59	1.95	-	-	-	0.004384	-	-	Dubbel	0.049103	Dubbel	-
31	36.04	1.65	2.02	-	-	-	0.004384	-	-	Dubbel	0.050488	Dubbel	-
32	36.07	1.71	2.08	-	-	-	0.004384	-	-	Dubbel	0.051847	Dubbel	-
33	36.10	1.77	2.15	-	-	-	0.004384	-	-	Dubbel	0.053181	Dubbel	-
34	36.13	1.82	2.21	-	-	-	0.004384	-	-	Dubbel	0.054489	Dubbel	-
35	36.16	1.88	2.28	-	-	-	0.004384	-	-	Dubbel	0.055770	Dubbel	-
36	36.19	1.94	2.34	-	-	-	0.004384	-	-	Dubbel	0.057025	Dubbel	-
37	36.22	2.00	2.41	-	-	-	0.004384	-	-	Dubbel	0.058254	Dubbel	-
38	36.25	2.06	2.47	-	-	-	0.004384	-	-	Dubbel	0.059456	Dubbel	-
39	36.28	2.11	2.54	-	-	-	0.004384	-	-	Dubbel	0.060631	Dubbel	-
40	36.31	2.17	2.60	-	-	-	0.004384	-	-	Dubbel	0.061779	Dubbel	-
41	36.34	2.23	2.67	-	-	-	0.004384	-	-	Dubbel	0.062899	Dubbel	-
42	36.37	2.29	2.73	-	-	-	0.004384	-	-	Dubbel	0.063992	Dubbel	-
43	36.39	2.35	2.80	-	-	-	0.004384	-	-	Dubbel	0.065057	Dubbel	-
44	36.42	2.41	2.86	-	-	-	0.004384	-	-	Dubbel	0.066094	Dubbel	-
45	36.45	2.47	2.93	-	-	-	0.004384	-	-	Dubbel	0.067102	Dubbel	-
46	36.48	2.53	2.99	-	-	-	0.004384	-	-	Dubbel	0.068082	Dubbel	-
47	36.50	2.58	3.06	-	-	-	0.004384	-	-	Dubbel	0.069034	Dubbel	-
48	36.53	2.64	3.12	-	-	-	0.004384	-	-	Dubbel	0.069956	Dubbel	-
49	36.56	2.70	3.19	-	-	-	0.004384	-	-	Dubbel	0.070850	Dubbel	-
50	36.58	2.76	3.26	-	-	-	0.004384	-	-	Dubbel	0.071714	Dubbel	-
51	36.61	2.82	3.32	-	-	-	0.004384	-	-	Dubbel	0.072549	Dubbel	-
52	36.63	2.88	3.39	-	-	-	0.004384	-	-	Dubbel	0.073354	Dubbel	-
53	36.66	2.94	3.45	-	-	-	0.004384	-	-	Dubbel	0.074129	Dubbel	-
54	36.68	3.00	3.52	-	-	-	0.004384	-	-	Dubbel	0.074874	Dubbel	-
55	36.71	3.06	3.58	-	-	-	0.004384	-	-	Dubbel	0.075589	Dubbel	-
56	36.73	3.12	3.65	-	-	-	0.004384	-	-	Dubbel	0.076273	Dubbel	-
57	36.76	3.18	3.71	-	-	-	0.004384	-	-	Dubbel	0.076927	Dubbel	-
58	36.78	3.24	3.78	-	-	-	0.004384	-	-	Dubbel	0.077550	Dubbel	-
59	36.81	3.30	3.84	-	-	-	0.004384	-	-	Dubbel	0.078142	Dubbel	-
60	36.83	3.36	3.91	-	-	-	0.004384	-	-	Dubbel	0.078702	Dubbel	-
61	36.85	3.43	3.97	-	-	-	0.004384	-	-	Dubbel	0.079232	Dubbel	-
62	36.88	3.49	4.04	-	-	-	0.004384	-	-	Dubbel	0.079730	Dubbel	-
63	36.90	3.55	4.10	-	-	-	0.004384	-	-	Dubbel	0.080196	Dubbel	-
64	36.92	3.61	4.17	-	-	-	0.004384	-	-	Dubbel	0.080630	Dubbel	-
65	36.94	3.67	4.23	-	-	-	0.004384	-	-	Dubbel	0.081032	Dubbel	-
66	36.97	3.73	4.30	-	-	-	0.004384	-	-	Dubbel	0.081403	Dubbel	-
67	36.99	3.79	4.36	-	-	-	0.004384	-	-	Dubbel	0.081740	Dubbel	-
68	37.01	3.85	4.43	-	-	-	0.004384	-	-	Dubbel	0.082046	Dubbel	-
69	37.03	3.92	4.49	-	-	-	0.004384	-	-	Dubbel	0.082318	Dubbel	-
70	37.05	3.98	4.56	-	-	-	0.004384	-	-	Dubbel	0.082558	Dubbel	-
71	37.07	4.04	4.62	-	-	-	0.004384	-	-	Dubbel	0.082765	Dubbel	-
72	37.09	4.10	4.69	-	-	-	0.004384	-	-	Dubbel	0.082938	Dubbel	-
73	37.11	4.16	4.75	-	-	-	0.004384	-	-	Dubbel	0.083079	Dubbel	-
74	37.13	4.22	4.82	-	-	-	0.004384	-	-	Dubbel	0.083185	Dubbel	-
75	37.15	4.29	4.88	-	-	-	0.004384	-	-	Dubbel	0.083259	Dubbel	-
76	37.17	4.35	4.95	-	-	-	0.004384	-	-	Dubbel	0.083298	Dubbel	-
77	37.19	4.41	5.01	-	-	-	0.004384	-	-	Dubbel	0.083304	Dubbel	-
78	37.21	4.47	5.08	-	-	-	0.004384	-	-	Dubbel	0.083276	Dubbel	-
79	37.23	4.54	5.14	-	-	-	0.004384	-	-	Dubbel	0.083213	Dubbel	-
80	37.25	4.60	5.21	-	-	-	0.004384	-	-	Dubbel	0.083116	Dubbel	-
81	37.26	4.66	5.27	-	-	-	0.004384	-	-	Dubbel	0.082985	Dubbel	-
82	37.28	4.72	5.34	-	-	-	0.004384	-	-	Dubbel	0.082820	Dubbel	-
83	37.30	4.79	5.40	-	-	-	0.004384	-	-	Dubbel	0.082619	Dubbel	-
84	37.32	4.85	5.47	-	-	-	0.004384	-	-	Dubbel	0.082384	Dubbel	-
85	37.33	4.91	5.53	-	-	-	0.004384	-	-	Dubbel	0.082114	Dubbel	-
86	37.35	4.97	5.60	-	-	-	0.004384	-	-	Dubbel	0.081809	Dubbel	-
87	37.37	5.04	5.66	-	-	-	0.004384	-	-	Dubbel	0.081469	Dubbel	-
88	37.38	5.10	5.73	-	-	-	0.004384	-	-	Dubbel	0.081094	Dubbel	-
89	37.40	5.16	5.79	-	-	-	0.004384	-	-	Dubbel	0.080683	Dubbel	-
90	37.41	5.23	5.86	-	-	-	0.004384	-	-	Dubbel	0.080237	Dubbel	-
91	37.43	5.29	5.92	-	-	-	0.004384	-	-	Dubbel	0.079755	Dubbel	-
92	37.44	5.35	5.99	-	-	-	0.004384	-	-	Dubbel	0.079238	Dubbel	-
93	37.46	5.42	6.05	-	-	-	0.004384	-	-	Dubbel	0.078685	Dubbel	-
94	37.47	5.48	6.12	-	-	-	0.004384	-	-	Dubbel	0.078095	Dubbel	-
95	37.49	5.54	6.18	-	-	-	0.004384	-	-	Dubbel	0.077470	Dubbel	-
96	37.50	5.61	6.25	-	-	-	0.004384	-	-	Dubbel	0.076809	Dubbel	-
97	37.51	5.67	6.31	-	-	-	0.004384	-	-	Dubbel	0.076112	Dubbel	-
98	37.53	5.74	6.38	-	-	-	0.004384	-	-	Dubbel	0.075379	Dubbel	-
99	37.54	5.80	6.44	-	-	-	0.004384	-	-	Dubbel	0.074609	Dubbel	-
100	37.55	5.86	6.51	-	-	-	0.004384	-	-	Dubbel	0.073803	Dubbel	-
101	37.56	5.93	6.58	-	-	-	0.004384	-	-	Dubbel	0.072960	Dubbel	-
102	37.58	5.99	6.64	-	-	-	0.004384	-	-	Dubbel	0.072081	Dubbel	-
103	37.59	6.06	6.71	-	-	-	0.004384	-	-	Dubbel	0.071165	Dubbel	-
104	37.60	6.12	6.77	-	-	-	0.004384	-	-	Dubbel	0.070213	Dubbel	-
105	37.61	6.18	6.84	-	-	-	0.004384	-	-	Dubbel	0.069224	Dubbel	-
106	37.62	6.25	6.90	-	-	-	0.004384	-	-	Dubbel	0.068198	Dubbel	-
107	37.63	6.31	6.97	-	-	-	0.004384	-	-	Dubbel	0.067135	Dubbel	-
108	37.64	6.38	7.03	-	-	-	0.004384	-	-	Dubbel	0.066035	Dubbel	-
109	37.65	6.44	7.10	-	-	-	0.004384	-	-	Dubbel	0.064898	Dubbel	-
110	37.66	6.50	7.16	-	-	-	0.004384	-	-	Dubbel	0.063724	Dubbel	-
111	37.67	6.57	7.23	-	-	-	0.004384	-	-	Dubbel	0.062513	Dubbel	-
112	37.68	6.63	7.29	-	-	-	0.004384	-	-	Dubbel	0.061264	Dubbel	-
113	37.69	6.70	7.36	-	-	-	0.004384	-	-	Dubbel	0.059979	Dubbel	-
114	37.70	6.76	7.42	-	-	-	0.004384	-	-	Dubbel	0.058656	Dubbel	-
115	37.71	6.83	7.49	-	-	-	0.004384	-	-	Dubbel	0.057296	Dubbel	-
116	37.72	6.89	7.55	-	-	-	0.004384	-	-	Dubbel	0.055899	Dubbel	-
117	37.72	6.96	7.62	-	-	-	0.004384	-	-	Dubbel	0.054464	Dubbel	-
118	37.73	7.02	7.68	-	-	-	0.004384	-	-	Dubbel	0.052992	Dubbel	-
119	37.74	7.09	7.75	-	-	-	0.004384	-	-	Dubbel	0.051483	Dubbel	-
120	37.75	7.15	7.81	-	-	-	0.004384	-	-	Dubbel	0.049936	Dubbel	-
121	37.75	7.22	7.88	-	-	-	0.004384	-	-	Dubbel	0.048352	Dubbel	-
122	37.76	7.28	7.94	-	-	-	0.004384	-	-	Dubbel	0.046730	Dubbel	-
123	37.77	7.34	8.01	-	-	-	0.004384	-	-	Dubbel	0.045070	Dubbel	-
124	37.77	7.41	8.07	-	-	-	0.004384	-	-	Dubbel	0.043373	Dubbel	-
125	37.78	7.47	8.14	-	-	-	0.004384	-	-	Dubbel	0.041639	Dubbel	-
126	37.78	7.54	8.20	-	-	-	0.004384	-	-	Dubbel	0.039867	Dubbel	-
127	37.79	7.60	8.27	-	-	-	0.004384	-	-	Dubbel	0.038057	Dubbel	-

Element	Hoek verandering Dhoek	Graden	Hoek element Rad	Graden	Eg doek [N]	T	Fhor [kN]	Fvert [kN]	Druk Δdoek [kN/m²]	Δdoek [Bar]	Druk P HW zijde [Bar]	P Balg [Bar]	P LW zijde [Bar]
1	0.004384	0.251197	0.945483625	54.1722213	11	3.172	2.571926163	1.8568279	48.727532	0.4872753	2.1582	2.2530753	1.7658
2	0.004384	0.251197	0.949868	54.42341833	11	3.172	2.580042152	1.8455342	48.727532	0.4872753	2.153022107	2.2478974	1.7606221
3	0.004384	0.251197	0.954252	54.67461536	11	3.172	2.58810855	1.834205	48.727532	0.4872753	2.147827874	2.2427032	1.7554279
4	0.004384	0.251197	0.958636	54.92581239	11	3.172	2.5961252	1.8228406	48.727532	0.4872753	2.142617402	2.2374927	1.7502174
5	0.004384	0.251197	0.963020	55.17700942	11	3.172	2.60409195	1.8114412	48.727532	0.4872753	2.137390791	2.2322661	1.7449908
6	0.004384	0.251197	0.967405	55.42820645	11	3.172	2.612008645	1.8000069	48.727532	0.4872753	2.13214814	2.2270235	1.7397481
7	0.004384	0.251197	0.971789	55.67940348	11	3.172	2.619875134	1.788538	48.727532	0.4872753	2.126889551	2.2217649	1.7344896
8	0.004384	0.251197	0.976173	55.9306005	11	3.172	2.627691266	1.7770348	48.727532	0.4872753	2.121615126	2.2164904	1.7292151
9	0.004384	0.251197	0.980557	56.18179753	11	3.172	2.63545689	1.7654974	48.727532	0.4872753	2.116324964	2.2112003	1.723925
10	0.004384	0.251197	0.984942	56.43299456	11	3.172	2.643171857	1.753926	48.727532	0.4872753	2.111019169	2.2058945	1.7186192
11	0.004384	0.251197	0.989326	56.68419159	11	3.172	2.650836019	1.742321	48.727532	0.4872753	2.105697841	2.2005732	1.7132978
12	0.004384	0.251197	0.993710	56.93538862	11	3.172	2.658449228	1.7306824	48.727532	0.4872753	2.100361084	2.1952364	1.7079611
13	0.004384	0.251197	0.998094	57.18658565	11	3.172	2.666011339	1.7190106	48.727532	0.4872753	2.095008999	2.1898843	1.702609
14	0.004384	0.251197	1.002478	57.43778268	11	3.172	2.673522205	1.7073058	48.727532	0.4872753	2.089641691	2.184517	1.6972417
15	0.004384	0.251197	1.006863	57.68897971	11	3.172	2.680981683	1.6955681	48.727532	0.4872753	2.084259261	2.1791346	1.6918593
16	0.004384	0.251197	1.011247	57.94017674	11	3.172	2.688389628	1.6837978	48.727532	0.4872753	2.078861813	2.1737371	1.6864618
17	0.004384	0.251197	1.015631	58.19137376	11	3.172	2.6957459	1.6719952	48.727532	0.4872753	2.073449451	2.1683248	1.6810495
18	0.004384	0.251197	1.020015	58.44257079	11	3.172	2.703050355	1.6601605	48.727532	0.4872753	2.06802228	2.1628976	1.6756223
19	0.004384	0.251197	1.024399	58.69376782	11	3.172	2.710302855	1.6482938	48.727532	0.4872753	2.062580403	2.1574557	1.6701804
20	0.004384	0.251197	1.028784	58.94496485	11	3.172	2.717503258	1.6363954	48.727532	0.4872753	2.057123925	2.1519992	1.6647239
21	0.004384	0.251197	1.033168	59.19616188	11	3.172	2.724651428	1.6244656	48.727532	0.4872753	2.051652951	2.1465283	1.659253
22	0.004384	0.251197	1.037552	59.44735891	11	3.172	2.731747226	1.6125046	48.727532	0.4872753	2.046167586	2.1410429	1.6537676
23	0.004384	0.251197	1.041936	59.69855594	11	3.172	2.738790517	1.6005126	48.727532	0.4872753	2.040667935	2.1355433	1.6482679
24	0.004384	0.251197	1.046321	59.94975297	11	3.172	2.745781165	1.5884898	48.727532	0.4872753	2.035154104	2.1300294	1.6427541
25	0.004384	0.251197	1.050705	60.20095	11	3.172	2.752719035	1.5764364	48.727532	0.4872753	2.0296262	2.1245015	1.6372262
26	0.004384	0.251197	1.055089	60.45214703	11	3.172	2.759603994	1.5643528	48.727532	0.4872753	2.024084328	2.1189597	1.6316843
27	0.004384	0.251197	1.059473	60.70334405	11	3.172	2.766435909	1.5522391	48.727532	0.4872753	2.018528596	2.1134039	1.6261286
28	0.004384	0.251197	1.063857	60.95454108	11	3.172	2.773214651	1.5400956	48.727532	0.4872753	2.012959108	2.1078344	1.6205591
29	0.004384	0.251197	1.068242	61.20573811	11	3.172	2.779940087	1.5279225	48.727532	0.4872753	2.007375974	2.1022513	1.614976
30	0.004384	0.251197	1.072626	61.45693514	11	3.172	2.78661209	1.51572	48.727532	0.4872753	2.0017793	2.0966546	1.6093793
31	0.004384	0.251197	1.077010	61.70813217	11	3.172	2.79323053	1.5034883	48.727532	0.4872753	1.996169193	2.0910445	1.6037692
32	0.004384	0.251197	1.081394	61.9593292	11	3.172	2.79979528	1.4912278	48.727532	0.4872753	1.990545762	2.0854211	1.5981458
33	0.004384	0.251197	1.085779	62.21052623	11	3.172	2.806306215	1.4789386	48.727532	0.4872753	1.984909115	2.0797844	1.5925091
34	0.004384	0.251197	1.090163	62.46172326	11	3.172	2.812763209	1.466621	48.727532	0.4872753	1.97925936	2.0741347	1.5868594
35	0.004384	0.251197	1.094547	62.71292029	11	3.172	2.819166138	1.4542752	48.727532	0.4872753	1.973596605	2.0684719	1.5811966
36	0.004384	0.251197	1.098931	62.96411731	11	3.172	2.825514879	1.4419014	48.727532	0.4872753	1.967920959	2.0627963	1.575521
37	0.004384	0.251197	1.103315	63.21531434	11	3.172	2.83180931	1.4294999	48.727532	0.4872753	1.962232532	2.0571079	1.5698325
38	0.004384	0.251197	1.107700	63.46651137	11	3.172	2.838049309	1.4170709	48.727532	0.4872753	1.956531433	2.0514068	1.5641314
39	0.004384	0.251197	1.112084	63.7177084	11	3.172	2.844234758	1.4046147	48.727532	0.4872753	1.950817771	2.0456931	1.5584178
40	0.004384	0.251197	1.116468	63.96890543	11	3.172	2.850365536	1.3921316	48.727532	0.4872753	1.945091657	2.039967	1.5526917
41	0.004384	0.251197	1.120852	64.22010246	11	3.172	2.856441527	1.3796216	48.727532	0.4872753	1.9393532	2.0342285	1.5469532
42	0.004384	0.251197	1.125236	64.47129949	11	3.172	2.862462614	1.3670851	48.727532	0.4872753	1.93360251	2.0284778	1.5412025
43	0.004384	0.251197	1.129621	64.72249652	11	3.172	2.86842868	1.3545224	48.727532	0.4872753	1.927839698	2.022715	1.5354397
44	0.004384	0.251197	1.134005	64.97369355	11	3.172	2.874339611	1.3419336	48.727532	0.4872753	1.922064876	2.0169402	1.5296649
45	0.004384	0.251197	1.138389	65.22489057	11	3.172	2.880195293	1.329319	48.727532	0.4872753	1.916278153	2.0111535	1.5238782
46	0.004384	0.251197	1.142773	65.4760876	11	3.172	2.885995615	1.3166789	48.727532	0.4872753	1.910479642	2.005355	1.5180796
47	0.004384	0.251197	1.147158	65.72728463	11	3.172	2.891740464	1.3040134	48.727532	0.4872753	1.904669453	1.9995448	1.5122695
48	0.004384	0.251197	1.151542	65.97848166	11	3.172	2.897429729	1.2913229	48.727532	0.4872753	1.898847698	1.993723	1.5064477
49	0.004384	0.251197	1.155926	66.22967869	11	3.172	2.903063303	1.2786076	48.727532	0.4872753	1.893014489	1.9878898	1.5006145
50	0.004384	0.251197	1.160310	66.48087572	11	3.172	2.908641075	1.2658677	48.727532	0.4872753	1.887169939	1.9820453	1.4947699
51	0.004384	0.251197	1.164694	66.73207275	11	3.172	2.91416294	1.2531035	48.727532	0.4872753	1.88131416	1.9761895	1.4889142
52	0.004384	0.251197	1.169079	66.98326978	11	3.172	2.919628791	1.2403152	48.727532	0.4872753	1.875447263	1.9703226	1.4830473
53	0.004384	0.251197	1.173463	67.23446681	11	3.172	2.925038522	1.227503	48.727532	0.4872753	1.869569363	1.9644447	1.4771694
54	0.004384	0.251197	1.177847	67.48566384	11	3.172	2.930392031	1.2146672	48.727532	0.4872753	1.863680571	1.9585559	1.4712806
55	0.004384	0.251197	1.182231	67.73686086	11	3.172	2.935689213	1.2018081	48.727532	0.4872753	1.857781002	1.9526563	1.465381
56	0.004384	0.251197	1.186615	67.98805789	11	3.172	2.940929968	1.1889259	48.727532	0.4872753	1.851870768	1.9467461	1.4594708
57	0.004384	0.251197	1.191000	68.23925492	11	3.172	2.946114194	1.1760209	48.727532	0.4872753	1.845949983	1.9408253	1.45355
58	0.004384	0.251197	1.195384	68.49045195	11	3.172	2.951241792	1.1630932	48.727532	0.4872753	1.840018761	1.9348941	1.4476188
59	0.004384	0.251197	1.199768	68.74164898	11	3.172	2.956312664	1.1501432	48.727532	0.4872753	1.834077216	1.9289525	1.4416772
60	0.004384	0.251197	1.204152	68.99284601	11	3.172	2.961326711	1.1371711	48.727532	0.4872753	1.828125463	1.9230008	1.4357255
61	0.004384	0.251197	1.208537	69.24404304	11	3.172	2.966283837	1.1241771	48.727532	0.4872753	1.822163614	1.9170389	1.4297636
62	0.004384	0.251197	1.212921	69.49524007	11	3.172	2.971183948	1.1111615	48.727532	0.4872753	1.816191786	1.9110671	1.4237918
63	0.004384	0.251197	1.217305	69.7464371	11	3.172	2.976026948	1.0981246	48.727532	0.4872753	1.810210093	1.9050854	1.4178101
64	0.004384	0.251197	1.221689	69.99763412	11	3.172	2.980812746	1.0850665	48.727532	0.4872753	1.80421865	1.899094	1.4118186
65	0.004384	0.251197	1.226073	70.24883115	11	3.172	2.985541248	1.0719876	48.727532	0.4872753	1.798217572	1.8930929	1.4058176
66	0.004384	0.251197	1.230458	70.50002818	11	3.172	2.990212364	1.0588881	48.727532	0.4872753	1.792206974	1.8870823	1.399807
67	0.004384	0.251197	1.234842	70.75122521	11	3.172	2.994826005	1.0457682	48.727532	0.4872753	1.786186972	1.8810623	1.393787
68	0.004384	0.251197	1.239226	71.00242224	11	3.172	2.999382081	1.0326282	48.727532	0.4872753	1.780157682	1.875033	1.3877577
69	0.004384	0.251197	1.243610	71.25361927	11	3.172	3.003880505	1.0194684	48.727532	0.4872753	1.774119219	1.8689945	1.3817192
70	0.004384	0.251197	1.247994	71.5048163	11	3.172	3.00832119	1.006289	48.727532	0.4872753	1.7680717	1.862947	1.3756717
71	0.004384	0.251197	1.252379	71.75601333	11	3.172	3.012704051	0.9930903	48.727532	0.4872753	1.762015241	1.8568906	1.3696152
72	0.004384	0.251197	1.256763	72.00721036	11	3.172	3.017029005	0.9798724	48.727532	0.4872753	1.755949958	1.8508253	1.36355
73	0.004384	0.251197	1.261147	72.25840738	11	3.172	3.021295967	0.9666357	48.727532	0.4872753	1.749875968	1.8447513	1.357476
74	0.004384	0.251197	1.265531	72.50960441	11	3.172	3.025504856	0.9533805	48.727532	0.4872753	1.743793388	1.8386687	1.3513934
75	0.004384	0.251197	1.269916	72.76080144	11	3.172	3.029655591	0.9401069	48.727532	0.4872753	1.737702334	1.8325777	1.3453023
76	0.004384	0.251197	1.274300	73.01199847	11	3.172	3.033748091	0.9268152	48.727532	0.4872753	1.731602924	1.8264782	1.3392029
77	0.004384	0.251197	1.278684	73.2631955	11	3.172	3.037782279	0.9135058	48.727532	0.4872753	1.725495274	1.8203706	1.3330953
78	0.004384	0.251197	1.283068	73.51439253	11	3.172	3.041758077	0.9001787	48.727532	0.4872753	1.719379503	1.8142548	1.3269795
79	0.004384	0.251197	1.287452	73.76558956	11	3.172	3.045675409	0.8868344	48.727532	0.4872753	1.713255727	1.808131	1.3208557
80	0.004384	0.251197	1.291837	74.01678659	11	3.172	3.049534198	0.873473	48.727532	0.4872753	1.707124065	1.8019994	1.3147241
81	0.004384	0.251197	1.296221	74.26798362	11	3.172	3.053334372	0.8600949	48.727532	0.4872753	1.700984635	1.79586	1.3085846
82	0.004384	0.251197	1.300605	74.51918064	11	3.172	3.057075856	0.8467002	48.727532	0.4872753	1.694837553	1.7897129	1.3024376
83	0.004384	0.251197	1.304989	74.77037767	11	3.172	3.060758579	0.8332892	48.727532	0.4872753	1.68868294	1.7835583	1.2962829
84	0.004384	0.251197	1.309373	75.0215747	11	3.172	3.064382471	0.8198622	48.727532	0.4872753	1.682520912	1.7773962	1.2901209
85	0.004384	0.251197	1.313758	75.27277173	11	3.172	3.067947461	0.8064194	48.727532	0.4872753	1.676351588	1.7712269	1.2839516
86	0.004384	0.251197	1.318142	75.52396876	11	3.172	3.071453481	0.7929612	48.727532	0.4872753	1.670175087	1.7650504	1.2777751
87	0.004384	0.251197	1.322526	75.77516579	11	3.172	3.074900464	0.7794877	48.727532	0.4872753	1.663991528	1.7588668	1.2715915
88	0.004384	0.251197	1.326910	76.02636282	11	3.172	3.078288343	0.7659992	48.727532	0.4872753	1.657801029	1.7526764	1.265401
89	0.004384	0.251197	1.331295	76.27755985	11	3.172	3.081617053	0.752496	48.727532	0.4872753	1.651603709	1.746479	1.2592037
90	0.004384	0.251197	1.335679	76.52875688	11	3.172	3.084886531	0.7389784	48.727532	0.4872753	1.645399688	1.740275	1.2529997
91	0.004384	0.251197	1.340063	76.77995391	11	3.172	3.088096713	0.7254465	48.727532	0.4872753	1.639189085	1.7340644	1.2467891
92	0.004384	0.251197	1.344447	77.03115093	11	3.172	3.091247538	0.7119007	48.727532	0.4872753	1.632972019	1.7278473	1.240572
93	0.004384	0.251197	1.348831	77.28234796	11	3.172	3.094338945	0.6983412	48.727532	0.4872753	1.626748609	1.7216239	1.2343486
94	0.004384	0.251197	1.353216	77.53354499	11	3.172	3.097370874	0.6847683	48.727532	0.4872753	1.620518976	1.7153943	1.228119
95	0.004384	0.251197	1.357600	77.78474202	11	3.172	3.100343269	0.6711822	48.727532	0.4872753	1.614283239	1.7091586	1.2218832
96	0.004384	0.251197	1.361984	78.03593905	11	3.172	3.10325607	0.6575832	48.727532	0.4872753	1.608041518	1.7029168	1.2156415
97	0.004384	0.251197	1.366368	78.28713608	11	3.172	3.106109223	0.6439716	48.727532	0.4872753	1.601793932	1.6966693	1.2093939
98	0.004384	0.251197	1.370753	78.53833311	11	3.172	3.108902672	0.6303476	48.727532	0.4872753	1.595540603	1.6904159	1.2031406
99	0.004384	0.251197	1.375137	78.78953014	11	3.172	3.111636365	0.6167115	48.727532	0.4872753	1.58928165	1.684157	1.1968816
100	0.004384	0.251197	1.379521	79.04072717	11	3.172	3.114310247	0.6030635	48.727532	0.4872753	1.583017193	1.6778925	1.1906172
101	0.004384	0.251197	1.383905	79.29192419	11	3.172	3.116924268	0.589404	48.727532	0.4872753	1.576747352	1.6716227	1.1843474
102	0.004384	0.251197	1.388289	79.54312122	11	3.172	3.119478378	0.5757331	48.727532	0.4872753	1.57047225	1.6653476	1.1780722
103	0.004384	0.251197	1.392674	79.79431825	11	3.172	3.121972528	0.5620511	48.727532	0.4872753	1.564192005	1.6590673	1.171792
104	0.004384	0.251197	1.397058	80.04551528	11	3.172	3.124406669	0.5483584	48.727532	0.4872753	1.557906739	1.6527821	1.1655067
105	0.004384	0.251197	1.401442	80.29671231	11	3.172	3.126780755	0.5346551	48.727532	0.4872753	1.551616572	1.6464919	1.1592166
106	0.004384	0.251197	1.405826	80.54790934	11	3.172	3.12909474	0.5209415	48.727532	0.4872753	1.545321626	1.6401969	1.1529216
107	0.004384	0.251197	1.410210	80.79910637	11	3.172	3.131348579	0.5072179	48.727532	0.4872753	1.539022021	1.6338973	1.146622
108	0.004384	0.251197	1.414595	81.0503034	11	3.172	3.13354223	0.4934846	48.727532	0.4872753	1.532717879	1.6275932	1.1403179
109	0.004384	0.251197	1.418979	81.30150043	11	3.172	3.135675651	0.4797418	48.727532	0.4872753	1.526409321	1.6212846	1.1340093
110	0.004384	0.251197	1.423363	81.55269745	11	3.172	3.137748799	0.4659897	48.727532	0.4872753	1.520096467	1.6149718	1.1276965
111	0.004384	0.251197	1.427747	81.80389448	11	3.172	3.139761636	0.4522287	48.727532	0.4872753	1.513779439	1.6086548	1.1213794
112	0.004384	0.251197	1.432132	82.05509151	11	3.172	3.141714123	0.438459	48.727532	0.4872753	1.50745836	1.6023337	1.1150584
113	0.004384	0.251197	1.436516	82.30628854	11	3.172	3.143606221	0.4246809	48.727532	0.4872753	1.501133349	1.5960087	1.1087333
114	0.004384	0.251197	1.440900	82.55748557	11	3.172	3.145437896	0.4108946	48.727532	0.4872753	1.494804529	1.5896799	1.1024045
115	0.004384	0.251197	1.445284	82.8086826	11	3.172	3.147209111	0.3971004	48.727532	0.4872753	1.488472022	1.5833473	1.096072
116	0.004384	0.251197	1.449668	83.05987963	11	3.172	3.148919832	0.3832986	48.727532	0.4872753	1.482135949	1.5770113	1.0897359
117	0.004384	0.251197	1.454053	83.31107666	11	3.172	3.150570027	0.3694894	48.727532	0.4872753	1.475796431	1.5706718	1.0833964
118	0.004384	0.251197	1.458437	83.56227369	11	3.172	3.152159664	0.3556732	48.727532	0.4872753	1.469453592	1.5643289	1.0770536
119	0.004384	0.251197	1.462821	83.81347072	11	3.172	3.153688713	0.34185	48.727532	0.4872753	1.463107552	1.5579829	1.0707076
120	0.004384	0.251197	1.467205	84.06466774	11	3.172	3.155157143	0.3280203	48.727532	0.4872753	1.456758434	1.5516338	1.0643584
121	0.004384	0.251197	1.471589	84.31586477	11	3.172	3.156564927	0.3141844	48.727532	0.4872753	1.450406359	1.5452817	1.0580064
122	0.004384	0.251197	1.475974	84.5670618	11	3.172	3.157912038	0.3003423	48.727532	0.4872753	1.44405145	1.5389268	1.0516515
123	0.004384	0.251197	1.480358	84.81825883	11	3.172	3.159198449	0.2864945	48.727532	0.4872753	1.43769383	1.5325692	1.0452938
124	0.004384	0.251197	1.484742	85.06945586	11	3.172	3.160424137	0.2726412	48.727532	0.4872753	1.431333619	1.5262089	1.0389336
125	0.004384	0.251197	1.489126	85.32065289	11	3.172	3.161589077	0.2587826	48.727532	0.4872753	1.424970941	1.5198463	1.0325709
126	0.004384	0.251197	1.493511	85.57184992	11	3.172	3.162693247	0.2449191	48.727532	0.4872753	1.418605917	1.5134812	1.0262059
127	0.004384	0.251197	1.497895	85.82304695	11	3.172	3.163736626	0.2310509	48.727532	0.4872753	1.412238671	1.507114	1.0198387

Element	Rekenhulp 1 Dhoek HW-WW	2 DHoek HW-WL	3 Dhoek LL	4 Dhoek LW-WW	5 dHoek LW-LW	6 dHoek LW-WL	Y	X
1	-	-	-	0.0	-	-	0.00	35.00
2	-	-	-	0.0	-	-	0.05	35.04
3	-	-	-	0.0	-	-	0.11	35.08
4	-	-	-	0.0	-	-	0.16	35.11
5	-	-	-	0.0	-	-	0.21	35.15
6	-	-	-	0.0	-	-	0.27	35.19
7	-	-	-	0.0	-	-	0.32	35.23
8	-	-	-	0.0	-	-	0.37	35.26
9	-	-	-	0.0	-	-	0.43	35.30
10	-	-	-	0.0	-	-	0.48	35.33
11	-	-	-	0.0	-	-	0.54	35.37
12	-	-	-	0.1	-	-	0.59	35.41
13	-	-	-	0.1	-	-	0.64	35.44
14	-	-	-	0.1	-	-	0.70	35.48
15	-	-	-	0.1	-	-	0.75	35.51
16	-	-	-	0.1	-	-	0.81	35.55
17	-	-	-	0.1	-	-	0.86	35.58
18	-	-	-	0.1	-	-	0.92	35.62
19	-	-	-	0.1	-	-	0.97	35.65
20	-	-	-	0.1	-	-	1.03	35.68
21	-	-	-	0.1	-	-	1.09	35.72
22	-	-	-	0.1	-	-	1.14	35.75
23	-	-	-	0.1	-	-	1.20	35.78
24	-	-	-	0.1	-	-	1.25	35.82
25	-	-	-	0.1	-	-	1.31	35.85
26	-	-	-	0.1	-	-	1.37	35.88
27	-	-	-	0.1	-	-	1.42	35.91
28	-	-	-	0.1	-	-	1.48	35.95
29	-	-	-	0.1	-	-	1.54	35.98
30	-	-	-	0.1	-	-	1.59	36.01
31	-	-	-	0.1	-	-	1.65	36.04
32	-	-	-	0.1	-	-	1.71	36.07
33	-	-	-	0.1	-	-	1.77	36.10
34	-	-	-	0.1	-	-	1.82	36.13
35	-	-	-	0.2	-	-	1.88	36.16
36	-	-	-	0.2	-	-	1.94	36.19
37	-	-	-	0.2	-	-	2.00	36.22
38	-	-	-	0.2	-	-	2.06	36.25
39	-	-	-	0.2	-	-	2.11	36.28
40	-	-	-	0.2	-	-	2.17	36.31
41	-	-	-	0.2	-	-	2.23	36.34
42	-	-	-	0.2	-	-	2.29	36.37
43	-	-	-	0.2	-	-	2.35	36.39
44	-	-	-	0.2	-	-	2.41	36.42
45	-	-	-	0.2	-	-	2.47	36.45
46	-	-	-	0.2	-	-	2.53	36.48
47	-	-	-	0.2	-	-	2.58	36.50
48	-	-	-	0.2	-	-	2.64	36.53
49	-	-	-	0.2	-	-	2.70	36.56
50	-	-	-	0.2	-	-	2.76	36.58
51	-	-	-	0.2	-	-	2.82	36.61
52	-	-	-	0.2	-	-	2.88	36.63
53	-	-	-	0.2	-	-	2.94	36.66
54	-	-	-	0.2	-	-	3.00	36.68
55	-	-	-	0.2	-	-	3.06	36.71
56	-	-	-	0.2	-	-	3.12	36.73
57	-	-	-	0.2	-	-	3.18	36.76
58	-	-	-	0.3	-	-	3.24	36.78
59	-	-	-	0.3	-	-	3.30	36.81
60	-	-	-	0.3	-	-	3.36	36.83
61	-	-	-	0.3	-	-	3.43	36.85
62	-	-	-	0.3	-	-	3.49	36.88
63	-	-	-	0.3	-	-	3.55	36.90
64	-	-	-	0.3	-	-	3.61	36.92
65	-	-	-	0.3	-	-	3.67	36.94
66	-	-	-	0.3	-	-	3.73	36.97
67	-	-	-	0.3	-	-	3.79	36.99
68	-	-	-	0.3	-	-	3.85	37.01
69	-	-	-	0.3	-	-	3.92	37.03
70	-	-	-	0.3	-	-	3.98	37.05
71	-	-	-	0.3	-	-	4.04	37.07
72	-	-	-	0.3	-	-	4.10	37.09
73	-	-	-	0.3	-	-	4.16	37.11
74	-	-	-	0.3	-	-	4.22	37.13
75	-	-	-	0.3	-	-	4.29	37.15
76	-	-	-	0.3	-	-	4.35	37.17
77	-	-	-	0.3	-	-	4.41	37.19
78	-	-	-	0.3	-	-	4.47	37.21
79	-	-	-	0.3	-	-	4.54	37.23
80	-	-	-	0.4	-	-	4.60	37.25
81	-	-	-	0.4	-	-	4.66	37.26
82	-	-	-	0.4	-	-	4.72	37.28
83	-	-	-	0.4	-	-	4.79	37.30
84	-	-	-	0.4	-	-	4.85	37.32
85	-	-	-	0.4	-	-	4.91	37.33
86	-	-	-	0.4	-	-	4.97	37.35
87	-	-	-	0.4	-	-	5.04	37.37
88	-	-	-	0.4	-	-	5.10	37.38
89	-	-	-	0.4	-	-	5.16	37.40
90	-	-	-	0.4	-	-	5.23	37.41
91	-	-	-	0.4	-	-	5.29	37.43
92	-	-	-	0.4	-	-	5.35	37.44
93	-	-	-	0.4	-	-	5.42	37.46
94	-	-	-	0.4	-	-	5.48	37.47
95	-	-	-	0.4	-	-	5.54	37.49
96	-	-	-	0.4	-	-	5.61	37.50
97	-	-	-	0.4	-	-	5.67	37.51
98	-	-	-	0.4	-	-	5.74	37.53
99	-	-	-	0.4	-	-	5.80	37.54
100	-	-	-	0.4	-	-	5.86	37.55
101	-	-	-	0.4	-	-	5.93	37.56
102	-	-	-	0.4	-	-	5.99	37.58
103	-	-	-	0.5	-	-	6.06	37.59
104	-	-	-	0.5	-	-	6.12	37.60
105	-	-	-	0.5	-	-	6.18	37.61
106	-	-	-	0.5	-	-	6.25	37.62
107	-	-	-	0.5	-	-	6.31	37.63
108	-	-	-	0.5	-	-	6.38	37.64
109	-	-	-	0.5	-	-	6.44	37.65
110	-	-	-	0.5	-	-	6.50	37.66
111	-	-	-	0.5	-	-	6.57	37.67
112	-	-	-	0.5	-	-	6.63	37.68
113	-	-	-	0.5	-	-	6.70	37.69
114	-	-	-	0.5	-	-	6.76	37.70
115	-	-	-	0.5	-	-	6.83	37.71
116	-	-	-	0.5	-	-	6.89	37.72
117	-	-	-	0.5	-	-	6.96	37.72
118	-	-	-	0.5	-	-	7.02	37.73
119	-	-	-	0.5	-	-	7.09	37.74
120	-	-	-	0.5	-	-	7.15	37.75
121	-	-	-	0.5	-	-	7.22	37.75
122	-	-	-	0.5	-	-	7.28	37.76
123	-	-	-	0.5	-	-	7.34	37.77
124	-	-	-	0.5	-	-	7.41	37.77
125	-	-	-	0.5	-	-	7.47	37.78
126	-	-	-	0.6	-	-	7.54	37.78
127	-	-	-	0.6	-	-	7.60	37.79

128	37.79	7.67	8.33	-	-	-	0.004384	-	-	Dubbel	0.036210	Dubbel	-	0.004384	0.251197	1.502279	86.07424398	11	3.172	3.164719194	0.2171782	48.727532	0.4872753	1.405869324	1.5007446	1.0134693	-	-	-	0.6	-	-	7.67	37.79
129	37.80	7.73	8.40	-	-	-	0.004384	-	-	Dubbel	0.034325	Dubbel	-	0.004384	0.251197	1.506663	86.325441	11	3.172	3.165640932	0.2033013	48.727532	0.4872753	1.399497999	1.4943733	1.007098	-	-	-	0.6	-	-	7.73	37.80
130	37.80	7.80	8.46	-	-	-	0.004384	-	-	Dubbel	0.032403	Dubbel	-	0.004384	0.251197	1.511047	86.57663803	11	3.172	3.166501822	0.1894206	48.727532	0.4872753	1.393124818	1.4880001	1.0007248	-	-	-	0.6	-	-	7.80	37.80
131	37.80	7.86	8.53	-	-	-	0.004384	-	-	Dubbel	0.030443	Dubbel	-	0.004384	0.251197	1.515432	86.82783506	11	3.172	3.167301848	0.1755362	48.727532	0.4872753	1.386749904	1.4816252	0.9943499	-	-	-	0.6	-	-	7.86	37.80
132	37.81	7.93	8.59	-	-	-	0.004384	-	-	Dubbel	0.028446	Dubbel	-	0.004384	0.251197	1.519816	87.07903209	11	3.172	3.168040994	0.1616484	48.727532	0.4872753	1.380373379	1.4752487	0.9879734	-	-	-	0.6	-	-	7.93	37.81
133	37.81	7.99	8.66	-	-	-	0.004384	-	-	Dubbel	0.026411	Dubbel	-	0.004384	0.251197	1.524200	87.33022912	11	3.172	3.168719246	0.1477575	48.727532	0.4872753	1.373995366	1.4688707	0.9815954	-	-	-	0.6	-	-	7.99	37.81
134	37.81	8.06	8.72	-	-	-	0.004384	-	-	Dubbel	0.024339	Dubbel	-	0.004384	0.251197	1.528584	87.58142615	11	3.172	3.169336591	0.1338638	48.727532	0.4872753	1.367615988	1.4624913	0.975216	-	-	-	0.6	-	-	8.06	37.81
135	37.82	8.12	8.79	-	-	-	0.004384	-	-	Dubbel	0.022229	Dubbel	-	0.004384	0.251197	1.532968	87.83262318	11	3.172	3.169893018	0.1199675	48.727532	0.4872753	1.361235367	1.4561107	0.9688354	-	-	-	0.6	-	-	8.12	37.82
136	37.82	8.19	8.85	-	-	-	0.004384	-	-	Dubbel	0.020081	Dubbel	-	0.004384	0.251197	1.537353	88.08382021	11	3.172	3.170388515	0.1060689	48.727532	0.4872753	1.354853626	1.4497289	0.9624536	-	-	-	0.6	-	-	8.19	37.82
137	37.82	8.25	8.92	-	-	-	0.004384	-	-	Dubbel	0.017897	Dubbel	-	0.004384	0.251197	1.541737	88.33501724	11	3.172	3.170823073	0.0921683	48.727532	0.4872753	1.348470887	1.4433462	0.9560709	-	-	-	0.6	-	-	8.25	37.82
138	37.82	8.32	8.98	-	-	-	0.004384	-	-	Dubbel	0.015674	Dubbel	-	0.004384	0.251197	1.546121	88.58621426	11	3.172	3.171196683	0.0782658	48.727532	0.4872753	1.342087273	1.4369626	0.9496873	-	-	-	0.6	-	-	8.32	37.82
139	37.83	8.38	9.05	-	-	-	0.004384	-	-	Dubbel	0.013414	Dubbel	-	0.004384	0.251197	1.550505	88.83741129	11	3.172	3.171509339	0.0643619	48.727532	0.4872753	1.335702907	1.4305782	0.9433029	-	-	-	0.6	-	-	8.38	37.83
140	37.83	8.45	9.11	-	-	-	0.004384	-	-	Dubbel	0.011117	Dubbel	-	0.004384	0.251197	1.554890	89.08860832	11	3.172	3.171761035	0.0504568	48.727532	0.4872753	1.329317912	1.4241932	0.9369179	-	-	-	0.6	-	-	8.45	37.83
141	37.83	8.51	9.18	-	-	-	0.004384	-	-	Dubbel	0.008783	Dubbel	-	0.004384	0.251197	1.559274	89.33980535	11	3.172	3.171951764	0.0365507	48.727532	0.4872753	1.32293241	1.4178077	0.9305324	-	-	-	0.6	-	-	8.51	37.83
142	37.83	8.58	9.24	-	-	-	0.004384	-	-	Dubbel	0.006411	Dubbel	-	0.004384	0.251197	1.563658	89.59100238	11	3.172	3.172081525	0.0226438	48.727532	0.4872753	1.316546524	1.4114218	0.9241465	-	-	-	0.6	-	-	8.58	37.83
143	37.83	8.64	9.31	-	-	-	0.004384	-	-	-0.001555771	-	0	-	0.004384	0.251197	1.568042	89.84219941	11	3.172	3.172150315	0.0087366	48.727532	0.4872753	1.310160376	1.4050357	0.9177604	-	-	-	0.6	-	-	8.64	37.83
144	37.83	8.71	9.37	-	-	-	0.004384	-	-	0.000927714	-	0	-	0.004384	0.251197	1.572426	90.09339644	11	3.172	3.172158131	-0.005171	48.727532	0.4872753	1.303774091	1.3986494	0.9113741	-	-	-	0.6	-	-	8.71	37.83
145	37.83	8.77	9.44	-	-	-	0.004384	-	-	0.003448341	-	0	-	0.004384	0.251197	1.576811	90.34459347	11	3.172	3.172104974	-0.019078	48.727532	0.4872753	1.297387789	1.3922631	0.9049878	-	-	-	0.6	-	-	8.77	37.83
146	37.83	8.84	9.50	-	-	-	0.004384	-	-	0.00600606	-	0	-	0.004384	0.251197	1.581195	90.5957905	11	3.172	3.171990846	-0.032985	48.727532	0.4872753	1.291001595	1.3858769	0.8986016	-	-	-	0.6	-	-	8.84	37.83
147	37.83	8.91	9.57	-	-	-	0.004384	-	-	0.008600818	-	0	-	0.004384	0.251197	1.585579	90.84698753	11	3.172	3.171815747	-0.046891	48.727532	0.4872753	1.28461563	1.379491	0.8922156	-	-	-	0.6	-	-	8.91	37.83
148	37.83	8.97	9.63	-	-	-	0.004384	-	-	0.01123256	-	0	-	0.004384	0.251197	1.589963	91.09818455	11	3.172	3.171579682	-0.060797	48.727532	0.4872753	1.278230018	1.3731053	0.88583	-	-	-	0.6	-	-	8.97	37.83
149	37.83	9.04	9.70	-	-	-	0.004384	-	-	0.013901225	-	0	-	0.004384	0.251197	1.594347	91.34938158	11	3.172	3.171282656	-0.074701	48.727532	0.4872753	1.271844881	1.3667202	0.8794449	-	-	-	0.7	-	-	9.04	37.83
150	37.82	9.10	9.77	-	-	-	0.004384	-	-	0.016606752	-	0	-	0.004384	0.251197	1.598732	91.60057861	11	3.172	3.170924673	-0.088604	48.727532	0.4872753	1.265460342	1.3603357	0.8730603	-	-	-	0.7	-	-	9.10	37.82
151	37.82	9.17	9.83	-	-	-	0.004384	-	-	0.019349078	-	0	-	0.004384	0.251197	1.603116	91.85177564	11	3.172	3.17050574	-0.102505	48.727532	0.4872753	1.259076523	1.3539518	0.8666765	-	-	-	0.7	-	-	9.17	37.82
152	37.82	9.23	9.90	-	-	-	0.004384	-	-	0.022128133	-	0	-	0.004384	0.251197	1.607500	92.10297267	11	3.172	3.170025866	-0.116404	48.727532	0.4872753	1.252693549	1.3475689	0.8602935	-	-	-	0.7	-	-	9.23	37.82
153	37.82	9.30	9.96	-	-	-	0.004384	-	-	0.024943849	-	0	-	0.004384	0.251197	1.611884	92.3541697	11	3.172	3.169485061	-0.130301	48.727532	0.4872753	1.24631154	1.3411869	0.8539115	-	-	-	0.7	-	-	9.30	37.82
154	37.81	9.36	10.03	-	-	-	0.004384	-	-	0.027796151	-	0	-	0.004384	0.251197	1.616269	92.60536673	11	3.172	3.168883333	-0.144196	48.727532	0.4872753	1.23993062	1.3348059	0.8475306	-	-	-	0.7	-	-	9.36	37.81
155	37.81	9.43	10.09	-	-	-	0.004384	-	-	0.030684964	-	0	-	0.004384	0.251197	1.620653	92.85656376	11	3.172	3.168220696	-0.158087	48.727532	0.4872753	1.233550911	1.3284262	0.8411509	-	-	-	0.7	-	-	9.43	37.81
156	37.81	9.49	10.16	-	-	-	0.004384	-	-	0.03361021	-	0	-	0.004384	0.251197	1.625037	93.10776079	11	3.172	3.167497161	-0.171976	48.727532	0.4872753	1.227172537	1.3220479	0.8347725	-	-	-	0.7	-	-	9.49	37.81
157	37.81	9.56	10.22	-	-	-	0.004384	-	-	0.036571806	-	0	-	0.004384	0.251197	1.629421	93.35895781	11	3.172	3.166712743	-0.185861	48.727532	0.4872753	1.220795619	1.3156709	0.8283956	-	-	-	0.7	-	-	9.56	37.81
158	37.80	9.62	10.29	-	-	-	0.004384	-	-	0.039569668	-	0	-	0.004384	0.251197	1.633805	93.61015484	11	3.172	3.165867456	-0.199743	48.727532	0.4872753	1.21442028	1.3092956	0.8220203	-	-	-	0.7	-	-	9.62	37.80
159	37.80	9.69	10.35	-	-	-	0.004384	-	-	0.042603709	-	0	-	0.004384	0.251197	1.638190	93.86135187	11	3.172	3.164961317	-0.213621	48.727532	0.4872753	1.208046643	1.302922	0.8156466	-	-	-	0.7	-	-	9.69	37.80
160	37.79	9.75	10.42	-	-	-	0.004384	-	-	0.045673838	-	0	-	0.004384	0.251197	1.642574	94.1125489	11	3.172	3.163994344	-0.227494	48.727532	0.4872753	1.201674831	1.2965502	0.8092748	-	-	-	0.7	-	-	9.75	37.79
161	37.79	9.82	10.48	-	-	-	0.004384	-	-	0.048779964	-	0	-	0.004384	0.251197	1.646958	94.36374593	11	3.172	3.162966554	-0.241364	48.727532	0.4872753	1.195304965	1.2901803	0.802905	-	-	-	0.7	-	-	9.82	37.79
162	37.78	9.88	10.55	-	-	-	0.004384	-	-	0.051921989	-	0	-	0.004384	0.251197	1.651342	94.61494296	11	3.172	3.161877968	-0.255229	48.727532	0.4872753	1.188937168	1.2838125	0.7965372	-	-	-	0.7	-	-	9.88	37.78
163	37.78	9.95	10.61	-	-	-	0.004384	-	-	0.055099816	-	0	-	0.004384	0.251197	1.655726	94.86613999	11	3.172	3.160728607	-0.269089	48.727532	0.4872753	1.182571563	1.2774469	0.7901716	-	-	-	0.7	-	-	9.95	37.78
164	37.77	10.01	10.68	-	-	-	0.004384	-	-	0.058313344	-	0	-	0.004384	0.251197	1.660111	95.11733702	11	3.172	3.159518492	-0.282943	48.727532	0.4872753	1.176208272	1.2710836	0.7838083	-	-	-	0.7	-	-	10.01	37.77
165	37.77	10.07	10.74	-	-	-	0.004384	-	-	0.061562467	-	0	-	0.004384	0.251197	1.664495	95.36853405	11	3.172	3.158247647	-0.296792	48.727532	0.4872753	1.169847417	1.2647227	0.7774474	-	-	-	0.7	-	-	10.07	37.77
166	37.76	10.14	10.81	-	-	-	0.004384	-	-	0.06484708	-	0	-	0.004384	0.251197	1.668879	95.61973107	11	3.172	3.156916096	-0.310636	48.727532	0.4872753	1.16348912	1.2583644	0.7710891	-	-	-	0.7	-	-	10.14	37.76
167	37.75	10.20	10.87	-	-	-	0.004384	-	-	0.068167071	-	0	-	0.004384	0.251197	1.673263	95.8709281	11	3.172	3.155523866	-0.324474	48.727532	0.4872753	1.157133505	1.2520088	0.7647335	-	-	-	0.7	-	-	10.20	37.75
168	37.75	10.27	10.94	-	-	-	0.004384	-	-	0.07152233	-	0	-	0.004384	0.251197	1.677648	96.12212513	11	3.172	3.154070982	-0.338305	48.727532	0.4872753	1.150780692	1.245656	0.7583807	-	-	-	0.7	-	-	10.27	37.75
169	37.74	10.33	11.00	-	-	-	0.004384	-	-	0.074912741	-	0	-	0.004384	0.251197	1.682032	96.37332216	11	3.172	3.152557472	-0.35213	48.727532	0.4872753	1.144430804	1.2393061	0.7520308	-	-	-	0.7	-	-	10.33	37.74
170	37.73	10.40	11.07	-	-	-	0.004384	-	-	0.078338185	-	0	-	0.004384	0.251197	1.686416	96.62451919	11	3.172	3.150983367	-0.365948	48.727532	0.4872753	1.138083963	1.2329593	0.745684	-	-	-	0.7	-	-	10.40	37.73
171	37.73	10.46	11.13	-	-	-	0.004384	-	-	0.081798542	-	0	-	0.004384	0.251197	1.690800	96.87571622	11	3.172	3.149348695	-0.379759	48.727532	0.4872753	1.131740291	1.2266156	0.7393403	-	-	-	0.7	-	-	10.46	37.73
172	37.72	10.53	11.20	-	-	-	0.004384	-	-	0.085293688	-	0	-	0.004384	0.251197	1.695184	97.12691325	11	3.172	3.147653489	-0.393563	48.727532	0.4872753	1.125399911	1.2202752	0.7329999	-	-	-	0.8	-	-	10.53	37.72
173	37.71	10.59	11.26	-	-	-	0.004384	-	-	0.088823497	-	0	-	0.004384	0.251197	1.699569	97.37811028	11	3.172	3.145897781	-0.407359	48.727532	0.4872753	1.119062943	1.2139383	0.7266629	-	-	-	0.8	-	-	10.59	37.71
174	37.70	10.66	11.33	-	-	-	0.004384	-	-	0.09238784	-	0	-	0.004384	0.251197	1.703953	97.62930731	11	3.172	3.144081604	-0.421147	48.727532	0.4872753	1.11272951	1.2076048	0.7203295	-	-	-	0.8	-	-	10.66	37.70
175	37.69	10.72	11.39	-	-	-	0.004384	-	-	0.095986586	-	0	-	0.004384	0.251197	1.708337	97.88050433	11	3.172	3.142204994	-0.434927	48.727532	0.4872753	1.106399733	1.2012751	0.7139997	-	-	-	0.8	-	-	10.72	37.69
176	37.68	10.79	11.46	-	-	-	0.004384	-	-	0.099619598	-	0	-	0.004384	0.251197	1.712721	98.13170136	11	3.172	3.140267987	-0.448699	48.727532	0.4872753	1.100073734	1.1949491	0.7076737	-	-	-	0.8	-	-	10.79	37.68
177	37.67	10.85	11.52	-	-	-	0.004384	-	-	0.103286741	-	0	-	0.004384	0.251197	1.717106	98.38289839	11	3.172	3.138270619	-0.462462	48.727532	0.4872753	1.093751635	1.188627	0.7013516	-	-	-	0.8	-	-	10.85	37.67
178	37.67	10.92	11.59	-	-	-	0.004384	-	-	0.106987875	-	0	-	0.004384	0.251197	1.721490	98.63409542	11	3.172	3.13621293	-0.476217	48.727532	0.4872753	1.087433557	1.1823089	0.6950336	-	-	-	0.8	-	-	10.92	37.67
179	37.66	10.98	11.65	-	-	-	0.004384	-	-	0.110722856	-	0	-	0.004384	0.251197	1.725874	98.88529245	11	3.172	3.134094959	-0.489962	48.727532	0.4872753	1.081119621	1.1759949	0.6887196	-	-	-	0.8	-	-	10.98	37.66
180	37.65	11.04	11.72	-	-	-	0.004384	-	-	0.114491539	-	0	-	0.004384	0.251197	1.730258	99.13648948	11	3.172	3.131916747	-0.503698	48.727532	0.4872753	1.07480995	1.1696853	0.68241	-	-	-	0.8	-	-	11.04	37.65
181	37.64	11.11	11.78	-	-	-	0.004384	-	-	0.118293777	-	0	-	0.004384	0.251197	1.734642	99.38768651	11	3.172	3.129678335	-0.517424	48.727532	0.4872753	1.068504664	1.16338	0.6761047	-	-	-	0.8	-	-	11.11	37.64
182	37.62	11.17	11.85	-	-	-	0.004384	-	-	0.122129419	-	0	-	0.004384	0.251197	1.739027	99.63888354	11	3.172	3.127379766	-0.53114	48.727532	0.4872753	1.062203884	1.1570792	0.6698039	-	-	-	0.8	-	-	11.17	37.62
183	37.61	11.24	11.91	-	-	-	0.004384	-	-	0.12599831	-	0	-	0.004384	0.251197	1.743411	99.89008057	11	3.172	3.125021085	-0.544846	48.727532	0.4872753	1.055907732	1.1507831	0.6635077	-	-	-	0.8	-	-	11.24	37.61
184	37.60	11.30	11.98	-	-	-	0.004384	-	-	0.129900296	-	0	-	0.004384	0.251197	1.747795	100.1412776	11	3.172	3.122602337	-0.558541	48.727532	0.4872753	1.049616329	1.1444917	0.6572163	-	-	-	0.8	-	-	11.30	37.60
185	37.59	11.36	12.04	-	-	-	0.004384	-	-	0.133835217	-	0	-	0.004384	0.251197	1.752179	100.3924746	11	3.172	3.120123568	-0.572226	48.727532	0.4872753	1.043329795	1.1382051	0.6509298	-	-	-	0.8	-	-	11.36	37.59
186	37.58	11.43	12.11	-	-	-	0.004384	-	-	0.137802913	-	0	-	0.004384	0.251197	1.756563	100.6436717	11	3.172	3.117584827	-0.5859	48.727532	0.4872753	1.037048251	1.1319236	0.6446483	-	-	-	0.8	-	-	11.43	37.58
187	37.57	11.49	12.17	-	-	-	0.004384	-	-	0.141803218	-	0	-	0.004384	0.251197	1.760948	100.8948687	11	3.172	3.114986162	-0.599562	48.727532	0.4872753	1.030771818	1.1256471	0.6383718	-	-	-	0.8	-	-	11.49	37.57
188	37.55	11.56	12.24	-	-	-	0.004384	-	-	0.145835967	-	0	-	0.004384	0.251197	1.765332	101.1460657	11	3.172	3.112327622	-0.613213	48.727532	0.4872753	1.024500617	1.1193759	0.6321006	-	-	-	0.8	-	-	11.56	37.55
189	37.54	11.62	12.30	-	-	-	0.004384	-	-	0.14990099	-	0	-	0.004384	0.251197	1.769716	101.3972627	11	3.172	3.109609259	-0.626853	48.727532	0.4872753	1.018234769	1.1131101	0.6258348	-	-	-	0.8	-	-	11.62	37.54
190	37.53	11.68	12.37	-	-	-	0.004384	-	-	0.153998116	-	0	-	0.004384	0.251197	1.774100	101.6484598	11	3.172	3.106831126	-0.64048	48.727532	0.4872753	1.011974393	1.1068497	0.6195744	-	-	-	0.8	-	-	11.68	37.53
191	37.52	11.75	12.43	-	-	-	0.004384	-	-	0.158127169	-	0	-	0.004384	0.251197	1.778485	101.8996568	11	3.172	3.103993275	-0.654095	48.727532	0.4872753	1.00571961	1.1005949	0.6133196	-	-	-	0.8	-	-	11.75	37.52
192	37.50	11.81	12.50	-	-	-	0.004384	-	-	0.162287974	-	0	-	0.004384	0.251197	1.782869	102.1508538	11	3.172	3.101095762	-0.667697	48.727532	0.4872753	0.99947054	1.0943459	0.6070705	-	-	-	0.8	-	-	11.81	37.50
193	37.49	11.88	12.56	-	-	-	0.004384	-	-	0.16648035	-	0	-	0.004384	0.251197	1.787253	102.4020509	11	3.172	3.098138641	-0.681286	48.727532	0.4872753	0.993227304	1.0881026	0.6008273	-	-	-	0.8	-	-	11.88	37.49
194	37.48	11.94	12.63	-	-	-	0.004384	-	-	0.170704115	-	0	-	0.004384	0.251197	1.791637	102.6532479	11	3.172	3.09512197	-0.694863	48.727532	0.4872753	0.986990021	1.0818653	0.59459	-	-	-	0.9	-	-	11.94	37.48
195	37.46	12.00	12.69	-	-	-	0.004384	-	-	0.174959085	-	0	-	0.004384	0.251197	1.796021	102.9044449	11	3.172	3.092045807	-0.708425	48.727532	0.4872753	0.980758812	1.0756341	0.5883588	-	-	-	0.9	-	-	12.00	37.46
196	37.45	12.07	12.76	-	-	-	0.004384	-	-	0.179245073	-	0	-	0.004384	0.251197	1.800406	103.1556419	11	3.172	3.08891021	-0.721975	48.727532	0.4872753	0.974533795	1.0694091	0.5821338	-	-	-	0.9	-	-	12.07	37.45
197	37.43	12.13	12.82	-	-	-	0.004384	-	-	0.183561888	-	0	-	0.004384	0.251197	1.804790	103.406839	11	3.172	3.085715241	-0.73551	48.727532	0.4872753	0.968315091	1.0631904	0.5759151	-	-	-	0.9	-	-	12.13	37.43
198	37.42	12.19	12.89	-	-	-	0.004384	-	-	0.187909339	-	0	-	0.004384	0.251197	1.809174	103.658036	11	3.172	3.08246096	-0.749032	48.727532	0.4872753	0.96210282	1.0569781	0.5697028	-	-	-	0.9	-	-	12.19	37.42
199	37.40	12.26	12.95	-	-	-	0.004384	-	-	0.19228723	-	0	-	0.004384	0.251197	1.813558	103.909233	11	3.172	3.07914743	-0.762539	48.727532	0.4872753	0.9558971	1.0507724	0.5634971	-	-	-	0.9	-	-	12.26	37.40
200	37.39	12.32	13.02	-	-	-	0.004384	-	-	0.196695365	-	0	-	0.004384	0.251197	1.817942	104.1604301	11	3.172	3.075774715	-0.776031	48.727532	0.4872753	0.949698051	1.0445734	0.5572981	-	-	-	0.9	-	-	12.32	37.39
201	37.37	12.38	13.09	-	-	-	0.004384	-	-	0.201133543	-	0	-	0.004384	0.251197	1.822327	104.4116271	11	3.172	3.07234288	-0.789508	48.727532	0.4872753	0.943505792	1.0383811	0.5511058	-	-	-	0.9	-	-	12.38	37.37
202	37.35	12.45	13.15	-	-	-	0.004384	-	-	0.205601563	-	0	-	0.004384	0.251197	1.826711	104.6628241	11	3.172	3.06885199	-0.80297	48.727532	0.4872753	0.937320442	1.0321958	0.5449204	-	-	-	0.9	-	-	12.45	37.35
203	37.34	12.51	13.22	-	-	-	0.004384	-	-	0.21009922	-	0	-	0.004384	0.251197	1.831095	104.9140211	11	3.172	3.065302113	-0.816417	48.727532	0.4872753	0.93114212	1.0260174	0.5387421	-	-	-	0.9	-	-	12.51	37.34
204	37.32	12.57	13.28	-	-	-	0.004384	-	-	0.214626307	-	0	-	0.004384	0.251197	1.835479	105.1652182	11	3.172	3.061693316	-0.829848	48.727532	0.4872753	0.924970945	1.0198463	0.5325709	-	-	-	0.9	-	-	12.57	37.32
205	37.30	12.63	13.35	-	-	-	0.004384	-	-	0.219182614	-	0	-	0.004384	0.251197	1.839864	105.4164152	11	3.172	3.05802567	-0.843263	48.727532	0.4872753	0.918807035	1.0136824	0.526407	-	-	-	0.9	-	-	12.63	37.30
206	37.29	12.70	13.41	-	-	-	0.004384	-	-	0.223767929	-	0	-	0.004384	0.251197	1.844248	105.6676122	11	3.172	3.054299245	-0.856662	48.727532	0.4872753	0.912650509	1.0075258	0.5202505	-	-	-	0.9	-	-	12.70	37.29
207	37.27	12.76	13.48	-	-	-	0.004384	-	-	0.228382039	-	0	-	0.004384	0.251197	1.848632	105.9188093	11	3.172	3.050514111	-0.870045	48.727532	0.4872753	0.906501485	1.0013768	0.5141015	-	-	-	0.9	-	-	12.76	37.27
208	37.25	12.82	13.54	-	-	-	0.004384	-	-	0.233024726	-	0	-	0.004384	0.251197	1.853016	106.1700063	11	3.172	3.046670343	-0.88341	48.727532	0.4872753	0.900360082	0.9952354	0.5079601	-	-	-	0.9	-	-	12.82	37.25
209	37.23	12.88	13.61	-	-	-	0.004384	-	-	0.237695771	-	0	-	0.004384	0.251197	1.857400	106.4212033	11	3.172	3.042768014	-0.896759	48.727532	0.4872753	0.894226417	0.9891017	0.5018264	-	-	-	0.9	-	-	12.88	37.23
210	37.21	12.95	13.67	-	-	-	0.004384	-	-	0.242394954	-	0	-	0.004384	0.251197	1.861785	106.6724003	11	3.172	3.038807199	-0.910091	48.727532	0.4872753	0.888100608	0.9829759	0.4957006	-	-	-	0.9	-	-	12.95	37.21
211	37.20	13.01	13.74	-	-	-	0.004384	-	-	0.247122049	-	0	-	0.004384	0.251197	1.866169	106.9235974	11	3.172	3.034787975	-0.923405	48.727532	0.4872753	0.881982773	0.9768581	0.4895828	-	-	-	0.9	-	-	13.01	37.20
212	37.18	13.07	13.80	-	-	-	0.004384	-	-	0.251876832	-	0	-	0.004384	0.251197	1.870553	107.1747944	11	3.172	3.030710417	-0.936701	48.727532	0.4872753	0.87587303	0.9707484	0.483473	-	-	-	0.9	-	-	13.07	37.18
213	37.16	13.13	13.87	-	-	-	0.004384	-	-	0.256659073	-	0	-	0.004384	0.251197	1.874937	107.4259914	11	3.172	3.026574605	-0.949979	48.727532	0.4872753	0.869771496	0.9646468	0.4773715	-	-	-	0.9	-	-	13.13	37.16
214	37.14	13.20	13.93	-	-	-	0.004384	-	-	0.261468542	-	0	-	0.004384	0.251197	1.879321	107.6771885	11	3.172	3.022380619	-0.963239	48.727532	0.4872753	0.863678289	0.9585536	0.4712783	-	-	-	0.9	-	-	13.20	37.14
215	37.12	13.26	14.00	-	-	-	0.004384	-	-	0.266305007	-	0	-	0.004384	0.251197	1.883706	107.9283855	11	3.172	3.018128538	-0.97648	48.727532	0.4872753	0.857593525	0.9524688	0.4651935	-	-	-	0.9	-	-	13.26	37.12
216	37.10	13.32	14.06	-	-	-	0.004384	-	-	0.271168231	-	0	-	0.004384	0.251197	1.888090	108.1795825	11	3.172	3.013818445	-0.989703	48.727532	0.4872753	0.851517321	0.9463926	0.4591173	-	-	-	0.9	-	-	13.32	37.10
217	37.08	13.38	14.13	-	-	-	0.004384	-	-	0.276057977	-	0	-	0.004384	0.251197	1.892474	108.4307795	11	3.172	3.009450423	-1.002907	48.727532	0.4872753	0.845449794	0.9403251	0.4530498	-	-	-	1.0	-	-	13.38	37.08
218	37.06	13.44	14.19	-	-	-	0.004384	-	-	0.280974006	-	0	-	0.004384	0.251197	1.896858	108.6819766	11	3.172	3.005024555	-1.016091	48.727532	0.4872753	0.839391062	0.9342664	0.4469911	-	-	-	1.0	-	-	13.44	37.06
219	37.04	13.51	14.26	-	-	-	0.004384	-	-	0.285916076	-	0	-	0.004384	0.251197	1.901243	108.9331736	11	3.172	3.000540926	-1.029256	48.727532	0.4872753	0.83334124	0.9282166	0.4409412	-	-	-	1.0	-	-	13.51	37.04
220	37.01	13.57	14.32	-	-	-	0.004384	-	-	0.290883942	-	0	-	0.004384	0.251197	1.905627	109.1843706	11	3.172	2.995999623	-1.042401	48.727532	0.4872753	0.827300444	0.9221758	0.4349004	-	-	-	1.0	-	-	13.57	37.01
221	36.99	13.63	14.39	-	-	-	0.004384	-	-	0.295877359	-	0	-	0.004384	0.251197	1.910011	109.4355677	11	3.172	2.991400733	-1.055526	48.727532	0.4872753	0.821268791	0.9161441	0.4288688	-	-	-	1.0	-	-	13.63	36.99
222	36.97	13.69	14.45	-	-	-	0.004384	-	-	0.300896076	-	0	-	0.004384	0.251197	1.914395	109.6867647	11	3.172	2.986744345	-1.068631	48.727532	0.4872753	0.815246397	0.9101217	0.4228464	-	-	-	1.0	-	-	13.69	36.97
223	36.95	13.75	14.52	-	-	-	0.004384	-	-	0.305939845	-	0	-	0.004384	0.251197	1.918779	109.9379617	11	3.172	2.982030547	-1.081715	48.727532	0.4872753	0.809233377	0.9041087	0.4168334	-	-	-	1.0	-	-	13.75	36.95
224	36.93	13.81	14.58	-	-	-	0.004384	-	-	0.311008413	-	0	-	0.004384	0.251197	1.923164	110.1891588	11	3.172	2.977259431	-1.094779	48.727532	0.4872753	0.803229847	0.8981052	0.4108298	-	-	-	1.0	-	-	13.81	36.93
225	36.91	13.87	14.65	-	-	-	0.004384	-	-	0.316101523	-	0	-	0.004384	0.251197	1.927548	110.4403558	11	3.172	2.972431088	-1.107821	48.727532	0.4872753	0.797235922	0.8921112	0.4048359	-	-	-	1.0	-	-	13.87	36.91
226	36.88	13.93	14.71	-	-	-	0.004384	-	-	0.32121892	-	0	-	0.004384	0.251197	1.931932	110.6915528	11	3.172	2.96754561	-1.120842	48.727532	0.4872753	0.791251718	0.886127	0.3988517	-	-	-	1.0	-	-	13.93	36.88
227	36.86	14.00	14.78	-	-	-	0.004384	-	-	0.326360343	-	0	-	0.004384	0.251197	1.936316	110.9427498	11	3.172	2.962603093	-1.133842	48.727532	0.4872753	0.78527735	0.8801527	0.3928774	-	-	-	1.0	-	-	14.00	36.86
228	36.84	14.06	14.84	-	-	-	0.004384	-	-	0.331525533	-	0	-	0.004384	0.251197	1.940700	111.1939469	11	3.172	2.957603631	-1.146819	48.727532	0.4872753	0.779312932	0.8741883	0.3869129	-	-	-	1.0	-	-	14.06	36.84
229	36.81	14.12	14.91	-	-	-	0.004384	-	-	0.336714225	-	0	-	0.004384	0.251197	1.945085	111.4451439	11	3.172	2.952547319	-1.159775	48.727532	0.4872753	0.773358579	0.8682339	0.3809586	-	-	-	1.0	-	-	14.12	36.81
230	36.79	14.18	14.97	-	-	-	0.004384	-	-	0.341926155	-	0	-	0.004384	0.251197	1.949469	111.6963409	11	3.172	2.947434256	-1.172709	48.727532	0.4872753	0.767414406	0.8622897	0.3750144	-	-	-	1.0	-	-	14.18	36.79
231	36.76	14.24	15.04	-	-	-	0.004384	-	-	0.347161055	-	0	-	0.004384	0.251197	1.953853	111.947538	11	3.172	2.942264539	-1.185619	48.727532	0.4872753	0.761480527	0.8563558	0.3690805	-	-	-	1.0	-	-	14.24	36.76
232	36.74	14.30	15.10	-	-	-	0.004384	-	-	0.352418656	-	0	-	0.004384	0.251197	1.958237	112.198735	11	3.172	2.937038268	-1.198507	48.727532	0.4872753	0.755557055	0.8504324	0.3631571	-	-	-	1.0	-	-	14.30	36.74
233	36.72	14.36	15.17	-	-	-	0.004384	-	-	0.357698686	-	0	-	0.004384	0.251197	1.962622	112.449932	11	3.172	2.931755543	-1.211373	48.727532	0.4872753	0.749644105	0.8445194	0.3572441	-	-	-	1.0	-	-	14.36	36.72
234	36.69	14.42	15.23	-	-	-	0.004384	-	-	0.363000873	-	0	-	0.004384	0.251197	1.967006	112.701129	11	3.172	2.926416467	-1.224214	48.727532	0.4872753	0.743741791	0.8386171	0.3513418	-	-	-	1.0	-	-	14.42	36.69
235	36.67	14.48	15.30	-	-	-	0.004384	-	-	0.368324941	-	0	-	0.004384	0.251197	1.971390	112.9523261	11	3.172	2.92102114	-1.237033	48.727532	0.4872753	0.737850225	0.8327255	0.3454502	-	-	-	1.0	-	-	14.48	36.67
236	36.64	14.54	15.36	-	-	-	0.004384	-	-	0.373670613	-	0	-	0.004384	0.251197	1.975774	113.2035231	11	3.172	2.915569668	-1.249827	48.727532	0.4872753	0.731969522	0.8268448	0.3395695	-	-	-	1.0	-	-	14.54	36.64
237	36.61	14.60	15.43	-	-	-	0.004384	-	-	0.37903761	-	0	-	0.004384	0.251197	1.980158	113.4547201	11	3.172	2.910062154	-1.262597	48.727532	0.4872753	0.726099793	0.8209751	0.3336998	-	-	-	1.0	-	-	14.60	36.61
238	36.59	14.66	15.49	-	-	-	0.004384	-	-	0.384425651	-	0	-	0.004384	0.251197	1.984543	113.7059172	11	3.172	2.904498706	-1.275344	48.727532	0.4872753	0.720241153	0.8151165	0.3278412	-	-	-	1.0	-	-	14.66	36.59
239	36.56	14.72	15.56	-	-	-	0.004384	-	-	0.389834454	-	0	-	0.004384	0.251197	1.988927	113.9571142	11	3.172	2.898879429	-1.288065	48.727532	0.4872753	0.714393713	0.809269	0.3219937	-	-	-	1.0	-	-	14.72	36.56
240	36.54	14.78	15.62	-	-	-	0.004384	-	-	0.395263734	-	0	-	0.004384	0.251197	1.993311	114.2083112	11	3.172	2.893204432	-1.300762	48.727532	0.4872753	0.708557585	0.8034329	0.3161576	-	-	-	1.1	-	-	14.78	36.54
241	36.51	14.84	15.69	-	-	-	0.004384	-	-	0.400713204	-	0	-	0.004384	0.251197	1.997695	114.4595082	11	3.172	2.887473823	-1.313434	48.727532	0.4872753	0.702732883	0.7976082	0.3103329	-	-	-	1.1	-	-	14.84	36.51
242	36.48	14.90	15.75	-	-	-	0.004384	-	-	0.406182576	-	0	-	0.004384	0.251197	2.002079	114.7107053	11	3.172	2.881687714	-1.326081	48.727532	0.4872753	0.696919719	0.791795	0.3045197	-	-	-	1.1	-	-	14.90	36.48
243	36.46	14.95	15.82	-	-	-	0.004384	-	-	0.41167156	-	0	-	0.004384	0.251197	2.006464	114.9619023	11	3.172	2.875846215	-1.338702	48.727532	0.4872753	0.691118202	0.7859935	0.2987182	-	-	-	1.1	-	-	14.95	36.46
244	36.43	15.01	15.88	-	-	-	0.004384	-	-	0.417179865	-	0	-	0.004384	0.251197	2.010848	115.2130993	11	3.172	2.869949438	-1.351297	48.727532	0.4872753	0.685328447	0.7802038	0.2929284	-	-	-	1.1	-	-	15.01	36.43
245	36.40	15.07	15.95	-	-	-	0.004384	-	-	0.422707196	-	0	-	0.004384	0.251197	2.015232	115.4642964	11	3.172	2.863997497	-1.363867	48.727532	0.4872753	0.679550562	0.7744259	0.2871506	-	-	-	1.1	-	-	15.07	36.40
246	36.37	15.13	16.01	-	-	-	0.004384	-	-	0.428253259	-	0	-	0.004384	0.251197	2.019616	115.7154934	11	3.172	2.857990506	-1.37641	48.727532	0.4872753	0.673784661	0.76866	0.2813847	-	-	-	1.1	-	-	15.13	36.37
247	36.34	15.19	16.08	-	-	-	0.004384	-	-	0.433817756	-	0	-	0.004384	0.251197	2.024001	115.9666904	11	3.172	2.851928581	-1.388927	48.727532	0.4872753	0.668030853	0.7629062	0.2756309	-	-	-	1.1	-	-	15.19	36.34
248	36.32	15.25	16.14	-	-	-	0.004384	-	-	0.439400389	-	0	-	0.004384	0.251197	2.028385	116.2178874	11	3.172	2.845811838	-1.401417	48.727532	0.4872753	0.662289249	0.7571646	0.2698892	-	-	-	1.1	-	-	15.25	36.32
249	36.29	15.31	16.21	-	-	-	0.004384	-	-	0.445000857	-	0	-	0.004384	0.251197	2.032769	116.4690845	11	3.172	2.839640395	-1.41388	48.727532	0.4872753	0.656559959	0.7514353	0.26416	-	-	-	1.1	-	-	15.31	36.29
250	36.26	15.37	16.28	-	-	-	0.004384	-	-	0.450618859	-	0	-	0.004384	0.251197	2.037153	116.7202815	11	3.172	2.83341437	-1.426316	48.727532	0.4872753	0.650843094	0.7457184	0.2584431	-	-	-	1.1	-	-	15.37	36.26
251	36.23	15.42	16.34	-	-	-	0.004384	-	-	0.456254091	-	0	-	0.004384	0.251197	2.041537	116.9714785	11	3.172	2.827133884	-1.438724	48.727532	0.4872753	0.645138764	0.7400141	0.2527388	-	-	-	1.1	-	-	15.42	36.23
252	36.20	15.48	16.41	-	-	-	0.004384	-	-	0.461906247	-	0	-	0.004384	0.251197	2.045922	117.2226756	11	3.172	2.820799056	-1.451105	48.727532	0.4872753	0.639447077	0.7343224	0.2470471	-	-	-	1.1	-	-	15.48	36.20
253	36.17	15.54	16.47	-	-	-	0.004384	-	-	0.46757502	-	0	-	0.004384	0.251197	2.050306	117.4738726	11	3.172	2.814410008	-1.463458	48.727532	0.4872753	0.633768144	0.7286435	0.2413681	-	-	-	1.1	-	-	15.54	36.17
254	36.14	15.60	16.54	-	-	-	0.004384	-	-	0.473260103	-	0	-	0.004384	0.251197	2.054690	117.7250696	11	3.172	2.807966864	-1.475783	48.727532	0.4872753	0.628102074	0.7229774	0.2357021	-	-	-	1.1	-	-	15.60	36.14
255	36.11	15.65	16.60	-	-	-	0.004384	-	-	0.478961186	-	0	-	0.004384	0.251197	2.059074	117.9762666	11	3.172	2.801469747	-1.48808	48.727532	0.4872753	0.622448975	0.7173243	0.230049	-	-	-	1.1	-	-	15.65	36.11
256	36.08	15.71	16.67	-	-	-	0.004384	-	-	0.484677956	-	0	-	0.004384	0.251197	2.063459	118.2274637	11	3.172	2.794918783	-1.500348	48.727532	0.4872753	0.616808957	0.7116843	0.224409	-	-	-	1.1	-	-	15.71	36.08
257	36.05	15.77	16.73	-	-	-	0.004384	-	-	0.490410101	-	0	-	0.004384	0.251197	2.067843	118.4786607	11	3.172	2.788314096	-1.512587	48.727532	0.4872753	0.611182127	0.7060574	0.2187821	-	-	-	1.1	-	-	15.77	36.05
258	36.02	15.83	16.80	-	-	-	0.004384	-	-	0.496157307	-	0	-	0.004384	0.251197	2.072227	118.7298577	11	3.172	2.781655814	-1.524797	48.727532	0.4872753	0.605568594	0.7004439	0.2131686	-	-	-	1.1	-	-	15.83	36.02
259	35.99	15.88	16.86	-	-	-	0.004384	-	-	0.501919257	-	0	-	0.004384	0.251197	2.076611	118.9810548	11	3.172	2.774944065	-1.536977	48.727532	0.4872753	0.599968465	0.6948438	0.2075685	-	-	-	1.1	-	-	15.88	35.99

260	35.95	15.94	16.93	-	-	-	0.004384	-	-	0.507695634	-	0	-	0.004384	0.251197	2.080995	119.2322518	11	3.172	2.768178978	-1.549128	48.727532	0.4872753	0.594381849	0.6892572	0.2019818	-	-	-	1.1	-	-	15.94	35.95
261	35.92	16.00	16.99	-	-	-	0.004384	-	-	0.51348612	-	0	-	0.004384	0.251197	2.085380	119.4834488	11	3.172	2.761360683	-1.56125	48.727532	0.4872753	0.588808853	0.6836842	0.1964089	-	-	-	1.1	-	-	16.00	35.92
262	35.89	16.05	17.06	-	-	-	0.004384	-	-	0.519290394	-	0	-	0.004384	0.251197	2.089764	119.7346459	11	3.172	2.754489311	-1.573341	48.727532	0.4872753	0.583249584	0.6781249	0.1908496	-	-	-	1.1	-	-	16.05	35.89
263	35.86	16.11	17.12	-	-	-	0.004384	-	-	0.525108135	-	0	-	0.004384	0.251197	2.094148	119.9858429	11	3.172	2.747564994	-1.585402	48.727532	0.4872753	0.577704148	0.6725795	0.1853041	-	-	-	1.2	-	-	16.11	35.86
264	35.82	16.17	17.19	-	-	-	0.004384	-	-	0.53093902	-	0	-	0.004384	0.251197	2.098532	120.2370399	11	3.172	2.740587866	-1.597433	48.727532	0.4872753	0.572172652	0.667048	0.1797727	-	-	-	1.2	-	-	16.17	35.82
265	35.79	16.22	17.25	-	-	-	0.004384	-	-	0.536782724	-	0	-	0.004384	0.251197	2.102916	120.4882369	11	3.172	2.733558059	-1.609433	48.727532	0.4872753	0.566655203	0.6615305	0.1742552	-	-	-	1.2	-	-	16.22	35.79
266	35.76	16.28	17.32	-	-	-	0.004384	-	-	0.542638923	-	0	-	0.004384	0.251197	2.107301	120.739434	11	3.172	2.726475711	-1.621402	48.727532	0.4872753	0.561151907	0.6560272	0.1687519	-	-	-	1.2	-	-	16.28	35.76
267	35.73	16.34	17.38	-	-	-	0.004384	-	-	0.548507289	-	0	-	0.004384	0.251197	2.111685	120.990631	11	3.172	2.719340955	-1.63334	48.727532	0.4872753	0.555662869	0.6505382	0.1632629	-	-	-	1.2	-	-	16.34	35.73
268	35.69	16.39	17.45	-	-	-	0.004384	-	-	0.554387495	-	0	-	0.004384	0.251197	2.116069	121.241828	11	3.172	2.71215393	-1.645246	48.727532	0.4872753	0.550188195	0.6450635	0.1577882	-	-	-	1.2	-	-	16.39	35.69
269	35.66	16.45	17.51	-	-	-	0.004384	-	-	0.560279211	-	0	-	0.004384	0.251197	2.120453	121.4930251	11	3.172	2.704914775	-1.657121	48.727532	0.4872753	0.544727991	0.6396033	0.152328	-	-	-	1.2	-	-	16.45	35.66
270	35.62	16.50	17.58	-	-	-	0.004384	-	-	0.566182106	-	0	-	0.004384	0.251197	2.124838	121.7442221	11	3.172	2.697623627	-1.668964	48.727532	0.4872753	0.53928236	0.6341577	0.1468824	-	-	-	1.2	-	-	16.50	35.62
271	35.59	16.56	17.64	-	-	-	0.004384	-	-	0.57209585	-	0	-	0.004384	0.251197	2.129222	121.9954191	11	3.172	2.690280627	-1.680775	48.727532	0.4872753	0.533851408	0.6287267	0.1414514	-	-	-	1.2	-	-	16.56	35.59
272	35.56	16.61	17.71	-	-	-	0.004384	-	-	0.578020109	-	0	-	0.004384	0.251197	2.133606	122.2466161	11	3.172	2.682885917	-1.692553	48.727532	0.4872753	0.52843524	0.6233106	0.1360352	-	-	-	1.2	-	-	16.61	35.56
273	35.52	16.67	17.77	-	-	-	0.004384	-	-	0.583954549	-	0	-	0.004384	0.251197	2.137990	122.4978132	11	3.172	2.675439638	-1.704299	48.727532	0.4872753	0.523033958	0.6179093	0.130634	-	-	-	1.2	-	-	16.67	35.52
274	35.49	16.72	17.84	-	-	-	0.004384	-	-	0.589898836	-	0	-	0.004384	0.251197	2.142374	122.7490102	11	3.172	2.667941933	-1.716013	48.727532	0.4872753	0.517647668	0.612523	0.1252477	-	-	-	1.2	-	-	16.72	35.49
275	35.45	16.78	17.90	-	-	-	0.004384	-	-	0.595852632	-	0	-	0.004384	0.251197	2.146759	123.0002072	11	3.172	2.660392947	-1.727693	48.727532	0.4872753	0.512276473	0.6071518	0.1198765	-	-	-	1.2	-	-	16.78	35.45
276	35.42	16.83	17.97	-	-	-	0.004384	-	-	0.601815601	-	0	-	0.004384	0.251197	2.151143	123.2514043	11	3.172	2.652792825	-1.73934	48.727532	0.4872753	0.506920475	0.6017958	0.1145205	-	-	-	1.2	-	-	16.83	35.42
277	35.38	16.89	18.03	-	-	-	0.004384	-	-	0.607787405	-	0	-	0.004384	0.251197	2.155527	123.5026013	11	3.172	2.645141713	-1.750954	48.727532	0.4872753	0.501579778	0.5964551	0.1091798	-	-	-	1.2	-	-	16.89	35.38
278	35.34	16.94	18.10	-	-	-	0.004384	-	-	0.613767703	-	0	-	0.004384	0.251197	2.159911	123.7537983	11	3.172	2.637439758	-1.762534	48.727532	0.4872753	0.496254485	0.5911298	0.1038545	-	-	-	1.2	-	-	16.94	35.34
279	35.31	17.00	18.16	-	-	-	0.004384	-	-	0.619756157	-	0	-	0.004384	0.251197	2.164295	124.0049953	11	3.172	2.629687107	-1.77408	48.727532	0.4872753	0.490944697	0.58582	0.0985447	-	-	-	1.2	-	-	17.00	35.31
280	35.27	17.05	18.23	-	-	-	-	0.004452	-	0.625752424	-	0.002797346	-	0.004452	0.255058	2.168680	124.2561924	11	3.204	2.647977535	-1.803363	49.21248	0.4921248	0.485650518	0.5853753	0.0932505	-	-	-	1.2	0.004452	-	17.05	35.27
281	35.23	17.10	18.29	-	-	-	-	0.004499	-	0.631818033	-	0.004797181	-	0.004499	0.257775	2.173131	124.5112499	11	3.238	2.668238979	-1.834601	49.740327	0.4974033	0.480372048	0.5853753	0.087972	-	-	-	1.2	0.008951	-	17.10	35.23
282	35.20	17.16	18.36	-	-	-	-	0.004546	-	0.63793423	-	0.006816918	-	0.004546	0.260483	2.177630	124.7690245	11	3.272	2.688099865	-1.866124	50.266569	0.5026657	0.475109633	0.5853753	0.0827096	-	-	-	1.2	0.013497	-	17.16	35.20
283	35.16	17.21	18.42	-	-	-	-	0.004593	-	0.644100452	-	0.008856612	-	0.004593	0.263183	2.182177	125.0295077	11	3.307	2.707553766	-1.897928	50.791177	0.5079118	0.46986355	0.5853753	0.0774635	-	-	-	1.2	0.018090	-	17.21	35.16
284	35.12	17.26	18.49	-	-	-	-	0.004640	-	0.650316115	-	0.010916308	-	0.004640	0.265875	2.186770	125.292691	11	3.341	2.726594242	-1.930014	51.314124	0.5131412	0.464634078	0.5853753	0.0722341	-	-	-	1.2	0.022731	-	17.26	35.12
285	35.09	17.32	18.55	-	-	-	-	0.004687	-	0.656580611	-	0.012996032	-	0.004687	0.268558	2.191410	125.5585658	11	3.374	2.745214843	-1.96238	51.835382	0.5183538	0.4594215	0.5853753	0.0670215	-	-	-	1.2	0.027418	-	17.32	35.09
286	35.05	17.37	18.62	-	-	-	-	0.004734	-	0.662893308	-	0.015095802	-	0.004734	0.271231	2.196098	125.8271234	11	3.408	2.763409107	-1.995023	52.354922	0.5235492	0.454226099	0.5853753	0.0618261	-	-	-	1.2	0.032152	-	17.37	35.05
287	35.01	17.42	18.68	-	-	-	-	0.004780	-	0.66925355	-	0.017215619	-	0.004780	0.273896	2.200831	126.0983548	11	3.442	2.781170566	-2.027942	52.872716	0.5287272	0.449048163	0.5853753	0.0566482	-	-	-	1.2	0.036932	-	17.42	35.01
288	34.97	17.48	18.75	-	-	-	-	0.004827	-	0.65630519	-	0.019355469	-	0.004827	0.276552	2.205612	126.3722509	11	3.476	2.798492749	-2.061135	53.388734	0.5338873	0.443887981	0.5853753	0.051488	-	-	-	1.2	0.041759	-	17.48	34.97
289	34.93	17.53	18.81	-	-	-	-	0.004873	-	0.660598603	-	0.021515326	-	0.004873	0.279198	2.210439	126.6488024	11	3.509	2.815369184	-2.094601	53.902948	0.5390295	0.438745845	0.5853753	0.0463458	-	-	-	1.2	0.046632	-	17.53	34.93
290	34.89	17.58	18.88	-	-	-	-	0.004919	-	0.664917484	-	0.023695148	-	0.004919	0.281834	2.215312	126.9280001	11	3.542	2.8317934	-2.128335	54.415327	0.5441533	0.433622049	0.5853753	0.041222	-	-	-	1.2	0.051551	-	17.58	34.89
291	34.85	17.63	18.94	-	-	-	-	0.004965	-	0.669261137	-	0.025894881	-	0.004965	0.284461	2.220230	127.2098344	11	3.576	2.847758933	-2.162337	54.925843	0.5492584	0.428516889	0.5853753	0.0361169	-	-	-	1.2	0.056516	-	17.63	34.85
292	34.82	17.68	19.01	-	-	-	-	0.005010	-	0.673628855	-	0.028114453	-	0.005010	0.287078	2.225195	127.4942956	11	3.609	2.863259325	-2.196603	55.434466	0.5543447	0.423430665	0.5853753	0.0310307	-	-	-	1.2	0.061526	-	17.68	34.82
293	34.78	17.74	19.07	-	-	-	-	0.005056	-	0.678019922	-	0.03035378	-	0.005056	0.289685	2.230206	127.7813738	11	3.642	2.878288131	-2.231131	55.941164	0.5594116	0.418363678	0.5853753	0.0259637	-	-	-	1.2	0.066582	-	17.74	34.78
294	34.74	17.79	19.14	-	-	-	-	0.005101	-	0.682433611	-	0.03261276	-	0.005101	0.292282	2.235262	128.0710591	11	3.675	2.892838919	-2.265917	56.445909	0.5644591	0.413316231	0.5853753	0.0209162	-	-	-	1.2	0.071683	-	17.79	34.74
295	34.70	17.84	19.20	-	-	-	-	0.005146	-	0.686869187	-	0.03489128	-	0.005146	0.294869	2.240363	128.3633413	11	3.707	2.906905277	-2.300958	56.948669	0.5694867	0.40828863	0.5853753	0.0158886	-	-	-	1.2	0.076830	-	17.84	34.70
296	34.66	17.89	19.27	-	-	-	-	0.005191	-	0.691325904	-	0.037189208	-	0.005191	0.297445	2.245509	128.6582101	11	3.740	2.920480812	-2.336251	57.449414	0.5744941	0.403281184	0.5853753	0.0108812	-	-	-	1.2	0.082021	-	17.89	34.66
297	34.61	17.94	19.33	-	-	-	-	0.005236	-	0.695803006	-	0.039506399	-	0.005236	0.30001	2.250701	128.955655	11	3.772	2.933559157	-2.371792	57.948112	0.5794811	0.398294202	0.5853753	0.0058942	-	-	-	1.2	0.087257	-	17.94	34.61
298	34.57	17.99	19.40	-	-	-	-	0.005281	-	0.700299727	-	0.041842692	-	0.005281	0.302565	2.255937	129.2556655	11	3.805	2.946133973	-2.407578	58.444732	0.5844473	0.393327998	0.5853753	0.000928	-	-	-	1.2	0.092538	-	17.99	34.57
299	34.53	18.04	19.46	-	-	0.005267	-	-	-	0.704815293	-	0.04419791	-	0.005267	0.301769	2.261218	129.5582306	11	3.811	2.938036797	-2.42695	58.537532	0.5853753	0.388382886	0.5853753	-0.004017	-	-	-	1.2	0.092538	-	18.04	34.53
300	34.49	18.09	19.53	-	-	0.005267	-	-	-	0.709299398	-	0.046568661	-	0.005267	0.301769	2.266485	129.8599995	11	3.811	2.925213698	-2.44239	58.537532	0.5853753	0.383459183	0.5853753	-0.008941	-	-	0.0	1.2	0.092538	-	18.09	34.49
301	34.45	18.14	19.60	-	-	0.005267	-	-	-	0.713763828	-	0.048955255	-	0.005267	0.301769	2.271751	130.1617684	11	3.811	2.912309455	-2.457763	58.537532	0.5853753	0.37855697	0.5853753	-0.013843	-	-	0.0	1.2	0.092538	-	18.14	34.45
302	34.41	18.19	19.66	-	-	0.005267	-	-	-	0.718208458	-	0.05135728	-	0.005267	0.301769	2.277018	130.4635373	11	3.811	2.899324424	-2.473068	58.537532	0.5853753	0.373676382	0.5853753	-0.018724	-	-	0.0	1.2	0.092538	-	18.19	34.41
303	34.37	18.24	19.73	-	-	0.005267	-	-	-	0.722633166	-	0.05377432	-	0.005267	0.301769	2.282285	130.7653063	11	3.811	2.886258967	-2.488304	58.537532	0.5853753	0.368817556	0.5853753	-0.023582	-	-	0.0	1.2	0.092538	-	18.24	34.37
304	34.32	18.29	19.79	-	-	0.005267	-	-	-	0.727037827	-	0.05620596	-	0.005267	0.301769	2.287552	131.0670752	11	3.811	2.873113446	-2.503471	58.537532	0.5853753	0.363980625	0.5853753	-0.028419	-	-	0.0	1.2	0.092538	-	18.29	34.32
305	34.28	18.34	19.86	-	-	0.005267	-	-	-	0.731422321	-	0.058651783	-	0.005267	0.301769	2.292819	131.3688441	11	3.811	2.859888226	-2.518568	58.537532	0.5853753	0.359165723	0.5853753	-0.033234	-	-	0.0	1.2	0.092538	-	18.34	34.28
306	34.24	18.39	19.92	-	-	0.005267	-	-	-	0.735786525	-	0.061111372	-	0.005267	0.301769	2.298086	131.670613	11	3.811	2.846583673	-2.533596	58.537532	0.5853753	0.354372986	0.5853753	-0.038027	-	-	0.0	1.2	0.092538	-	18.39	34.24
307	34.19	18.44	19.99	-	-	0.005267	-	-	-	0.740130319	-	0.063584309	-	0.005267	0.301769	2.303353	131.9723819	11	3.811	2.833200156	-2.548553	58.537532	0.5853753	0.349602545	0.5853753	-0.042797	-	-	0.0	1.2	0.092538	-	18.44	34.19
308	34.15	18.48	20.05	-	-	0.005267	-	-	-	0.744453581	-	0.066070175	-	0.005267	0.301769	2.308619	132.2741508	11	3.811	2.819738047	-2.56344	58.537532	0.5853753	0.344854532	0.5853753	-0.047545	-	-	0.0	1.2	0.092538	-	18.48	34.15
309	34.11	18.53	20.12	-	-	0.005267	-	-	-	0.748756193	-	0.068568548	-	0.005267	0.301769	2.313886	132.5759197	11	3.811	2.806197719	-2.578255	58.537532	0.5853753	0.34012908	0.5853753	-0.052271	-	-	0.1	1.2	0.092538	-	18.53	34.11
310	34.06	18.58	20.18	-	-	0.005267	-	-	-	0.753038034	-	0.07107901	-	0.005267	0.301769	2.319153	132.8776886	11	3.811	2.792579548	-2.592999	58.537532	0.5853753	0.335426319	0.5853753	-0.056974	-	-	0.1	1.2	0.092538	-	18.58	34.06
311	34.02	18.63	20.25	-	-	0.005267	-	-	-	0.757298986	-	0.073601139	-	0.005267	0.301769	2.324420	133.1794575	11	3.811	2.778883912	-2.607671	58.537532	0.5853753	0.330746381	0.5853753	-0.061654	-	-	0.1	1.2	0.092538	-	18.63	34.02
312	33.97	18.68	20.31	-	-	0.005267	-	-	-	0.761538931	-	0.076134513	-	0.005267	0.301769	2.329687	133.4812264	11	3.811	2.76511119	-2.622271	58.537532	0.5853753	0.326089394	0.5853753	-0.066311	-	-	0.1	1.2	0.092538	-	18.68	33.97
313	33.93	18.72	20.38	-	-	0.005267	-	-	-	0.765757751	-	0.078678709	-	0.005267	0.301769	2.334954	133.7829953	11	3.811	2.751261764	-2.636798	58.537532	0.5853753	0.321455488	0.5853753	-0.070945	-	-	0.1	1.2	0.092538	-	18.72	33.93
314	33.88	18.77	20.44	-	-	0.005267	-	-	-	0.769955329	-	0.081233305	-	0.005267	0.301769	2.340221	134.0847642	11	3.811	2.737336019	-2.651252	58.537532	0.5853753	0.316844792	0.5853753	-0.075555	-	-	0.1	1.2	0.092538	-	18.77	33.88
315	33.84	18.82	20.51	-	-	0.005267	-	-	-	0.774131549	-	0.083797878	-	0.005267	0.301769	2.345487	134.3865332	11	3.811	2.723334341	-2.665632	58.537532	0.5853753	0.312257433	0.5853753	-0.080143	-	-	0.1	1.2	0.092538	-	18.82	33.84
316	33.79	18.86	20.57	-	-	0.005267	-	-	-	0.778286295	-	0.086372004	-	0.005267	0.301769	2.350754	134.6883021	11	3.811	2.709257118	-2.679939	58.537532	0.5853753	0.307693539	0.5853753	-0.084706	-	-	0.1	1.2	0.092538	-	18.86	33.79
317	33.75	18.91	20.64	-	-	0.005267	-	-	-	0.782419451	-	0.088955258	-	0.005267	0.301769	2.356021	134.990071	11	3.811	2.695104741	-2.694171	58.537532	0.5853753	0.303153236	0.5853753	-0.089247	-	-	0.1	1.2	0.092538	-	18.91	33.75
318	33.70	18.96	20.70	-	-	0.005267	-	-	-	0.786530903	-	0.091547217	-	0.005267	0.301769	2.361288	135.2918399	11	3.811	2.680877603	-2.708328	58.537532	0.5853753	0.298636651	0.5853753	-0.093763	-	-	0.1	1.2	0.092538	-	18.96	33.70
319	33.65	19.00	20.77	-	-	0.005267	-	-	-	0.790620536	-	0.094147456	-	0.005267	0.301769	2.366555	135.5936088	11	3.811	2.666576098	-2.72241	58.537532	0.5853753	0.294143908	0.5853753	-0.098256	-	-	0.1	1.2	0.092538	-	19.00	33.65
320	33.61	19.05	20.83	-	-	0.005267	-	-	-	0.794688238	-	0.09675555	-	0.005267	0.301769	2.371822	135.8953777	11	3.811	2.652200622	-2.736417	58.537532	0.5853753	0.289675132	0.5853753	-0.102725	-	-	0.1	1.2	0.092538	-	19.05	33.61
321	33.56	19.09	20.90	-	-	0.005267	-	-	-	0.798733896	-	0.099371074	-	0.005267	0.301769	2.377089	136.1971466	11	3.811	2.637751575	-2.750348	58.537532	0.5853753	0.285230447	0.5853753	-0.10717	-	-	0.1	1.2	0.092538	-	19.09	33.56
322	33.51	19.14	20.96	-	-	0.005267	-	-	-	0.802757397	-	0.101993603	-	0.005267	0.301769	2.382356	136.4989155	11	3.811	2.623229358	-2.764202	58.537532	0.5853753	0.280809977	0.5853753	-0.11159	-	-	0.1	1.2	0.092538	-	19.14	33.51
323	33.47	19.18	21.03	-	-	0.005267	-	-	-	0.806758629	-	0.104622712	-	0.005267	0.301769	2.387622	136.8006844	11	3.811	2.608634373	-2.77798	58.537532	0.5853753	0.276413843	0.5853753	-0.115986	-	-	0.1	1.2	0.092538	-	19.18	33.47
324	33.42	19.23	21.09	-	-	0.005267	-	-	-	0.810737483	-	0.107257977	-	0.005267	0.301769	2.392889	137.1024533	11	3.811	2.593967024	-2.791681	58.537532	0.5853753	0.272042169	0.5853753	-0.120358	-	-	0.1	1.2	0.092538	-	19.23	33.42
325	33.37	19.27	21.16	-	-	0.005267	-	-	-	0.814693847	-	0.109898972	-	0.005267	0.301769	2.398156	137.4042222	11	3.811	2.57922772	-2.805304	58.537532	0.5853753	0.267695075	0.5853753	-0.124705	-	-	0.1	1.2	0.092538	-	19.27	33.37
326	33.32	19.32	21.22	-	-	0.005267	-	-	-	0.818627611	-	0.112545272	-	0.005267	0.301769	2.403423	137.7059911	11	3.811	2.564416869	-2.818849	58.537532	0.5853753	0.263372681	0.5853753	-0.129027	-	-	0.1	1.2	0.092538	-	19.32	33.32
327	33.28	19.36	21.29	-	-	0.005267	-	-	-	0.822538667	-	0.115196453	-	0.005267	0.301769	2.408690	138.00776	11	3.811	2.549534881	-2.832317	58.537532	0.5853753	0.259075109	0.5853753	-0.133325	-	-	0.1	1.2	0.092538	-	19.36	33.28
328	33.23	19.40	21.35	-	-	0.005267	-	-	-	0.826426905	-	0.11785209	-	0.005267	0.301769	2.413957	138.309529	11	3.811	2.53458217	-2.845705	58.537532	0.5853753	0.254802476	0.5853753	-0.137598	-	-	0.2	1.2	0.092538	-	19.40	33.23
329	33.18	19.45	21.42	-	-	0.005267	-	-	-	0.830292219	-	0.120511759	-	0.005267	0.301769	2.419224	138.6112979	11	3.811	2.51955915	-2.859015	58.537532	0.5853753	0.250554902	0.5853753	-0.141845	-	-	0.2	1.2	0.092538	-	19.45	33.18
330	33.13	19.49	21.48	-	-	0.005267	-	-	-	0.834134501	-	0.123175036	-	0.005267	0.301769	2.424490	138.9130668	11	3.811	2.504466238	-2.872246	58.537532	0.5853753	0.246332504	0.5853753	-0.146067	-	-	0.2	1.2	0.092538	-	19.49	33.13
331	33.08	19.53	21.55	-	-	0.005267	-	-	-	0.837953644	-	0.125841498	-	0.005267	0.301769	2.429757	139.2148357	11	3.811	2.489303853	-2.885396	58.537532	0.5853753	0.242135399	0.5853753	-0.150265	-	-	0.2	1.2	0.092538	-	19.53	33.08
332	33.03	19.57	21.61	-	-	0.005267	-	-	-	0.841749542	-	0.128510721	-	0.005267	0.301769	2.435024	139.5166046	11	3.811	2.474072416	-2.898467	58.537532	0.5853753	0.237963705	0.5853753	-0.154436	-	-	0.2	1.2	0.092538	-	19.57	33.03
333	32.98	19.62	21.68	-	-	0.005267	-	-	-	0.845522091	-	0.131182283	-	0.005267	0.301769	2.440291	139.8183735	11	3.811	2.458772348	-2.911457	58.537532	0.5853753	0.233817536	0.5853753	-0.158582	-	-	0.2	1.2	0.092538	-	19.62	32.98
334	32.93	19.66	21.74	-	-	0.005267	-	-	-	0.849271185	-	0.133855761	-	0.005267	0.301769	2.445558	140.1201424	11	3.811	2.443404074	-2.924367	58.537532	0.5853753	0.229697007	0.5853753	-0.162703	-	-	0.2	1.2	0.092538	-	19.66	32.93
335	32.88	19.70	21.81	-	-	0.005267	-	-	-	0.85299672	-	0.136530735	-	0.005267	0.301769	2.450825	140.4219113	11	3.811	2.427968021	-2.937195	58.537532	0.5853753	0.225602234	0.5853753	-0.166798	-	-	0.2	1.2	0.092538	-	19.70	32.88
336	32.83	19.74	21.87	-	-	0.005267	-	-	-	0.856698593	-	0.139206783	-	0.005267	0.301769	2.456092	140.7236802	11	3.811	2.412464616	-2.949942	58.537532	0.5853753	0.221533329	0.5853753	-0.170867	-	-	0.2	1.2	0.092538	-	19.74	32.83
337	32.78	19.78	21.94	-	-	0.005267	-	-	-	0.860376702	-	0.141883485	-	0.005267	0.301769	2.461358	141.0254491	11	3.811	2.396894291	-2.962608	58.537532	0.5853753	0.217490405	0.5853753	-0.17491	-	-	0.2	1.2	0.092538	-	19.78	32.78
338	32.73	19.82	22.00	-	-	0.005267	-	-	-	0.864030944	-	0.144560422	-	0.005267	0.301769	2.466625	141.327218	11	3.811	2.381257476	-2.975191	58.537532	0.5853753	0.213473575	0.5853753	-0.178926	-	-	0.2	1.2	0.092538	-	19.82	32.73
339	32.68	19.86	22.07	-	-	0.005267	-	-	-	0.867661218	-	0.147237174	-	0.005267	0.301769	2.471892	141.6289869	11	3.811	2.365554605	-2.987691	58.537532	0.5853753	0.209482949	0.5853753	-0.182917	-	-	0.2	1.2	0.092538	-	19.86	32.68
340	32.63	19.91	22.13	-	-	0.005267	-	-	-	0.871267424	-	0.149913324	-	0.005267	0.301769	2.477159	141.9307558	11	3.811	2.349786115	-3.000109	58.537532	0.5853753	0.20551864	0.5853753	-0.186881	-	-	0.2	1.2	0.092538	-	19.91	32.63
341	32.58	19.95	22.20	-	-	0.005267	-	-	-	0.87484946	-	0.152588455	-	0.005267	0.301769	2.482426	142.2325248	11	3.811	2.333952442	-3.012443	58.537532	0.5853753	0.201580755	0.5853753	-0.190819	-	-	0.2	1.2	0.092538	-	19.95	32.58
342	32.53	19.99	22.26	-	-	0.005267	-	-	-	0.878407229	-	0.15526215	-	0.005267	0.301769	2.487693	142.5342937	11	3.811	2.318054026	-3.024694	58.537532	0.5853753	0.197669406	0.5853753	-0.194731	-	-	0.2	1.2	0.092538	-	19.99	32.53
343	32.48	20.02	22.33	-	-	0.005267	-	-	-	0.88194063	-	0.157933994	-	0.005267	0.301769	2.492960	142.8360626	11	3.811	2.302091308	-3.03686	58.537532	0.5853753	0.1937847	0.5853753	-0.198615	-	-	0.2	1.2	0.092538	-	20.02	32.48
344	32.42	20.06	22.39	-	-	0.005267	-	-	-	0.885449567	-	0.160603574	-	0.005267	0.301769	2.498226	143.1378315	11	3.811	2.28606473	-3.048943	58.537532	0.5853753	0.189926745	0.5853753	-0.202473	-	-	0.2	1.2	0.092538	-	20.06	32.42
345	32.37	20.10	22.46	-	-	0.005267	-	-	-	0.888933942	-	0.163270475	-	0.005267	0.301769	2.503493	143.4396004	11	3.811	2.269974737	-3.060941	58.537532	0.5853753	0.186095649	0.5853753	-0.206304	-	-	0.2	1.2	0.092538	-	20.10	32.37
346	32.32	20.14	22.52	-	-	0.005267	-	-	-	0.892393658	-	0.165934286	-	0.005267	0.301769	2.508760	143.7413693	11	3.811	2.253821776	-3.072854	58.537532	0.5853753	0.182291516	0.5853753	-0.210108	-	-	0.2	1.2	0.092538	-	20.14	32.32
347	32.27	20.18	22.59	-	-	0.005267	-	-	-	0.895828619	-	0.168594597	-	0.005267	0.301769	2.514027	144.0431382	11	3.811	2.237606294	-3.084682	58.537532	0.5853753	0.178514454	0.5853753	-0.213886	-	-	0.3	1.2	0.092538	-	20.18	32.27
348	32.21	20.22	22.65	-	-	0.005267	-	-	-	0.89923873	-	0.171250997	-	0.005267	0.301769	2.519294	144.3449071	11	3.811	2.221328742	-3.096424	58.537532	0.5853753	0.174764566	0.5853753	-0.217635	-	-	0.3	1.2	0.092538	-	20.22	32.21
349	32.16	20.26	22.72	-	-	0.005267	-	-	-	0.902623897	-	0.173903078	-	0.005267	0.301769	2.524561	144.646676	11	3.811	2.20498957	-3.108081	58.537532	0.5853753	0.171041957	0.5853753	-0.221358	-	-	0.3	1.2	0.092538	-	20.26	32.16
350	32.11	20.29	22.79	-	-	0.005267	-	-	-	0.905984024	-	0.176550434	-	0.005267	0.301769	2.529828	144.9484449	11	3.811	2.188589233	-3.119651	58.537532	0.5853753	0.16734673	0.5853753	-0.225053	-	-	0.3	1.2	0.092538	-	20.29	32.11
351	32.05	20.33	22.85	-	-	0.005267	-	-	-	0.90931902	-	0.179192658	-	0.005267	0.301769	2.535094	145.2502138	11	3.811	2.172128184	-3.131135	58.537532	0.5853753	0.163678987	0.5853753	-0.228721	-	-	0.3	1.2	0.092538	-	20.33	32.05
352	32.00	20.37	22.92	-	-	0.005267	-	-	-	0.912628792	-	0.181829346	-	0.005267	0.301769	2.540361	145.5519827	11	3.811	2.155606882	-3.142532	58.537532	0.5853753	0.160038831	0.5853753	-0.232361	-	-	0.3	1.2	0.092538	-	20.37	32.00
353	31.95	20.41	22.98	-	-	0.005267	-	-	-	0.915913248	-	0.184460095	-	0.005267	0.301769	2.545628	145.8537516	11	3.811	2.139025783	-3.153841	58.537532	0.5853753	0.156426361	0.5853753	-0.235974	-	-	0.3	1.2	0.092538	-	20.41	31.95
354	31.89	20.44	23.05	-	-	0.005267	-	-	-	0.919172296	-	0.187084504	-	0.005267	0.301769	2.550895	146.1555206	11	3.811	2.122385348	-3.165063	58.537532	0.5853753	0.15284168	0.5853753	-0.239558	-	-	0.3	1.2	0.092538	-	20.44	31.89
355	31.84	20.48	23.11	-	-	0.005267	-	-	-	0.922405847	-	0.189702174	-	0.005267	0.301769	2.556162	146.4572895	11	3.811	2.105686039	-3.176198	58.537532	0.5853753	0.149284885	0.5853753	-0.243115	-	-	0.3	1.2	0.092538	-	20.48	31.84
356	31.78	20.51	23.18	-	-	0.005267	-	-	-	0.925613811	-	0.192312705	-	0.005267	0.301769	2.561429	146.7590584	11	3.811	2.088928319	-3.187244	58.537532	0.5853753	0.145756075	0.5853753	-0.246644	-	-	0.3	1.2	0.092538	-	20.51	31.78
357	31.73	20.55	23.24	-	-	0.005267	-	-	-	0.928796098	-	0.194915702	-	0.005267	0.301769	2.566696	147.0608273	11	3.811	2.072112652	-3.198202	58.537532	0.5853753	0.142255349	0.5853753	-0.250145	-	-	0.3	1.2	0.092538	-	20.55	31.73
358	31.68	20.59	23.31	-	-	0.005267	-	-	-	0.93195262	-	0.19751077	-	0.005267	0.301769	2.571962	147.3625962	11	3.811	2.055239505	-3.209071	58.537532	0.5853753	0.138782803	0.5853753	-0.253617	-	-	0.3	1.2	0.092538	-	20.59	31.68
359	31.62	20.62	23.37	-	-	0.005267	-	-	-	0.935083291	-	0.200097515	-	0.005267	0.301769	2.577229	147.6643651	11	3.811	2.038309346	-3.219851	58.537532	0.5853753	0.135338534	0.5853753	-0.257061	-	-	0.3	1.2	0.092538	-	20.62	31.62
360	31.57	20.66	23.44	-	-	0.005267	-	-	-	0.938188022	-	0.202675546	-	0.005267	0.301769	2.582496	147.966134	11	3.811	2.021322646	-3.230542	58.537532	0.5853753	0.131922638	0.5853753	-0.260477	-	-	0.3	1.2	0.092538	-	20.66	31.57
361	31.51	20.69	23.50	-	-	0.005267	-	-	-	0.941266729	-	0.205244475	-	0.005267	0.301769	2.587763	148.2679029	11	3.811	2.004279874	-3.241143	58.537532	0.5853753	0.128535209	0.5853753	-0.263865	-	-	0.3	1.2	0.092538	-	20.69	31.51
362	31.46	20.72	23.57	-	-	0.005267	-	-	-	0.944319325	-	0.207803912	-	0.005267	0.301769	2.593030	148.5696718	11	3.811	1.987181504	-3.251654	58.537532	0.5853753	0.125176341	0.5853753	-0.267224	-	-	0.3	1.2	0.092538	-	20.72	31.46
363	31.40	20.76	23.63	-	-	0.005267	-	-	-	0.947345725	-	0.210353473	-	0.005267	0.301769	2.598297	148.8714407	11	3.811	1.97002801	-3.262075	58.537532	0.5853753	0.121846127	0.5853753	-0.270554	-	-	0.3	1.2	0.092538	-	20.76	31.40
364	31.34	20.79	23.70	-	-	0.005267	-	-	-	0.950345847	-	0.212892773	-	0.005267	0.301769	2.603564	149.1732096	11	3.811	1.952819868	-3.272406	58.537532	0.5853753	0.118544659	0.5853753	-0.273855	-	-	0.3	1.2	0.092538	-	20.79	31.34
365	31.29	20.82	23.76	-	-	0.005267	-	-	-	0.953319606	-	0.215421432	-	0.005267	0.301769	2.608831	149.4749785	11	3.811	1.935557555	-3.282646	58.537532	0.5853753	0.11527203	0.5853753	-0.277128	-	-	0.3	1.2	0.092538	-	20.82	31.29
366	31.23	20.86	23.83	-	-	0.005267	-	-	-	0.95626692	-	0.217939069	-	0.005267	0.301769	2.614097	149.7767474	11	3.811	1.91824155	-3.292794	58.537532	0.5853753	0.11202833	0.5853753	-0.280372	-	-	0.4	1.2	0.092538	-	20.86	31.23
367	31.18	20.89	23.89	-	-	0.005267	-	-	-	0.959187708	-	0.220445306	-	0.005267	0.301769	2.619364	150.0785164	11	3.811	1.900872334	-3.302852	58.537532	0.5853753	0.108813649	0.5853753	-0.283586	-	-	0.4	1.2	0.092538	-	20.89	31.18
368	31.12	20.92	23.96	-	-	0.005267	-	-	-	0.962081888	-	0.222939769	-	0.005267	0.301769	2.624631	150.3802853	11	3.811	1.883450388	-3.312818	58.537532	0.5853753	0.105628076	0.5853753	-0.286772	-	-	0.4	1.2	0.092538	-	20.92	31.12
369	31.06	20.96	24.02	-	-	0.005267	-	-	-	0.96494938	-	0.225422085	-	0.005267	0.301769	2.629898	150.6820542	11	3.811	1.865976195	-3.322691	58.537532	0.5853753	0.1024717	0.5853753	-0.289928	-	-	0.4	1.2	0.092538	-	20.96	31.06
370	31.01	20.99	24.09	-	-	0.005267	-	-	-	0.967790105	-	0.227891881	-	0.005267	0.301769	2.635165	150.9838231	11	3.811	1.848450241	-3.332473	58.537532	0.5853753	0.099344608	0.5853753	-0.293055	-	-	0.4	1.2	0.092538	-	20.99	31.01
371	30.95	21.02	24.15	-	-	0.005267	-	-	-	0.970603983	-	0.23034879	-	0.005267	0.301769	2.640432	151.285592	11	3.811	1.830873011	-3.342162	58.537532	0.5853753	0.096246886	0.5853753	-0.296153	-	-	0.4	1.2	0.092538	-	21.02	30.95
372	30.89	21.05	24.22	-	-	0.005267	-	-	-	0.973390937	-	0.232792446	-	0.005267	0.301769	2.645699	151.5873609	11	3.811	1.813244993	-3.351759	58.537532	0.5853753	0.093178621	0.5853753	-0.299221	-	-	0.4	1.2	0.092538	-	21.05	30.89
373	30.83	21.08	24.28	-	-	0.005267	-	-	-	0.97615089	-	0.235222483	-	0.005267	0.301769	2.650965	151.8891298	11	3.811	1.795566676	-3.361263	58.537532	0.5853753	0.090139899	0.5853753	-0.30226	-	-	0.4	1.2	0.092538	-	21.08	30.83
374	30.78	21.11	24.35	-	-	0.005267	-	-	-	0.978883764	-	0.237638541	-	0.005267	0.301769	2.656232	152.1908987	11	3.811	1.777838551	-3.370673	58.537532	0.5853753	0.087130802	0.5853753	-0.305269	-	-	0.4	1.2	0.092538	-	21.11	30.78
375	30.72	21.14	24.41	-	-	0.005267	-	-	-	0.981589484	-	0.240040261	-	0.005267	0.301769	2.661499	152.4926676	11	3.811	1.760061109	-3.37999	58.537532	0.5853753	0.084151415	0.5853753	-0.308249	-	-	0.4	1.2	0.092538	-	21.14	30.72
376	30.66	21.17	24.48	-	-	0.005267	-	-	-	0.984267975	-	0.242427286	-	0.005267	0.301769	2.666766	152.7944365	11	3.811	1.742234843	-3.389213	58.537532	0.5853753	0.08120182	0.5853753	-0.311198	-	-	0.4	1.2	0.092538	-	21.17	30.66
377	30.60	21.20	24.54	-	-	0.005267	-	-	-	0.986919163	-	0.244799261	-	0.005267	0.301769	2.672033	153.0962054	11	3.811	1.724360248	-3.398342	58.537532	0.5853753	0.0782821	0.5853753	-0.314118	-	-	0.4	1.2	0.092538	-	21.20	30.60
378	30.55	21.23	24.61	-	-	0.005267	-	-	-	0.989542974	-	0.247155836	-	0.005267	0.301769	2.677300	153.3979743	11	3.811	1.706437819	-3.407377	58.537532	0.5853753	0.075392334	0.5853753	-0.317008	-	-	0.4	1.2	0.092538	-	21.23	30.55
379	30.49	21.26	24.67	-	-	0.005267	-	-	-	0.992139335	-	0.249496661	-	0.005267	0.301769	2.682567	153.6997432	11	3.811	1.688468055	-3.416317	58.537532	0.5853753	0.072532604	0.5853753	-0.319867	-	-	0.4	1.2	0.092538	-	21.26	30.49
380	30.43	21.29	24.74	-	-	0.005267	-	-	-	0.994708175	-	0.25182139	-	0.005267	0.301769	2.687833	154.0015122	11	3.811	1.670451453	-3.425162	58.537532	0.5853753	0.069702988	0.5853753	-0.322697	-	-	0.4	1.2	0.092538	-	21.29	30.43
381	30.37	21.32	24.80	-	-	0.005267	-	-	-	0.997249421	-	0.254129679	-	0.005267	0.301769	2.693100	154.3032811	11	3.811	1.652388512	-3.433913	58.537532	0.5853753	0.066903566	0.5853753	-0.325496	-	-	0.4	1.2	0.092538	-	21.32	30.37
382	30.31	21.35	24.87	-	-	0.005267	-	-	-	0.999763004	-	0.256421189	-	0.005267	0.301769	2.698367	154.60505	11	3.811	1.634279735	-3.442568	58.537532	0.5853753	0.064134414	0.5853753	-0.328266	-	-	0.4	1.2	0.092538	-	21.35	30.31
383	30.25	21.37	24.93	-	-	0.005267	-	-	-	1.002248854	-	0.25869558	-	0.005267	0.301769	2.703634	154.9068189	11	3.811	1.616125624	-3.451128	58.537532	0.5853753	0.06139561	0.5853753	-0.331004	-	-	0.4	1.2	0.092538	-	21.37	30.25
384	30.19	21.40	25.00	-	-	0.005267	-	-	-	1.004706902	-	0.260952518	-	0.005267	0.301769	2.708901	155.2085878	11	3.811	1.597926681	-3.459592	58.537532	0.5853753	0.058687229	0.5853753	-0.333713	-	-	0.4	1.2	0.092538	-	21.40	30.19
385	30.14	21.43	25.06	-	-	0.005267	-	-	-	1.007137079	-	0.26319167	-	0.005267	0.301769	2.714168	155.5103567	11	3.811	1.579683412	-3.46796	58.537532	0.5853753	0.056009347	0.5853753	-0.336391	-	-	0.5	1.2	0.092538	-	21.43	30.14
386	30.08	21.46	25.13	-	-	0.005267	-	-	-	1.009539319	-	0.265412708	-	0.005267	0.301769	2.719435	155.8121256	11	3.811	1.561396324	-3.476232	58.537532	0.5853753	0.053362038	0.5853753	-0.339038	-	-	0.5	1.2	0.092538	-	21.46	30.08
387	30.02	21.48	25.19	-	-	0.005267	-	-	-	1.011913554	-	0.267615303	-	0.005267	0.301769	2.724701	156.1138945	11	3.811	1.543065922	-3.484407	58.537532	0.5853753	0.050745375	0.5853753	-0.341655	-	-	0.5	1.2	0.092538	-	21.48	30.02
388	29.96	21.51	25.26	-	-	0.005267	-	-	-	1.01425972	-	0.269799134	-	0.005267	0.301769	2.729968	156.4156634	11	3.811	1.524692717	-3.492486	58.537532	0.5853753	0.048159431	0.5853753	-0.344241	-	-	0.5	1.2	0.092538	-	21.51	29.96
389	29.90	21.54	25.32	-	-	0.005267	-	-	-	1.016577749	-	0.271963879	-	0.005267	0.301769	2.735235	156.7174323	11	3.811	1.506277216	-3.500468	58.537532	0.5853753	0.045604278	0.5853753	-0.346796	-	-	0.5	1.2	0.092538	-	21.54	29.90
390	29.84	21.56	25.39	-	-	0.005267	-	-	-	1.018867579	-	0.274109221	-	0.005267	0.301769	2.740502	157.0192012	11	3.811	1.487819932	-3.508353	58.537532	0.5853753	0.043079987	0.5853753	-0.34932	-	-	0.5	1.2	0.092538	-	21.56	29.84
391	29.78	21.59	25.45	-	-	0.005267	-	-	-	1.021129146	-	0.276234846	-	0.005267	0.301769	2.745769	157.3209701	11	3.811	1.469321376	-3.51614	58.537532	0.5853753	0.040586627	0.5853753	-0.351813	-	-	0.5	1.2	0.092538	-	21.59	29.78

392	29.72	21.61	25.52	-	-	0.005267	-	-	-	1.023362388	-	0.278340442	-	0.005267	0.301769	2.751036	157.622739	11	3.811	1.450782062	-3.52383	58.537532	0.5853753	0.038124268	0.5853753	-0.354276	-	-	0.5	1.2	0.092538	-	21.61	29.72
393	29.66	21.64	25.58	-	-	0.005267	-	-	-	1.025567241	-	0.280425701	-	0.005267	0.301769	2.756303	157.924508	11	3.811	1.432202503	-3.531422	58.537532	0.5853753	0.035692978	0.5853753	-0.356707	-	-	0.5	1.2	0.092538	-	21.64	29.66
394	29.60	21.66	25.65	-	-	0.005267	-	-	-	1.027743645	-	0.28249032	-	0.005267	0.301769	2.761569	158.2262769	11	3.811	1.413583215	-3.538916	58.537532	0.5853753	0.033292824	0.5853753	-0.359107	-	-	0.5	1.2	0.092538	-	21.66	29.60
395	29.54	21.68	25.71	-	-	0.005267	-	-	-	1.02989154	-	0.284533995	-	0.005267	0.301769	2.766836	158.5280458	11	3.811	1.394924715	-3.546312	58.537532	0.5853753	0.030923874	0.5853753	-0.361476	-	-	0.5	1.2	0.092538	-	21.68	29.54
396	29.48	21.71	25.78	-	-	0.005267	-	-	-	1.032010866	-	0.286556429	-	0.005267	0.301769	2.772103	158.8298147	11	3.811	1.37622752	-3.55361	58.537532	0.5853753	0.028586192	0.5853753	-0.363814	-	-	0.5	1.2	0.092538	-	21.71	29.48
397	29.42	21.73	25.84	-	-	0.005267	-	-	-	1.034101564	-	0.288557327	-	0.005267	0.301769	2.777370	159.1315836	11	3.811	1.357492149	-3.560809	58.537532	0.5853753	0.026279844	0.5853753	-0.36612	-	-	0.5	1.2	0.092538	-	21.73	29.42
398	29.35	21.76	25.91	-	-	0.005267	-	-	-	1.036163577	-	0.290536397	-	0.005267	0.301769	2.782637	159.4333525	11	3.811	1.338719121	-3.567909	58.537532	0.5853753	0.024004894	0.5853753	-0.368395	-	-	0.5	1.2	0.092538	-	21.76	29.35
399	29.29	21.78	25.97	-	-	0.005267	-	-	-	1.038196846	-	0.29249335	-	0.005267	0.301769	2.787904	159.7351214	11	3.811	1.319908957	-3.574911	58.537532	0.5853753	0.021761404	0.5853753	-0.370639	-	-	0.5	1.2	0.092538	-	21.78	29.29
400	29.23	21.80	26.04	-	-	0.005267	-	-	-	1.040201317	-	0.294427903	-	0.005267	0.301769	2.793171	160.0368903	11	3.811	1.30106218	-3.581813	58.537532	0.5853753	0.019549437	0.5853753	-0.372851	-	-	0.5	1.2	0.092538	-	21.80	29.23
401	29.17	21.82	26.11	-	-	0.005267	-	-	-	1.042176932	-	0.296339773	-	0.005267	0.301769	2.798438	160.3386592	11	3.811	1.282179311	-3.588616	58.537532	0.5853753	0.017369055	0.5853753	-0.375031	-	-	0.5	1.2	0.092538	-	21.82	29.17
402	29.11	21.84	26.17	-	-	0.005267	-	-	-	1.044123638	-	0.298228682	-	0.005267	0.301769	2.803704	160.6404281	11	3.811	1.263260875	-3.595319	58.537532	0.5853753	0.015220318	0.5853753	-0.37718	-	-	0.5	1.2	0.092538	-	21.84	29.11
403	29.05	21.87	26.24	-	-	0.005267	-	-	-	1.046041379	-	0.300094356	-	0.005267	0.301769	2.808971	160.942197	11	3.811	1.244307396	-3.601922	58.537532	0.5853753	0.013103285	0.5853753	-0.379297	-	-	0.5	1.2	0.092538	-	21.87	29.05
404	28.99	21.89	26.30	-	-	0.005267	-	-	-	1.047930104	-	0.301936525	-	0.005267	0.301769	2.814238	161.2439659	11	3.811	1.225319401	-3.608426	58.537532	0.5853753	0.011018015	0.5853753	-0.381382	-	-	0.6	1.2	0.092538	-	21.89	28.99
405	28.93	21.91	26.37	-	-	0.005267	-	-	-	1.04978976	-	0.30375492	-	0.005267	0.301769	2.819505	161.5457348	11	3.811	1.206297415	-3.61483	58.537532	0.5853753	0.008964566	0.5853753	-0.383435	-	-	0.6	1.2	0.092538	-	21.91	28.93
406	28.86	21.93	26.43	-	-	0.005267	-	-	-	1.051620295	-	0.305549278	-	0.005267	0.301769	2.824772	161.8475038	11	3.811	1.187241967	-3.621133	58.537532	0.5853753	0.006942995	0.5853753	-0.385457	-	-	0.6	1.2	0.092538	-	21.93	28.86
407	28.80	21.95	26.50	-	-	0.005267	-	-	-	1.053421658	-	0.30731934	-	0.005267	0.301769	2.830039	162.1492727	11	3.811	1.168153586	-3.627336	58.537532	0.5853753	0.004953358	0.5853753	-0.387447	-	-	0.6	1.2	0.092538	-	21.95	28.80
408	28.74	21.97	26.56	-	-	0.005267	-	-	-	1.055193799	-	0.309064848	-	0.005267	0.301769	2.835306	162.4510416	11	3.811	1.1490328	-3.633438	58.537532	0.5853753	0.00299571	0.5853753	-0.389404	-	-	0.6	1.2	0.092538	-	21.97	28.74
409	28.68	21.99	26.63	-	-	0.005267	-	-	-	1.056936669	-	0.310785549	-	0.005267	0.301769	2.840572	162.7528105	11	3.811	1.12988014	-3.639439	58.537532	0.5853753	0.001070106	0.5853753	-0.39133	-	-	0.6	1.2	0.092538	-	21.99	28.68
410	28.62	22.01	26.69	-	-	0.005267	-	-	-	1.058650221	-	0.312481196	-	0.005267	0.301769	2.845839	163.0545794	11	3.811	1.110696137	-3.645339	58.537532	0.5853753	-0.000823401	0.5853753	-0.393223	-	-	0.6	1.2	0.092538	-	22.01	28.62
411	28.55	22.03	26.76	-	-	0.005267	-	-	-	1.060334405	-	0.314151542	-	0.005267	0.301769	2.851106	163.3563483	11	3.811	1.091481324	-3.651139	58.537532	0.5853753	-0.002684759	0.5853753	-0.395085	-	-	0.6	1.2	0.092538	-	22.03	28.55
412	28.49	22.05	26.82	-	-	0.005267	-	-	-	1.061989176	-	0.315796347	-	0.005267	0.301769	2.856373	163.6581172	11	3.811	1.072236234	-3.656837	58.537532	0.5853753	-0.004513916	0.5853753	-0.396914	-	-	0.6	1.2	0.092538	-	22.05	28.49
413	28.43	22.06	26.89	-	-	0.005267	-	-	-	1.063614488	-	0.317415372	-	0.005267	0.301769	2.861640	163.9598861	11	3.811	1.0529614	-3.662433	58.537532	0.5853753	-0.006310821	0.5853753	-0.398711	-	-	0.6	1.2	0.092538	-	22.06	28.43
414	28.37	22.08	26.95	-	-	0.005267	-	-	-	1.065210296	-	0.319008384	-	0.005267	0.301769	2.866907	164.261655	11	3.811	1.033657357	-3.667928	58.537532	0.5853753	-0.008075424	0.5853753	-0.400475	-	-	0.6	1.2	0.092538	-	22.08	28.37
415	28.30	22.10	27.02	-	-	0.005267	-	-	-	1.066776554	-	0.320575152	-	0.005267	0.301769	2.872174	164.5634239	11	3.811	1.014324641	-3.673322	58.537532	0.5853753	-0.009807676	0.5853753	-0.402208	-	-	0.6	1.2	0.092538	-	22.10	28.30
416	28.24	22.12	27.08	-	-	0.005267	-	-	-	1.068313221	-	0.322115452	-	0.005267	0.301769	2.877440	164.8651928	11	3.811	0.994963788	-3.678613	58.537532	0.5853753	-0.01150753	0.5853753	-0.403908	-	-	0.6	1.2	0.092538	-	22.12	28.24
417	28.18	22.13	27.15	-	-	0.005267	-	-	-	1.069820253	-	0.32362906	-	0.005267	0.301769	2.882707	165.1669617	11	3.811	0.975575334	-3.683802	58.537532	0.5853753	-0.013174938	0.5853753	-0.405575	-	-	0.6	1.2	0.092538	-	22.13	28.18
418	28.12	22.15	27.21	-	-	0.005267	-	-	-	1.071297608	-	0.325115758	-	0.005267	0.301769	2.887974	165.4687306	11	3.811	0.956159818	-3.688889	58.537532	0.5853753	-0.014809854	0.5853753	-0.40721	-	-	0.6	1.2	0.092538	-	22.15	28.12
419	28.05	22.17	27.28	-	-	0.005267	-	-	-	1.072745246	-	0.326575333	-	0.005267	0.301769	2.893241	165.7704996	11	3.811	0.936717779	-3.693874	58.537532	0.5853753	-0.016412232	0.5853753	-0.408812	-	-	0.6	1.2	0.092538	-	22.17	28.05
420	27.99	22.18	27.34	-	-	0.005267	-	-	-	1.074163126	-	0.328007575	-	0.005267	0.301769	2.898508	166.0722685	11	3.811	0.917249756	-3.698756	58.537532	0.5853753	-0.017982029	0.5853753	-0.410382	-	-	0.6	1.2	0.092538	-	22.18	27.99
421	27.93	22.20	27.41	-	-	0.005267	-	-	-	1.075551209	-	0.329412276	-	0.005267	0.301769	2.903775	166.3740374	11	3.811	0.897756288	-3.703536	58.537532	0.5853753	-0.0195192	0.5853753	-0.411919	-	-	0.6	1.2	0.092538	-	22.20	27.93
422	27.86	22.21	27.47	-	-	0.005267	-	-	-	1.076909457	-	0.330789235	-	0.005267	0.301769	2.909042	166.6758063	11	3.811	0.878237916	-3.708213	58.537532	0.5853753	-0.021023703	0.5853753	-0.413424	-	-	0.6	1.2	0.092538	-	22.21	27.86
423	27.80	22.23	27.54	-	-	0.005267	-	-	-	1.078237831	-	0.332138254	-	0.005267	0.301769	2.914308	166.9775752	11	3.811	0.858695183	-3.712787	58.537532	0.5853753	-0.022495496	0.5853753	-0.414895	-	-	0.7	1.2	0.092538	-	22.23	27.80
424	27.74	22.24	27.60	-	-	0.005267	-	-	-	1.079536295	-	0.333459139	-	0.005267	0.301769	2.919575	167.2793441	11	3.811	0.839128629	-3.717258	58.537532	0.5853753	-0.023934539	0.5853753	-0.416335	-	-	0.7	1.2	0.092538	-	22.24	27.74
425	27.67	22.26	27.67	-	-	0.005267	-	-	-	1.080804813	-	0.3347517	-	0.005267	0.301769	2.924842	167.581113	11	3.811	0.819538798	-3.721626	58.537532	0.5853753	-0.025340791	0.5853753	-0.417741	-	-	0.7	1.2	0.092538	-	22.26	27.67
426	27.61	22.27	27.73	-	-	0.005267	-	-	-	1.08204335	-	0.336015752	-	0.005267	0.301769	2.930109	167.8828819	11	3.811	0.799926234	-3.725891	58.537532	0.5853753	-0.026714213	0.5853753	-0.419114	-	-	0.7	1.2	0.092538	-	22.27	27.61
427	27.54	22.29	27.80	-	-	0.005267	-	-	-	1.083251872	-	0.337251112	-	0.005267	0.301769	2.935376	168.1846508	11	3.811	0.780291479	-3.730052	58.537532	0.5853753	-0.028054768	0.5853753	-0.420455	-	-	0.7	1.2	0.092538	-	22.29	27.54
428	27.48	22.30	27.86	-	-	0.005267	-	-	-	1.084430344	-	0.338457604	-	0.005267	0.301769	2.940643	168.4864197	11	3.811	0.76063508	-3.73411	58.537532	0.5853753	-0.029362417	0.5853753	-0.421762	-	-	0.7	1.2	0.092538	-	22.30	27.48
429	27.42	22.31	27.93	-	-	0.005267	-	-	-	1.085578734	-	0.339635055	-	0.005267	0.301769	2.945910	168.7881886	11	3.811	0.74095758	-3.738065	58.537532	0.5853753	-0.030637126	0.5853753	-0.423037	-	-	0.7	1.2	0.092538	-	22.31	27.42
430	27.35	22.32	27.99	-	-	0.005267	-	-	-	1.086697011	-	0.340783295	-	0.005267	0.301769	2.951176	169.0899575	11	3.811	0.721259527	-3.741915	58.537532	0.5853753	-0.031878858	0.5853753	-0.424279	-	-	0.7	1.2	0.092538	-	22.32	27.35
431	27.29	22.34	28.06	-	-	0.005267	-	-	-	1.087785143	-	0.34190216	-	0.005267	0.301769	2.956443	169.3917265	11	3.811	0.701541466	-3.745662	58.537532	0.5853753	-0.03308758	0.5853753	-0.425488	-	-	0.7	1.2	0.092538	-	22.34	27.29
432	27.23	22.35	28.12	-	-	0.005267	-	-	-	1.0888431	-	0.342991489	-	0.005267	0.301769	2.961710	169.6934954	11	3.811	0.681803945	-3.749305	58.537532	0.5853753	-0.034263256	0.5853753	-0.426663	-	-	0.7	1.2	0.092538	-	22.35	27.23
433	27.16	22.36	28.19	-	-	0.005267	-	-	-	1.089870852	-	0.344051127	-	0.005267	0.301769	2.966977	169.9952643	11	3.811	0.66204751	-3.752844	58.537532	0.5853753	-0.035405856	0.5853753	-0.427806	-	-	0.7	1.2	0.092538	-	22.36	27.16
434	27.10	22.37	28.25	-	-	0.005267	-	-	-	1.090868372	-	0.345080921	-	0.005267	0.301769	2.972244	170.2970332	11	3.811	0.642272711	-3.756279	58.537532	0.5853753	-0.036515347	0.5853753	-0.428915	-	-	0.7	1.2	0.092538	-	22.37	27.10
435	27.03	22.38	28.32	-	-	0.005267	-	-	-	1.091835632	-	0.346080725	-	0.005267	0.301769	2.977511	170.5988021	11	3.811	0.622480095	-3.75961	58.537532	0.5853753	-0.037591698	0.5853753	-0.429992	-	-	0.7	1.2	0.092538	-	22.38	27.03
436	26.97	22.39	28.38	-	-	0.005267	-	-	-	1.092772604	-	0.347050394	-	0.005267	0.301769	2.982778	170.900571	11	3.811	0.602670211	-3.762836	58.537532	0.5853753	-0.03863488	0.5853753	-0.431035	-	-	0.7	1.2	0.092538	-	22.39	26.97
437	26.90	22.40	28.45	-	-	0.005267	-	-	-	1.093679263	-	0.347989791	-	0.005267	0.301769	2.988045	171.2023399	11	3.811	0.58284361	-3.765958	58.537532	0.5853753	-0.039644864	0.5853753	-0.432045	-	-	0.7	1.2	0.092538	-	22.40	26.90
438	26.84	22.41	28.51	-	-	0.005267	-	-	-	1.094555584	-	0.34889878	-	0.005267	0.301769	2.993311	171.5041088	11	3.811	0.56300084	-3.768975	58.537532	0.5853753	-0.040621621	0.5853753	-0.433022	-	-	0.7	1.2	0.092538	-	22.41	26.84
439	26.78	22.42	28.58	-	-	0.005267	-	-	-	1.095401542	-	0.349777231	-	0.005267	0.301769	2.998578	171.8058777	11	3.811	0.543142454	-3.771888	58.537532	0.5853753	-0.041565125	0.5853753	-0.433965	-	-	0.7	1.2	0.092538	-	22.42	26.78
440	26.71	22.43	28.64	-	-	0.005267	-	-	-	1.096217114	-	0.35062502	-	0.005267	0.301769	3.003845	172.1076466	11	3.811	0.523269	-3.774697	58.537532	0.5853753	-0.042475349	0.5853753	-0.434875	-	-	0.7	1.2	0.092538	-	22.43	26.71
441	26.65	22.44	28.71	-	-	0.005267	-	-	-	1.097002277	-	0.351442024	-	0.005267	0.301769	3.009112	172.4094155	11	3.811	0.503381031	-3.7774	58.537532	0.5853753	-0.043352268	0.5853753	-0.435752	-	-	0.7	1.2	0.092538	-	22.44	26.65
442	26.58	22.45	28.77	-	-	0.005267	-	-	-	1.097757009	-	0.352228127	-	0.005267	0.301769	3.014379	172.7111844	11	3.811	0.483479099	-3.779999	58.537532	0.5853753	-0.044195858	0.5853753	-0.436596	-	-	0.8	1.2	0.092538	-	22.45	26.58
443	26.52	22.46	28.84	-	-	0.005267	-	-	-	1.09848129	-	0.352983217	-	0.005267	0.301769	3.019646	173.0129533	11	3.811	0.463563754	-3.782493	58.537532	0.5853753	-0.045006096	0.5853753	-0.437406	-	-	0.8	1.2	0.092538	-	22.46	26.52
444	26.45	22.47	28.90	-	-	0.005267	-	-	-	1.099175099	-	0.353707185	-	0.005267	0.301769	3.024913	173.3147223	11	3.811	0.443635551	-3.784882	58.537532	0.5853753	-0.045782958	0.5853753	-0.438183	-	-	0.8	1.2	0.092538	-	22.47	26.45
445	26.39	22.47	28.97	-	-	0.005267	-	-	-	1.099838417	-	0.354399929	-	0.005267	0.301769	3.030179	173.6164912	11	3.811	0.423695041	-3.787166	58.537532	0.5853753	-0.046526424	0.5853753	-0.438926	-	-	0.8	1.2	0.092538	-	22.47	26.39
446	26.32	22.48	29.03	-	-	0.005267	-	-	-	1.100471227	-	0.355061349	-	0.005267	0.301769	3.035446	173.9182601	11	3.811	0.403742779	-3.789345	58.537532	0.5853753	-0.047236472	0.5853753	-0.439636	-	-	0.8	1.2	0.092538	-	22.48	26.32
447	26.26	22.49	29.10	-	-	0.005267	-	-	-	1.101073509	-	0.35569135	-	0.005267	0.301769	3.040713	174.220029	11	3.811	0.383779316	-3.791419	58.537532	0.5853753	-0.047913084	0.5853753	-0.440313	-	-	0.8	1.2	0.092538	-	22.49	26.26
448	26.19	22.49	29.16	-	-	0.005267	-	-	-	1.101645248	-	0.356289843	-	0.005267	0.301769	3.045980	174.5217979	11	3.811	0.363805208	-3.793388	58.537532	0.5853753	-0.04855624	0.5853753	-0.440956	-	-	0.8	1.2	0.092538	-	22.49	26.19
449	26.13	22.50	29.23	-	-	0.005267	-	-	-	1.102186427	-	0.356856743	-	0.005267	0.301769	3.051247	174.8235668	11	3.811	0.343821007	-3.795251	58.537532	0.5853753	-0.049165922	0.5853753	-0.441566	-	-	0.8	1.2	0.092538	-	22.50	26.13
450	26.07	22.51	29.30	-	-	0.005267	-	-	-	1.102697032	-	0.357391967	-	0.005267	0.301769	3.056514	175.1253357	11	3.811	0.323827269	-3.79701	58.537532	0.5853753	-0.049742113	0.5853753	-0.442142	-	-	0.8	1.2	0.092538	-	22.51	26.07
451	26.00	22.51	29.36	-	-	0.005267	-	-	-	1.103177049	-	0.357895441	-	0.005267	0.301769	3.061781	175.4271046	11	3.811	0.303824548	-3.798662	58.537532	0.5853753	-0.050284799	0.5853753	-0.442685	-	-	0.8	1.2	0.092538	-	22.51	26.00
452	25.94	22.52	29.43	-	-	0.005267	-	-	-	1.103626463	-	0.358367092	-	0.005267	0.301769	3.067047	175.7288735	11	3.811	0.2838134	-3.80021	58.537532	0.5853753	-0.050793962	0.5853753	-0.443194	-	-	0.8	1.2	0.092538	-	22.52	25.94
453	25.87	22.52	29.49	-	-	0.005267	-	-	-	1.104045264	-	0.358806853	-	0.005267	0.301769	3.072314	176.0306424	11	3.811	0.263794378	-3.801652	58.537532	0.5853753	-0.051269591	0.5853753	-0.44367	-	-	0.8	1.2	0.092538	-	22.52	25.87
454	25.81	22.53	29.56	-	-	0.005267	-	-	-	1.104433438	-	0.35921466	-	0.005267	0.301769	3.077581	176.3324113	11	3.811	0.243768039	-3.802989	58.537532	0.5853753	-0.05171167	0.5853753	-0.444112	-	-	0.8	1.2	0.092538	-	22.53	25.81
455	25.74	22.53	29.62	-	-	0.005267	-	-	-	1.104790976	-	0.359590457	-	0.005267	0.301769	3.082848	176.6341802	11	3.811	0.223734937	-3.80422	58.537532	0.5853753	-0.052120188	0.5853753	-0.44452	-	-	0.8	1.2	0.092538	-	22.53	25.74
456	25.68	22.54	29.69	-	-	0.005267	-	-	-	1.105117867	-	0.359934189	-	0.005267	0.301769	3.088115	176.9359491	11	3.811	0.203695629	-3.805345	58.537532	0.5853753	-0.052495134	0.5853753	-0.444895	-	-	0.8	1.2	0.092538	-	22.54	25.68
457	25.61	22.54	29.75	-	-	0.005267	-	-	-	1.105414102	-	0.360245807	-	0.005267	0.301769	3.093382	177.2377181	11	3.811	0.183650671	-3.806366	58.537532	0.5853753	-0.052836497	0.5853753	-0.445236	-	-	0.8	1.2	0.092538	-	22.54	25.61
458	25.55	22.54	29.82	-	-	0.005267	-	-	-	1.105679673	-	0.360525267	-	0.005267	0.301769	3.098649	177.539487	11	3.811	0.163600619	-3.80728	58.537532	0.5853753	-0.053144267	0.5853753	-0.445544	-	-	0.8	1.2	0.092538	-	22.54	25.55
459	25.48	22.54	29.88	-	-	0.005267	-	-	-	1.105914573	-	0.360772529	-	0.005267	0.301769	3.103915	177.8412559	11	3.811	0.143546028	-3.808089	58.537532	0.5853753	-0.053418437	0.5853753	-0.445818	-	-	0.8	1.2	0.092538	-	22.54	25.48
460	25.42	22.55	29.95	-	-	0.005267	-	-	-	1.106118796	-	0.360987557	-	0.005267	0.301769	3.109182	178.1430248	11	3.811	0.123487455	-3.808792	58.537532	0.5853753	-0.053658998	0.5853753	-0.446059	-	-	0.8	1.2	0.092538	-	22.55	25.42
461	25.35	22.55	30.01	-	-	0.005267	-	-	-	1.106292334	-	0.361170322	-	0.005267	0.301769	3.114449	178.4447937	11	3.811	0.103425457	-3.80939	58.537532	0.5853753	-0.053865944	0.5853753	-0.446266	-	-	0.9	1.2	0.092538	-	22.55	25.35
462	25.29	22.55	30.08	-	-	0.005267	-	-	-	1.106435185	-	0.361320796	-	0.005267	0.301769	3.119716	178.7465626	11	3.811	0.083360589	-3.809881	58.537532	0.5853753	-0.05403927	0.5853753	-0.446439	-	-	0.9	1.2	0.092538	-	22.55	25.29
463	25.22	22.55	30.14	-	-	0.005267	-	-	-	1.106547343	-	0.361438959	-	0.005267	0.301769	3.124983	179.0483315	11	3.811	0.06329341	-3.810268	58.537532	0.5853753	-0.054178969	0.5853753	-0.446579	-	-	0.9	1.2	0.092538	-	22.55	25.22
464	25.16	22.55	30.21	-	-	0.005267	-	-	-	1.106628806	-	0.361524794	-	0.005267	0.301769	3.130250	179.3501004	11	3.811	0.043224474	-3.810548	58.537532	0.5853753	-0.05428504	0.5853753	-0.446685	-	-	0.9	1.2	0.092538	-	22.55	25.16
465	25.09	22.55	30.27	-	-	0.005267	-	-	-	1.106679571	-	0.361578288	-	0.005267	0.301769	3.135517	179.6518693	11	3.811	0.02315434	-3.810723	58.537532	0.5853753	-0.054357477	0.5853753	-0.446757	-	-	0.9	1.2	0.092538	-	22.55	25.09
466	25.02	22.55	30.34	-	-	0.005267	-	-	-	1.106699638	-	0.361599434	-	0.005267	0.301769	3.140783	179.9536382	11	3.811	0.003083563	-3.810792	58.537532	0.5853753	-0.05439628	0.5853753	-0.446796	-	-	0.9	1.2	0.092538	-	22.55	25.02
467	24.96	22.55	30.40	-	-	0.005267	-	-	-	1.106689004	-	0.361588228	-	0.005267	0.301769	3.146050	180.2554071	11	3.811	-0.016987299	-3.810755	58.537532	0.5853753	-0.054401448	0.5853753	-0.446801	-	-	0.9	1.2	0.092538	-	22.55	24.96
468	24.89	22.55	30.47	-	-	0.005267	-	-	-	1.106647672	-	0.361544673	-	0.005267	0.301769	3.151317	180.557176	11	3.811	-0.037057691	-3.810613	58.537532	0.5853753	-0.05437298	0.5853753	-0.446773	-	-	0.9	1.2	0.092538	-	22.55	24.89
469	24.83	22.55	30.53	-	-	0.005267	-	-	-	1.106575641	-	0.361468775	-	0.005267	0.301769	3.156584	180.8589449	11	3.811	-0.057127054	-3.810365	58.537532	0.5853753	-0.054310877	0.5853753	-0.446711	-	-	0.9	1.2	0.092538	-	22.55	24.83
470	24.76	22.55	30.60	-	-	0.005267	-	-	-	1.106472914	-	0.361360544	-	0.005267	0.301769	3.161851	181.1607139	11	3.811	-0.077194832	-3.810011	58.537532	0.5853753	-0.05421514	0.5853753	-0.446615	-	-	0.9	1.2	0.092538	-	22.55	24.76
471	24.70	22.55	30.66	-	-	0.005267	-	-	-	1.106339494	-	0.361219995	-	0.005267	0.301769	3.167118	181.4624828	11	3.811	-0.097260469	-3.809552	58.537532	0.5853753	-0.054085774	0.5853753	-0.446486	-	-	0.9	1.2	0.092538	-	22.55	24.70
472	24.63	22.55	30.73	-	-	0.005267	-	-	-	1.106175384	-	0.36104715	-	0.005267	0.301769	3.172385	181.7642517	11	3.811	-0.117323408	-3.808987	58.537532	0.5853753	-0.05392278	0.5853753	-0.446323	-	-	0.9	1.2	0.092538	-	22.55	24.63
473	24.57	22.55	30.79	-	-	0.005267	-	-	-	1.105980589	-	0.360842032	-	0.005267	0.301769	3.177652	182.0660206	11	3.811	-0.137383093	-3.808316	58.537532	0.5853753	-0.053726164	0.5853753	-0.446126	-	-	0.9	1.2	0.092538	-	22.55	24.57
474	24.50	22.55	30.86	-	-	0.005267	-	-	-	1.105755115	-	0.360604671	-	0.005267	0.301769	3.182918	182.3677895	11	3.811	-0.157438967	-3.80754	58.537532	0.5853753	-0.053495931	0.5853753	-0.445896	-	-	0.9	1.2	0.092538	-	22.55	24.50
475	24.44	22.54	30.92	-	-	0.005267	-	-	-	1.105498967	-	0.3603351	-	0.005267	0.301769	3.188185	182.6695584	11	3.811	-0.177490473	-3.806658	58.537532	0.5853753	-0.053232087	0.5853753	-0.445632	-	-	0.9	1.2	0.092538	-	22.54	24.44
476	24.37	22.54	30.99	-	-	0.005267	-	-	-	1.105212153	-	0.360033359	-	0.005267	0.301769	3.193452	182.9713273	11	3.811	-0.197537056	-3.80567	58.537532	0.5853753	-0.05293464	0.5853753	-0.445335	-	-	0.9	1.2	0.092538	-	22.54	24.37
477	24.31	22.54	31.05	-	-	0.005267	-	-	-	1.10489468	-	0.359699489	-	0.005267	0.301769	3.198719	183.2730962	11	3.811	-0.217578159	-3.804577	58.537532	0.5853753	-0.052603598	0.5853753	-0.445004	-	-	0.9	1.2	0.092538	-	22.54	24.31
478	24.24	22.53	31.12	-	-	0.005267	-	-	-	1.104546559	-	0.35933354	-	0.005267	0.301769	3.203986	183.5748651	11	3.811	-0.237613226	-3.803378	58.537532	0.5853753	-0.05223897	0.5853753	-0.444639	-	-	0.9	1.2	0.092538	-	22.53	24.24
479	24.18	22.53	31.18	-	-	0.005267	-	-	-	1.104167797	-	0.358935562	-	0.005267	0.301769	3.209253	183.876634	11	3.811	-0.257641702	-3.802074	58.537532	0.5853753	-0.051840766	0.5853753	-0.444241	-	-	0.9	1.2	0.092538	-	22.53	24.18
480	24.11	22.52	31.25	-	-	0.005267	-	-	-	1.103758406	-	0.358505613	-	0.005267	0.301769	3.214520	184.1784029	11	3.811	-0.277663032	-3.800664	58.537532	0.5853753	-0.051408998	0.5853753	-0.443809	-	-	1.0	1.2	0.092538	-	22.52	24.11
481	24.05	22.52	31.31	-	-	0.005267	-	-	-	1.103318396	-	0.358043754	-	0.005267	0.301769	3.219786	184.4801718	11	3.811	-0.297676659	-3.799149	58.537532	0.5853753	-0.050943677	0.5853753	-0.443344	-	-	1.0	1.2	0.092538	-	22.52	24.05
482	23.98	22.51	31.38	-	-	0.005267	-	-	-	1.102847781	-	0.357550051	-	0.005267	0.301769	3.225053	184.7819407	11	3.811	-0.317682028	-3.797529	58.537532	0.5853753	-0.050444816	0.5853753	-0.442845	-	-	1.0	1.2	0.092538	-	22.51	23.98
483	23.92	22.51	31.44	-	-	0.005267	-	-	-	1.102346574	-	0.357024574	-	0.005267	0.301769	3.230320	185.0837097	11	3.811	-0.337678585	-3.795803	58.537532	0.5853753	-0.049912429	0.5853753	-0.442312	-	-	1.0	1.2	0.092538	-	22.51	23.92
484	23.85	22.50	31.51	-	-	0.005267	-	-	-	1.101814787	-	0.356467399	-	0.005267	0.301769	3.235587	185.3854786	11	3.811	-0.357665775	-3.793972	58.537532	0.5853753	-0.049346531	0.5853753	-0.441747	-	-	1.0	1.2	0.092538	-	22.50	23.85
485	23.79	22.50	31.57	-	-	0.005267	-	-	-	1.101252437	-	0.355878604	-	0.005267	0.301769	3.240854	185.6872475	11	3.811	-0.377643044	-3.792035	58.537532	0.5853753	-0.048747138	0.5853753	-0.441147	-	-	1.0	1.2	0.092538	-	22.50	23.79
486	23.72	22.49	31.64	-	-	0.005267	-	-	-	1.100659538	-	0.355258275	-	0.005267	0.301769	3.246121	185.9890164	11	3.811	-0.397609836	-3.789994	58.537532	0.5853753	-0.048114266	0.5853753	-0.440514	-	-	1.0	1.2	0.092538	-	22.49	23.72
487	23.66	22.48	31.70	-	-	0.005267	-	-	-	1.100036106	-	0.354606499	-	0.005267	0.301769	3.251388	186.2907853	11	3.811	-0.417565599	-3.787847	58.537532	0.5853753	-0.047447932	0.5853753	-0.439848	-	-	1.0	1.2	0.092538	-	22.48	23.66
488	23.60	22.48	31.77	-	-	0.005267	-	-	-	1.099382161	-	0.35392337	-	0.005267	0.301769	3.256654	186.5925542	11	3.811	-0.437509779	-3.785595	58.537532	0.5853753	-0.046748156	0.5853753	-0.439148	-	-	1.0	1.2	0.092538	-	22.48	23.60
489	23.53	22.47	31.83	-	-	0.005267	-	-	-	1.098697718	-	0.353208986	-	0.005267	0.301769	3.261921	186.8943231	11	3.811	-0.457441823	-3.783238	58.537532	0.5853753	-0.046014956	0.5853753	-0.438415	-	-	1.0	1.2	0.092538	-	22.47	23.53
490	23.47	22.46	31.90	-	-	0.005267	-	-	-	1.097982798	-	0.352463447	-	0.005267	0.301769	3.267188	187.196092	11	3.811	-0.477361177	-3.780777	58.537532	0.5853753	-0.045248353	0.5853753	-0.437648	-	-	1.0	1.2	0.092538	-	22.46	23.47
491	23.40	22.45	31.96	-	-	0.005267	-	-	-	1.09723742	-	0.351686862	-	0.005267	0.301769	3.272455	187.4978609	11	3.811	-0.497267289	-3.77821	58.537532	0.5853753	-0.044448368	0.5853753	-0.436848	-	-	1.0	1.2	0.092538	-	22.45	23.40
492	23.34	22.44	32.03	-	-	0.005267	-	-	-	1.096461605	-	0.35087934	-	0.005267	0.301769	3.277722	187.7996298	11	3.811	-0.517159607	-3.775539	58.537532	0.5853753	-0.043615024	0.5853753	-0.436015	-	-	1.0	1.2	0.092538	-	22.44	23.34
493	23.27	22.44	32.09	-	-	0.005267	-	-	-	1.095655375	-	0.350040998	-	0.005267	0.301769	3.282989	188.1013987	11	3.811	-0.53703758	-3.772762	58.537532	0.5853753	-0.042748343	0.5853753	-0.435148	-	-	1.0	1.2	0.092538	-	22.44	23.27
494	23.21	22.43	32.16	-	-	0.005267	-	-	-	1.094818751	-	0.349171955	-	0.005267	0.301769	3.288256	188.4031676	11	3.811	-0.556900655	-3.769882	58.537532	0.5853753	-0.04184835	0.5853753	-0.434248	-	-	1.0	1.2	0.092538	-	22.43	23.21
495	23.14	22.42	32.22	-	-	0.005267	-	-	-	1.093951757	-	0.348272335	-	0.005267	0.301769	3.293522	188.7049365	11	3.811	-0.576748281	-3.766896	58.537532	0.5853753	-0.040915069	0.5853753	-0.433315	-	-	1.0	1.2	0.092538	-	22.42	23.14
496	23.08	22.41	32.29	-	-	0.005267	-	-	-	1.093054418	-	0.347342268	-	0.005267	0.301769	3.298789	189.0067055	11	3.811	-0.596579909	-3.763806	58.537532	0.5853753	-0.039948526	0.5853753	-0.432349	-	-	1.0	1.2	0.092538	-	22.41	23.08
497	23.02	22.40	32.35	-	-	0.005267	-	-	-	1.092126757	-	0.346381886	-	0.005267	0.301769	3.304056	189.3084744	11	3.811	-0.616394988	-3.760612	58.537532	0.5853753	-0.038948749	0.5853753	-0.431349	-	-	1.0	1.2	0.092538	-	22.40	23.02
498	22.95	22.39	32.42	-	-	0.005267	-	-	-	1.091168801	-	0.345391326	-	0.005267	0.301769	3.309323	189.6102433	11	3.811	-0.636192968	-3.757313	58.537532	0.5853753	-0.037915765	0.5853753	-0.430316	-	-	1.0	1.2	0.092538	-	22.39	22.95
499	22.89	22.38	32.48	-	-	0.005267	-	-	-	1.090180576	-	0.344370732	-	0.005267	0.301769	3.314590	189.9120122	11	3.811	-0.655973301	-3.753911	58.537532	0.5853753	-0.036849602	0.5853753	-0.42925	-	-	1.1	1.2	0.092538	-	22.38	22.89
500	22.82	22.36	32.55	-	-	0.005267	-	-	-	1.08916211	-	0.343320248	-	0.005267	0.301769	3.319857	190.2137811	11	3.811	-0.675735437	-3.750404	58.537532	0.5853753	-0.035750291	0.5853753	-0.42815	-	-	1.1	1.2	0.092538	-	22.36	22.82
501	22.76	22.35	32.62	-	-	0.005267	-	-	-	1.08811343	-	0.342240025	-	0.005267	0.301769	3.325124	190.51555	11	3.811	-0.695478828	-3.746793	58.537532	0.5853753	-0.034617861	0.5853753	-0.427018	-	-	1.1	1.2	0.092538	-	22.35	22.76
502	22.69	22.34	32.68	-	-	0.005267	-	-	-	1.087034567	-	0.341130219	-	0.005267	0.301769	3.330390	190.8173189	11	3.811	-0.715202926	-3.743078	58.537532	0.5853753	-0.033452344	0.5853753	-0.425852	-	-	1.1	1.2	0.092538	-	22.34	22.69
503	22.63	22.33	32.75	-	-	0.005267	-	-	-	1.08592555	-	0.339990987	-	0.005267	0.301769	3.335657	191.1190878	11	3.811	-0.734907185	-3.739259	58.537532	0.5853753	-0.032253773	0.5853753	-0.424654	-	-	1.1	1.2	0.092538	-	22.33	22.63
504	22.57	22.32	32.81	-	-	0.005267	-	-	-	1.084786409	-	0.338822494	-	0.005267	0.301769	3.340924	191.4208567	11	3.811	-0.754591058	-3.735336	58.537532	0.5853753	-0.03102218	0.5853753	-0.423422	-	-	1.1	1.2	0.092538	-	22.32	22.57
505	22.50	22.30	32.88	-	-	0.005267	-	-	-	1.083617177	-	0.337624908	-	0.005267	0.301769	3.346191	191.7226256	11	3.811	-0.774253999	-3.73131	58.537532	0.5853753	-0.029757601	0.5853753	-0.422158	-	-	1.1	1.2	0.092538	-	22.30	22.50
506	22.44	22.29	32.94	-	-	0.005267	-	-	-	1.082417885	-	0.336398399	-	0.005267	0.301769	3.351458	192.0243945	11	3.811	-0.793895462	-3.727181	58.537532	0.5853753	-0.028460069	0.5853753	-0.42086	-	-	1.1	1.2	0.092538	-	22.29	22.44
507	22.38	22.28	33.01	-	-	0.005267	-	-	-	1.081188567	-	0.335143144	-	0.005267	0.301769	3.356725	192.3261634	11	3.811	-0.813514903	-3.722948	58.537532	0.5853753	-0.027129621	0.5853753	-0.41953	-	-	1.1	1.2	0.092538	-	22.28	22.38
508	22.31	22.26	33.07	-	-	0.005267	-	-	-	1.079929258	-	0.333859323	-	0.005267	0.301769	3.361992	192.6279323	11	3.811	-0.833111777	-3.718611	58.537532	0.5853753	-0.025766293	0.5853753	-0.418166	-	-	1.1	1.2	0.092538	-	22.26	22.31
509	22.25	22.25	33.14	-	-	0.005267	-	-	-	1.078639991	-	0.332547121	-	0.005267	0.301769	3.367259	192.9297013	11	3.811	-0.852685541	-3.714172	58.537532	0.5853753	-0.024370125	0.5853753	-0.41677	-	-	1.1	1.2	0.092538	-	22.25	22.25
510	22.18	22.23	33.20	-	-	0.005267	-	-	-	1.077320803	-	0.331206726	-	0.005267	0.301769	3.372525	193.2314702	11	3.811	-0.872235651	-3.709629	58.537532	0.5853753	-0.022941153	0.5853753	-0.415341	-	-	1.1	1.2	0.092538	-	22.23	22.18
511	22.12	22.22	33.27	-	-	0.005267	-	-	-	1.075971731	-	0.329838331	-	0.005267	0.301769	3.377792	193.5332391	11	3.811	-0.891761566	-3.704984	58.537532	0.5853753	-0.021479419	0.5853753	-0.413879	-	-	1.1	1.2	0.092538	-	22.22	22.12
512	22.06	22.20	33.33	-	-	0.005267	-	-	-	1.074592811	-	0.328442133	-	0.005267	0.301769	3.383059	193.835008	11	3.811	-0.911262744	-3.700236	58.537532	0.5853753	-0.019984962	0.5853753	-0.412385	-	-	1.1	1.2	0.092538	-	22.20	22.06
513	21.99	22.19	33.40	-	-	0.005267	-	-	-	1.073184082	-	0.327018332	-	0.005267	0.301769	3.388326	194.1367769	11	3.811	-0.930738643	-3.695385	58.537532	0.5853753	-0.018457825	0.5853753	-0.410858	-	-	1.1	1.2	0.092538	-	22.19	21.99
514	21.93	22.17	33.46	-	-	0.005267	-	-	-	1.071745584	-	0.325567134	-	0.005267	0.301769	3.393593	194.4385458	11	3.811	-0.950188724	-3.690432	58.537532	0.5853753	-0.016898048	0.5853753	-0.409298	-	-	1.1	1.2	0.092538	-	22.17	21.93
515	21.87	22.16	33.53	-	-	0.005267	-	-	-	1.070277355	-	0.324088747	-	0.005267	0.301769	3.398860	194.7403147	11	3.811	-0.969612447	-3.685376	58.537532	0.5853753	-0.015305677	0.5853753	-0.407706	-	-	1.1	1.2	0.092538	-	22.16	21.87
516	21.81	22.14	33.59	-	-	0.005267	-	-	-	1.068779438	-	0.322583384	-	0.005267	0.301769	3.404127	195.0420836	11	3.811	-0.989009273	-3.680218	58.537532	0.5853753	-0.013680754	0.5853753	-0.406081	-	-	1.1	1.2	0.092538	-	22.14	21.81
517	21.74	22.12	33.66	-	-	0.005267	-	-	-	1.067251872	-	0.321051262	-	0.005267	0.301769	3.409393	195.3438525	11	3.811	-1.008378664	-3.674958	58.537532	0.5853753	-0.012023324	0.5853753	-0.404423	-	-	1.1	1.2	0.092538	-	22.12	21.74
518	21.68	22.11	33.72	-	-	0.005267	-	-	-	1.065694702	-	0.319492603	-	0.005267	0.301769	3.414660	195.6456214	11	3.811	-1.027720083	-3.669596	58.537532	0.5853753	-0.010333435	0.5853753	-0.402733	-	-	1.2	1.2	0.092538	-	22.11	21.68
519	21.62	22.09	33.79	-	-	0.005267	-	-	-	1.064107969	-	0.317907631	-	0.005267	0.301769	3.419927	195.9473903	11	3.811	-1.047032993	-3.664133	58.537532	0.5853753	-0.008611133	0.5853753	-0.401011	-	-	1.2	1.2	0.092538	-	22.09	21.62
520	21.55	22.07	33.85	-	-	0.005267	-	-	-	1.062491718	-	0.316296574	-	0.005267	0.301769	3.425194	196.2491592	11	3.811	-1.066316859	-3.658567	58.537532	0.5853753	-0.006856465	0.5853753	-0.399256	-	-	1.2	1.2	0.092538	-	22.07	21.55
521	21.49	22.05	33.92	-	-	0.005267	-	-	-	1.060845994	-	0.314659666	-	0.005267	0.301769	3.430461	196.5509281	11	3.811	-1.085571145	-3.6529	58.537532	0.5853753	-0.00506948	0.5853753	-0.397469	-	-	1.2	1.2	0.092538	-	22.05	21.49
522	21.43	22.03	33.98	-	-	0.005267	-	-	-	1.059170842	-	0.312997142	-	0.005267	0.301769	3.435728	196.8526971	11	3.811	-1.104795318	-3.647132	58.537532	0.5853753	-0.003250228	0.5853753	-0.39565	-	-	1.2	1.2	0.092538	-	22.03	21.43
523	21.37	22.01	34.05	-	-	0.005267	-	-	-	1.057466309	-	0.311309243	-	0.005267	0.301769	3.440995	197.154466	11	3.811	-1.123988844	-3.641263	58.537532	0.5853753	-0.001398759	0.5853753	-0.393799	-	-	1.2	1.2	0.092538	-	22.01	21.37

524	21.31	22.00	34.11	-	-	0.005267	-	-	-	1.055732442	-	0.309596214	-	0.005267	0.301769	3.446261	197.4562349	11	3.811	-1.143151191	-3.635292	58.537532	0.5853753	0.000484876	0.5853753	-0.391915	-	-	1.2	1.2	0.092538	-	22.00	21.31
525	21.24	21.98	34.18	-	-	0.005267	-	-	-	1.05396929	-	0.307858301	-	0.005267	0.301769	3.451528	197.7580038	11	3.811	-1.162281828	-3.629221	58.537532	0.5853753	0.002400623	0.5853753	-0.389999	-	-	1.2	1.2	0.092538	-	21.98	21.24
526	21.18	21.96	34.24	-	-	0.005267	-	-	-	1.052176901	-	0.306095757	-	0.005267	0.301769	3.456795	198.0597727	11	3.811	-1.181380222	-3.623049	58.537532	0.5853753	0.004348431	0.5853753	-0.388052	-	-	1.2	1.2	0.092538	-	21.96	21.18
527	21.12	21.94	34.31	-	-	0.005267	-	-	-	1.050355324	-	0.304308837	-	0.005267	0.301769	3.462062	198.3615416	11	3.811	-1.200445846	-3.616777	58.537532	0.5853753	0.006328244	0.5853753	-0.386072	-	-	1.2	1.2	0.092538	-	21.94	21.12
528	21.06	21.91	34.37	-	-	0.005267	-	-	-	1.048504611	-	0.3024978	-	0.005267	0.301769	3.467329	198.6633105	11	3.811	-1.21947817	-3.610404	58.537532	0.5853753	0.008340009	0.5853753	-0.38406	-	-	1.2	1.2	0.092538	-	21.91	21.06
529	21.00	21.89	34.44	-	-	0.005267	-	-	-	1.046624812	-	0.300662908	-	0.005267	0.301769	3.472596	198.9650794	11	3.811	-1.238476665	-3.603931	58.537532	0.5853753	0.010383669	0.5853753	-0.382016	-	-	1.2	1.2	0.092538	-	21.89	21.00
530	20.93	21.87	34.50	-	-	0.005267	-	-	-	1.044715981	-	0.298804427	-	0.005267	0.301769	3.477863	199.2668483	11	3.811	-1.257440806	-3.597359	58.537532	0.5853753	0.012459167	0.5853753	-0.379941	-	-	1.2	1.2	0.092538	-	21.87	20.93
531	20.87	21.85	34.57	-	-	0.005267	-	-	-	1.042778169	-	0.296922628	-	0.005267	0.301769	3.483129	199.5686172	11	3.811	-1.276370065	-3.590686	58.537532	0.5853753	0.014566447	0.5853753	-0.377834	-	-	1.2	1.2	0.092538	-	21.85	20.87
532	20.81	21.83	34.63	-	-	0.005267	-	-	-	1.040811431	-	0.295017784	-	0.005267	0.301769	3.488396	199.8703861	11	3.811	-1.295263918	-3.583914	58.537532	0.5853753	0.016705449	0.5853753	-0.375695	-	-	1.2	1.2	0.092538	-	21.83	20.81
533	20.75	21.81	34.70	-	-	0.005267	-	-	-	1.038815821	-	0.293090171	-	0.005267	0.301769	3.493663	200.172155	11	3.811	-1.314121841	-3.577042	58.537532	0.5853753	0.018876114	0.5853753	-0.373524	-	-	1.2	1.2	0.092538	-	21.81	20.75
534	20.69	21.79	34.76	-	-	0.005267	-	-	-	1.036791395	-	0.291140071	-	0.005267	0.301769	3.498930	200.4739239	11	3.811	-1.332943311	-3.570071	58.537532	0.5853753	0.021078383	0.5853753	-0.371322	-	-	1.2	1.2	0.092538	-	21.79	20.69
535	20.63	21.76	34.83	-	-	0.005267	-	-	-	1.034738208	-	0.289167766	-	0.005267	0.301769	3.504197	200.7756929	11	3.811	-1.351727804	-3.563001	58.537532	0.5853753	0.023312193	0.5853753	-0.369088	-	-	1.2	1.2	0.092538	-	21.76	20.63
536	20.57	21.74	34.89	-	-	0.005267	-	-	-	1.032656318	-	0.287173544	-	0.005267	0.301769	3.509464	201.0774618	11	3.811	-1.370474802	-3.555832	58.537532	0.5853753	0.025577483	0.5853753	-0.366823	-	-	1.2	1.2	0.092538	-	21.74	20.57
537	20.51	21.72	34.96	-	-	0.005267	-	-	-	1.030545782	-	0.285157696	-	0.005267	0.301769	3.514731	201.3792307	11	3.811	-1.389183782	-3.548565	58.537532	0.5853753	0.02787419	0.5853753	-0.364526	-	-	1.3	1.2	0.092538	-	21.72	20.51
538	20.45	21.69	35.02	-	-	0.005267	-	-	-	1.028406659	-	0.283120516	-	0.005267	0.301769	3.519997	201.6809996	11	3.811	-1.407854227	-3.541199	58.537532	0.5853753	0.030202251	0.5853753	-0.362198	-	-	1.3	1.2	0.092538	-	21.69	20.45
539	20.39	21.67	35.09	-	-	0.005267	-	-	-	1.026239008	-	0.281062301	-	0.005267	0.301769	3.525264	201.9827685	11	3.811	-1.426485619	-3.533735	58.537532	0.5853753	0.032561601	0.5853753	-0.359838	-	-	1.3	1.2	0.092538	-	21.67	20.39
540	20.33	21.64	35.15	-	-	0.005267	-	-	-	1.02404289	-	0.278983351	-	0.005267	0.301769	3.530531	202.2845374	11	3.811	-1.44507744	-3.526173	58.537532	0.5853753	0.034952173	0.5853753	-0.357448	-	-	1.3	1.2	0.092538	-	21.64	20.33
541	20.27	21.62	35.22	-	-	0.005267	-	-	-	1.021818365	-	0.276883971	-	0.005267	0.301769	3.535798	202.5863063	11	3.811	-1.463629175	-3.518513	58.537532	0.5853753	0.037373903	0.5853753	-0.355026	-	-	1.3	1.2	0.092538	-	21.62	20.27
542	20.20	21.59	35.28	-	-	0.005267	-	-	-	1.019565495	-	0.274764468	-	0.005267	0.301769	3.541065	202.8880752	11	3.811	-1.482140309	-3.510756	58.537532	0.5853753	0.039826723	0.5853753	-0.352573	-	-	1.3	1.2	0.092538	-	21.59	20.20
543	20.14	21.57	35.35	-	-	0.005267	-	-	-	1.017284342	-	0.272625151	-	0.005267	0.301769	3.546332	203.1898441	11	3.811	-1.50061033	-3.502901	58.537532	0.5853753	0.042310565	0.5853753	-0.350089	-	-	1.3	1.2	0.092538	-	21.57	20.14
544	20.09	21.54	35.41	-	-	0.005267	-	-	-	1.01497497	-	0.270466334	-	0.005267	0.301769	3.551599	203.491613	11	3.811	-1.519038723	-3.494949	58.537532	0.5853753	0.04482536	0.5853753	-0.347575	-	-	1.3	1.2	0.092538	-	21.54	20.09
545	20.03	21.52	35.48	-	-	0.005267	-	-	-	1.012637444	-	0.268288334	-	0.005267	0.301769	3.556866	203.7933819	11	3.811	-1.537424979	-3.4869	58.537532	0.5853753	0.047371037	0.5853753	-0.345029	-	-	1.3	1.2	0.092538	-	21.52	20.03
546	19.97	21.49	35.54	-	-	0.005267	-	-	-	1.010271826	-	0.26609147	-	0.005267	0.301769	3.562132	204.0951508	11	3.811	-1.555768587	-3.478754	58.537532	0.5853753	0.049947528	0.5853753	-0.342452	-	-	1.3	1.2	0.092538	-	21.49	19.97
547	19.91	21.46	35.61	-	-	0.005267	-	-	-	1.007878184	-	0.263876065	-	0.005267	0.301769	3.567399	204.3969197	11	3.811	-1.574069038	-3.470512	58.537532	0.5853753	0.052554759	0.5853753	-0.339845	-	-	1.3	1.2	0.092538	-	21.46	19.91
548	19.85	21.44	35.67	-	-	0.005267	-	-	-	1.005456584	-	0.261642444	-	0.005267	0.301769	3.572666	204.6986887	11	3.811	-1.592325825	-3.462173	58.537532	0.5853753	0.05519266	0.5853753	-0.337207	-	-	1.3	1.2	0.092538	-	21.44	19.85
549	19.79	21.41	35.74	-	-	0.005267	-	-	-	1.003007093	-	0.259390935	-	0.005267	0.301769	3.577933	205.0004576	11	3.811	-1.610538441	-3.453739	58.537532	0.5853753	0.057861156	0.5853753	-0.334539	-	-	1.3	1.2	0.092538	-	21.41	19.79
550	19.73	21.38	35.81	-	-	0.005267	-	-	-	1.000529778	-	0.257121871	-	0.005267	0.301769	3.583200	205.3022265	11	3.811	-1.628706382	-3.445208	58.537532	0.5853753	0.060560173	0.5853753	-0.33184	-	-	1.3	1.2	0.092538	-	21.38	19.73
551	19.67	21.35	35.87	-	-	0.005267	-	-	-	0.998024709	-	0.254835586	-	0.005267	0.301769	3.588467	205.6039954	11	3.811	-1.646829142	-3.436583	58.537532	0.5853753	0.063289637	0.5853753	-0.32911	-	-	1.3	1.2	0.092538	-	21.35	19.67
552	19.61	21.33	35.94	-	-	0.005267	-	-	-	0.995491955	-	0.252532416	-	0.005267	0.301769	3.593734	205.9057643	11	3.811	-1.66490622	-3.427861	58.537532	0.5853753	0.066049472	0.5853753	-0.326351	-	-	1.3	1.2	0.092538	-	21.33	19.61
553	19.55	21.30	36.00	-	-	0.005267	-	-	-	0.992931587	-	0.250212702	-	0.005267	0.301769	3.599000	206.2075332	11	3.811	-1.682937113	-3.419045	58.537532	0.5853753	0.068839602	0.5853753	-0.32356	-	-	1.3	1.2	0.092538	-	21.30	19.55
554	19.49	21.27	36.07	-	-	0.005267	-	-	-	0.990343674	-	0.247876786	-	0.005267	0.301769	3.604267	206.5093021	11	3.811	-1.700921323	-3.410134	58.537532	0.5853753	0.071659949	0.5853753	-0.32074	-	-	1.3	1.2	0.092538	-	21.27	19.49
555	19.44	21.24	36.13	-	-	0.005267	-	-	-	0.98772829	-	0.245525013	-	0.005267	0.301769	3.609534	206.811071	11	3.811	-1.718858349	-3.401128	58.537532	0.5853753	0.074510434	0.5853753	-0.31789	-	-	1.3	1.2	0.092538	-	21.24	19.44
556	19.38	21.21	36.20	-	-	0.005267	-	-	-	0.985085506	-	0.243157733	-	0.005267	0.301769	3.614801	207.1128399	11	3.811	-1.736747694	-3.392028	58.537532	0.5853753	0.077390979	0.5853753	-0.315009	-	-	1.4	1.2	0.092538	-	21.21	19.38
557	19.32	21.18	36.26	-	-	0.005267	-	-	-	0.982415397	-	0.240775295	-	0.005267	0.301769	3.620068	207.4146088	11	3.811	-1.754588863	-3.382834	58.537532	0.5853753	0.080301504	0.5853753	-0.312098	-	-	1.4	1.2	0.092538	-	21.18	19.32
558	19.26	21.15	36.33	-	-	0.005267	-	-	-	0.979718035	-	0.238378053	-	0.005267	0.301769	3.625335	207.7163777	11	3.811	-1.772381359	-3.373546	58.537532	0.5853753	0.083241928	0.5853753	-0.309158	-	-	1.4	1.2	0.092538	-	21.15	19.26
559	19.20	21.12	36.39	-	0.004478	-	-	-	-	0.976993496	-	0.235966362	-	0.004478	0.256552	3.630602	208.0181466	11	3.250	-1.52648096	-2.868701	49.916315	0.4991632	0.08621217	0.5853753	-0.306188	-	0.0	1.4	1.2	0.092538	-	21.12	19.20
560	19.15	21.09	36.46	-	0.004451	-	-	-	-	0.974655883	-	0.233641127	-	0.004451	0.254999	3.635079	208.2746987	11	3.230	-1.53005946	-2.844637	49.616318	0.4961632	0.089212146	0.5853753	-0.303188	-	0.0	1.4	1.2	0.092538	-	21.09	19.15
561	19.09	21.06	36.52	-	0.004423	-	-	-	-	0.972313055	-	0.231308458	-	0.004423	0.253433	3.639530	208.5296978	11	3.210	-1.533298401	-2.820497	49.313798	0.493138	0.092237337	0.5853753	-0.300163	-	0.0	1.4	1.2	0.092538	-	21.06	19.09
562	19.03	21.03	36.59	-	0.004396	-	-	-	-	0.969965533	-	0.228968737	-	0.004396	0.251854	3.643953	208.7831309	11	3.190	-1.536198162	-2.796284	49.008779	0.4900878	0.09528753	0.5853753	-0.297112	-	0.0	1.4	1.2	0.092538	-	21.03	19.03
563	18.98	21.00	36.65	-	0.004368	-	-	-	-	0.967613835	-	0.226622339	-	0.004368	0.250263	3.648349	209.0349852	11	3.170	-1.538759202	-2.772002	48.701281	0.4870128	0.09836251	0.5853753	-0.294037	-	0.0	1.4	1.2	0.092538	-	21.00	18.98
564	18.92	20.97	36.72	-	0.004340	-	-	-	-	0.965258478	-	0.224269637	-	0.004340	0.248659	3.652717	209.285248	11	3.150	-1.540982061	-2.747655	48.391326	0.4839133	0.101462065	0.5853753	-0.290938	-	0.0	1.4	1.2	0.092538	-	20.97	18.92
565	18.86	20.93	36.78	-	0.004312	-	-	-	-	0.962899979	-	0.221910997	-	0.004312	0.247042	3.657057	209.5339066	11	3.130	-1.542867359	-2.723247	48.078934	0.4807893	0.104585979	0.5853753	-0.287814	-	0.0	1.4	1.2	0.092538	-	20.93	18.86
566	18.81	20.90	36.85	-	0.004283	-	-	-	-	0.960538855	-	0.219546784	-	0.004283	0.245413	3.661368	209.7809486	11	3.109	-1.544415796	-2.698782	47.764128	0.4776413	0.107734037	0.5853753	-0.284666	-	0.0	1.4	1.2	0.092538	-	20.90	18.81
567	18.75	20.87	36.91	-	0.004255	-	-	-	-	0.958175619	-	0.217177353	-	0.004255	0.243772	3.665652	210.0263616	11	3.089	-1.545628147	-2.674264	47.44693	0.4744693	0.110906024	0.5853753	-0.281494	-	0.0	1.4	1.2	0.092538	-	20.87	18.75
568	18.69	20.84	36.98	-	0.004226	-	-	-	-	0.955810785	-	0.214803059	-	0.004226	0.242118	3.669906	210.2701332	11	3.068	-1.546505265	-2.649696	47.12736	0.4712736	0.114101723	0.5853753	-0.278298	-	0.0	1.4	1.2	0.092538	-	20.84	18.69
569	18.64	20.80	37.04	-	0.004197	-	-	-	-	0.953444865	-	0.212424249	-	0.004197	0.240453	3.674132	210.5122513	11	3.047	-1.54704808	-2.625083	46.80544	0.4680544	0.117320918	0.5853753	-0.275079	-	0.0	1.4	1.2	0.092538	-	20.80	18.64
570	18.58	20.77	37.11	-	0.004167	-	-	-	-	0.95107837	-	0.210041264	-	0.004167	0.238775	3.678329	210.752704	11	3.026	-1.547257594	-2.600427	46.481193	0.4648119	0.120563392	0.5853753	-0.271837	-	0.1	1.4	1.2	0.092538	-	20.77	18.58
571	18.52	20.74	37.17	-	0.004138	-	-	-	-	0.948711809	-	0.207654443	-	0.004138	0.237086	3.682496	210.9914791	11	3.005	-1.547134882	-2.575732	46.154639	0.4615464	0.123828927	0.5853753	-0.268571	-	0.1	1.4	1.2	0.092538	-	20.74	18.52
572	18.47	20.70	37.24	-	0.004108	-	-	-	-	0.946345689	-	0.205264117	-	0.004108	0.235385	3.686634	211.2285649	11	2.983	-1.546681091	-2.551003	45.825802	0.458258	0.127117306	0.5853753	-0.265283	-	0.1	1.4	1.2	0.092538	-	20.70	18.47
573	18.41	20.67	37.30	-	0.004078	-	-	-	-	0.943980515	-	0.202870613	-	0.004078	0.233672	3.690742	211.4639497	11	2.962	-1.54589744	-2.526242	45.494701	0.454947	0.13042831	0.5853753	-0.261972	-	0.1	1.4	1.2	0.092538	-	20.67	18.41
574	18.36	20.64	37.37	-	0.004048	-	-	-	-	0.941616792	-	0.200474252	-	0.004048	0.231948	3.694821	211.6976218	11	2.940	-1.544785214	-2.501453	45.16136	0.4516136	0.133761721	0.5853753	-0.258638	-	0.1	1.4	1.2	0.092538	-	20.64	18.36
575	18.30	20.60	37.43	-	0.004018	-	-	-	-	0.93925502	-	0.198075347	-	0.004018	0.230212	3.698869	211.9295698	11	2.918	-1.54334577	-2.476639	44.8258	0.448258	0.13711732	0.5853753	-0.255283	-	0.1	1.4	1.2	0.092538	-	20.60	18.30
576	18.25	20.57	37.50	-	0.003987	-	-	-	-	0.936895699	-	0.19567421	-	0.003987	0.228466	3.702887	212.1597823	11	2.896	-1.541580529	-2.451803	44.488043	0.4448804	0.140494889	0.5853753	-0.251905	-	0.1	1.4	1.2	0.092538	-	20.57	18.25
577	18.19	20.53	37.56	-	0.003957	-	-	-	-	0.934539326	-	0.193271142	-	0.003957	0.226708	3.706874	212.388248	11	2.874	-1.539490979	-2.42695	44.148111	0.4414811	0.143894208	0.5853753	-0.248506	-	0.1	1.4	1.2	0.092538	-	20.53	18.19
578	18.14	20.50	37.63	-	0.003926	-	-	-	-	0.932186397	-	0.190866443	-	0.003926	0.224939	3.710831	212.6149558	11	2.852	-1.537078671	-2.402081	43.806026	0.4380603	0.147315058	0.5853753	-0.245085	-	0.1	1.4	1.2	0.092538	-	20.50	18.14
579	18.08	20.46	37.69	-	0.003895	-	-	-	-	0.929837403	-	0.188460402	-	0.003895	0.223159	3.714757	212.8398945	11	2.829	-1.53434522	-2.377201	43.46181	0.4346181	0.15075722	0.5853753	-0.241643	-	0.1	1.4	1.2	0.092538	-	20.46	18.08
580	18.03	20.43	37.76	-	0.003864	-	-	-	-	0.927492834	-	0.186053307	-	0.003864	0.221368	3.718652	213.0630534	11	2.807	-1.531292302	-2.352312	43.115485	0.4311548	0.154220473	0.5853753	-0.23818	-	0.1	1.4	1.2	0.092538	-	20.43	18.03
581	17.97	20.39	37.82	-	0.003832	-	-	-	-	0.925153178	-	0.183645437	-	0.003832	0.219567	3.722515	213.2844215	11	2.784	-1.527921655	-2.327417	42.767072	0.4276707	0.157704599	0.5853753	-0.234695	-	0.1	1.4	1.2	0.092538	-	20.39	17.97
582	17.92	20.36	37.89	-	0.003801	-	-	-	-	0.92281892	-	0.181237063	-	0.003801	0.217755	3.726348	213.5039881	11	2.761	-1.524235074	-2.30252	42.416594	0.4241659	0.161209377	0.5853753	-0.231191	-	0.1	1.4	1.2	0.092538	-	20.36	17.92
583	17.86	20.32	37.95	-	0.003769	-	-	-	-	0.920490541	-	0.178828455	-	0.003769	0.215932	3.730148	213.7217428	11	2.738	-1.520234414	-2.277622	42.064073	0.4206407	0.164734589	0.5853753	-0.227665	-	0.1	1.4	1.2	0.092538	-	20.32	17.86
584	17.81	20.28	38.02	-	0.003737	-	-	-	-	0.91816852	-	0.176419872	-	0.003737	0.214099	3.733917	213.9376749	11	2.715	-1.515921585	-2.252728	41.709531	0.4170953	0.168280013	0.5853753	-0.22412	-	0.1	1.4	1.2	0.092538	-	20.28	17.81
585	17.76	20.25	38.08	-	0.003705	-	-	-	-	0.915853333	-	0.174011569	-	0.003705	0.212256	3.737654	214.1517742	11	2.692	-1.511298553	-2.22784	41.352989	0.4135299	0.171845431	0.5853753	-0.220555	-	0.1	1.4	1.2	0.092538	-	20.25	17.76
586	17.70	20.21	38.15	-	0.003672	-	-	-	-	0.913545453	-	0.171603794	-	0.003672	0.210403	3.741358	214.3640303	11	2.669	-1.506367339	-2.20296	40.99447	0.4099447	0.175430623	0.5853753	-0.216969	-	0.1	1.4	1.2	0.092538	-	20.21	17.70
587	17.65	20.17	38.21	-	0.003640	-	-	-	-	0.91124535	-	0.169196789	-	0.003640	0.20854	3.745030	214.5744332	11	2.645	-1.501130015	-2.178091	40.633995	0.40634	0.179035368	0.5853753	-0.213365	-	0.1	1.4	1.2	0.092538	-	20.17	17.65
588	17.59	20.14	38.28	-	0.003607	-	-	-	-	0.908953491	-	0.166790788	-	0.003607	0.206666	3.748670	214.7829729	11	2.622	-1.495588706	-2.153235	40.271587	0.4027159	0.182659448	0.5853753	-0.209741	-	0.1	1.4	1.2	0.092538	-	20.14	17.59
589	17.54	20.10	38.34	-	0.003574	-	-	-	-	0.906670338	-	0.16438602	-	0.003574	0.204783	3.752277	214.9896393	11	2.598	-1.489745586	-2.128396	39.907268	0.3990727	0.186302644	0.5853753	-0.206097	-	0.1	1.4	1.2	0.092538	-	20.10	17.54
590	17.49	20.06	38.41	-	0.003541	-	-	-	-	0.904396353	-	0.161982708	-	0.003541	0.202891	3.755851	215.1944227	11	2.574	-1.48360288	-2.103576	39.541059	0.3954106	0.189964735	0.5853753	-0.202435	-	0.1	1.4	1.2	0.092538	-	20.06	17.49
591	17.43	20.03	38.47	-	0.003508	-	-	-	-	0.90213199	-	0.159581066	-	0.003508	0.200989	3.759392	215.3973135	11	2.550	-1.477162859	-2.078776	39.172982	0.3917298	0.193645502	0.5853753	-0.198754	-	0.1	1.4	1.2	0.092538	-	20.03	17.43
592	17.38	19.99	38.54	-	0.003475	-	-	-	-	0.899877704	-	0.157181305	-	0.003475	0.199077	3.762900	215.598302	11	2.526	-1.470427841	-2.054	38.803059	0.3880306	0.197344727	0.5853753	-0.195055	-	0.1	1.4	1.2	0.092538	-	19.99	17.38
593	17.33	19.95	38.60	-	0.003441	-	-	-	-	0.897633943	-	0.154783626	-	0.003441	0.197156	3.766375	215.7973789	11	2.502	-1.463400188	-2.02925	38.431313	0.3843131	0.201062191	0.5853753	-0.191338	-	0.1	1.4	1.2	0.092538	-	19.95	17.33
594	17.28	19.91	38.67	-	0.003407	-	-	-	-	0.895401154	-	0.152388225	-	0.003407	0.195225	3.769816	215.9945346	11	2.478	-1.45608231	-2.004527	38.057765	0.3805776	0.204797675	0.5853753	-0.187602	-	0.1	1.4	1.2	0.092538	-	19.91	17.28
595	17.22	19.87	38.73	-	0.003373	-	-	-	-	0.893179778	-	0.149995292	-	0.003373	0.193286	3.773223	216.1897601	11	2.453	-1.448476655	-1.979835	37.682436	0.3768244	0.208550961	0.5853753	-0.183849	-	0.1	1.4	1.2	0.092538	-	19.87	17.22
596	17.17	19.84	38.80	-	0.003339	-	-	-	-	0.890970254	-	0.147605008	-	0.003339	0.191338	3.776597	216.3830462	11	2.429	-1.440585716	-1.955174	37.305349	0.3730535	0.212321831	0.5853753	-0.180078	-	0.1	1.4	1.2	0.092538	-	19.84	17.17
597	17.12	19.80	38.86	-	0.003305	-	-	-	-	0.888773017	-	0.14521755	-	0.003305	0.18938	3.779936	216.5743839	11	2.404	-1.432412025	-1.930547	36.926526	0.3692653	0.216110067	0.5853753	-0.17629	-	0.2	1.4	1.2	0.092538	-	19.80	17.12
598	17.07	19.76	38.93	-	0.003271	-	-	-	-	0.886588495	-	0.142833086	-	0.003271	0.187414	3.783241	216.7637643	11	2.379	-1.423958153	-1.905956	36.545987	0.3654599	0.219915451	0.5853753	-0.172485	-	0.2	1.4	1.2	0.092538	-	19.76	17.07
599	17.01	19.72	38.99	-	0.003237	-	-	-	-	0.884417118	-	0.14045178	-	0.003237	0.18544	3.786512	216.9511786	11	2.354	-1.41522671	-1.881403	36.163756	0.3616376	0.223737766	0.5853753	-0.168662	-	0.2	1.4	1.2	0.092538	-	19.72	17.01
600	16.96	19.68	39.06	-	0.003202	-	-	-	-	0.882259305	-	0.138073788	-	0.003202	0.183456	3.789749	217.1366181	11	2.329	-1.406220342	-1.856889	35.779853	0.3577985	0.227576796	0.5853753	-0.164823	-	0.2	1.4	1.2	0.092538	-	19.68	16.96
601	16.91	19.64	39.13	-	0.003167	-	-	-	-	0.880115478	-	0.135699257	-	0.003167	0.181464	3.792951	217.3200743	11	2.304	-1.396941731	-1.832416	35.3943	0.353943	0.231432324	0.5853753	-0.160968	-	0.2	1.4	1.2	0.092538	-	19.64	16.91
602	16.86	19.60	39.19	-	0.003132	-	-	-	-	0.877986048	-	0.133328333	-	0.003132	0.179464	3.796118	217.5015387	11	2.279	-1.387393593	-1.807986	35.007119	0.3500712	0.235304134	0.5853753	-0.157096	-	0.2	1.4	1.2	0.092538	-	19.60	16.86
603	16.81	19.56	39.26	-	0.003097	-	-	-	-	0.875871428	-	0.130961149	-	0.003097	0.177456	3.799250	217.681003	11	2.254	-1.37757868	-1.7836	34.618331	0.3461833	0.239192009	0.5853753	-0.153208	-	0.2	1.4	1.2	0.092538	-	19.56	16.81
604	16.75	19.52	39.32	-	0.003062	-	-	-	-	0.873772022	-	0.128597836	-	0.003062	0.17544	3.802347	217.858459	11	2.228	-1.367499772	-1.759261	34.227959	0.3422796	0.243095734	0.5853753	-0.149304	-	0.2	1.4	1.2	0.092538	-	19.52	16.75
605	16.70	19.48	39.39	-	0.003027	-	-	-	-	0.871688232	-	0.126238517	-	0.003027	0.173415	3.805409	218.0338985	11	2.203	-1.357159684	-1.734968	33.836023	0.3383602	0.247015095	0.5853753	-0.145385	-	0.2	1.4	1.2	0.092538	-	19.48	16.70
606	16.65	19.44	39.45	-	0.002991	-	-	-	-	0.869620456	-	0.123883307	-	0.002991	0.171383	3.808436	218.2073136	11	2.177	-1.34656126	-1.710725	33.442544	0.3344254	0.250949877	0.5853753	-0.14145	-	0.2	1.4	1.2	0.092538	-	19.44	16.65
607	16.60	19.40	39.52	-	0.002956	-	-	-	-	0.867569087	-	0.121532318	-	0.002956	0.169343	3.811427	218.3786963	11	2.151	-1.335707373	-1.686531	33.047546	0.3304755	0.254899866	0.5853753	-0.1375	-	0.2	1.4	1.2	0.092538	-	19.40	16.60
608	16.55	19.36	39.58	-	0.002920	-	-	-	-	0.865534513	-	0.119185651	-	0.002920	0.167295	3.814383	218.5480389	11	2.126	-1.324600922	-1.662389	32.651048	0.3265105	0.258864847	0.5853753	-0.133535	-	0.2	1.4	1.2	0.092538	-	19.36	16.55
609	16.50	19.32	39.65	-	0.002884	-	-	-	-	0.863517118	-	0.116843403	-	0.002884	0.165239	3.817303	218.7153336	11	2.100	-1.313244837	-1.638299	32.253071	0.3225307	0.262844607	0.5853753	-0.129555	-	0.2	1.4	1.2	0.092538	-	19.32	16.50
610	16.45	19.28	39.71	-	0.002848	-	-	-	-	0.861517282	-	0.114505666	-	0.002848	0.163177	3.820187	218.880573	11	2.074	-1.301642072	-1.614262	31.853639	0.3185364	0.266838934	0.5853753	-0.125561	-	0.2	1.4	1.2	0.092538	-	19.28	16.45
611	16.40	19.24	39.78	-	0.002812	-	-	-	-	0.859535379	-	0.112172523	-	0.002812	0.161106	3.823035	219.0437496	11	2.048	-1.289795604	-1.590281	31.452771	0.3145277	0.270847616	0.5853753	-0.121552	-	0.2	1.4	1.2	0.092538	-	19.24	16.40
612	16.35	19.20	39.84	-	0.002776	-	-	-	-	0.857571781	-	0.109844051	-	0.002776	0.159029	3.825846	219.204856	11	2.021	-1.277708438	-1.566354	31.050488	0.3105049	0.274870439	0.5853753	-0.11753	-	0.2	1.4	1.2	0.092538	-	19.20	16.35
613	16.30	19.16	39.91	-	0.002739	-	-	-	-	0.855626853	-	0.107520321	-	0.002739	0.156944	3.828622	219.3638849	11	1.995	-1.265383599	-1.542484	30.646813	0.3064681	0.278907194	0.5853753	-0.113493	-	0.2	1.4	1.2	0.092538	-	19.16	16.30
614	16.25	19.12	39.97	-	0.002703	-	-	-	-	0.853700956	-	0.105201399	-	0.002703	0.154853	3.831361	219.5208294	11	1.969	-1.252824135	-1.518672	30.241765	0.3024177	0.282957668	0.5853753	-0.109442	-	0.2	1.4	1.2	0.092538	-	19.12	16.25
615	16.20	19.07	40.04	-	0.002666	-	-	-	-	0.851794447	-	0.102887344	-	0.002666	0.152754	3.834064	219.6756822	11	1.942	-1.240033115	-1.494918	29.835367	0.2983537	0.287021652	0.5853753	-0.105378	-	0.2	1.4	1.2	0.092538	-	19.07	16.20
616	16.15	19.03	40.10	-	0.002629	-	-	-	-	0.849907678	-	0.100578207	-	0.002629	0.150649	3.836730	219.8284367	11	1.916	-1.22701363	-1.471222	29.427639	0.2942764	0.291098936	0.5853753	-0.101301	-	0.2	1.4	1.2	0.092538	-	19.03	16.15
617	16.10	18.99	40.17	-	0.002592	-	-	-	-	0.848040995	-	0.098274035	-	0.002592	0.148537	3.839359	219.9790858	11	1.889	-1.213768788	-1.447586	29.018601	0.290186	0.295189309	0.5853753	-0.097211	-	0.2	1.4	1.2	0.092538	-	18.99	16.10
618	16.05	18.95	40.23	-	0.002555	-	-	-	-	0.846194742	-	0.095974869	-	0.002555	0.146419	3.841952	220.127623	11	1.862	-1.200301717	-1.42401	28.608276	0.2860828	0.299292564	0.5853753	-0.093107	-	0.2	1.4	1.2	0.092538	-	18.95	16.05
619	16.00	18.91	40.30	-	0.002518	-	-	-	-	0.844369255	-	0.093680742	-	0.002518	0.144294	3.844507	220.2740416	11	1.836	-1.186615562	-1.400495	28.196683	0.2819668	0.303408492	0.5853753	-0.088992	-	0.2	1.4	1.2	0.092538	-	18.91	16.00
620	15.95	18.87	40.36	-	0.002481	-	-	-	-	0.842564867	-	0.091391683	-	0.002481	0.142162	3.847026	220.4183352	11	1.809	-1.172713485	-1.377041	27.783844	0.2778384	0.307536885	0.5853753	-0.084863	-	0.2	1.4	1.2	0.092538	-	18.87	15.95
621	15.90	18.82	40.43	-	0.002444	-	-	-	-	0.840781906	-	0.089107714	-	0.002444	0.140025	3.849507	220.5604974	11	1.782	-1.158598664	-1.353648	27.369779	0.2736978	0.311677536	0.5853753	-0.080722	-	0.2	1.4	1.2	0.092538	-	18.82	15.90
622	15.85	18.78	40.49	-	0.002406	-	-	-	-	0.839020696	-	0.086828851	-	0.002406	0.137881	3.851951	220.7005219	11	1.755	-1.144274294	-1.330317	26.954508	0.2695451	0.315830237	0.5853753	-0.07657	-	0.2	1.4	1.2	0.092538	-	18.78	15.85
623	15.80	18.74	40.56	-	0.002369	-	-	-	-	0.837281553	-	0.084555106	-	0.002369	0.135731	3.854357	220.8384026	11	1.728	-1.129743581	-1.307048	26.538054	0.2653805	0.319994784	0.5853753	-0.072405	-	0.2	1.4	1.2	0.092538	-	18.74	15.80
624	15.75	18.70	40.62	-	0.002331	-	-	-	-	0.835564792	-	0.082286483	-	0.002331	0.133575	3.856726	220.9741335	11	1.700	-1.115009748	-1.283842	26.120435	0.2612044	0.32417097	0.5853753	-0.068229	-	0.2	1.4	1.2	0.092538	-	18.70	15.75
625	15.70	18.65	40.69	-	0.002294	-	-	-	-	0.83387072	-	0.080022981	-	0.002294	0.131413	3.859058	221.1077085	11	1.673	-1.100076029	-1.260698	25.701673	0.2570167	0.32835859	0.5853753	-0.064041	-	0.2	1.4	1.2	0.092538	-	18.65	15.70
626	15.65	18.61	40.75	-	0.002256	-	-	-	-	0.832199641	-	0.077764594	-	0.002256	0.129246	3.861351	221.2391218	11	1.646	-1.084945672	-1.237617	25.281788	0.2528179	0.332557439	0.5853753	-0.059843	-	0.2	1.4	1.2	0.092538	-	18.61	15.65
627	15.60	18.57	40.82	-	0.002218	-	-	-	-	0.830551853	-	0.075511311	-	0.002218	0.127073	3.863607	221.3683677	11	1.618	-1.069621935	-1.214599	24.860801	0.248608	0.336767314	0.5853753	-0.055633	-	0.2	1.4	1.2	0.092538	-	18.57	15.60
628	15.55	18.52	40.88	-	0.002180	-	-	-	-	0.828927649	-	0.073263113	-	0.002180	0.124894	3.865825	221.4954406	11	1.591	-1.054108089	-1.191644	24.438731	0.2443873	0.340988012	0.5853753	-0.051412	-	0.2	1.4	1.2	0.092538	-	18.52	15.55
629	15.50	18.48	40.95	-	0.002142	-	-	-	-	0.827327318	-	0.071019978	-	0.002142	0.12271	3.868005	221.6203349	11	1.563	-1.038407413	-1.168751	24.015599	0.240156	0.345219328	0.5853753	-0.047181	-	0.2	1.4	1.2	0.092538	-	18.48	15.50
630	15.46	18.44	41.01	-	0.002103	-	-	-	-	0.825751142	-	0.068781879	-	0.002103	0.120521	3.870146	221.7430452	11	1.536	-1.022523197	-1.14592	23.591426	0.2359143	0.349461061	0.5853753	-0.042939	-	0.2	1.4	1.2	0.092538	-	18.44	15.46
631	15.41	18.39	41.08	-	0.002065	-	-	-	-	0.824199401	-	0.066548781	-	0.002065	0.118327	3.872250	221.8635663	11	1.508	-1.00645874	-1.123153	23.166231	0.2316623	0.35371301	0.5853753	-0.038687	-	0.2	1.4	1.2	0.092538	-	18.39	15.41
632	15.36	18.35	41.14	-	0.002027	-	-	-	-	0.822672367	-	0.064320647	-	0.002027	0.116127	3.874315	221.9818928	11	1.480	-0.990217351	-1.100447	22.740035	0.2274003	0.357974972	0.5853753	-0.034425	-	0.2	1.4	1.2	0.092538	-	18.35	15.36
633	15.31	18.31	41.21	-	0.001988	-	-	-	-	0.821170308	-	0.062097433	-	0.001988	0.113922	3.876342	222.0980196	11	1.453	-0.973802344	-1.077803	22.312857	0.2231286	0.362246747	0.5853753	-0.030153	-	0.2	1.4	1.2	0.092538	-	18.31	15.31
634	15.26	18.26	41.27	-	0.001950	-	-	-	-	0.819693487	-	0.05987909	-	0.001950	0.111713	3.878330	222.2119419	11	1.425	-0.957217043	-1.055221	21.884719	0.2188472	0.366528136	0.5853753	-0.025872	-	0.2	1.4	1.2	0.092538	-	18.26	15.26
635	15.21	18.22	41.34	-	0.001911	-	-	-	-	0.818242162	-	0.057665566	-	0.001911	0.109498	3.880280	222.3236546	11	1.397	-0.940464777	-1.0327	21.455638	0.2145564	0.370818938	0.5853753	-0.021581	-	0.3	1.4	1.2	0.092538	-	18.22	15.21
636	15.17	18.18	41.40	-	0.001872	-	-	-	-	0.816816587	-	0.055456801	-	0.001872	0.107279	3.882191	222.433153	11	1.369	-0.923548883	-1.010241	21.025637	0.2102564	0.375118954	0.5853753	-0.017281	-	0.3	1.4	1.2	0.092538	-	18.18	15.17
637	15.12	18.13	41.47	-	0.001834	-	-	-	-	0.815417008	-	0.053252734	-	0.001834	0.105056	3.884063	222.5404323	11	1.341	-0.906472703	-0.987841	20.594734	0.2059473	0.379427986	0.5853753	-0.012972	-	0.3	1.4	1.2	0.092538	-	18.13	15.12
638	15.07	18.09	41.53	-	0.001795	-	-	-	-	0.814043669	-	0.051053297	-	0.001795	0.102828	3.885897	222.645488	11	1.313	-0.889239586	-0.965501	20.162949	0.2016295	0.383745836	0.5853753	-0.008654	-	0.3	1.4	1.2	0.092538	-	18.09	15.07
639	15.02	18.04	41.60	-	0.001756	-	-	-	-	0.812696807	-	0.048858417	-	0.001756	0.100595	3.887692	222.7483155	11	1.284	-0.871852884	-0.943221	19.730302	0.197303	0.388072307	0.5853753	-0.004328	-	0.3	1.4	1.2	0.092538	-	18.04	15.02
640	14.97	18.00	41.66	-	-	-	-	-	-	0.811376653	-	0.046668018	-	-	0	3.889447	222.8489106	11	1.256	-0.854315954	-0.920999	19.296812	0.1929681	0.392407201	0.5853753	7.201E-06	-	0.3	1.4	1.2	0.092538	-	18.00	14.97
641	14.93	17.96	41.73	-	-	-	-	-	-	0.811376653	-	0.044554984	-	-	0	3.889447	222.8489106	11	1.228	-0.835087919	-0.90027	18.8625	0.188625	0.396750322	0.5853753	0.0043503	-	0.3	1.4	1.2	0.092538	-	17.96	14.93
642	14.88	17.91	41.79	-	-	-	-	-	-	0.811376653	-	0.042441949	-	-	0	3.889447	222.8489106	11	1.200	-0.815859884	-0.879541	18.428188	0.1842819	0.401093443	0.5853753	0.0086934	-	0.3	1.4	1.2	0.092538	-	17.91	14.88
643	14.83	17.87	41.86	-	-	-	-	-	-	0.811376653	-	0.040328915	-	-	0	3.889447	222.8489106	11	1.171	-0.796631849	-0.858812	17.993876	0.1799388	0.405436565	0.5853753	0.0130366	-	0.3	1.4	1.2	0.092538	-	17.87	14.83
644	14.78	17.82	41.92	-	-	-	-	-	-	0.811376653	-	0.038215881	-	-	0	3.889447	222.8489106	11	1.143	-0.777403814	-0.838084	17.559564	0.1755956	0.409779686	0.5853753	0.0173797	-	0.3	1.4	1.2	0.092538	-	17.82	14.78
645	14.73	17.78	41.99	-	-	-	-	-	-	0.811376653	-	0.036102847	-	-	0	3.889447	222.8489106	11	1.115	-0.758175779	-0.817355	17.125251	0.1712525	0.414122807	0.5853753	0.0217228	-	0.3	1.4	1.2	0.092538	-	17.78	14.73
646	14.69	17.73	42.05	-	-	-	-	-	-	0.811376653	-	0.033989812	-	-	0	3.889447	222.8489106	11	1.087	-0.738947744	-0.796626	16.690939	0.1669094	0.418465929	0.5853753	0.0260659	-	0.3	1.4	1.2	0.092538	-	17.73	14.69
647	14.64	17.69	42.12	-	-	-	-	-	-	0.811376653	-	0.031876778	-	-	0	3.889447	222.8489106	11	1.058	-0.719719709	-0.775897	16.256627	0.1625663	0.42280905	0.5853753	0.030409	-	0.3	1.4	1.2	0.092538	-	17.69	14.64
648	14.59	17.65	42.18	-	-	-	-	-	-	0.811376653	-	0.029763744	-	-	0	3.889447	222.8489106	11	1.030	-0.700491674	-0.755168	15.822315	0.1582232	0.427152171	0.5853753	0.0347522	-	0.3	1.4	1.2	0.092538	-	17.65	14.59
649	14.54	17.60	42.25	-	-	-	-	-	-	0.811376653	-	0.02765071	-	-	0	3.889447	222.8489106	11	1.002	-0.681263639	-0.734439	15.388003	0.15388	0.431495292	0.5853753	0.0390953	-	0.3	1.4	1.2	0.092538	-	17.60	14.54
650	14.50	17.56	42.32	-	-	-	-	-	-	0.811376653	-	0.025537675	-	-	0	3.889447	222.8489106	11	0.973	-0.662035604	-0.71371	14.953691	0.1495369	0.435838414	0.5853753	0.0434384	-	0.3	1.4	1.2	0.092538	-	17.56	14.50
651	14.45	17.51	42.38	-	-	-	-	-	-	0.811376653	-	0.023424641	-	-	0	3.889447	222.8489106	11	0.945	-0.642807569	-0.692981	14.519379	0.1451938	0.440181535	0.5853753	0.0477815	-	0.3	1.4	1.2	0.092538	-	17.51	14.45
652	14.40	17.47	42.45	-	-	-	-	-	-	0.811376653	-	0.021311607	-	-	0	3.889447	222.8489106	11	0.917	-0.623579533	-0.672253	14.085067	0.1408507	0.444524656	0.5853753	0.0521247	-	0.3	1.4	1.2	0.092538	-	17.47	14.40
653	14.35	17.42	42.51	-	-	-	-	-	-	0.811376653	-	0.019198573	-	-	0	3.889447	222.8489106	11	0.889	-0.604351498	-0.651524	13.650754	0.1365075	0.448867777	0.5853753	0.0564678	-	0.3	1.4	1.2	0.092538	-	17.42	14.35
654	14.31	17.38	42.58	-	-	-	-	-	-	0.811376653	-	0.017085539	-	-	0	3.889447	222.8489106	11	0.860	-0.585123463	-0.630795	13.216442	0.1321644	0.453210899	0.5853753	0.0608109	-	0.3	1.4	1.2	0.092538	-	17.38	14.31
655	14.26	17.34	42.64	-	-	-	-	-	-	0.811376653	-	0.014972504	-	-	0	3.889447	222.8489106	11	0.832	-0.565895428	-0.610066	12.78213	0.1278213	0.45755402	0.5853753	0.065154	-	0.3	1.4	1.2	0.092538	-	17.34	14.26

656	14.21	17.29	42.71	-	-	-	-	-	-	0.811376653	-	0.01285947	-	-	-	-	0	3.889447	222.8489106	11	0.804	-0.546667393	-0.589337	12.347818	0.1234782	0.461897141	0.5853753	0.0694971	-	0.3	1.4	1.2	0.092538	-	17.29	14.21
657	14.16	17.25	42.77	-	-	-	-	-	-	0.811376653	-	0.010746436	-	-	-	-	0	3.889447	222.8489106	11	0.776	-0.527439358	-0.568608	11.913506	0.1191351	0.466240263	0.5853753	0.0738403	-	0.3	1.4	1.2	0.092538	-	17.25	14.16
658	14.11	17.20	42.84	-	-	-	-	-	-	0.811376653	-	0.008633402	-	-	-	-	0	3.889447	222.8489106	11	0.747	-0.508211323	-0.547879	11.479194	0.1147919	0.470583384	0.5853753	0.0781834	-	0.3	1.4	1.2	0.092538	-	17.20	14.11
659	14.07	17.16	42.90	-	-	-	-	-	-	0.811376653	-	0.006520367	-	-	-	-	0	3.889447	222.8489106	11	0.719	-0.488983288	-0.527151	11.044882	0.1104488	0.474926505	0.5853753	0.0825265	-	0.3	1.4	1.2	0.092538	-	17.16	14.07
660	14.02	17.11	42.97	-	-	-	-	-	-	0.811376653	-	0.004407333	-	-	-	-	0	3.889447	222.8489106	11	0.691	-0.469755253	-0.506422	10.61057	0.1061057	0.479269626	0.5853753	0.0868696	-	0.3	1.4	1.2	0.092538	-	17.11	14.02
661	13.97	17.07	43.03	-	-	-	-	-	-	0.811376653	-	0.002294299	-	-	-	-	0	3.889447	222.8489106	11	0.662	-0.450527218	-0.485693	10.176257	0.1017626	0.483612748	0.5853753	0.0912127	-	0.3	1.4	1.2	0.092538	-	17.07	13.97
662	13.92	17.03	43.10	-	-	-	-	-	-	0.811376653	-	0.000181265	-	-	-	-	0	3.889447	222.8489106	11	0.634	-0.431299183	-0.464964	9.7419453	0.0974195	0.487955869	0.5853753	0.0955559	-	0.3	1.4	1.2	0.092538	-	17.03	13.92
663	13.88	16.98	43.16	0.000854	-	-	-	-	-	0.809444884	-	0	-	0.000854	-	0.000854	0.04891	3.889447	222.8489106	11	0.618	-0.420035707	-0.452821	9.4875322	0.0948753	0.49229899	0.5871743	0.099899	0.0	0.3	1.4	1.2	0.092538	-	16.98	13.88
664	13.83	16.94	43.23	0.000854	-	-	-	-	-	0.806691318	-	0	-	0.000854	-	0.000854	0.04891	3.890301	222.8978201	11	0.618	-0.420422097	-0.452463	9.4875322	0.0948753	0.496642111	0.5915174	0.1042421	0.0	0.3	1.4	1.2	0.092538	-	16.94	13.83
665	13.78	16.89	43.29	0.000854	-	-	-	-	-	0.803938575	-	0	-	0.000854	-	0.000854	0.04891	3.891154	222.9467296	11	0.618	-0.42080818	-0.452104	9.4875322	0.0948753	0.500989228	0.5958645	0.1085892	0.0	0.3	1.4	1.2	0.092538	-	16.89	13.78
666	13.73	16.85	43.36	0.000854	-	-	-	-	-	0.801186666	-	0	-	0.000854	-	0.000854	0.04891	3.892008	222.9956391	11	0.618	-0.421193957	-0.451744	9.4875322	0.0948753	0.505340336	0.6002157	0.1129403	0.0	0.3	1.4	1.2	0.092538	-	16.85	13.73
667	13.69	16.80	43.42	0.000854	-	-	-	-	-	0.798435603	-	0	-	0.000854	-	0.000854	0.04891	3.892862	223.0445486	11	0.618	-0.421579427	-0.451384	9.4875322	0.0948753	0.509695434	0.6045708	0.1172954	0.0	0.3	1.4	1.2	0.092538	-	16.80	13.69
668	13.64	16.76	43.49	0.000854	-	-	-	-	-	0.795685397	-	0	-	0.000854	-	0.000854	0.04891	3.893715	223.0934581	11	0.618	-0.421964589	-0.451024	9.4875322	0.0948753	0.514054517	0.6089298	0.1216545	0.0	0.3	1.4	1.2	0.092538	-	16.76	13.64
669	13.59	16.72	43.55	0.000854	-	-	-	-	-	0.792936059	-	0	-	0.000854	-	0.000854	0.04891	3.894569	223.1423676	11	0.618	-0.422349444	-0.450664	9.4875322	0.0948753	0.518417583	0.6132929	0.1260176	0.0	0.3	1.4	1.2	0.092538	-	16.72	13.59
670	13.54	16.67	43.62	0.000854	-	-	-	-	-	0.790187601	-	0	-	0.000854	-	0.000854	0.04891	3.895423	223.1912772	11	0.618	-0.422733992	-0.450303	9.4875322	0.0948753	0.522784628	0.6176599	0.1303846	0.0	0.3	1.4	1.2	0.092538	-	16.67	13.54
671	13.50	16.63	43.68	0.000854	-	-	-	-	-	0.787440033	-	0	-	0.000854	-	0.000854	0.04891	3.896276	223.2401867	11	0.618	-0.423118231	-0.449942	9.4875322	0.0948753	0.527155649	0.622031	0.1347556	0.0	0.3	1.4	1.2	0.092538	-	16.63	13.50
672	13.45	16.58	43.75	0.000854	-	-	-	-	-	0.784693367	-	0	-	0.000854	-	0.000854	0.04891	3.897130	223.2890962	11	0.618	-0.423502162	-0.449581	9.4875322	0.0948753	0.531530643	0.626406	0.1391306	0.0	0.3	1.4	1.2	0.092538	-	16.58	13.45
673	13.40	16.54	43.81	0.000854	-	-	-	-	-	0.781947614	-	0	-	0.000854	-	0.000854	0.04891	3.897984	223.3380057	11	0.618	-0.423885784	-0.449219	9.4875322	0.0948753	0.535909607	0.6307849	0.1435096	0.0	0.3	1.4	1.2	0.092538	-	16.54	13.40
674	13.35	16.49	43.88	0.000854	-	-	-	-	-	0.779202786	-	0	-	0.000854	-	0.000854	0.04891	3.898837	223.3869152	11	0.618	-0.424269098	-0.448857	9.4875322	0.0948753	0.540292538	0.6351679	0.1478925	0.0	0.3	1.4	1.2	0.092538	-	16.49	13.35
675	13.31	16.45	43.94	0.000854	-	-	-	-	-	0.776458893	-	0	-	0.000854	-	0.000854	0.04891	3.899691	223.4358247	11	0.618	-0.424652102	-0.448495	9.4875322	0.0948753	0.544679432	0.6395548	0.1522794	0.0	0.3	1.4	1.2	0.092538	-	16.45	13.31
676	13.26	16.40	44.01	0.000854	-	-	-	-	-	0.773715948	-	0	-	0.000854	-	0.000854	0.04891	3.900544	223.4847342	11	0.618	-0.425034797	-0.448132	9.4875322	0.0948753	0.549070286	0.6439456	0.1566703	0.0	0.3	1.4	1.2	0.092538	-	16.40	13.26
677	13.21	16.36	44.07	0.000854	-	-	-	-	-	0.77097396	-	0	-	0.000854	-	0.000854	0.04891	3.901398	223.5336437	11	0.618	-0.425417182	-0.447769	9.4875322	0.0948753	0.553465098	0.6483404	0.1610651	0.0	0.3	1.4	1.2	0.092538	-	16.36	13.21
678	13.16	16.31	44.14	0.000854	-	-	-	-	-	0.768232942	-	0	-	0.000854	-	0.000854	0.04891	3.902252	223.5825533	11	0.618	-0.425799257	-0.447406	9.4875322	0.0948753	0.557863863	0.6527392	0.1654639	0.0	0.3	1.4	1.2	0.092538	-	16.31	13.16
679	13.12	16.27	44.20	0.000854	-	-	-	-	-	0.765492904	-	0	-	0.000854	-	0.000854	0.04891	3.903105	223.6314628	11	0.618	-0.426181022	-0.447042	9.4875322	0.0948753	0.562266578	0.6571419	0.1698666	0.0	0.3	1.4	1.2	0.092538	-	16.27	13.12
680	13.07	16.22	44.27	0.000854	-	-	-	-	-	0.762753859	-	0	-	0.000854	-	0.000854	0.04891	3.903959	223.6803723	11	0.618	-0.426562477	-0.446678	9.4875322	0.0948753	0.566673241	0.6615486	0.1742732	0.0	0.3	1.4	1.2	0.092538	-	16.22	13.07
681	13.02	16.18	44.33	0.000854	-	-	-	-	-	0.760015816	-	0	-	0.000854	-	0.000854	0.04891	3.904813	223.7292818	11	0.618	-0.42694362	-0.446314	9.4875322	0.0948753	0.571083849	0.6659592	0.1786838	0.0	0.3	1.4	1.2	0.092538	-	16.18	13.02
682	12.98	16.13	44.40	0.000854	-	-	-	-	-	0.757278788	-	0	-	0.000854	-	0.000854	0.04891	3.905666	223.7781913	11	0.618	-0.427324453	-0.445949	9.4875322	0.0948753	0.575498397	0.6703737	0.1830984	0.0	0.3	1.4	1.2	0.092538	-	16.13	12.98
683	12.93	16.09	44.46	0.000854	-	-	-	-	-	0.754542786	-	0	-	0.000854	-	0.000854	0.04891	3.906520	223.8271008	11	0.618	-0.427704974	-0.445585	9.4875322	0.0948753	0.579916883	0.6747922	0.1875169	0.0	0.3	1.4	1.2	0.092538	-	16.09	12.93
684	12.88	16.04	44.53	0.000854	-	-	-	-	-	0.751807821	-	0	-	0.000854	-	0.000854	0.04891	3.907373	223.8760103	11	0.618	-0.428085183	-0.445219	9.4875322	0.0948753	0.584339304	0.6792146	0.1919393	0.0	0.3	1.4	1.2	0.092538	-	16.04	12.88
685	12.83	16.00	44.59	0.000854	-	-	-	-	-	0.749073903	-	0	-	0.000854	-	0.000854	0.04891	3.908227	223.9249199	11	0.618	-0.42846508	-0.444854	9.4875322	0.0948753	0.588765656	0.683641	0.1963657	0.0	0.3	1.4	1.2	0.092538	-	16.00	12.83
686	12.79	15.95	44.66	0.000854	-	-	-	-	-	0.746341046	-	0	-	0.000854	-	0.000854	0.04891	3.909081	223.9738294	11	0.618	-0.428844666	-0.444488	9.4875322	0.0948753	0.593195936	0.6880713	0.2007959	0.0	0.3	1.4	1.2	0.092538	-	15.95	12.79
687	12.74	15.91	44.72	0.000854	-	-	-	-	-	0.743609258	-	0	-	0.000854	-	0.000854	0.04891	3.909934	224.0227389	11	0.618	-0.429223938	-0.444122	9.4875322	0.0948753	0.597630141	0.6925055	0.2052301	0.0	0.3	1.4	1.2	0.092538	-	15.91	12.74
688	12.69	15.86	44.79	0.000854	-	-	-	-	-	0.740878553	-	0	-	0.000854	-	0.000854	0.04891	3.910788	224.0716484	11	0.618	-0.429602898	-0.443755	9.4875322	0.0948753	0.602068267	0.6969436	0.2096683	0.0	0.3	1.4	1.2	0.092538	-	15.86	12.69
689	12.65	15.82	44.85	0.000854	-	-	-	-	-	0.738148941	-	0	-	0.000854	-	0.000854	0.04891	3.911642	224.1205579	11	0.618	-0.429981545	-0.443388	9.4875322	0.0948753	0.606510312	0.7013856	0.2141103	0.0	0.3	1.4	1.2	0.092538	-	15.82	12.65
690	12.60	15.77	44.92	0.000854	-	-	-	-	-	0.735420433	-	0	-	0.000854	-	0.000854	0.04891	3.912495	224.1694674	11	0.618	-0.430359879	-0.443021	9.4875322	0.0948753	0.610956272	0.7058316	0.2185563	0.0	0.3	1.4	1.2	0.092538	-	15.77	12.60
691	12.55	15.73	44.98	0.000854	-	-	-	-	-	0.732693041	-	0	-	0.000854	-	0.000854	0.04891	3.913349	224.2183769	11	0.618	-0.430737899	-0.442653	9.4875322	0.0948753	0.615406144	0.7102815	0.2230061	0.0	0.3	1.4	1.2	0.092538	-	15.73	12.55
692	12.51	15.68	45.05	0.000854	-	-	-	-	-	0.729966776	-	0	-	0.000854	-	0.000854	0.04891	3.914203	224.2672865	11	0.618	-0.431115605	-0.442285	9.4875322	0.0948753	0.619859925	0.7147352	0.2274599	0.0	0.3	1.4	1.2	0.092538	-	15.68	12.51
693	12.46	15.64	45.11	0.000854	-	-	-	-	-	0.727241649	-	0	-	0.000854	-	0.000854	0.04891	3.915056	224.316196	11	0.618	-0.431492997	-0.441917	9.4875322	0.0948753	0.624317611	0.7191929	0.2319176	0.0	0.3	1.4	1.2	0.092538	-	15.64	12.46
694	12.41	15.59	45.18	0.000854	-	-	-	-	-	0.724517672	-	0	-	0.000854	-	0.000854	0.04891	3.915910	224.3651055	11	0.618	-0.431870074	-0.441549	9.4875322	0.0948753	0.628779199	0.7236545	0.2363792	0.0	0.3	1.4	1.2	0.092538	-	15.59	12.41
695	12.37	15.54	45.24	0.000854	-	-	-	-	-	0.721794855	-	0	-	0.000854	-	0.000854	0.04891	3.916763	224.414015	11	0.618	-0.432246837	-0.44118	9.4875322	0.0948753	0.633244687	0.72812	0.2408447	0.0	0.3	1.4	1.2	0.092538	-	15.54	12.37
696	12.32	15.50	45.31	0.000854	-	-	-	-	-	0.71907321	-	0	-	0.000854	-	0.000854	0.04891	3.917617	224.4629245	11	0.618	-0.432623285	-0.440811	9.4875322	0.0948753	0.63771407	0.7325894	0.2453141	0.0	0.3	1.4	1.2	0.092538	-	15.50	12.32
697	12.27	15.45	45.37	0.000854	-	-	-	-	-	0.716352748	-	0	-	0.000854	-	0.000854	0.04891	3.918471	224.511834	11	0.618	-0.432999418	-0.440441	9.4875322	0.0948753	0.642187345	0.7370627	0.2497873	0.0	0.3	1.4	1.2	0.092538	-	15.45	12.27
698	12.23	15.41	45.44	0.000854	-	-	-	-	-	0.71363348	-	0	-	0.000854	-	0.000854	0.04891	3.919324	224.5607435	11	0.618	-0.433375235	-0.440072	9.4875322	0.0948753	0.64666451	0.7415398	0.2542645	0.0	0.3	1.4	1.2	0.092538	-	15.41	12.23
699	12.18	15.36	45.50	0.000854	-	-	-	-	-	0.710915418	-	0	-	0.000854	-	0.000854	0.04891	3.920178	224.609653	11	0.618	-0.433750736	-0.439702	9.4875322	0.0948753	0.65114556	0.7460209	0.2587456	0.0	0.3	1.4	1.2	0.092538	-	15.36	12.18
700	12.14	15.32	45.57	0.000854	-	-	-	-	-	0.708198573	-	0	-	0.000854	-	0.000854	0.04891	3.921032	224.6585626	11	0.618	-0.434125921	-0.439331	9.4875322	0.0948753	0.655630493	0.7505058	0.2632305	0.0	0.3	1.4	1.2	0.092538	-	15.32	12.14
701	12.09	15.27	45.64	0.000854	-	-	-	-	-	0.705482957	-	0	-	0.000854	-	0.000854	0.04891	3.921885	224.7074721	11	0.618	-0.43450079	-0.43896	9.4875322	0.0948753	0.660119306	0.7549946	0.2677193	0.0	0.3	1.4	1.2	0.092538	-	15.27	12.09
702	12.04	15.23	45.70	0.000854	-	-	-	-	-	0.702768579	-	0	-	0.000854	-	0.000854	0.04891	3.922739	224.7563816	11	0.618	-0.434875342	-0.438589	9.4875322	0.0948753	0.664611994	0.7594873	0.272212	0.0	0.3	1.4	1.2	0.092538	-	15.23	12.04
703	12.00	15.18	45.77	0.000854	-	-	-	-	-	0.700055452	-	0	-	0.000854	-	0.000854	0.04891	3.923593	224.8052911	11	0.618	-0.435249578	-0.438218	9.4875322	0.0948753	0.669108556	0.7639839	0.2767086	0.0	0.3	1.4	1.2	0.092538	-	15.18	12.00
704	11.95	15.13	45.83	0.000854	-	-	-	-	-	0.697343587	-	0	-	0.000854	-	0.000854	0.04891	3.924446	224.8542006	11	0.618	-0.435623496	-0.437846	9.4875322	0.0948753	0.673608987	0.7684843	0.281209	0.0	0.3	1.4	1.2	0.092538	-	15.13	11.95
705	11.90	15.09	45.90	0.000854	-	-	-	-	-	0.694632995	-	0	-	0.000854	-	0.000854	0.04891	3.925300	224.9031101	11	0.618	-0.435997097	-0.437474	9.4875322	0.0948753	0.678113284	0.7729886	0.2857133	0.0	0.3	1.4	1.2	0.092538	-	15.09	11.90
706	11.86	15.04	45.96	0.000854	-	-	-	-	-	0.691923688	-	0	-	0.000854	-	0.000854	0.04891	3.926153	224.9520196	11	0.618	-0.43637038	-0.437102	9.4875322	0.0948753	0.682621444	0.7774968	0.2902214	0.0	0.3	1.4	1.2	0.092538	-	15.04	11.86
707	11.81	15.00	46.03	0.000854	-	-	-	-	-	0.689215675	-	0	-	0.000854	-	0.000854	0.04891	3.927007	225.0009292	11	0.618	-0.436743345	-0.436729	9.4875322	0.0948753	0.687133464	0.7820088	0.2947335	0.0	0.3	1.4	1.2	0.092538	-	15.00	11.81
708	11.77	14.95	46.09	0.000854	-	-	-	-	-	0.68650897	-	0	-	0.000854	-	0.000854	0.04891	3.927861	225.0498387	11	0.618	-0.437115992	-0.436356	9.4875322	0.0948753	0.69164934	0.7865247	0.2992493	0.0	0.3	1.4	1.2	0.092538	-	14.95	11.77
709	11.72	14.90	46.16	0.000854	-	-	-	-	-	0.683803583	-	0	-	0.000854	-	0.000854	0.04891	3.928714	225.0987482	11	0.618	-0.43748832	-0.435983	9.4875322	0.0948753	0.69616907	0.7910444	0.3037691	0.0	0.3	1.4	1.2	0.092538	-	14.90	11.72
710	11.67	14.86	46.22	0.000854	-	-	-	-	-	0.681099525	-	0	-	0.000854	-	0.000854	0.04891	3.929568	225.1476577	11	0.618	-0.43786033	-0.435609	9.4875322	0.0948753	0.700692649	0.795568	0.3082926	0.0	0.3	1.4	1.2	0.092538	-	14.86	11.67
711	11.63	14.81	46.29	0.000854	-	-	-	-	-	0.678396808	-	0	-	0.000854	-	0.000854	0.04891	3.930422	225.1965672	11	0.618	-0.43823202	-0.435235	9.4875322	0.0948753	0.705220075	0.8000954	0.3128201	0.0	0.3	1.4	1.2	0.092538	-	14.81	11.63
712	11.58	14.77	46.35	0.000854	-	-	-	-	-	0.675695442	-	0	-	0.000854	-	0.000854	0.04891	3.931275	225.2454767	11	0.618	-0.438603391	-0.434861	9.4875322	0.0948753	0.709751344	0.8046267	0.3173513	0.0	0.3	1.4	1.2	0.092538	-	14.77	11.58
713	11.54	14.72	46.42	0.000854	-	-	-	-	-	0.672995439	-	0	-	0.000854	-	0.000854	0.04891	3.932129	225.2943862	11	0.618	-0.438974443	-0.434487	9.4875322	0.0948753	0.714286453	0.8091618	0.3218865	0.0	0.3	1.4	1.2	0.092538	-	14.72	11.54
714	11.49	14.67	46.48	0.000854	-	-	-	-	-	0.670296811	-	0	-	0.000854	-	0.000854	0.04891	3.932982	225.3432957	11	0.618	-0.439345174	-0.434112	9.4875322	0.0948753	0.718825399	0.8137007	0.3264254	0.0	0.3	1.4	1.2	0.092538	-	14.67	11.49
715	11.44	14.63	46.55	0.000854	-	-	-	-	-	0.667599568	-	0	-	0.000854	-	0.000854	0.04891	3.933836	225.3922053	11	0.618	-0.439715586	-0.433736	9.4875322	0.0948753	0.723368178	0.8182435	0.3309682	0.0	0.3	1.4	1.2	0.092538	-	14.63	11.44
716	11.40	14.58	46.61	0.000854	-	-	-	-	-	0.664903721	-	0	-	0.000854	-	0.000854	0.04891	3.934690	225.4411148	11	0.618	-0.440085677	-0.433361	9.4875322	0.0948753	0.727914787	0.8227901	0.3355148	0.0	0.3	1.4	1.2	0.092538	-	14.58	11.40
717	11.35	14.53	46.68	0.000854	-	-	-	-	-	0.662209283	-	0	-	0.000854	-	0.000854	0.04891	3.935543	225.4900243	11	0.618	-0.440455447	-0.432985	9.4875322	0.0948753	0.732465222	0.8273405	0.3400652	0.0	0.3	1.4	1.2	0.092538	-	14.53	11.35
718	11.31	14.49	46.74	0.000854	-	-	-	-	-	0.659516263	-	0	-	0.000854	-	0.000854	0.04891	3.936397	225.5389338	11	0.618	-0.440824897	-0.432609	9.4875322	0.0948753	0.737019481	0.8318948	0.3446195	0.0	0.3	1.4	1.2	0.092538	-	14.49	11.31
719	11.26	14.44	46.81	0.000854	-	-	-	-	-	0.656824674	-	0	-	0.000854	-	0.000854	0.04891	3.937251	225.5878433	11	0.618	-0.441194025	-0.432233	9.4875322	0.0948753	0.74157756	0.8364529	0.3491776	0.0	0.3	1.4	1.2	0.092538	-	14.44	11.26
720	11.22	14.39	46.87	0.000854	-	-	-	-	-	0.654134527	-	0	-	0.000854	-	0.000854	0.04891	3.938104	225.6367528	11	0.618	-0.441562832	-0.431856	9.4875322	0.0948753	0.746139456	0.8410148	0.3537395	0.0	0.3	1.4	1.2	0.092538	-	14.39	11.22
721	11.17	14.35	46.94	0.000854	-	-	-	-	-	0.651445832	-	0	-	0.000854	-	0.000854	0.04891	3.938958	225.6856623	11	0.618	-0.441931317	-0.431479	9.4875322	0.0948753	0.750705166	0.8455805	0.3583052	0.1	0.3	1.4	1.2	0.092538	-	14.35	11.17
722	11.13	14.30	47.00	0.000854	-	-	-	-	-	0.648758602	-	0	-	0.000854	-	0.000854	0.04891	3.939812	225.7345719	11	0.618	-0.44229948	-0.431101	9.4875322	0.0948753	0.755274685	0.85015	0.3628747	0.1	0.3	1.4	1.2	0.092538	-	14.30	11.13
723	11.08	14.25	47.07	0.000854	-	-	-	-	-	0.646072846	-	0	-	0.000854	-	0.000854	0.04891	3.940665	225.7834814	11	0.618	-0.442667321	-0.430724	9.4875322	0.0948753	0.759848011	0.8547233	0.367448	0.1	0.3	1.4	1.2	0.092538	-	14.25	11.08
724	11.03	14.21	47.13	0.000854	-	-	-	-	-	0.643388577	-	0	-	0.000854	-	0.000854	0.04891	3.941519	225.8323909	11	0.618	-0.443034839	-0.430346	9.4875322	0.0948753	0.764425141	0.8593005	0.3720251	0.1	0.3	1.4	1.2	0.092538	-	14.21	11.03
725	10.99	14.16	47.20	0.000854	-	-	-	-	-	0.640705806	-	0	-	0.000854	-	0.000854	0.04891	3.942372	225.8813004	11	0.618	-0.443402034	-0.429967	9.4875322	0.0948753	0.76900607	0.8638814	0.3766061	0.1	0.3	1.4	1.2	0.092538	-	14.16	10.99
726	10.94	14.11	47.26	0.000854	-	-	-	-	-	0.638024543	-	0	-	0.000854	-	0.000854	0.04891	3.943226	225.9302099	11	0.618	-0.443768906	-0.429589	9.4875322	0.0948753	0.773590797	0.8684661	0.3811908	0.1	0.3	1.4	1.2	0.092538	-	14.11	10.94
727	10.90	14.07	47.33	0.000854	-	-	-	-	-	0.635344801	-	0	-	0.000854	-	0.000854	0.04891	3.944080	225.9791194	11	0.618	-0.444135455	-0.42921	9.4875322	0.0948753	0.778179317	0.8730546	0.3857793	0.1	0.3	1.4	1.2	0.092538	-	14.07	10.90
728	10.85	14.02	47.39	0.000854	-	-	-	-	-	0.63266659	-	0	-	0.000854	-	0.000854	0.04891	3.944933	226.0280289	11	0.618	-0.44450168	-0.42883	9.4875322	0.0948753	0.782771626	0.8776469	0.3903716	0.1	0.3	1.4	1.2	0.092538	-	14.02	10.85
729	10.81	13.97	47.46	0.000854	-	-	-	-	-	0.629989922	-	0	-	0.000854	-	0.000854	0.04891	3.945787	226.0769385	11	0.618	-0.444867581	-0.428451	9.4875322	0.0948753	0.787367723	0.882243	0.3949677	0.1	0.3	1.4	1.2	0.092538	-	13.97	10.81
730	10.76	13.93	47.52	0.000854	-	-	-	-	-	0.627314807	-	0	-	0.000854	-	0.000854	0.04891	3.946641	226.125848	11	0.618	-0.445233158	-0.428071	9.4875322	0.0948753	0.791967603	0.8868429	0.3995676	0.1	0.3	1.4	1.2	0.092538	-	13.93	10.76
731	10.72	13.88	47.59	0.000854	-	-	-	-	-	0.624641257	-	0	-	0.000854	-	0.000854	0.04891	3.947494	226.1747575	11	0.618	-0.445598411	-0.427691	9.4875322	0.0948753	0.796571263	0.8914466	0.4041713	0.1	0.3	1.4	1.2	0.092538	-	13.88	10.72
732	10.67	13.83	47.65	0.000854	-	-	-	-	-	0.621969284	-	0	-	0.000854	-	0.000854	0.04891	3.948348	226.223667	11	0.618	-0.445963339	-0.42731	9.4875322	0.0948753	0.8011787	0.896054	0.4087787	0.1	0.3	1.4	1.2	0.092538	-	13.83	10.67
733	10.63	13.79	47.72	0.000854	-	-	-	-	-	0.619298897	-	0	-	0.000854	-	0.000854	0.04891	3.949201	226.2725765	11	0.618	-0.446327942	-0.426929	9.4875322	0.0948753	0.80578991	0.9006652	0.4133899	0.1	0.3	1.4	1.2	0.092538	-	13.79	10.63
734	10.58	13.74	47.78	0.000854	-	-	-	-	-	0.61663011	-	0	-	0.000854	-	0.000854	0.04891	3.950055	226.321486	11	0.618	-0.44669222	-0.426548	9.4875322	0.0948753	0.81040489	0.9052802	0.4180049	0.1	0.3	1.4	1.2	0.092538	-	13.74	10.58
735	10.54	13.69	47.85	0.000854	-	-	-	-	-	0.613962932	-	0	-	0.000854	-	0.000854	0.04891	3.950909	226.3703955	11	0.618	-0.447056172	-0.426167	9.4875322	0.0948753	0.815023636	0.909899	0.4226236	0.1	0.3	1.4	1.2	0.092538	-	13.69	10.54
736	10.49	13.64	47.91	0.000854	-	-	-	-	-	0.611297375	-	0	-	0.000854	-	0.000854	0.04891	3.951762	226.419305	11	0.618	-0.447419798	-0.425785	9.4875322	0.0948753	0.819646146	0.9145215	0.4272461	0.1	0.3	1.4	1.2	0.092538	-	13.64	10.49
737	10.45	13.60	47.98	0.000854	-	-	-	-	-	0.60863345	-	0	-	0.000854	-	0.000854	0.04891	3.952616	226.4682146	11	0.618	-0.447783099	-0.425403	9.4875322	0.0948753	0.824272416	0.9191477	0.4318724	0.1	0.3	1.4	1.2	0.092538	-	13.60	10.45
738	10.40	13.55	48.04	0.000854	-	-	-	-	-	0.605971168	-	0	-	0.000854	-	0.000854	0.04891	3.953470	226.5171241	11	0.618	-0.448146073	-0.42502	9.4875322	0.0948753	0.828902442	0.9237778	0.4365024	0.1	0.3	1.4	1.2	0.092538	-	13.55	10.40
739	10.36	13.50	48.11	0.000854	-	-	-	-	-	0.603310541	-	0	-	0.000854	-	0.000854	0.04891	3.954323	226.5660336	11	0.618	-0.44850872	-0.424638	9.4875322	0.0948753	0.833536221	0.9284115	0.4411362	0.1	0.3	1.4	1.2	0.092538	-	13.50	10.36
740	10.31	13.46	48.17	0.000854	-	-	-	-	-	0.60065158	-	0	-	0.000854	-	0.000854	0.04891	3.955177	226.6149431	11	0.618	-0.448871041	-0.424255	9.4875322	0.0948753	0.83817375	0.9330491	0.4457738	0.1	0.3	1.4	1.2	0.092538	-	13.46	10.31
741	10.27	13.41	48.24	0.000854	-	-	-	-	-	0.597994295	-	0	-	0.000854	-	0.000854	0.04891	3.956031	226.6638526	11	0.618	-0.449233035	-0.423871	9.4875322	0.0948753	0.842815026	0.9376903	0.450415	0.1	0.3	1.4	1.2	0.092538	-	13.41	10.27
742	10.22	13.36	48.30	0.000854	-	-	-	-	-	0.595338699	-	0	-	0.000854	-	0.000854	0.04891	3.956884	226.7127621	11	0.618	-0.449594701	-0.423488	9.4875322	0.0948753	0.847460044	0.9423354	0.45506	0.1	0.3	1.4	1.2	0.092538	-	13.36	10.22
743	10.18	13.31	48.37	0.000854	-	-	-	-	-	0.592684802	-	0	-	0.000854	-	0.000854	0.04891	3.957738	226.7616716	11	0.618	-0.44995604	-0.423104	9.4875322	0.0948753	0.852108802	0.9469841	0.4597088	0.1	0.3	1.4	1.2	0.092538	-	13.31	10.18
744	10.14	13.27	48.43	0.000854	-	-	-	-	-	0.590032616	-	0	-	0.000854	-	0.000854	0.04891	3.958591	226.8105812	11	0.618	-0.450317051	-0.422719	9.4875322	0.0948753	0.856761296	0.9516366	0.4643613	0.1	0.3	1.4	1.2	0.092538	-	13.27	10.14
745	10.09	13.22	48.50	0.000854	-	-	-	-	-	0.587382151	-	0	-	0.000854	-	0.000854	0.04891	3.959445	226.8594907	11	0.618	-0.450677734	-0.422335	9.4875322	0.0948753	0.861417523	0.9562928	0.4690175	0.1	0.3	1.4	1.2	0.092538	-	13.22	10.09
746	10.05	13.17	48.56	0.000854	-	-	-	-	-	0.584733418	-	0	-	0.000854	-	0.000854	0.04891	3.960299	226.9084002	11	0.618	-0.451038088	-0.42195	9.4875322	0.0948753	0.866077479	0.9609528	0.4736775	0.1	0.3	1.4	1.2	0.092538	-	13.17	10.05
747	10.00	13.12	48.63	0.000854	-	-	-	-	-	0.58208643	-	0	-	0.000854	-	0.000854	0.04891	3.961152	226.9573097	11	0.618	-0.451398113	-0.421565	9.4875322	0.0948753	0.870741161	0.9656165	0.4783412	0.1	0.3	1.4	1.2	0.092538	-	13.12	10.00
748	9.96	13.08	48.69	0.000854	-	-	-	-	-	0.579441197	-	0	-	0.000854	-	0.000854	0.04891	3.962006	227.0062192	11	0.618	-0.45175781	-0.421179	9.4875322	0.0948753	0.875408566	0.9702839	0.4830086	0.1	0.3	1.4	1.2	0.092538	-	13.08	9.96
749	9.91	13.03	48.76	0.000854	-	-	-	-	-	0.576797731	-	0	-	0.000854	-	0.000854	0.04891	3.962860	227.0551287	11	0.618	-0.452117178	-0.420794	9.4875322	0.0948753	0.880079691	0.974955	0.4876797	0.1	0.3	1.4	1.2	0.092538	-	13.03	9.91
750	9.87	12.98	48.83	0.000854	-	-	-	-	-	0.574156042	-	0	-	0.000854	-	0.000854	0.04891	3.963713	227.1040382	11	0.618	-0.452476216	-0.420407	9.4875322	0.0948753	0.884754531	0.9796299	0.4923545	0.1	0.3	1.4	1.2	0.092538	-	12.98	9.87
751	9.82	12.93	48.89	0.000854	-	-	-	-	-	0.571516141	-	0	-	0.000854	-	0.000854	0.04891	3.964567	227.1529478	11	0.618	-0.452834924	-0.420021	9.4875322	0.0948753	0.889433083	0.9843084	0.4970331	0.1	0.3	1.4	1.2	0.092538	-	12.93	9.82
752	9.78	12.89	48.96	0.000854	-	-	-	-	-	0.56887804	-	0	-	0.000854	-	0.000854	0.04891	3.965420	227.2018573	11	0.618	-0.453193302	-0.419634	9.4875322	0.0948753	0.894115345	0.9889907	0.5017153	0.1	0.3	1.4	1.2	0.092538	-	12.89	9.78
753	9.74	12.84	49.02	0.000854	-	-	-	-	-	0.566241751	-	0	-	0.000854	-	0.000854	0.04891	3.966274	227.2507668	11	0.618	-0.45355135	-0.419247	9.4875322	0.0948753	0.898801312	0.9936766	0.5064013	0.1	0.3	1.4	1.2	0.092538	-	12.84	9.74
754	9.69	12.79	49.09	0.000854	-	-	-	-	-	0.563607283	-	0	-	0.000854	-	0.000854	0.04891	3.967128	227.2996763	11	0.618	-0.453909068	-0.41886	9.4875322	0.0948753	0.903490981	0.9983663	0.511091	0.1	0.3	1.4	1.2	0.092538	-	12.79	9.69
755	9.65	12.74	49.15	0.000854	-	-	-	-	-	0.560974649	-	0	-	0.000854	-	0.000854	0.04891	3.967981	227.3485858	11	0.618	-0.454266455	-0.418472	9.4875322	0.0948753	0.908184349	1.0030597	0.5157843	0.1	0.3	1.4	1.2	0.092538	-	12.74	9.65
756	9.60	12.69	49.22	0.000854	-	-	-	-	-	0.558343859	-	0	-	0.000854	-	0.000854	0.04891	3.968835	227.3974953	11	0.618	-0.454623511	-0.418084	9.4875322	0.0948753	0.912881412	1.0077567	0.5204814	0.1	0.3	1.4	1.2	0.092538	-	12.69	9.60
757	9.56	12.65	49.28	0.000854	-	-	-	-	-	0.555714925	-	0	-	0.000854	-	0.000854	0.04891	3.969689	227.4464048	11	0.618	-0.454980236	-0.417696	9.4875322	0.0948753	0.917582167	1.0124575	0.5251822	0.1	0.3	1.4	1.2	0.092538	-	12.65	9.56
758	9.52	12.60	49.35	0.000854	-	-	-	-	-	0.553087858	-	0	-	0.000854	-	0.000854	0.04891	3.970542	227.4953143	11	0.618	-0.455336629	-0.417308	9.4875322	0.0948753	0.922286611	1.0171619	0.5298866	0.1	0.3	1.4	1.2	0.092538	-	12.60	9.52
759	9.47	12.55	49.41	0.000854	-	-	-	-	-	0.550462668	-	0	-	0.000854	-	0.000854	0.04891	3.971396	227.5442239	11	0.618	-0.45569269	-0.416919	9.4875322	0.0948753	0.92699474	1.02187	0.5345947	0.1	0.3	1.4	1.2	0.092538	-	12.55	9.47
760	9.43	12.50	49.48	0.000854	-	-	-	-	-	0.547839368	-	0	-	0.000854	-	0.000854	0.04891	3.972250	227.5931334	11	0.618	-0.45604842	-0.41653	9.4875322	0.0948753	0.93170655	1.0265819	0.5393066	0.1	0.3	1.4	1.2	0.092538	-	12.50	9.43
761	9.38	12.45	49.54	0.000854	-	-	-	-	-	0.545217967	-	0	-	0.000854	-	0.000854	0.04891	3.973103	227.6420429	11	0.618	-0.456403816	-0.41614	9.4875322	0.0948753	0.936422039	1.0312974	0.544022	0.1	0.3	1.4	1.2	0.092538	-	12.45	9.38
762	9.34	12.41	49.61	0.000854	-	-	-	-	-	0.542598478	-	0	-	0.000854	-	0.000854	0.04891	3.973957	227.6909524	11	0.618	-0.45675888	-0.41575	9.4875322	0.0948753	0.941141202	1.0360165	0.5487412	0.1	0.3	1.4	1.2	0.092538	-	12.41	9.34
763	9.30	12.36	49.67	0.000854	-	-	-	-	-	0.539980912	-	0	-	0.000854	-	0.000854	0.04891	3.974810	227.7398619	11	0.618	-0.457113612	-0.41536	9.4875322	0.0948753	0.945864037	1.0407394	0.553464	0.1	0.3	1.4	1.2	0.092538	-	12.36	9.30
764	9.25	12.31	49.74	0.000854	-	-	-	-	-	0.537365279	-	0	-	0.000854	-	0.000854	0.04891	3.975664	227.7887714	11	0.618	-0.45746801	-0.41497	9.4875322	0.0948753	0.950590539	1.0454659	0.5581905	0.1	0.3	1.4	1.2	0.092538	-	12.31	9.25
765	9.21	12.26	49.80	0.000854	-	-	-	-	-	0.53475159	-	0	-	0.000854	-	0.000854	0.04891	3.976518	227.8376809	11	0.618	-0.457822075	-0.414579	9.4875322	0.0948753	0.955320706	1.050196	0.5629207	0.1	0.3	1.4	1.2	0.092538	-	12.26	9.21
766	9.16	12.21	49.87	0.000854	-	-	-	-	-	0.532139858	-	0	-	0.000854	-	0.000854	0.04891	3.977371	227.8865905	11	0.618	-0.458175806	-0.414188	9.4875322	0.0948753	0.960054534	1.0549299	0.5676545	0.1	0.3	1.4	1.2	0.092538	-	12.21	9.16
767	9.12	12.17	49.93	0.000854	-	-	-	-	-	0.529530092	-	0	-	0.000854	-	0.000854	0.04891	3.978225	227.9355	11	0.618	-0.458529204	-0.413797	9.4875322	0.0948753	0.96479202	1.0596673	0.572392	0.1	0.3	1.4	1.2	0.092538	-	12.17	9.12
768	9.08	12.12	50.00	0.000854	-	-	-	-	-	0.526922305	-	0	-	0.000854	-	0.000854	0.04891	3.979079	227.9844095	11	0.618	-0.458882267	-0.413406	9.4875322	0.0948753	0.96953316	1.0644085	0.5771332	0.1	0.3	1.4	1.2	0.092538	-	12.12	9.08
769	9.03	12.07	50.06	0.000854	-	-	-	-	-	0.524316507	-	0	-	0.000854	-	0.000854	0.04891	3.979932	228.033319	11	0.618	-0.459234996	-0.413014	9.4875322	0.0948753	0.97427795	1.0691533	0.5818779	0.1	0.3	1.4	1.2	0.092538	-	12.07	9.03
770	8.99	12.02	50.13	0.000854	-	-	-	-	-	0.521712709	-	0	-	0.000854	-	0.000854	0.04891	3.980786	228.0822285	11	0.618	-0.459587391	-0.412622	9.4875322	0.0948753	0.979026387	1.0739017	0.5866264	0.1	0.3	1.4	1.2	0.092538	-	12.02	8.99
771	8.95	11.97	50.19	0.000854	-	-	-	-	-	0.519110922	-	0	-	0.000854	-	0.000854	0.04891	3.981639	228.131138	11	0.618	-0.45993945	-0.412229	9.4875322	0.0948753	0.983778468	1.0786538	0.5913785	0.1	0.3	1.4	1.2	0.092538	-	11.97	8.95
772	8.90	11.92	50.26	0.000854	-	-	-	-	-	0.516511158	-	0	-	0.000854	-	0.000854	0.04891	3.982493	228.1800475	11	0.618	-0.460291175	-0.411836	9.4875322	0.0948753	0.98853419	1.0834095	0.5961342	0.1	0.3	1.4	1.2	0.092538	-	11.92	8.90
773	8.86	11.87	50.32	0.000854	-	-	-	-	-	0.513913428	-	0	-	0.000854	-	0.000854	0.04891	3.983347	228.228957	11	0.618	-0.460642564	-0.411443	9.4875322	0.0948753	0.993293548	1.0881689	0.6008935	0.1	0.3	1.4	1.2	0.092538	-	11.87	8.86
774	8.82	11.83	50.39	0.000854	-	-	-	-	-	0.511317742	-	0	-	0.000854	-	0.000854	0.04891	3.984200	228.2778666	11	0.618	-0.460993617	-0.41105	9.4875322	0.0948753	0.99805654	1.0929319	0.6056565	0.1	0.3	1.4	1.2	0.092538	-	11.83	8.82
775	8.77	11.78	50.45	0.000854	-	-	-	-	-	0.508724112	-	0	-	0.000854	-	0.000854	0.04891	3.985054	228.3267761	11	0.618	-0.461344334	-0.410656	9.4875322	0.0948753	1.002823161	1.0976985	0.6104232	0.1	0.3	1.4	1.2	0.092538	-	11.78	8.77
776	8.73	11.73	50.52	0.000854	-	-	-	-	-	0.506132549	-	0	-	0.000854	-	0.000854	0.04891	3.985908	228.3756856	11	0.618	-0.461694715	-0.410262	9.4875322	0.0948753	1.007593409	1.1024687	0.6151934	0.1	0.3	1.4	1.2	0.092538	-	11.73	8.73
777	8.69	11.68	50.58	0.000854	-	-	-	-	-	0.503543064	-	0	-	0.000854	-	0.000854	0.04891	3.986761	228.4245951	11	0.618	-0.46204476	-0.409868	9.4875322	0.0948753	1.01236728	1.1072426	0.6199673	0.1	0.3	1.4	1.2	0.092538	-	11.68	8.69
778	8.64	11.63	50.65	0.000854	-	-	-	-	-	0.500955668	-	0	-	0.000854	-	0.000854	0.04891	3.987615	228.4735046	11	0.618	-0.462394468	-0.409473	9.4875322	0.0948753	1.01714477	1.11202	0.6247448	0.1	0.3	1.4	1.2	0.092538	-	11.63	8.64
779	8.60	11.58	50.71	0.000854	-	-	-	-	-	0.498370372	-	0	-	0.000854	-	0.000854	0.04891	3.988469	228.5224141	11	0.618	-0.462743839	-0.409079	9.4875322	0.0948753	1.021925876	1.1168012	0.6295259	0.1	0.3	1.4	1.2	0.092538	-	11.58	8.60
780	8.56	11.53	50.78	0.000854	-	-	-	-	-	0.495787187	-	0	-	0.000854	-	0.000854	0.04891	3.989322	228.5713236	11	0.618	-0.463092873	-0.408683	9.4875322	0.0948753	1.026710594	1.1215859	0.6343106	0.1	0.3	1.4	1.2	0.092538	-	11.53	8.56
781	8.51	11.49	50.84	0.000854	-	-	-	-	-	0.493206125	-	0	-	0.000854	-	0.000854	0.04891	3.990176	228.6202332	11	0.618	-0.46344157	-0.408288	9.4875322	0.0948753	1.031498921	1.1263742	0.6390989	0.1	0.3	1.4	1.2	0.092538	-	11.49	8.51
782	8.47	11.44	50.91	0.000854	-	-	-	-	-	0.490627196	-	0	-	0.000854	-	0.000854	0.04891	3.991029	228.6691427	11	0.618	-0.463789929	-0.407892	9.4875322	0.0948753	1.036290854	1.1311662	0.6438909	0.1	0.3	1.4	1.2	0.092538	-	11.44	8.47
783	8.43	11.39	50.97	0.000854	-	-	-	-	-	0.488050412	-	0	-	0.000854	-	0.000854	0.04891	3.991883	228.7180522	11	0.618	-0.464137949	-0.407496	9.4875322	0.0948753	1.041086389	1.1359617	0.6486864	0.1	0.3	1.4	1.2	0.092538	-	11.39	8.43
784	8.38	11.34	51.04	0.000854	-	-	-	-	-	0.485475783	-	0	-	0.000854	-	0.000854	0.04891	3.992737	228.7669617	11	0.618	-0.464485632	-0.4071	9.4875322	0.0948753	1.045885523	1.1407608	0.6534855	0.1	0.3	1.4	1.2	0.092538	-	11.34	8.38
785	8.34	11.29	51.10	0.000854	-	-	-	-	-	0.482903321	-	0	-	0.000854	-	0.000854	0.04891	3.993590	228.8158712	11	0.618	-0.464832976	-0.406703	9.4875322	0.0948753	1.050688251	1.1455636	0.6582883	0.1	0.3	1.4	1.2	0.092538	-	11.29	8.34
786	8.30	11.24	51.17	0.000854	-	-	-	-	-	0.480333036	-	0	-	0.000854	-	0.000854	0.04891	3.994444	228.8647807	11	0.618	-0.465179982	-0.406306	9.4875322	0.0948753	1.055494571	1.1503699	0.6630946	0.1	0.3	1.4	1.2	0.092538	-	11.24	8.30
787	8.26	11.19	51.23	0.000854	-	-	-	-	-	0.47776494	-	0	-	0.000854	-	0.000854	0.04891	3.995298	228.9136902	11	0.618	-0.465526648	-0.405909	9.4875322	0.0948753	1.060304479	1.1551798	0.6679045	0.1	0.3	1.4	1.2	0.092538	-	11.19	8.26

788	8.21	11.14	51.30	0.000854	-	-	-	-	-	0.475199044	-	0	-	0.000854	0.04891	3.996151	228.9625998	11	0.618	-0.465872975	-0.405511	9.4875322	0.0948753	1.065117971	1.1599933	0.672718	0.1	0.3	1.4	1.2	0.092538	-	11.14	8.21
789	8.17	11.09	51.36	0.000854	-	-	-	-	-	0.472635358	-	0	-	0.000854	0.04891	3.997005	229.0115093	11	0.618	-0.466218963	-0.405114	9.4875322	0.0948753	1.069935045	1.1648104	0.677535	0.1	0.3	1.4	1.2	0.092538	-	11.09	8.17
790	8.13	11.04	51.43	0.000854	-	-	-	-	-	0.470073895	-	0	-	0.000854	0.04891	3.997858	229.0604188	11	0.618	-0.466564611	-0.404715	9.4875322	0.0948753	1.074755696	1.169631	0.6823557	0.1	0.3	1.4	1.2	0.092538	-	11.04	8.13
791	8.09	11.00	51.49	0.000854	-	-	-	-	-	0.467514664	-	0	-	0.000854	0.04891	3.998712	229.1093283	11	0.618	-0.466909919	-0.404317	9.4875322	0.0948753	1.07957992	1.1744552	0.6871799	0.1	0.3	1.4	1.2	0.092538	-	11.00	8.09
792	8.04	10.95	51.56	0.000854	-	-	-	-	-	0.464957677	-	0	-	0.000854	0.04891	3.999566	229.1582378	11	0.618	-0.467254887	-0.403918	9.4875322	0.0948753	1.084407716	1.179283	0.6920077	0.1	0.3	1.4	1.2	0.092538	-	10.95	8.04
793	8.00	10.90	51.62	0.000854	-	-	-	-	-	0.462402945	-	0	-	0.000854	0.04891	4.000419	229.2071473	11	0.618	-0.467599514	-0.403519	9.4875322	0.0948753	1.089239078	1.1841144	0.6968391	0.1	0.3	1.4	1.2	0.092538	-	10.90	8.00
794	7.96	10.85	51.69	0.000854	-	-	-	-	-	0.459850479	-	0	-	0.000854	0.04891	4.001273	229.2560568	11	0.618	-0.467943801	-0.40312	9.4875322	0.0948753	1.094074004	1.1889493	0.701674	0.1	0.3	1.4	1.2	0.092538	-	10.85	7.96
795	7.92	10.80	51.75	0.000854	-	-	-	-	-	0.45730029	-	0	-	0.000854	0.04891	4.002127	229.3049664	11	0.618	-0.468287746	-0.40272	9.4875322	0.0948753	1.098912489	1.1937878	0.7065125	0.1	0.3	1.4	1.2	0.092538	-	10.80	7.92
796	7.87	10.75	51.82	0.000854	-	-	-	-	-	0.454752389	-	0	-	0.000854	0.04891	4.002980	229.3538759	11	0.618	-0.468631351	-0.40232	9.4875322	0.0948753	1.103754531	1.1986299	0.7113545	0.1	0.3	1.4	1.2	0.092538	-	10.75	7.87
797	7.83	10.70	51.88	0.000854	-	-	-	-	-	0.452206787	-	0	-	0.000854	0.04891	4.003834	229.4027854	11	0.618	-0.468974614	-0.40192	9.4875322	0.0948753	1.108600126	1.2034754	0.7162001	0.1	0.3	1.4	1.2	0.092538	-	10.70	7.83
798	7.79	10.65	51.95	0.000854	-	-	-	-	-	0.449663496	-	0	-	0.000854	0.04891	4.004688	229.4516949	11	0.618	-0.469317535	-0.40152	9.4875322	0.0948753	1.11344927	1.2083246	0.7210493	0.1	0.3	1.4	1.2	0.092538	-	10.65	7.79
799	7.75	10.60	52.01	0.000854	-	-	-	-	-	0.447122525	-	0	-	0.000854	0.04891	4.005541	229.5006044	11	0.618	-0.469660114	-0.401119	9.4875322	0.0948753	1.118301959	1.2131773	0.725902	0.1	0.3	1.4	1.2	0.092538	-	10.60	7.75
800	7.70	10.55	52.08	0.000854	-	-	-	-	-	0.444583886	-	0	-	0.000854	0.04891	4.006395	229.5495139	11	0.618	-0.470002351	-0.400718	9.4875322	0.0948753	1.123158191	1.2180335	0.7307582	0.1	0.3	1.4	1.2	0.092538	-	10.55	7.70
801	7.66	10.50	52.15	0.000854	-	-	-	-	-	0.44204759	-	0	-	0.000854	0.04891	4.007248	229.5984234	11	0.618	-0.470344245	-0.400317	9.4875322	0.0948753	1.128017962	1.2228933	0.735618	0.1	0.3	1.4	1.2	0.092538	-	10.50	7.66
802	7.62	10.45	52.21	0.000854	-	-	-	-	-	0.439513649	-	0	-	0.000854	0.04891	4.008102	229.6473329	11	0.618	-0.470685797	-0.399915	9.4875322	0.0948753	1.132881268	1.2277566	0.7404813	0.1	0.3	1.4	1.2	0.092538	-	10.45	7.62
803	7.58	10.40	52.28	0.000854	-	-	-	-	-	0.436982072	-	0	-	0.000854	0.04891	4.008956	229.6962425	11	0.618	-0.471027006	-0.399513	9.4875322	0.0948753	1.137748105	1.2326234	0.7453481	0.1	0.3	1.4	1.2	0.092538	-	10.40	7.58
804	7.53	10.35	52.34	0.000854	-	-	-	-	-	0.434452871	-	0	-	0.000854	0.04891	4.009809	229.745152	11	0.618	-0.471367871	-0.399111	9.4875322	0.0948753	1.142618471	1.2374938	0.7502185	0.1	0.3	1.4	1.2	0.092538	-	10.35	7.53
805	7.49	10.30	52.41	0.000854	-	-	-	-	-	0.431926058	-	0	-	0.000854	0.04891	4.010663	229.7940615	11	0.618	-0.471708393	-0.398708	9.4875322	0.0948753	1.147492361	1.2423677	0.7550924	0.1	0.3	1.4	1.2	0.092538	-	10.30	7.49
806	7.45	10.25	52.47	0.000854	-	-	-	-	-	0.429401642	-	0	-	0.000854	0.04891	4.011517	229.842971	11	0.618	-0.472048572	-0.398306	9.4875322	0.0948753	1.152369772	1.2472451	0.7599698	0.1	0.3	1.4	1.2	0.092538	-	10.25	7.45
807	7.41	10.20	52.54	0.000854	-	-	-	-	-	0.426879635	-	0	-	0.000854	0.04891	4.012370	229.8918805	11	0.618	-0.472388406	-0.397902	9.4875322	0.0948753	1.1572507	1.252126	0.7648507	0.1	0.3	1.4	1.2	0.092538	-	10.20	7.41
808	7.37	10.15	52.60	0.000854	-	-	-	-	-	0.424360049	-	0	-	0.000854	0.04891	4.013224	229.94079	11	0.618	-0.472727896	-0.397499	9.4875322	0.0948753	1.162135142	1.2570105	0.7697351	0.1	0.3	1.4	1.2	0.092538	-	10.15	7.37
809	7.32	10.10	52.67	0.000854	-	-	-	-	-	0.421842893	-	0	-	0.000854	0.04891	4.014078	229.9896995	11	0.618	-0.473067042	-0.397095	9.4875322	0.0948753	1.167023095	1.2618984	0.7746231	0.1	0.3	1.4	1.2	0.092538	-	10.10	7.32
810	7.28	10.05	52.73	0.000854	-	-	-	-	-	0.419328179	-	0	-	0.000854	0.04891	4.014931	230.0386091	11	0.618	-0.473405842	-0.396691	9.4875322	0.0948753	1.171914554	1.2667899	0.7795146	0.1	0.3	1.4	1.2	0.092538	-	10.05	7.28
811	7.24	10.00	52.80	0.000854	-	-	-	-	-	0.416815918	-	0	-	0.000854	0.04891	4.015785	230.0875186	11	0.618	-0.473744298	-0.396287	9.4875322	0.0948753	1.176809516	1.2716848	0.7844095	0.1	0.3	1.4	1.2	0.092538	-	10.00	7.24
812	7.20	9.95	52.86	0.000854	-	-	-	-	-	0.41430612	-	0	-	0.000854	0.04891	4.016638	230.1364281	11	0.618	-0.474082409	-0.395883	9.4875322	0.0948753	1.181707978	1.2765833	0.789308	0.1	0.3	1.4	1.2	0.092538	-	9.95	7.20
813	7.16	9.90	52.93	0.000854	-	-	-	-	-	0.411798797	-	0	-	0.000854	0.04891	4.017492	230.1853376	11	0.618	-0.474420174	-0.395478	9.4875322	0.0948753	1.186609936	1.2814853	0.7942099	0.1	0.3	1.4	1.2	0.092538	-	9.90	7.16
814	7.12	9.85	52.99	0.000854	-	-	-	-	-	0.40929396	-	0	-	0.000854	0.04891	4.018346	230.2342471	11	0.618	-0.474757594	-0.395073	9.4875322	0.0948753	1.191515387	1.2863907	0.7991154	0.1	0.3	1.4	1.2	0.092538	-	9.85	7.12
815	7.07	9.80	53.06	0.000854	-	-	-	-	-	0.40679162	-	0	-	0.000854	0.04891	4.019199	230.2831566	11	0.618	-0.475094668	-0.394667	9.4875322	0.0948753	1.196424326	1.2912996	0.8040243	0.1	0.3	1.4	1.2	0.092538	-	9.80	7.07
816	7.03	9.75	53.12	0.000854	-	-	-	-	-	0.404291787	-	0	-	0.000854	0.04891	4.020053	230.3320661	11	0.618	-0.475431395	-0.394261	9.4875322	0.0948753	1.201336751	1.2962121	0.8089368	0.1	0.3	1.4	1.2	0.092538	-	9.75	7.03
817	6.99	9.70	53.19	0.000854	-	-	-	-	-	0.401794472	-	0	-	0.000854	0.04891	4.020907	230.3809756	11	0.618	-0.475767776	-0.393855	9.4875322	0.0948753	1.206252657	1.301128	0.8138527	0.1	0.3	1.4	1.2	0.092538	-	9.70	6.99
818	6.95	9.65	53.25	0.000854	-	-	-	-	-	0.399299687	-	0	-	0.000854	0.04891	4.021760	230.4298852	11	0.618	-0.47610381	-0.393449	9.4875322	0.0948753	1.211172042	1.3060474	0.818772	0.1	0.3	1.4	1.2	0.092538	-	9.65	6.95
819	6.91	9.60	53.32	0.000854	-	-	-	-	-	0.396807442	-	0	-	0.000854	0.04891	4.022614	230.4787947	11	0.618	-0.476439498	-0.393043	9.4875322	0.0948753	1.216094901	1.3109702	0.8236949	0.1	0.3	1.4	1.2	0.092538	-	9.60	6.91
820	6.87	9.55	53.38	0.000854	-	-	-	-	-	0.394317748	-	0	-	0.000854	0.04891	4.023467	230.5277042	11	0.618	-0.476774838	-0.392636	9.4875322	0.0948753	1.221021231	1.3158966	0.8286212	0.1	0.3	1.4	1.2	0.092538	-	9.55	6.87
821	6.83	9.50	53.45	0.000854	-	-	-	-	-	0.391830617	-	0	-	0.000854	0.04891	4.024321	230.5766137	11	0.618	-0.47710983	-0.392229	9.4875322	0.0948753	1.225951028	1.3208263	0.833551	0.1	0.3	1.4	1.2	0.092538	-	9.50	6.83
822	6.78	9.45	53.51	0.000854	-	-	-	-	-	0.389346058	-	0	-	0.000854	0.04891	4.025175	230.6255232	11	0.618	-0.477444476	-0.391821	9.4875322	0.0948753	1.230884289	1.3257596	0.8384843	0.1	0.3	1.4	1.2	0.092538	-	9.45	6.78
823	6.74	9.40	53.58	0.000854	-	-	-	-	-	0.386864083	-	0	-	0.000854	0.04891	4.026028	230.6744327	11	0.618	-0.477778773	-0.391414	9.4875322	0.0948753	1.235821011	1.3306963	0.843421	0.1	0.3	1.4	1.2	0.092538	-	9.40	6.74
824	6.70	9.35	53.64	0.000854	-	-	-	-	-	0.384384703	-	0	-	0.000854	0.04891	4.026882	230.7233422	11	0.618	-0.478112722	-0.391006	9.4875322	0.0948753	1.240761189	1.3356365	0.8483612	0.1	0.3	1.4	1.2	0.092538	-	9.35	6.70
825	6.66	9.30	53.71	0.000854	-	-	-	-	-	0.381907929	-	0	-	0.000854	0.04891	4.027736	230.7722518	11	0.618	-0.478446322	-0.390597	9.4875322	0.0948753	1.24570482	1.3405801	0.8533048	0.1	0.3	1.4	1.2	0.092538	-	9.30	6.66
826	6.62	9.25	53.77	0.000854	-	-	-	-	-	0.379433771	-	0	-	0.000854	0.04891	4.028589	230.8211613	11	0.618	-0.478779574	-0.390189	9.4875322	0.0948753	1.2506519	1.3455272	0.8582519	0.1	0.3	1.4	1.2	0.092538	-	9.25	6.62
827	6.58	9.20	53.84	0.000854	-	-	-	-	-	0.376962241	-	0	-	0.000854	0.04891	4.029443	230.8700708	11	0.618	-0.479112478	-0.38978	9.4875322	0.0948753	1.255602426	1.3504777	0.8632024	0.1	0.3	1.4	1.2	0.092538	-	9.20	6.58
828	6.54	9.15	53.90	0.000854	-	-	-	-	-	0.374493349	-	0	-	0.000854	0.04891	4.030297	230.9189803	11	0.618	-0.479445032	-0.389371	9.4875322	0.0948753	1.260556394	1.3554317	0.8681564	0.1	0.3	1.4	1.2	0.092538	-	9.15	6.54
829	6.50	9.10	53.97	0.000854	-	-	-	-	-	0.372027107	-	0	-	0.000854	0.04891	4.031150	230.9678898	11	0.618	-0.479777236	-0.388961	9.4875322	0.0948753	1.265513801	1.3603891	0.8731138	0.1	0.3	1.4	1.2	0.092538	-	9.10	6.50
830	6.45	9.05	54.03	0.000854	-	-	-	-	-	0.369563524	-	0	-	0.000854	0.04891	4.032004	231.0167993	11	0.618	-0.480109091	-0.388552	9.4875322	0.0948753	1.270474643	1.36535	0.8780746	0.1	0.3	1.4	1.2	0.092538	-	9.05	6.45
831	6.41	9.00	54.10	0.000854	-	-	-	-	-	0.367102612	-	0	-	0.000854	0.04891	4.032857	231.0657088	11	0.618	-0.480440596	-0.388142	9.4875322	0.0948753	1.275438916	1.3703142	0.8830389	0.1	0.3	1.4	1.2	0.092538	-	9.00	6.41
832	6.37	8.95	54.16	0.000854	-	-	-	-	-	0.364644382	-	0	-	0.000854	0.04891	4.033711	231.1146184	11	0.618	-0.480771752	-0.387731	9.4875322	0.0948753	1.280406617	1.3752819	0.8880066	0.1	0.3	1.4	1.2	0.092538	-	8.95	6.37
833	6.33	8.90	54.23	0.000854	-	-	-	-	-	0.362188845	-	0	-	0.000854	0.04891	4.034565	231.1635279	11	0.618	-0.481102556	-0.387321	9.4875322	0.0948753	1.285377742	1.3802531	0.8929777	0.1	0.3	1.4	1.2	0.092538	-	8.90	6.33
834	6.29	8.85	54.29	0.000854	-	-	-	-	-	0.359736011	-	0	-	0.000854	0.04891	4.035418	231.2124374	11	0.618	-0.48143301	-0.38691	9.4875322	0.0948753	1.290352288	1.3852276	0.8979523	0.1	0.3	1.4	1.2	0.092538	-	8.85	6.29
835	6.25	8.80	54.36	0.000854	-	-	-	-	-	0.357285891	-	0	-	0.000854	0.04891	4.036272	231.2613469	11	0.618	-0.481763114	-0.386499	9.4875322	0.0948753	1.29533025	1.3902056	0.9029303	0.1	0.3	1.4	1.2	0.092538	-	8.80	6.25
836	6.21	8.75	54.42	0.000854	-	-	-	-	-	0.354838497	-	0	-	0.000854	0.04891	4.037126	231.3102564	11	0.618	-0.482092866	-0.386088	9.4875322	0.0948753	1.300311626	1.3951869	0.9079116	0.1	0.3	1.4	1.2	0.092538	-	8.75	6.21
837	6.17	8.69	54.49	0.000854	-	-	-	-	-	0.352393838	-	0	-	0.000854	0.04891	4.037979	231.3591659	11	0.618	-0.482422267	-0.385676	9.4875322	0.0948753	1.305296411	1.4001717	0.9128964	0.1	0.3	1.4	1.2	0.092538	-	8.69	6.17
838	6.13	8.64	54.55	0.000854	-	-	-	-	-	0.349951926	-	0	-	0.000854	0.04891	4.038833	231.4080754	11	0.618	-0.482751317	-0.385264	9.4875322	0.0948753	1.310284602	1.4051599	0.9178846	0.2	0.3	1.4	1.2	0.092538	-	8.64	6.13
839	6.09	8.59	54.62	0.000854	-	-	-	-	-	0.347512772	-	0	-	0.000854	0.04891	4.039686	231.4569849	11	0.618	-0.483080014	-0.384852	9.4875322	0.0948753	1.315276196	1.4101515	0.9228762	0.2	0.3	1.4	1.2	0.092538	-	8.59	6.09
840	6.05	8.54	54.68	0.000854	-	-	-	-	-	0.345076386	-	0	-	0.000854	0.04891	4.040540	231.5058945	11	0.618	-0.48340836	-0.384439	9.4875322	0.0948753	1.320271188	1.4151465	0.9278712	0.2	0.3	1.4	1.2	0.092538	-	8.54	6.05
841	6.01	8.49	54.75	0.000854	-	-	-	-	-	0.342642779	-	0	-	0.000854	0.04891	4.041394	231.554804	11	0.618	-0.483736353	-0.384026	9.4875322	0.0948753	1.325269575	1.4201449	0.9328696	0.2	0.3	1.4	1.2	0.092538	-	8.49	6.01
842	5.97	8.44	54.81	0.000854	-	-	-	-	-	0.340211963	-	0	-	0.000854	0.04891	4.042247	231.6037135	11	0.618	-0.484063994	-0.383613	9.4875322	0.0948753	1.330271354	1.4251467	0.9378714	0.2	0.3	1.4	1.2	0.092538	-	8.44	5.97
843	5.93	8.39	54.88	0.000854	-	-	-	-	-	0.337783947	-	0	-	0.000854	0.04891	4.043101	231.652623	11	0.618	-0.484391283	-0.3832	9.4875322	0.0948753	1.33527652	1.4301518	0.9428765	0.2	0.3	1.4	1.2	0.092538	-	8.39	5.93
844	5.89	8.34	54.94	0.000854	-	-	-	-	-	0.335358742	-	0	-	0.000854	0.04891	4.043955	231.7015325	11	0.618	-0.484718218	-0.382786	9.4875322	0.0948753	1.340285071	1.4351604	0.9478851	0.2	0.3	1.4	1.2	0.092538	-	8.34	5.89
845	5.85	8.29	55.01	0.000854	-	-	-	-	-	0.33293636	-	0	-	0.000854	0.04891	4.044808	231.750442	11	0.618	-0.4850448	-0.382372	9.4875322	0.0948753	1.345297002	1.4401723	0.952897	0.2	0.3	1.4	1.2	0.092538	-	8.29	5.85
846	5.80	8.24	55.07	0.000854	-	-	-	-	-	0.330516812	-	0	-	0.000854	0.04891	4.045662	231.7993515	11	0.618	-0.485371028	-0.381958	9.4875322	0.0948753	1.35031231	1.4451876	0.9579123	0.2	0.3	1.4	1.2	0.092538	-	8.24	5.80
847	5.76	8.18	55.14	0.000854	-	-	-	-	-	0.328100107	-	0	-	0.000854	0.04891	4.046516	231.8482611	11	0.618	-0.485696903	-0.381544	9.4875322	0.0948753	1.355330991	1.4502063	0.962931	0.2	0.3	1.4	1.2	0.092538	-	8.18	5.76
848	5.72	8.13	55.20	0.000854	-	-	-	-	-	0.325686256	-	0	-	0.000854	0.04891	4.047369	231.8971706	11	0.618	-0.486022424	-0.381129	9.4875322	0.0948753	1.360353041	1.4552284	0.967953	0.2	0.3	1.4	1.2	0.092538	-	8.13	5.72
849	5.68	8.08	55.27	0.000854	-	-	-	-	-	0.323275272	-	0	-	0.000854	0.04891	4.048223	231.9460801	11	0.618	-0.486347591	-0.380714	9.4875322	0.0948753	1.365378458	1.4602538	0.9729785	0.2	0.3	1.4	1.2	0.092538	-	8.08	5.68
850	5.64	8.03	55.34	0.000854	-	-	-	-	-	0.320867163	-	0	-	0.000854	0.04891	4.049076	231.9949896	11	0.618	-0.486672404	-0.380299	9.4875322	0.0948753	1.370407236	1.4652826	0.9780072	0.2	0.3	1.4	1.2	0.092538	-	8.03	5.64
851	5.60	7.98	55.40	0.000854	-	-	-	-	-	0.318461941	-	0	-	0.000854	0.04891	4.049930	232.0438991	11	0.618	-0.486996861	-0.379883	9.4875322	0.0948753	1.375439374	1.4703147	0.9830394	0.2	0.3	1.4	1.2	0.092538	-	7.98	5.60
852	5.56	7.93	55.47	0.000854	-	-	-	-	-	0.316059617	-	0	-	0.000854	0.04891	4.050784	232.0928086	11	0.618	-0.487320964	-0.379467	9.4875322	0.0948753	1.380474866	1.4753502	0.9880749	0.2	0.3	1.4	1.2	0.092538	-	7.93	5.56
853	5.52	7.88	55.53	0.000854	-	-	-	-	-	0.313660201	-	0	-	0.000854	0.04891	4.051637	232.1417181	11	0.618	-0.487644712	-0.379051	9.4875322	0.0948753	1.385513709	1.480389	0.9931137	0.2	0.3	1.4	1.2	0.092538	-	7.88	5.52
854	5.48	7.83	55.60	0.000854	-	-	-	-	-	0.311263705	-	0	-	0.000854	0.04891	4.052491	232.1906277	11	0.618	-0.487968105	-0.378635	9.4875322	0.0948753	1.390555899	1.4854312	0.9981559	0.2	0.3	1.4	1.2	0.092538	-	7.83	5.48
855	5.44	7.77	55.66	0.000854	-	-	-	-	-	0.308870138	-	0	-	0.000854	0.04891	4.053345	232.2395372	11	0.618	-0.488291142	-0.378218	9.4875322	0.0948753	1.395601434	1.4904768	1.0032014	0.2	0.3	1.4	1.2	0.092538	-	7.77	5.44
856	5.40	7.72	55.73	0.000854	-	-	-	-	-	0.306479512	-	0	-	0.000854	0.04891	4.054198	232.2884467	11	0.618	-0.488613823	-0.377801	9.4875322	0.0948753	1.400650309	1.4955256	1.0082503	0.2	0.3	1.4	1.2	0.092538	-	7.72	5.40
857	5.36	7.67	55.79	0.000854	-	-	-	-	-	0.304091837	-	0	-	0.000854	0.04891	4.055052	232.3373562	11	0.618	-0.488936148	-0.377384	9.4875322	0.0948753	1.40570252	1.5005778	1.0133025	0.2	0.3	1.4	1.2	0.092538	-	7.67	5.36
858	5.32	7.62	55.86	0.000854	-	-	-	-	-	0.301707124	-	0	-	0.000854	0.04891	4.055905	232.3862657	11	0.618	-0.489258116	-0.376966	9.4875322	0.0948753	1.410758064	1.5056334	1.0183581	0.2	0.3	1.4	1.2	0.092538	-	7.62	5.32
859	5.28	7.57	55.92	0.000854	-	-	-	-	-	0.299325384	-	0	-	0.000854	0.04891	4.056759	232.4351752	11	0.618	-0.489579729	-0.376549	9.4875322	0.0948753	1.415816937	1.5106923	1.0234169	0.2	0.3	1.4	1.2	0.092538	-	7.57	5.28
860	5.25	7.52	55.99	0.000854	-	-	-	-	-	0.296946627	-	0	-	0.000854	0.04891	4.057613	232.4840847	11	0.618	-0.489900984	-0.37613	9.4875322	0.0948753	1.420879135	1.5157545	1.0284791	0.2	0.3	1.4	1.2	0.092538	-	7.52	5.25
861	5.21	7.46	56.05	0.000854	-	-	-	-	-	0.294570864	-	0	-	0.000854	0.04891	4.058466	232.5329942	11	0.618	-0.490221883	-0.375712	9.4875322	0.0948753	1.425944656	1.52082	1.0335447	0.2	0.3	1.4	1.2	0.092538	-	7.46	5.21
862	5.17	7.41	56.12	0.000854	-	-	-	-	-	0.292198106	-	0	-	0.000854	0.04891	4.059320	232.5819038	11	0.618	-0.490542424	-0.375294	9.4875322	0.0948753	1.431013494	1.5258888	1.0386135	0.2	0.3	1.4	1.2	0.092538	-	7.41	5.17
863	5.13	7.36	56.18	0.000854	-	-	-	-	-	0.289828363	-	0	-	0.000854	0.04891	4.060174	232.6308133	11	0.618	-0.490862608	-0.374875	9.4875322	0.0948753	1.436085647	1.530961	1.0436856	0.2	0.3	1.4	1.2	0.092538	-	7.36	5.13
864	5.09	7.31	56.25	0.000854	-	-	-	-	-	0.287461646	-	0	-	0.000854	0.04891	4.061027	232.6797228	11	0.618	-0.491182434	-0.374456	9.4875322	0.0948753	1.44116111	1.5360364	1.0487611	0.2	0.3	1.4	1.2	0.092538	-	7.31	5.09
865	5.05	7.26	56.31	0.000854	-	-	-	-	-	0.285097967	-	0	-	0.000854	0.04891	4.061881	232.7286323	11	0.618	-0.491501902	-0.374036	9.4875322	0.0948753	1.44623988	1.5411152	1.0538399	0.2	0.3	1.4	1.2	0.092538	-	7.26	5.05
866	5.01	7.21	56.38	0.000854	-	-	-	-	-	0.282737334	-	0	-	0.000854	0.04891	4.062735	232.7775418	11	0.618	-0.491821012	-0.373616	9.4875322	0.0948753	1.451321954	1.5461973	1.058922	0.2	0.3	1.4	1.2	0.092538	-	7.21	5.01
867	4.97	7.15	56.44	0.000854	-	-	-	-	-	0.28037976	-	0	-	0.000854	0.04891	4.063588	232.8264513	11	0.618	-0.492139764	-0.373196	9.4875322	0.0948753	1.456407327	1.5512826	1.0640073	0.2	0.3	1.4	1.2	0.092538	-	7.15	4.97
868	4.93	7.10	56.51	0.000854	-	-	-	-	-	0.278025254	-	0	-	0.000854	0.04891	4.064442	232.8753608	11	0.618	-0.492458157	-0.372776	9.4875322	0.0948753	1.461495996	1.5563713	1.069096	0.2	0.3	1.4	1.2	0.092538	-	7.10	4.93
869	4.89	7.05	56.57	0.000854	-	-	-	-	-	0.275673827	-	0	-	0.000854	0.04891	4.065295	232.9242704	11	0.618	-0.492776191	-0.372356	9.4875322	0.0948753	1.466587957	1.5614633	1.074188	0.2	0.3	1.4	1.2	0.092538	-	7.05	4.89
870	4.85	7.00	56.64	0.000854	-	-	-	-	-	0.273325491	-	0	-	0.000854	0.04891	4.066149	232.9731799	11	0.618	-0.493093867	-0.371935	9.4875322	0.0948753	1.471683207	1.5665585	1.0792832	0.2	0.3	1.4	1.2	0.092538	-	7.00	4.85
871	4.81	6.95	56.70	0.000854	-	-	-	-	-	0.270980255	-	0	-	0.000854	0.04891	4.067003	233.0220894	11	0.618	-0.493411182	-0.371514	9.4875322	0.0948753	1.476781741	1.5716571	1.0843817	0.2	0.3	1.4	1.2	0.092538	-	6.95	4.81
872	4.77	6.89	56.77	0.000854	-	-	-	-	-	0.26863813	-	0	-	0.000854	0.04891	4.067856	233.0709989	11	0.618	-0.493728139	-0.371093	9.4875322	0.0948753	1.481883556	1.5767589	1.0894836	0.2	0.3	1.4	1.2	0.092538	-	6.89	4.77
873	4.73	6.84	56.83	0.000854	-	-	-	-	-	0.266299127	-	0	-	0.000854	0.04891	4.068710	233.1199084	11	0.618	-0.494044735	-0.370671	9.4875322	0.0948753	1.486988649	1.581864	1.0945886	0.2	0.3	1.4	1.2	0.092538	-	6.84	4.73
874	4.69	6.79	56.90	0.000854	-	-	-	-	-	0.263963256	-	0	-	0.000854	0.04891	4.069564	233.1688179	11	0.618	-0.494360972	-0.370249	9.4875322	0.0948753	1.492097015	1.5869723	1.099697	0.2	0.3	1.4	1.2	0.092538	-	6.79	4.69
875	4.66	6.74	56.96	0.000854	-	-	-	-	-	0.261630528	-	0	-	0.000854	0.04891	4.070417	233.2177274	11	0.618	-0.494676848	-0.369827	9.4875322	0.0948753	1.497208651	1.592084	1.1048087	0.2	0.3	1.4	1.2	0.092538	-	6.74	4.66
876	4.62	6.69	57.03	0.000854	-	-	-	-	-	0.259300954	-	0	-	0.000854	0.04891	4.071271	233.266637	11	0.618	-0.494992364	-0.369405	9.4875322	0.0948753	1.502323553	1.5971989	1.1099236	0.2	0.3	1.4	1.2	0.092538	-	6.69	4.62
877	4.58	6.63	57.09	0.000854	-	-	-	-	-	0.256974544	-	0	-	0.000854	0.04891	4.072124	233.3155465	11	0.618	-0.495307519	-0.368982	9.4875322	0.0948753	1.507441718	1.602317	1.1150417	0.2	0.3	1.4	1.2	0.092538	-	6.63	4.58
878	4.54	6.58	57.16	0.000854	-	-	-	-	-	0.254651309	-	0	-	0.000854	0.04891	4.072978	233.364456	11	0.618	-0.495622313	-0.368559	9.4875322	0.0948753	1.512563141	1.6074385	1.1201631	0.2	0.3	1.4	1.2	0.092538	-	6.58	4.54
879	4.50	6.53	57.22	0.000854	-	-	-	-	-	0.252331259	-	0	-	0.000854	0.04891	4.073832	233.4133655	11	0.618	-0.495936746	-0.368136	9.4875322	0.0948753	1.517687819	1.6125631	1.1252878	0.2	0.3	1.4	1.2	0.092538	-	6.53	4.50
880	4.46	6.48	57.29	0.000854	-	-	-	-	-	0.250014405	-	0	-	0.000854	0.04891	4.074685	233.462275	11	0.618	-0.496250818	-0.367712	9.4875322	0.0948753	1.522815748	1.6176911	1.1304157	0.2	0.3	1.4	1.2	0.092538	-	6.48	4.46
881	4.42	6.42	57.35	0.000854	-	-	-	-	-	0.247700757	-	0	-	0.000854	0.04891	4.075539	233.5111845	11	0.618	-0.496564528	-0.367288	9.4875322	0.0948753	1.527946925	1.6228222	1.1355469	0.2	0.3	1.4	1.2	0.092538	-	6.42	4.42
882	4.38	6.37	57.42	0.000854	-	-	-	-	-	0.245390326	-	0	-	0.000854	0.04891	4.076393	233.560094	11	0.618	-0.496877876	-0.366864	9.4875322	0.0948753	1.533081346	1.6279567	1.1406813	0.2	0.3	1.4	1.2	0.092538	-	6.37	4.38
883	4.34	6.32	57.48	0.000854	-	-	-	-	-	0.243083123	-	0	-	0.000854	0.04891	4.077246	233.6090035	11	0.618	-0.497190862	-0.36644	9.4875322	0.0948753	1.538219006	1.6330943	1.145819	0.2	0.3	1.4	1.2	0.092538	-	6.32	4.34
884	4.31	6.27	57.55	0.000854	-	-	-	-	-	0.240779158	-	0	-	0.000854	0.04891	4.078100	233.6579131	11	0.618	-0.497503486	-0.366016	9.4875322	0.0948753	1.543359903	1.6382352	1.1509599	0.2	0.3	1.4	1.2	0.092538	-	6.27	4.31
885	4.27	6.22	57.61	0.000854	-	-	-	-	-	0.238478441	-	0	-	0.000854	0.04891	4.078954	233.7068226	11	0.618	-0.497815748	-0.365591	9.4875322	0.0948753	1.548504032	1.6433794	1.156104	0.2	0.3	1.4	1.2	0.092538	-	6.22	4.27
886	4.23	6.16	57.68	0.000854	-	-	-	-	-	0.236180983	-	0	-	0.000854	0.04891	4.079807	233.7557321	11	0.618	-0.498127646	-0.365166	9.4875322	0.0948753	1.55365139	1.6485267	1.1612514	0.2	0.3	1.4	1.2	0.092538	-	6.16	4.23
887	4.19	6.11	57.74	0.000854	-	-	-	-	-	0.233886795	-	0	-	0.000854	0.04891	4.080661	233.8046416	11	0.618	-0.498439182	-0.36474	9.4875322	0.0948753	1.558801973	1.6536773	1.166402	0.2	0.3	1.4	1.2	0.092538	-	6.11	4.19
888	4.15	6.06	57.81	0.000854	-	-	-	-	-	0.231595887	-	0	-	0.000854	0.04891	4.081514	233.8535511	11	0.618	-0.498750354	-0.364315	9.4875322	0.0948753	1.563955778	1.6588311	1.1715558	0.2	0.3	1.4	1.2	0.092538	-	6.06	4.15
889	4.11	6.00	57.87	0.000854	-	-	-	-	-	0.22930827	-	0	-	0.000854	0.04891	4.082368	233.9024606	11	0.618	-0.499061163	-0.363889	9.4875322	0.0948753	1.569112799	1.6639881	1.1767128	0.2	0.3	1.4	1.2	0.092538	-	6.00	4.11
890	4.08	5.95	57.94	0.000854	-	-	-	-	-	0.227023953	-	0	-	0.000854	0.04891	4.083222	233.9513701	11	0.618	-0.499371608	-0.363463	9.4875322	0.0948753	1.574273035	1.6691484	1.181873	0.2	0.3	1.4	1.2	0.092538	-	5.95	4.08
891	4.04	5.90	58.00	0.000854	-	-	-	-	-	0.224742949	-	0	-	0.000854	0.04891	4.084075	234.0002797	11	0.618	-0.49968169	-0.363036	9.4875322	0.0948753	1.57943648	1.6743118	1.1870365	0.2	0.3	1.4	1.2	0.092538	-	5.90	4.04
892	4.00	5.85	58.07	0.000854	-	-	-	-	-	0.222465266	-	0	-	0.000854	0.04891	4.084929	234.0491892	11	0.618	-0.499991407	-0.36261	9.4875322	0.0948753	1.584603132	1.6794785	1.1922031	0.2	0.3	1.4	1.2	0.092538	-	5.85	4.00
893	3.96	5.79	58.13	0.000854	-	-	-	-	-	0.220190915	-	0	-	0.000854	0.04891	4.085783	234.0980987	11	0.618	-0.50030076	-0.362183	9.4875322	0.0948753	1.589772986	1.6846483	1.197373	0.2	0.3	1.4	1.2	0.092538	-	5.79	3.96
894	3.92	5.74	58.20	0.000854	-	-	-	-	-	0.217919908	-	0	-	0.000854	0.04891	4.086636	234.1470082	11	0.618	-0.500609749	-0.361755	9.4875322	0.0948753	1.594946039	1.6898214	1.202546	0.2	0.3	1.4	1.2	0.092538	-	5.74	3.92
895	3.88	5.69	58.26	0.000854	-	-	-	-	-	0.215652254	-	0	-	0.000854	0.04891	4.087490	234.1959177	11	0.618	-0.500918372	-0.361328	9.4875322	0.0948753	1.600122286	1.6949976	1.2077223	0.2	0.3	1.4	1.2	0.092538	-	5.69	3.88
896	3.85	5.64	58.33	0.000854	-	-	-	-	-	0.213387964	-	0	-	0.000854	0.04891	4.088343	234.2448272	11	0.618	-0.501226631	-0.3609	9.4875322	0.0948753	1.605301725	1.700177	1.2129017	0.2	0.3	1.4	1.2	0.092538	-	5.64	3.85
897	3.81	5.58	58.39	0.000854	-	-	-	-	-	0.211127048	-	0	-	0.000854	0.04891	4.089197	234.2937367	11	0.618	-0.501534524	-0.360472	9.4875322	0.0948753	1.610484351	1.7053597	1.2180844	0.2	0.3	1.4	1.2	0.092538	-	5.58	3.81
898	3.77	5.53	58.46	0.000854	-	-	-	-	-	0.208869517	-	0	-	0.000854	0.04891	4.090051	234.3426463	11	0.618	-0.501842052	-0.360044	9.4875322	0.0948753	1.615670161	1.7105455	1.2232702	0.2	0.3	1.4	1.2	0.092538	-	5.53	3.77
899	3.73	5.48	58.52	0.000854	-	-	-	-	-	0.206615382	-	0	-	0.000854	0.04891	4.090904	234.3915558	11	0.618	-0.502149214	-0.359615	9.4875322	0.0948753	1.620859151	1.7157345	1.2284592	0.2	0.3	1.4	1.2	0.092538	-	5.48	3.73
900	3.69	5.42	58.59	0.000854	-	-	-	-	-	0.204364651	-	0	-	0.000854	0.04891	4.091758	234.4404653	11	0.618	-0.502456011	-0.359187	9.4875322	0.0948753	1.626051316	1.7209266	1.2336513	0.2	0.3	1.4	1.2	0.092538	-	5.42	3.69
901	3.66	5.37	58.66	0.000854	-	-	-	-	-	0.202117337	-	0	-	0.000854	0.04891	4.092612	234.4893748	11	0.618	-0.502762441	-0.358758	9.4875322	0.0948753	1.631246654	1.726122	1.2388467	0.2	0.3	1.4	1.2	0.092538	-	5.37	3.66
902	3.62	5.32	58.72	0.000854	-	-	-	-	-	0.199873449	-	0	-	0.000854	0.04891	4.093465	234.5382843	11	0.618	-0.503068505	-0.358328	9.4875322	0.0948753	1.63644516	1.7313205	1.2440452	0.2	0.3	1.4	1.2	0.092538	-	5.32	3.62
903	3.58	5.27	58.79	0.000854	-	-	-	-	-	0.197632998	-	0	-	0.000854	0.04891	4.094319	234.5871938	11	0.618	-0.503374202	-0.357899	9.4875322	0.0948753	1.641646831	1.7365222	1.2492468	0.2	0.3	1.4	1.2	0.092538	-	5.27	3.58
904	3.54	5.21	58.85	0.000854	-	-	-	-	-	0.195395994	-	0	-	0.000854	0.04891	4.095173	234.6361033	11	0.618	-0.503679532	-0.357469	9.4875322	0.0948753	1.646851663	1.741727	1.2544517	0.2	0.3	1.4	1.2	0.092538	-	5.21	3.54
905	3.51	5.16	58.92	0.000854	-	-	-	-	-	0.193162447	-	0	-	0.000854	0.04891	4.096026	234.6850128	11	0.618	-0.503984496	-0.357039	9.4875322	0.0948753	1.652059652	1.746935	1.2596597	0.2	0.3	1.4	1.2	0.092538	-	5.16	3.51
906	3.47	5.11	58.98	0.000854	-	-	-	-	-	0.190932369	-	0	-	0.000854	0.04891	4.096880	234.7339224	11	0.618	-0.504289092	-0.356609	9.4875322	0.0948753	1.657270794	1.7521461	1.2648708	0.2	0.3	1.4	1.2	0.092538	-	5.11	3.47
907	3.43	5.05	59.05	0.000854	-	-	-	-	-	0.188705769	-	0	-	0.000854	0.04891	4.097733	234.7828319	11	0.618	-0.50459332	-0.356178	9.4875322	0.0948753	1.662485086	1.7573604	1.2700851	0.2	0.3	1.4	1.2	0.092538	-	5.05	3.43
908	3.39	5.00	59.11	0.000854	-	-	-	-	-	0.186482657	-	0	-	0.000854	0.04891	4.098587	234.8317414	11	0.618	-0.504897181	-0.355747	9.4875322	0.0948753	1.667702523	1.7625778	1.2753025	0.2	0.3	1.4	1.2	0.092538	-	5.00	3.39
909	3.35	4.95	59.18	0.000854	-	-	-	-	-	0.184263044	-	0	-	0.000854	0.04891	4.099441	234.8806509	11	0.618	-0.505200675	-0.355316	9.4875322	0.0948753	1.672923102	1.7677984	1.2805231	0.2	0.3	1.4	1.2	0.092538	-	4.95	3.35
910	3.32	4.89	59.24	0.000854	-	-	-	-	-	0.182046941	-	0	-	0.000854	0.04891	4.100294	234.9295604	11	0.618	-0.5055038	-0.354885	9.4875322	0.0948753	1.67814682	1.7730221	1.2857468	0.2	0.3	1.4	1.2	0.092538	-	4.89	3.32
911	3.28	4.84	59.31	0.000854	-	-	-	-	-	0.179834357	-	0	-	0.000854	0.04891	4.101148	234.9784699	11	0.618	-0.505806556	-0.354453	9.4875322	0.0948753	1.683373671	1.778249	1.2909737	0.2	0.3	1.4	1.2	0.092538	-	4.84	3.28
912	3.24	4.79	59.37	0.000854	-	-	-	-	-	0.177625303	-	0	-	0.000854	0.04891	4.102002	235.0273794	11	0.618	-0.506108944	-0.354021	9.4875322	0.0948753	1.688603653	1.783479	1.2962037	0.2	0.3	1.4	1.2	0.092538	-	4.79	3.24
913	3.21	4.73	59.44	0.000854	-	-	-	-	-	0.17541979	-	0	-	0.000854	0.04891	4.102855	235.076289	11	0.618	-0.506410963	-0.353589	9.4875322	0.0948753	1.693836762	1.7887121	1.3014368	0.2	0.3	1.4	1.2	0.092538	-	4.73	3.21
914	3.17	4.68	59.50	0.000854	-	-	-	-	-	0.173217827	-	0	-	0.000854	0.04891	4.103709	235.1251985	11	0.618	-0.506712614	-0.353156	9.4875322	0.0948753	1.699072994	1.7939483	1.306673	0.2	0.3	1.4	1.2	0.092538	-	4.68	3.17
915	3.13	4.63	59.57	0.000854	-	-	-	-	-	0.171019425	-	0	-	0.000854	0.04891	4.104562	235.174108	11	0.618	-0.507013895	-0.352724	9.4875322	0.0948753	1.704312344	1.7991877	1.3119123	0.2	0.3	1.4	1.2	0.092538	-	4.63	3.13
916	3.09	4.57	59.63	0.000854	-	-	-	-	-	0.168824594	-	0	-	0.000854	0.04891	4.105416	235.2230175	11	0.618	-0.507314806	-0.352291	9.4875322	0.0948753	1.70955481	1.8044301	1.3171548	0.2	0.3	1.4	1.2	0.092538	-	4.57	3.09
917	3.06	4.52	59.70	0.000854	-	-	-	-	-	0.166633344	-	0	-	0.000854	0.04891	4.106270	235.271927	11	0.618	-0.507615348	-0.351858	9.4875322	0.0948753	1.714800387	1.8096757	1.3224004	0.2	0.3	1.4	1.2	0.092538	-	4.52	3.06
918	3.02	4.47	59.76	0.000854	-	-	-	-	-	0.164445687	-	0	-	0.000854	0.04891	4.107123	235.3208365	11	0.618	-0.50791552	-0.351424	9.4875322	0.0948753	1.720049072	1.8149244	1.3276491	0.2	0.3	1.4	1.2	0.092538	-	4.47	3.02
919	2.98	4.41	59.83	0.000854	-	-	-	-	-	0.162261631	-	0	-	0.000854	0.04891	4.107977	235.369746	11	0.618	-0.508215322	-0.35099	9.4875322	0.0948753	1.72530086	1.8201762	1.3329009	0.2	0.3	1.4	1.2	0.092538	-	4.41	2.98

920	2.95	4.36	59.89	0.000854	-	-	-	-	-	0.160081188	-	0	-	0.000854	0.04891	4.108831	235.4186555	11	0.618	-0.508514753	-0.350557	9.4875322	0.0948753	1.730555749	1.8254311	1.3381557	0.2	0.3	1.4	1.2	0.092538	-	4.36	2.95
921	2.91	4.31	59.96	0.000854	-	-	-	-	-	0.157904367	-	0	-	0.000854	0.04891	4.109684	235.4675651	11	0.618	-0.508813814	-0.350122	9.4875322	0.0948753	1.735813733	1.8306891	1.3434137	0.2	0.3	1.4	1.2	0.092538	-	4.31	2.91
922	2.87	4.25	60.02	0.000854	-	-	-	-	-	0.155731179	-	0	-	0.000854	0.04891	4.110538	235.5164746	11	0.618	-0.509112504	-0.349688	9.4875322	0.0948753	1.74107481	1.8359501	1.3486748	0.2	0.3	1.4	1.2	0.092538	-	4.25	2.87
923	2.83	4.20	60.09	0.000854	-	-	-	-	-	0.153561634	-	0	-	0.000854	0.04891	4.111392	235.5653841	11	0.618	-0.509410824	-0.349253	9.4875322	0.0948753	1.746338975	1.8412143	1.353939	0.2	0.3	1.4	1.2	0.092538	-	4.20	2.83
924	2.80	4.14	60.15	0.000854	-	-	-	-	-	0.151395742	-	0	-	0.000854	0.04891	4.112245	235.6142936	11	0.618	-0.509708772	-0.348818	9.4875322	0.0948753	1.751606225	1.8464815	1.3592062	0.2	0.3	1.4	1.2	0.092538	-	4.14	2.80
925	2.76	4.09	60.22	0.000854	-	-	-	-	-	0.149233513	-	0	-	0.000854	0.04891	4.113099	235.6632031	11	0.618	-0.510006348	-0.348383	9.4875322	0.0948753	1.756876556	1.8517519	1.3644766	0.2	0.3	1.4	1.2	0.092538	-	4.09	2.76
926	2.72	4.04	60.28	0.000854	-	-	-	-	-	0.147074958	-	0	-	0.000854	0.04891	4.113952	235.7121126	11	0.618	-0.510303553	-0.347947	9.4875322	0.0948753	1.762149963	1.8570253	1.36975	0.2	0.3	1.4	1.2	0.092538	-	4.04	2.72
927	2.69	3.98	60.35	0.000854	-	-	-	-	-	0.144920087	-	0	-	0.000854	0.04891	4.114806	235.7610221	11	0.618	-0.510600386	-0.347512	9.4875322	0.0948753	1.767426443	1.8623018	1.3750264	0.2	0.3	1.4	1.2	0.092538	-	3.98	2.69
928	2.65	3.93	60.41	0.000854	-	-	-	-	-	0.14276891	-	0	-	0.000854	0.04891	4.115660	235.8099317	11	0.618	-0.510896847	-0.347076	9.4875322	0.0948753	1.772705993	1.8675813	1.380306	0.2	0.3	1.4	1.2	0.092538	-	3.93	2.65
929	2.61	3.88	60.48	0.000854	-	-	-	-	-	0.140621437	-	0	-	0.000854	0.04891	4.116513	235.8588412	11	0.618	-0.511192936	-0.346639	9.4875322	0.0948753	1.777988608	1.8728639	1.3855886	0.2	0.3	1.4	1.2	0.092538	-	3.88	2.61
930	2.58	3.82	60.54	0.000854	-	-	-	-	-	0.138477679	-	0	-	0.000854	0.04891	4.117367	235.9077507	11	0.618	-0.511488652	-0.346203	9.4875322	0.0948753	1.783274285	1.8781496	1.3908743	0.2	0.3	1.4	1.2	0.092538	-	3.82	2.58
931	2.54	3.77	60.61	0.000854	-	-	-	-	-	0.136337645	-	0	-	0.000854	0.04891	4.118221	235.9566602	11	0.618	-0.511783996	-0.345766	9.4875322	0.0948753	1.788563019	1.8834383	1.396163	0.2	0.3	1.4	1.2	0.092538	-	3.77	2.54
932	2.51	3.71	60.67	0.000854	-	-	-	-	-	0.134201346	-	0	-	0.000854	0.04891	4.119074	236.0055697	11	0.618	-0.512078967	-0.345329	9.4875322	0.0948753	1.793854807	1.8887301	1.4014548	0.2	0.3	1.4	1.2	0.092538	-	3.71	2.51
933	2.47	3.66	60.74	0.000854	-	-	-	-	-	0.132068792	-	0	-	0.000854	0.04891	4.119928	236.0544792	11	0.618	-0.512373564	-0.344892	9.4875322	0.0948753	1.799149645	1.894025	1.4067496	0.2	0.3	1.4	1.2	0.092538	-	3.66	2.47
934	2.43	3.61	60.80	0.000854	-	-	-	-	-	0.129939992	-	0	-	0.000854	0.04891	4.120782	236.1033887	11	0.618	-0.512667788	-0.344454	9.4875322	0.0948753	1.80444753	1.8993229	1.4120475	0.2	0.3	1.4	1.2	0.092538	-	3.61	2.43
935	2.40	3.55	60.87	0.000854	-	-	-	-	-	0.127814958	-	0	-	0.000854	0.04891	4.121635	236.1522983	11	0.618	-0.512961639	-0.344017	9.4875322	0.0948753	1.809748456	1.9046238	1.4173485	0.2	0.3	1.4	1.2	0.092538	-	3.55	2.40
936	2.36	3.50	60.93	0.000854	-	-	-	-	-	0.125693699	-	0	-	0.000854	0.04891	4.122489	236.2012078	11	0.618	-0.513255115	-0.343579	9.4875322	0.0948753	1.815052421	1.9099277	1.4226524	0.2	0.3	1.4	1.2	0.092538	-	3.50	2.36
937	2.32	3.44	61.00	0.000854	-	-	-	-	-	0.123576226	-	0	-	0.000854	0.04891	4.123342	236.2501173	11	0.618	-0.513548218	-0.34314	9.4875322	0.0948753	1.82035942	1.9152347	1.4279594	0.2	0.3	1.4	1.2	0.092538	-	3.44	2.32
938	2.29	3.39	61.06	0.000854	-	-	-	-	-	0.121462548	-	0	-	0.000854	0.04891	4.124196	236.2990268	11	0.618	-0.513840947	-0.342702	9.4875322	0.0948753	1.82566945	1.9205448	1.4332695	0.2	0.3	1.4	1.2	0.092538	-	3.39	2.29
939	2.25	3.34	61.13	0.000854	-	-	-	-	-	0.119352675	-	0	-	0.000854	0.04891	4.125050	236.3479363	11	0.618	-0.514133301	-0.342263	9.4875322	0.0948753	1.830982507	1.9258578	1.4385825	0.2	0.3	1.4	1.2	0.092538	-	3.34	2.25
940	2.22	3.28	61.19	0.000854	-	-	-	-	-	0.117246618	-	0	-	0.000854	0.04891	4.125903	236.3968458	11	0.618	-0.51442528	-0.341824	9.4875322	0.0948753	1.836298586	1.9311739	1.4438986	0.2	0.3	1.4	1.2	0.092538	-	3.28	2.22
941	2.18	3.23	61.26	0.000854	-	-	-	-	-	0.115144387	-	0	-	0.000854	0.04891	4.126757	236.4457553	11	0.618	-0.514716885	-0.341385	9.4875322	0.0948753	1.841617685	1.936493	1.4492177	0.2	0.3	1.4	1.2	0.092538	-	3.23	2.18
942	2.14	3.17	61.32	0.000854	-	-	-	-	-	0.113045992	-	0	-	0.000854	0.04891	4.127611	236.4946648	11	0.618	-0.515008114	-0.340945	9.4875322	0.0948753	1.846939799	1.9418151	1.4545398	0.2	0.3	1.4	1.2	0.092538	-	3.17	2.14
943	2.11	3.12	61.39	0.000854	-	-	-	-	-	0.110951442	-	0	-	0.000854	0.04891	4.128464	236.5435744	11	0.618	-0.515298969	-0.340506	9.4875322	0.0948753	1.852264924	1.9471402	1.4598649	0.2	0.3	1.4	1.2	0.092538	-	3.12	2.11
944	2.07	3.06	61.45	0.000854	-	-	-	-	-	0.108860749	-	0	-	0.000854	0.04891	4.129318	236.5924839	11	0.618	-0.515589447	-0.340066	9.4875322	0.0948753	1.857593057	1.9524684	1.4651931	0.2	0.3	1.4	1.2	0.092538	-	3.06	2.07
945	2.04	3.01	61.52	0.000854	-	-	-	-	-	0.106773921	-	0	-	0.000854	0.04891	4.130171	236.6413934	11	0.618	-0.51587955	-0.339625	9.4875322	0.0948753	1.862924193	1.9577995	1.4705242	0.2	0.3	1.4	1.2	0.092538	-	3.01	2.04
946	2.00	2.96	61.58	0.000854	-	-	-	-	-	0.10469097	-	0	-	0.000854	0.04891	4.131025	236.6903029	11	0.618	-0.516169277	-0.339185	9.4875322	0.0948753	1.868258328	1.9631337	1.4758583	0.2	0.3	1.4	1.2	0.092538	-	2.96	2.00
947	1.96	2.90	61.65	0.000854	-	-	-	-	-	0.102611904	-	0	-	0.000854	0.04891	4.131879	236.7392124	11	0.618	-0.516458628	-0.338744	9.4875322	0.0948753	1.87359546	1.9684708	1.4811955	0.2	0.3	1.4	1.2	0.092538	-	2.90	1.96
948	1.93	2.85	61.71	0.000854	-	-	-	-	-	0.100536735	-	0	-	0.000854	0.04891	4.132732	236.7881219	11	0.618	-0.516747603	-0.338303	9.4875322	0.0948753	1.878935583	1.9738109	1.4865356	0.2	0.3	1.4	1.2	0.092538	-	2.85	1.93
949	1.89	2.79	61.78	0.000854	-	-	-	-	-	0.098465471	-	0	-	0.000854	0.04891	4.133586	236.8370314	11	0.618	-0.517036201	-0.337862	9.4875322	0.0948753	1.884278694	1.979154	1.4918787	0.2	0.3	1.4	1.2	0.092538	-	2.79	1.89
950	1.86	2.74	61.85	0.000854	-	-	-	-	-	0.096398124	-	0	-	0.000854	0.04891	4.134440	236.885941	11	0.618	-0.517324423	-0.33742	9.4875322	0.0948753	1.88962479	1.9845001	1.4972248	0.2	0.3	1.4	1.2	0.092538	-	2.74	1.86
951	1.82	2.68	61.91	0.000854	-	-	-	-	-	0.094334702	-	0	-	0.000854	0.04891	4.135293	236.9348505	11	0.618	-0.517612267	-0.336979	9.4875322	0.0948753	1.894973865	1.9898492	1.5025739	0.2	0.3	1.4	1.2	0.092538	-	2.68	1.82
952	1.79	2.63	61.98	0.000854	-	-	-	-	-	0.092275217	-	0	-	0.000854	0.04891	4.136147	236.98376	11	0.618	-0.517899734	-0.336537	9.4875322	0.0948753	1.900325917	1.9952012	1.5079259	0.2	0.3	1.4	1.2	0.092538	-	2.63	1.79
953	1.75	2.57	62.04	0.000854	-	-	-	-	-	0.090219678	-	0	-	0.000854	0.04891	4.137001	237.0326695	11	0.618	-0.518186824	-0.336095	9.4875322	0.0948753	1.905680941	2.0005563	1.5132809	0.2	0.3	1.4	1.2	0.092538	-	2.57	1.75
954	1.72	2.52	62.11	0.000854	-	-	-	-	-	0.088168094	-	0	-	0.000854	0.04891	4.137854	237.081579	11	0.618	-0.518473536	-0.335652	9.4875322	0.0948753	1.911038934	2.0059143	1.5186389	0.2	0.3	1.4	1.2	0.092538	-	2.52	1.72
955	1.68	2.46	62.17	0.000854	-	-	-	-	-	0.086120476	-	0	-	0.000854	0.04891	4.138708	237.1304885	11	0.618	-0.518759871	-0.335209	9.4875322	0.0948753	1.916399891	2.0112752	1.5239999	0.3	0.3	1.4	1.2	0.092538	-	2.46	1.68
956	1.64	2.41	62.24	0.000854	-	-	-	-	-	0.084076835	-	0	-	0.000854	0.04891	4.139561	237.179398	11	0.618	-0.519045827	-0.334766	9.4875322	0.0948753	1.921763809	2.0166391	1.5293638	0.3	0.3	1.4	1.2	0.092538	-	2.41	1.64
957	1.61	2.36	62.30	0.000854	-	-	-	-	-	0.082037179	-	0	-	0.000854	0.04891	4.140415	237.2283076	11	0.618	-0.519331405	-0.334323	9.4875322	0.0948753	1.927130683	2.022006	1.5347307	0.3	0.3	1.4	1.2	0.092538	-	2.36	1.61
958	1.57	2.30	62.37	0.000854	-	-	-	-	-	0.080001518	-	0	-	0.000854	0.04891	4.141269	237.2772171	11	0.618	-0.519616605	-0.33388	9.4875322	0.0948753	1.932500511	2.0273758	1.5401005	0.3	0.3	1.4	1.2	0.092538	-	2.30	1.57
959	1.54	2.25	62.43	0.000854	-	-	-	-	-	0.077969864	-	0	-	0.000854	0.04891	4.142122	237.3261266	11	0.618	-0.519901426	-0.333436	9.4875322	0.0948753	1.937873287	2.0327486	1.5454733	0.3	0.3	1.4	1.2	0.092538	-	2.25	1.54
960	1.50	2.19	62.50	0.000854	-	-	-	-	-	0.075942224	-	0	-	0.000854	0.04891	4.142976	237.3750361	11	0.618	-0.520185869	-0.332992	9.4875322	0.0948753	1.943249008	2.0381243	1.550849	0.3	0.3	1.4	1.2	0.092538	-	2.19	1.50
961	1.47	2.14	62.56	0.000854	-	-	-	-	-	0.073918611	-	0	-	0.000854	0.04891	4.143830	237.4239456	11	0.618	-0.520469932	-0.332548	9.4875322	0.0948753	1.948627671	2.043503	1.5562277	0.3	0.3	1.4	1.2	0.092538	-	2.14	1.47
962	1.43	2.08	62.63	0.000854	-	-	-	-	-	0.071899032	-	0	-	0.000854	0.04891	4.144683	237.4728551	11	0.618	-0.520753616	-0.332104	9.4875322	0.0948753	1.954009271	2.0488846	1.5616093	0.3	0.3	1.4	1.2	0.092538	-	2.08	1.43
963	1.40	2.03	62.69	0.000854	-	-	-	-	-	0.069883499	-	0	-	0.000854	0.04891	4.145537	237.5217646	11	0.618	-0.52103692	-0.331659	9.4875322	0.0948753	1.959393804	2.0542691	1.5669938	0.3	0.3	1.4	1.2	0.092538	-	2.03	1.40
964	1.36	1.97	62.76	0.000854	-	-	-	-	-	0.06787202	-	0	-	0.000854	0.04891	4.146390	237.5706741	11	0.618	-0.521319845	-0.331214	9.4875322	0.0948753	1.964781266	2.0596566	1.5723813	0.3	0.3	1.4	1.2	0.092538	-	1.97	1.36
965	1.33	1.92	62.82	0.000854	-	-	-	-	-	0.065864607	-	0	-	0.000854	0.04891	4.147244	237.6195837	11	0.618	-0.52160239	-0.330769	9.4875322	0.0948753	1.970171654	2.065047	1.5777717	0.3	0.3	1.4	1.2	0.092538	-	1.92	1.33
966	1.29	1.86	62.89	0.000854	-	-	-	-	-	0.063861268	-	0	-	0.000854	0.04891	4.148098	237.6684932	11	0.618	-0.521884555	-0.330324	9.4875322	0.0948753	1.975564963	2.0704403	1.583165	0.3	0.3	1.4	1.2	0.092538	-	1.86	1.29
967	1.26	1.81	62.95	0.000854	-	-	-	-	-	0.061862014	-	0	-	0.000854	0.04891	4.148951	237.7174027	11	0.618	-0.52216634	-0.329878	9.4875322	0.0948753	1.98096119	2.0758365	1.5885612	0.3	0.3	1.4	1.2	0.092538	-	1.81	1.26
968	1.22	1.75	63.02	0.000854	-	-	-	-	-	0.059866854	-	0	-	0.000854	0.04891	4.149805	237.7663122	11	0.618	-0.522447744	-0.329432	9.4875322	0.0948753	1.98636033	2.0812357	1.5939603	0.3	0.3	1.4	1.2	0.092538	-	1.75	1.22
969	1.19	1.70	63.08	0.000854	-	-	-	-	-	0.057875799	-	0	-	0.000854	0.04891	4.150659	237.8152217	11	0.618	-0.522728767	-0.328986	9.4875322	0.0948753	1.99176238	2.0866377	1.5993624	0.3	0.3	1.4	1.2	0.092538	-	1.70	1.19
970	1.15	1.64	63.15	0.000854	-	-	-	-	-	0.055888857	-	0	-	0.000854	0.04891	4.151512	237.8641312	11	0.618	-0.523009409	-0.32854	9.4875322	0.0948753	1.997167336	2.0920427	1.6047673	0.3	0.3	1.4	1.2	0.092538	-	1.64	1.15
971	1.12	1.59	63.21	0.000854	-	-	-	-	-	0.053906039	-	0	-	0.000854	0.04891	4.152366	237.9130407	11	0.618	-0.523289671	-0.328093	9.4875322	0.0948753	2.002575193	2.0974505	1.6101752	0.3	0.3	1.4	1.2	0.092538	-	1.59	1.12
972	1.09	1.53	63.28	0.000854	-	-	-	-	-	0.051927355	-	0	-	0.000854	0.04891	4.153220	237.9619503	11	0.618	-0.523569551	-0.327646	9.4875322	0.0948753	2.007985949	2.1028613	1.6155859	0.3	0.3	1.4	1.2	0.092538	-	1.53	1.09
973	1.05	1.48	63.34	0.000854	-	-	-	-	-	0.049952814	-	0	-	0.000854	0.04891	4.154073	238.0108598	11	0.618	-0.523849049	-0.327199	9.4875322	0.0948753	2.013399598	2.1082749	1.6209996	0.3	0.3	1.4	1.2	0.092538	-	1.48	1.05
974	1.02	1.42	63.41	0.000854	-	-	-	-	-	0.047982426	-	0	-	0.000854	0.04891	4.154927	238.0597693	11	0.618	-0.524128166	-0.326752	9.4875322	0.0948753	2.018816138	2.1136915	1.6264161	0.3	0.3	1.4	1.2	0.092538	-	1.42	1.02
975	0.98	1.37	63.47	0.000854	-	-	-	-	-	0.046016202	-	0	-	0.000854	0.04891	4.155780	238.1086788	11	0.618	-0.524406901	-0.326304	9.4875322	0.0948753	2.024235563	2.1191109	1.6318356	0.3	0.3	1.4	1.2	0.092538	-	1.37	0.98
976	0.95	1.31	63.54	0.000854	-	-	-	-	-	0.04405415	-	0	-	0.000854	0.04891	4.156634	238.1575883	11	0.618	-0.524685254	-0.325857	9.4875322	0.0948753	2.029657871	2.1245332	1.6372579	0.3	0.3	1.4	1.2	0.092538	-	1.31	0.95
977	0.91	1.26	63.60	0.000854	-	-	-	-	-	0.04209628	-	0	-	0.000854	0.04891	4.157488	238.2064978	11	0.618	-0.524963224	-0.325409	9.4875322	0.0948753	2.035083056	2.1299584	1.6426831	0.3	0.3	1.4	1.2	0.092538	-	1.26	0.91
978	0.88	1.20	63.67	0.000854	-	-	-	-	-	0.040142602	-	0	-	0.000854	0.04891	4.158341	238.2554073	11	0.618	-0.525240812	-0.32496	9.4875322	0.0948753	2.040511116	2.1353864	1.6481111	0.3	0.3	1.4	1.2	0.092538	-	1.20	0.88
979	0.84	1.14	63.73	0.000854	-	-	-	-	-	0.038193126	-	0	-	0.000854	0.04891	4.159195	238.3043169	11	0.618	-0.525518017	-0.324512	9.4875322	0.0948753	2.045942046	2.1408174	1.653542	0.3	0.3	1.4	1.2	0.092538	-	1.14	0.84
980	0.81	1.09	63.80	0.000854	-	-	-	-	-	0.036247862	-	0	-	0.000854	0.04891	4.160049	238.3532264	11	0.618	-0.525794839	-0.324063	9.4875322	0.0948753	2.051375842	2.1462512	1.6589758	0.3	0.3	1.4	1.2	0.092538	-	1.09	0.81
981	0.78	1.03	63.86	0.000854	-	-	-	-	-	0.034306819	-	0	-	0.000854	0.04891	4.160902	238.4021359	11	0.618	-0.526071279	-0.323614	9.4875322	0.0948753	2.056812501	2.1516878	1.6644125	0.3	0.3	1.4	1.2	0.092538	-	1.03	0.78
982	0.74	0.98	63.93	0.000854	-	-	-	-	-	0.032370007	-	0	-	0.000854	0.04891	4.161756	238.4510454	11	0.618	-0.526347334	-0.323165	9.4875322	0.0948753	2.062252018	2.1571273	1.669852	0.3	0.3	1.4	1.2	0.092538	-	0.98	0.74
983	0.71	0.92	63.99	0.000854	-	-	-	-	-	0.030437436	-	0	-	0.000854	0.04891	4.162609	238.4999549	11	0.618	-0.526623006	-0.322716	9.4875322	0.0948753	2.067694389	2.1625697	1.6752944	0.3	0.3	1.4	1.2	0.092538	-	0.92	0.71
984	0.67	0.87	64.06	0.000854	-	-	-	-	-	0.028509114	-	0	-	0.000854	0.04891	4.163463	238.5488644	11	0.618	-0.526898295	-0.322266	9.4875322	0.0948753	2.073139611	2.1680149	1.6807396	0.3	0.3	1.4	1.2	0.092538	-	0.87	0.67
985	0.64	0.81	64.12	0.000854	-	-	-	-	-	0.026585053	-	0	-	0.000854	0.04891	4.164317	238.5977739	11	0.618	-0.527173199	-0.321816	9.4875322	0.0948753	2.078587679	2.173463	1.6861877	0.3	0.3	1.4	1.2	0.092538	-	0.81	0.64
986	0.61	0.76	64.19	0.000854	-	-	-	-	-	0.024665261	-	0	-	0.000854	0.04891	4.165170	238.6466834	11	0.618	-0.52744772	-0.321366	9.4875322	0.0948753	2.08403859	2.1789139	1.6916386	0.3	0.3	1.4	1.2	0.092538	-	0.76	0.61
987	0.57	0.70	64.25	0.000854	-	-	-	-	-	0.022749749	-	0	-	0.000854	0.04891	4.166024	238.695593	11	0.618	-0.527721856	-0.320916	9.4875322	0.0948753	2.089492339	2.1843677	1.6970923	0.3	0.3	1.4	1.2	0.092538	-	0.70	0.57
988	0.54	0.64	64.32	0.000854	-	-	-	-	-	0.020838525	-	0	-	0.000854	0.04891	4.166878	238.7445025	11	0.618	-0.527995607	-0.320465	9.4875322	0.0948753	2.094948923	2.1898242	1.7025489	0.3	0.3	1.4	1.2	0.092538	-	0.64	0.54
989	0.50	0.59	64.38	0.000854	-	-	-	-	-	0.0189316	-	0	-	0.000854	0.04891	4.167731	238.793412	11	0.618	-0.528268974	-0.320014	9.4875322	0.0948753	2.100408337	2.1952837	1.7080083	0.3	0.3	1.4	1.2	0.092538	-	0.59	0.50
990	0.47	0.53	64.45	0.000854	-	-	-	-	-	0.017028982	-	0	-	0.000854	0.04891	4.168585	238.8423215	11	0.618	-0.528541956	-0.319563	9.4875322	0.0948753	2.105870578	2.2007459	1.7134706	0.3	0.3	1.4	1.2	0.092538	-	0.53	0.47
991	0.44	0.48	64.51	0.000854	-	-	-	-	-	0.015130683	-	0	-	0.000854	0.04891	4.169439	238.891231	11	0.618	-0.528814552	-0.319112	9.4875322	0.0948753	2.111335642	2.206211	1.7189356	0.3	0.3	1.4	1.2	0.092538	-	0.48	0.44
992	0.40	0.42	64.58	0.000854	-	-	-	-	-	0.013236711	-	0	-	0.000854	0.04891	4.170292	238.9401405	11	0.618	-0.529086764	-0.31866	9.4875322	0.0948753	2.116803524	2.2116788	1.7244035	0.3	0.3	1.4	1.2	0.092538	-	0.42	0.40
993	0.37	0.37	64.64	0.000854	-	-	-	-	-	0.011347075	-	0	-	0.000854	0.04891	4.171146	238.98905	11	0.618	-0.529358589	-0.318208	9.4875322	0.0948753	2.122274221	2.2171495	1.7298742	0.3	0.3	1.4	1.2	0.092538	-	0.37	0.37
994	0.34	0.31	64.71	0.000854	-	-	-	-	-	0.009461786	-	0	-	0.000854	0.04891	4.171999	239.0379596	11	0.618	-0.529630029	-0.317756	9.4875322	0.0948753	2.127747728	2.222623	1.7353477	0.3	0.3	1.4	1.2	0.092538	-	0.31	0.34
995	0.30	0.25	64.77	0.000854	-	-	-	-	-	0.007580853	-	0	-	0.000854	0.04891	4.172853	239.0868691	11	0.618	-0.529901084	-0.317304	9.4875322	0.0948753	2.133224042	2.2280994	1.740824	0.3	0.3	1.4	1.2	0.092538	-	0.25	0.30
996	0.27	0.20	64.84	0.000854	-	-	-	-	-	0.005704285	-	0	-	0.000854	0.04891	4.173707	239.1357786	11	0.618	-0.530171751	-0.316852	9.4875322	0.0948753	2.138703159	2.2335785	1.7463032	0.3	0.3	1.4	1.2	0.092538	-	0.20	0.27
997	0.24	0.14	64.90	0.000854	-	-	-	-	-	0.003832092	-	0	-	0.000854	0.04891	4.174560	239.1846881	11	0.618	-0.530442033	-0.316399	9.4875322	0.0948753	2.144185074	2.2390604	1.7517851	0.3	0.3	1.4	1.2	0.092538	-	0.14	0.24
998	0.20	0.09	64.97	0.000854	-	-	-	-	-	0.001964283	-	0	-	0.000854	0.04891	4.175414	239.2335976	11	0.618	-0.530711928	-0.315946	9.4875322	0.0948753	2.149669784	2.2445451	1.7572698	0.3	0.3	1.4	1.2	0.092538	-	0.09	0.20
999	0.17	0.03	65.03	0.000854	-	-	-	-	-	0.000100869	-	0	-	0.000854	0.04891	4.176268	239.2825071	11	0.618	-0.530981437	-0.315493	9.4875322	0.0948753	2.155157285	2.2500326	1.7627573	0.3	0.3	1.4	1.2	0.092538	-	0.03	0.17
1000	0.14	-0.02	65.10	0.000854	-	-	-	-	-	-0.0017009	-	0	-	0.000854	0.04891	4.177121	239.3314166	11	0.618	-0.531250558	-0.31504	9.4875322	0.0948753	2.160647572	2.2555229	1.7682476	0.3	0.3	1.4	1.2	0.092538	-	-0.02	0.14
				22.00	5.27	16.93	18.16	1.24	58.59											779.17	-1223.66	36271.31	362.71											
												0.08	3.81																					

Appendix B: Optimization of membrane force

Here the spread sheet is used to optimize the configurations of the inflatable rubber barrier by changing the the base width B, the circumferential membrane length or all parameters at once.

B.1. Variation of base width B

By changing the base width to B = 34.5 m the resulting air pressure in the barrier becomes 0.59 bar and the tension force results to 711.3 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal

WATER/ LUCHT

17	m	Water hoogte balg
0.591057	bar	Luchtdruk
34.5	m	Breedte tussen klemlijnen
65.1	m	Lengte membraan

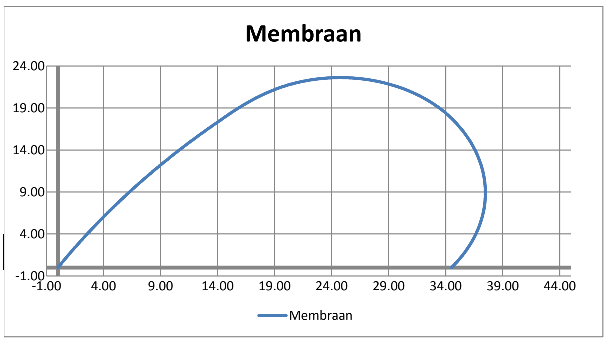
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	34.50	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.59	Bar
Druk balg in meter waterkolom	H	5.91	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**

Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	365.1	427.1	792.2	**kN**
RV	610.4	568.8	1`179.2	**kN**
Verschil verval en horizontal klemlijn		1%	7.45	kN

Berekende waardes				
Tenstion		T	711.30	kN/m2
			711305	N
Eind hoek	ϕB	h1	4.17	Rad
			239.1	Graden
			59.1	Graden
Start hoek	ϕA	h2	0.93	Rad
			53.1	Graden

Volumes	m3	%
Water	519.61	86.27%
Lucht	82.72	13.73%
Totaal	602.33	

Coordinaten	X	Y
Maxima	37.48	22.62
Vast punt 1	-	-
Vast punt 2	34.50	-
Onnauwkeurigheid	0.00	0.00
	0.00	0.00
Onnauwkeurigheid	1.38	0.06
Totaal	0.06	
Factor		0.55
Ybij X max	-	
X bij Y max		24.71

Afwijkingen	m	%
Hbalg	1.38	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	7.45	6.31%
Totaal		0.00%

Figure B.1.: Crest-height calculations with B = 34.5 m

By changing the base width to B = 34.0 m the resulting air pressure in the barrier becomes 0.59 bar and the tension force results to 710.07 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal

WATER/AIR

17	m	Water hoogte balg
0.59208	bar	Luchtdruk
34	m	Breedte tussen klemlijnen
65.1	m	Lengte membraan

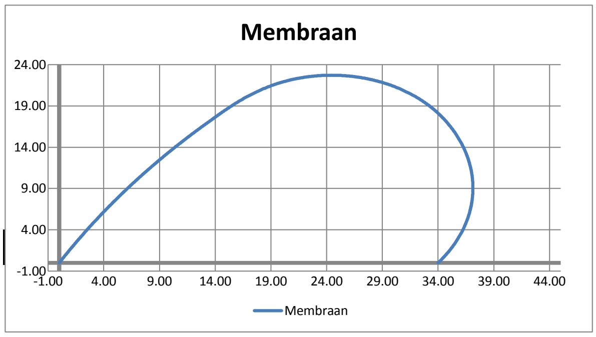
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	34.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.59	Bar
Druk balg in meter waterkolom	H	5.92	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	357.0	436.2	793.2	kN
RV	613.8	560.3	1`174.1	kN
Verschil verval en horizontal klemlijn		1%	8.40	kN

Berekende waardes				
Tenstion		T	710.07	kN/m2
			710070	N
Eind hoek	ϕB	h1	4.19	Rad
			239.8	Graden
			59.8	Graden
Start hoek	ϕA	h2	0.91	Rad
			52.1	Graden

Volumes	m3	%
Water	516.48	85.93%
Lucht	84.54	14.07%
Totaal	601.02	

Coordinaten	X	Y
Maxima	37.12	22.72
Vast punt 1	-	-
Vast punt 2	34.00	-
Onnauwkeurigheid	0.00	-0.00
	0.01	0.00
Onnauwkeurigheid	1.28	0.05
Totaal	0.05	
Factor		0.55
Ybij X max	-	
X bij Y max		24.47

Afwijkingen	m	%
Hbalg	1.28	
X	0.00	0.02%
Y	0.00	0.02%
Hverval	8.40	7.11%
Totaal		0.03%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.2.: Crest-height calculations with B = 34.0 m

By changing the base width to B = 33.0 m the resulting air pressure in the barrier becomes 0.59 bar and the tension force results to 709.87 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/ LUCHT

17	m Water hoogte balg
0,594911	bar Luchtdruk
33	m Breedte tussen klemlijnen
65,1	m Lengte membraan

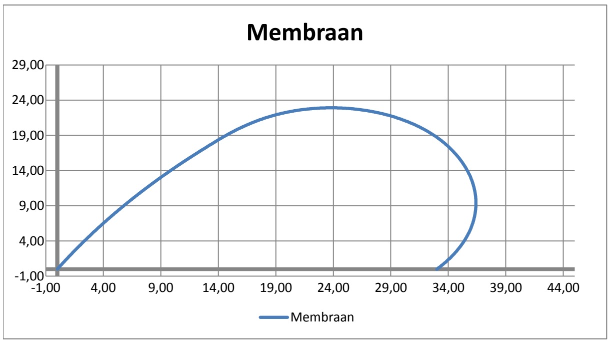
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	33,00	m
Lengte membraan	Lmin	65,10	m
Water hoogte balg	Hin	17,00	m
Luchtdruk (bar)	dP	0,59	Bar
Druk balg in meter waterkolom	H	5,95	m
Hoogte van de balg	Hbalg	24,00	m
Hoog water zijde	HW	22,00	m
Laag water zijde	LW	18,00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0,15	2,5	Rad
Luchtdruk (bar)	0,01	0,6	bar

Vaste gegevens			
Zwaartekracht	g	9,81	m/s²
Hoogte onbelast	Ho	22,00	m
Kruinhoogte	Hkruin	1,00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0,07	m

Doek eigenschappen		
Breedte	1,00	m
Doek dikte	16,00	mm
Eigen gewicht doek	1082,00	kg/m3
Elasticiteit doek	5000000,00	kN/m2
Gewicht ds	1,13	kg
	11,06	N



Output

Belastingen				
Hoogwaterzijde			2.374	**kN**
Laagwaterzijde			1.589	**kN**
		Hverval	785	**kN**
Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	340,3	454,1	794,5	**kN**
RV	623,0	545,6	1.168,6	**kN**
Verschil verval en horizontal klemlijn		1%	9,66	kN

Berekende waardes				
Tension		T	709,87	kN/m2
			709874	N
Eind hoek	ϕB	h1	4,21	Rad
			241,4	Graden
			61,4	Graden
Start hoek	ϕA	h2	0,88	Rad
			50,2	Graden

Volumes	m3	%
Water	510,86	85,26%
Lucht	88,35	14,74%
Totaal	599,21	

Coordinaten	X	Y
Maxima	36,40	22,91
Vast punt 1	-	-
Vast punt 2	33,00	-
Onnauwkeurigheid	0,01	0,01
	0,01	0,00
Onnauwkeurigheid	1,09	0,05
Totaal	0,05	
Factor		0,55
Ybij X max	-	
X bij Y max		23,84

Afwijkingen	m	%
Hbalg	1,09	
X	0,01	0,03%
Y	0,01	0,03%
Hverval	9,66	8,19%
Totaal		0,06%

Figure B.3.: Crest-height calculations with B = 33.0 m

By changing the base width to B = 32.0 m the resulting air pressure in the barrier becomes 0.60 bar and the tension force results to 708.04 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/ LUCHT

17	m	Water hoogte balg
0.597803	bar	Luchtdruk
32	m	Breedte tussen klemlijnen
65.1	m	Lengte membraan

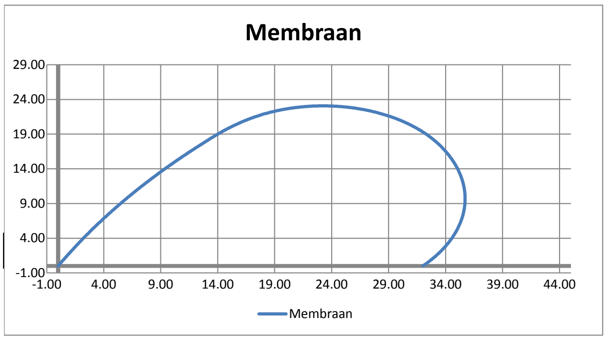
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	32.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	5.98	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen		
Hoogwaterzijde	2`374	**kN**
Laagwaterzijde	1`589	**kN**
Hverval	785	**kN**

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	323.9	471.9	795.7	**kN**
RV	629.6	527.9	1`157.5	**kN**
Verschil verval en horizontal klemlijn		1%	10.92	kN

Berekende waardes				
Tenstion		T	708.04	kN/m2
			708036	N
Eind hoek	ϕB	h1	4.24	Rad
			242.8	Graden
			62.8	Graden
Start hoek	ϕA	h2	0.84	Rad
			48.2	Graden

Volumes	m3	%
Water	505.23	84.70%
Lucht	91.28	15.30%
Totaal	596.51	

Coordinaten	X	Y
Maxima	35.71	23.07
Vast punt 1	-	-
Vast punt 2	32.00	-
Onnauwkeurigheid	-0.00	0.00
	0.00	0.00
Onnauwkeurigheid	0.93	0.04
Totaal	0.04	
Factor		0.55
Ybij X max	-	
X bij Y max		23.22

Afwijkingen	m	%
Hbalg	0.93	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	10.92	9.25%
Totaal		0.00%

Figure B.4.: Crest-height calculations with B = 32.0 m

By changing the base width to B = 31.0 m the resulting air pressure in the barrier becomes 0.57 bar and the tension force results to 652.1 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/ LUCHT

17	m Water hoogte balg
0.570971	bar Luchtdruk
31	m Breedte tussen klemlijnen
65.1	m Lengte membraan

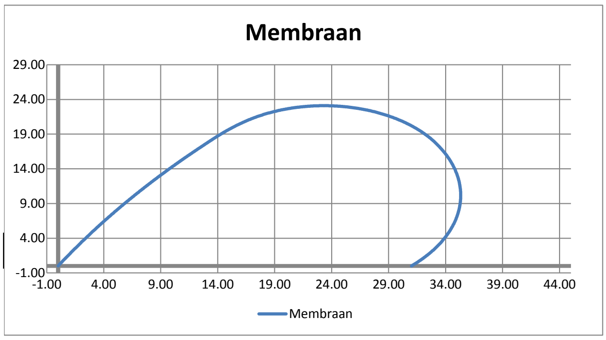
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.57	Bar
Druk balg in meter waterkolom	H	5.71	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN
Belasting per klemlijn op basis van trek				
	Punt B	Punt A	totaal	
RH	322.4	468.7	791.1	kN
RV	566.8	453.4	1`020.2	kN
Verschil verval en horizontal klemlijn		1%	6.35	kN

Berekende waardes				
Tenstion		T	652.12	kN/m2
			652119	N
Eind hoek	ϕB	h1	4.20	Rad
			240.4	Graden
			60.4	Graden
Start hoek	ϕA	h2	0.77	Rad
			44.0	Graden

Volumes	m3	%
Water	496.49	84.68%
Lucht	89.81	15.32%
Totaal	586.31	

Coordinaten	X	Y
Maxima	35.32	23.10
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	-0.00	0.00
	0.00	0.00
Onnauwkeurigheid	0.90	0.04
Totaal	0.04	
Factor		0.55
Ybij X max	-	
X bij Y max		23.33

Afwijkingen	m	%
Hbalg	0.90	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	6.35	5.38%
Totaal		0.00%

Figure B.5.: Crest-height calculations with B = 31.0 m

By changing the base width to B = 30.0 m the resulting air pressure in the barrier becomes 0.58 bar and the tension force results to 669.4 kN/m’.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/ LUCHT

17 m Water hoogte balg
0.58436 bar Luchtdruk
30 m Breedte tussen klemlijnen
65.1 m Lengte membraan

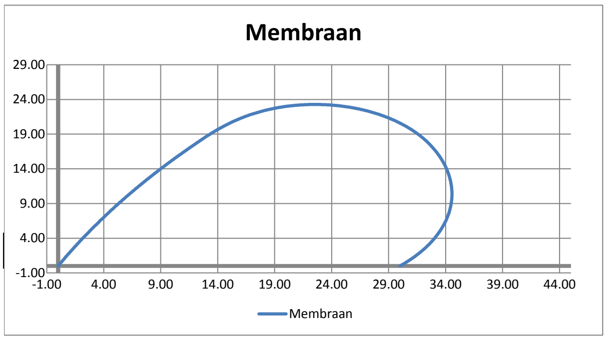
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	30.00	m
Lengte membraan	Lmin	65.10	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.58	Bar
Druk balg in meter waterkolom	H	5.84	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.06	N



Output

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	301.9	491.9	793.8	kN
RV	597.4	454.0	1`051.5	kN
Verschil verval en horizontal klemlijn		1%	9.04	kN

Berekende waardes				
Tenstion		T	669.40	kN/m2
			669404	N
Eind hoek	ϕB	h1	4.24	Rad
			243.2	Graden
			63.2	Graden
Start hoek	ϕA	h2	0.75	Rad
			42.7	Graden

Volumes	m3	%
Water	493.00	84.04%
Lucht	93.63	15.96%
Totaal	586.63	

Coordinaten	X	Y
Maxima	34.56	23.28
Vast punt 1	-	-
Vast punt 2	30.00	-
Onnauwkeurigheid	-0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	0.72	0.03
Totaal	0.03	
Factor		0.55
Ybij X max	-	
X bij Y max		22.52

Afwijkingen	m	%
Hbalg	0.72	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	9.04	7.66%
Totaal		0.00%

Figure B.6.: Crest-height calculations with B = 30.0 m

B.2. Variation of circumferential membrane length

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 67.0 m the resulting air pressure in the barrier becomes 0.60 bar and the tension force results to 748.8 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m	Water hoogte balg
0.599999	bar	Luchtdruk
31	m	Breedte tussen klemlijnen
67	m	Lengte membraan

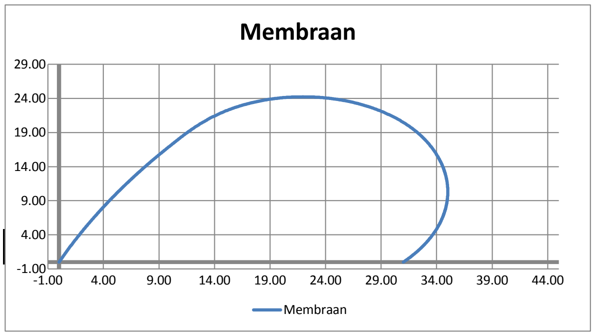
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	67.00	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	6.00	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.16	kg
	11.38	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**
Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	291.9	504.2	796.2	**kN**
RV	689.6	553.6	1`243.2	**kN**
Verschil verval en horizontal klemlijn		1%	11.36	kN

Berekende waardes				
Tenstion		T	748.82	kN/m2
			748817	N
Eind hoek	ϕB	h1	4.31	Rad
			247.1	Graden
			67.1	Graden
Start hoek	ϕA	h2	0.83	Rad
			47.7	Graden

Volumes	m3	%
Water	512.45	81.06%
Lucht	119.72	18.94%
Totaal	632.17	

Coordinaten	X	Y
Maxima	35.00	24.23
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	-0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	0.23	0.01
Totaal	0.01	
Factor		0.55
Ybij X max	-	
X bij Y max		21.97

Afwijkingen	m	%
Hbalg	0.23	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	11.36	9.63%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.7.: Crest-height calculations with L = 67.0 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 66.0 m the resulting air pressure in the barrier becomes 0.57 bar and the tension force results to 664.6 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m Water hoogte balg
0.567081	bar Luchtdruk
31	m Breedte tussen klemlijnen
66	m Lengte membraan

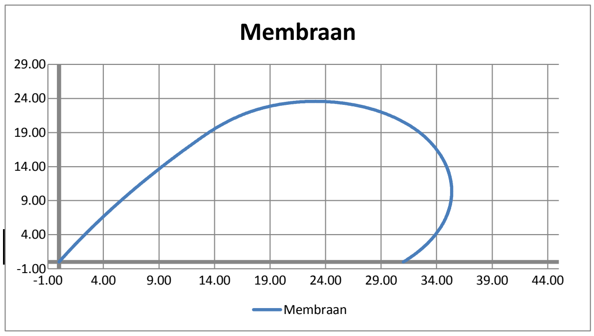
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	66.00	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.57	Bar
Druk balg in meter waterkolom	H	5.67	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.14	kg
	11.21	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**
Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	319.7	473.7	793.4	**kN**
RV	582.7	466.2	1`048.9	**kN**
Verschil verval en horizontal klemlijn		1%	8.60	kN

Berekende waardes				
Tenstion		T	664.64	kN/m2
			664640	N
Eind hoek	ϕB	h1	4.21	Rad
			241.3	Graden
			61.3	Graden
Start hoek	ϕA	h2	0.78	Rad
			44.5	Graden

Volumes	m3	%
Water	502.63	83.24%
Lucht	101.21	16.76%
Totaal	603.84	

Coordinaten	X	Y
Maxima	35.36	23.57
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	0.00	0.00
	0.00	0.00
Onnauwkeurigheid	0.43	0.02
Totaal	0.02	
Factor		0.55
Ybij X max	-	
X bij Y max		23.09

Afwijkingen	m	%
Hbalg	0.43	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	8.60	7.29%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.8.: Crest-height calculations with L = 66.0 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 65.5 m the resulting air pressure in the barrier becomes 0.57 bar and the tension force results to 667.6 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m Water hoogte balg
0.574899	bar Luchtdruk
31	m Breedte tussen klemlijnen
65.5	m Lengte membraan

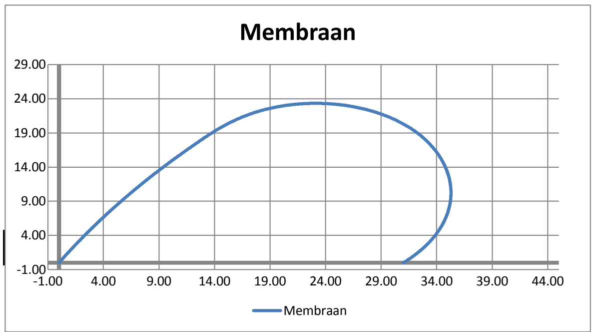
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	65.50	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.57	Bar
Druk balg in meter waterkolom	H	5.75	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.12	N



Output

Belastingen			
Hoogwaterzijde		2`374	**kN**
Laagwaterzijde		1`589	**kN**
	Hverval	785	**kN**

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	318.6	475.2	793.8	**kN**
RV	586.6	468.9	1`055.5	**kN**
Verschil verval en horizontal klemlijn		1%	9.03	kN

Berekende waardes				
Tension		T	667.58	kN/m2
			667581	N
Eind hoek	ϕB	h1	4.21	Rad
			241.5	Graden
			61.5	Graden
Start hoek	ϕA	h2	0.78	Rad
			44.6	Graden

Volumes	m3	%
Water	500.04	83.96%
Lucht	95.56	16.04%
Totaal	595.60	

Coordinaten	X	Y
Maxima	35.29	23.33
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	0.67	0.03
Totaal	0.03	
Factor		0.55
Ybij X max	-	
X bij Y max		23.10

Afwijkingen	m	%
Hbalg	0.67	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	9.03	7.65%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.9.: Crest-height calculations with L = 65.5 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 65.0 m the resulting air pressure in the barrier becomes 0.59 bar and the tension force results to 680.5 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m Water hoogte balg
0.587795	bar Luchtdruk
31	m Breedte tussen klemlijnen
65	m Lengte membraan

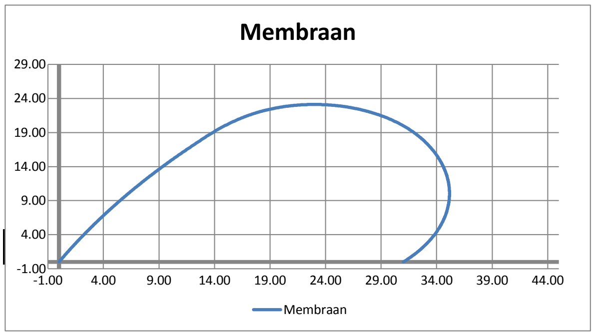
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	65.00	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.59	Bar
Druk balg in meter waterkolom	H	5.88	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s²
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.13	kg
	11.04	N



Output

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	314.6	479.5	794.1	kN
RV	603.4	482.8	1`086.2	kN
Verschil verval en horizontal klemlijn		1%	9.33	kN

Berekende waardes				
Tenstion		T	680.47	kN/m2
			680467	N
Eind hoek	ϕB	h1	4.23	Rad
			242.5	Graden
			62.5	Graden
Start hoek	ϕA	h2	0.79	Rad
			45.2	Graden

Volumes	m3	%
Water	497.69	84.55%
Lucht	90.97	15.45%
Totaal	588.66	

Coordinaten	X	Y
Maxima	35.15	23.12
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	0.88	0.04
Totaal	0.04	
Factor		0.55
Ybij X max	-	
X bij Y max		23.02

Afwijkingen	m	%
Hbalg	0.88	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	9.33	7.91%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.10.: Crest-height calculations with L = 65.0 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 64.5 m the resulting air pressure in the barrier becomes 0.60 bar and the tension force results to 689.2 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m Water hoogte balg
0.598628	bar Luchtdruk
31	m Breedte tussen klemlijnen
64.5	m Lengte membraan

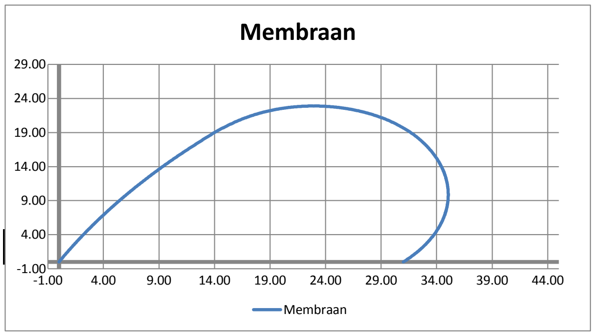
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	64.50	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	5.99	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.06	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.12	kg
	10.95	N



Output

Belastingen			
Hoogwaterzijde		2`374	**kN**
Laagwaterzijde		1`589	**kN**
	Hverval	785	**kN**

Belasting per klemlijn op basis van trek	Punt B	Punt A	totaal	
RH	311.8	482.1	793.9	**kN**
RV	614.6	492.5	1`107.2	**kN**
Verschil verval en horizontal klemlijn		1%	9.06	kN

Berekende waardes				
Tenstion		T	689.20	kN/m2
			689197	N
Eind hoek	ϕB	h1	4.24	Rad
			243.1	Graden
			63.1	Graden
Start hoek	ϕA	h2	0.80	Rad
			45.6	Graden

Volumes	m3	%
Water	495.31	85.20%
Lucht	86.05	14.80%
Totaal	581.36	

Coordinaten	X	Y
Maxima	35.04	22.89
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	-0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	1.11	0.05
Totaal	0.05	
Factor		0.55
Ybij X max	-	
X bij Y max		22.96

Afwijkingen	m	%
Hbalg	1.11	
X	0.00	0.01%
Y	0.00	0.00%
Hverval	9.06	7.68%
Totaal		0.01%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.11.: Crest-height calculations with L = 64.5 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 64.0 m the resulting air pressure in the barrier becomes 0.59 bar and the tension force results to 691.4 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17 m Water hoogte balg
0.594978 bar Luchtdruk
31 m Breedte tussen klemlijnen
64 m Lengte membraan

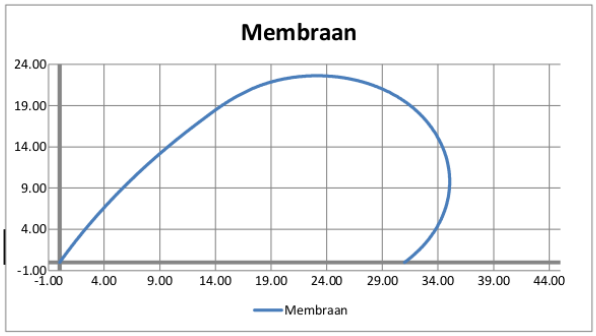
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	64.00	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.59	Bar
Druk balg in meter waterkolom	H	5.95	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.06	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.11	kg
	10.87	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**
Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	315.7	474.4	790.1	**kN**
RV	594.4	477.4	1`071.7	**kN**
Verschil verval en horizontal klemlijn		1%	5.26	kN

Berekende waardes				
Tenstion		T	691.39	kN/m2
			672997	N
Eind hoek	ϕB	h1	4.22	Rad
			242.0	Graden
			62.0	Graden
Start hoek	ϕA	h2	0.79	Rad
			45.2	Graden

Volumes	m3	%
Water	490.99	86.04%
Lucht	79.68	13.96%
Totaal	570.67	

Coordinaten	X	Y
Maxima	35.05	22.62
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	0.00	-0.00
	0.00	0.00
Onnauwkeurigheid	1.38	0.06
Totaal	0.06	
Factor		0.55
Ybij X max	-	
X bij Y max		23.15

Afwijkingen	m	%
Hbalg	1.38	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	5.26	4.46%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.12.: Crest-height calculations with L = 64.0 m

By keeping the the base width to B = 31.0 m and changing the circumferential length to L = 63.5 m the resulting air pressure in the barrier becomes 0.60 bar and the tension force results to 694.1 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m Water hoogte balg
0.598461	bar Luchtdruk
31	m Breedte tussen klemlijnen
63.5	m Lengte membraan

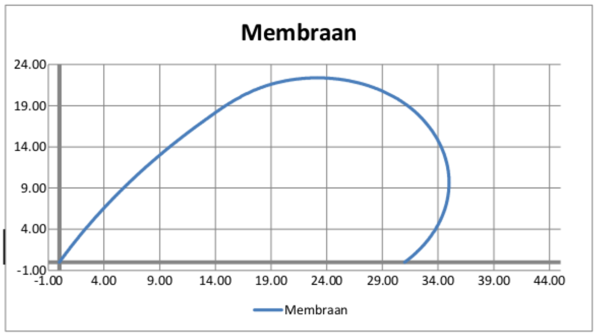
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	31.00	m
Lengte membraan	Lmin	63.50	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.60	Bar
Druk balg in meter waterkolom	H	5.98	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.06	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.10	kg
	10.78	N



Output

Belastingen				
Hoogwaterzijde			2`374	**kN**
Laagwaterzijde			1`589	**kN**
		Hverval	785	**kN**

Belasting per klemlijn op basis van trek				
	Punt B	**Punt A**	**totaal**	
RH	316.1	471.0	787.1	**kN**
RV	590.5	476.2	1`066.7	**kN**
Verschil verval en horizontal klemlijn		0%	2.32	kN

Berekende waardes				
Tenstion		T	694.13	kN/m2
			669788	N
Eind hoek	ϕB	h1	4.22	Rad
			241.8	Graden
			61.8	Graden
Start hoek	ϕA	h2	0.79	Rad
			45.3	Graden

Volumes	m3	%
Water	487.63	86.77%
Lucht	74.36	13.23%
Totaal	561.99	

Coordinaten	X	Y
Maxima	34.98	22.38
Vast punt 1	-	-
Vast punt 2	31.00	-
Onnauwkeurigheid	-0.01	0.00
	0.01	0.00
Onnauwkeurigheid	1.62	0.07
Totaal	0.07	
Factor		0.55
Ybij X max	-	
X bij Y max		23.16

Afwijkingen	m	%
Hbalg	1.62	
X	0.01	0.03%
Y	0.00	0.00%
Hverval	2.32	1.97%
Totaal		0.03%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.13.: Crest-height calculations with L = 63.5 m

B.3. Total optimization

By varying the circumferential length L, the base width B, the internal air pressure and the tension force an optimized system can be found. The Base width becomes B = 30.58 m, the circumferential length L = 65.90 m and the internal air pressure becomes 0.56 bar. With these parameters the resulting tension force in the membrane is 651.5 kN/m'.

Met drukregulering, $\Delta F_{horizontaal}$ minimaal WATER/AIR

17	m	Water hoogte balg
0.563028	bar	Luchtdruk
30.58	m	Breedte tussen klemlijnen
65.9	m	Lengte membraan

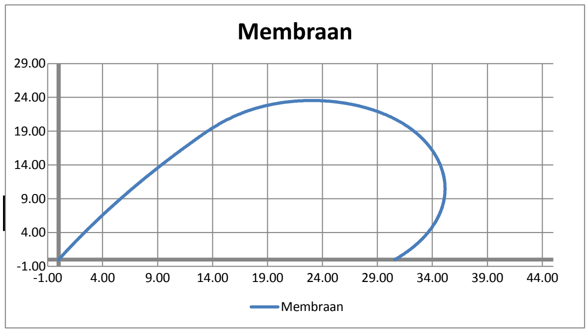
Input

Vaste gegevens		Waarde	Grootheid
Breedte tussen klemlijnen	Bb	30.58	m
Lengte membraan	Lmin	65.90	m
Water hoogte balg	Hin	17.00	m
Luchtdruk (bar)	dP	0.56	Bar
Druk balg in meter waterkolom	H	5.63	m
Hoogte van de balg	Hbalg	24.00	m
Hoog water zijde	HW	22.00	m
Laag water zijde	LW	18.00	m

Te bereken waardes	Bandbreedte		
Trek in balg	70	1000	kN
Aanvangshoek	0.15	2.5	Rad
Luchtdruk (bar)	0.01	0.6	bar
Breedte tussen klemlijnen	30	40	m
Lengte membraan	50	80	m

Vaste gegevens			
Zwaartekracht	g	9.81	m/s^2
Hoogte onbelast	Ho	22.00	m
Kruinhoogte	Hkruin	1.00	m
Aantal delen	n	1000	st
Dichtheid water Hellevoetsluis	RH	1000	kg/m3
Dichtheid water Goidschalxoord	RG	1000	kg/m3
Dichtheid water	RW	1000	kg/m3
Afmeting deel	dS	0.07	m

Doek eigenschappen		
Breedte	1.00	m
Doek dikte	16.00	mm
Eigen gewicht doek	1082.00	kg/m3
Elasticiteit doek	5000000.00	kN/m2
Gewicht ds	1.14	kg
	11.19	N



Output

Belastingen				
Hoogwaterzijde			2`374	kN
Laagwaterzijde			1`589	kN
		Hverval	785	kN

Belasting per klemlijn op basis van trek				
	Punt B	Punt A	totaal	
RH	317.0	475.8	792.8	kN
RV	569.1	445.0	1`014.1	kN
Verschil verval en horizontal klemlijn		1%	8.02	kN

Berekende waardes				
Tenstion		T	651.47	kN/m2
			651470	N
Eind hoek	ϕB	h1	4.20	Rad
			240.9	Graden
			60.9	Graden
Start hoek	ϕA	h2	0.75	Rad
			43.1	Graden

Volumes	m3	%
Water	499.52	83.35%
Lucht	99.76	16.65%
Totaal	599.27	

Coordinaten	X	Y
Maxima	35.15	23.54
Vast punt 1	-	-
Vast punt 2	30.58	-
Onnauwkeurigheid	0.00	0.00
	0.00	0.00
Onnauwkeurigheid	0.46	0.02
Totaal	0.02	
Factor		0.55
Ybij X max	-	
X bij Y max		23.00

Afwijkingen	m	%
Hbalg	0.46	
X	0.00	0.00%
Y	0.00	0.00%
Hverval	8.02	6.80%
Totaal		0.00%

Vaste input
Vaste gegevens
Berekende variabelen a.h.v. solver
Berekende gegevens

Figure B.14.: Crest-height calculations with all optimized parameters