Aerospace Propulsion Products is the leading European company in designing and producing rocket ignition systems and spinoff products. One of their directors, Edwin Vermeulen, gave us an insight on the company and its future. He states that “whatever rocket technology is needed, we have the technology in house to provide the ignition systems.”

INTRODUCTION
Last October we visited Aerospace Propulsion Products (hereafter referred to as APP) in Klundert, Brabant. Here we met Edwin Vermeulen, one of the two directors of the company specialized in rocket igniters. Mr. Vermeulen, a mechanical engineer, gave us a tour of the facility and provided his personal insight into the company and the market. Edwin Vermeulen started his career at DAF trucks where he spent seven years designing and simulating truck engines. After that he worked at Stork as a project manager on rocket ignition systems. When several years later the design activities of Stork were transferred to APP, he became the director of engineering and marketing of the company.

ROCKET IGNITION SYSTEMS
APP was founded by TNO in the 80s for the development of the Ariane 5 rocket engine ignition system. Due to the large scale of the project it was decided to move the activities from a TNO laboratory to the premises of a munition factory near Bergen op Zoom. The development of Ariane 5 rocket igniters was accomplished together with TNO and Stork. The initial plan was to close the company after the project was completed. However, due to its success, APP was not closed down and they continued to work on rocket ignition systems. In 2005 the company grew when Stork decided to incorporate all product development activities into the company. In 2009 Stork decided to sell their shares of APP and therefore TNO is the single owner of the company. Nowadays, APP is a successful company specialized in the development and production of rocket ignition systems and spinoff products.

WHAT MAKES APP COMPETITIVE?
With over thirty years of experience in rocket ignition systems, APP has gained a lot of experience and managed innovations in both the production and design of these products. For example they provided the igniters for the first, second and third stages of the VEGA launcher that was launched just last year. This igniter uses novel carbon composite materials and parts that were made by additive manufacturing. Although this technology is still very new for space parts, APP already introduced 3D printing ten years ago in the production of their products. In general, APP has created many smaller innovations in both the production and design that have contributed to their success in providing the rocket ignition industry.

APP WITHIN THE ESA OBJECTIVE
APP has proven to be able to provide high-quality products to contractors such as Astrium, Avio, Snecma and ESA. However, being competitive is not the only requirement to succeed in the European space market. Any APP project for a European launcher also has to fit within the ESA objective that all the countries that have invested into space get some fair return for their industry. In the past, launcher projects have usually been developed entirely by a few large companies such as Astrium and Snecma. Edwin Vermeulen from APP believes it is more cost-effective to outsource work to specialized subcontractors. He states, “let us do it, it’s more cost efficient and you get better quality”. So far, APP has been very successful in providing these specialized products and the three big space companies (EADS Astrium, Snecma and Avio) are now their main customers.
ESA MINISTERIAL CONFERENCE 2012
The ESA ministerial conference is held every couple of years during which the member states discuss strategic plans and budgets for the coming years. The last conference, held in 2012, mainly focused on the launcher debate. The big question for ESA member states was whether to invest in an improvement of the Ariane 5 launcher or a complete new successor (i.e., Ariane 6). Questions posed were how it would be financed and organized, and especially how the development and production could be performed at the most cost-effective way. The discussion was not finished during the last conference and was subsequently decided to be tabled until 2014. However Edwin Vermeulen is positive about the situation. He believes that any scenario, whether an improvement of Ariane 5 or a successor, will give APP opportunities for new products and developments. He optimistically notes that “whatever rocket technology is needed, we have the technology to provide ignition systems”.

APP OUTSIDE EUROPE
It’s not easy to work outside Europe on rocket technology. First of all one has to understand the market differences on all levels. Second to that, it has to be a certainty that the exported rocket technology is only used for space applications. APP has established a business relation with South Korea ten years ago that is still ongoing. Ten years ago an opportunity presented itself when both parties found themselves interested in the cooperation. As Mr. Vermeulen stated: “We have done some work for the next generation launcher of South Korea, I’m not sure whether in the end it will be a commercial success for APP but we try at least.” Collaboration outside Europe is more challenging and time demanding, still APP explores and pursues opportunities outside it’s boundaries. The other country that APP is doing business development in is India.

SPINOFF PRODUCTS & OPPORTUNITIES
There are several ways in which APP applies its technology outside the space market. The civil market proved to have a need for the technology that APP has in-house. The technology of producing hot or cool gasses, stored in solid state, can be used for different purposes depending on the device used. Hot gas generators are among others used for ignition, turbine start-up, emergency situations including valves and fire extinguishing. The most successful spinoff product in this sequence is the gas generator for a dust explosion suppression system of the Belgian company StuvEx, which has been sold for over ten years. Together with TNO and a company called CGG Technologies (Cool Gas Generator), APP has developed a similar technology, the difference being that the resulting gas is at room temperature. Cool gas generators offer a whole new range of opportunities. They can be used for medical purposes (oxygen) or emergency actuation purposes (nitrogen, used for inflation, actuation, fire extinguishing, etc.). Edwin Vermeulen stated, “Our vision is that in five to ten years more than half of our turnover comes from this type of more industrial products, not used in space”.

APP has recently finalized the development of a new spinoff product in collaboration with TNO and ISIS (Innovative Solutions in Space). Since space debris is an increasing problem and launching nano-satellites is increasingly popular, there is an upcoming trend and a realization that nano-satellites need to have a means of de-orbiting as well. That’s why APP, TNO and ISIS have developed a small kick-stage unit which can accomplish this task.

OPPORTUNITIES FOR TUDELFT STUDENTS
There is always an opportunity for internships at APP. Master theses are not lying on the shelf at APP, but can be created for motivated candidates. Edwin Vermeulen stated, “I would really encourage people to at least try and contact us if you would like to do an internship, master thesis or to have a job here”. APP would also like to make a contribution to the aerospace engineering study. There is currently a discussion with some of the university responsible about the possibilities for APP to support the university, for example by creating dedicated projects.

References
APP website: http://www.appbv.nl