

APPENDIX

REWIRING FOR SUSTAINABILITY

**A circular redesign of ECG lead sets as a step
towards a more sustainable healthcare system**

***This appendix only presents the information that is allowed to
be shared. Confidential information is not shared here***

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July 2025

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B

SPU Cable

Materials & Man.	Mass (g)	Mass (kg)	Eco-intensity (impacts/kg)	Calculated Impact
Cables	33,20	0,03	0,973	0,032
Connectors	7,68	0,01	1,790	0,014
One-pin Connector	7,43	0,01	0,566	0,004
Manufacturing		0,05	2,334	0,113
				0,163

Transport	Mass (kg)	Distance (km)	Eco-intensity (impacts/ton-kg)	Calculated Impact
China to the Netherlands	0,05	7572,93	0,578	0,211

Use	Mass (g)	Mass (kg)	Eco-intensity (impacts/item)	Calculated Impact
10 Electrodes	16	0,02	4,510	0,072

End-of-life	Mass (kg)	Eco-intensity (impacts/kg)	Calculated Impact
Cables	0,03	1,141	0,038
Connectors	0,01	1,141	0,009
One-pin Connector	0,01	1,141	0,008
			0,055
		Total	0,502

MPU Cable

	Mass (g)	Mass (kg)	Eco-intensity (impacts/kg)	Calculated Impact
Cables	72,60	0,07	1,945	0,141
Connectors	21,40	0,02	3,580	0,077
One-pin Connector	18,30	0,02	1,133	0,021
Manufacturing		0,11	4,668	0,524
				0,763

Transport	Mass (kg)	Distance (km)	Eco-intensity (impacts/ton-kg)	Calculated Impact
China to the Netherlands	0,11	7572,93	0,578	0,491

Use	Mass (g)	Mass (kg)	Eco-intensity (impacts/item)	Calculated Impact
10 Electrodes	16	0,02	4,510	0,072
Water	250	0,25	0,001	0,000
Micro-fibre cloth	1	0,00	2,051	0,002
				0,074

End-of-life	Mass (kg)	Eco-intensity (impacts/kg)	Calculated Impact
Cables	0,07	2,283	0,166
Connectors	0,02	2,283	0,049
One-pin Connector	0,02	2,283	0,042
			0,256

Total	1,585
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Cycles 1

SPU impact = (Materials +
Transport + End of life)
*Cycles

MTE = 0,429

Cycle	SPU	Impact
0		0,00
1		0,43
2		0,86
3		1,29
4		1,72
5		2,15
6		2,58
7		3,01
8		3,44
9		3,87
10		4,29
11		4,72
12		5,15
13		5,58
14		6,01
15		6,44
16		6,87
17		7,30
18		7,73
19		8,16
20		8,59
21		9,02
22		9,45
23		9,88
24		10,31
25		10,74
26		11,17
27		11,60
28		12,03
29		12,46
30		12,88

$$\text{MPU impact} = (\text{Materials} + \text{Transport} + \text{End of life}) + \text{Use} * \text{Cycles}$$

MTE = 1,511
Use = 0,002

MPU	Impact
	1,51
	1,51
	1,52
	1,52
	1,52
	1,52
	1,53
	1,53
	1,53
	1,53
	1,53
	1,54
	1,54
	1,54
	1,54
	1,55
	1,55
	1,55
	1,55
	1,56
	1,56
	1,56
	1,57
	1,57
	1,57
	1,57
	1,58

Electrode impact =
Use*cycles

Use = 0,0722

Electrode Impact
0,00
0,07
0,14
0,22
0,29
0,36
0,43
0,51
0,58
0,65
0,72
0,79
0,87
0,94
1,01
1,08
1,15
1,23
1,30
1,37
1,44
1,52
1,59
1,66
1,73
1,80
1,88
1,95
2,02
2,09
2,17

SPU Cable						
	g	kg	Precentage	Eco-intensity (impacts/kg)	Material	Comments
Total weight	80	0,08				
Cable (10 cm)	0,83	0,00083				
Plastic outside	0,38	0,00038	46%	1,800	TPU	
Metal isolation	0,23	0,00023	28%	3,175	Copper wire	https://en.wikipedia.org/wiki/Shielded_cable
Cable inside cable						
Copper inside cable	0,11	0,00011	13%	3,175	Copper wire	
Second plastic layer	0,11	0,00011	13%	1,800		
Total Cable (6m)	49,8	0,0498				
1 Clamp Connector	3,07	0,00307				
Total Clamp Connectors	15,35	0,01535				
Digital connector	14,85	0,01485		1,800		
Label	0,25	0,00025				

MPU Cable						
	g	kg	Precentage	Eco-intensity (impacts/kg)	Material	Comments
Total weight	112,3	0,1123				
Cable (10 cm)	1,21	0,00121				
Plastic outside	0,45	0,00045	37%	1,800	TPU	
Metal isolation	0,35	0,00035	29%	3,175	Copper wire	https://en.wikipedia.org/wiki/Shielded_cable
Cable inside cable						
Copper inside cable	0,205	0,000205	17%	3,175	Copper wire	
Second plastic layer	0,205	0,000205	17%	1,800		
Total Cable (6m)	72,6	0,0726				
1 Clamp Connector	4,28	0,00428				
Total Clamp Connectors	21,4	0,0214				
Digital connector	18,30	0,0183		1,800		
Label	0,25	0,00025				

C

01.

ELEKTRODEN PLAKKEN AAN ELKAAR & KABELS IN DE KNOOP



02.

KABELS GAAN KAPOT



03.

VIEZE ECG KABELS



04.

KABELS RAKEN KWIJT TUSSEN AFDELINGEN

