

This appendix refers to the EPD MD-23160-EN, developed according to EN15804+A2:2019. Results in the appendix communicates LCA results in the format described in EN15804+A1:2013, in order to accommodate a need in the transition period between the two standard revisions. The appendix cannot stand alone, as the reference EPD describes the basis of the assessment.

Large actuators

ENVIRONMENTAL IMPACTS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	2.77E+01	0.00E+00	0.00E+00	0.00E+00	4.25E-02	1.63E+00	8.72E-05	-1.65E+01
ODP	[kg CFC11-eq.]	6.86E-11	0.00E+00	0.00E+00	0.00E+00	3.92E-18	9.98E-09	2.62E-19	-1.47E-14
AP	[kg SO ₂ -eq.]	1.70E-01	0.00E+00	0.00E+00	0.00E+00	3.66E-05	6.29E-04	5.02E-07	-5.78E-02
EP	[kg PO ₄ ³⁻ -eq.]	1.04E-02	0.00E+00	0.00E+00	0.00E+00	8.79E-06	2.25E-04	5.71E-08	-4.04E-03
POCP	[kg ethene-eq.]	1.15E-02	0.00E+00	0.00E+00	0.00E+00	-1.28E-06	5.46E-05	4.62E-08	-3.83E-03
ADPE	[kg Sb-eq.]	4.31E-03	0.00E+00	0.00E+00	0.00E+00	3.18E-09	6.23E-07	2.68E-11	-1.82E-04
ADPF	[MJ]	3.10E+02	0.00E+00	0.00E+00	0.00E+00	5.74E-01	2.44E+00	1.14E-03	-1.77E+02
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

RESOURCE USE PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.37E-03	1.06E+00	4.41E-05
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.37E-03	1.06E+00	4.41E-05
PENRE	[MJ]	7.72E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-01	7.37E-01	2.71E-04
PENRM	[MJ]	3.23E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.10E-02	0.00E+00
PENRT	[MJ]	7.75E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-01	7.16E-01	2.71E-04
SM	[kg]	7.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	4.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-05	3.99E-03	6.84E-08
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	-1.27E-07	0.00E+00	0.00E+00	0.00E+00	4.91E-13	-3.90E-10	5.89E-15	-1.71E-09
NHWD	[kg]	8.13E-01	0.00E+00	0.00E+00	0.00E+00	1.91E-05	5.88E-02	1.35E-03	-6.23E-01
RWD	[kg]	9.81E-03	0.00E+00	0.00E+00	0.00E+00	7.45E-07	2.04E-04	1.34E-08	-1.28E-02
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.32E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.59E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: 1,95*10 ² or 195, while 1,12E-11 is the same as 1,12*10 ⁻¹¹ or 0,0000000000112.								

Medium actuators

ENVIRONMENTAL IMPACTS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	3.08E+01	0.00E+00	0.00E+00	0.00E+00	2.63E-02	9.84E-01	9.47E-04	-9.21E+00
ODP	[kg CFC11-eq.]	5.84E-10	0.00E+00	0.00E+00	0.00E+00	2.42E-18	4.68E-09	1.84E-18	-1.05E-14
AP	[kg SO ₂ -eq.]	1.69E-01	0.00E+00	0.00E+00	0.00E+00	2.27E-05	3.18E-04	2.49E-06	-3.40E-02
EP	[kg PO ₄ ³⁻ -eq.]	1.07E-02	0.00E+00	0.00E+00	0.00E+00	5.44E-06	1.10E-04	2.23E-06	-2.28E-03
POCP	[kg ethene-eq.]	1.21E-02	0.00E+00	0.00E+00	0.00E+00	-7.93E-07	2.49E-05	2.47E-07	-2.14E-03
ADPE	[kg Sb-eq.]	9.33E-04	0.00E+00	0.00E+00	0.00E+00	1.97E-09	2.98E-07	1.41E-10	-1.33E-04
ADPF	[MJ]	3.20E+02	0.00E+00	0.00E+00	0.00E+00	3.55E-01	1.14E+00	1.35E-02	-1,01E+02
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources								
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RESOURCE USE PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	2.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-02	6.64E-01	5.99E-04
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.19E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-02	6.64E-01	5.99E-04
PENRE	[MJ]	1.51E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-01	1.18E+00	6.33E-03
PENRM	[MJ]	8.73E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.09E-01	0.00E+00
PENRT	[MJ]	1.52E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-01	6.75E-01	6.33E-03
SM	[kg]	8.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	8.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-05	3.82E-03	2.27E-07
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								
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WASTE CATEGORIES AND OUTPUT FLOWS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	1.20E-06	0.00E+00	0.00E+00	0.00E+00	5.99E-13	-2.25E-10	4.58E-13	-2.02E-09
NHWD	[kg]	1.92E+00	0.00E+00	0.00E+00	0.00E+00	2.33E-05	8.53E-02	7.80E-03	-6.91E-01
RWD	[kg]	5.37E-03	0.00E+00	0.00E+00	0.00E+00	4.61E-07	9.59E-05	1.52E-07	-7.50E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								
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Small actuators

ENVIRONMENTAL IMPACTS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	1.25E+01	0.00E+00	0.00E+00	0.00E+00	9.66E-03	1.95E-01	0.00E+00	-6.12E+00
ODP	[kg CFC11-eq.]	3.07E-11	0.00E+00	0.00E+00	0.00E+00	8.92E-19	8.98E-12	0.00E+00	-8.32E-15
AP	[kg SO ₂ -eq.]	6.18E-02	0.00E+00	0.00E+00	0.00E+00	8.34E-06	8.60E-05	0.00E+00	-2.07E-02
EP	[kg PO ₄ ³⁻ -eq.]	4.19E-03	0.00E+00	0.00E+00	0.00E+00	2.00E-06	1.03E-05	0.00E+00	-1.53E-03
POCP	[kg ethene-eq.]	4.66E-03	0.00E+00	0.00E+00	0.00E+00	-2.92E-07	5.48E-06	0.00E+00	-1.33E-03
ADPE	[kg Sb-eq.]	9.02E-04	0.00E+00	0.00E+00	0.00E+00	7.24E-10	2.36E-08	0.00E+00	-4.13E-05
ADPF	[MJ]	1.24E+02	0.00E+00	0.00E+00	0.00E+00	1.31E-01	2.43E-01	0.00E+00	-6.64E+01
Caption	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources								
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RESOURCE USE PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	1.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.66E-03	5.98E-01	0.00E+00
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.20E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.66E-03	5.98E-01	0.00E+00
PENRE	[MJ]	9.39E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.44E-02	1.89E-01	0.00E+00
PENRM	[MJ]	2.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.76E-03	0.00E+00
PENRT	[MJ]	9.42E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.44E-02	1.83E-01	0.00E+00
SM	[kg]	6.36E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	3.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.34E-06	3.49E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water								
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WASTE CATEGORIES AND OUTPUT FLOWS PER KG									
Parameter	Unit	A1-A3	A4-A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	-3.25E-07	0.00E+00	0.00E+00	0.00E+00	3.49E-13	-2.40E-10	0.00E+00	-2.17E-09
NHWD	[kg]	1.31E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-05	5.19E-02	0.00E+00	-8.68E-01
RWD	[kg]	2.67E-03	0.00E+00	0.00E+00	0.00E+00	1.70E-07	3.53E-06	0.00E+00	-5.68E-03

CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.51E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.74E-01
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.23E-01
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy								
	The numbers are declared in scientific notation. fx 1.95E+02. This number can also be written as: 1.95*10 ² or 195. while 1.12E-11 is the same as 1.12*10 ⁻¹¹ or 0.0000000000112.								

Checked and approved by



Guangli Du
Third party verifier of MD-23160-EN



Martha Katrine Sørensen
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