

This appendix refers to the EPD MD-23060-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.

ENVIRONMENTAL IMPACTS PER 1 M ² of B60 Grafit									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	1.34E+00	4.01E-02	3.15E-02	0.00E+00	7.09E-04	1.37E+00	0.00E+00	-4.53E-01
ODP	[kg CFC11-eq.]	7.83E-10	4.78E-15	1.49E-15	0.00E+00	8.47E-17	6.42E-14	0.00E+00	-3.69E-12
AP	[kg SO ₂ -eq.]	2.05E-03	4.01E-05	1.72E-06	0.00E+00	6.24E-07	7.28E-05	0.00E+00	-6.32E-04
EP	[kg PO ₄ ³⁻ -eq.]	3.11E-04	8.59E-06	3.83E-07	0.00E+00	1.30E-07	1.62E-05	0.00E+00	-1.21E-04
POCP	[kg ethene-eq.]	9.52E-03	-3.22E-06	1.79E-07	0.00E+00	-2.14E-08	7.68E-06	0.00E+00	-6.73E-05
ADPE	[kg Sb-eq.]	2.78E-07	4.17E-09	3.47E-11	0.00E+00	7.40E-11	1.38E-09	0.00E+00	-1.11E-07
ADPF	[MJ]	3.61E+01	5.36E-01	3.26E-03	0.00E+00	9,51E-03	1.25E-01	0.00E+00	-4.73E+00
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, e.g., 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 1 M ² of B60 Grafit									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.53E+00	3.76E-02	8.37E-04	3.53E+00	3.76E-02	8.37E-04	3.53E+00	3.76E-02
PERM	[MJ]	6.97E-02	0.00E+00	0.00E+00	6.97E-02	0.00E+00	0.00E+00	6.97E-02	0.00E+00
PERT	[MJ]	3.60E+00	3.76E-02	8.37E-04	3.60E+00	3.76E-02	8.37E-04	3.60E+00	3.76E-02
PENRE	[MJ]	3.66E+01	5.45E-01	3.81E-03	3.66E+01	5.45E-01	3.81E-03	3.66E+01	5.45E-01
PENRM	[MJ]	1.54E+01	0.00E+00	0.00E+00	1.54E+01	0.00E+00	0.00E+00	1.54E+01	0.00E+00
PENRT	[MJ]	5.20E+01	5.45E-01	3.81E-03	5.20E+01	5.45E-01	3.81E-03	5.20E+01	5.45E-01
SM	[kg]	1.81E-02	0.00E+00	0.00E+00	1.81E-02	0.00E+00	0.00E+00	1.81E-02	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]	6.85E-03	4.34E-05	6.10E-05	6.85E-03	4.34E-05	6.10E-05	6.85E-03	4.34E-05
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 = Net use of fresh water								
	The numbers are declared in scientific notation, e.g., 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 1 M ² of B60 Grafit									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	2.12E-09	2.88E-12	3.26E-13	0.00E+00	0.00E+00	1.40E-11	0.00E+00	-1.18E-09

NHWD	[kg]	9.23E-03	8.87E-05	1.15E-04	0.00E+00	0.00E+00	4.95E-03	0.00E+00	-1.82E-02
RWD	[kg]	1.06E-04	1.01E-06	2.09E-07	0.00E+00	0.00E+00	8.98E-06	0.00E+00	-1.83E-04

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]	1.50E-02	0.00E+00	2.15E-03	0.00E+00	0.00E+00	0.00E+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]	7.85E-04	0.00E+00	5.80E-02	0.00E+00	0.00E+00	2.47E+00	0.00E+00	0.00E+00
EET	[MJ]	1.41E-03	0.00E+00	1.03E-01	0.00E+00	0.00E+00	4.39E+00	0.00E+00	0.00E+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, e.g., 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.								

ENVIRONMENTAL IMPACTS PER 1 M² B80 Grafit

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	1.41E+00	3.45E-02	3.88E-02	0.00E+00	0.00E+00	7.67E-04	1.48E+00	0.00E+00	-5.01E-01
ODP	[kg CFC11-eq.]	1.15E-09	4.11E-15	1.85E-15	0.00E+00	0.00E+00	9.16E-17	6.94E-14	0.00E+00	-4.07E-12
AP	[kg SO ₂ -eq.]	2.11E-03	3.44E-05	2.15E-06	0.00E+00	0.00E+00	6.75E-07	7.86E-05	0.00E+00	-6.98E-04
EP	[kg PO ₄ ³⁻ -eq.]	3.34E-04	7.37E-06	4.79E-07	0.00E+00	0.00E+00	1.40E-07	1.75E-05	0.00E+00	-1.33E-04
POCP	[kg ethene-eq.]	1.04E-02	-2.73E-06	2.23E-07	0.00E+00	0.00E+00	-2.32E-08	8.30E-06	0.00E+00	-7.46E-05
ADPE	[kg Sb-eq.]	3.67E-07	3.59E-09	4.41E-11	0.00E+00	0.00E+00	8.00E-11	1.49E-09	0.00E+00	-1.23E-07
ADPF	[MJ]	3.90E+01	4.61E-01	4.17E-03	0.00E+00	0.00E+00	1.03E-02	1.35E-01	0.00E+00	-5.34E+00
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, e.g., 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 1 M² of B80 Grafit

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	3.51E+00	3.24E-02	1.05E-03	0.00E+00	7.21E-04	3.78E-02	0.00E+00	-7.19E+00
PERM	[MJ]	7.21E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	3.58E+00	3.24E-02	1.05E-03	0.00E+00	7.21E-04	3.78E-02	0.00E+00	-7.19E+00
PENRE	[MJ]	3.97E+01	4.69E-01	4.86E-03	0.00E+00	1.04E-02	1.60E-01	0.00E+00	-5.94E+00
PENRM	[MJ]	1.67E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.64E+01	4.69E-01	4.86E-03	0.00E+00	1.04E-02	1.60E-01	0.00E+00	-5.94E+00
SM	[kg]	1.53E-02	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]	7.44E-03	3.74E-05	7.60E-05	0.00E+00	8.33E-07	2.82E-03	0.00E+00	-2.60E-03
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 = Net use of fresh water								
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WASTE CATEGORIES AND OUTPUT FLOWS PER 1 M² of B80 Grafit

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	2.33E-09	2.48E-12	4.05E-13	0.00E+00	5.53E-14	1.51E-11	0.00E+00	-1.31E-09
NHWD	[kg]	9.73E-03	7.64E-05	1.43E-04	0.00E+00	1.70E-06	5.35E-03	0.00E+00	-2.00E-02
RWD	[kg]	1.14E-04	8.70E-07	2.59E-07	0.00E+00	1.94E-08	9.71E-06	0.00E+00	-2.02E-04

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]	6.11E-03	0.00E+00	4.70E-03	0.00E+00	0.00E+00	0.00E+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]	2.62E-04	0.00E+00	7.27E-02	0.00E+00	0.00E+00	2.67E+00	0.00E+00	0.00E+00
EET	[MJ]	4.70E-04	0.00E+00	1.29E-01	0.00E+00	0.00E+00	4.75E+00	0.00E+00	0.00E+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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ENVIRONMENTAL IMPACTS PER M² of B150 Grafit

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	1.99E+00	3.60E-02	1.94E-02	0.00E+00	0.00E+00	1.24E-03	2.39E+00	0.00E+00	-7.99E-01
ODP	[kg CFC11-eq.]	1.38E-09	4.30E-15	9.42E-16	0.00E+00	0.00E+00	1.48E-16	1.12E-13	0.00E+00	-6.49E-12
AP	[kg SO ₂ -eq.]	3.22E-03	3.53E-05	1.16E-06	0.00E+00	0.00E+00	1.09E-06	1.27E-04	0.00E+00	-1.11E-03
EP	[kg PO ₄ ³⁻ -eq.]	4.65E-04	7.53E-06	2.57E-07	0.00E+00	0.00E+00	2.26E-07	2.83E-05	0.00E+00	-2.11E-04
POCP	[kg ethene-eq.]	1.66E-02	-2.59E-06	1.11E-07	0.00E+00	0.00E+00	-3.74E-08	1.34E-05	0.00E+00	-1.20E-04
ADPE	[kg Sb-eq.]	4.59E-07	3.75E-09	3.03E-11	0.00E+00	0.00E+00	1.29E-10	2.40E-09	0.00E+00	-1.96E-07
ADPF	[MJ]	5.83E+01	4.82E-01	3.14E-03	0.00E+00	0.00E+00	1.66E-02	2.18E-01	0.00E+00	-8.89E+00
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 M² of B150 Grafit

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	5.80E+00	3.38E-02	6.01E-04	0.00E+00	1.16E-03	6.10E-02	0.00E+00	-1.13E+01
PERM	[MJ]	1.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	5.92E+00	3.38E-02	6.01E-04	0.00E+00	1.16E-03	6.10E-02	0.00E+00	-1.13E+01
PENRE	[MJ]	5.93E+01	4.90E-01	3.51E-03	0.00E+00	1.68E-02	2.59E-01	0.00E+00	-9.84E+00
PENRM	[MJ]	2.68E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	8.61E+01	4.90E-01	3.51E-03	0.00E+00	1.68E-02	2.59E-01	0.00E+00	-9.84E+00
SM	[kg]	3.17E-02	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]	1.16E-02	3.91E-05	3.87E-05	0.00E+00	1.34E-06	4.55E-03	0.00E+00	-4.14E-03
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 = Net use of fresh water								
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WASTE CATEGORIES AND OUTPUT FLOWS PER 1 M² of B150 Grafit

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	3.68E-09	2.59E-12	2.10E-13	0.00E+00	8.91E-14	2.44E-11	0.00E+00	-2.10E-09
NHWD	[kg]	1.54E-02	7.98E-05	7.25E-05	0.00E+00	2.74E-06	8.64E-03	0.00E+00	-3.16E-02
RWD	[kg]	1.75E-04	9.09E-07	1.33E-07	0.00E+00	3.13E-08	1.57E-05	0.00E+00	-3.21E-04
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]	1.80E-02	0.00E+00	1.50E-02	0.00E+00	0.00E+00	0.00E+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]	1.31E-03	0.00E+00	3.79E-02	0.00E+00	0.00E+00	4.30E+00	0.00E+00	0.00E+00
EET	[MJ]	2.35E-03	0.00E+00	6.54E-02	0.00E+00	0.00E+00	7.66E+00	0.00E+00	0.00E+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, e.g., 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


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