

This appendix refers to the EPD MD-20009-EN, revision 2, 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.

Results per functional unit – System 1

PTM BituFlex (top layer) & PTM DuraFlex Kombi (bottom layer)

ENVIRONMENTAL IMPACTS PER [m2 installed 2-layer roof waterproofing during 60 years]																				
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration			
													C2	C3	C4	D	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	3,52E+00	1,02E-01	1,88E+00	0	0	0	3,37E+00	0	0	0	0	1,63E-01	0	0	-1,79E+00	7,17E-02	2,40E+01	9,79E-03	-8,99E+00
ODP	[kg CFC11-eq.]	8,73E-08	2,54E-17	1,29E-07	0	0	0	1,50E-07	0	0	0	0	4,06E-17	0	0	-6,66E-08	1,78E-17	1,02E-07	1,59E-09	-2,08E-08
AP	[kg SO ₂ -eq.]	1,36E-02	8,91E-05	4,22E-03	0	0	0	1,00E-02	0	0	0	0	1,42E-04	0	0	-2,28E-02	6,25E-05	6,78E-03	7,20E-05	-1,32E-02
EP	[kg PO ₄ ³⁻ -eq.]	1,48E-03	1,66E-05	6,63E-04	0	0	0	1,12E-03	0	0	0	0	2,65E-05	0	0	4,25E-04	1,17E-05	1,57E-03	1,73E-05	-1,04E-03
POCP	[kg ethene-eq.]	6,85E-03	-1,25E-06	1,27E-03	0	0	0	4,71E-03	0	0	0	0	-1,99E-06	0	0	-1,83E-02	-8,77E-07	3,84E-04	8,53E-06	-6,44E-03
ADPE	[kg Sb-eq.]	1,57E-06	8,42E-09	1,19E-05	0	0	0	1,89E-06	0	0	0	0	1,34E-08	0	0	7,03E-07	5,91E-09	1,17E-05	1,46E-08	-1,34E-06
ADPF	[MJ]	2,68E+02	1,39E+00	4,89E+01	0	0	0	1,87E+02	0	0	0	0	2,21E+00	0	0	-6,28E+02	9,72E-01	5,45E+00	1,33E-01	-3,15E+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																			

RESOURCE USE PER [m2 installed 2-layer roof waterproofing during 60 years]																				
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration			
													C2	C3	C4	D	C2	C3	C4	D
PERE	[MJ]	1,71E+01	8,02E-02	2,43E+00	0	0	0	1,03E+01	0	0	0	0	1,28E-01	0	0	-1,67E+00	5,63E-02	2,38E-01	1,02E-03	-6,09E+01
PERM	[MJ]	7,20E-01	0	8,64E-02	0	0	0	4,03E-01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	[MJ]	1,78E+01	8,02E-02	2,52E+00	0	0	0	1,07E+01	0	0	0	0	1,28E-01	0	0	-1,67E+00	5,63E-02	2,38E-01	1,02E-03	-6,09E+01
PENRE	[MJ]	8,19E+01	1,39E+00	2,68E+01	0	0	0	6,80E+01	0	0	0	0	2,22E+00	0	0	-1,21E+02	9,77E-01	2,01E+02	1,34E-01	-1,62E+02
PENRM	[MJ]	2,02E+02	0	2,42E+01	0	0	0	1,29E+02	0	0	0	0	0	0	0	-5,45E+02	0	0	0	-1,70E+02
PENRT	[MJ]	2,84E+02	1,39E+00	5,10E+01	0	0	0	1,97E+02	0	0	0	0	2,22E+00	0	0	-6,66E+02	9,77E-01	5,76E+00	1,34E-01	-3,32E+02
SM	[kg]	2,04E-01	0	2,47E-02	0	0	0	9,31E-02	0	0	0	0	0	0	0	0,00E+00	0	0	0	0,00E+00
RSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	[m³]	1,69E-02	9,34E-05	6,54E-03	0	0	0	9,99E-03	0	0	0	0	1,49E-04	0	0	-4,91E-03	6,56E-05	1,32E-02	7,23E-06	-2,87E-02
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																			

WASTE CATEGORIES AND OUTPUT FLOWS PER [m2 installed 2-layer roof waterproofing during 60 years]																				
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration			
													C2	C3	C4	D	C2	C3	C4	D
HWD	[kg]	1,42E-07	6,44E-08	2,89E-08	0	0	0	1,51E-07	0	0	0	0	1,03E-07	0	0	8,10E-10	4,52E-08	0	0	-7,96E-08
NHWD	[kg]	4,90E-02	2,21E-04	7,99E-03	0	0	0	2,32E-02	0	0	0	0	3,52E-04	0	0	7,37E-01	1,55E-04	0	0	8,93E-02
RWD	[kg]	1,12E-03	2,57E-06	9,93E-05	0	0	0	7,22E-04	0	0	0	0	4,09E-06	0	0	-3,73E-05	1,80E-06	0	0	-2,19E-03
CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	[kg]	0	0	1,14E-01	0	0	0	1,56E-01	0	0	0	0	0	1,45E+01	0	0	0	4,35E+00	0	0
MER	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	[MJ]	0	0	4,49E-01	0	0	0	2,69E-01	0	0	0	0	0	0	0	0	0	3,95E+01	0	0
EET	[MJ]	0	0	8,68E-01	0	0	0	5,19E-01	0	0	0	0	0	0	0	0	0	7,64E+01	0	0
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																			

Results per functional unit – System 2

PTM BituFlex Kombi (top layer) & PTM DuraFlex (bottom layer)

ENVIRONMENTAL IMPACTS PER [m2 installed 2-layer roof waterproofing during 60 years]																				
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration			
													C2	C3	C4	D	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	3,85E+00	1,02E-01	1,92E+00	0	0	0	3,48E+00	0	0	0	0	1,64E-01	0	0	-1,80E+00	7,21E-02	2,41E+01	9,85E-03	-9,04E+00
ODP	[kg CFC11-eq.]	7,26E-08	2,54E-17	1,26E-07	0	0	0	1,54E-07	0	0	0	0	4,08E-17	0	0	-6,70E-08	1,79E-17	1,02E-07	1,60E-09	-2,10E-08
AP	[kg SO ₂ -eq.]	1,39E-02	8,91E-05	4,13E-03	0	0	0	1,07E-02	0	0	0	0	1,43E-04	0	0	-2,29E-02	6,29E-05	6,82E-03	7,24E-05	-1,33E-02
EP	[kg PO ₄ ³⁻ -eq.]	1,27E-03	1,66E-05	6,30E-04	0	0	0	1,15E-03	0	0	0	0	2,66E-05	0	0	4,28E-04	1,17E-05	1,58E-03	1,74E-05	-1,05E-03
POCP	[kg ethene-eq.]	7,09E-03	-1,25E-06	1,28E-03	0	0	0	4,95E-03	0	0	0	0	-2,00E-06	0	0	-1,84E-02	-8,82E-07	3,86E-04	8,58E-06	-6,48E-03
ADPE	[kg Sb-eq.]	1,05E-06	8,42E-09	1,18E-05	0	0	0	1,93E-06	0	0	0	0	1,35E-08	0	0	7,07E-07	5,94E-09	1,18E-05	1,47E-08	-1,35E-06
ADPF	[MJ]	2,80E+02	1,39E+00	5,00E+01	0	0	0	1,95E+02	0	0	0	0	2,22E+00	0	0	-6,31E+02	9,78E-01	5,48E+00	1,34E-01	-3,16E+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																			

RESOURCE USE PER [m2 installed 2-layer roof waterproofing during 60 years]																				
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration			
													C2	C3	C4	D	C2	C3	C4	D
PERE	[MJ]	1,83E+01	8,02E-02	2,52E+00	0	0	0	1,07E+01	0	0	0	0	1,29E-01	0	0	-1,68E+00	5,66E-02	2,39E-01	1,03E-03	-6,12E+01
PERM	[MJ]	5,99E-01	0	7,18E-02	0	0	0	3,35E-01	0	0	0	0	0	0	0	0	0	0	0	0
PERT	[MJ]	1,89E+01	8,02E-02	2,59E+00	0	0	0	1,11E+01	0	0	0	0	1,29E-01	0	0	-1,68E+00	5,66E-02	2,39E-01	1,03E-03	-6,12E+01
PENRE	[MJ]	9,28E+01	1,39E+00	2,76E+01	0	0	0	7,21E+01	0	0	0	0	2,23E+00	0	0	-1,24E+02	9,82E-01	5,79E+00	1,35E-01	-1,63E+02
PENRM	[MJ]	2,05E+02	0	2,46E+01	0	0	0	1,34E+02	0	0	0	0	0	0	0	-5,46E+02	0	0	0	-1,71E+02
PENRT	[MJ]	2,98E+02	1,39E+00	5,22E+01	0	0	0	2,06E+02	0	0	0	0	2,23E+00	0	0	-6,70E+02	9,82E-01	5,79E+00	1,35E-01	-3,34E+02
SM	[kg]	1,73E-01	0	2,07E-02	0	0	0	1,00E-01	0	0	0	0	0	0	0	0,00E+00	0	0	0	0,00E+00
RSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FW	[m ³]	1,51E-02	9,34E-05	6,34E-03	0	0	0	1,04E-02	0	0	0	1,50E-04	0	0	-4,94E-03	6,59E-05	1,33E-02	7,27E-06	-2,88E-02
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																		

WASTE CATEGORIES AND OUTPUT FLOWS PER [m2 installed 2-layer roof waterproofing during 60 years]																					
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	100% recycling				30% recycling, 70% incineration				
													C2	C3	C4	D	C2	C3	C4	D	
HWD	[kg]	1,56E-07	6,44E-08	3,04E-08	0	0	0	1,59E-07	0	0	0	0	1,03E-07	0	0	8,15E-10	4,54E-08	0	0	-8,01E-08	
NHWD	[kg]	5,65E-02	2,21E-04	8,83E-03	0	0	0	2,87E-02	0	0	0	0	3,54E-04	0	0	7,42E-01	1,56E-04	0	0	9,00E-02	
RWD	[kg]	1,28E-03	2,57E-06	9,74E-05	0	0	0	7,69E-04	0	0	0	0	4,12E-06	0	0	-3,76E-05	1,81E-06	0	0	-2,20E-03	
CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MFR	[kg]	0	0	1,09E-01	0	0	0	1,66E-01	0	0	0	0	0	1,46E+01	0	0	0	0	4,38E+00	0	0
MER	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EEE	[MJ]	0	0	4,49E-01	0	0	0	2,73E-01	0	0	0	0	0	0	0	0	0	0	3,97E+01	0	0
EET	[MJ]	0	0	8,68E-01	0	0	0	5,28E-01	0	0	0	0	0	0	0	0	0	0	7,68E+01	0	0
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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