

This appendix refers to the EPD MD-20009-EN, revision 1, 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 [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO <sub>2</sub> -eq.]	3,71E+00	1,02E-01	1,90E+00	0	0	0	3,45E+00	0	0	0	0	7,17E-02	2,40E+01	9,79E-03	-8,68E+00
ODP	[kg CFC11-eq.]	8,38E-08	2,54E-17	1,29E-07	0	0	0	1,50E-07	0	0	0	0	1,78E-17	1,02E-07	1,59E-09	-5,88E-10
AP	[kg SO <sub>2</sub> -eq.]	1,30E-02	8,91E-05	4,15E-03	0	0	0	9,71E-03	0	0	0	0	6,25E-05	6,78E-03	7,20E-05	-9,85E-03
EP	[kg PO <sub>4</sub> <sup>3-</sup> -eq.]	1,20E-03	1,66E-05	6,28E-04	0	0	0	9,86E-04	0	0	0	0	1,17E-05	1,57E-03	1,73E-05	-1,02E-03
POCP	[kg ethene-eq.]	6,85E-03	-1,25E-06	1,27E-03	0	0	0	4,70E-03	0	0	0	0	-8,77E-07	3,84E-04	8,53E-06	-4,03E-03
ADPE	[kg Sb-eq.]	1,32E-06	8,42E-09	1,18E-05	0	0	0	1,78E-06	0	0	0	0	5,91E-09	1,17E-05	1,46E-08	-1,33E-06
ADPF	[MJ]	2,72E+02	1,39E+00	4,94E+01	0	0	0	1,88E+02	0	0	0	0	9,72E-01	5,45E+00	1,33E-01	-2,32E+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 [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	9,53E+00	8,02E-02	1,51E+00	0	0	0	5,98E+00	0	0	0	0	5,63E-02	2,38E-01	1,02E-03	-6,08E+01
PERM	[MJ]	7,20E-01	0	8,64E-02	0	0	0	4,03E-01	0	0	0	0	0	0	0	0
PERT	[MJ]	1,02E+01	8,02E-02	1,60E+00	0	0	0	6,38E+00	0	0	0	0	5,63E-02	2,38E-01	1,02E-03	-6,08E+01
PENRE	[MJ]	8,65E+01	1,39E+00	2,74E+01	0	0	0	6,99E+01	0	0	0	0	9,77E-01	5,76E+00	1,34E-01	-2,45E+02
PENRM	[MJ]	2,02E+02	0	2,42E+01	0	0	0	1,29E+02	0	0	0	0	0	0	0	0
PENRT	[MJ]	2,88E+02	1,39E+00	5,16E+01	0	0	0	1,99E+02	0	0	0	0	9,77E-01	5,76E+00	1,34E-01	-2,45E+02
SM	[kg]	1,77E-01	0,00E+00	2,14E-02	0	0	0	9,31E-02	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	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
FW	[m <sup>3</sup> ]	1,55E-02	9,34E-05	6,38E-03	0	0	0	9,09E-03	0	0	0	0	6,56E-05	1,32E-02	7,23E-06	-2,79E-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 = Use of net fresh water															

WASTE CATEGORIES AND OUTPUT FLOWS PER [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1,32E-07	6,44E-08	2,75E-08	0	0	0	1,46E-07	0	0	0	0	4,52E-08	0,00E+00	0,00E+00	-7,37E-08
NHWD	[kg]	4,47E-02	2,21E-04	7,47E-03	0	0	0	1,98E-02	0	0	0	0	1,55E-04	0,00E+00	0,00E+00	2,06E+00
RWD	[kg]	1,17E-03	2,57E-06	1,06E-04	0	0	0	7,17E-04	0	0	0	0	1,80E-06	0,00E+00	0,00E+00	-2,18E-03

CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	[kg]	1,50E-01	0,00E+00	1,14E-01	0	0	0	1,56E-01	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EET	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	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 [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO <sub>2</sub> -eq.]	3,99E+00	1,02E-01	1,94E+00	0	0	0	3,56E+00	0	0	0	0	7,21E-02	2,41E+01	9,85E-03	-8,73E+00
ODP	[kg CFC11-eq.]	7,26E-08	2,54E-17	1,26E-07	0	0	0	1,54E-07	0	0	0	0	1,79E-17	1,02E-07	1,60E-09	-5,95E-10
AP	[kg SO <sub>2</sub> -eq.]	1,32E-02	8,91E-05	4,06E-03	0	0	0	1,03E-02	0	0	0	0	6,29E-05	6,82E-03	7,24E-05	-9,93E-03
EP	[kg PO <sub>4</sub> <sup>3-</sup> -eq.]	1,03E-03	1,66E-05	6,02E-04	0	0	0	1,02E-03	0	0	0	0	1,17E-05	1,58E-03	1,74E-05	-1,02E-03
POCP	[kg ethene-eq.]	7,08E-03	-1,25E-06	1,28E-03	0	0	0	4,94E-03	0	0	0	0	-8,82E-07	3,86E-04	8,58E-06	-4,07E-03
ADPE	[kg Sb-eq.]	8,53E-07	8,42E-09	1,18E-05	0	0	0	1,82E-06	0	0	0	0	5,94E-09	1,18E-05	1,47E-08	-1,34E-06
ADPF	[MJ]	2,83E+02	1,39E+00	5,03E+01	0	0	0	1,97E+02	0	0	0	0	9,78E-01	5,48E+00	1,34E-01	-2,34E+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 [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1,04E+01	8,02E-02	1,58E+00	0	0	0	6,30E+00	0	0	0	0	5,66E-02	2,39E-01	1,03E-03	-6,11E+01
PERM	[MJ]	5,99E-01	0	7,18E-02	0	0	0	3,35E-01	0	0	0	0	0	0	0	0
PERT	[MJ]	1,10E+01	8,02E-02	1,65E+00	0	0	0	6,64E+00	0	0	0	0	5,66E-02	2,39E-01	1,03E-03	-6,11E+01
PENRE	[MJ]	9,56E+01	1,39E+00	2,79E+01	0	0	0	7,37E+01	0	0	0	0	9,82E-01	5,79E+00	1,35E-01	-2,47E+02
PENRM	[MJ]	2,05E+02	0	2,46E+01	0	0	0	1,34E+02	0	0	0	0	0	0	0	0
PENRT	[MJ]	3,01E+02	1,39E+00	5,25E+01	0	0	0	2,08E+02	0	0	0	0	9,82E-01	5,79E+00	1,35E-01	-2,47E+02
SM	[kg]	1,73E-01	0,00E+00	2,07E-02	0	0	0	1,00E-01	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	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
FW	[m <sup>3</sup> ]	1,35E-02	9,34E-05	6,14E-03	0	0	0	9,44E-03	0	0	0	0	6,59E-05	1,33E-02	7,27E-06	-2,81E-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 = Use of net fresh water															

WASTE CATEGORIES AND OUTPUT FLOWS PER [m <sup>2</sup> installed 2-layer roof waterproofing during 60 years]																
Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	1,48E-07	6,44E-08	2,94E-08	0	0	0	1,54E-07	0	0	0	0	4,54E-08	0,00E+00	0,00E+00	-7,40E-08
NHWD	[kg]	5,04E-02	2,21E-04	8,10E-03	0	0	0	2,52E-02	0	0	0	0	1,56E-04	0,00E+00	0,00E+00	2,08E+00
RWD	[kg]	1,27E-03	2,57E-06	9,62E-05	0	0	0	7,63E-04	0	0	0	0	1,81E-06	0,00E+00	0,00E+00	-2,19E-03

CRU	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MFR	[kg]	1,77E-01	0,00E+00	1,09E-01	0	0	0	1,66E-01	0	0	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EEE	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EET	[MJ]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy															

Checked and approved by



Guangli Du  
Third party verifier of MD-20009-EN\_rev1



Henrik Fred Larsen  
EPD Danmark