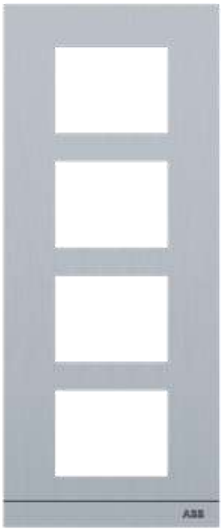
PRODUCTS FAMILY DECLARATION FOR OS FRAME(ALUMINUM) OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration



ORGANIZATION	WEBSITE
ABB Xiamen Smart Technology Co., Ltd	https://new.abb.com/cn/en/about/businesses/electrification/xiamen-smart-technology-co
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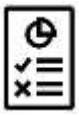
ABB Purpose & Embedding Sustainability

ABB is demonstrating their commitment to sustainability by making themselves sustainable. Across their own operations and value chain, aspiring to become a role model for others to follow. With **ABB Purpose** ABB is focusing on reducing harmful emissions, preserving natural resources, and championing ethical and humane behavior to achieve this. Detail info see the website: Sustainability strategy 2030 — ABB Group (global.abb)



General Information

Reference product	The refence product is one unit of OS frame produced by ABB, the representative product is 41394CF-A (SAP Number: 2TMA200160A0015).
Description of the product	The OS frame is an important part of video outdoor station which is the component of the wire bus door entry system produced by ABB XM. Through the OS frame, different functional modules (e.g., touch screen, transponder, keypad) can be fixed in the video outdoor station and to achieve the function of communication between the guests outside the building and the residents in the buildings.
Functional unit of the representative product	Protect people from direct contact with live active parts and ensure the grouping of control, command and protection devices in a single unequipped cabinet having the following dimensions 0.349 m x 0.135 m x 0.205 m while protecting them against mechanical impacts (IK07) and the penetration of solid objects and liquids (IP54), according to the appropriate use scenario, and for the reference service life of the product of 20 years.
Products concerned	Aluminum alloy is the main raw material of the product, accounting over 80% of the net weight of the product. The products covered by this PEP are: 41393CF-A(2TMA200160A0013),41393CF-A-03(2TMA200160A0033), 41393CF-B(2TMA220161B1002),41393CF-B-03(2TMA220160B1002), 41393CF-W-03(2TMA220160W0008),41394CF-A(2TMA200160A0015), 41394CF-A-03(2TMA200160A0034),41394CF-B(2TMA220161B1003), 41394CF-B-03(2TMA220160B1003),41395CF-A(2TMA200160A0017), 41395CF-A-03(2TMA200160A0035),41383CF-A(2TMA200160A0003), 41383CF-A-03(2TMA200160A0028),41383CF-B(2TMA220161B1004), 41383CF-B-03(2TMA220160B1004),41384CF-A(2TMA200160A0005), 41384CF-A-03(2TMA200160A0029),41384CF-B(2TMA220161B1005), 41384CF-B-03(2TMA220160B1005),41385CF-A(2TMA200160A0007), 41385CF-A-03(2TMA200160A0030),41385CF-B(2TMA220161B1006), 41385CF-B-03(2TMA220160B1006),41386CF-A(2TMA200160A0009), 41386CF-A-03(2TMA200160A0031),41386CF-W-03(2TMA220160W0012), 41388CF-A(2TMA220161A0010),41388CF-W-03(2TMA220160W0013), 41388CF-A-03(2TMA220160A0008),413810CF-A(2TMA220161A0011), 413810CF-A-03(2TMA220160A0009),413812CF-A-03(2TMA220160A0010), 413812CF-W-03(2TMA220160W0014),41391CF-A(2TMA220160A0003), 41392CF-A(2TMA200160A0011),41392CF-A-03(2TMA200160A0032), 41392CF-B(2TMA220161B1001),41392CF-B-03(2TMA220160B1001), 41392CF-W-03(2TMA220160W0007),41396CF-A(2TMA200160A0019), 41396CF-A-03(2TMA200160A0036),41396CF-W-03(2TMA220160W0009), 41398CF-A(2TMA220160A0004),41398CF-A(2TMA220161A0008), 41398CF-A-03(2TMA220160A0005),41398CF-W-03(2TMA220160W0010), 413910CF-A(2TMA220161A0009),413910CF-A-03(2TMA220160A0006), 413912CF-A-03(2TMA220160A0007),413912CF-W-03(2TMA220160W0011).

Constituent materials

Total weight of Reference product	Net weight of the product is 405.2 g. The total weight of packaged product is 558.2 g (including product packaging and transportation packaging).

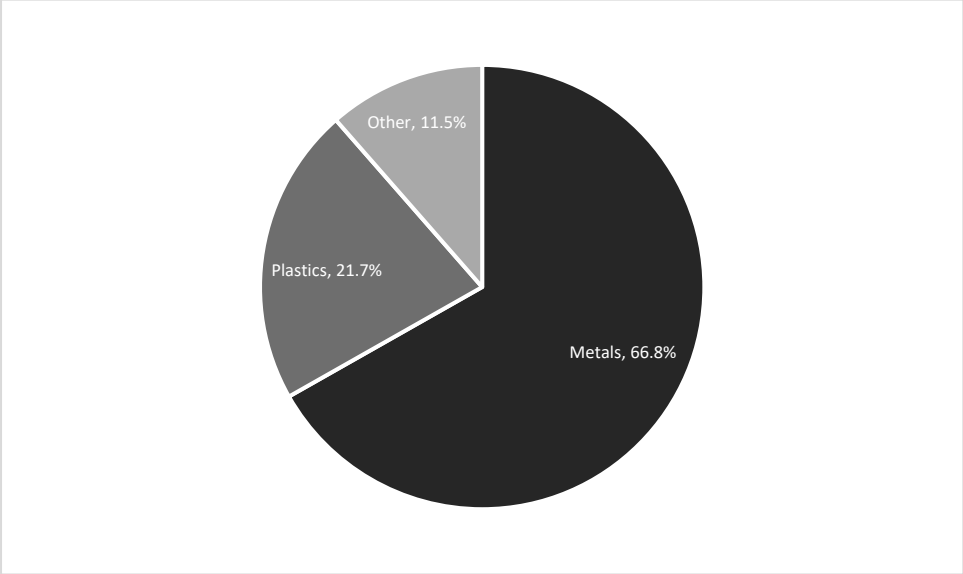


Figure 1 Constituent materials of the reference product (2TMA200160A0015)

Table 1 Information on mass of reference product and its packaging

Components	2TMA200160A0015	Product weight, incl. product pack (g)	Product weight, incl. product pack and transportation pack (g)
Product (g)	405.22	553.02	558.20
Product packaging (g)	147.80		
Transportation packaging (g)	5.19		

Detailed constituent materials of the reference product were shown in Figure 1 and then listed in Table 2.

Table 2 Materials distribution of the reference product

Plastics as % of weight		Metals as % of weight		Paper as % of weight		Other as % of weight	
Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%
PE	15.3%	Stainless steel	6.9%	Paper	11.4%	Others	<0.1%
PA66	5.1%	Aluminum alloy	59.3%				
EPDM	0.6%	Low carbon steel	0.6%				
PC	0.4%						
PU foam	0.3%						

Environmental impacts

Reference lifetime		20 years

Product category		Frame. According to the Specific rules for electrical switchgear and control gear Solutions (PSR-0005-ed3-EN-2023 06 06), the product is covered by Unequipped enclosures and Cabinets-cabinet.			
Installation elements		The product is installed manually. There is no input of materials / accessories and energy during the installation. The main environmental impact was caused by the waste generated in this stage.			
Use scenario		No energy consumption in the RSL of reference product			
Geographical representativeness		The studied product is produced in China but used in worldwide.			
Technological representativeness		In the manufacturing stage, specific data was collected to calculate the environmental impact caused by the manufacturing process. For the production of raw materials and parts, datasets from Ecoinvent 3.8 were used. During the dataset selection, the technological representation was considered carefully. Datasets with the same production processes were preferred. If not available, datasets with similar production processes were chosen.			
Software and databases used		Simapro version 9.4.04 & databases ecoinvent 3.8 & EF3.0			
Standards applied in ABB		ABB had used many recycling materials, e.g., plastic and metal. The products' standards applied include: EN 62368-1:2014/A11:2017 EN IEC 61000-6-1:2019 EN 61000-6-3:2007/A1:2011			
Energy model used	**Manufacturing**	**Distribution**	**Installation**	**Use**	**End of life**
	Average electricity mix in China	Global	Non-applicable	Non-applicable	Global

Table 3 Environmental impact indicators of life cycle Impact assessment

Compulsory Indicators

Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Climate change	kg CO2 eq	1.64E+01	1.26E+01	3.25E+00	2.53E-01	0.00E+00	3.54E-01
Climate change - Fossil	kg CO2 eq	1.62E+01	1.26E+01	3.25E+00	4.34E-02	0.00E+00	3.50E-01
Climate change - Biogenic	kg CO2 eq	1.61E-01	-5.30E-02	1.04E-03	2.09E-01	0.00E+00	3.77E-03
Climate change - Land use and LU change	kg CO2 eq	3.09E-02	3.04E-02	2.21E-04	2.85E-06	0.00E+00	2.64E-04
Ozone depletion	kg CFC11 eq	1.25E-06	4.87E-07	7.35E-07	1.01E-09	0.00E+00	2.72E-08
Acidification	mol H+ eq	9.71E-02	7.68E-02	1.74E-02	5.60E-05	0.00E+00	2.84E-03
Eutrophication, freshwater	kg P eq	4.21E-03	3.97E-03	4.38E-05	8.24E-07	0.00E+00	1.96E-04
Eutrophication, marine	kg N eq	2.02E-02	1.35E-02	6.31E-03	2.67E-05	0.00E+00	3.23E-04
Eutrophication, terrestrial	mol N eq	2.09E-01	1.36E-01	6.91E-02	2.39E-04	0.00E+00	3.73E-03
Photochemical ozone formation	kg NMVOC eq	5.93E-02	4.03E-02	1.78E-02	6.08E-05	0.00E+00	1.10E-03
Resource use, minerals and metals	kg Sb eq	9.97E-05	5.29E-05	1.04E-06	2.31E-08	0.00E+00	4.58E-05
Resource use, fossils	MJ	1.76E+02	1.28E+02	4.53E+01	7.48E-02	0.00E+00	3.06E+00
Water use	m3 depriv.	2.43E+00	2.23E+00	3.21E-02	6.77E-03	0.00E+00	1.58E-01

Note: the recycled content and the scrape rates of raw materials of the products and products' packaging are adjusted to 0% and 30% respectively according to the PSR.

Table 4 Resource use indicators of life cycle Impact assessment

Compulsory Indicators

Resource use indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	1.68E+01	1.63E+01	1.42E-01	1.90E-03	0.00E+00	3.17E-01
Use of renewable primary energy resources as raw materials	MJ	1.47E+00	1.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	1.83E+01	1.78E+01	1.42E-01	1.90E-03	0.00E+00	3.17E-01
Use of non-renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	1.74E+02	1.26E+02	4.53E+01	7.48E-02	0.00E+00	3.06E+00
Use of non-renewable primary energy resources as raw materials	MJ	1.94E+00	1.94E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	1.76E+02	1.28E+02	4.53E+01	7.48E-02	0.00E+00	3.06E+00
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Freshwater	m^3	8.79E-02	8.20E-02	1.36E-03	2.23E-04	0.00E+00	4.28E-03

Table 5 Waste category indicators of life cycle Impact assessment

Compulsory Indicators

Waste category indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Hazardous waste disposed	kg	4.37E-03	2.23E-03	1.20E-04	1.86E-07	0.00E+00	2.02E-03
Non-hazardous waste disposed	kg	2.99E+00	2.56E+00	1.02E-01	5.65E-03	0.00E+00	3.25E-01
Radioactive waste disposed	kg	5.48E-04	2.15E-04	3.21E-04	3.33E-07	0.00E+00	1.20E-05

Table 6 Output flow indicators

Compulsory Indicators

Output flow indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.63E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.63E-01
Materials for energy recovery	kg	1.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-02
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: The recovery of materials for materials and energy was calculated according to Annex D of the PCR.

Biogenic Carbon of product and packaging

As no biogenic carbon in the product, thus, only the biogenic carbon in the packaging was calculated. Of the product packaging and packaging for transportation, the materials containing biogenic carbon are wood pallet and paper board.

Table 7 Amount of biogenic carbon of product and packaging

Item	Unit (kg of C)	Total
Biogenic carbon content of the product	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	6.05E-02	6.05E-02

Extrapolation to a homogeneous environmental family

To determine the environmental impact of a product covered by the PEP other than the representative product, the following rules apply:

1) Manufacturing stage

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product, thus, the impacts should be calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

2) Distribution

The impact for this phase of a product covered by the PEP other than the representative product is proportional to the packaged product weight, thus, the impacts should be calculated by multiple the coefficients factor_2 in Table 8 by the environmental impact for those phases of the representative product.

3) Installation

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product packaging, thus, the impacts should be calculated by multiple the coefficients factor_3 in Table 8 by the environmental impact for those phases of the representative product.

4) End of life phases

The impacts of the representing product from the end-of-life are less than 2% of the total impact. However, the impact for this phase of a product covered by the PEP other than the representative product is calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

Table 8 Extrapolation rules homogeneous family products

SAP Number	Article Number	Factor_1	Factor_2	Factor_3
2TMA200160A0013	41393CF-A	0.89	0.89	0.90
2TMA200160A0033	41393CF-A-03	0.89	0.89	0.90
2TMA220161B1002	41393CF-B	0.89	0.89	0.90
2TMA220160B1002	41393CF-B-03	0.89	0.89	0.90
2TMA220160W0008	41393CF-W-03	0.89	0.89	0.90
2TMA200160A0015	41394CF-A	1.00	1.00	1.00
2TMA200160A0034	41394CF-A-03	1.04	1.00	0.90
2TMA220161B1003	41394CF-B	1.04	1.00	0.90
2TMA220160B1003	41394CF-B-03	1.04	1.00	0.90
2TMA200160A0017	41395CF-A	1.21	1.02	0.50
2TMA200160A0035	41395CF-A-03	1.21	1.02	0.50
2TMA200160A0003	41383CF-A	0.82	0.84	0.90
2TMA200160A0028	41383CF-A-03	0.82	0.84	0.90
2TMA220161B1004	41383CF-B	0.82	0.84	0.90
2TMA220160B1004	41383CF-B-03	0.82	0.84	0.90
2TMA200160A0005	41384CF-A	0.92	0.92	0.90
2TMA200160A0029	41384CF-A-03	0.92	0.92	0.90
2TMA220161B1005	41384CF-B	0.92	0.92	0.90

2TMA220160B1005	41384CF-B-03	0.92	0.92	0.90
2TMA200160A0007	41385CF-A	1.04	0.89	0.50
2TMA200160A0030	41385CF-A-03	1.04	0.89	0.50
2TMA220161B1006	41385CF-B	1.04	0.89	0.50
2TMA220160B1006	41385CF-B-03	1.04	0.89	0.50
2TMA200160A0009	41386CF-A	1.25	1.24	1.21
2TMA200160A0031	41386CF-A-03	1.25	1.24	1.21
2TMA220160W0012	41386CF-W-03	1.25	1.24	1.21
2TMA220161A0010	41388CF-A	2.43	2.26	1.79
2TMA220160W0013	41388CF-W-03	2.43	2.26	1.79
2TMA220160A0008	41388CF-A-03	2.43	2.26	1.79
2TMA220161A0011	413810CF-A	2.68	2.44	1.79
2TMA220160A0009	413810CF-A-03	2.68	2.44	1.79
2TMA220160A0010	413812CF-A-03	3.66	4.38	6.38
2TMA220160W0014	413812CF-W-03	3.66	4.38	6.38
2TMA220160A0003	41391CF-A	0.55	0.57	0.62
2TMA200160A0011	41392CF-A	0.69	0.67	0.62
2TMA200160A0032	41392CF-A-03	0.69	0.67	0.62
2TMA220161B1001	41392CF-B	0.69	0.67	0.62
2TMA220160B1001	41392CF-B-03	0.69	0.67	0.62
2TMA220160W0007	41392CF-W-03	0.69	0.67	0.62
2TMA200160A0019	41396CF-A	1.40	1.35	1.21
2TMA200160A0036	41396CF-A-03	1.40	1.35	1.21
2TMA220160W0009	41396CF-W-03	1.40	1.35	1.21
2TMA220160A0004	41398CF-A	1.66	1.64	1.59
2TMA220161A0008	41398CF-A	2.36	3.45	6.47
2TMA220160A0005	41398CF-A-03	2.36	2.21	1.79
2TMA220160W0010	41398CF-W-03	2.36	2.21	1.79
2TMA220161A0009	413910CF-A	2.65	2.42	1.79
2TMA220160A0006	413910CF-A-03	2.65	2.42	1.79
2TMA220160A0007	413912CF-A-03	3.58	4.32	6.38
2TMA220160W0011	413912CF-W-03	3.58	4.32	6.38
2TMA220160A0007	413912CF-A-03	0.89	0.89	0.90
2TMA220160W0011	413912CF-W-03	0.89	0.89	0.90

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Independent verification of the declaration and data in compliance with ISO 14025: 2006	
Internal: ☐	External: ☒
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)	
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 “Environmental labels and declarations. Type III environmental declarations”	