PRODUCTS FAMILY DECLARATION FOR CAMERA MODULE OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration

ORGANIZATION	WEBSITE
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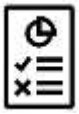
ABB Purpose & Embedding Sustainability

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 reference product is one unit of camera module produced by ABB, the representative product is 83501-101 (2TMA020120B0005).
Description of the product	Through fixing in the OS frame, the camera module can take pictures and video for the visitors to achieve the function of communication between the visitors outside the building and the residents in the buildings.
Functional unit of the representative product	To take pictures and video for the visitors to achieve the function of communication between the visitors outside the building and the residents in the buildings.
Products concerned	The products covered by this PEP are: M251021C (2TMA070150N0038), 83501-101(2TMA020120B0005), 83501-101-500(2TMA020120B0008), M251021C-02(2TMA210010N0001), 83501-101-500-01 (2TMA070150N0043), 83501-101-500-02(2TMA210010N0039), 83501-101-500(2TMA020120B0020), 83503(2TMA200160N0010.

Constituent materials

Total weight of Reference product	The net weight of the product is 105.5 g, and the total packed weight is 161.0 g (including product packaging and transportation packaging).

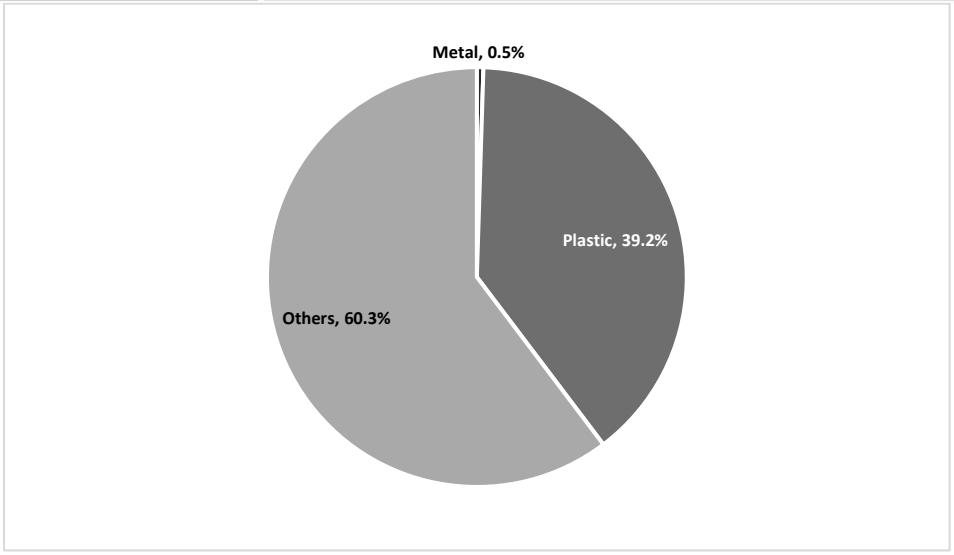


Figure 1 Constituent materials of the reference product 83501-101 (2TMA020120B0005)

Table 1 Information on mass of reference product and its packaging

Components	2TMA020120B0005	Product weight, incl. product pack (g)	Product weight, incl. product pack and transportation pack (g)
Product (g)	105.5	159.7	161.0
Product packaging (g)	54.2		
Transportation packaging (g)	1.3		

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-%
PC	33.8%	Low carbon steel	0.5%	Paper	32.5%	Electronic parts	27.2%
PE	2.3%					Acrylic adhesive	0.6%
POM	1.9%						
Silicone rubber	0.6%						
PU Foam	0.6%						

Environmental impacts

Reference lifetime		10 years

Product category		Camera module. According to the Specific rules for electrical switchgear and control gear Solutions (PSR-0005-ed3-EN-2023 06 06), the product is covered by other equipment - Category 2: active products.			
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		The product was solely sold to Germany. Thus, the use stage has been modeled using the corresponding low voltage electricity mix of Germany.			
Geographical representativeness		The studied product is produced in China but used in Germany.			
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 & EF 3.0			
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	Germany	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	4.77E+01	4.54E+00	1.46E+00	9.01E-02	4.14E+01	2.16E-01
Climate change - Fossil	kg CO2 eq	4.44E+01	4.56E+00	1.46E+00	8.14E-03	3.82E+01	2.16E-01
Climate change - Biogenic	kg CO2 eq	3.27E+00	-3.18E-02	4.66E-04	8.20E-02	3.22E+00	3.85E-04
Climate change - Land use and LU change	kg CO2 eq	6.01E-02	7.68E-03	8.75E-05	1.02E-06	5.23E-02	2.72E-05
Ozone depletion	kg CFC11 eq	1.59E-06	2.09E-07	3.32E-07	3.62E-10	1.04E-06	8.95E-09
Acidification	mol H+ eq	1.44E-01	3.64E-02	7.62E-03	1.96E-05	9.78E-02	1.73E-03
Eutrophication, freshwater	kg P eq	6.09E-02	3.74E-03	1.85E-05	2.92E-07	5.71E-02	3.06E-06
Eutrophication, marine	kg N eq	3.81E-02	5.69E-03	2.80E-03	9.26E-06	2.84E-02	1.21E-03
Eutrophication, terrestrial	mol N eq	2.98E-01	6.11E-02	3.07E-02	8.32E-05	2.05E-01	9.36E-04
Photochemical ozone formation	kg NMVOC eq	7.88E-02	1.84E-02	7.91E-03	2.12E-05	5.21E-02	3.29E-04
Resource use, minerals and metals	kg Sb eq	1.33E-03	9.96E-04	4.06E-07	8.22E-09	3.38E-04	8.10E-08
Resource use, fossils	MJ	6.03E+02	5.51E+01	2.04E+01	2.67E-02	5.26E+02	8.77E-01

Water use	m3 depriv.	3.87E+00	1.39E+00	1.35E-02	2.23E-03	2.44E+00	2.87E-02

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	1.30E+02	6.41E+00	6.14E-02	6.70E-04	1.23E+02	9.79E-02
Use of renewable primary energy resources as raw materials	MJ	5.97E-01	5.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	1.30E+02	7.01E+00	6.14E-02	6.70E-04	1.23E+02	9.79E-02
Use of non-renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	6.01E+02	5.33E+01	2.04E+01	2.67E-02	5.26E+02	8.77E-01
Use of non-renewable primary energy resources as raw materials	MJ	1.86E+00	1.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	6.03E+02	5.51E+01	2.04E+01	2.67E-02	5.26E+02	8.77E-01
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	3.00E-01	4.15E-02	5.85E-04	7.42E-05	2.57E-01	8.73E-04

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	6.08E-03	5.18E-03	5.46E-05	6.52E-08	8.40E-04	1.24E-06
Non-hazardous waste disposed	kg	3.58E+00	5.86E-01	3.29E-02	5.62E-02	2.49E+00	4.11E-01
Radioactive waste disposed	kg	2.46E-03	1.21E-04	1.45E-04	1.20E-07	2.18E-03	4.96E-06

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	6.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.24E-04
Materials for energy recovery	kg	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E-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	1.92E-02	1.92E-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) Use

The environmental impact for B1-B6 stage of a product covered by the PEP other than the representative product should be calculated by multiple the factor_4 in Table 8 by the environmental impact for this phase of the representative product. Factor_4 is proportional to the amount of energy consumption.

5) 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 for homogeneous family products

SAP Number	Article Number	Factor_1	Factor_2	Factor_3	Factor_4
2TMA020120B0005	83501-101	1.00	1.00	1.00	1.00
2TMA020120B0008	83501-101-500	0.99	1.00	1.02	1.00
2TMA020120B0020	83501-101-500	0.99	1.00	1.02	1.00
2TMA070150N0038	M251021C	1.21	1.15	1.03	1.17
2TMA070150N0043	83501-101-500-01	0.97	0.99	1.02	1.00
2TMA200160N0010	83503	1.02	1.02	1.01	0.98
2TMA210010N0001	M251021C-02	1.21	1.15	1.04	1.17
2TMA210010N0039	83501-101-500-02	0.99	1.00	1.02	1.00

Registration number: ABBG-00246-V01.01-EN	Drafting Rules: "PCR-ed4-EN-2021 09 06 Supplemented by “PSR-0005-ed3-EN-2023 06 06”
Verifier accreditation number: VH50	Information and reference documents: www.pep-ecopassport.org
Date of issue: 09-2023	Validity period: 5 years
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”	