Product Environmental Profile

Halyester Empty Enclosure -Type K

Representative product	K466 (1860092) Empty enclosures, with transparent fixed cover and base plate Product Category: Unequipped enclosures and cabinets
Description of the product	Halyester Empty Enclosure can be used vertically and horizontally. The front cover of this is made up of UV resistant polycarbonate and it is having IP66 Degree of Protection.
Homogeneous Environmental Families Covered	The PEP concerns following product offerings from Eaton Halyester Empty Enclosure as mentioned below: 1860092 (Reference), 1860093, 1860812, 1860091, 1860810, 1860809
Functional unit	"Protect people from direct contact with live active parts and ensure the grouping of control, command and protection devices in a single enclosure, or cabinet having the following dimensions 540mm x 540mm x 171mm, while protecting them against mechanical impacts (IK09/IK10) and the penetration of solid objects and liquids (IP66), according to the appropriate use scenario, and for the reference service life of the product of 20 years."
Company information	Eaton Industries (Netherlands) B.V., Critical Systems, Electrical Systems & Solutions, NL-7559 SC Hengelo, Europalaan 210, Netherlands Email: productstewardship-es@eaton.com

Constituent Materials			
Reference product mass	5.01E+00 Kg (With packaging)		
Category PEP Material	**Material constituent**	**Mass (kg)**	**% Contribution**
Plastics	Polyester Resin	1.64E+00	32.8%
Plastics	Polycarbonate	1.54E+00	30.7%
Others	High Pressure Laminate	1.29E+00	25.8%
Others	Cardboard	5.32E-01	10.6%
Metals	Stainless Steel	4.22E-03	0.1%
Plastics	Polyamide6	1.58E-03	<0.1%
Others	Label	2.25E-04	<0.1%
Total		5.01E+00	100.0%

Substance Assessment
The representative product is compliant without exemption with the EU-RoHS Directive (2011/65/EU), and the product does not contain any substance listed as Substance-of-Very-High-Concern (SVHC) as Duty-to-Declare on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

Additional Environmental Information	
Manufacturing	The reference product is assembled at an Eaton plant Hengelo, Netherlands holding management system certifications according to ISO 14001 standards.
Distribution	Eaton is committed to minimizing weight and volume of product and packaging with focus to optimize transport efficiency.
Installation	The installation process does not require any energy consumption and there is no waste other than the obsolete product packaging generated during this step.
Use	The product does not require energy consumption and maintenance during operation
End of life	The recyclability rate of the overall product is 32.39% if it is properly dismantled prior to shredding. The rate is calculated based on “ECO’DEEE recyclability and recoverability calculation method” (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

Environmental Impacts	
The calculation of the environmental impacts is the result of the Product’s Life Cycle Analysis in accordance with ISO 14040/44, covering the entire lifecycle, i.e., "Cradle-to-Grave” including the following life cycle phases: production, distribution, installation, use and end of life. System modelling was carried out using the commercial LCA software EIME v6.2.3 with database version CODDE-2024-04 Updated on 2024-06-04. Indicators Set: PEF EF 3.1 (Compliance: PEP ed.4, EN15804+A2) v2.0	
Manufacturing Phase	The product is assembled as well as packed at Eaton Industries (Netherlands) B.V.,Critical Systems, Electrical Systems & Solutions, NL-7559 SC Hengelo, Europalaan 210, Netherlands Energy model used: Netherlands
Distribution Phase	Distribution of the product in its packaging from the Eaton's last logistics platform to the installation place in Netherlands is considered as per PCR rules.

Installation Phase	Product is installed in Netherlands. Installation of product and treatment of packaging waste are considered in this phase. There is no energy consumption for reference product. Energy model used: Europe
Use Phase	Reference lifetime: 20 Years Usage profile: No energy consumption by the product during its useful life. Also, product do not require any maintenance/replacement during useful life.
End of life Phase	Product disposed with WEEE guidelines. Energy model used: Europe
Module-D	Module D is calculated according to PCR-ed4-EN-2021 09 06 based on the materials recycled and the modelled end-of-life scenario. It expresses the net benefits and loads beyond the boundaries of the system and are not to be included in the life cycle totals.

Environmental Impact Indicators: Mandatory

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Climate change - total (GWP)	kg CO_2 eq.	2.92E+01	2.47E+01	3.41E-01	1.54E+00	2.61E+00	-5.20E+00
Climate change - fossil fuels (GWP-f)	kg CO_2 eq.	2.73E+01	2.37E+01	3.41E-01	6.69E-01	2.60E+00	-5.59E+00
Climate change - biogenics (GWP-b)	kg CO_2 eq.	1.82E+00	9.54E-01	0.00E+00	8.68E-01	8.26E-04	3.89E-01
Climate change - land use and land use transformation (GWP-lu)	kg CO_2 eq.	2.31E-03	2.31E-03	0.00E+00	0.00E+00	0.00E+00	-1.95E-03
Ozone depletion (ODP)	kg eq. CFC-11	1.43E-06	1.37E-06	5.23E-10	8.46E-09	4.70E-08	-1.25E-07
Acidification (AP)	mole of H^+ eq.	1.54E-01	1.42E-01	2.16E-03	1.84E-03	7.68E-03	-1.21E-02
Freshwater eutrophication (Ep-fw)	kg P eq.	4.02E-04	2.01E-04	1.28E-07	7.96E-06	1.93E-04	-3.96E-05
Marine aquatic eutrophication (Ep-m)	kg of N eq.	2.60E-02	2.20E-02	1.01E-03	8.51E-04	2.08E-03	-3.30E-03
Terrestrial eutrophication (Ep-t)	mole of N eq.	2.80E-01	2.44E-01	1.11E-02	5.68E-03	1.99E-02	-3.33E-02
Photochemical ozone formation (POCP)	kg of NMVOC eq.	9.67E-02	8.72E-02	2.80E-03	1.33E-03	5.34E-03	-1.05E-02
Depletion of abiotic resources - elements (ADP-e)	kg eq. Sb	1.48E-05	1.46E-05	1.34E-08	2.78E-08	9.15E-08	-3.57E-06
Depletion of abiotic resources - fossil fuels (ADP-f)	MJ	5.15E+02	4.77E+02	4.76E+00	5.93E+00	2.68E+01	-1.38E+02
Water scarcity (WDP)	m^3 eq. deprivation worldwide	5.06E+00	4.89E+00	1.30E-03	4.92E-02	1.19E-01	-1.15E+00

Inventory Flow Indicators: Mandatory

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	2.26E+01	1.88E+01	6.35E-03	8.11E-01	2.99E+00	-5.79E+00
Use of renewable primary energy resources used as raw materials	MJ	1.38E+01	1.38E+01	0.00E+00	0.00E+00	0.00E+00	-7.86E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.64E+01	3.26E+01	6.35E-03	8.11E-01	2.99E+00	-1.36E+01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	3.91E+02	3.54E+02	4.76E+00	5.93E+00	2.68E+01	-9.30E+01
Use of non-renewable primary energy resources used as raw materials	MJ	1.24E+02	1.24E+02	0.00E+00	0.00E+00	0.00E+00	-4.48E+01
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	5.15E+02	4.77E+02	4.76E+00	5.93E+00	2.68E+01	-1.38E+02
Use of secondary materials	kg	3.43E-01	3.43E-01	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
Net use of fresh water	m^3	1.21E-01	1.15E-01	3.02E-05	3.87E-03	2.79E-03	-2.69E-02
Hazardous waste disposed of	kg	5.84E+00	1.27E+00	0.00E+00	3.29E-02	4.54E+00	-2.32E-01
Non-hazardous waste disposed of	kg	1.41E+01	1.04E+01	1.20E-02	2.15E-01	3.52E+00	-4.24E+00
Radioactive waste disposed of	kg	6.64E-03	6.36E-03	8.53E-06	3.81E-05	2.28E-04	-2.26E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.33E+00	4.43E-01	0.00E+00	4.37E-01	1.45E+00	0.00E+00
Materials for energy recovery	kg	2.98E-01	1.53E-01	0.00E+00	4.79E-02	9.73E-02	0.00E+00
Exported energy	MJ by energy vector	6.27E-01	9.21E-04	0.00E+00	0.00E+00	6.26E-01	0.00E+00
Biogenic carbon content of the product	kg of C.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	kg of C.	2.77E-01	2.77E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Environmental Impact Indicators: Optional

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Emission of fine particles	incidence of diseases	9.33E-07	8.52E-07	1.76E-08	1.09E-08	5.27E-08	-9.14E-08
Ionizing radiation, human health	kBq U^{235} eq.	7.03E+00	5.99E+00	8.31E-04	8.08E-02	9.60E-01	-2.24E+00
Ecotoxicity, fresh water	CTUe	2.19E+02	2.01E+02	2.23E-01	8.78E+00	9.11E+00	-1.06E+02

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	C1-C4 - End of life	D - Benefits and loads beyond the system boundaries
Human toxicity, cancer effects	CTUh	4.91E-07	4.27E-07	6.00E-12	6.39E-08	2.22E-10	-1.05E-07
Human toxicity, non-cancer effects	CTUh	2.08E-07	1.97E-07	1.16E-10	1.89E-09	8.19E-09	-4.84E-08
Impacts related to land use/soil quality	-	6.53E+00	6.52E+00	0.00E+00	1.75E-03	7.03E-04	-5.44E+00
Total use of primary energy during the life cycle	MJ	5.51E+02	5.10E+02	4.77E+00	6.74E+00	2.97E+01	-1.51E+02

To evaluate the environmental impact of other product covered by this PEP, multiply the impact figures by-

Factors for Manufacturing, Distribution, Installation, End-of-Life, and Module-D Phase:

Product Number	Product Number	Phases	GWP	GWP-f	GWP-b	GWP-lu	ODP	AP	Ep-fw	Ep-m	Ep-t	POCP	ADP-e	ADP-f	WDP
1860092 (Reference)	K466	Manufacturing	1.00												
		Distribution													
		Installation													
		End of Life													
		Module-D													
1860093	K484	Manufacturing	0.94	0.94	0.89	1.05	0.89	0.91	0.91	0.92	0.92	0.92	0.95	0.95	0.93
		Distribution	0.94												
		Installation	0.90												
		End of Life	0.94	0.94	1.04	1.00	0.95	0.99	0.88	0.96	0.98	0.97	1.01	1.00	1.00
		Module-D	1.05	1.04	0.81	1.05	1.03	1.01	1.02	1.01	1.02	1.02	1.01	1.04	1.03
1860812	K464	Manufacturing	0.69	0.69	0.68	0.70	0.65	0.70	0.65	0.69	0.69	0.70	0.83	0.70	0.68
		Distribution	0.68												
		Installation	0.60												
		End of Life	0.67	0.67	0.70	1.00	0.70	0.70	0.66	0.68	0.70	0.69	0.70	0.71	0.70
		Module-D	0.70	0.69	0.55	0.70	0.70	0.68	0.68	0.68	0.68	0.68	0.93	0.70	0.69
1860091	K444	Manufacturing	0.43	0.44	0.32	0.35	0.42	0.46	0.40	0.45	0.45	0.46	0.70	0.43	0.42
		Distribution	0.43												
		Installation	0.48												
		End of Life	0.39	0.39	0.36	1.00	0.42	0.39	0.43	0.40	0.40	0.40	0.38	0.40	0.40
		Module-D	0.35	0.37	0.56	0.35	0.40	0.39	0.39	0.39	0.38	0.38	0.86	0.36	0.37
1860810	K434	Manufacturing	0.33	0.33	0.20	0.28	0.30	0.35	0.30	0.34	0.34	0.35	0.65	0.33	0.32
		Distribution	0.33												
		Installation	0.39												
		End of Life	0.30	0.30	0.29	1.00	0.32	0.31	0.31	0.31	0.31	0.31	0.30	0.32	0.32
		Module-D	0.28	0.30	0.46	0.28	0.33	0.31	0.31	0.31	0.31	0.30	0.84	0.29	0.30
1860809	K433	Manufacturing	0.27	0.28	0.11	0.22	0.23	0.30	0.22	0.29	0.29	0.29	0.61	0.27	0.25
		Distribution	0.27												
		Installation	0.32												
		End of Life	0.23	0.23	0.23	1.00	0.27	0.25	0.25	0.24	0.25	0.25	0.24	0.27	0.26
		Module-D	0.22	0.23	0.38	0.22	0.27	0.25	0.25	0.25	0.24	0.24	0.83	0.22	0.24

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		Validity period	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006			
Internal	X	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 and 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 »			