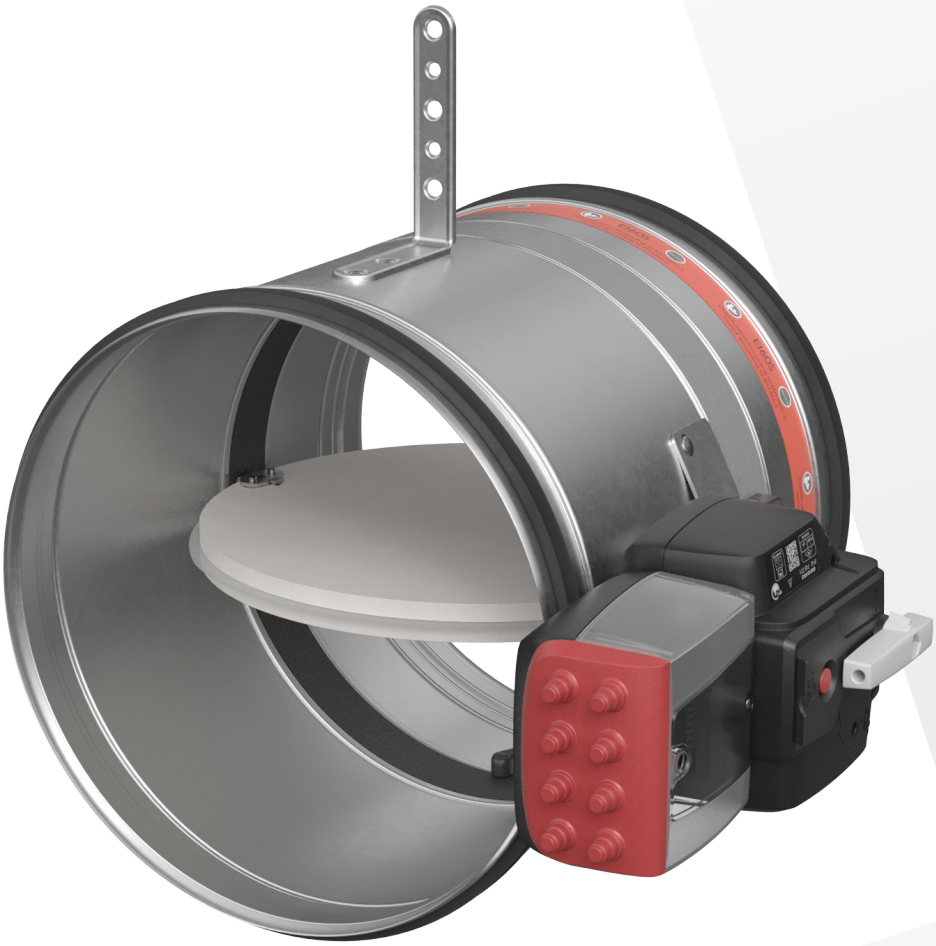
CR60 FIRE DAMPER FAMILY

Product Environmental Profile



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Verifier accreditation number: **VH45**	Information and reference documents: www.pep-ecopassport.org
Date of issue: **08-2026**	Validity period: **5 years**
Independent verification of the declaration and data in accordance with ISO 14025: 2006	
Internal: ☐	External: ☑
The PCR review was carried out by a group of experts chaired by Julie Orgelet (DDemain).	
The PEPs comply with standards XP C08 -100-1:2016 and EN 50693:2019 or NF E38-500:2022. The components of this PEP cannot be compared with the components of another programme.	
This document complies with ISO 14025:2006 " Environmental labels and declarations. Type III environmental declarations"	

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Product	CR60 fire damper family
Product category	Heating, ventilation and air conditioning equipment – fire damper
Product manufacturing site	Cesam Hlavná 1409/58 952 01 Vráble, Slovakia +421 37 793 0080
Publication date	19.08.2026
Validity period of this PEP	19.08.2026- 19.08.2031
Reference year of the LCA study	2025

This is a translation

This document is a translation of the PEP Ecopassport® document, an EPD declaration based on the French INIES programme. This declaration will shortly be replaced by an EPD framework. Both EPD programs comply with the ISO 14025 and EN15804 + A2 standard.

1. Description of Rf-Technologies

As a family-run business, Rf-Technologies is one of Europe's leading manufacturers of specialised fire protection solutions, constantly innovating and investing in high-quality, certified products. With production sites in Belgium and Slovakia and a wide distribution network spanning over 15 countries, we contribute to fire safety in critical facilities such as hospitals, offices, and government buildings.

2. Product family

This PEP presents the environmental impact of the CR60 fire damper range. The CR60 fire damper range consists of dampers with an identical design that can be manufactured in 9 diameters: 100, 125, 150, 160, 180, 200, 250, 300 and 315 mm, all offering a fire resistance till 60 minutes. These fire dampers are installed where ventilation ducts pass trough the walls of fire resistant compartments. Their role is to maintain the fire resistance rating of the wall through which they pass and to prevent the spread of smoke.

3. Description of the reference product and its characteristics

The reference product covered by this PEP is the CR60-160, which is part of the passive fire safety equipment.
The CR60-160 is a circular fire damper with a fire resistance up to 60 minutes, operated with a BOBI, motorised mechanism.

Technical characteristics of the reference product	Product value	Unit
Minimum fire resistance	60	min
Diameter	160	mm
Length	345	mm
Mass with actuator, excluding packaging	3,31	kg
Mass of product packaging	0,20	kg

For further technical details, see the classification report: CR60_classification_report_Efectis

The total mass of the product is 3,51 kg, comprising 3,31 kg of product and 0,20 kg of packaging. At the reference flow rate, the total mass of the product is 1,76 kg.

Material composition of the reference product:

Material composition of the reference product					
Metals		**Polymers**		**Others**	
Galvanised steel	53,3%	PC-ABS	7,1%	Ca-Si	7,8%
Non-ferrous metals	6,7%	PA 6.6	6,1%	Wood	4,3%
Stainless steel	2,9%	TPE	3,1%	Cardboard	1,3%
		EPDM	2,3%	Graphite strip	1,2%
		Other polymers	1,7%	PCB	1,2%
		SBR	1,0%		

4. Functional unit (FU)

The characterisation of the functional unit is as follows: "To transfer air for ventilation and/or air filtration and/or smoke extraction from a building, for a connection section of 1 dm^2, over the product's typical service life of 30 years".
The reference flow rate is defined as 1 CR60-160 unit divided by 2.

Declared Unit (DU) corresponds to the reference product CR60-160. According to the defined mathematical relationship, 1 DU is equivalent to 2 FUs. Consequently, the reference flow for the functional unit is defined as 1 CR60-160 unit divided by 2.

5. Life Cycle Assessment Methodology

For the calculation of the LCA results, the Sphera software, LCA for Experts, version 10.9.1.17 with the MLC 2025 database was used. The impact is calculated for a reference period of 30 years.
The LCA study covers all modules with geographical representativeness:
World: modules A1, A2, A3
France: modules A4, A5, B1, B2, B3, B4, B5, B6, B7, C1, C2, C3, C4, D.

Modules declared in this PEP and their geographical application																	
Stage	"PRODUCT stage"			"CONSTRUCTION PROCESS stage"		"USE stage"							"END OF LIFE stage"				Benefits and costs beyond the system boundaries
Modules	Supply of raw materials	Transport (to the manufacturer)	Manufacturing	Transport (to the construction site)	Construction/installation process	Use	Maintenance	Repair	Replacement	Renovation	Operational energy consumption	Operational water use	Deconstruction/demolition	Transport (to waste treatment)	Waste treatment	Waste disposal	Reuse, recovery, recycling potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Declared modules	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Representative area/country	GLOBAL			FRANCE													

Manufacturing

The manufacturing stage accounts for the production of raw materials and their transport to the manufacturing site in Slovakia, the electricity consumed during manufacturing, the production of packaging materials, the management of production losses, and the transport of the product to the final logistics hub.

Data set for energy:
- SK: Residual grid mix Sphera
- RER: Electricity grid mix Sphera

Distribution

Distribution from the manufacturer's final logistics hub to French customers by Euro V lorries, > 27t with an load factor of 85%. The distribution distance is 1300 km.

Installation

The installation module accounts for
- 3,8 kg of mortar and its transport to the construction site.
- The processing and disposal of packaging materials in accordance with a scenario prescribed by PSR-0008-ed3.1-EN-2025 06 17. The packaging materials are recycled, incinerated and landfilled.

Use

The reference product is equipped with a motorised mechanism. The motorised mechanism operates on electricity. In France (FR: Electricity grid mix Sphera, <1kV), electricity is consumed during regular fire damper tests, at a frequency of one test per week. Electricity consumption depends on the frequency of testing. For less frequent testing, the B6 results are lower than those stated in this PEP. It is recommended to periodically test the movement of the damper blades.

End of life

Modelled in accordance with PEP-PCR-ed4-EN-2021 09 06. The materials of the reference product undergo:

Recycling	53,7%
Landfilling	35,1%
Incineration without energy recovery	11,2%

Module D

Takes into account the benefits of recycling. Total for:

Recycling	Galvanised steel	1,17 kg
	Non-ferrous metals	0,13 kg
	Stainless steel	0,08 kg
	PC-ABS	0,05 kg
	Cardboard	0,04 kg
	Metals PCB	0,01 kg
	Wooden pallet	0,01 kg
	PE	0,01 kg

Results for the functional unit, cross-section 1 dm^2.

Results for the functional unit								
Indicator	Modules	LCA excluding D	A1-A3	A4	A5	B	C1-C4	D
	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Benefits and costs
Climate change - total	[kg CO_2 eq.]	8,69E+00	7,58E+00	1,89E-01	3,18E-01	8,42E-04	6,10E-01	-1,50E+00
Climate change – fossil	[kg CO_2 eq.]	8,41E+00	7,55E+00	1,80E-01	1,91E-01	8,29E-04	4,87E-01	-1,50E+00
Climate change – biogenic	[kg CO_2 eq.]	2,71E-01	1,34E-02	7,22E-03	1,27E-01	1,03E-05	1,24E-01	-1,22E-03
Climate change, land use and land-use change	[kg CO_2 eq.]	9,20E-03	7,44E-03	1,38E-03	2,50E-04	2,52E-06	1,29E-04	-1,04E-03
Ozone depletion	[kg CFC-11 eq.]	5,43E-09	5,43E-09	2,76E-14	5,03E-13	4,27E-14	1,98E-13	-2,00E-11
Acidification	[Mole of H+ eq.]	3,29E-02	3,09E-02	9,82E-04	4,63E-04	2,25E-06	5,07E-04	-3,85E-03
Freshwater eutrophication	[kg P eq.]	2,56E-05	1,85E-05	7,67E-07	3,16E-07	3,01E-09	6,03E-06	-4,45E-07
Marine eutrophication	[kg N eq.]	5,89E-03	4,97E-03	4,82E-04	1,86E-04	6,81E-07	2,48E-04	-9,20E-04
Terrestrial eutrophication	[Mole of N eq.]	6,28E-02	5,33E-02	5,17E-03	1,79E-03	7,10E-06	2,54E-03	-1,01E-02
Photochemical ozone formation, human health	[kg NMVOC eq.]	1,86E-02	1,67E-02	9,08E-04	4,45E-04	1,57E-06	6,16E-04	-2,97E-03
Resource use, minerals and metals	[kg Sb eq.]	4,16E-04	4,16E-04	1,21E-08	2,12E-07	3,73E-10	8,04E-09	-1,13E-04
Use of resources, fossil	[MJ]	1,26E+02	1,22E+02	2,29E+00	1,16E+00	8,60E-02	6,37E-01	-1,17E+01
Water use	[m^3 world equivalent]	6,97E-01	6,33E-01	6,99E-04	1,89E-02	3,30E-04	4,50E-02	-1,95E-01
Use of renewable primary energy (PERE)	[MJ]	2,20E+01	2,07E+01	1,48E-01	9,93E-01	2,52E-02	8,69E-02	-3,37E+00
Primary energy resources used as raw materials (PERM)	[MJ]	1,04E+00	1,84E+00	0,00E+00	-7,99E-01	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT)	[MJ]	2,30E+01	2,25E+01	1,48E-01	1,94E-01	2,52E-02	8,69E-02	-3,37E+00
Use of non-renewable primary energy (PENRE)	[MJ]	1,20E+02	1,09E+02	2,29E+00	1,24E+00	8,60E-02	7,67E+00	-1,17E+01
Non-renewable primary energy resources used as raw materials (PENRM)	[MJ]	6,08E+00	1,32E+01	0,00E+00	-7,94E-02	0,00E+00	-7,04E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT)	[MJ]	1,26E+02	1,22E+02	2,29E+00	1,16E+00	8,60E-02	6,37E-01	-1,17E+01
Use of secondary materials	[kg]	1,21E-01	1,21E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	[MJ]	5,41E-23	5,41E-23	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	[MJ]	6,36E-22	6,36E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Freshwater use	[m3]	3,38E-02	3,21E-02	9,67E-05	5,37E-04	3,70E-05	1,08E-03	-4,53E-03
Hazardous waste disposed	[kg]	1,15E-05	1,15E-05	9,27E-11	3,37E-10	4,60E-11	1,33E-10	9,69E-09
Non-hazardous waste disposed	[kg]	9,47E-01	3,02E-01	3,57E-04	1,09E-01	2,76E-05	5,36E-01	-2,01E-02
Radioactive waste disposed	[kg]	4,93E-03	4,85E-03	9,01E-06	2,79E-05	2,68E-05	7,65E-06	1,68E-06
Components for reuse	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	[kg]	1,17E+00	2,60E-01	0,00E+00	2,64E-02	0,00E+00	8,86E-01	0,00E+00
Materials for energy recovery	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Electricity exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Thermal energy exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Particulate matter	[Disease incidences]	5,33E-07	5,18E-07	5,83E-09	6,15E-09	1,95E-11	2,92E-09	-5,03E-08
Ionising radiation, human health	[kBq U235 eq.]	4,75E-01	4,61E-01	1,99E-03	4,32E-03	6,82E-03	1,12E-03	-1,43E-03
Ecotoxicity (freshwater)	[CTUe]	4,82E+01	4,23E+01	4,27E+00	9,16E-01	4,99E-03	6,62E-01	-2,13E+00
Human toxicity, carcinogenic	[CTUh]	2,35E-08	2,34E-08	5,39E-11	2,79E-11	5,94E-13	1,40E-11	-2,11E-09
Human toxicity, non-carcinogenic	[CTUh]	6,51E-08	5,85E-08	3,93E-09	2,11E-09	6,13E-12	6,39E-10	7,44E-11
Land use	[Pt]	9,12E+01	8,89E+01	1,56E+00	4,92E-01	1,07E-02	1,71E-01	-5,03E+00
Total primary energy consumption over the life cycle	[MJ]	1,49E+02	1,45E+02	2,44E+00	1,35E+00	1,11E-01	7,24E-01	-1,51E+01

Biogenic carbon content of the product	[kg C]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content of associated packaging	[kg C]	4,77E-01	4,77E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Results for the functional unit									
Indicator	Modules	Use phase	B1	B2	B3	B4	B5	B6	B7
	Unit	Total	Use	Mainte-nance	Repair	Replacement	Refurbi-shment	Energy consump-tion	Water use
Climate change - total	[kg CO2 eq.]	8,42E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,42E-04	0,00E+00
Climate change – fossil	[kg CO2 eq.]	8,29E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,29E-04	0,00E+00
Climate change – biogenic	[kg CO2 eq.]	1,03E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,03E-05	0,00E+00
Climate change, land use and land-use change	[kg CO2 eq.]	2,52E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E-06	0,00E+00
Ozone depletion	[kg CFC-11 eq.]	4,27E-14	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,27E-14	0,00E+00
Acidification	[Mole of H+ eq.]	2,25E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,25E-06	0,00E+00
Freshwater eutrophication	[kg P eq.]	3,01E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,01E-09	0,00E+00
Marine eutrophication	[kg N eq.]	6,81E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,81E-07	0,00E+00
Terrestrial eutrophication	[Mole of N eq.]	7,10E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,10E-06	0,00E+00
Photochemical ozone formation, human health	[kg NMVOC eq.]	1,57E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,57E-06	0,00E+00
Resource use, minerals and metals	[kg Sb eq.]	3,73E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,73E-10	0,00E+00
Resource use, fossil	[MJ]	8,60E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,60E-02	0,00E+00
Water use	[m^3 world equiv.]	3,30E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,30E-04	0,00E+00
Use of renewable primary energy (PERE)	[MJ]	2,52E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E-02	0,00E+00
Primary energy resources used as raw materials (PENRM)	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT)	[MJ]	2,52E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E-02	0,00E+00
Use of non-renewable primary energy (PENRE)	[MJ]	8,60E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,60E-02	0,00E+00
Non-renewable primary energy resources used as raw materials (PERM)	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT)	[MJ]	8,60E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,60E-02	0,00E+00
Use of secondary materials	[kg]	0,00E+00	0,00E+00	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	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	0,00E+00	0,00E+00
Freshwater use	[m3]	3,70E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,70E-05	0,00E+00
Hazardous waste disposed	[kg]	4,60E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,60E-11	0,00E+00
Non-hazardous waste disposed	[kg]	2,76E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,76E-05	0,00E+00
Radioactive waste disposed of	[kg]	2,68E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,68E-05	0,00E+00
Components for reuse	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Electricity exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Thermal energy exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Particulate matter	[Disease incidences]	1,95E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,95E-11	0,00E+00
Ionising radiation, human health	[kBq U235 eq.]	6,82E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,82E-03	0,00E+00
Ecotoxicity (freshwater)	[CTUe]	4,99E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,99E-03	0,00E+00
Human toxicity, cancer	[CTUh]	5,94E-13	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,94E-13	0,00E+00
Human toxicity, non-carcinogenic	[CTUh]	6,13E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,13E-12	0,00E+00
Land use	[Pt]	1,07E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,07E-02	0,00E+00
Total primary energy use over the life cycle	[MJ]	1,11E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,11E-01	0,00E+00

Results for the reference product, cross-section 2 dm².

Results for the reference product								
Indicator	Modules	LCA excluding D	A1-A3	A4	A5	B	C1-C4	D
	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Benefits and costs
Climate change - total	[kg CO2 eq.]	1,74E+01	1,52E+01	3,77E-01	6,36E-01	1,68E-03	1,22E+00	-3,01E+00
Climate change – fossil fuels	[kg CO2 eq.]	1,68E+01	1,51E+01	3,60E-01	3,81E-01	1,66E-03	9,73E-01	-3,00E+00
Climate change – biogenic	[kg CO2 eq.]	5,43E-01	2,69E-02	1,44E-02	2,54E-01	2,06E-05	2,48E-01	-2,43E-03
Climate change, land use and land-use change	[kg CO2 eq.]	1,84E-02	1,49E-02	2,76E-03	5,00E-04	5,05E-06	2,57E-04	-2,08E-03
Ozone depletion	[kg CFC-11 eq.]	1,09E-08	1,09E-08	5,52E-14	1,01E-12	8,54E-14	3,96E-13	-3,99E-11
Acidification	[Mole of H+ eq.]	6,57E-02	6,18E-02	1,96E-03	9,25E-04	4,50E-06	1,01E-03	-7,69E-03
Freshwater eutrophication	[kg P eq.]	5,11E-05	3,69E-05	1,53E-06	6,31E-07	6,02E-09	1,21E-05	-8,91E-07
Marine eutrophication	[kg N eq.]	1,18E-02	9,95E-03	9,65E-04	3,72E-04	1,36E-06	4,95E-04	-1,84E-03
Terrestrial eutrophication	[Mole of N eq.]	1,26E-01	1,07E-01	1,03E-02	3,58E-03	1,42E-05	5,07E-03	-2,02E-02
Photochemical ozone formation, human health	[kg NMVOC eq.]	3,73E-02	3,33E-02	1,82E-03	8,91E-04	3,15E-06	1,23E-03	-5,94E-03
Resource use, minerals and metals	[kg Sb eq.]	8,32E-04	8,32E-04	2,42E-08	4,24E-07	7,45E-10	1,61E-08	-2,25E-04
Resource use, fossil fuels	[MJ]	2,52E+02	2,44E+02	4,58E+00	2,32E+00	1,72E-01	1,27E+00	-2,34E+01
Water use	[m^3 world equivalent]	1,39E+00	1,27E+00	1,40E-03	3,78E-02	6,60E-04	9,00E-02	-3,90E-01
Use of renewable primary energy (PERE)	[MJ]	4,39E+01	4,14E+01	2,96E-01	1,99E+00	5,04E-02	1,74E-01	-6,73E+00
Primary energy resources used as raw materials (PERM)	[MJ]	2,08E+00	3,67E+00	0,00E+00	-1,60E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT)	[MJ]	4,60E+01	4,51E+01	2,96E-01	3,87E-01	5,04E-02	1,74E-01	-6,73E+00
Use of non-renewable primary energy (PENRE)	[MJ]	2,40E+02	2,18E+02	4,58E+00	2,48E+00	1,72E-01	1,53E+01	-2,34E+01
Non-renewable primary energy resources used as raw materials (PENRM)	[MJ]	1,22E+01	2,64E+01	0,00E+00	-1,59E-01	0,00E+00	-1,41E+01	0,00E+00
Total use of non-renewable primary energy resources (PENRT)	[MJ]	2,52E+02	2,44E+02	4,58E+00	2,32E+00	1,72E-01	1,27E+00	-2,34E+01
Use of secondary materials	[kg]	2,42E-01	2,42E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels	[MJ]	1,08E-22	1,08E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels	[MJ]	1,27E-21	1,27E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Freshwater use	[m3]	6,77E-02	6,42E-02	1,93E-04	1,07E-03	7,40E-05	2,15E-03	-9,06E-03
Hazardous waste disposed	[kg]	2,30E-05	2,30E-05	1,85E-10	6,75E-10	9,19E-11	2,66E-10	1,94E-08
Non-hazardous waste disposed	[kg]	1,89E+00	6,04E-01	7,15E-04	2,18E-01	5,52E-05	1,07E+00	-4,03E-02
Radioactive waste disposed of	[kg]	9,85E-03	9,71E-03	1,80E-05	5,58E-05	5,37E-05	1,53E-05	3,36E-06
Components for reuse	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	[kg]	2,34E+00	5,20E-01	0,00E+00	5,28E-02	0,00E+00	1,77E+00	0,00E+00
Materials for energy recovery	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Electricity exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Thermal energy exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Particulate matter	[Disease incidences]	1,07E-06	1,04E-06	1,17E-08	1,23E-08	3,90E-11	5,83E-09	-1,01E-07
Ionising radiation, human health	[kBq U235 eq.]	9,51E-01	9,22E-01	3,99E-03	8,63E-03	1,36E-02	2,25E-03	-2,86E-03
Ecotoxicity (freshwater)	[CTUe]	9,64E+01	8,47E+01	8,54E+00	1,83E+00	9,97E-03	1,32E+00	-4,25E+00
Human toxicity, carcinogenic	[CTUh]	4,69E-08	4,67E-08	1,08E-10	5,57E-11	1,19E-12	2,81E-11	-4,22E-09
Human toxicity, non-carcinogenic	[CTUh]	1,30E-07	1,17E-07	7,87E-09	4,22E-09	1,23E-11	1,28E-09	1,49E-10
Land use	[Pt]	1,82E+02	1,78E+02	3,12E+00	9,84E-01	2,13E-02	3,41E-01	-1,01E+01
Total primary energy use over the life cycle	[MJ]	2,98E+02	2,89E+02	4,87E+00	2,71E+00	2,22E-01	1,45E+00	-3,01E+01

Biogenic carbon content of the product	[kg C]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content of associated packaging	[kg C]	9,54E-01	9,54E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Results for the reference product, cross-section 2 dm².

Results for the reference product									
Indicator	Modules	Stage of use	B1	B2	B3	B4	B5	B6	B7
	Unit	Total	Use	Mainte-nance	Repair	Replace-ment	Refurbi-shment	Energy onsump-tion	Water use
Climate change - total	[kg CO2 eq.]	1,68E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,68E-03	0,00E+00
Climate change – fossil fuels	[kg CO2 eq.]	1,66E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,66E-03	0,00E+00
Climate change – biogenic	[kg CO2 eq.]	2,06E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,06E-05	0,00E+00
Climate change, land use and land-use change	[kg CO2 eq.]	5,05E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,05E-06	0,00E+00
Ozone depletion	[kg CFC-11 eq.]	8,54E-14	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,54E-14	0,00E+00
Acidification	[Mole of H+ eq.]	4,50E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,50E-06	0,00E+00
Freshwater eutrophication	[kg P eq.]	6,02E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,02E-09	0,00E+00
Marine eutrophication	[kg N eq.]	1,36E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,36E-06	0,00E+00
Terrestrial eutrophication	[Mole of N eq.]	1,42E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E-05	0,00E+00
Photochemical ozone formation, human health	[kg NMVOC eq.]	3,15E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,15E-06	0,00E+00
Resource use, minerals and metals	[kg Sb eq.]	7,45E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,45E-10	0,00E+00
Use of resources, fossil fuels	[MJ]	1,72E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E-01	0,00E+00
Water use	[m^3 equiv. world]	6,60E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,60E-04	0,00E+00
Use of renewable primary energy (PERE)	[MJ]	5,04E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,04E-02	0,00E+00
Primary energy resources used as raw materials (PERM)	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT)	[MJ]	5,04E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,04E-02	0,00E+00
Use of non-renewable primary energy (PENRE)	[MJ]	1,72E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E-01	0,00E+00
Non-renewable primary energy resources used as raw materials (PENRM)	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT)	[MJ]	1,72E -01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E-01	0,00E+00
Use of secondary materials	[kg]	0,00E+00	0,00E+00	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	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	0,00E+00	0,00E+00
Freshwater use	[m3]	7,40E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,40E-05	0,00E+00
Hazardous waste disposed	[kg]	9,19E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,19E-11	0,00E+00
Non-hazardous waste disposed	[kg]	5,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,52E-05	0,00E+00
Radioactive waste disposed of	[kg]	5,37E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,37E-05	0,00E+00
Components for reuse	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Electricity exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Thermal energy exported	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Particulate matter	[Disease incidences]	3,90E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,90E-11	0,00E+00
Ionising radiation, human health	[kBq U235 eq.]	1,36E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,36E-02	0,00E+00
Ecotoxicity (freshwater)	[CTUe]	9,97E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,97E-03	0,00E+00
Human toxicity, carcinogenic	[CTUh]	1,19E-12	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,19E-12	0,00E+00
Human toxicity, non-carcinogenic	[CTUh]	1,23E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E-11	0,00E+00
Land use	[Pt]	2,13E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,13E-02	0,00E+00
Total primary energy use over the life cycle	[MJ]	2,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,22E-01	0,00E+00

Extrapolation rules

The extrapolation coefficients have been calculated in accordance with standard PSR-0008-ed3.1-EN-2025 06 17 and are used to calculate the impact of other members of the CR60 family. To calculate the result for the selected diameter, multiply the result of the indicator by a coefficient that depends on the module. The reference product is shown in red.

Diameter [mm]	100	125	150	160	180	200	250	300	315
To calculate the functional unit									
Modules A123, A4 and D	2,08	1,53	1,45	1,00	0,90	0,80	0,58	0,49	0,46
Module A5	1,09	1,39	1,13	1,00	1,18	1,21	0,77	0,87	0,79
Module B1-B7	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Module C1-C4	2,14	1,54	1,11	1,00	0,89	0,77	0,57	0,47	0,27
Product calculation									
Modules A123, A4 and D	0,83	0,92	0,98	1,00	1,15	1,24	1,43	1,73	1,76
Module A5	0,44	0,83	1,00	1,00	1,50	1,88	1,88	3,06	3,06
Module B1-B7	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Module C1-C4	0,85	0,92	0,98	1,00	1,13	1,20	1,40	1,65	1,69

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