ENVIRONMENTAL PRODUCT DECLARATION (EPD) FOR POLYETHYLENE FITTINGS PE100 – PE100RC: SPIGOT, TRANSITION AND ELECTROFUSION FITTINGS PRODUCED BY PLASTITALIA SPA

Company: Plastitalia S.p.A. – Via Ferrara snc, 98061 Brolo (ME) Italy
Programme operator: The International EPD ® System – c/o EPD International AB - Valhallavägen 81 SE-114 27 Stockholm Sweden - www.environdec.com
PCR: 2019:14 Construction products, version 1.11
Geographical scope: Global
EPD registration number: S-P-06850
Date of publication (issue): 20/10/2022
Date of validity: 12/10/2027

EPD in accordance with ISO 14025 and EN 15804:2012+A2:2019
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

EPD Revision number and date: n. 0, 07th October 2022


PLASTITALIA™ S.p.A.
high performance fittings
PLAST
dn 1600

SUMMARY

PLASTITALIA™ S.p.A.
high performance fittings

1) INTRODUCTION

This Environmental Product Declaration (EPD) provides a quantitative and verified description of the environmental performance of the Polyethylene Fittings used in the construction of systems dedicated to the distribution of fluids in liquid or gaseous state under pressure or vacuum conditions. More in detail, this EPD covers the following products:

a. Spigot fittings
b. Transition fittings PE/Brass
c. Transition fittings PE/Steel, with uncoated pipe
d. Transition fittings PE/Steel, with coated pipe
e. Electrofusion fittings

The worst case in each products group is used as representative product. The worst case is the product having the highest impact (GWP-GHG) in the upstream (A1-A3 modules).

Products not covered by the present EPD are:

- Fabricated bends, i.e.all products whose code starts with “CS”
- Tapping tees, i.e.all products whose code starts with “CPCC”

The EPD is in compliance with ISO 14025 and EN 15804:2012+A2:2019.
The reference CPC code for PE Fittings is CPC 36320 – “Tubes, pipes and hoses, and fittings therefor, of plastics”.

Spigot Fittings

Transition Fittings

Electrofusion Fittings

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2) COMPANY INFORMATION

Plastitalia S.p.A. is a leading company in design and manufacture of polyethylene (PE) fittings used in a range of applications such as, but not limited to: construction works, rural, plumbing, rainwater, sewerage, wastewater, energy, mining, industrial, firefighting, etc. The product range is huge in terms of different figures and shapes and diameters are from 20 to 1.600 mm.

Plastitalia S.p.A. has one manufacturing site located in Brolo (ME) Italy where the products are shipped all around the world.

The Company is strictly committed to participate and to be part of international Technical Committees promoting in this way positive changes in field of the application of its own products. As matter of the fact Plastitalia S.p.A. is a company third part certified in the field of different management schemes:

- EMAS
- ISO 9001
- ISO 14001
- ISO 45001

and respects the International Labour Organization requirements (ILO).

Products are third part certified according to the main international product standards such as: UNI EN 12201-3, UNI EN 1555-3, UNI EN ISO 15494, FM Class number 1613, etc. (the complete list of products and managements certificate is available on www.plastitaliaspa.com).

FM APPROVED

Certificate of Compliance

This certificate is issued for the following:

Polyethylene (PE) Fittings for Underground Fire Protection Service
(see attached listing)

Prepared for:
Plastitalia SpA
Via Ferrara
Brolo, Messina 98061
Italy

Manufactured at:
Plastitalia SpA
Via Ferrara
Brolo, Messina 98061
Italy

FM Approvals Class: 1613

Approval Identification: PR453916 Approval Granted: November 26, 2019

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

David Fuller
VP - Manager of Fire Protection
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062 USA

FM Approvals
Member of the FM Global Group

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Certificato di Registrazione
Registration Certificate

EMAS

PLASTITALIA S.P.A.
Via Ferrara, s.n.c.
98061 - Brolo (Messina)

N. Registrazione: IT-000485
Registration Number

Data di Registrazione: 26 Aprile 2006
Registration Date

FABBRICAZIONE DI LASTRE, FOGLI, TUBI E PROFILATI IN MATERIE PLASTICHE NACE: 22.21
MANUFACTURE OF PLASTIC PLATES, SHEETS, TUBES AND PROFILES

Questa Organizzazione ha adottato un sistema di gestione ambientale conforme al Regolamento EMAS allo scopo di attuare il miglioramento continuo delle proprie prestazioni ambientali e di pubblicare una dichiarazione ambientale. Il sistema di gestione ambientale è stato verificato e la dichiarazione ambientale è stata convalidata da un verificatore ambientale accreditato.
L'Organizzazione è stata registrata secondo lo schema EMAS e pertanto è autorizzata a utilizzare il relativo logo. Il presente certificato ha validità soltanto se l'organizzazione risulta inserita nell'elenco nazionale delle organizzazioni registrate EMAS.

This Organisation has established an environmental management system according to EMAS Regulation in order to promote the continuous improvement of its environmental performance and to publish an environmental statement. The environmental management system has been verified and the environmental statement has been validated by accredited environmental verifier. The Organization is registered under EMAS and therefore is entitled to use the EMAS Logo. This certificate is valid only if the Organization is listed into the national EMAS Register.

Roma, 17 Settembre 2020
Rome

Certificato valido fino al: 20 Maggio 2023
Expiry date

Comitato Ecolabel - Ecoaudit
Sezione EMAS Italia
Il Presidente
Dott. Silvio Schinaia

PLASTITALIA™ S.p.A.
high performance fittings

IIP

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THE INTERNATIONAL CERTIFICATION NETWORK
www.iqnet-certification.com

IQNet, the association of the world's first class certification bodies, is the largest provider of management System Certification in the world. IQNet is composed of more than 30 bodies and counts over 150 subsidiaries all over the globe.

CERTIFICATO N. 179
CERTIFICATE N.

Si certifica che il Sistema di Gestione per la Qualità di
We hereby certify that the Quality Management System operated by

PLASTITALIA SPA
sede legale: VIA FERRARA — 98061 BROLO (ME)
UNITA' OPERATIVE / OPERATIVE UNITS
VIA FERRARA — 98061 BROLO (ME)

è conforme alla norma
is in compliance with the standard

UNI EN ISO 9001:2015

per le seguenti attività
for the following activities

IAF14

Progettazione e produzione mediante stampaggio ad iniezione, saldatura e lavorazione meccanica di raccordi in PE 80 e PE 100 per il trasporto di acqua, gas e fluidi in pressione.
Planning and production through injection moulding, welding and mechanical working of PE80 and PE100 fittings for transport of water, gas and under pressure fluids.

Prima emissione	Emissione corrente	Scadenza
First Issue	Current Issue	Expiring date
01/01/1997	30/12/2020	02/11/2023

Il Direttore Generale
Mauro La Ciacera

IIP SRL - via Velleia 2 - 20900 Monza (MB)
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ACCREDIA
SGQ N° 006A
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

FEDERAZIONE CISQ
www.cisq.com
CISQ è la Federazione Italiana di Organismi di Certificazione dei sistemi di gestione aziendale.
CISQ is the Italian Federation of management system Certification Bodies.

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CERTIFICATO N. 025
CERTIFICATE N.

Si certifica che il Sistema di Gestione Ambientale di
We hereby certify that the Enviromental Management System operated by

PLASTITALIA SPA
sede legale: VIA FERRARA — 98061 BROLO (ME)
UNITA' OPERATIVE / OPERATIVE UNITS
VIA FERRARA — 98061 BROLO (ME)

è conforme alla norma
is in compliance with the standard

UNI EN ISO 14001:2015

per le seguenti attività
for the following activities

IAF14

Progettazione e produzione mediante stampaggio ad iniezione, saldatura e lavorazione meccanica di raccordi in PE80 e PE100 per il trasporto di acqua, gas e fluidi in pressione.
Planning and production through injection moulding, welding and mechanical working of PE80 and PE100 fittings for transport of water, gas and under pressure fluids.

Sistema di gestione ambientale conforme alla Norma UNI EN ISO 14001:2015 valutato secondo le prescrizioni del documento ACCREDIA RT-09

Prima emissione	Emissione corrente	Scadenza
First Issue	Current Issue	Expiring date
01/11/2002	07/05/2020	02/11/2023

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Mauro La Ciacera

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ACCREDIA
SGA N ° 014D
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The International Certification Network
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CERTIFICATO N. 044
CERTIFICATE N.

Si certifica che il Sistema di gestione della Salute e Sicurezza sul Lavoro di
We hereby certify that the Occupational Health and Safety Management System operated by

PLASTITALIA SPA
sede legale: VIA FERRARA — 98061 BROLO (ME)
UNITA' OPERATIVE / OPERATIVE UNITS
VIA FERRARA — 98061 BROLO (ME)

è conforme alla norma
is in compliance with the standard

UNI ISO 45001:2018

per le seguenti attività
for the following activities

IAF14

Progettazione e produzione mediante stampaggio ad iniezione, saldatura e lavorazione meccanica di raccordi in PE 80 e PE 100 per il trasporto di acqua, gas e fluidi in pressione.
Design and production through injection moulding, welding and mechanical working of PE80 and PE100 fittings for transport of water, gas and under pressure fluids.

Prima emissione	Emissione corrente	Scadenza
First Issue	Current Issue	Expiring date
22/07/2013	19/07/2022	21/07/2025

L'Amministratore Delegato
Mauro La Ciacera

ACCREDIA
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IIP

CERTIFICATO DI CONFORMITÀ
Certificate of conformity

UNI iip UNI

n° 2095 / 2021 — Rev. 1

Prodotti *Products*	**Sistemi di tubazione di Polietilene (PE) per applicazione industriali – Raccordi in Polietilene (PE)** ***Polyethylene (PE) piping systems for industrial application - Polyethylene (PE) Fittings***
Gamma di prodotti *Range of products*	**vedere allegato / *see annex***
Norma *Standard*	**UNI EN ISO 15494 : 2021**
Nome commerciale *Trade name*	**PLAST - PLASTFAST**
Produttore *Manufacturer*	**PLASTITALIA SPA**
Sede legale *Head office*	**VIA FERRARA — 98061 BROLO (ME)**
Sito produttivo *Production site*	**VIA FERRARA — 98061 BROLO (ME)**

Istituto Italiano dei Plastici S.r.l. (I.I.P. S.r.l.) certifica che i prodotti sopra elencati sono conformi alla norma indicata ed ai requisiti di I.I.P. S.r.l. specificati nel Regolamento generale e nelle Regole particolari applicabili. Il produttore, sottoposto a sorveglianza continua da parte di I.I.P. S.r.l., è autorizzato ad apporre sui prodotti certificati il marchio IIP-UNI con numero distintivo **265**.
Il presente certificato di conformità è valido (salvo modifica, sospensione o revoca) fino al **31/12/2023**.

Istituto Italiano dei Plastici S.r.l. (I.I.P. S.r.l.) certifies that the above listed products are in conformity with the indicated standard and the requirements of I.I.P. S.r.l. specified in the general Rules and in the applicable particular Rules.
*The manufacturer, which is subjected to continuous surveillance by I.I.P. S.r.l., is entitled to put on the certified products the IIP-UNI conformity Mark with the distinctive number **265**.*
*This certificate of conformity is valid (unless modification, suspension or withdrawal) until **31/12/2023**.*

Monza, 19/05/2022

ISTITUTO ITALIANO DEI PLASTICI S.r.l.
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L'Amministratore Delegato
(Mauro La Ciacera)

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MOD.57 - Rev.4

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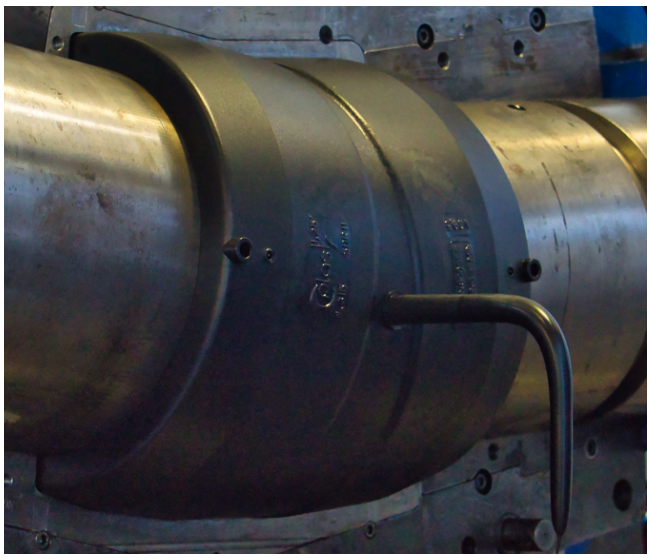
high performance fittings

3) PRODUCTION PROCESS

PE part of any fittings is obtained by the process so called: injection moulding. In the case of transition fittings we distinguish two different preparation processes. For fittings provided with steel end part the preparation process is about the cutting, the turning and milling of the metal part. For fittings provided with brass end part no extra operation are carried in the factory, since the brass part is supplied, by an external supplier, ready for to be over-injected.

In general the moulding process consists in the feeding a moulding machine with the appropriate raw material (PE compound already stabilized), the compound is heat up by a combination of friction and heat and so, is brought up to the ideal temperature to inject it, with a certain level of pressure, in the mould cavity. The level of pressure in the mould is then maintained for a certain time, allowing the material to cold down to a sufficiently safe, from the dimensional point of view, extraction temperature.

The fabrication process of transition fittings, after the placing of the metal parts in the mould cavity is equal to the one already explained.



After the injection process and in the case of electrofusion fittings, the bodies so obtained are worked to add mechanically the electrical coil(s), the terminal pins, labels and instruction for use.

All fittings are then packed following factory's specification. Figure 1 schematizes the production process.

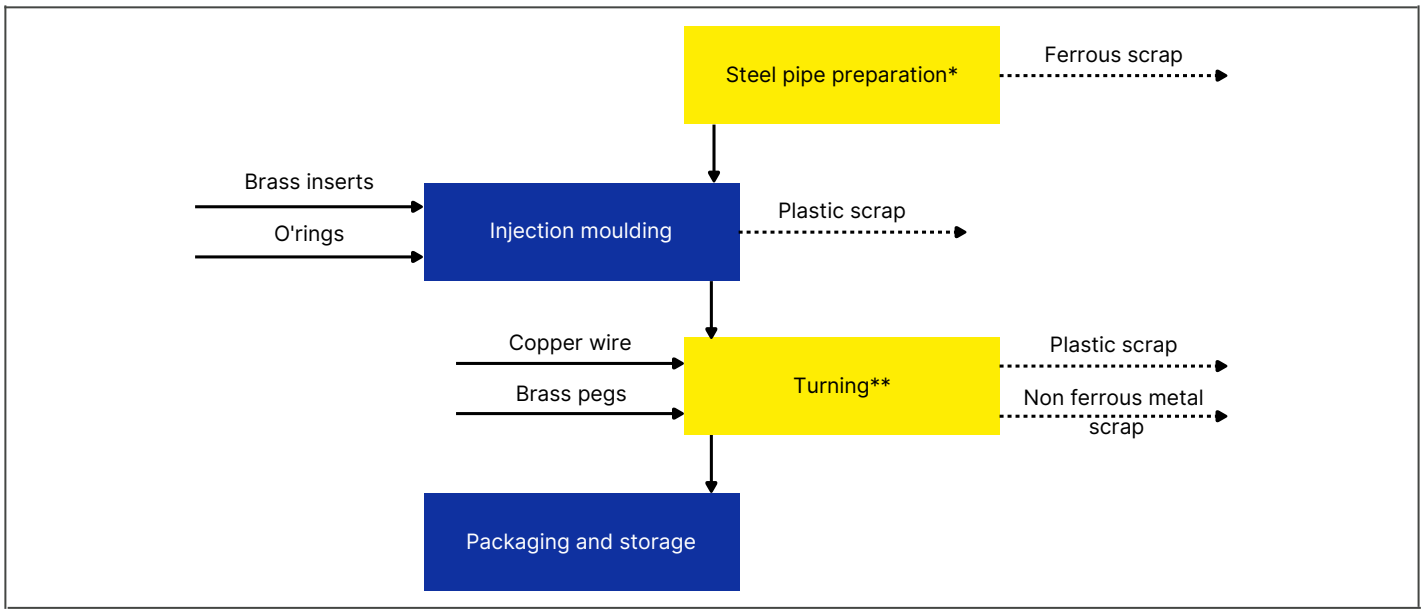


*Figure 1 Scheme of the manufacturing process occurring in Plastitalia's site for PE fittings (*Only for transition fittings PE/steel; ** only for some types of spigot fittings and for all electrofusion fittings*

4) PRODUCT DECLARATION AND COMPOSITION

4a - Product description

PLAST and PLASTfast fittings are designed and manufactured in the following different shapes and functions:

- Electrofusion fittings, socket and saddles;
- Long and short spigots fittings, weldable by means of heated tool procedure (butt weld);
- Transition fittings PE/steel, PE/brass;

They have:

- Mechanical strength and structural stability
- Safety in their use
- Technical characteristics that allow for easy replacement
- Suitable characteristics for hygiene, health and the environment

The period during which the performance of our products is maintained at design level is consequent to the design coefficients used, the operating temperature and at the applied pressure level.
The TEPPFA position Document (https://www.teppfa.eu/media/position-papers/a-position-100-years-lifetime-ofpolyethylene-pipe/) indicates that polyethylene products such as fittings can be used in the systems embedded in the construction works designed for a durability class of 100 years.
Products are permanently marked in the body with the mark “PLAST” or “PLASTfast”.

Table 1 Product characteristics of PE fittings

Name	PLAST - PLASTfast
UN CPC code	36320 – “Tubes, pipes and hoses, and fittings therefor, of plastics”
Density	> 0,945 gr/cm^3
Melt Flow Rate	> 0,15 gv/10min (190° - 10Kg)
Minimum Required Strength (50 year @ 20°C)	10MPa
Tensile Yield Strength	> 18 N/mm^2
Elongation at Yield	> 300%
Poisson's ratio	0,4
Thermal Expansion	Coefficient 2,0 x 10^{-4} Δ°C
Thermal Conductivity	0,4w x m^{-1} x k^{-1}

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4b - Product composition

The fittings investigated are manufactured from fully pre-compounded PE100 or PE100-RC pelleted resin, containing additives to introduce desirable properties such as stability, durability and colouration.

Table 2 Bill of Materials of reference products

PE fitting type	Spigot	Transition			Electrofusion
Reference product	Adaptor dn900	PE/Brass dn20	PE/Steel with uncoated pipe dn32	PE/Stee with coated pipe dn25	Tee-dn32
Composition of the product (%)					
PE	100	14,91	8,65	7,14	93,99
Brass insert*		85,09	-	-	-
PE coated steel pipe**	-	-	-	92,83	-
Uncoated steel pipe	-	-	91,32	-	-
NBR O'ring	-	-	0,03	0,028	-
Brass peg	-	-	-	-	4,96
Copper wire	-	-	-	-	1,65
Weight of the product (kg)					
Product weight	49,2	0,11	0,85	0,61	30,34
Weight of the product packaging (kg per finished product) (kg)					
Cardboard box	1,142857	0,006	0,02	0,018	0,018
Wood pallet	1,457142	0,003	0,015	0,012	0,012
PE film for pallet	0,071428	0,0001	0,000625	0,0005	0,0005
PE film/bag for fitting	-	0,0031	0,01	0,009	0,009
Bar code label (paper)	0,000152	0,000152	0,000152	0,000152	0,000152
Instructions (paper)	1,142857	-	-	-	0,018

**SVHC content in the insert is Lead. The brass complies with standard EN 12164 with the quantity Pb ≤ 2,2%*
*** 93,8% steel and 6,2% PE*

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5) METHODOLOGY

5b - Standard, declared unit, system boundary and reference year

The LCA study behind the present EPD is in accordance with:

- EN ISO 14040: 2006 Environmental management -- Life cycle assessment -- Principles and framework
- EN ISO 14044:2006 Environmental management -- Life cycle assessment -- Requirements and guidelines
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- General Programme Instructions (GPI) for the International EPD® VERSION 3.01
- The International EPD® System Product Category Rules (PCRs) for construction products, 2019:14 version 1.11.

The data elaboration has been performed with the Gabi software, version 10.5.1.124.
The database used are the most updated ones implemented in Gabi software. More in detail, main database used is Sphera.

The declared unit is 1 kg of PE fitting, plus its packaging.

The EPD is a “Cradle to Gate with modules C1-C4 and D”. Modules A4 to A5 and B1 to B7 are excluded as they are strongly dependent on the specific application (and location) within the reference market.

Table 3 reports the system boundary as well as information on geography, specific data and variation

Processes included in the study are:

- Raw Materials supply (A1): Production of raw materials used in the products, as well as the production of energy carriers used in the production process.
- Transport of raw materials to the factory (A2)
- Manufacturing of the PE fittings (A3): It basically includes the injection moulding as well as the treatment of waste generated from the direct or indirect (when externally performed) preparation processes. The production of primary packaging and of the ancillary materials are included in this module.
- De-construction/demolition processes (C1): Diesel consumption
- Transport from collection to waste processing and disposal site (C2)
- Waste processing (C3): shredding and sorting
- Disposal (C4): landfill and incineration of plastic, landfill of metals share not entering the recycling route
- Module D: transport to recycling treatment site, remelting process and benefit due to the avoided production of primary metals.

The reference year of the study is 2021.

Table 3 System boundaries, geography, share of specific data (in GWP-GHG indicator) and data variation

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE	USE STAGE	END-OF-LIFE STAGE				BENEFITS AND LOADS BEYOND SYSTEM BOUNDARY
	Raw Material Supply	Transport	Manufacturing	Transport and Construction/ Installation	Use, Maintenance, Repair, Replacement Refurbishment, Operational energy and water use	De-construction/ Demolition	Transport	Waste processing	Disposal	Reuse, Recycling potential
Module	A1	A2	A3	A4 to A5	B1 to B7	C1	C2	C3	C4	D
Module declared	X	X	X	N.A.		X	X	X	X	X
Geography	IT, DE, EU, GLO	GLO, EU, US	GLO, EU			EU, GLO	EU, GLO	EU, GLO	EU, GLO	EU, GLO
Specific data*	>90%									
Variation – products**	Spigot fittings: -34% Transition fittings PE/Steel, with coated pipe: -12% Electrofusion fittings: -42%									

**Share of the GWP-GHG indicator results in A1-A3 coming from product-specific LCI data*
***For transition fittings PE/Brass and PE/Steel, with uncoated pipe the product variation is <10%.*

5b - Data quality, cut-off and scenario

All background data used in the study are from LCI database and are not older than 5 years. With specific reference to the electricity used in the manufacturing processes, this is 100% from renewables and reflects the sources used by the electricity supplier.

Energy and resources in input as well as waste in output are allocated to the products based on their mass.

Raw and packaging materials for the finished products are fully included as well as the energy for manufacturing. In the same way, all manufacturing waste (including hazardous waste) are included in the analysis.
The construction of the manufacturing site (capital goods) is not included. A minor input is excluded, namely the secondary packaging of few raw materials and the packaging of few packaging materials. The excluded material input is < 5% of the total input flows (mass) to the module A1-A3.

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As one of the main reference markets, building sector is considered for the End-of-life modules. The end-of-life scenario is Europe based. Fittings are assumed to be manually dismantled. In light of this, no impacts are accounted for in module C1.

The reference service life of PE fittings is linked to the specific applications, which include buried and elevated/building integrated systems. Buried systems at the end of their service life are phased out and left in the ground or are declassed, thus, no burden arises from the end-of-life modules and module D.

Elevated/building-integrated systems are considered to be demolished and/or deconstructed. Scenario description is reported in Table 4. Module D is calculated on net flows, in compliance to EN 15804 requirements, thus, metal flows entering module D are reduced by the % of initial recycled content.

Table 4 End of life scenario for PE fittings installed in elevated systems and in building-integrated systems

End of life scenario for PE fittings in elevated/building-integrated systems		
Process input	Amount	Module
Diesel for demolition	0,0359 MJ/kg per declared unit	C1
Transport to waste processing	100 km by truck, Euro 4, diesel driven	C2
Electricity for shredding and sorting	0,0037 kWh/kg per declared unit	C3
Treatment of PE from declared unit	45,25% incineration	C4
	54,75% landfill	
Treatment of metals from declared unit	5% landfill	C4
	95% recycling	D

6) PARAMETERS DESCRIBING THE ENVIRONMENTAL IMPACTS

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

6a - Spigot fittings

Table 5: Environmental profile of spigot fittings (Adaptator dn900)

Spigot fittings – Adaptor dn900						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	3,20E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate Change, fossil (GWPf) [kg CO2 eq.]	3,14E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate Change, biogenic (GWPb) [kg CO2 eq.]	4,94E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	3,33E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Ozone depletion (ODP) [kg CFC-11 eq.]	3,40E-11	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	7,63E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication, freshwater (EPfr) [kg P eq.]*	1,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication, marine (EPmar) [kg N eq.]	2,61E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication, terrestrial (EPter) [Mole of N eq.]	2,79E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	8,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	1,35E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Resource use, fossils (ADPf) [MJ] **	1,11E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Water use (WU) [m³ world equiv.] **	2,72E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	4,66E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	3,10E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

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Table 6: Environmental profile of spigot fittings (Adaptator dn63). A1-A3 variability respect to the reference product is -32%.

Spigot fittings – Adaptor dn63						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	2,17E+00	3,12E-03	6,70E-03	1,32E-03	1,46E+00	-6,99E-01
Climate Change, fossil (GWPf) [kg CO2 eq.]	2,12E+00	3,11E-03	6,66E-03	1,31E-03	1,46E+00	-6,96E-01
Climate Change, biogenic (GWPb) [kg CO2 eq.]	3,92E-02	0,00E+00	0,00E+00	1,18E-05	0,00E+00	-3,40E-03
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	2,51E-03	1,66E-05	3,73E-05	2,78E-07	2,04E-05	-7,23E-05
Ozone depletion (ODP) [kg CFC-11 eq.]	3,66E-11	1,78E-16	4,01E-16	1,92E-14	1,13E-13	-4,37E-12
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	5,34E-03	1,47E-05	3,94E-05	2,87E-06	2,56E-04	-8,75E-04
Eutrophication, freshwater (EPfr) [kg P eq.]*	1,35E-05	8,88E-09	2,00E-08	3,84E-09	7,26E-06	-8,95E-07
Eutrophication, marine (EPmar) [kg N eq.]	1,84E-03	6,94E-06	1,94E-05	6,44E-07	5,48E-05	-2,42E-04
Eutrophication, terrestrial (EPter) [Mole of N eq.]	1,95E-02	7,68E-05	2,14E-04	6,76E-06	9,38E-04	-2,60E-03
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	5,71E-03	1,95E-05	3,72E-05	1,74E-06	1,69E-04	-6,80E-04
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	1,07E-06	2,49E-10	5,60E-10	3,58E-10	4,16E-09	-9,99E-08
Resource use, fossils (ADPf) [MJ] **	7,37E+01	3,98E-02	8,95E-02	2,37E-02	7,16E-01	-1,18E+01
Water use (WU) [m³ world equiv.] **	1,92E-01	2,67E-05	6,01E-05	2,94E-04	1,30E-01	-6,79E-02
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	4,15E-05	2,73E-08	6,14E-08	1,18E-08	2,23E-05	-2,75E-06
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	2,10E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

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6b - Transition fittings PE/Brass

Table 7: Environmental profile of Transition fittings PE/brass (dn20)

Transition fittings PE/brass – dn20						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	1,73E+00	3,12E-03	6,70E-03	1,32E-03	2,20E-01	-1,04E-01
Climate Change, fossil (GWPf) [kg CO2 eq.]	1,72E+00	3,11E-03	6,66E-03	1,31E-03	2,20E-01	-1,04E-01
Climate Change, biogenic (GWPb) [kg CO2 eq.]	9,08E-03	0,00E+00	0,00E+00	1,18E-05	0,00E+00	-5,06E-04
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	3,05E-03	1,66E-05	3,73E-05	2,78E-07	4,51E-06	-1,08E-05
Ozone depletion (ODP) [kg CFC-11 eq.]	4,21E-11	1,78E-16	4,01E-16	1,92E-14	2,09E-14	-6,52E-13
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	1,24E-02	1,47E-05	3,94E-05	2,87E-06	4,71E-05	-1,31E-04
Eutrophication, freshwater (EPfr) [kg P eq.]*	1,13E-05	8,88E-09	2,00E-08	3,84E-09	1,65E-06	-1,33E-07
Eutrophication, marine (EPmar) [kg N eq.]	1,92E-03	6,94E-06	1,94E-05	6,44E-07	1,01E-05	-3,61E-05
Eutrophication, terrestrial (EPter) [Mole of N eq.]	2,04E-02	7,68E-05	2,14E-04	6,76E-06	1,62E-04	-3,88E-04
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	5,33E-03	1,95E-05	3,72E-05	1,74E-06	3,16E-05	-1,01E-04
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	4,20E-04	2,49E-10	5,60E-10	3,58E-10	8,30E-10	-1,49E-08
Resource use, fossils (ADPf) [MJ] **	3,12E+01	3,98E-02	8,95E-02	2,37E-02	1,50E-01	-1,76E+00
Water use (WU) [m³ world equiv.] **	4,41E-01	2,67E-05	6,01E-05	2,94E-04	1,94E-02	-1,01E-02
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	3,48E-05	2,73E-08	6,14E-08	1,18E-08	5,05E-06	-4,10E-07
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	1,71E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

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6c - Transition fittings PE/steel, with uncoated PIPE

Table 8: Environmental profile of Transition fittings PE/steel, with uncoated pipe (dn32)

Transition fittings – PE/Steel, with uncoated pipe – dn32						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	2,80E+00	3,12E-03	6,70E-03	1,32E-03	1,29E-01	-1,19E+00
Climate Change, fossil (GWPf) [kg CO2 eq.]	2,77E+00	3,11E-03	6,66E-03	1,31E-03	1,29E-01	-1,19E+00
Climate Change, biogenic (GWPb) [kg CO2 eq.]	2,10E-02	0,00E+00	0,00E+00	1,18E-05	0,00E+00	1,51E-03
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	2,00E-03	1,66E-05	3,73E-05	2,78E-07	3,34E-06	-3,09E-04
Ozone depletion (ODP) [kg CFC-11 eq.]	2,15E-11	1,78E-16	4,01E-16	1,92E-14	1,41E-14	2,75E-12
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	7,88E-03	1,47E-05	3,94E-05	2,87E-06	3,17E-05	-3,17E-03
Eutrophication, freshwater (EPfr) [kg P eq.]*	9,05E-06	8,88E-09	2,00E-08	3,84E-09	1,23E-06	-2,79E-07
Eutrophication, marine (EPmar) [kg N eq.]	2,08E-03	6,94E-06	1,94E-05	6,44E-07	6,86E-06	-6,67E-04
Eutrophication, terrestrial (EPter) [Mole of N eq.]	2,23E-02	7,68E-05	2,14E-04	6,76E-06	1,04E-04	-7,22E-03
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	6,12E-03	1,95E-05	3,72E-05	1,74E-06	2,15E-05	-2,21E-03
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	7,07E-07	2,49E-10	5,60E-10	3,58E-10	5,84E-10	1,62E-08
Resource use, fossils (ADPf) [MJ] **	3,18E+01	3,98E-02	8,95E-02	2,37E-02	1,08E-01	-9,41E+00
Water use (WU) [m³ world equiv.] **	2,71E-02	2,67E-05	6,01E-05	2,94E-04	1,12E-02	1,78E-02
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	2,78E-05	2,73E-08	6,14E-08	1,18E-08	3,78E-06	-8,56E-07
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	2,74E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

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6d - Transition fittings PE/steel, with PE coated PIPE

Table 9: Environmental profile of Transition fittings PE/steel, with PE coated pipe (dn25)

Transition fittings – PE/Steel, with PE coated pipe – dn25						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	3,25E+00	3,12E-03	6,70E-03	1,32E-03	1,07E-01	-1,20E+00
Climate Change, fossil (GWPf) [kg CO2 eq.]	3,22E+00	3,11E-03	6,66E-03	1,31E-03	1,07E-01	-1,20E+00
Climate Change, biogenic (GWPb) [kg CO2 eq.]	2,39E-02	0,00E+00	0,00E+00	1,18E-05	0,00E+00	1,59E-03
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	1,93E-03	1,66E-05	3,73E-05	2,78E-07	3,06E-06	-3,13E-04
Ozone depletion (ODP) [kg CFC-11 eq.]	3,84E-08	1,78E-16	4,01E-16	1,92E-14	1,25E-14	2,87E-12
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	1,24E-02	1,47E-05	3,94E-05	2,87E-06	2,80E-05	-3,21E-03
Eutrophication, freshwater (EPfr) [kg P eq.]*	2,88E-04	8,88E-09	2,00E-08	3,84E-09	1,13E-06	-2,69E-07
Eutrophication, marine (EPmar) [kg N eq.]	2,61E-03	6,94E-06	1,94E-05	6,44E-07	6,07E-06	-6,74E-04
Eutrophication, terrestrial (EPter) [Mole of N eq.]	2,93E-02	7,68E-05	2,14E-04	6,76E-06	9,07E-05	-7,30E-03
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	7,85E-03	1,95E-05	3,72E-05	1,74E-06	1,90E-05	-2,24E-03
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	3,11E-04	2,49E-10	5,60E-10	3,58E-10	5,25E-10	1,81E-08
Resource use, fossils (ADPf) [MJ] **	4,07E+01	3,98E-02	8,95E-02	2,37E-02	9,78E-02	-9,37E+00
Water use (WU) [m^3 world equiv.] **	2,18E-01	2,67E-05	6,01E-05	2,94E-04	9,28E-03	1,92E-02
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	8,84E-04	2,73E-08	6,14E-08	1,18E-08	3,48E-06	-8,25E-07
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	3,18E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

6e - Electrofusion fittings

Table 10: Environmental profile of Electrofusion fittings (Tee – dn32)

Electrofusion fittings (Tee - dn32)						
Impact category – core indicators	A1-A3	C1	C2	C3	C4	D
Climate Change - total (GWPtot) [kg CO2 eq.]	3,76E+00	3,12E-03	6,70E-03	1,32E-03	1,36E+00	-6,62E-01
Climate Change, fossil (GWPf) [kg CO2 eq.]	3,70E+00	3,11E-03	6,66E-03	1,31E-03	1,36E+00	-6,58E-01
Climate Change, biogenic (GWPb) [kg CO2 eq.]	4,77E-02	0,00E+00	0,00E+00	1,18E-05	0,00E+00	-3,13E-03
Climate Change, land use and land use change (GWPluc) [kg CO2 eq.]	3,24E-03	1,66E-05	3,73E-05	2,78E-07	1,92E-05	-1,02E-04
Ozone depletion (ODP) [kg CFC-11 eq.]	6,03E-10	1,78E-16	4,01E-16	1,92E-14	1,06E-13	-4,11E-12
Acidification terrestrial and freshwater (AP) [Mole of H+ eq.]	9,71E-03	1,47E-05	3,94E-05	2,87E-06	2,39E-04	-9,92E-04
Eutrophication, freshwater (EPfr) [kg P eq.]*	2,94E-05	8,88E-09	2,00E-08	3,84E-09	6,82E-06	-8,54E-07
Eutrophication, marine (EPmar) [kg N eq.]	2,89E-03	6,94E-06	1,94E-05	6,44E-07	5,13E-05	-2,35E-04
Eutrophication, terrestrial (EPter) [Mole of N eq.]	3,07E-02	7,68E-05	2,14E-04	6,76E-06	8,78E-04	-2,52E-03
Photochemical ozone formation, human health (POCP) [kg NMVOC eq.]	9,25E-03	1,95E-05	3,72E-05	1,74E-06	1,59E-04	-6,66E-04
Resource use, mineral and metals (ADPe) [kg Sb eq.] **	6,91E-05	2,49E-10	5,60E-10	3,58E-10	3,90E-09	-8,09E-06
Resource use, fossils (ADPf) [MJ] **	1,22E+02	3,98E-02	8,95E-02	2,37E-02	6,72E-01	-1,11E+01
Water use (WU) [m^3 world equiv.] **	5,75E-01	2,67E-05	6,01E-05	2,94E-04	1,22E-01	-6,98E-02
Eutrophication, freshwater (EPfr) [kg PO4 eq.]	9,03E-05	2,73E-08	6,14E-08	1,18E-08	2,09E-05	-2,62E-06
Additional GWP-GHG indicator required by PCRs						
Climate change - GWP-GHG [kg CO2 eq.]***	3,65E+00	-	-	-	-	-

** The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.*
***The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*
****The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.*

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7) INDICATORS OF RESOURCES, WASTE, OUTPUT FLOWS AND BIOGENIC CONTENT

7a - Spigot fittings

Table 11: Indicators of resources use, waste, output flows and biogenic content for spigot fittings (Adaptator – dn900)

	Adaptator dn900					
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	3,20E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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
Total use of renewable primary energy resources (PERT) [MJ]	3,20E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable primary energy (PENRE) [MJ]	4,53E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	6,55E+01	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]	1,11E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	1,37E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	1,54E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed (NHWD) [kg]	5,13E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed (RWD) [kg]	5,46E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	8,23E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	6,27E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	1,12E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	1,90E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

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Table 12: Indicators of resources use, waste, output flows and biogenic content for spigot fittings (Adaptator – dn63)

Adaptator dn63						
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	2,80E+01	2,26E-03	5,09E-03	1,32E-02	8,42E-02	-3,01E+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
Total use of renewable primary energy resources (PERT) [MJ]	2,80E+01	2,26E-03	5,09E-03	1,32E-02	8,42E-02	-3,01E+00
Use of non-renewable primary energy (PENRE) [MJ]	3,08E+01	3,98E-02	8,97E-02	2,37E-02	7,16E-01	-1,18E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,30E+01	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]	7,38E+01	3,98E-02	8,97E-02	2,37E-02	7,16E-01	-1,18E+01
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	1,01E-02	2,56E-06	5,75E-06	1,25E-05	3,07E-03	-2,88E-03
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	3,00E-08	1,91E-13	4,30E-13	2,05E-12	1,00E-10	-1,63E-09
Non-hazardous waste disposed (NHWD) [kg]	3,28E-02	5,71E-06	1,29E-05	1,79E-05	5,51E-01	-5,68E-03
Radioactive waste disposed (RWD) [kg]	3,96E-04	4,91E-08	1,11E-07	3,78E-06	1,68E-05	-8,60E-04
Materials for Recycling (MFR) [kg]	1,43E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	1,76E-02	0,00E+00	0,00E+00	3,02E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	3,15E-02	0,00E+00	0,00E+00	5,38E+00	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	5,46E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

7b - Transition fittings PE/brass

Table 13: Indicators of resources use, waste, output flows and biogenic content for transition fittings PE/Brass (dn20)

	Transition fitting PE/Brass dn20					
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	2,52E+01	2,26E-03	5,09E-03	1,32E-02	1,61E-02	-4,49E-01
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
Total use of renewable primary energy resources (PERT) [MJ]	2,52E+01	2,26E-03	5,09E-03	1,32E-02	1,61E-02	-4,49E-01
Use of non-renewable primary energy (PENRE) [MJ]	2,46E+01	3,98E-02	8,97E-02	2,37E-02	1,50E-01	-1,76E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	6,65E+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]	3,13E+01	3,98E-02	8,97E-02	2,37E-02	1,50E-01	-1,76E+00
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	1,30E-02	2,56E-06	5,75E-06	1,25E-05	4,58E-04	-4,30E-04
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	2,28E-08	1,91E-13	4,30E-13	2,05E-12	2,16E-11	-2,43E-10
Non-hazardous waste disposed (NHWD) [kg]	3,43E-01	5,71E-06	1,29E-05	1,79E-05	1,25E-01	-8,47E-04
Radioactive waste disposed (RWD) [kg]	1,37E-03	4,91E-08	1,11E-07	3,78E-06	3,03E-06	-1,28E-04
Materials for Recycling (MFR) [kg]	3,96E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	1,26E-02	0,00E+00	0,00E+00	4,51E-01	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	2,27E-02	0,00E+00	0,00E+00	8,02E-01	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	3,39E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

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7c - Transition fittings PE/steel, with uncoated PIPE

Table 14: Indicators of resources use, waste, output flows and biogenic content for transition fittings PE/Steel, with uncoated pipe (dn32)

PE/Steel with uncoated pipe - dn32						
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	1,89E+01	2,26E-03	5,09E-03	1,32E-02	1,11E-02	9,61E-01
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
Total use of renewable primary energy resources (PERT) [MJ]	1,89E+01	2,26E-03	5,09E-03	1,32E-02	1,11E-02	9,61E-01
Use of non-renewable primary energy (PENRE) [MJ]	2,78E+01	3,98E-02	8,97E-02	2,37E-02	1,08E-01	-9,51E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,21E+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]	3,20E+01	3,98E-02	8,97E-02	2,37E-02	1,08E-01	-9,51E+00
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	4,35E-03	2,56E-06	5,75E-06	1,25E-05	2,66E-04	-9,83E-04
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	8,75E-09	1,91E-13	4,30E-13	2,05E-12	1,58E-11	2,79E-10
Non-hazardous waste disposed (NHWD) [kg]	3,73E-02	5,71E-06	1,29E-05	1,79E-05	9,31E-02	-1,65E-02
Radioactive waste disposed (RWD) [kg]	3,35E-04	4,91E-08	1,11E-07	3,78E-06	2,01E-06	6,59E-05
Materials for Recycling (MFR) [kg]	1,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	4,58E-03	0,00E+00	0,00E+00	2,62E-01	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	8,20E-03	0,00E+00	0,00E+00	4,65E-01	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	1,61E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

PLASTITALIA™ S.p.A. high performance fittings

7d - Transition fittings PE/steel, with PE coated PIPE

Table 15: Indicators of resources use, waste, output flows and biogenic content for transition fittings PE/Steel, with PE coated pipe (dn25)

	PE/Steel with coated pipe - dn25					
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	1,95E+01	2,26E-03	5,09E-03	1,32E-02	9,85E-03	1,03E+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
Total use of renewable primary energy resources (PERT) [MJ]	1,95E+01	2,26E-03	5,09E-03	1,32E-02	9,85E-03	1,03E+00
Use of non-renewable primary energy (PENRE) [MJ]	3,74E+01	3,98E-02	8,97E-02	2,37E-02	9,78E-02	-9,47E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	3,52E+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]	4,09E+01	3,98E-02	8,97E-02	2,37E-02	9,78E-02	-9,47E+00
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	9,01E-03	2,56E-06	5,75E-06	1,25E-05	2,20E-04	-9,52E-04
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	1,08E-08	1,91E-13	4,30E-13	2,05E-12	1,44E-11	3,10E-10
Non-hazardous waste disposed (NHWD) [kg]	3,75E-02	5,71E-06	1,29E-05	1,79E-05	8,56E-02	-1,67E-02
Radioactive waste disposed (RWD) [kg]	3,96E-04	4,91E-08	1,11E-07	3,78E-06	1,77E-06	8,12E-05
Materials for Recycling (MFR) [kg]	1,38E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	5,05E-03	0,00E+00	0,00E+00	2,16E-01	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	9,04E-03	0,00E+00	0,00E+00	3,84E-01	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	1,95E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

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7e - Electrofusion fittings

Table 16: Indicators of resources use, waste, output flows and biogenic content for electrofusion fittings (Tee – dn32)

	Tee – dn63					
Resources use indicators	A1-A3	C1	C2	C3	C4	D
Use of renewable primary energy (PERE) [MJ]	3,30E+01	2,26E-03	5,09E-03	1,32E-02	7,89E-02	-2,84E+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
Total use of renewable primary energy resources (PERT) [MJ]	3,30E+01	2,26E-03	5,09E-03	1,32E-02	7,89E-02	-2,84E+00
Use of non-renewable primary energy (PENRE) [MJ]	7,37E+01	3,98E-02	8,97E-02	2,37E-02	6,72E-01	-1,11E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,86E+01	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]	1,22E+02	3,98E-02	8,97E-02	2,37E-02	6,72E-01	-1,11E+01
Input of secondary material (SM) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [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 (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	2,28E-02	2,56E-06	5,75E-06	1,25E-05	2,87E-03	-2,80E-03
Output flows and waste categories indicators	A1-A3	C1	C2	C3	C4	D
Components for Re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Hazardous waste disposed (HWD) [kg]	2,31E-08	1,91E-13	4,30E-13	2,05E-12	9,43E-11	-1,54E-09
Non-hazardous waste disposed (NHWD) [kg]	7,69E-02	5,71E-06	1,29E-05	1,79E-05	5,18E-01	6,97E-04
Radioactive waste disposed (RWD) [kg]	1,55E-03	4,91E-08	1,11E-07	3,78E-06	1,57E-05	-8,03E-04
Materials for Recycling (MFR) [kg]	1,83E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	3,99E-02	0,00E+00	0,00E+00	2,82E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	7,13E-02	0,00E+00	0,00E+00	5,02E+00	0,00E+00	0,00E+00
Biogenic carbon content	A1-A3	C1	C2	C3	C4	D
Biogenic carbon content in packaging [kg]*	8,58E-02	-	-	-	-	-

**1 kg biogenic carbon is equivalent to 44/12 kg CO2*

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8) ADDITIONAL INFORMATION

8a - Additional information on the programme and the EPD

EPDs within the same product category but from different program may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804. Environmental product declarations within the same product category from different programs may not be comparable. This EPD and the PCR 2019:14 “Construction products” are available on the website of The International EPD® System (www.environdec.com).

The verifier and the Programme Operator do not make any claim nor have any responsibility of the legality of the products included in the present EPD. The LCA study and the present EPD have been issued with the technical scientific support of Ecoinnovazione S.r.l., spin-off ENEA (http://ecoinnovazione.it/?lang=en).
The EPD owner has the sole ownership, liability, and responsibility for the EPD.

8b - Additional information on the products and on the company

Products covered by the present EPD are produced in Brolo (ME).

For further information on product characteristics, typical applications, technical datasheets and case histories, please visit our website www.plastitaliaspa.com or contact us to alessandro.princiotta@plastitaliaspa.com

PLASTITALIA™ S.p.A.
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9) VERIFICATION AND REGISTRATION

CEN standard EN 15804 served as core PCR	
EPD Programme:	The International EPD® System For more information – www.environdec.com
GPI:	General Programme Instruction 3.01
PCR:	PCR 2019:14 Construction products version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec/com/contact
EPD owner	PLASTITALIA S.p.A. Via Ferrara snc, 98061 – Brolo (ME) Italy Tel. +390941536311 Fax. +390941561476 www.plastitaliaspa.com @: alessandro.princiotta@plastitaliaspa.com
Technical support:	Ecoinnovazione S.r.l. – spin-off ENEA Via della Liberazione 6, 40128 Bologna www.ecoinnovazione.it
Independent verification of the declaration and data according to ISO 14025: 2006	☒ External ☐ Internal Covering ☐ EPD Process verification ☒ EPD verification
Third party verifier:	SGS Italia S.p.A. Via Caldera 21, 20153 Milano. Tel +3902 73931 Fax: +39 02 7012 4630 www.it.sgs.com
Accredited by:	Accredia, certificate n.006H
Procedure for follow-up during EPD validity involves third party verifier	☒Yes ☐No

10) REFERENCES

Ecoinnovazione, Technical report: LCA Study of Plastitalia Polyethylene fittings PE100 – PE100RC. October, REV 3

EN ISO 14040: 2006 Environmental management -- Life cycle assessment -- Principles and framework

EN ISO 14044:2006 Environmental management -- Life cycle assessment -- Requirements and guidelines

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

General Programme Instructions (GPI) for the International EPD® VERSION 3.01

The International EPD® System, Product Category Rules (PCRs) for construction products, 2019:14 v. 1.11.

PLASTITALIA™ S.p.A.
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