NUPI INDUSTRIE ITALIANE S.p.A.

ENVIRONMENTAL PRODUCT DECLARATION

Product names:

POLYPROPYLENE BRASS TRANSITION FITTINGS TYPE NIRON, NIRON BETA AND POLYSYSTEM

Site Plants:

Busto Arsizio (VA)

in compliance with ISO 14025 and EN 15804+A2:2019

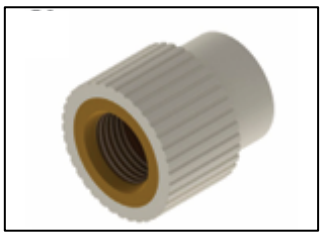
Program Operator	EPDItaly
Publisher	EPDItaly

Declaration Number	2026PCPPTR
Registration Number	EPDITALY1362

Issue Date	15/09/2026
Valid to	15/09/2031







General information

EPD OWNER:	Nupi Industrie Italiane S.p.A., Piazza San Marco n. 1, 20121 – Milano (MI) Italy
PLANT INVOLVED in the declaration:	Busto Arsizio: Via Stefano Ferrario n. 8 - 21052 Busto Arsizio (VA), Italy
SCOPE OF APPLICATION:	This Environmental Product Declaration (EPD) is valid for NIRON AND POLYSYSTEM BRASS TRANSITION fittings made of polypropylene. The production plant involved is the one located in Busto Arsizio (BA). The type of declaration is related to an average fitting product. The life cycle assessment is representative for the product introduced in the declaration for the given system boundaries.
PROGRAM OPERATOR:	EPDITALY, via Gaetano De Castillia 10, 20124 Milano, Italia.
INDIPENDENT CHECK:	This declaration has been developed referring to EPDItaly, following the General Programme Instruction; further information and the document itself are available at: www.epditaly.it. EPD document valid within the following geographical area: Italy and other countries according to sales market conditions. CEN standard EN 15804 served as the core PCR (PCR ICMQ-001/15 rev.3.2; 03/11/2025). PCR review was conducted by Daniele Pace. Contact via info@epditaly.it Independent verification of the declaration and data, according to EN ISO 14025:2010. Third party verifier: ICMQ SpA, via De Castillia, 10 20124 Milano (www.icmq.it) ☐EPD process certification (Internal)☑ EPD verification (External) ***Accredited by: Accredia***
CPC CODE:	3632 - Tubes, pipes and hoses, and fittings therefor, of plastics
CORPORATE CONTACT:	info@nupinet.com
TECHNICAL SUPPORT:	Sphera https://www.sphera.com
COMPARABILITY:	Environmental product declarations published within the same product category, but from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804+A2.

ACCOUNTABILITY:	Nupi Industrie Italiane S.p.A relieves EPDItaly from any non-compliance with environmental legislation. The EPD owner will be responsible for the information and supporting evidence; EPDItaly declines all responsibility for the manufacturer's information, data and results of the life cycle assessment.
REFERENCE DOCUMENT:	This declaration has been developed following the EPDItaly Program Regulations and Annexes of EPDItaly, available at www.epditaly.it.
PRODUCT CATEGORY RULES (PCR):	PCR ICMQ-001/15 rev.3.2 – 03/11/2025 EN 15804+A2:2019 is the framework reference for PCRs. EN 16904:2025
EPD PROJECT REPORT	2026_08_25_68%OT-32%PP_medio

Company

OUR MISSION – FOR OVER 50 YEARS

Cutting edge solutions for any kind of installation

The primary goal of Nupi Industrie Italiane S.p.A. corporate strategy is not only the production of systems that meet performance requirements and comply with the use for which they are intended, but above all general customer satisfaction. Producing better and faster are goals that technology makes more and more compatible.

In 2022, Nupi Industrie Italiane S.p.A. celebrated its 50th anniversary! In October 2015, it took over from Nupigeco S.p.A., founded in October 2008 from the merger of NUPI S.p.A. and GECO System S.p.A., to form a single large company. Combining their many years of experience and constant growth, the two firms decided to create a new flexible and advanced company, ready to play its role to satisfy the demands of the market whilst being environmentally astute.

The goal was to combine the expertise in the development and production of piping systems for plumbing, industrial applications, gas, irrigation and heating, with the experience in the production of polymer BRASS TRANSITION fittings specifically dedicated to oil, chemical and petrochemical fields.







Management System and Certifications

Nupi Industrie Italiane S.p.A. submits its management and production systems to external audits performed by third party certification bodies.
Audit frequency depends on the procedure established by the specific standard and by each certification body. Nupi Industrie Italiane S.p.A. is certified in compliance with the standards for quality (EN ISO 9001), environment (EN ISO 14001) and Health and Safety of workers (ISO 45001).
Thanks to the synergy between the phases of research, production, quality control and after-sales service, the company obtained several international quality company and product certifications.

UNI EN ISO 9001
UNI EN ISO 14001
ISO 45001



MANAGMENT QUALITY UNI EN ISO 9001:2015

POLICY ENVIRONMENTAL UNI EN ISO 14001:2015

SAFETY AT WORK UNI ISO 45001:2018

Product Certifications

The company leadership is based on these solid foundations in a competitive and high technology industry such as plastics processing. A record that NUPI Industrie Italiane S.p.A. maintains thanks to high quality products and constant attention to customers' needs through an efficient after-sales service, a precise and timely technical assistance and installers' training.
NUPI products are of high quality, complying with regulations and conforming to the most stringent standards and certifications schemes. The full updated list is available on the website: www.nupiindustrieitaliane.com.

EPD Goal and scope

The entire life cycle of the product is considered (Type of EPD: cradle to grave and module D) and the modules described below are declared in this EPD:

*Modules **A1-A3** include those processes that provide energy and material input for the system (A1), transport up to the factory gate of the plant (A2), manufacturing processes as well as waste processing and emissions to air (A3).*

*Module **A4** includes the transport from the production site to the customer or to the point of installation of the products.*

*Module **A5** considers all fitting systems installation steps (negligible), the installation is done inside building mainly manually performed or with a minimum energy plus packaging waste processing (recycling, incineration, disposal). Credits from energy substitution are declared in module D. During this phase, a specific leftover has been considered.*

*Module **B1** considers the use of the installed product. During the use of plastic fittings, a scenario of zero impact is considered.*

*Module **B2** includes the maintenance of the product. A scenario of zero impact is considered.*

*Modules **B3-B4-B5** are related to the repair, replacement and refurbishment of the products. If the products are properly installed no repair, replacement or refurbishment processes are necessary. A scenario of zero impact is then considered.*

*Module **C1** considers deconstruction, including dismantling or demolition of the product from the building.*
For products installed inside buildings a scenario of zero impact is considered.

*Module **C2** considers transportation of the discarded fittings to a recycling or disposal process.*

*Module **C3** considers waste processing for products sorting, recycling and incineration.*

*Module **C4** includes all waste disposal processes, including pre-treatment and management of the disposal site.*

*Module **D** includes benefits from all net flows in the end-of-life stage that leave the product boundary system after having passed the end-of-waste stage. Benefits from packaging incineration (electricity and thermal energy) are declared within module D.*

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse- Recovery- Recycling- potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = modules included in the study

The emission factor for the electricity used in A3 is 0.199 KgCO2eq/kWh.

According to the PCR ICMQ-001/15 rev. 3.2 this EPD is a “cradle to grave and module D” Type. it is an average EPD for the product NIRON AND POLYSYSTEM brass transition fittings produced in NUPI INDUSTRIE ITALIANE S.p.A. plant, located in Busto Arsizio (VA). All data refer to the 2024 production and sales.

All manufacturing activities and packaging/auxiliary’s production are in module A3, while energy production and input materials are in A1. Transport to clients (A4) is included together with end-of-life scenarios (benefits and loads included according to D module).

The declaration is a Type 3 EPD (product EPD based on a qualified LCA-Tool) according to /REGULATIONS OF THE EPDItaly PROGRAMME 6/.

Geographical validity: EU+GLO

Time Representativeness: The primary data cover a period of 12 months, reference 2024.

Database: MLC Database 2024.2

NUPI LCA Tool v.5 25.01.2025: The LCA model is created using the Sphera LCA for Expert (previously GaBi Professional) Software system for life cycle engineering, developed by Sphera. The /MANAGED LCA CONTENT (GABI DATABASES)/ provides the life cycle inventory data for several of the raw and process materials obtained from the background system.

EPD realized by means of a validated algorithm:
In 2019 NUPI Industrie Italiane S.p.A. implemented and certified a Process for EPD generation by using an algorithm that has been validated and certified by ICMQ S.p.A., in agreement with EPDItaly’s requirements. The process is based on an automatic data collection from different manufacturing plants that have been integrated, verified and validated in compliance with internal procedures. The validated algorithm allows the automatic calculation of the indicators reported into the current EPD coming from an LCA model implemented into the NUPI LCA process tool.
In 2025, after the five years period of validity, the NUPI LCA tool has been updated and validated by ICMQ S.p.A. The LCA tool enables the creation of partly verified LCA results for pipes, fittings and piping systems produced by NUPI.

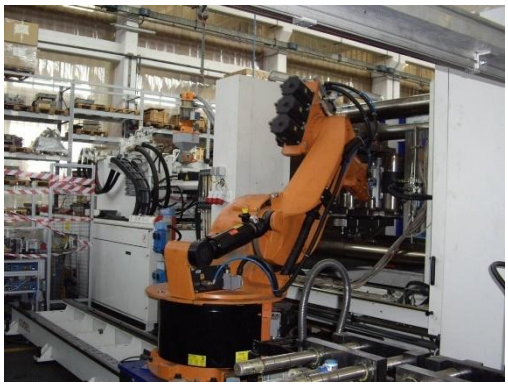
Product description

Detailed product description

POLYSYSTEM, NIRON and NIRON BETA BRASS TRANSITION fittings are polypropylene random copolymer (PP-R and PP-RCT) products manufactured by Nupi Industrie Italiane S.p.A. for the conveyance of hot and cold water and other technical fluids in building services and industrial applications. The BRASS TRANSITION fittings are produced in a range of diameters and pressure classes and are designed for use in plumbing, heating, cooling and HVAC systems. POLYPROPYLENE BRASS TRANSITION fittings are joined by thermal fusion, creating homogeneous and leak-tight connections. The products are manufactured in accordance with the applicable requirements of EN ISO 15874 and related product specifications.

Production processes description

FITTINGS INJECTION MOULDING (Busto Arsizio)



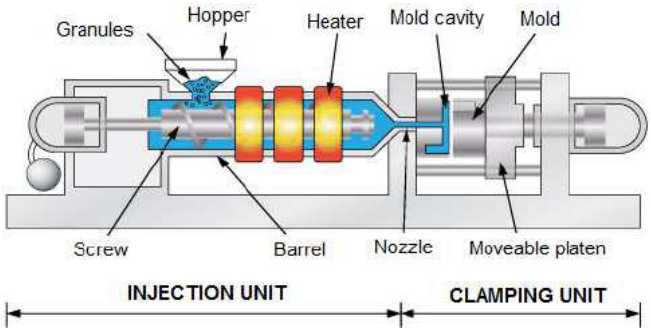


Figure 1 Injection Molding process

Equipment to mould fittings consists of a mould and an injection moulding press. The mould is a split metal block that is machined to form a part shaped cavity in the block. Hollows in the part are created by core pins shaped into the part cavity. The moulded part is created by filling the cavity in the mould block through a filling port, called a gate.

The injection moulding press has two parts; a press to open and close the mould block, and an injection extruder to inject material into the mould block cavity. The injection extruder is similar to a conventional extruder except that, in addition to rotating, the extruder screw also moves lengthwise in the barrel. Injection moulding is a cyclical process. The mould block is closed and the extruder barrel is moved into contact with the mould gate. The screw is rotated and then drawn back, filling the barrel ahead of the screw with material. Screw rotation is stopped, and the screw is rammed forward, injecting molten material into the mould cavity under high pressure. The part in the mould block is cooled by water circulating through the mould block. When the part has solidified, the extruder barrel and mould core pins are retracted, the mould is opened, and the part is ejected.

Niron&Polysystem BRASS TRANSITION fittings are designed to fully exploit the characteristics of the materials used to make them and offer high performance standards that allow them to be used both for plumbing and heating systems. The table below, an excerpt from Standard EN ISO 15874, demonstrates the fields of use and the corresponding operating pressures and temperatures guaranteed for this system.

PP-R

	APPLICATION CLASSES								P_D					
	1	2	4	5	1	2	4	5			10	8	6	4
P_D	S				SDR				S	SDR	ALLOWABLE CLASSES			
4	5	5	5	3,2	11	11	11	7,4	2,5	6	1&4	2	5	5
6	5	3,2	5	3,2	11	7,4	11	7,4	3,2	7,4	2)	1&4	2	5
8	3,2	2,5	3,2	-	7,4	6	7,4	1)	5	11	2)	2)	1&4	1&2&4
10	2,5	-	2,5	-	6	1)	6	1)						

PP-RCT

	APPLICATION CLASSES								P_D					
	1	2	4	5	1	2	4	5			10	8	6	4
P_D	S				SDR				S	SDR	ALLOWABLE CLASSES			
4	8	8	8	5	17	17	17	11	3,2	7,4	1&2&4	5	5	5
6	5	5	5	4	11	11	11	9	4	9	2)	1,2,4	5	5
8	4	4	4	3,2	9	9	9	7,4	5	11	2)	2)	1&2&4	5
10	3,2	3,2	3,2	1)	7,4	7,4	7,4	1)	8	17	2)	2)	2)	1&2&4

1) Series/SDR not available in the NIRON piping range.

2) Application class not covered by this Series/SDR.

Example: A PP-RCT, SDR7,4, Series 3,2 pipe can be used in application classes 1,2 and 4 with a design pressure of 10 bar and in class 5 with a design pressure of 8 bar.

Service Conditions - Application classes as per EN ISO 15874 and ISO 10508

PROPERTIES	TEST METHOD	VALUES AT +23°C	UNIT OF MEASURE
Volumic mass	ISO 1183	**0,898**	g/cm^3
Yield strength	ISO 527	**23**	N/mm^2
Elongation at break	ISO 527	**> 50**	%
Modulus of elasticity	ISO 527	**850**	N/mm^2
Melt flow index MFI 190/5	ISO 1133	**0,5**	g/10 min
Heat conductivity (λ)	DIN 52612	**0,24**	W/mk
Linear thermal expansion coefficient	VDE 0304	**$1,5 \times 10^{-4}$**	K^{-1}
Melting point	DIN 53736b2	**150 - 154**	°C
Impact strength (Charpy)			
+23°C	ISO 179/1 e A	**no break**	KJ/m^2
-30°C	ISO 179/1 e A	**50**	KJ/m^2
Volumic strength	IEC 93	**$>10^{15}$**	Ω cm
Dielectric strength	IEC 243/1	**75**	KV/mm
Dielectric loss factor	DIN 53483	**$< 5 \times 10^{-4}$**	
Fire resistance	DIN 4102	**B2**	

Physical properties Niron and Polysystem PP material

BRASS TRANSITION fittings are classified as Class 1, 2 or 5 in compliance with EN ISO 15874 Table 1 in combination with the dedicated Design Pressure given by the fitting SDR.

Base materials/ancillary materials in the functional/declared unit

Material	Brass Transition Fittings
Polypropylene granulate	31.2 %
Pigments	0.3 %
Brass insert	68.5 %
TOTAL	100 %

The product contains lead in the brass inserts with a percentage of 2-2.5 % in weight. Lead is included in the “Candidate List of Substances of Very High Concern for Authorization" – SVHC – as per REACH regulation.

Description of functional/declared unit

In this EPD an average fitting is considered. The fitting diameters range considered in the data collection includes a size range from DN 16 to DN 125, type couplers, elbows, tees and welding saddles, with male or female brass threaded inserts. The complete list is in Annex I. The raw material used can be PP-R or PP-RCT.

It has been considered a declared unit of 1 kg of NIRON, NIRON BETA AND POLYSYSTEM BRASS TRANSITION fittings.

The declared unit’s packaging includes 0,038 kg/kg of wooden pallets, 0,027 kg/kg cardboard boxes and 0,008 kg/kg of polyethylene stretch films.

Reference service life (RSL)

NIRON AND POLYSYSTEM BRASS TRANSITION fittings are regarded as having 50 years RSL independent of their material.

Products Distribution

Polypropylene BRASS TRANSITION fittings the packaging consists in stretch film for shipping, wooden pallets and cardboard boxes.

Installation

According to PCR EN 16904 installation of the product was considered to be negligible, as it is done manually in the building or with a minimum energy. Environmental impacts from waste packaging materials (A5) and release of biogenic carbon dioxide from wood pallets and cardboard boxes was considered. The impacts of material production, its processing and its disposal as installation waste are also included. Packaging treatment scenarios are based on Eurostat data for Europe.

No emissions are generated during installation and plastic BRASS TRANSITION fittings installations do not cause health or environmental hazards.

End of Life

After the demolition and deconstruction phase, the EU EOL as per MFA JRC 2025 (2024 data) scenario for Polypropylene materials has been chosen (45.5 % incineration, 39.3% landfill and 15.2% recycling).
For brass inserts, 95% are recovered and recycled and 5% are sent to landfill.

For transport from the installation site to the treatment site (C2), the considered distances (as per EN 16904) were:

- incineration = 150 km
- recycling = 500 km
- landfilling = 50 km

LCA results – Environmental impacts per declared unit

The tables below show the environmental impacts results of 1 kg of NIRON, NIRON BETA AND POLYSYSTEM BRASS TRANSITION fittings.

Additional environmental impact indicators have been calculated and included in the project report but are not declared according to /EN 15804+A2:2019/ chapter 7.2.3.2.

CORE ENVIRONMENTAL IMPACT INDICATORS												
	A1	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP - total [kg CO_2 eq.]	1,59E+00	1,17E-01	2,94E-01	2,00E+00	2,80E-01	1,40E-01	0,00E+00	0,00E+00	3,97E-02	4,76E-01	4,25E-03	-3,22E-01
GWP- fossil [kg CO_2 eq.]	1,58E+00	1,15E-01	3,89E-01	2,08E+00	2,80E-01	1,38E-02	0,00E+00	0,00E+00	3,96E-02	4,76E-01	4,22E-03	-3,21E-01
GWP - biogenic [kg CO_2 eq.]	2,57E-03	3,24E-04	-9,54E-02	-9,25E-02	2,56E-04	1,27E-01	0,00E+00	0,00E+00	3,64E-05	8,35E-05	1,28E-05	-1,30E-03
GWP - LULUC [kg CO_2 eq.]	2,11E-03	1,86E-03	2,87E-04	4,26E-03	3,18E-05	2,57E-06	0,00E+00	0,00E+00	5,12E-06	4,01E-06	1,69E-05	-3,06E-05
ODP [kg CFC-11 eq.]	1,52E-11	1,69E-14	3,02E-13	1,55E-11	3,28E-14	1,44E-14	0,00E+00	0,00E+00	4,95E-15	2,10E-13	1,36E-14	-2,11E-12
AP [mol of H+ eq.]	9,86E-03	2,85E-04	2,37E-04	1,04E-02	2,34E-03	1,47E-05	0,00E+00	0,00E+00	5,35E-05	7,16E-05	2,59E-05	-4,14E-04
EP - freshwater [kg P eq.]	2,92E-06	4,75E-07	5,84E-07	3,98E-06	7,40E-08	1,02E-07	0,00E+00	0,00E+00	1,04E-08	5,70E-08	2,10E-06	-4,72E-07
EP - marine [kg N eq.]	1,17E-03	1,05E-04	1,02E-04	1,38E-03	1,02E-03	5,51E-06	0,00E+00	0,00E+00	2,11E-05	1,57E-05	5,74E-06	-1,30E-04
EP - terrestrial [mol of N eq.]	1,26E-02	1,20E-03	1,08E-03	1,49E-02	1,12E-02	5,91E-05	0,00E+00	0,00E+00	2,37E-04	2,80E-04	6,31E-05	-1,40E-03
POCP [kg NMVOC eq.]	4,18E-03	2,83E-04	3,07E-04	4,77E-03	2,33E-03	2,37E-05	0,00E+00	0,00E+00	5,80E-05	4,55E-05	1,82E-05	-4,51E-04
ADPe [kg Sb eq.]*	3,41E-04	9,78E-09	9,38E-08	3,41E-04	7,29E-09	2,95E-10	0,00E+00	0,00E+00	1,06E-09	3,18E-09	2,79E-10	-2,56E-08
ADPf [MJ]*	4,16E+01	1,52E+00	1,24E+00	4,44E+01	3,66E+00	4,88E-02	0,00E+00	0,00E+00	5,27E-01	2,92E-01	6,92E-02	-7,23E+00
WDP [m^3 world equiv.]*	4,34E-01	1,73E-03	7,21E-02	5,08E-01	6,71E-04	3,70E-03	0,00E+00	0,00E+00	9,96E-05	4,48E-02	5,37E-04	-4,04E-02

Caption: GWP - total = global warming potential; GWP - fossil = global warming potential (fossil fuel only); GWP - biogenic = global warming potential (biogenic); GWP - luluc = global warming potential (land use only); ODP = ozone depletion; AP = acidification terrestrial and freshwater; EP - freshwater = eutrophication potential (freshwater); EP - marine = eutrophication potential (marine); EP- terrestrial = eutrophication potential (terrestrial); POCP = photochemical ozone formation; ADPE = abiotic depletion potential (element), ADPF = abiotic depletion potential (fossil) WDP = water scarcity.

*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 according to EN 15804+A2:2019 chapter 7.2.3.2.

LCA results – Resource use per declared unit

RESOURCE USE												
	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE [MJ]	1,03E+01	1,26E-01	3,50E-01	1,08E+01	2,55E-02	2,42E-01	0,00E+00	0,00E+00	3,86E-03	1,15E-01	1,06E-02	-1,41E+00
PERM [MJ]	0,00E+00	0,00E+00	1,09E+00	1,09E+00	0,00E+00	-2,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [MJ]	1,03E+01	1,26E-01	1,44E+00	1,19E+01	2,55E-02	9,79E-03	0,00E+00	0,00E+00	3,86E-03	1,15E-01	1,06E-02	-1,41E+00
PENRE [MJ]	2,71E+01	1,52E+00	8,57E-01	2,95E+01	3,66E+00	1,90E-01	0,00E+00	0,00E+00	5,27E-01	6,91E+00	6,92E-02	-7,23E+00
PENRM [MJ]	1,45E+01	0,00E+00	3,82E-01	1,49E+01	0,00E+00	-1,41E-01	0,00E+00	0,00E+00	0,00E+00	-6,61E+00	0,00E+00	0,00E+00
PENRT [MJ]	4,16E+01	1,52E+00	1,24E+00	4,44E+01	3,66E+00	4,88E-02	0,00E+00	0,00E+00	5,27E-01	2,92E-01	6,92E-02	-7,23E+00
SM [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	0,00E+00	0,00E+00	0,00E+00	5,63E-02
RSF [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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF [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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW [m³]	1,04E-02	1,41E-04	1,88E-03	1,24E-02	2,82E-05	8,96E-05	0,00E+00	0,00E+00	4,22E-06	1,09E-03	1,61E-05	-1,40E-03

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

LCA results – Output flows and waste categories per declared unit

WASTE CATEGORIES AND OUTPUT FLOWS												
	A1	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1-B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD [kg]	3,18E-08	5,79E-11	1,70E-08	4,89E-08	1,30E-10	4,11E-10	0,00E+00	0,00E+00	1,92E-11	5,93E-09	1,71E-11	-2,81E-09
NHWD [kg]	2,29E-01	2,45E-04	6,74E-03	2,36E-01	3,76E-04	1,30E-02	0,00E+00	0,00E+00	5,49E-05	4,05E-03	1,62E-01	-2,69E-03
RWD [kg]	1,12E-03	2,76E-06	3,38E-05	1,16E-03	5,58E-06	1,90E-06	0,00E+00	0,00E+00	8,40E-07	3,39E-05	9,49E-07	-2,95E-04
EEE [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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,54E-02	0,00E+00	0,00E+00	0,00E+00	7,67E-01	0,00E+00	0,00E+00
CRU [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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,14E-02	0,00E+00	0,00E+00	0,00E+00	9,55E-01	0,00E+00	0,00E+00
MFR [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,24E-02	0,00E+00	0,00E+00	0,00E+00	1,70E+00	0,00E+00	0,00E+00

.Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

LCA results – Biogenic carbon content of product and packaging per declared unit

Biogenic carbon content of product and packaging	
Biogenic carbon content in product [kg]	0,00E+00
Biogenic carbon content in packaging [kg]	2,57E-02

Assumptions and approximations

Where possible, a conservative approach has been adopted, overestimating burdens to prove irrelevance. In other cases, proxy data were selected based on scientific experience, in order to improve the accuracy of the model. Where it was not possible to know the precise composition of materials in the supply chain (due to commercial or industrial confidential suppliers' reasons or due to missing datasets), these have been approximated with LCIs of similar materials, estimated by the combination of available dataset or reconstructed with literature data.

1. Where potential benefits from energy recovery in A5 and C modules are considered, for rest of world countries (other than Europe) these are calculated based on the European grid mix.
2. Wastes deriving from extraordinary maintenance activities have not been considered.
3. Some components produced by third party companies come to NUPI with their own packaging. This packaging is not accounted for in this study.
4. In case of CCHP system in place as electricity is produced only for internal use, no electricity is sent to national grid.
5. Internal transports between production sites have not been considered
6. A European scenario has been considered for end of life scenarios.

Cut off criteria

EN 15804+A2:2019 requires that where there are data gaps or insufficient input data for a unit process the cut-off criteria shall be 1% of renewable and non-renewable primary energy usage and 1% of the total mass of this unit process. It can be concluded that the total sum of neglected material flows does not exceed 5% of mass, energy or environmental relevance. On the other hand, impacts generated from the machinery and facilities itself are neglected. This is in accordance with ISO14040/44 (2006).

In this study, the only aspects that have been omitted are the polyamide strips for packaging as they are <1% of their respective unit processes.

Data quality

The data quality can be considered as good. The LCA model has been checked and most relevant flows were considered. Technological, geographical and temporal representativeness is good.

Examination period

Primary data collected in the context of this study refer to 2024.

Allocation of background data

In general, the allocation principles used in standard Sphera LCA for Expert (previously GaBi Professional) datasets are explained within Sphera LCA for Expert (GaBi)-Documentation (MANAGED LCA CONTENT (GABI DATABASES)).

- **Module A1** includes the manufacture of primary materials which are required for the BRASS TRANSITION fittings manufacturing. The datasets for the primary basic materials already include their upstream process. The energy demand is also considered.
- **Module A2** includes the transports of the basic materials to the BRASS TRANSITION fittings producer. Fuel use is also included in the transport sub-plans. Truck-trailer, Euro 6 A-C, 20 - 28t gross weight / 12.4t payload capacity, Container ship, 5,000 to 200,000 dwt payload capacity, deep sea and Rail transport cargo - average, average train, gross tonne weight 1,000t / 726t payload capacity are used as standard processes in the model.
- **Module A3** includes the production of BRASS TRANSITION fittings, auxiliaries and packaging materials. In this module are also considered emissions to air, production of wastes and their treatment (such activities refer to NUPI Industrie Italiane S.p.A. direct activities. Primary data have been used for (such as injection moulding for BRASS TRANSITION fittings production and emissions/wastes).
- **Module A4** takes into account the transport to the final customer/distributor or construction site. The distribution scenario is taken from an internal survey and shown below:

Means of transport	GaBi transport dataset	Weighted Average distance [km]
Truck	Truck, Euro 5, > 32 t/ 27% utilization factor 26 t truck max load	900,58
Ship	Average ship, 5000-200000 dwt payload capacity/ deep sea	2267,10

- **Module C1** (Deconstruction / demolition)- As generic scenario for the demolition of the product, it is considered that it is mainly demolished together with the construction of the building. During the demolition of a building a significant amount of energy is used. This energy is mainly used to break inert waste streams, such as concrete and brick, and only a very little, insignificant part could be allocated to the product. Therefore, the impact of the deconstruction/demolition stage allocated to the product can be considered as zero.
- **Module C2, C3** (sorting, recycling and incineration with energy recovery) and C4 (landfilling) consider the end of life scenarios of the product, considering all components. The percentages to the given scenarios have been taken from MFA JRC 2025 (2024 data) as shown below:

  - 45.5 % incineration, 39.3% landfill, 15,2% recycling typical for products made of PP.

  For transport from the installation site to the treatment site, reference can be made to the document /TEPPFA EOL SCENARIO/ where it is stated that:
  • incineration = 150 km
  • recycling = 500 km
  • landfilling = 50 km

Module D consists of loads and benefits beyond the system boundaries.

Other additional environmental information

Emissions to indoor air:

No direct emissions at the building site. Nupi Industrie Italiane S.p.A confirms that the NIRON AND POLYSYSTEM BRASS TRANSITION fittings contain Lead in a percentage of 2-2.5 % w/w. Lead is a substance mentioned on the REACH SVHC list.

Emissions to soil and water:

No direct emissions at the building site. Nupi Industrie Italiane S.p.A confirms that NIRON AND POLYSYSTEM BRASS TRANSITION fittings contain Lead in a percentage of 2-2.5 % w/w. Lead is a substance mentioned on the REACH SVHC list.

Annex I – Products specific weight table

Item Code	Description	Weight (kg/pc)
03NRFF1612	Female threaded adapter	0,07
03NRFF2012	Female threaded adapter	0,06
03NRFF2034	Female threaded adapter	0,10
03NRFF2512	Female threaded adapter	0,06
03NRFF2534	Female threaded adapter	0,10
03NRFF3234	Female threaded adapter	0,11
03NRFF321	Female threaded adapter	0,19
03NRFF401	Female threaded adapter	0,22
03NRFF40114	Female threaded adapter	0,29
03NRFF50114	Female threaded adapter	0,29
03NRFF50112	Female threaded adapter	0,41
03NRFF63112	Female threaded adapter	0,45
03NRFF632	Female threaded adapter	0,54
03NRFF752	Female threaded adapter	0,66
03NRFF75212	Female threaded adapter	0,78
03NRFF903	Female threaded adapter	1,29
03NRFF1104	Female threaded adapter	1,92
03NRFF1254	Female threaded adapter	2,15
03NRFM1612	Male threaded adapter	0,10
03NRFM2012	Male threaded adapter	0,10
03NRFM2034	Male threaded adapter	0,16
03NRFM2512	Male threaded adapter	0,10
03NRFM2534	Male threaded adapter	0,14
03NRFM3234	Male threaded adapter	0,16
03NRFM321	Male threaded adapter	0,28
03NRFM401	Male threaded adapter	0,29
03NRFM40114	Male threaded adapter	0,38
03NRFM50114	Male threaded adapter	0,39
03NRFM50112	Male threaded adapter	0,51

Item Code	Description	Weight (kg/pc)
27NRFM2012L	Male Threaded Adapter	0,10
27NRFM2034L	Male Threaded Adapter	0,15
27NRFM2512L	Male Threaded Adapter	0,10
27NRFM2534L	Male Threaded Adapter	0,14
27NRFM3234L	Male Threaded Adapter	0,16
27NRFM321L	Male Threaded Adapter	0,28
27NRFM401L	Male Threaded Adapter	0,29
27NRFM40114L	Male Threaded Adapter	0,38
27NRFM50114L	Male Threaded Adapter	0,41
27NRFM50112L	Male Threaded Adapter	0,51
27NRFM63112L	Male Threaded Adapter	0,59
27NRFM632L	Male Threaded Adapter	0,78
27NRFM752L	Male Threaded Adapter	0,86
27NRFM75212L	Male Threaded Adapter	1,28
27NRFM903L	Male Threaded Adapter	1,85
27NRFM1104L	Male Threaded Adapter	3,03
27NRFM1254L	Male Threaded Adapter	3,10
27NRFF11632L	SDR 11 - Female Threaded Adapter	0,53
27NRFF1175212L	SDR 11 - Female Threaded Adapter	0,79
27NRFF11903L	SDR 11 - Female Threaded Adapter	1,29
27NRFF111104L	SDR 11 - Female Threaded Adapter	1,93
27NRFF111254L	SDR 11 - Female Threaded Adapter	2,04
27NRFM11632L	SDR 11 - Female Threaded Adapter	0,71
27NRFM1175212L	SDR 11 - Female Threaded Adapter	1,15
27NRFM11903L	SDR 11 - Female Threaded Adapter	1,73
27NRFM111104L	SDR 11 - Female Threaded Adapter	3,05
27NRFM111254L	SDR 11 - Female Threaded Adapter	3,13
27NGSF01160200L	Female Threaded Welding Saddle	0,16
27NGSF01250315L	Female Threaded Welding Saddle	0,16

03NRFM63112	Male threaded adapter	0,52
03NRFM632	Male threaded adapter	0,78
03NRFM752	Male threaded adapter	0,86
03NRFM75212	Male threaded adapter	1,28
03NRFM903	Male threaded adapter	1,86
03NRFM1104	Male threaded adapter	3,03
03NRFM1254	Male threaded adapter	3,03
03NRFF11632	Female transition spigot SDR11	0,53
03NRFF1175212	Female transition spigot SDR11	0,80
03NRFF11903	Female transition spigot SDR11	1,24
03NRFF111104	Female transition spigot SDR11	2,08
03NRFF111254	Female transition spigot SDR11	2,04
03NRFM11632	Male transition spigot SDR11	0,73
03NRFM1175212	Male transition spigot SDR11	1,23
03NRFM11903	Male transition spigot SDR11	1,65
03NRFM111104	Male transition spigot SDR11	3,05
03NRFM111254	Male transition spigot SDR11	3,13
03NGSF01160200	FEMALE SIDE FUSION WELDING SADDLE	0,16
03NGSF01250315	FEMALE SIDE FUSION WELDING SADDLE	0,16
03NGSF016375	FEMALE SIDE FUSION WELDING SADDLE	0,16
03NGSF0190110125	FEMALE SIDE FUSION WELDING SADDLE	0,17
03NGSF12160200	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF12250315	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF12355630	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF124050	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF126375	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF1290110125	FEMALE SIDE FUSION WELDING SADDLE	0,06
03NGSF34160200	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGSF34250315	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGSF34355630	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGSF344050	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGSF346375	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGSF3490110125	FEMALE SIDE FUSION WELDING SADDLE	0,09
03NGF1612	FEMALE THREADED 90° ELBOW Ø16 x 1/2"	0,08
03NGF2012	FEMALE THREADED 90° ELBOW ø20 x 1/2"	0,07
03NGF2512	FEMALE THREADED 90° ELBOW ø25 x 1/2"	0,08
03NGF2534	FEMALE THREADED 90° ELBOW ø25 x 3/4"	0,11
03NGF321	FEMALE THREADED 90° ELBOW ø32 x 1"	0,19
03NGF3212	FEMALE THREADED 90° ELBOW ø32 x 1/2"	0,10
27NGSF016375L	Female Threaded Welding Saddle	0,16
27NGSF0190110125L	Female Threaded Welding Saddle	0,16
27NGSF12160200L	Female Threaded Welding Saddle	0,06
27NGSF12250315L	Female Threaded Welding Saddle	0,06
27NGSF12355630L	Female Threaded Welding Saddle	0,06
27NGSF124050L	Female Threaded Welding Saddle	0,06
27NGSF126375L	Female Threaded Welding Saddle	0,06
27NGSF1290110125L	Female Threaded Welding Saddle	0,06
27NGSF34160200L	Female Threaded Welding Saddle	0,09
27NGSF34250315L	Female Threaded Welding Saddle	0,10
27NGSF34355630L	Female Threaded Welding Saddle	0,09
27NGSF344050L	Female Threaded Welding Saddle	0,10
27NGSF346375L	Female Threaded Welding Saddle	0,09
27NGSF3490110125L	Female Threaded Welding Saddle	0,10
27NGF2012L	FEMALE THREADED 90° ELBOW ø20 x 1/2"	0,07
27NGF2512L	FEMALE THREADED 90° ELBOW ø25 x 1/2"	0,08
27NGF2534L	FEMALE THREADED 90° ELBOW ø25 x 3/4"	0,11
27NGF321L	FEMALE THREADED 90° ELBOW ø32 x 1"	0,19
27NGF3212L	FEMALE THREADED 90° ELBOW ø32 x 1/2"	0,10
27NGF3234L	FEMALE THREADED 90° ELBOW ø32 x 3/4"	0,12
27NGF401L	FEMALE THREADED 90° ELBOW ø40 x 1"1/4	0,24
27NGF50112L	FEMALE THREADED 90° ELBOW ø50 x 1"1/2	0,49
27NGF50114L	FEMALE THREADED 90° ELBOW ø50 x 1"1/4	0,42
27NGF63112L	FEMALE THREADED 90° ELBOW ø63 x 1"1/2	0,75
27NGF632L	FEMALE THREADED 90° ELBOW ø63 x 2"	0,72
27NGM2012L	MALE THREADED 90° ELBOW ø20 x 1/2"	0,11
27NGM2512L	MALE THREADED 90° ELBOW ø25 x 1/2"	0,12
27NGM2534L	MALE THREADED 90° ELBOW ø25 x 3/4"	0,15
27NGM321L	MALE THREADED 90° ELBOW ø32 x 1"	0,30
27NGM3212L	MALE THREADED 90° ELBOW ø32 x 1/2"	0,12
27NGM3234L	MALE THREADED 90° ELBOW ø32 x 3/4"	0,16
27NGMFF2012L	Male Threaded 90° Elbow for bathtub	0,08
27NTER2012L	Female Threaded 90° Elbows with hanger	0,08
27NGTF2012L	Male Threaded 90° Elbows with double hanger	0,07
27NGTM2012L	Male Threaded 90° Elbows with double hanger	0,11
27NGOF2012L	Female Threaded 90° Elbow for bathtub	0,08
27NGOF2512L	Female Threaded 90° Elbow for bathtub	0,09
27NGOM2012L	Male Threaded 90° Elbow for bathtub	0,11
27NTF2012L	FEMALE THREADED TEE ø20x1/2"	0,08

03NGF3234	FEMALE THREADED 90° ELBOW ø32 x 3/4"	0,12
03NGF401	FEMALE THREADED 90° ELBOW ø40 x 1"1/4	0,24
03NGF50112	FEMALE THREADED 90° ELBOW ø50 x 1"1/2	0,48
03NGF50114	FEMALE THREADED 90° ELBOW ø50 x 1"1/4	0,30
03NGF63112	FEMALE THREADED 90° ELBOW ø63 x 1"1/2	0,75
03NGF632	FEMALE THREADED 90° ELBOW ø63 x 2"	0,75
03NGM1612	MALE THREADED 90° ELBOW Ø16 x 1/2"	0,11
03NGM2012	MALE THREADED 90° ELBOW ø20 x 1/2"	0,11
03NGM2512	MALE THREADED 90° ELBOW ø25 x 1/2"	0,12
03NGM2534	MALE THREADED 90° ELBOW ø25 x 3/4"	0,15
03NGM321	MALE THREADED 90° ELBOW ø32 x 1"	0,30
03NGM3212	MALE THREADED 90° ELBOW ø32 x 1/2"	0,13
03NGM3234	MALE THREADED 90° ELBOW ø32 x 3/4"	0,18
03NGMFF2012	MALE/FEMALE THREADED 90° ELBOW ø20 x 1/2"	0,08
03NTER1612	FEMALE THREADED 90° ELBOW WITH HANGER	0,08
03NTER2012	FEMALE THREADED 90° ELBOW WITH HANGER	0,08
03NGTF2012	FEMALE THREADED 90° ELBOW WITH HANGER	0,08
03NGTF2038	FEMALE THREADED 90° ELBOW WITH HANGER	0,07
03NGTM2012	MALE THREADED 90° ELBOW WITH HANGER	0,11
03NGTM2038	MALE THREADED 90° ELBOW WITH HANGER	0,09
03NGOF2012	FEMALE THREADED 90° ELBOW FOR BATHTUB	0,08
03NGOF2512	FEMALE THREADED 90° ELBOW FOR BATHTUB	0,09
03NGOM2012	MALE THREADED 90° ELBOW FOR BATHTUB	0,11
03NTF1612	FEMALE THREADED TEE ø16x1/2"	0,09
03NTF2012	FEMALE THREADED TEE ø20x1/2"	0,08
03NTF2512	FEMALE THREADED TEE ø25x1/2"	0,12
03NTF2534	FEMALE THREADED TEE ø25x3/4"	0,12
03NTF321	FEMALE THREADED TEE ø32/1"	0,22
03NTF3212	FEMALE THREADED TEE ø32x1/2"	0,11
03NTF3234	FEMALE THREADED TEE ø32x3/4"	0,13
03NTM1612	MALE THREADED TEE ø16x1/2"	0,11
03NTM2012	MALE THREADED TEE ø20x1/2"	0,11
03NTM2512	MALE THREADED TEE ø25x1/2"	0,11
03NTM2534	MALE THREADED TEE ø25x3/4"	0,16
03NTM321	MALE THREADED TEE ø32x1"	0,32
03NTM3212	MALE THREADED TEE ø32x1/2"	0,15
03NTM3234	MALE THREADED TEE ø32x3/4"	0,18
27NRFF2012L	Female Threaded Adapter ø20x ½"	0,06
27NRFF2034L	Female Threaded Adapter ø20x ¾"	0,10
27NTF2512L	FEMALE THREADED TEE ø25x1/2"	0,12
27NTF2534L	FEMALE THREADED TEE ø25x3/4"	0,12
27NTF321L	FEMALE THREADED TEE ø32/1"	0,21
27NTF3212L	FEMALE THREADED TEE ø32x1/2"	0,11
27NTF3234L	FEMALE THREADED TEE ø32x3/4"	0,14
27NTM2012L	MALE THREADED TEE ø20x1/2"	0,11
27NTM2512L	MALE THREADED TEE ø25x1/2"	0,12
27NTM2534L	MALE THREADED TEE ø25x3/4"	0,16
27NTM321L	MALE THREADED TEE ø32x1"	0,32
27NTM3212L	MALE THREADED TEE ø32x1/2"	0,15
27NTM3234L	MALE THREADED TEE ø32x3/4"	0,18
16V6781	FEMALE THREADED 90° ELBOW WITH DOUBLE HANGERS ø20x3/8"	0,08
16V6782	FEMALE THREADED 90° ELBOW WITH DOUBLE HANGERS ø20x1/2"	0,08
16V6790	MALE THREADED 90° ELBOW WITH DOUBLE HANGERS ø20x3/8"	0,09
16V6791	MALE THREADED 90° ELBOW WITH DOUBLE HANGERS ø20x1/2"	0,11
16V6795	FEMALE THREADED 90° ELBOW FOR TEMPLATE ø20x1/2"	0,08
16V6796	MALE THREADED 90° ELBOW FOR TEMPLATE ø20x1/2"	0,09
16V6797	FEMALE THREADED 90° ELBOW FOR TEMPLATE ø25x1/2"	0,09
16V6805	MALE/FEMALE THREADED 90° ELBOW ø20x1/2"	0,07
16V6832	FEMALE THREADED 90° ELBOW ø20x1/2"	0,07
16V6834	FEMALE THREADED 90° ELBOW ø25x1/2"	0,08
16V6835	FEMALE THREADED 90° ELBOW ø25x3/4"	0,11
16V6836	FEMALE THREADED 90° ELBOW ø32x1"	0,19
16V6837	FEMALE THREADED 90° ELBOW ø32x3/4"	0,12
16V6838	FEMALE THREADED 90° ELBOW ø32x1/2"	0,10
16V6841	MALE THREADED 90° ELBOW ø20x1/2"	0,11
16V6842	MALE THREADED 90° ELBOW ø25x1/2"	0,11
16V6843	MALE THREADED 90° ELBOW ø25x3/4"	0,15
16V6844	MALE THREADED 90° ELBOW ø32x1"	0,30
16V6845	MALE THREADED 90° ELBOW ø32x3/4"	0,18
16V6846	MALE THREADED 90° ELBOW ø32x1/2"	0,13
16V6851	FEMALE THREADED TEE ø20 x1/2" x20	0,08
16V6852	FEMALE THREADED TEE ø32 x1" x32	0,21
16V6853	FEMALE THREADED TEE ø25 x1/2" x25	0,09
16V6854	FEMALE THREADED TEE ø25 x3/4" x32	0,12
16V6855	FEMALE THREADED TEE ø32 x3/4" x32	0,14
16V6855A	FEMALE THREADED TEE ø32 x1/2" x32	0,11
16V6856	MALE THREADED TEE ø20x 1/2" x20	0,11
16V6857	MALE THREADED TEE ø25x 1/2" x25	0,12

27NRFF2512L	Female Threaded Adapter ø25x ½"	0,06
27NRFF2534L	Female Threaded Adapter ø25x ¾"	0,10
27NRFF3234L	Female Threaded Adapter ø32x ¾"	0,12
27NRFF321L	Female Threaded Adapter ø32x 1"	0,17
27NRFF401L	Female Threaded Adapter ø40x 1"	0,23
27NRFF40114L	Female Threaded Adapter ø40 x 1¼"	0,29
27NRFF50114L	Female Threaded Adapter ø50 x 1¼"	0,32
27NRFF50112L	Female Threaded Adapter ø50x 1½"	0,39
27NRFF63112L	Female Threaded Adapter ø63x 1½"	0,49
27NRFF632L	Female Threaded Adapter ø63x 2"	0,57
27NRFF752L	Female Threaded Adapter ø75x 2"	0,65
27NRFF75212L	Female Threaded Adapter ø75x 2½"	0,81
27NRFF903L	Female Threaded Adapter ø90 x 3"	1,33
27NRFF1104L	Female Threaded Adapter ø110 x 4"	2,05
27NRFF1254L	Female Threaded Adapter ø125 x 4"	2,10

16V6858	MALE THREADED TEE ø25x 3/4" x25	0,16
16V6859	MALE THREADED TEE ø32x 3/4" x32	0,19
16V6859A	MALE THREADED TEE ø32x 1/2" x32	0,15
16V6860	MALE THREADED TEE ø32x 1" x32	0,32

References

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

ISO 14044: Environmental Management – Life Cycle Assessment – Requirements and Guidelines.

ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

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

MANAGED LCA CONTENT (GABI DATABASES) - Life cycle assessment database, by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2024.2 https://sphera.com/life-cycle-assessment-lca-database/

SPHERA LCA FOR EXPERT (GABI) - Life cycle assessment software (version 10), by Sphera Solutions GmbH, Leinfelden-Echterdingen, 2024 https://sphera.com/life-cycle-assessment-lca-software/

UNI EN 16904:2025 – Plastics piping systems inside the building structure - Environmental product.

declarations - Product category rules complementary to EN 15804.

PCR-ICMQ-001-15_Rev-3.2; 03/11/2025– PCR for construction products.

REGULATIONS OF THE EPDItaly PROGRAMME V.6.

EN 15941 - Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data.

CEN/TR 16970:2016 - Sustainability of construction works - Guidance for the implementation of EN 15804.

EPD background report NUPI LCA tool v.8.1 30-01-2025.

EUROSTAT 2021 - Packaging waste by waste management operations.