NUPI INDUSTRIE ITALIANE S.p.A.

ENVIRONMENTAL PRODUCT DECLARATION

Product names:

POLYPROPYLENE MULTILAYER PIPES FOR HOT AND COLD WATER TYPE NIRON, NIRON BETA AND POLYSYSTEM

Site Plants:

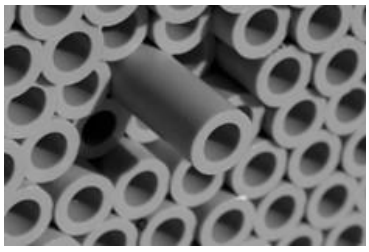
Castel Guelfo (BO)

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

Program Operator	EPDItaly
Publisher	EPDItaly

Declaration Number	2026PCPPFG
Registration Number	EPDITALY1357

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:	Castel Guelfo: Via dell'Artigianato n. 13 - 40023 Castel Guelfo di Bologna (BO), Italy
SCOPE OF APPLICATION:	This Environmental Product Declaration (EPD) is valid for NIRON AND POLYSYSTEM pipes in polypropylene. The involved production plant is the one located in Castel Guelfo (BO). The type of declaration is related to an average pipe 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_10_MULTI NIRON

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 pipes 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 pipe systems installation steps (negligible), the installation is done inside building mainly manually performed) 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 piping systems, 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 piping system 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 0.247 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 multilayer pipes with fiberglass produced in NUPI INDUSTRIE ITALIANE S.p.A. plant located in Castel Guelfo (BO). 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 pipes are polypropylene random copolymer (PP-R and PP-RCT) piping 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 pipes are produced in a range of diameters and pressure classes and are designed for use in plumbing, heating, cooling and HVAC systems. POLYPROPYLENE pipes are joined by thermal fusion, creating homogeneous and leak-tight connections. The PP-RCT material provides enhanced long-term hydrostatic strength and temperature resistance compared to conventional PP-R materials. The products are manufactured in accordance with the applicable requirements of EN ISO 15874 and related product specifications.

In this EPD Polypropylene multilayer pipes reinforced with fiberglass (as Niron Clima, Niron FG, Niron Fibers, Niron Beta and Polysystem with fiber glass) are considered.

Production processes description

PIPE EXTRUSION (Castel Guelfo)



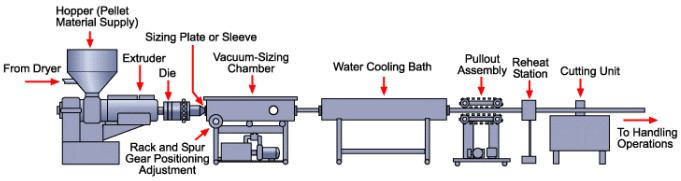


Figure 1 Pipes extrusion process

Nupi Industrie Italiane S.p.A. manufactures both solid wall (monolayer) plastic pipes, in diameter sizes ranging from 16 mm to 1000 mm, and coextruded multilayer (from two to five layers) pipes.

The raw materials used to manufacture plastic pipes are supplied in pellets (provided in bulk transporter, octabins or bags), both as natural resin or finished compound. Resin is pneumatically conveyed from the bulk transporters to silos at the plant site. The resin is then transferred from the silos to the pipe extruder by a vacuum transfer system.

The pipe extrusion line consists of the extruder, die, cooling systems, puller, printer, saw and take-off equipment. The function of the extruder is to heat, melt, mix, and convey the material to the die, where it is shaped into a pipe. The extruder is used to heat the raw material and then force the resulting melted polymer through the pipe extrusion die. The pipe extrusion die supports and distributes the homogeneous polymer melt around a solid mandrel, which forms it into an annular shape for solid wall pipe.

The dimensions and tolerances of the pipe are determined and set during the sizing and cooling operation. The sizing operation holds the pipe in its proper dimensions during the cooling of the molten material. During vacuum sizing, the molten material is drawn through a sizing tube or rings while its surface is cooled enough to maintain proper dimensions and a circular form. The outside surface of the pipe is held against the sizing sleeve by vacuum. After the pipe exits the vacuum sizing tank, it is moved through a second vacuum tank or a series of spray or immersion cooling tanks.

The puller must provide the necessary force to pull the pipe through the entire cooling operation. Pipes are marked at specific intervals through ink jet or hot marking with tape machines.

Finished pipes can be coiled (depending to their sizes and physical/mechanical characteristics) or cut in customised straight lengths for handling and shipping convenience. Coiled pipes and straight lengths are then arranged with the proper packaging, ready for the storage, handling and transport phases.

Technical data

Niron&Polysystem pipes 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							
	1	2	4	5	1	2	4	5
P_D	S				SDR			
4	5	5	5	3,2	11	11	11	7,4
6	5	3,2	5	3,2	11	7,4	11	7,4
8	3,2	2,5	3,2	-	7,4	6	7,4	1)
10	2,5	-	2,5	-	6	1)	6	1)

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

PP-RCT

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

		P_D			
		10	8	6	4
S	SDR	ALLOWABLE CLASSES			
3,2	7,4	1&2&4	5	5	5
4	9	2)	1,2,4	5	5
5	11	2)	2)	1&2&4	5
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 x 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 x 10^{-4}**	
Fire resistance	DIN 4102	**B2**	

Technical properties Niron and Polysystem

Pipes 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 pipe SDR.

Base materials/ancillary materials in the functional unit/declared unit

Material		Piping system
Polypropylene granulate	Base	80.7 %
Pigments for Polypropylene	Ancillary	0.6 %
Polypropylene with fiber glass	Base	18,7 %
TOTAL		100%

The product does not contain any substances included in the “Candidate List Of Substances of Very High Concern for Authorization” (SVHC) in compliance with REACH regulation.

Description of functional unit

In this EPD an average pipe is considered. The pipe diameters range considered in the data collection includes a size range from DN 16 to DN 355. It has been considered a declared unit of 1 kg of NIRON, NIRON BETA AND POLYSYSTEM pipes with fiberglass.

The declared unit’s packaging includes 0,0007 kg of wooden crates and 0,0171 kg of protective polyethylene sleeve.

The product does not contain substances included in the "Candidate list of substances of very high concern (SVHC) for authorization" in a percentage greater than 0.1% in weight/weight.

Products Distribution

In NUPI, pipes and fittings are supplied to customers with appropriate protection and packaging. For Polypropylene pipes the packaging consists in plastic bags and wood crates.

Reference service life

NIRON AND POLYSYSTEM pipes are regarded as having 50 years RSL independent of their material according to /UNI EN 16904:2025/.

Installation

According to PCR EN 16904 installation of the product was considered to be negligible, as it is done manually in the building. Environmental impacts from waste packaging materials (A5) and release of biogenic carbon dioxide from wood pallets 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 pipes installations do not cause health or environmental hazards. 3% of scraps have been included in.

End of Life

After the demolition and deconstruction phase, the EU EoI 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 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 multilayer pipes.

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.]	2,03E+00	1,16E-01	3,02E-01	2,45E+00	2,98E-01	2,67E-02	0,00E+00	0,00E+00	1,57E-02	1,34E+00	1,16E-02	-8,06E-01
GWP- fossil [kg CO_2 eq.]	2,03E+00	1,14E-01	3,00E-01	2,44E+00	2,98E-01	2,40E-02	0,00E+00	0,00E+00	1,57E-02	1,34E+00	1,15E-02	-8,03E-01
GWP - biogenic [kg CO_2 eq.]	7,94E-03	3,12E-04	1,45E-03	9,70E-03	2,73E-04	2,63E-03	0,00E+00	0,00E+00	1,44E-05	2,70E-04	3,54E-05	-3,22E-03
GWP - LULUC [kg CO_2 eq.]	2,77E-04	1,77E-03	1,77E-05	2,06E-03	3,80E-05	8,68E-07	0,00E+00	0,00E+00	2,03E-06	2,22E-05	4,25E-05	-8,07E-05
ODP [kg CFC-11 eq.]	6,29E-12	1,63E-14	2,23E-13	6,53E-12	3,69E-14	2,04E-14	0,00E+00	0,00E+00	1,96E-15	5,95E-13	3,81E-14	-5,16E-12
AP [mol of H+ eq.]	4,38E-03	3,71E-04	1,11E-04	4,86E-03	1,78E-03	5,56E-06	0,00E+00	0,00E+00	2,12E-05	4,46E-04	6,91E-05	-1,02E-03
EP - freshwater [kg P eq.]	2,44E-06	4,52E-07	1,00E-07	2,99E-06	7,85E-08	7,82E-08	0,00E+00	0,00E+00	4,14E-09	1,93E-07	6,63E-06	-1,15E-06
EP - marine [kg N eq.]	1,24E-03	1,36E-04	4,21E-05	1,42E-03	8,62E-04	1,44E-06	0,00E+00	0,00E+00	8,39E-06	1,75E-04	1,49E-05	-3,21E-04
EP - terrestrial [mol of N eq.]	1,33E-02	1,54E-03	4,67E-04	1,53E-02	9,48E-03	2,07E-05	0,00E+00	0,00E+00	9,41E-05	2,24E-03	1,63E-04	-3,45E-03
POCP [kg NMVOC eq.]	5,15E-03	3,69E-04	1,48E-04	5,67E-03	1,77E-03	4,36E-06	0,00E+00	0,00E+00	2,30E-05	4,58E-04	4,76E-05	-1,12E-03
ADPe [kg Sb eq.]*	2,38E-06	9,38E-09	3,98E-08	2,43E-06	7,96E-09	4,18E-10	0,00E+00	0,00E+00	4,22E-10	1,00E-08	7,68E-10	-6,38E-08
ADPf [MJ]*	7,09E+01	1,50E+00	1,32E+00	7,37E+01	3,95E+00	2,96E-02	0,00E+00	0,00E+00	2,09E-01	8,10E-01	1,95E-01	-1,83E+01
WDP [m^3 world equiv.]*	3,00E-01	1,65E-03	8,91E-02	3,91E-01	7,44E-04	2,42E-03	0,00E+00	0,00E+00	3,95E-05	1,32E-01	1,49E-03	-9,53E-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]	4,83E+00	1,20E-01	1,14E-01	5,06E+00	2,88E-02	2,02E-02	0,00E+00	0,00E+00	1,53E-03	3,58E-01	2,95E-02	-3,43E+00
PERM [MJ]	0,00E+00	0,00E+00	2,18E-02	2,18E-02	0,00E+00	-6,53E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT [MJ]	4,83E+00	1,20E-01	1,36E-01	5,09E+00	2,88E-02	1,36E-02	0,00E+00	0,00E+00	1,53E-03	3,58E-01	2,95E-02	-3,43E+00
PENRE [MJ]	2,93E+01	1,50E+00	5,13E-01	3,13E+01	3,95E+00	3,29E-01	0,00E+00	0,00E+00	2,09E-01	2,06E+01	1,95E-01	-1,83E+01
PENRM [MJ]	4,16E+01	0,00E+00	8,10E-01	4,24E+01	0,00E+00	-3,00E-01	0,00E+00	0,00E+00	0,00E+00	-1,97E+01	0,00E+00	0,00E+00
PENRT [MJ]	7,09E+01	1,50E+00	1,32E+00	7,37E+01	3,95E+00	2,96E-02	0,00E+00	0,00E+00	2,09E-01	8,10E-01	1,95E-01	-1,83E+01
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	1,25E-01
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]	8,51E-03	1,34E-04	2,21E-03	1,09E-02	3,15E-05	6,11E-05	0,00E+00	0,00E+00	1,67E-06	3,19E-03	4,46E-05	-3,45E-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]	1,85E-08	5,67E-11	1,46E-08	3,32E-08	1,43E-10	8,57E-10	0,00E+00	0,00E+00	7,61E-12	1,88E-08	4,82E-11	-7,03E-09
NHWD [kg]	2,84E-02	2,37E-04	3,99E-03	3,26E-02	4,11E-04	4,72E-03	0,00E+00	0,00E+00	2,18E-05	2,44E-02	3,91E-01	-6,71E-03
RWD [kg]	5,45E-04	2,66E-06	1,25E-05	5,60E-04	6,27E-06	2,92E-06	0,00E+00	0,00E+00	3,33E-07	8,16E-05	2,75E-06	-7,39E-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	6,99E-03	0,00E+00	0,00E+00	0,00E+00	1,52E-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	4,47E-02	0,00E+00	0,00E+00	0,00E+00	2,57E+00	0,00E+00	0,00E+00
MFR [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,90E-02	0,00E+00	0,00E+00	0,00E+00	4,68E+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]	4,82E-04

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. For gaskets made of alloys and/or paper, a recycling scenario has not been considered, but only incineration and landfill scenarios
7. 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 and 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 pipes 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 pipes 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 pipes, 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 plastic extrusion for pipes 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/ 24.7% utilization factor 33,5 t truck max load	1545,07
Ship	Average ship, 5000-200000 dwt payload capacity/ deep sea	284,14

- **Module C1** (Deconstruction / demolition)- As generic scenario for the demolition of piping system, 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 piping system. Therefore, the impact of the deconstruction/demolition stage allocated to the piping system 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 pipes do not contain any substances mentioned on the REACH-list.

Emissions to soil and water:

No direct emissions at the building site. Nupi Industrie Italiane S.p.A confirms that NIRON AND POLYSYSTEM pipes do not contain any substances mentioned on the REACH-list.

Annex I - Products specific weight table

Items Code	Description	Peso metro (kg)
03TNIRRCTCL1609	PIPE NIRON FIBER ø160 (SDR9 - S4)	7,83
03TNIRRCTCL20011	PIPE NIRON FIBER ø200 (SDR11 - S5)	10,09
03TNIRRCTCL20017	PIPE NIRON FIBER ø200 (SDR 17 - S8)	7,12
03TNIRRCTCL2009	PIPE NIRON FIBER ø200 (SDR9 - S4)	12,00
03TNIRRCTCL2074	PIPE NIRON ø20 (SDR 7,4 -S 3,2)	0,16
03TNIRRCTCL25011	PIPE NIRON FIBER ø250 (SDR11 - S5)	15,60
03TNIRRCTCL25017	PIPE NIRON FIBER ø250 (SDR 17 - S8)	11,02
03TNIRRCTCL2509	PIPE NIRON FIBER ø250 (SDR9 - S4)	18,70
03TNIRRCTCL2574	PIPE NIRON ø25 (SDR 7,4 -S 3,2)	0,25
03TNIRRCTCL31511	PIPE NIRON FIBER ø315 (SDR11 - S5)	25,19
03TNIRRCTCL31517	PIPE NIRON FIBER ø315 (SDR 17 - S8)	17,45
03TNIRRCTCL3159	PIPE NIRON FIBER ø315 (SDR9 - S4)	30,44
03TNIRRCTCL329	PIPE NIRON FIBER ø32 (SDR9 - S4)	0,33
03TNIRRCTCL35511	PIPE NIRON FIBER ø355 (SDR11 - S5)	40,31
03TNIRRCTCL35517	PIPE NIRON FIBER ø355 (SDR 17 - S8)	16,91
03TNIRRCTCL3559	PIPE NIRON FIBER ø355 (SDR9 - S4)	38,58
03TNIRRCTCL4011	PIPE NIRON FIBER ø40 (SDR11 - S5)	0,43
03TNIRRCTCL409	PIPE NIRON FIBER ø40 (SDR9 - S4)	0,51
03TNIRRCTCL5011	PIPE NIRON FIBER ø50 (SDR11 - S5)	0,67
03TNIRRCTCL509	PIPE NIRON FIBER ø50 (SDR9 - S4)	0,78
03TNIRRCTCL6311	PIPE NIRON FIBER ø63 (SDR11 - S5)	1,04
03TNIRRCTCL639	PIPE NIRON FIBER ø63 (SDR9 - S4)	1,24
03TNIRRCTCL7511	PIPE NIRON FIBER ø75 (SDR11 - S5)	1,44
03TNIRRCTCL759	PIPE NIRON FIBER ø75 (SDR9 - S4)	1,74
03TNIRRCTCL9011	PIPE NIRON FIBER ø90 (SDR11 - S5)	2,08
03TNIRRCTCL909	PIPE NIRON FIBER ø90 (SDR9 - S4)	2,51
16VCL600711	POLYSYSTEM PP-R CLIMA MULTILAYER PIPE ø63 x 5,8	1,04
16VCL600811	POLYSYSTEM PP-R CLIMA MULTILAYER PIPE ø75 x 6,8	1,44
16VCL600911	POLYSYSTEM PP-R CLIMA MULTILAYER PIPE ø90 x 8,2	2,08
16VCL601011	POLYSYSTEM PP-R CLIMA MULTILAYER PIPE ø110 x 10	3,16
16VCL601111	POLYSYSTEM PP-R CLIMA MULTILAYER PIPE ø125 x 11,4	4,09
16VFG6002	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø20 x 3,4	0,16
16VFG6003	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø25 x 4,2	0,24

Items Code	Description	Peso metro (kg)
16VFG6004	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø32 x 5,4	0,39
16VFG6005	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø40 x 6,7	0,59
16VFG6006	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø50 x 8,3	0,92
16VFG6007	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø63 x 10,5	1,46
16VFG6008	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø75 x 10,3	2,06
16VFG6009	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø90 x 12,3	2,95
16VFG6010	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø110 x 15,1	4,44
16VFG6011	POLYSYSTEM FG PP-R PIPE WITH FIBERGLASS ø125 x 17,1	5,68
27TNIRCLUV11011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø110	3,10
27TNIRCLUV11017	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø110	2,07
27TNIRCLUV12511	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø125	4,01
27TNIRCLUV12517	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø125	2,64
27TNIRCLUV16011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø160	6,60
27TNIRCLUV16017	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø160	4,34
27TNIRCLUV20011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø200	10,27
27TNIRCLUV20017	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø200	6,80
27TNIRCLUV25011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø250	15,98
27TNIRCLUV25017	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø250	10,58
27TNIRCLUV31511	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø315	25,19
27TNIRCLUV31517	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø315	17,26
27TNIRCLUV329	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø32	0,32
27TNIRCLUV35511	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø355	32,12
27TNIRCLUV35517	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø355	21,38
27TNIRCLUV4011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø40	0,42
27TNIRCLUV5011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø50	0,65
27TNIRCLUV6317	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø63	0,72
27TNIRCLUV6311	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø63	1,03
27TNIRCLUV7511	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø75	1,44
27TNIRCLUV7517	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø75	0,97
27TNIRCLUV9011	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø90	2,08
27TNIRCLUV9017	NIRON CLIMA PP-RCT PIPE W/FIBER GLASS LAYER AND UV BARRIER ø90	1,46
27TNIRCL11011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 11 - S 5)	3,10
27TNIRCLFM11011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 11 - S 5) - FM APPROVED	3,16
27TNIRCL11017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 17 - S 8)	2,16
27TNIRCL11073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 7,4 - S 3,2)	4,52
27TNIRCLFM11073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 7,4 - S 3,2)	3,01
27TNIRCL1109	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø110 (SDR 9 - S 4)	3,78
27TNIRCL12511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 11 - S 5)	4,02

Items Code	Description	Peso metro (kg)
27TNIRCLFM12511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 11 - S 5) - FM APPROVED	4,02
27TNIRCL12517	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 17 - S 8)	2,77
27TNIRCL12573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 7,4 - S 3,2)	5,78
27TNIRCLFM12573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 7,4 - S 3,2)	5,78
27TNIRCL1259	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø125 (SDR 9 - S 4)	4,89
27TNIRCL16011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø160 (SDR 11 - S 5)	6,50
27TNIRCL16017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø160 (SDR 17 - S 8)	4,52
27TNIRCL16073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø160 (SDR 7,4 - S 3,2)	9,36
27TNIRCL1609	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø160 (SDR 9 - S 4)	7,70
27TNIRCL20011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø200 (SDR 11 - S 5)	10,09
27TNIRCL20017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø200 (SDR 17 - S 8)	7,05
27TNIRCL20073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø200 (SDR 7,4 - S 3,2)	15,57
27TNIRCL2009	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø200 (SDR 9 - S 4)	12,35
27TNIRCL2073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø20 (SDR 7,4 - S 3,2)	0,16
27TNIRCL25011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø250 (SDR 11 - S 5)	15,94
27TNIRCL25017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø250 (SDR 17 - S 8)	10,90
27TNIRCL25073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø250 (SDR 7,4 - S 3,2)	24,36
27TNIRCL2509	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø250 (SDR 9 - S 4)	19,08
27TNIRCL2573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø25 (SDR 7,4 - S 3,2)	0,25
27TNIRCLFM2573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø25 (SDR 7,4 - S 3,2)	0,25
27TNIRCL31511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 11 - S 5)	25,19
27TNIRCL31517	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 17 - S 8)	17,26
27TNIRCL31573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 7,4 - S 3,2)	38,25
27TNIRCL3159	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 9 - S 4)	30,10
27TNIRCL3273	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø32 (SDR 7,4 - S 3,2)	0,40
27TNIRCLFM3273	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø32 (SDR 7,4 - S 3,2)	0,40
27TNIRCL329	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø32 (SDR 9 - S 4)	0,33
27TNIRCLFM329	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø32 (SDR 9 - S 4)	0,33
27TNIRCL35511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø355 (SDR 11 - S 5)	31,93
27TNIRCL35517	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø355 (SDR 17 - S 8)	21,83
27TNIRCL3559	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 9 - S 4)	37,88
27TNIRCL4011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø40 (SDR 11 - S 5)	0,43
27TNIRCLFM4011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø40 (SDR 11 - S 5) - FM APPROVED	0,43
27TNIRCL4073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø40 (SDR 7,4 - S 3,2)	0,62
27TNIRCLFM4073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø40 (SDR 7,4 - S 3,2)	0,62
27TNIRCL409	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø40 (SDR 9 - S 4)	0,52
27TNIRCL5011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø50 (SDR 11 - S 5)	0,67
27TNIRCLFM5011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø50 (SDR 11 - S 5) - FM APPROVED	0,67

Items Code	Description	Peso metro (kg)
27TNIRCL5073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø50 (SDR 7,4 - S 3,2)	0,95
27TNIRCLFM5073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø50 (SDR 7,4 - S 3,2)	0,95
27TNIRCL509	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø50 (SDR 9 - S 4)	0,80
27TNIRCL56017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø560 (SDR 17 - S 8)	52,51
27TNIRCL6311	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 11 - S 5)	1,04
27TNIRCLFM6311	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø315 (SDR 11 - S 5) - FM APPROVED	1,04
27TNIRCL6317	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø63 (SDR 17 - S 8)	0,72
27TNIRCL6373	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø63 (SDR 7,4 - S 3,2)	1,48
27TNIRCLFM6373	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø63 (SDR 7,4 - S 3,2)	1,48
27TNIRCL639	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø63 (SDR 9 - S 4)	1,25
27TNIRCL7511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø355 (SDR 11 - S 5)	1,44
27TNIRCLFM7511	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø355 (SDR 11 - S 5) - FM APPROVED	1,44
27TNIRCL7517	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø75 (SDR 17 - S 8)	1,03
27TNIRCL7573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø75 (SDR 7,4 - S 3,2)	2,10
27TNIRCLFM7573	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø75 (SDR 7,4 - S 3,2)	2,10
27TNIRCL759	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø75 (SDR 9 - S 4)	1,77
27TNIRCL9011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 11 - S 5)	2,08
27TNIRCLFM9011	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 11 - S 5) - FM APPROVED	2,08
27TNIRCL9017	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 17 - S 8)	1,46
27TNIRCL9073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 7,4 - S 3,2)	3,01
27TNIRCLFM9073	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 7,4 - S 3,2)	3,01
27TNIRCL909	PP-RCT PIPE CLIMA PIPE WITH FIBERGLASS ø90 (SDR 9 - S 4)	2,55

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.

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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.

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