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UNIVERSITÀ
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SYSTEM GROUP

ITALIANA CORRUGATI

Declaration of Environmental Product Footprint

CORRUGATED POLYETHYLENE PIPES FOR FLUID DISTRIBUTION

Revision No. 1 of 18/03/2024
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Summary

1. General

In recent years, the phenomenon of climate change and the unsustainable use of our planet's resources has taken centre stage in political debates because of the negative impacts it could cause to our economic and social system. This has led governmental bodies around the world to define new standards and laws for the creation of products with less environmental impact.

In particular, the European Union (EU) has defined a methodology to calculate the environmental impact of various types of products. This methodology is called PEF (**Product Environmental Footprint**) and is based on product life cycle analysis (LCA - **Life Cycle Assessment**). In recent years, in fact, there has been a growing demand for product certifications based on LCA and this has brought to light the need to create rules for analysing the environmental impact of products belonging to the same category.

The Italian government, in order to support the creation of a green economy and to curb the excessive use of resources, decided to adopt these PEF rules to create a voluntary national scheme for calculating and communicating the environmental footprint of a product called "**Made Green in Italy**" (MGI).

The adoption of this scheme has the following objectives:

- Promote sustainable production and consumption patterns
- Contribute to the implementation of EU environmental strategies
- Stimulate the continuous improvement of products and the reduction of the negative impacts they have at various stages of their life cycle
- Promote informed, conscious and sustainable consumption choices
- Ensuring the transparency and comparability of products' environmental performance
- Strengthen the image of 'Made in Italy' products to favour their competitiveness
- Define an effective method of communicating a product's environmental performance

Figure 1 - The "Made Green in Italy" label

1.1. Product Information

The purpose of this Environmental Footprint Statement is to analyse the potential environmental impacts associated with the life cycle of polyethylene (PE) corrugated pipes produced by Italiana Corrugati S.p.A. (part of the System Group) at its plant in Piandimeleto (PU).
The purpose of this study is to adhere to the "Made Green in Italy" scheme.

Table 1 shows the specifications of the product under analysis and Table 2 illustrates its composition. It is also shown in Figure.

Table 1 - Pipeline characteristics

Feature	Corrugated PE pipe for unpressurised sewage - Magnum	Unit of Measurement
Diameter	250	mm
SN	8	/
Weight per metre	2,70	kg/m
Reference flow	270	kg
Installation mode	Traditional Laying	/

Table 2 - Pipeline composition

Material	Corrugated PE piping for unpressurised sewage (%)
Virgin HDPE granule	99%
Dye Master	1%

Figure 2 - Picture showing the pipeline under study

The following table instead shows all Italiana Corrugati products included in the brand and represented by the tubing described above.

Table 3 - Products of Italiana Corrugati included in the mark

Corrugated PE pipe for non-pressure sewerage
MAGNUM BLACK
MAGNUM ITALCOR PE
ITALCOR MAGNUM

Product subject of the study meets the requirements for the name "Made in Italy" specified in art. 60 of EU Reg. n.952/2013. Attached is a self-declaration on compliance with the requirements for the designation 'Made in Italy'.

1.2. Company information

System Group is a reality that was born in a small town in the Pesaro hinterland from the idea of entrepreneur Alvaro Boscarini who founded Centraltubi in 1979, but which took shape in the early 1990s when this first company, after 12 years already a leader in the field of polyethylene pipe production, was joined by Futura, a company operating in the fittings and special accessories market. These were the first stages of a successful journey that led in the following years to the creation of five other important companies: Sa.Mi Plastic in the field of smooth polyethylene pipes and multilayer pipes for plumbing systems, Pebo in the field of plastics processing, Italiana Corrugati for the production of corrugated polyethylene pipes, Rototec in the field of rotational moulding and Mecsystem, the group's engineering department.

Italiana Corrugati was founded in 1996, and produces double-wall corrugated PEAD pipes for underground civil and industrial drainage systems and for cavity and drainage systems. Having established itself on the market right from the outset, it has gained extensive experience in the commercial field which, added to decades of technical and managerial experience, as well as new and state-of-the-art equipment, make it one of the leading companies in the sector. It is currently equipped with fully automated extrusion lines for double- and single-wall corrugated pipes, which allow in-line quality and dimensional control, guaranteeing a high and homogeneous product quality standard. It also has a well-equipped and modern Laboratory where pressure, flexibility, impact and heat resistance tests are carried out, necessary to test product quality.

For Italiana Corrugati the production site is the same as the registered office: Loc. Fonte del Doglio 22/E 61026 Piandimeleto (PU).

1.3. Website

This environmental footprint statement is available on the website: https://tubi.net/wp-content/uploads/2024/03/MGI_DIAP_SystemGroup_ItalianaCorrugati_rev0-1.pdf

1.4. Declaration Information

This declaration refers to the 'Study to evaluate the environmental footprint of a corrugated polyethylene pipeline for fluid distribution - Revision No.1 dated 18/03/2024' carried out on behalf of System Group and independently verified in March 2024 by Bureau Veritas.
The following standards/recommendations were used to conduct this study:

The following standards/recommendations were used to conduct this study:

- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework
- ISO 14040:2006/Amd 1:2020 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14044:2006/Amd 1:2017 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14044:2006/Amd 2:2020 Environmental management - Life cycle assessment - Requirements and guidelines
- Recommendation 2013/179/EU Commission Recommendation of 9 April 2013 on the use of common methodologies for measuring and reporting environmental performance throughout the life cycle of products and organisations
- Product Category Rules (CPR) on Polyethylene (PE) Piping Systems for Fluid Distribution- NACE 22.21.21 and NACE 22.21.29 version 1 valid until 05/06/2027
- Regulations for the implementation of the voluntary national scheme for the assessment and communication of the environmental footprint of products, called 'Made Green in Italy', referred to in Article 21, paragraph 1, of Law 28 December 2015, no. 221

This DIAP is intended for: Contracting Stations, designers, technicians and economic operators active in the building, plumbing and civil construction sector.

1.5. Information on the production process

The system boundaries include the entire life cycle of the analysed product, according to a "from cradle to grave" application. Figure 3 represents the system boundaries analysed in this study. The following table shows the processes to be considered, divided by life cycle phases (Raw Materials, Production, Distribution, Use Phase, End of Life).

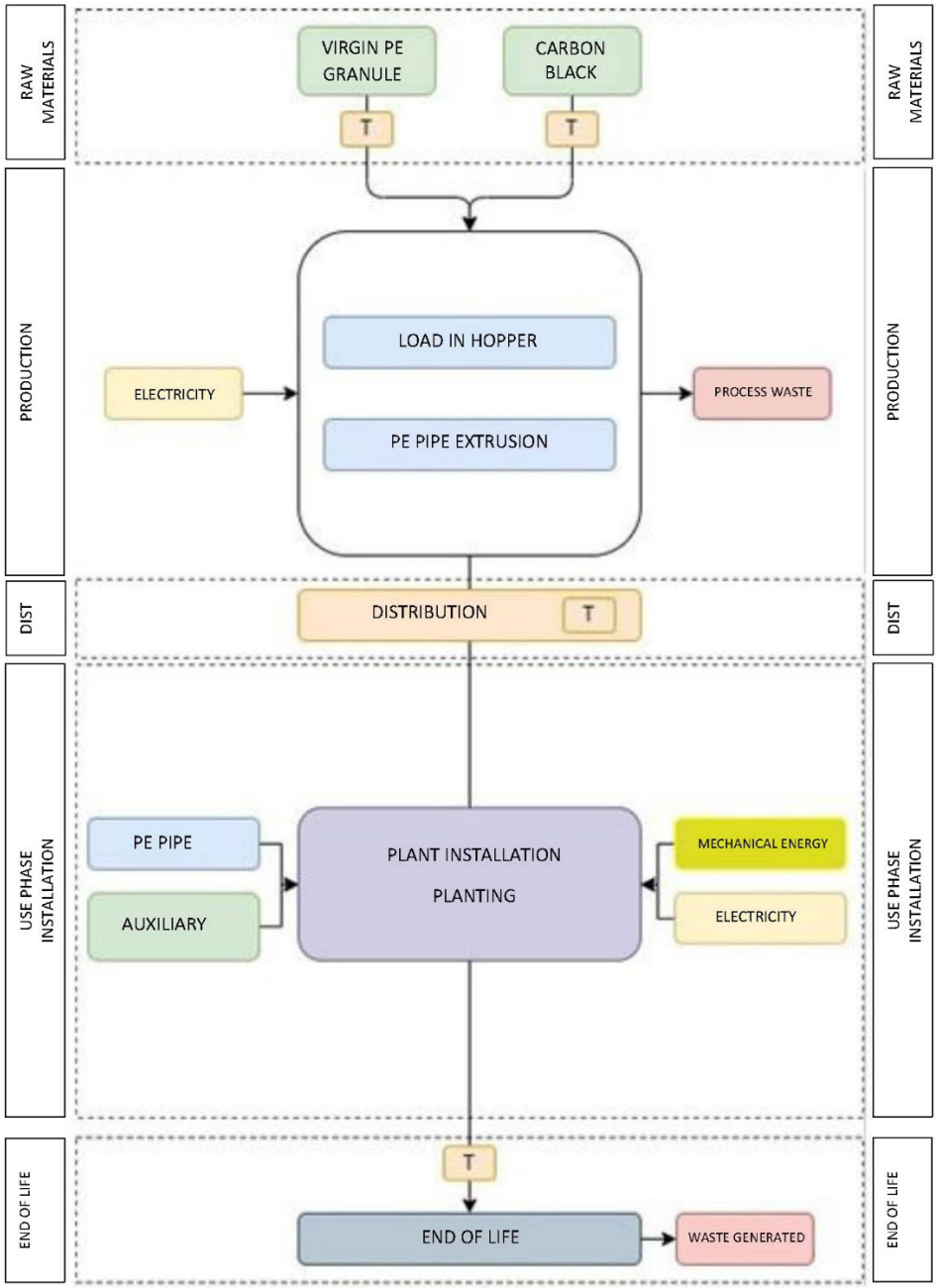

Figure 3 - System boundary diagram for the pipes under study

According to the CPR, the following processes can be excluded under the cut-off rule:

- Production of company infrastructure related to the production of the product (production plant);
- Production, transport and end-of-life management of finished product packaging;
- End-of-life management of raw material packaging;
- Other consumption linked to general plant activities not directly related to the production process of the good under consideration (e.g., office consumption, consumption linked to the heating of premises);
- Management of plant waste, atmospheric emissions and consumable auxiliaries.

1.6. Functional unit and reference flow

The functional unit (FU) has been defined in accordance with the applicable CPR as follows:

"Carry 100 metres of fluid"

Table 4 Key aspects of the functional unit

Question	Answer
What?	Transporting fluids under pressure or not
How much?	100 metres of pipe
With what performance?	The required flow rate must be guaranteed
For how long?	50 years

The reference flow is defined as the quantity of product required to perform the defined function and must be measured as the quantity of materials required to install and transport a fluid to the pipe system.

Table 5 Reference flow of the analysed product

Product	Reference flow [kg]
Corrugated PE pipe for unpressurised sewage - Magnum	270

1.7.Geographical product traceability

Below is a table with reference to all the activities carried out and the associated geographical reference, useful for product traceability purposes.

Table 6 Life cycle stage and associated geographical reference

Life Cycle Phase	Geographical reference
Raw Materials	Europe
Packaging Raw Materials	Global
Production Process (Electricity)	Italy
Distribution	Europe
Installation	Europe
End-of-Life	Europe

2. Environmental Footprint

2.1. Environmental Footprint Calculation

Characterised, normalised and weighted results for the pipeline under study are reported below. The values reported in this chapter are for the three impact categories relevant for the benchmark calculation of the specific product category. The results for all impact categories analysed are given in the Annex below.

Table 7 - Results characterised for the pipeline under study

Product	Climate change [kgCO_2eq]	Particulate matter [disease inc.]	Resource use, fossils [MJ]
Corrugated PE pipe for unpressurised sewage - Magnum	1,47E+03	1,76E-04	2,96E+04

Table 8 - Standardised results for the pipeline under study

Product	Climate change [person eq.]	Particulate matter [person eq.]	Resource use, fossils [person eq.]
Corrugated PE pipe for unpressurised sewage - Magnum	1,81E-01	2,96E-01	4,55E-01

Table 9 - Weighted results for the pipe under study

Product	Climate change [mPt]	Particulate matter [mPt]	Resource use, fossils [mPt]	Single Score [mPt]
Corrugated PE pipe for unpressurised sewage - Magnum	3,82E+01	2,65E+01	3,78E+01	1,03E+02

2.2. Comparison with the Benchmark

The following is a comparison of the results obtained with the threshold of the Classes of Merit determined in the RCP.
Since the single score is higher than the Class A threshold, but lower than the Class B threshold, both products under study fall into Class B. In light of this, a three-year impact reduction plan will be prepared to achieve Class A for both study products.

Table 10 - Comparison of results with RCP thresholds

Product Classification	Single Score [Pt]	Lower threshold Class B [Pt]	Upper threshold Class B [Pt]	Product Class
Corrugated PE pipe for unpressurised sewage - Magnum	1,03E-01	9,98E-02	1,04E-01	**Class B**

Annex

Table 11 - Results characterised for all impact categories analysed

Impact category	Unit of measurement	Total	Raw materials	Production process	Distribution	Use phase	End of Life
Climate change	kg CO2 eq	1,47E+03	5,56E+02	9,60E+01	2,09E+01	6,44E+02	1,52E+02
Ozone depletion	kg CFC11 eq	1,56E-04	1,35E-05	1,48E-05	4,87E-06	1,31E-04	-8,12E-06
Ionising radiation	kBq U-235 eq	1,13E+02	3,73E+01	9,71E+00	1,64E+00	7,45E+01	-9,89E+00
Photochemical ozone formation	kg NMVOC eq	9,64E+00	1,90E+00	1,85E-01	1,14E-01	7,57E+00	-1,34E-01
Particulate matter	disease inc.	1,76E-04	2,01E-05	1,24E-06	1,86E-06	1,54E-04	-1,43E-06
Human toxicity, non-cancer	CTUh	8,90E-06	3,46E-06	3,90E-07	2,60E-07	5,91E-06	-1,13E-06
Human toxicity, cancer	CTUh	5,54E-07	1,67E-07	1,62E-08	8,04E-09	3,40E-07	2,29E-08
Acidification	mol H+ eq	8,06E+00	2,01E+00	3,49E-01	1,06E-01	5,95E+00	-3,52E-01
Eutrophication, freshwater	kg P eq	1,18E-01	8,15E-02	1,44E-02	1,36E-03	4,14E-02	-2,07E-02
Eutrophication, marine	kg N eq	3,32E+00	3,79E-01	5,87E-02	3,64E-02	2,49E+00	3,49E-01
Eutrophication, terrestrial	mol N eq	3,22E+01	3,99E+00	6,32E-01	3,98E-01	2,75E+01	-2,94E-01
Ecotoxicity, freshwater	CTUe	1,01E+04	2,91E+03	6,78E+02	2,48E+02	6,73E+03	-4,89E+02
Land use	Pt	7,32E+03	6,51E+02	1,83E+02	2,19E+02	6,37E+03	-1,07E+02
Water use	m3 depriv.	5,76E+02	4,42E+02	2,68E+01	9,53E-01	1,54E+02	-4,82E+01
Resource use, fossils	MJ	2,96E+04	1,95E+04	1,39E+03	3,18E+02	9,55E+03	-1,16E+03
Resource use, minerals and metals	kg Sb eq	6,37E-03	3,73E-03	1,51E-04	7,32E-05	2,54E-03	-1,19E-04
Climate change - Fossil	kg CO2 eq	1,47E+03	5,55E+02	9,56E+01	2,09E+01	6,43E+02	1,53E+02
Climate change - Biogenic	kg CO2 eq	8,27E-01	9,07E-01	4,16E-01	7,42E-03	7,54E-01	-1,26E+00
Climate change - Land use and LU change	kg CO2 eq	3,44E-01	1,82E-01	7,70E-03	8,27E-03	1,52E-01	-5,98E-03

Table 12 - Normalised results for all impact categories analysed

Impact category	Unit of measurement	Total	Raw materials	Production process	Distribution	Use phase	End of Life
Climate change	Person eq	1,81E-01	6,87E-02	1,19E-02	2,58E-03	7,96E-02	1,87E-02
Ozone depletion	Person eq	2,91E-03	2,51E-04	2,75E-04	9,08E-05	2,45E-03	-1,51E-04
Ionising radiation	Person eq	2,68E-02	8,85E-03	2,30E-03	3,88E-04	1,76E-02	-2,34E-03
Photochemical ozone formation	Person eq	2,37E-01	4,68E-02	4,55E-03	2,80E-03	1,87E-01	-3,30E-03

Particulate matter	Person eq	2,96E-01	3,37E-02	2,09E-03	3,13E-03	2,59E-01	-2,41E-03
Human toxicity, non-cancer	Person eq	3,87E-02	1,51E-02	1,70E-03	1,13E-03	2,57E-02	-4,91E-03
Human toxicity, cancer	Person eq	3,28E-02	9,87E-03	9,57E-04	4,76E-04	2,01E-02	1,36E-03
Acidification	Person eq	1,45E-01	3,62E-02	6,28E-03	1,90E-03	1,07E-01	-6,33E-03
Eutrophication, freshwater	Person eq	7,33E-02	5,07E-02	8,95E-03	8,44E-04	2,58E-02	-1,29E-02
Eutrophication, marine	Person eq	1,70E-01	1,94E-02	3,01E-03	1,86E-03	1,28E-01	1,79E-02
Eutrophication, terrestrial	Person eq	1,82E-01	2,26E-02	3,58E-03	2,25E-03	1,56E-01	-1,66E-03
Ecotoxicity, freshwater	Person eq	2,36E-01	6,82E-02	1,59E-02	5,82E-03	1,58E-01	-1,15E-02
Land use	Person eq	8,93E-03	7,94E-04	2,23E-04	2,67E-04	7,78E-03	-1,30E-04
Water use	Person eq	5,02E-02	3,86E-02	2,34E-03	8,31E-05	1,35E-02	-4,20E-03
Resource use, fossils	Person eq	4,55E-01	2,99E-01	2,14E-02	4,89E-03	1,47E-01	-1,78E-02
Resource use, minerals and metals	Person eq	1,00E-01	5,86E-02	2,37E-03	1,15E-03	3,99E-02	-1,87E-03
Climate change - Fossil	Person eq	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate change - Biogenic	Person eq	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate change - Land use and LU change	Person eq	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 13 - Weighted results for all impact categories analysed

Impact category	Unit of measurement	Total	Raw materials	Production process	Distribution	Use phase	End of Life
Climate change	mPt	3,82E+01	1,45E+01	2,50E+00	5,43E-01	1,68E+01	3,95E+00
Ozone depletion	mPt	1,84E-01	1,59E-02	1,74E-02	5,73E-03	1,54E-01	-9,55E-03
Ionising radiation	mPt	1,34E+00	4,43E-01	1,15E-01	1,94E-02	8,84E-01	-1,17E-01
Photochemical ozone formation	mPt	1,13E+01	2,24E+00	2,18E-01	1,34E-01	8,92E+00	-1,58E-01
Particulate matter	mPt	2,65E+01	3,02E+00	1,87E-01	2,80E-01	2,32E+01	-2,16E-01
Human toxicity, non-cancer	mPt	7,13E-01	2,77E-01	3,13E-02	2,08E-02	4,74E-01	-9,03E-02
Human toxicity, cancer	mPt	6,98E-01	2,10E-01	2,04E-02	1,01E-02	4,28E-01	2,89E-02
Acidification	mPt	9,00E+00	2,25E+00	3,90E-01	1,18E-01	6,64E+00	-3,92E-01
Eutrophication, freshwater	mPt	2,05E+00	1,42E+00	2,50E-01	2,36E-02	7,21E-01	-3,61E-01
Eutrophication, marine	mPt	5,02E+00	5,74E-01	8,90E-02	5,51E-02	3,78E+00	5,28E-01

Eutrophication, terrestrial	mPt	6,77E+00	8,38E-01	1,33E-01	8,36E-02	5,78E+00	-6,17E-02
Ecotoxicity, freshwater	mPt	4,54E+00	1,31E+00	3,05E-01	1,12E-01	3,03E+00	-2,20E-01
Land use	mPt	7,09E-01	6,31E-02	1,77E-02	2,12E-02	6,17E-01	-1,03E-02
Water use	mPt	4,27E+00	3,28E+00	1,99E-01	7,07E-03	1,15E+00	-3,58E-01
Resource use, fossils	mPt	3,78E+01	2,49E+01	1,78E+00	4,07E-01	1,22E+01	-1,48E+00
Resource use, minerals and metals	mPt	7,56E+00	4,42E+00	1,79E-01	8,68E-02	3,01E+00	-1,41E-01
Climate change - Fossil	mPt	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate change - Biogenic	mPt	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Climate change - Land use and LU change	mPt	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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