

ENVIRONMENTAL PRODUCT DECLARATION

PE Pipes

In accordance with ISO 14025 and EN 15804:2012+A2:2019

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An EPD should provide current information and may be updated if conditions change.

The stated validity is therefore subject to the continued registration and publication at www.environdec.com



Geographical area of application of this EPD:

New Zealand

Year taken as reference for the data:

FY18/19 - 1st July 2018 to 30th June 2019

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General Information

Programme information

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules).

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Declaration owner



by **alixaxis**

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EPD Australasia

CEN standard EN 15804 served as the core PCR

PCR:	Construction products, PCR 2019:14, 1.11 and UN CPC 369
PCR prepared by:	IVL Swedish Environmental Research Institute Moderator: Martin Erlandsson, martin.erlandsson@ivl.se
Independent external verification of the declaration and data, according to ISO 14025:2010	EPD process certification (Internal) EPD verification (External)
Procedure for follow-up of data during EPD validity involves third party verifier:	No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Company information

Marley NZ has been providing spouting, downpipes, building, plumbing and electrical solutions for New Zealanders since 1959. Marley also export products to the Pacific Islands, South East Asia, Australia and the UK.

With local manufacturing sites employing over 200 local people, the vast majority of the products we sell are proudly New Zealand made.

Belonging to the Aliaxis group has also provided Marley NZ with access to thousands of new products around the world.

Bureau Veritas is the body that certifies the compliance of Marley NZ to the following management systems:

- › ISO 9001 – Quality Management Systems
- › ISO 14001- Environmental Management Systems

To demonstrate compliance to New Zealand product standards, Marley NZ distributes PE pipes with “S” Mark Product Certification

- › Polyethylene (PE) pipes for pressure applications - AS/NZS 4130
License No: 2639, 2807 and 2804
- › Conduit systems for cable management – Part 21: Particular requirements – rigid conduit systems – AS/NZS 61386.21
License No: 2806
- › Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications - AS/NZS 5065
License No: 2854



Product information

Table 1 - Product characteristics of PE pipes

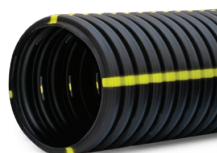
PRODUCT CHARACTERISTICS	
Product names/Application	Polyethylene (PE) pipes covered in this EPD are: • Polyethylene (PE) non-pressure pipes ◦ Land drainage ◦ Telecom and power duct • Polyethylene (PE) pressure pipes ◦ Effluent ◦ Water supply ◦ Irrigation
UN CPC Code	369 – Other plastic products
Density	925 - 960 kg/m ³
Yield tensile strength	12 – 25 Mpa
Coefficient of linear thermal expansion	10 x 10 ⁻⁵ / °C
Melting point	125 - 133°C
Poissons ratio	0.4
Stifness modulus	250 - 1100 MPa



All products specifications can be found in Appendix B.

Table 2. PE products included in EPD

PRODUCT SERIES	MARLEY'S PRODUCTS	APPLICATION
PE non-pressure pipe		
400	Drainflo®	Land drainage
500	Drainflo®	Land drainage
Comducts	Calibre® Duct	Telecom
SUBD	Calibre® Duct	Power duct
PE pressure pipe		
220	Effluent Pipe	Effluent
300 6 bar	Oasis® 6 Bar Pipe	Water supply- mains pressure, irrigation, pumped sewer
300 9 bar	Oasis® 9 Bar Pipe	Water supply- mains pressure, irrigation, pumped sewer
310	Marley Royal Blue Polyethylene Pressure Pipe – PE100	Water supply- mains pressure, irrigation, pumped sewer
950	950 Series® - Alkathene Pipe	Water supply- mains pressure, irrigation, pumped sewer
1200	Blue Polyethylene Pressure Pipe	Water supply- mains pressure, irrigation, pumped sewer
1210	Royal Blue Polyethylene Pressure Pipe	Water supply- mains pressure, irrigation, pumped sewer



Drainflo® 400



Drainflo® 500



Calibre® – Comm Duct



Calibre® – Power Duct



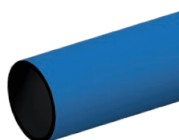
Effluent Pipe



Oasis® 6 Bar Pipe



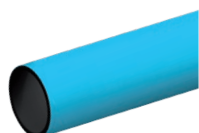
Oasis® 9 Bar Pipe



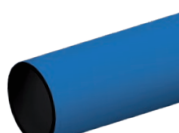
Marley Royal Blue Polyethylene Pressure Pipe – PE100



950 Series® – Alkathene Pipe



Blue Polyethylene Pressure Pipe



Royal Blue Polyethylene Pressure Pipe

Table 3 - Content declaration for representative PE pipes

Product Components	Post-consumer material, weight -%		Cas #
	Non-pressure PE	Pressure PE	
Polyethylene resin	>95%	>95%	25213-02-9, 25087-34-7, 9002-88-4
Carbon Black	<3%	2-2.5%	1333-86-4
Other pigments	<2%	<2%	Various
Other additives (UV stabilisers, anti-oxidants)	<2%	<2%	Various
Packaging materials	Weight -% (versus the product)		
	PE Non-pressure	PE Pressure	
Synthetic twine	< 0.1%	< 0.1%	
Softwood	< 0.1%	< 0.1%	
PET Strapping	< 0.1%	< 0.1%	

Product life cycle overview

The life cycle of a building product is divided into three process modules according to the General Program Instructions (GPI) and four information modules according to ISO 21930 and EN 15804 and supplemented by an optional information module on potential loads and benefits beyond the building life cycle. Table 4 shows the system boundary and scope of the EPD. The scope of this EPD Cradle to gate with module C1–C4, module D and optional modules A4–A5. Due to the durability of PE pressure pipes, and lack of planned or required maintenance throughout the service life, modules B1–B7 were also deemed not relevant (of negligible impact).

Table 4 - Scope of assessment and system boundary

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling -potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	X
Geography	Global/ NZ	NZ	NZ	NZ	NZ								NZ	NZ	NZ	NZ	NZ

X = module included in EPD

MND= Module not declared (does not indicate zero impact result)

System diagram

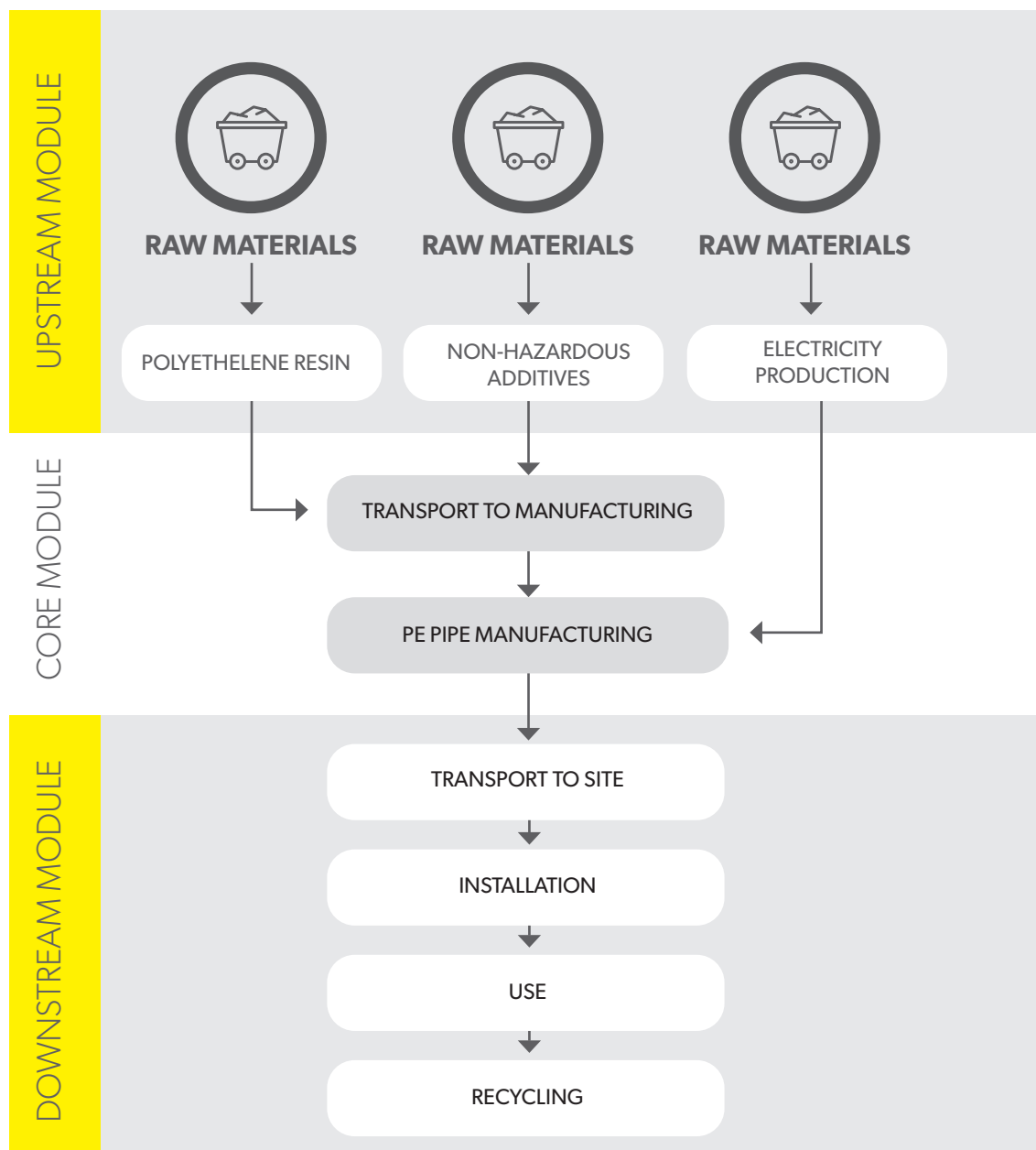


Figure 1 Life cycle diagram of PE pipe production

Manufacturing Stage

Marley PE pipes are manufactured in three sites:

- › Manurewa, Auckland - North Island
- › Horotiu, Waikato - North Island
- › Tinwald, Ashburton - South Island.

Marley PE pipes are produced using extrusion technology and process that is sophisticated and highly controlled.

The PE resin is the main ingredient in the PE pipe feed mix, and is manufactured typically in Europe, Middle East and Asia.

The PE raw material is compounded into pellet form containing precise amounts of polymer, lubricants, stabilisers, anti-oxidants and pigments for the specific end product application by the raw material supplier and to ensure optimised processing. Internal PE pipe scrap from production can also be fed back into the feed mix to minimise wastage.

The PE compound is preheated to remove moisture and volatiles and is conveyed to the extruder using a controlled rate feeder. The extruder consists of a single screw configuration which melts and conveys the PE material along the length of the extruder barrel.

Various zones exist along the length of the screw and act to melt, mix, de-gas and compresses the PE compound. External electrical heater bands along the barrel, together with the frictional heat generated as the PE material passes through the gaps between barrel and screw provide the energy needed to fully melt the PE compound materials. The total heat input is carefully controlled to ensure full melting of the PE without degrading the material.

After passing through a mixing zone at the tip of the extruder, the PE melt then feeds into a head and die combination, where the melt is formed into the size of pipe required. Once the molten PE pipe form leaves the die, it enters the sizing system, where it is initially cooled to the required dimensions, the pipe surfaces are cooled with refrigerated water sprays whilst in contact with precision machined sizing sleeves.

The initially cooled pipe is then progressively passed through a series of water spray cooling tanks to reduce the PE material to ambient temperature, and to finalise the pipe dimensions. The pipe information of size, material, class, and batch data required is then marked on the pipe by an in-line printer. The completed pipe is then cut to standard or required length by an in-line saw.

Finally, PE straights are packaged with a softwood timber frame and PET strapping and PE coils with synthetic twine.

Distribution Stage

Marley distributes to New Zealand's major markets. Figures for this stage were calculated with a weighted average based on volume production in each manufacturing sites and the distribution centres for each of the different products.

An average distance of 30kms was assumed from manufacturing site to distribution centres, products transported via rigid truck.

Installation Stage

Marley PE non pressure pipes are mainly used for land drainage and telco/electrical.

Direct drilling is the most common way of installing the Calibre[®] Duct pipes which are mainly installed below ground, they normally utilize butt fusion jointing which is carried out above ground and after cooling, long lengths of pipe are snaked into the trench. As such, it results in long continuous lengths of pipeline that can take advantage of trenchless installation techniques.

The Drainflo[®] corrugated drainage range still requires cover and bedding. Depending on the diameter of the Drainflo pipe, the installation and equipment will be different. Pipes with a DN 110 or below will be installed using a compact track loader and if the DN is bigger than a 110 then a mechanical excavator will be used.

Marley PE pressure pipes are installed following similar parameters to PVC pipes but depending on the final use some pipes are hand dug or installed above ground (smaller DN's). The equipment used for the installation of the pipes will depend directly on their DN, if DN is up to 110mm then a compact track loader is used, if DN is above 110 then a mechanical excavator is used.

Use Stage

Maintenance of pipe systems is not required and not planned as deterioration of the pipe in service is not a consideration. These systems are designed with a life expectancy of in excess of 100 years. Replacements and/or repairs are rarely required on PE pipelines and almost entirely due to third party interference.

There there's no release of dangerous substances to indoor air, soil and water during the use stage.

End of life Stage

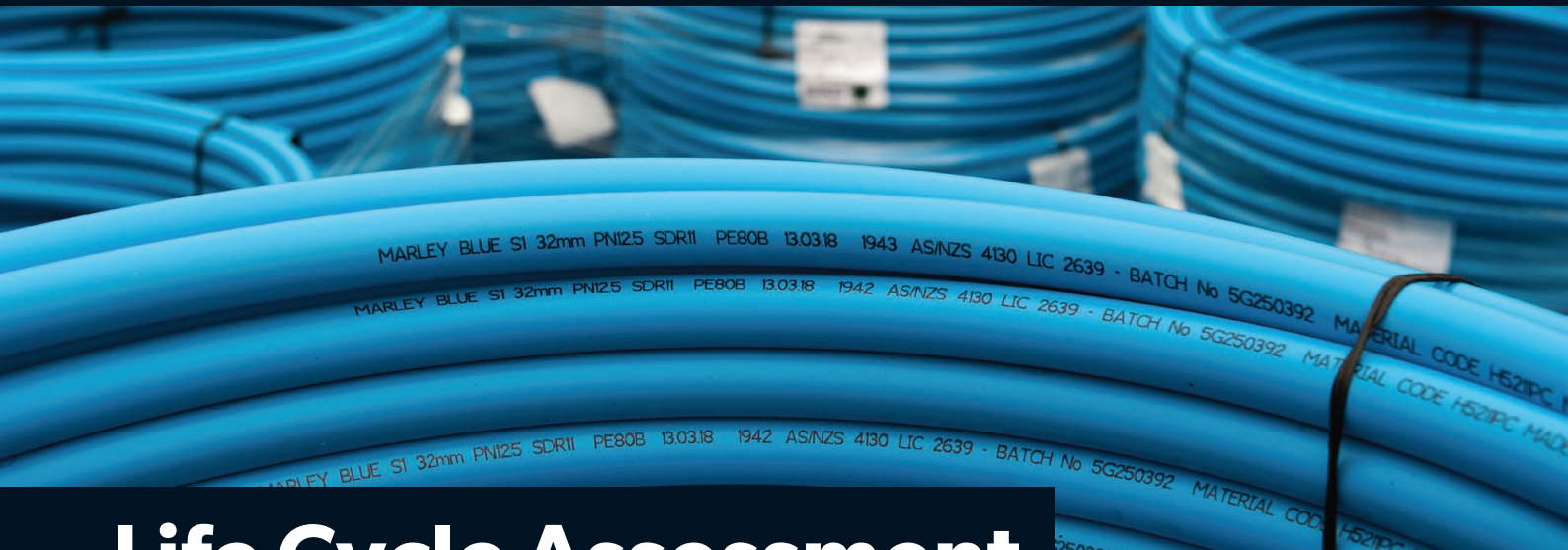
The vast majority of PE pipes are installed underground and are assumed to remain underground at end of life. The PE pipes are inert and there is no incentive to dig them up to send for waste treatment.





Figure 2. Marley PE pipe manufacturing sites and showing modules related to the EPD





Life Cycle Assessment Methodology

This section includes the main details of the LCA study as well as assumptions and methods of the assessment. A summary of the key life cycle assessment parameters is given in Table 8.

Life cycle impact assessment methods used: based on EN 15804 +A2

Table 5 - Details of LCA

Declared unit	1 kg of installed pipe
Geographical coverage	New Zealand
LCA scope	Cradle to gate with module C1–C4, module D and optional modules A4-A5
Reference service life	100 years - While the design life of the PE pipe is in excess of 100 years, the duration of the pipe use in buildings will be less for buildings with a shorter lifetime

Life cycle thinking is a core concept in sustainable consumption and production for policy and business. Upstream and downstream consequences of decisions must be taken into account to help avoid the shifting of burdens from one type of environmental impact to another, from one political region to another, or from one stage to another in a product's life cycle from the cradle to the grave.

LCA is the compilation of the inputs, outputs and environmental impacts of a product system throughout its life cycle. It is a technique that enables industries to identify the resource flows and environmental impacts (such as greenhouse gas emissions, water and energy use) associated with the provision of products and services.

According to EN 15804, EPDs of construction products may not be comparable if they do not comply with this standard, and EPDs might not be comparable, particularly if different functional units are used.

Core data collection

Life cycle data has been sourced from material quantity data and production process data from:

- › Marley's reporting systems and staff
- › Marley feed mix suppliers
- › Core manufacturing data was collected directly from Marley manufacturing sites. Electricity consumption was allocated to pipe via mass of pipe produced.

Background data

Generic background data was sourced for raw materials in the upstream module, transportation and end of life waste treatment. Background data was adapted to represent Marley PVC-U pipe product as accurately as possible.

Database(s) and LCA software used:

The inventory data for the process are entered into the SimaPro (v9.1.1.1) LCA software program and linked to the pre-existing data for the upstream feedstocks and services selected in order of preference from:

- › Life cycle inventory ecoinvent 3.5, adapted where relevant to New Zealand conditions (energy sources, transport distances and modes and so on, and documented to show how the data is adapted for national relevance).
- › The Australasian Unit Process LCI compiled by Life Cycle Strategies (Life Cycle Strategies, 2015).
- › Other sources with sensitivity analysis reported to show the significance of this data for the results and conclusions drawn.

All background data used was less than 10 years old.

Data quality and validation

Edge Environment has used the following criteria in selecting data for modelling:

- › **Relevance:** select sources, data, and methods appropriate to assessing the chosen product's LCI,
- › **Completeness:** include all LCI items that provide a material's contribution to a product's life cycle emissions,
- › **Consistency:** enable meaningful comparisons in life cycle impact assessment (LCIA) information,
- › **Accuracy:** reduce bias and uncertainty as far as is practical,
- › **Transparency:** when communicating, disclose enough information to allow third parties to make decisions,
- › **Time coverage:** the data collected represents recent practice for the construction of the project, and
- › **Geographical coverage:** the data collected are representative of the sourcing of materials, whether from New Zealand or overseas, and are in line with the goal of the study.

Cut-off rules

According to the PCR 2019:14, Life cycle inventory data shall according to EN 15804 A2 include a minimum of 95% of total inflows (mass and energy) per module. Inflows not included in the LCA shall be documented in the EPD. In accordance with the PCR 2019:14, the following system boundaries are applied to manufacturing equipment and employees:

- › Environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in the LCI. Capital equipment and buildings typically account for less than a few percent of nearly all LCIs and this is usually smaller than the error in the inventory data itself. For this project, it is assumed that capital equipment makes a negligible contribution to the impacts as per Frischknecht et al. (2007) with no further investigation.
- › Personnel-related impacts, such as transportation to and from work, are also not accounted for in the LCI. The impacts of employees are also excluded from inventory impacts on the basis that if they were not employed for this production or service function, they would be employed for another. It is very hard to decide what proportion of the impacts from their whole lives should count towards their employment. For this project, the impacts of employees are excluded.

Allocation

Allocation was carried out in accordance with the PCR (EPD International, 2019), section 4.5. No-allocation between co-products in the core module as there were no co-products created during manufacturing. Energy consumed in core module was allocated to pipe via mass of pipe produced





PE Pipe Environmental Performance

Environmental Indicators

The potential environmental impacts used in this EPD are explained in Table 6.

Table 6 - Environmental indicators used in the EPD

	Impact category	Abbreviation	Unit	Definition	Disclaimer
Environmental impacts	Global warming potential - Fossil	GWP - F	kg CO ₂ eq.	Estimates GHG warming effect for fossil, given as kgCO ₂ -eq.	
	Global warming potential - Biogenic	GWP - B	kg CO ₂ eq.	Estimates GHG warming effect for biogenic, given as kgCO ₂ -eq.	
	Global warming potential - Land use and Land use change	GWP - Luluc	kg CO ₂ eq.	Estimates GHG warming effect for land use and land use change, given as kgCO ₂ -eq.	
	Global warming potential - Total	GWP - T	kg CO ₂ eq.	Estimates the total GHG warming effect, given as kgCO ₂ -eq.	
	Ozone depletion potential	ODP	kg CFC 11 eq.	Estimates the potential reduction of ozone in Earth's atmosphere as per CFC-11 eq effects.	
	Acidification potential	AP	mol H ⁺ eq.	Estimates the increase of oceans acidity as per SO ₂ eq effects.	
	Eutrophication, freshwater	EP - F	kg PO ₄ ³⁻ eq.	Estimates the potential increment of nutrients in freshwater as kg PO ₄ effects.	
	Eutrophication, freshwater	EP - F2	kg P eq.	Estimates the potential increment of nutrients in freshwater as kg P equivalent effects.	
	Eutrophication, marine	EP - M	kg N eq.	Estimates the potential increment of nutrients in marine water as kg N equivalent effects.	
	Eutrophication, terrestrial	EP – T	mol N eq.	Estimates the potential increment of nutrients in land as mol N equivalent effects.	
	Photochemical ozone formation	POCP	kg NMVOC eq.	Estimates photochemical smog (air pollution) potential as kg C ₂ H ₄ eq	2
	Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	Estimates the impact on minerals reserves as antimony (Sb) equivalents	2
	Abiotic depletion potential - Fossil	ADP - F	MJ	Estimates the impact on fossil fuels reserves as MJ	
	Water depletion Potential	WDP	m ³ eq.	Estimates the potential of water deprivation, to either humans or ecosystems, and serves in calculating the impact score of water consumption at midpoint in LCA or to calculate a water scarcity footprint as per ISO 14046.	2

Impact category	Abbreviation	Unit	Definition	Disclaimer
Resource use	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	Estimates the use of renewable primary energy excluding renewable primary energy resources used as raw materials
	Use of renewable primary energy resources used as raw materials	PERM	MJ	Estimates the use of renewable primary energy resources used as raw materials
	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ	Estimates the total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)
	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	Estimates the use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
	Use of non-renewable primary energy resources used as raw materials	PENRM	MJ	Estimates the use of non-renewable primary energy resources used as raw materials
	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ	Estimates the total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)
	Use of secondary material	SM	kg	Estimates the use of secondary material
	Use of renewable secondary fuels	RSF	MJ	Estimates the use of renewable secondary fuels
	Use of non-renewable secondary fuels	NRSF	MJ	Estimates the use of non-renewable secondary fuels
	Use of net fresh water	FW	m ³	Estimates the use of net fresh water
Waste	Hazardous waste disposed	HWD	kg	Estimates the hazardous waste disposed
	Non-hazardous waste disposed	NHWD	kg	Estimates the non-hazardous waste disposed
	Radioactive waste disposed/stored	RWD	kg	Estimates the radioactive waste disposed/stored

	Impact category	Abbreviation	Unit	Definition	Disclaimer
Output flows	Components for re-use	CFR	kg	Estimates the components for re-use	
	Material for recycling	MFR	kg	Estimates the material for recycling	
	Materials for energy recovery	MFEE	kg	Estimates the materials for energy recovery	
	Exported energy, electricity	EE - e	MJ	Estimates the exported energy, electricity	
	Exported energy, thermal	EE - t	MJ	Estimates the exported energy, thermal	
Additional environmental impact indicators	Global warming potential, excluding biogenic uptake, emissions and storage	GWP - GHG	kg CO ₂ eq. (GWP100)	Estimates GHG warming effect for a change in a 100 years time, given as CO ₂ -eq.	
	Particulate matter	PM	disease incidence	Estimates the potential incidence of disease due to PM emissions	
	Ionising radiation - human health	IRP	kBq U-235 eq	Estimates the potential health damages related to the man-made routine releases of radioactive material to the environment	1
	Eco-toxicity, freshwater	ETP - fw	CTUe	Estimates the potential impact on fresh water ecosystems, as a result of emissions of toxic substances to air, water and soil.	2
	Human toxicity potential - cancer effects	HTP - c	CTUh	Estimates the potential Comparative Toxic Unit for humans - cancer	2
	Human toxicity potential - non cancer effects	HTP - nc	CTUh	Estimates the potential Comparative Toxic Unit for humans - non cancer	2
	Soil quality	SQP	dimensionless	Estimates the potential soil quality index (SQP)	2
	Biogenic content	Biogenic Content	Kg C	Estimated the amount of carbon that is stored in biological materials, such as plants or soil	

Disclaimer 1: This impact category deals mainly with the eventual impact of low dose ionizing nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2: 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.

Results: Environmental information

The following section provides the environmental impact results produced by the LCA. Results are not presented as a weighted average of all products (results for all products were calculated individually) due to the results variation being greater than ±10% in some cases.

In this section, only the results of the most representative product of each product category are presented. The results for all remaining products can be found in the appendix A.

Two different installation processes are presented for PE non pressure to cater for the different applications: communication and electrical pipes are usually installed trenchless through horizontal directional drilling, whereas the rest are usually installed in open trenches.

The total impact is the sum of the following parts:

- › Value shown in A1-3
- › Value of module A4
- › A5: value of the column (for the correspondent installation type) where the range of the DN is included divided by the weight of the product (found in Appendix B) due to this value being presented per metre of pipe installed.
- › C1-4: The four columns correspondent to module C (C1-C4)
- › The value of column Module D

EPD Results PE non-pressure

Results for modules A1-4, C-D

Table 7. Results for 1kg of Comducts - Calibre[®] Duct.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.82E+00	1.72E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.70E-03	3.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.60E-03	7.02E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.83E+00	1.72E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.81E-07	3.82E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.72E-02	1.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.64E-03	1.91E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.75E-04	1.30E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	3.42E-03	4.47E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.70E-02	4.89E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	9.93E-03	1.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.54E-05	5.86E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	8.04E+01	2.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.39E+00	8.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.39E+00	2.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.39E+00	2.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.62E+01	2.71E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.25E+02	2.71E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.46E-02	1.27E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	7.89E-05	6.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.62E-01	1.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	8.64E-05	1.66E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.67E+00	1.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.09E-07	1.71E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.15E-01	1.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.20E+01	2.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	9.00E-10	1.05E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	2.03E-08	2.58E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	5.54E+00	1.79E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	7.10E-05



Results for modules A5

Table 8. Results for 1m of installed pipe in open trench.

DN and DN range (mm)												
Indicator	Unit	20	40	63	90	110	125	140	160	180	250	
		15-25	32-40	50-65	90	110	125	140	160	180	250	
Environmental impacts	GWP-fossil	kg CO ₂ eq.	9.87E-01	1.31E+00	1.74E+00	2.28E+00	2.16E+00	2.64E+00	3.01E+00	3.55E+00	4.33E+00	7.19E+00
	GWP-biogenic	kg CO ₂ eq.	2.69E-03	5.58E-03	9.98E-03	1.54E-02	1.84E-02	2.38E-02	2.61E-02	2.95E-02	3.86E-02	6.77E-02
	GWP-luluc	kg CO ₂ eq.	2.56E-04	5.34E-04	8.85E-04	1.33E-03	1.68E-03	1.98E-03	2.27E-03	2.67E-03	3.13E-03	4.87E-03
	GWP-total	kg CO ₂ eq.	9.90E-01	1.31E+00	1.75E+00	2.29E+00	2.18E+00	2.66E+00	3.04E+00	3.58E+00	4.37E+00	7.27E+00
	ODP	kg CFC 11 eq.	4.73E-08	9.85E-08	1.63E-07	2.46E-07	3.10E-07	3.66E-07	4.18E-07	4.92E-07	5.78E-07	9.04E-07
	AP	mol H ⁺ eq.	8.16E-03	1.04E-02	1.32E-02	1.69E-02	1.52E-02	1.83E-02	2.11E-02	2.51E-02	3.01E-02	4.93E-02
	EP-freshwater	kg PO ₄ ³⁻ eq.	1.37E-03	1.87E-03	2.56E-03	3.44E-03	3.38E-03	4.17E-03	4.72E-03	5.52E-03	6.82E-03	1.15E-02
	EP-freshwater	kg P eq.	8.17E-05	1.70E-04	2.98E-04	4.58E-04	5.54E-04	7.01E-04	7.76E-04	8.86E-04	1.13E-03	1.93E-03
	EP-marine	kg N eq.	3.27E-03	3.93E-03	4.78E-03	5.85E-03	4.78E-03	5.73E-03	6.65E-03	7.98E-03	9.54E-03	1.57E-02
	EP-terrestrial	mol N eq.	3.59E-02	4.34E-02	5.29E-02	6.49E-02	5.35E-02	6.40E-02	7.43E-02	8.92E-02	1.06E-01	1.74E-01
	POCP	kg NMVOC eq.	9.23E-03	1.10E-02	1.33E-02	1.61E-02	1.29E-02	1.55E-02	1.80E-02	2.17E-02	2.59E-02	4.27E-02
	ADP-minerals & metals*	kg Sb eq.	1.96E-06	4.07E-06	7.39E-06	1.15E-05	1.36E-05	1.79E-05	1.94E-05	2.18E-05	2.91E-05	5.21E-05
	ADP-fossil*	MJ	4.59E+00	9.29E+00	1.55E+01	2.34E+01	2.89E+01	3.48E+01	3.94E+01	4.60E+01	5.54E+01	8.92E+01
	WDP	m ³	5.75E-01	8.13E-01	1.11E+00	1.50E+00	1.54E+00	1.82E+00	2.10E+00	2.49E+00	2.95E+00	4.70E+00
Resource use	PERE	MJ	2.09E-01	4.29E-01	1.66E+00	3.01E+00	2.47E+00	5.68E+00	5.01E+00	4.35E+00	1.01E+01	2.55E+01
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	2.09E-01	4.29E-01	1.66E+00	3.01E+00	2.47E+00	5.68E+00	5.01E+00	4.35E+00	1.01E+01	2.55E+01
	PENRE	MJ	4.86E+00	9.85E+00	1.65E+01	2.49E+01	3.07E+01	3.70E+01	4.19E+01	4.89E+01	5.89E+01	9.51E+01
	PENRM	MJ	3.20E-02	3.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	4.89E+00	9.88E+00	1.65E+01	2.49E+01	3.07E+01	3.70E+01	4.19E+01	4.89E+01	5.89E+01	9.51E+01
	SM	kg	0.00E+00	1.00E+00	2.00E+00	3.00E+00	4.00E+00	5.00E+00	6.00E+00	7.00E+00	8.00E+00	9.00E+00
	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
	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
	FW	m ³	3.14E-03	6.49E-03	1.07E-02	1.61E-02	2.03E-02	2.39E-02	2.74E-02	3.22E-02	3.78E-02	5.91E-02
Waste	Hazardous waste disposed	kg	1.50E-05	3.12E-05	5.19E-05	7.83E-05	9.85E-05	1.16E-04	1.33E-04	1.56E-04	1.84E-04	2.89E-04
	Non-hazardous waste disposed	kg	1.61E-01	3.35E-01	5.58E-01	8.42E-01	1.06E+00	1.25E+00	1.43E+00	1.68E+00	1.98E+00	3.13E+00
	Radioactive waste disposed	kg	2.55E-05	5.32E-05	8.79E-05	1.32E-04	1.67E-04	1.96E-04	2.25E-04	2.65E-04	3.09E-04	4.78E-04

DN and DN range (mm)												
Indicator	Unit	20	40	63	90	110	125	140	160	180	250	
		15-25	32-40	50-65	90	110	125	140	160	180	250	
Output flows	Components for re-use	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
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	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
	Exported energy, thermal	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
Additional environmental impacts	GWP - GHG	kg CO ₂ eq.	9.73E-01	1.29E+00	1.71E+00	2.24E+00	2.12E+00	2.59E+00	2.96E+00	3.48E+00	4.25E+00	7.06E+00
	Particulate matter	disease incidence	4.97E-08	8.69E-08	1.47E-07	2.35E-07	2.21E-07	3.84E-07	3.74E-07	3.73E-07	6.61E-07	1.46E-06
	Ionising radiation - human health	kBq U-235 eq	3.95E-02	8.23E-02	1.36E-01	2.05E-01	2.59E-01	3.03E-01	3.48E-01	4.11E-01	4.78E-01	7.40E-01
	Eco-toxicity (freshwater)	CTUe	2.12E+01	2.60E+01	3.31E+01	4.19E+01	3.49E+01	4.48E+01	5.03E+01	5.84E+01	7.53E+01	1.33E+02
	Human toxicity potential - cancer effects	CTUh	5.59E-10	1.07E-09	2.07E-09	3.66E-09	2.94E-09	6.72E-09	5.95E-09	5.18E-09	1.20E-08	3.02E-08
	Human toxicity potential - non cancer effects	CTUh	1.40E-08	1.91E-08	2.61E-08	3.50E-08	3.42E-08	4.23E-08	4.79E-08	5.59E-08	6.94E-08	1.17E-07
	Soil quality	dimensionless	5.15E+00	1.07E+01	1.77E+01	2.66E+01	3.35E+01	3.93E+01	4.51E+01	5.32E+01	6.21E+01	9.64E+01

Table 9. Results for 1m of installed pipe with directional drilling.

DN 90 is used as the representative DN of the range 15-180 as it provides the average results from the results from the different DNs in the range. Results in the range do not vary more than 1.2%.

DN and DN range (mm)				
Indicator	Unit	90	250	
		15-180	250	A5
Environmental impacts	GWP-fossil	kg CO ₂ eq.	5.63E+00	6.26E+00
	GWP-biogenic	kg CO ₂ eq.	1.82E-03	1.83E-02
	GWP-luluc	kg CO ₂ eq.	9.53E-06	1.05E-04
	GWP-total	kg CO ₂ eq.	5.63E+00	6.28E+00
	ODP	kg CFC 11 eq.	3.15E-09	2.68E-08
	AP	mol H ⁺ eq.	4.95E-02	5.17E-02
	EP-freshwater	kg PO ₄ ³⁻ eq.	7.37E-03	8.71E-03
	EP-freshwater	kg P eq.	4.22E-05	4.27E-04
	EP-marine	kg N eq.	2.15E-02	2.19E-02
	EP-terrestrial	mol N eq.	2.34E-01	2.38E-01
	POCP	kg NMVOC eq.	6.12E-02	6.22E-02
	ADP-minerals&metals*	kg Sb eq.	1.55E-06	1.60E-05
	ADP-fossil*	MJ	2.79E+00	1.03E+01
	WDP	m ³	2.88E+00	2.98E+00
Resource use	PERE	MJ	2.00E+00	2.18E+01
	PERM	MJ	0.00E+00	0.00E+00
	PERT	MJ	2.00E+00	2.18E+01
	PENRE	MJ	2.88E+00	1.12E+01
	PENRM	MJ	0.00E+00	0.00E+00
	PENRT	MJ	2.88E+00	1.12E+01
	SM	kg	3.00E+00	9.00E+00
	RSF	MJ	0.00E+00	0.00E+00
	NRSF	MJ	0.00E+00	0.00E+00
	FW	m ³	5.30E-04	2.03E-03
Waste	Hazardous waste disposed	kg	1.54E-06	1.14E-05
	Non-hazardous waste disposed	kg	2.15E-02	1.60E-01
	Radioactive waste disposed	kg	2.89E-07	3.14E-06
Output flows	Components for re-use	kg	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00
Additional indicators	GWP - GHG	kg CO ₂ eq.	5.56E+00	6.17E+00
	Particulate matter	disease incidence	2.26E-07	1.11E-06
	Ionising radiation - human health	kBq U-235 eq	5.12E-04	5.25E-03
	Eco-toxicity (freshwater)	CTUe	1.38E+02	1.62E+02
	Human toxicity potential - cancer effects	CTUh	3.39E-09	2.66E-08
	Human toxicity potential - non cancer effects	CTUh	7.60E-08	9.08E-08
	Soil quality	dimensionless	4.55E-01	1.61E+00

EPD Results PE pressure

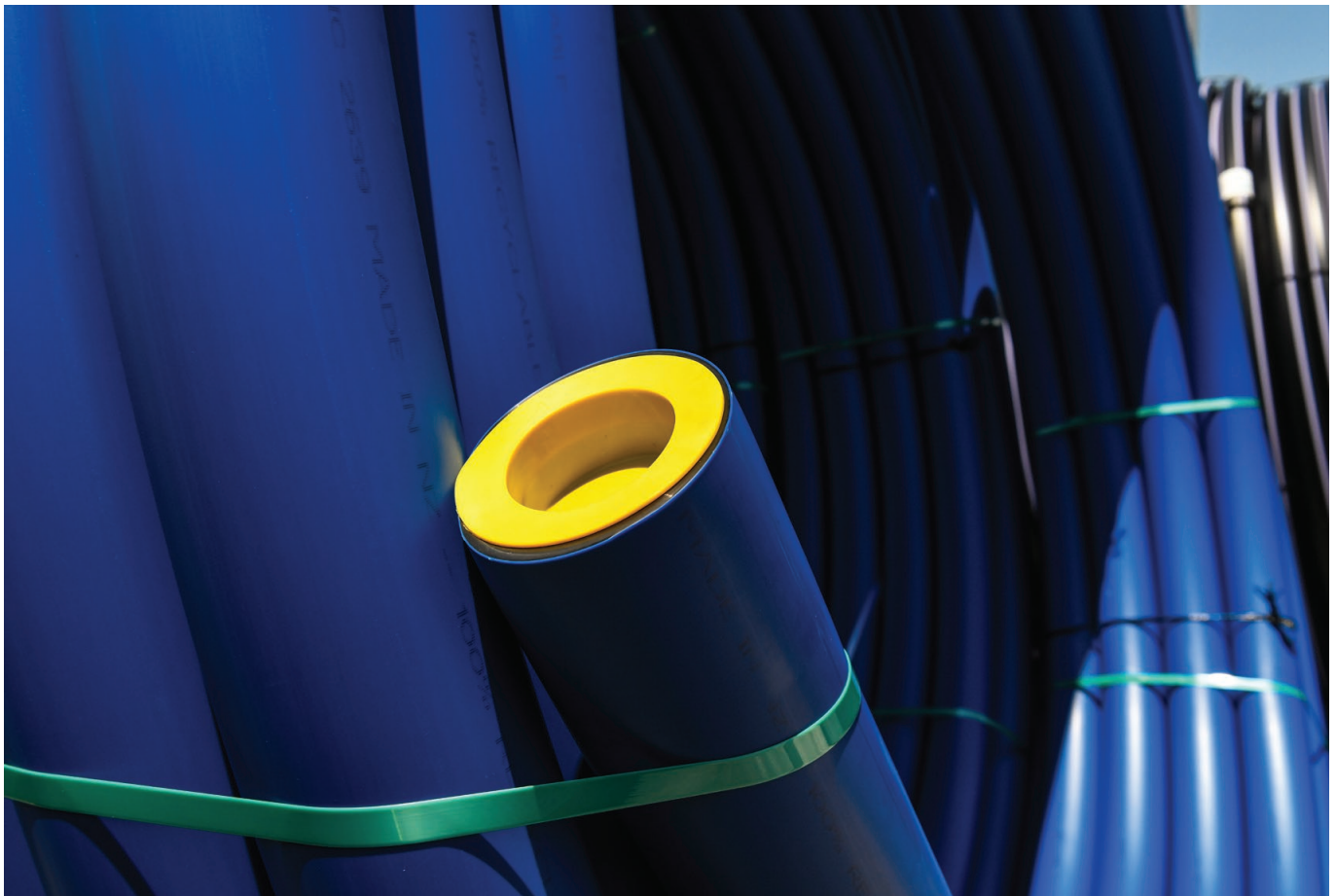
Results for modules A1-4, C-D

Table 10. Results for 1kg of Series 1200 - Blue Polythene Pressure Pipe.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.68E+00	3.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.87E-03	7.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.54E-03	1.56E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.69E+00	3.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.22E-07	8.50E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.38E-02	2.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.38E-03	4.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.66E-04	2.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.74E-03	9.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	2.94E-02	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.06E-03	2.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.53E-05	1.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.83E+01	5.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.38E+00	1.89E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.35E+00	6.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.35E+00	6.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.40E+01	6.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	4.05E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.25E+02	6.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.49E-02	2.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	9.05E-05	1.48E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.45E-01	2.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	6.05E-05	3.69E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.53E+00	3.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	9.80E-08	3.81E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	9.64E-02	2.59E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.00E+01	4.93E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.49E-10	2.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.93E-08	5.74E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	4.81E+00	3.98E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	9.77E-05



Results for modules A5

Table 11. Results for 1m of installed pipe.

			DN and DN range (mm)											
	Indicator	Unit	16	32	50	63	75	90	125	180	250	355	500	630
			13-20	25-40	45-57	63	75	90-110	125-140	160-200	225-280	315-400	450-560	630
Environmental impacts	GWP-fossil	kg CO ₂ eq.	3.72E-04	1.31E-03	1.49E+00	1.73E+00	1.96E+00	2.26E+00	1.02E+01	1.21E+01	1.43E+01	1.74E+01	2.55E+01	3.11E+01
	GWP-biogenic	kg CO ₂ eq.	4.32E-07	1.52E-06	7.11E-03	9.19E-03	1.12E-02	1.38E-02	5.35E-02	6.42E-02	7.51E-02	8.92E-02	1.29E-01	1.55E-01
	GWP-luluc	kg CO ₂ eq.	2.56E-08	8.86E-08	6.81E-04	8.81E-04	1.07E-03	1.32E-03	5.13E-03	6.15E-03	7.20E-03	8.54E-03	1.23E-02	1.49E-02
	GWP-total	kg CO ₂ eq.	3.73E-04	1.32E-03	1.50E+00	1.74E+00	1.97E+00	2.28E+00	1.02E+01	1.22E+01	1.44E+01	1.75E+01	2.56E+01	3.13E+01
	ODP	kg CFC 11 eq.	6.16E-12	2.17E-11	1.26E-07	1.62E-07	1.98E-07	2.44E-07	9.46E-07	1.13E-06	1.33E-06	1.58E-06	2.27E-06	2.75E-06
	AP	mol H ⁺ eq.	3.20E-07	1.11E-06	1.17E-02	1.33E-02	1.49E-02	1.70E-02	7.82E-02	9.31E-02	1.10E-01	1.34E-01	1.96E-01	2.40E-01
	EP-freshwater	kg PO ₄ ³⁻ eq.	1.48E-07	5.22E-07	2.16E-03	2.53E-03	2.89E-03	3.36E-03	1.48E-02	1.77E-02	2.08E-02	2.53E-02	3.68E-02	4.49E-02
	EP-freshwater	kg P eq.	7.95E-09	2.74E-08	2.16E-04	2.80E-04	3.41E-04	4.20E-04	1.63E-03	1.95E-03	2.28E-03	2.71E-03	3.91E-03	4.73E-03
	EP-marine	kg N eq.	3.01E-07	1.06E-06	4.34E-03	4.85E-03	5.33E-03	5.98E-03	2.85E-02	3.39E-02	4.00E-02	4.92E-02	7.20E-02	8.83E-02
	EP-terrestrial	mol N eq.	1.19E-06	4.20E-06	4.79E-02	5.36E-02	5.91E-02	6.63E-02	3.15E-01	3.75E-01	4.42E-01	5.44E-01	7.96E-01	9.76E-01
	POCP	kg NMVOC eq.	5.78E-07	2.04E-06	1.21E-02	1.35E-02	1.48E-02	1.65E-02	7.92E-02	9.41E-02	1.11E-01	1.37E-01	2.00E-01	2.46E-01
	ADP-minerals & metals*	kg Sb eq.	2.01E-10	6.83E-10	5.19E-06	6.70E-06	8.16E-06	1.01E-05	3.90E-05	4.68E-05	5.48E-05	6.50E-05	9.38E-05	1.13E-04
	ADP-fossil*	MJ	3.77E-04	1.18E-03	1.18E+01	1.52E+01	1.84E+01	2.27E+01	8.83E+01	1.06E+02	1.24E+02	1.47E+02	2.13E+02	2.57E+02
	WDP	m³	2.45E-04	8.66E-04	9.46E-01	1.12E+00	1.29E+00	1.51E+00	6.57E+00	7.84E+00	9.24E+00	1.12E+01	1.64E+01	1.99E+01
Resource use	PERE	MJ	2.52E-05	8.76E-05	5.45E-01	7.03E-01	8.56E-01	1.05E+00	4.10E+00	4.91E+00	5.75E+00	6.83E+00	9.86E+00	1.19E+01
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	2.52E-05	8.76E-05	5.45E-01	7.03E-01	8.56E-01	1.05E+00	4.10E+00	4.91E+00	5.75E+00	6.83E+00	9.86E+00	1.19E+01
	PENRE	MJ	4.02E-04	1.26E-03	1.25E+01	1.61E+01	1.95E+01	2.41E+01	9.37E+01	1.12E+02	1.31E+02	1.56E+02	2.25E+02	2.72E+02
	PENRM	MJ	3.20E-02	3.20E-02	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
	PENRT	MJ	3.24E-02	3.33E-02	1.25E+01	1.61E+01	1.95E+01	2.41E+01	9.37E+01	1.12E+02	1.31E+02	1.56E+02	2.25E+02	2.72E+02
	SM	kg	0.00E+00	1.00E+00	2.00E+00	3.00E+00	4.00E+00	5.00E+00	6.00E+00	7.00E+00	8.00E+00	9.00E+00	1.00E+01	1.10E+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	3.45E-06	1.22E-05	8.28E-03	1.07E-02	1.30E-02	1.61E-02	6.22E-02	7.47E-02	8.77E-02	1.05E-01	1.51E-01	1.82E-01
Waste	Hazardous waste disposed	kg	6.38E-10	2.24E-09	3.98E-05	5.15E-05	6.27E-05	7.74E-05	3.00E-04	3.60E-04	4.21E-04	4.99E-04	7.20E-04	8.70E-04
	Non-hazardous waste disposed	kg	5.02E-05	1.78E-04	4.27E-01	5.51E-01	6.72E-01	8.29E-01	3.21E+00	3.85E+00	4.51E+00	5.36E+00	7.74E+00	9.34E+00
	Radioactive waste disposed	kg	1.68E-09	5.90E-09	6.79E-05	8.78E-05	1.07E-04	1.32E-04	5.11E-04	6.13E-04	7.17E-04	8.51E-04	1.23E-03	1.48E-03

			DN and DN range (mm)											
Indicator	Unit		16	32	50	63	75	90	125	180	250	355	500	630
			13-20	25-40	45-57	63	75	90-110	125-140	160-200	225-280	315-400	450-560	630
Output flows	Components for re-use	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
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	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
	Exported energy, thermal	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
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	3.43E-04	1.21E-03	1.47E+00	1.70E+00	1.93E+00	2.23E+00	9.99E+00	1.19E+01	1.40E+01	1.71E+01	2.50E+01	3.06E+01
	Particulate matter	disease incidence	4.32E-09	1.53E-08	1.17E-07	1.56E-07	1.91E-07	2.42E-07	8.21E-07	1.15E-06	1.66E-06	2.60E-06	4.32E-06	4.92E-06
	Ionising radiation - human health	kBq U-235 eq	2.08E-06	7.24E-06	1.05E-01	1.36E-01	1.65E-01	2.04E-01	7.91E-01	9.49E-01	1.11E+00	1.32E+00	1.90E+00	2.29E+00
	Eco-toxicity (freshwater)	CTUe	2.05E-02	7.25E-02	2.90E+01	3.27E+01	3.62E+01	4.09E+01	1.92E+02	2.29E+02	2.71E+02	3.35E+02	4.93E+02	6.02E+02
	Human toxicity potential - cancer effects	CTUh	1.13E-10	4.01E-10	1.62E-09	2.29E-09	2.88E-09	3.81E-09	1.11E-08	1.75E-08	2.88E-08	5.05E-08	8.76E-08	9.79E-08
	Human toxicity potential - non cancer effects	CTUh	2.21E-11	7.84E-11	2.21E-08	2.59E-08	2.96E-08	3.45E-08	1.52E-07	1.81E-07	2.15E-07	2.64E-07	3.88E-07	4.71E-07
	Soil quality	dimensionless	3.64E-04	1.28E-03	1.36E+01	1.76E+01	2.14E+01	2.65E+01	1.03E+02	1.23E+02	1.44E+02	1.71E+02	2.46E+02	2.98E+02

Interpretation of LCA results

The majority of environmental impact lies within the raw material supplied to Marley manufacturing sites – comparatively little impact is caused by the PVC-U pipe manufacturing at Marley sites. From the feed mix ingredients, PVC resin is responsible for the majority of all environmental impacts and use of resources, although additives were still found to have a significant impact.

Inputs for each product were allocated based on the weight of pipes produced in each site and calculated as a weighted average of the different manufacturing sites where each type of pipe is produced. The background LCA report tested the variation in results between manufacturing locations to assess whether an average of the manufacturing sites can be applied without justification (it's necessary to ensure that the variation in the GWP- GHG impact between sites isn't higher than 10% in modules A1-A3). It was found that none of them differ in more than 10%. This EPD is representative of the average production and is less susceptible to variation when production volumes alter.

Sensitivity analysis

Manufacturing location

As the pipes covered in this study are manufactured in different locations with varying electricity intensities and water consumption, the maximum differences between sites was assessed for each product. However a weighted average was deemed appropriate as the purpose of this EPD is to represent the average Marley PE pipe product supplied.

Additional Environmental Information



See meridian.co.nz/certified

Meridian's Energy Certified Renewable Energy Programme

Globally Aliaxis has a goal to reach 100% renewable electricity by 2025 to help reduce the CO₂ emissions by 75% per tonne of production on its sites. Aligned with that goal, in November 2021 Marley joined Meridian Energy's Certified Renewable Energy programme. Meridian is committed to only generating electricity from 100% renewable sources.

Meridian's Certified Renewable Energy product allows Marley to purchase renewable energy certificates to verify that the amount of electricity Marley use from the grid is matched on an annual basis with electricity produced from Meridian's certified hydro stations and wind farms.

Committing to this programme enables Marley to report our Scope 2 electricity emissions as zero, using the market-based reporting methodology as per the GHG Protocol's Scope 2 Standards.

Additional environmental work

- › Use of Post Industrial and Consumer Recycled Material: In certain product applications Marley is using recycled material from industrial and consumer sources. Clean offcuts are delivered to our site for Marley to reprocess and use in the pipe manufacture. Marley also uses post-consumer recycled material that is sourced and recycled locally in certain product ranges.
- › Collecting PE Pipe Offcuts for Recycling – As well as offering a drop off service for taking clean pipe offcuts for recycling Marley has also been working with Waste Management New Zealand to offer a single stream collection service for uPVC and HDPE pipe offcuts. This service is steadily expanding across several different regional centres.



References

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Appendix

Appendix A – Additional EPD Results

PE non pressure

EPD results for 1kg of Series 400 Drainflo®.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.62E+00	4.23E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.46E-03	8.83E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.51E-03	1.73E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.64E+00	4.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.20E-07	9.41E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.21E-02	2.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.25E-03	4.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.59E-04	3.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.41E-03	1.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	2.57E-02	1.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	7.14E-03	2.91E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.53E-05	1.44E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.77E+01	6.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.40E+00	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.33E+00	7.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.33E+00	7.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.33E+01	6.67E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.93E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	6.67E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.47E-02	3.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	8.03E-05	1.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.48E-01	3.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	5.91E-05	4.08E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.47E+00	4.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	9.83E-08	4.22E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	9.34E-02	2.87E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	2.97E+01	5.45E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.30E-10	2.58E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential -non cancer effects	CTUh	1.90E-08	6.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	4.79E+00	4.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	2.66E-05

EPD results for 1kg of Series 500 Drainflo®.

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.62E+00	4.23E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.59E-03	8.83E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.51E-03	1.73E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.63E+00	4.24E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.20E-07	9.41E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.21E-02	2.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.24E-03	4.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.58E-04	3.19E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.40E-03	1.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	2.56E-02	1.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	7.12E-03	2.91E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.53E-05	1.44E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.76E+01	6.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.39E+00	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.33E+00	7.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.33E+00	7.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.33E+01	6.67E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.93E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	6.67E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.47E-02	3.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	8.18E-05	1.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.48E-01	3.17E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	5.91E-05	4.08E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.47E+00	4.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	9.83E-08	4.22E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	9.33E-02	2.87E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	2.97E+01	5.45E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.30E-10	2.58E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.90E-08	6.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	4.78E+00	4.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator		Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	0.00E+00

EPD results for 1kg of Subd - CALIBRE[®] Duct.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	3.31E+00	4.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	1.13E-02	8.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.84E-03	1.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	3.33E+00	4.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	2.69E-07	8.93E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	2.69E-02	2.72E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	3.51E-03	4.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	5.27E-04	3.03E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	5.51E-03	1.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	6.01E-02	1.14E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	1.57E-02	2.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.60E-05	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	8.65E+01	5.97E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.52E+00	1.99E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.57E+00	6.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.57E+00	6.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	9.27E+01	6.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.31E+02	6.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.46E-02	2.96E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	2.65E-05	1.55E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	3.63E-01	3.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	1.25E-04	3.87E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	3.16E+00	3.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.30E-07	4.01E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.50E-01	2.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.72E+01	5.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	1.10E-09	2.45E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential -non cancer effects	CTUh	2.44E-08	6.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	7.63E+00	4.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	0.00E+00

PE pressure - EPD results

EPD results for 1kg of Series 220 - Effluent Pipe.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.68E+00	4.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.84E-03	9.92E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.36E-03	1.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.69E+00	4.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.62E-07	1.06E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.48E-02	3.22E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.41E-03	5.27E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.59E-04	3.58E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.92E-03	1.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.14E-02	1.35E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.55E-03	3.27E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.51E-05	1.62E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.86E+01	7.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.37E+00	2.35E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.34E+00	8.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.34E+00	8.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.42E+01	7.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.84E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	7.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.43E-02	3.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	7.75E-05	1.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.41E-01	3.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	7.72E-05	4.59E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.53E+00	4.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.03E-07	4.74E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.06E-01	3.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.07E+01	6.13E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.53E-10	2.89E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential -non cancer effects	CTUh	1.94E-08	7.13E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	5.05E+00	4.94E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	1.05E-06

EPD results for 1kg of 300 6 bar Series - Oasis[®] 6 bar pipe.

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.72E+00	6.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.79E-03	1.42E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.55E-03	2.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.73E+00	6.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.62E-07	1.50E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.50E-02	4.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.45E-03	7.54E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.64E-04	5.11E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.95E-03	1.77E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.17E-02	1.93E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.63E-03	4.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.53E-05	2.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.90E+01	1.01E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.32E+00	3.35E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.38E+00	1.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.38E+00	1.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.47E+01	1.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	1.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.42E-02	4.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	7.99E-05	2.61E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.42E-01	5.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	7.74E-05	6.53E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.57E+00	6.69E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.05E-07	6.73E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.07E-01	4.59E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.09E+01	8.71E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.58E-10	4.11E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.95E-08	1.01E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	5.07E+00	7.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator		Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	2.53E-05

EPD results for 1kg of 300 9 bar Series - Oasis® 9 bar pipe.

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.72E+00	1.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.77E-03	3.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.55E-03	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.73E+00	1.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.62E-07	3.73E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.50E-02	1.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.45E-03	1.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.64E-04	1.27E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.95E-03	4.39E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.17E-02	4.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.63E-03	1.16E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.53E-05	5.70E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.90E+01	2.50E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.38E+00	8.31E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.35E+00	2.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.35E+00	2.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.47E+01	2.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	2.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.45E-02	1.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	7.99E-05	6.48E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.41E-01	1.25E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	7.74E-05	1.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.57E+00	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.05E-07	1.67E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.07E-01	1.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.09E+01	2.16E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.58E-10	1.02E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.95E-08	2.51E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	5.07E+00	1.74E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator		Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	1.35E-06

EPD results for 1kg of Series 310 - Royal Blue Polythene Pressure Pipe - PE 100.

	Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.67E+00	1.39E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.89E-03	2.91E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.39E-03	5.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.69E+00	1.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.27E-07	3.10E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.36E-02	9.58E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.36E-03	1.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.65E-04	1.05E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.70E-03	3.64E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	2.90E-02	3.98E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	7.96E-03	9.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.52E-05	4.73E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.81E+01	2.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.44E+00	6.89E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.36E+00	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.36E+00	2.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.38E+01	2.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	4.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.24E+02	2.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.45E-02	1.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	5.58E-05	5.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.54E-01	1.04E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	6.14E-05	1.34E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.52E+00	1.38E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	9.82E-08	1.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	9.64E-02	9.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.02E+01	1.79E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.54E-10	8.47E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.94E-08	2.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	4.92E+00	1.44E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Indicator	Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	1.71E-03

EPD results for 1kg of Series 950 - Alkathene Pipe.

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.68E+00	4.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.84E-03	1.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.36E-03	1.99E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.69E+00	4.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.62E-07	1.08E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.48E-02	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.41E-03	5.41E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.59E-04	3.67E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.92E-03	1.27E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.14E-02	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.55E-03	3.36E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.51E-05	1.66E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.86E+01	7.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.37E+00	2.42E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.34E+00	8.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.34E+00	8.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.42E+01	7.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	3.84E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.23E+02	7.69E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.43E-02	3.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	7.86E-05	1.89E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.41E-01	3.65E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	7.72E-05	4.70E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.53E+00	4.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	1.03E-07	4.86E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	1.06E-01	3.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.07E+01	6.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.53E-10	2.97E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.93E-08	7.31E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	5.04E+00	5.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator		Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	7.25E-06

EPD results for 1kg of Series 1210 - Royal Blue Polythene.

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
Environmental impacts	GWP-fossil	kg CO ₂ eq.	2.67E+00	3.82E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-biogenic	kg CO ₂ eq.	9.99E-03	7.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO ₂ eq.	1.38E-03	1.56E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-total	kg CO ₂ eq.	2.69E+00	3.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ODP	kg CFC 11 eq.	1.24E-07	8.50E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	AP	mol H ⁺ eq.	1.44E-02	2.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg PO ₄ ³⁻ eq.	2.41E-03	4.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-freshwater	kg P eq.	4.66E-04	2.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-marine	kg N eq.	2.83E-03	9.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EP-terrestrial	mol N eq.	3.04E-02	1.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	POCP	kg NMVOC eq.	8.32E-03	2.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-minerals&metals*	kg Sb eq.	1.51E-05	1.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	ADP-fossil*	MJ	7.81E+01	5.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	WDP	m ³	1.42E+00	1.89E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Resource use	PERE	MJ	3.35E+00	6.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.35E+00	6.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRE	MJ	8.37E+01	6.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRM	MJ	4.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.24E+02	6.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	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
	FW	m ³	1.46E-02	2.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Waste	Hazardous waste disposed	kg	6.33E-05	1.48E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Non-hazardous waste disposed	kg	2.31E-01	2.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Radioactive waste disposed	kg	6.07E-05	3.69E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Output flows	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional environmental impacts	GWP-GHG	kg CO ₂ eq.	2.53E+00	3.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Particulate matter	disease incidence	9.57E-08	3.81E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Ionising radiation - human health	kBq U-235 eq	9.69E-02	2.59E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Eco-toxicity (freshwater)	CTUe	3.00E+01	4.93E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - cancer effects	CTUh	8.48E-10	2.33E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Human toxicity potential - non cancer effects	CTUh	1.91E-08	5.74E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Soil quality	dimensionless	4.68E+00	3.98E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Indicator		Unit	Quantity
Biogenic content	Biogenic carbon content in product	kg C	0.00E+00
	Biogenic carbon content in packaging	kg C	1.88E-03

Appendix B – Product Detail

Tables 1 and 2 show product details for Marley pipe products included in this study. Other product specifications are available on their website.

Table 1- PE non-pressure products

Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
400	Land Drainage	110	0.438	100	400.110.100
400	Land Drainage	110	0.68	100	400.110.100.HW
400	Land Drainage	110	0.438	100	400.110.100FS
400	Land Drainage	110	0.68	100	400.110.100HWFS
400	Land Drainage	110	0.438	15	400.110.15
400	Land Drainage	110	0.438	15	400.110.15FS
400	Land Drainage	110	0.438	30	400.110.30
400	Land Drainage	110	0.68	30	400.110.30.HW
400	Land Drainage	110	0.438	30	400.110.30FS
400	Land Drainage	110	0.438	5	400.110.5.EXPOL
400	Land Drainage	110	0.438	50	400.110.50
400	Land Drainage	160	0.85	15	400.160.15
400	Land Drainage	160	0.85	45	400.160.45
400	Land Drainage	160	1.27	45	400.160.45.HW
400	Land Drainage	160	1.27	45	400.160.45.HWFS
400	Land Drainage	160	0.85	45	400.160.45FS
400	Land Drainage	65	0.25	150	400.65.150
400	Land Drainage	65	0.25	15	400.65.15HP
400	Land Drainage	65	0.25	30	400.65.30
400	Land Drainage	65	0.25	30	400.65.30FS
500	Land Drainage	110	0.68	100	500.110.100.HWU
500	Land Drainage	110	0.438	100	500.110.100U
500	Land Drainage	110	0.438	15	500.110.15U
500	Land Drainage	110	0.438	30	500.110.30U
500	Land Drainage	110	0.515	30	500.110.30U.O
500	Land Drainage	160	0.85	15	500.160.15U
500	Land Drainage	160	1.265	45	500.160.45.HWU
500	Land Drainage	160	0.85	45	500.160.45U
500	Land Drainage	65	0.25	15	500.65.150U
500	Land Drainage	65	0.25	15	500.65.150U.O
500	Land Drainage	65	0.25	15	500.65.15U
500	Land Drainage	65	0.25	30	500.65.30U
500	Land Drainage	65	0.25	30	500.65.30U.O
Comducts	Communication Duct	110	2.133	100	COMD.110.100.G
Comducts	Communication Duct	110	2.133	100	COMD.110.100.O
Comducts	Communication Duct	110	2.133	150	COMD.110.150.O
Comducts	Communication Duct	110	2.133	50	COMD.110.50.G
Comducts	Communication Duct	110	2.133	50	COMD.110.50.O
Comducts	Communication Duct	140	0.362	100	COMD.140.100.O
Comducts	Communication Duct	160	4.52	160	COMD.160SD17.DM.OR
Comducts	Communication Duct	40	0.292	200	COMD.40.200.O
Comducts	Communication Duct	50	0.449	100	COMD.50.100.OR
Comducts	Communication Duct	50	0.449	100	COMD.50.100.TG
Comducts	Communication Duct	63	0.716	100	COMD.63.100.G
Comducts	Communication Duct	63	0.716	100	COMD.63.100.O

Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
Comducts	Communication Duct	63	0.716	150	COMD.63.150.G
Comducts	Communication Duct	63	0.716	50	COMD.63.50.G
Comducts	Communication Duct	20	0.121	100	SERVD.20.100.TG
Comducts	Communication Duct	20	0.121	200	SERVD.20.200.TG
Comducts	Communication Duct	180	5.79	11.8	SGW.180SDR17.11.8
Comducts	Communication Duct	32	0.231	1000	SUBD.32.1000.BGSC
Comducts	Communication Duct	32	0.231	1000	SUBD.32.1000.O
Comducts	Communication Duct	32	0.231	1000	SUBD.32.1000.RDU
Comducts	Communication Duct	32	0.231	200	SUBD.32.200.G
Comducts	Communication Duct	32	0.231	200	SUBD.32.200.O
Comducts	Communication Duct	32	0.231	200	SUBD.32.200.TG
Comducts	Communication Duct	32	0.231	500	SUBD.32.500.TG

Table 2 - PE pressure products

Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
1200	PE80 pressure Blue	20	0.112	100	1200.20.100
1210	PE80 pressure Blue	20	0.112	200	1200.20.200
1200	PE80 pressure Blue	20	0.112	25	1200.20.25
1200	PE80 pressure Blue	20	0.112	5	1200.20.5
1200	PE80 pressure Blue	20	0.112	50	1200.20.50
1200	PE80 pressure Blue	25	0.171	100	1200.25.100
1200	PE80 pressure Blue	25	0.171	200	1200.25.200
1200	PE80 pressure Blue	25	0.171	25	1200.25.25
1200	PE80 pressure Blue	25	0.171	5	1200.25.5
1200	PE80 pressure Blue	25	0.171	50	1200.25.50
1200	PE80 pressure Blue	32	0.272	100	1200.32.100
1200	PE80 pressure Blue	32	0.272	200	1200.32.200
1200	PE80 pressure Blue	32	0.272	25	1200.32.25
1200	PE80 pressure Blue	32	0.272	5	1200.32.5
1200	PE80 pressure Blue	32	0.272	50	1200.32.50
1200	PE80 pressure Blue	40	0.433	100	1200.40.100
1200	PE80 pressure Blue	40	0.433	200	1200.40.200
1200	PE80 pressure Blue	40	0.433	25	1200.40.25
1200	PE80 pressure Blue	40	0.433	5	1200.40.5
1200	PE80 pressure Blue	40	0.433	50	1200.40.50
1200	PE80 pressure Blue	50	0.672	100	1200.50.100
1200	PE80 pressure Blue	50	0.672	25	1200.50.25
1200	PE80 pressure Blue	50	0.672	5	1200.50.5
1200	PE80 pressure Blue	50	0.672	50	1200.50.50
1200	PE80 pressure Blue	63	1.062	100	1200.63.100
1200	PE80 pressure Blue	63	1.062	200	1200.63.25
1200	PE80 pressure Blue	63	1.062	5	1200.63.5
1200	PE80 pressure Blue	63	1.062	50	1200.63.50
1210	PE100 Pressure Blue	125	3.403	100	1210.125.100
1210	PE100 Pressure Blue	125	3.403	12	1210.125.12
1210	PE100 Pressure Blue	125	4.122	100	1210.125.16.100
1210	PE100 Pressure Blue	125	4.122	12	1210.125.16.12
1210	PE100 Pressure Blue	125	4.122	50	1210.125.16.50

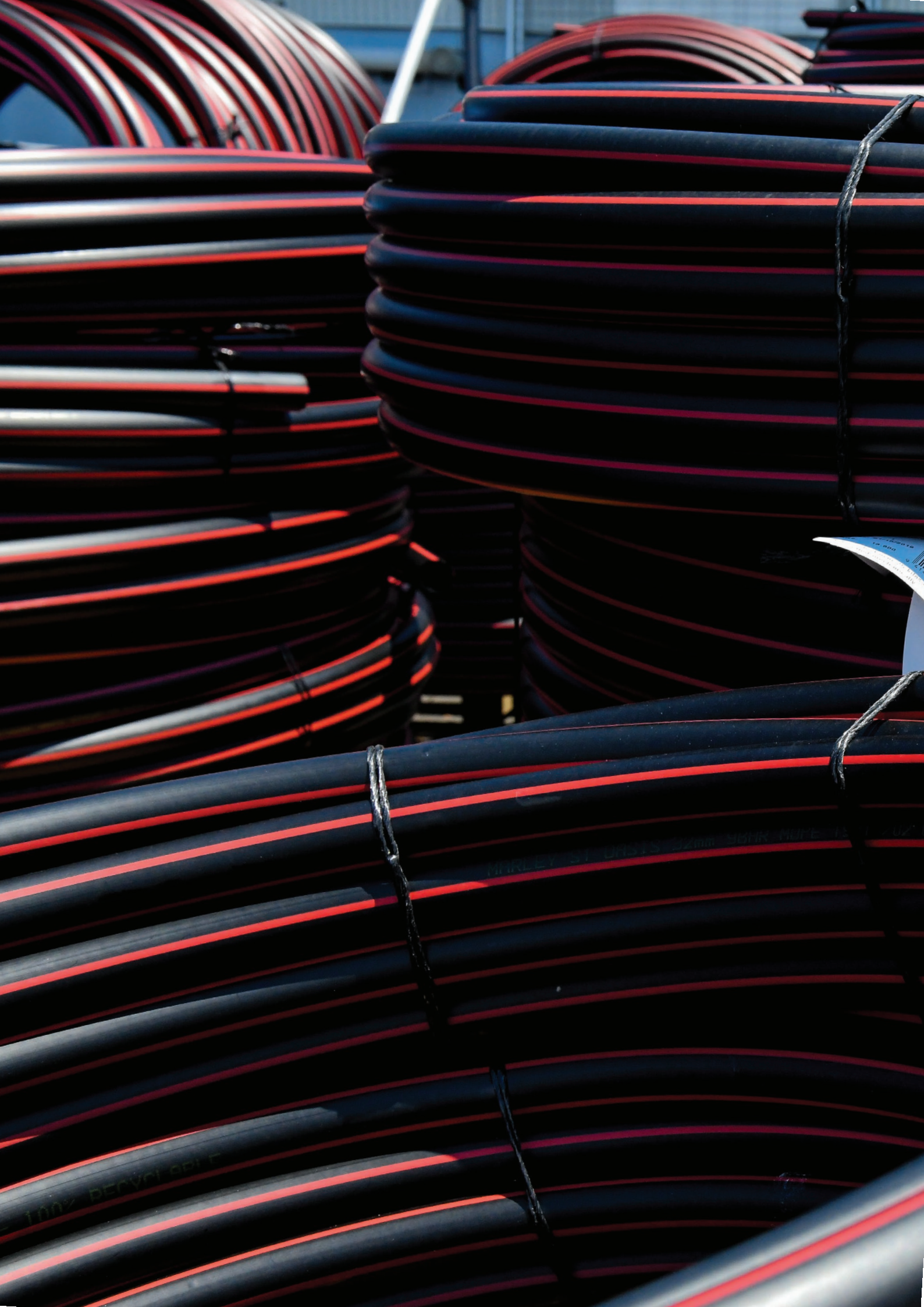
Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
1210	PE100 Pressure Blue	125	4.122	6	1210.125.16.6
1210	PE100 Pressure Blue	125	3.403	50	1210.125.50
1210	PE100 Pressure Blue	125	3.403	6	1210.125.6
1210	PE100 Pressure Blue	180	7.061	12	1210.180.12
1210	PE100 Pressure Blue	180	7.061	17	1210.180.12.17
1210	PE100 Pressure Blue	180	7.061	6	1210.180.12.6
1210	PE100 Pressure Blue	180	8.524	12	1210.180.16.12
1210	PE100 Pressure Blue	180	10.197	12	1210.180.20.12.STRIPE
1210	PE100 Pressure Blue	200	8.658	12	1210.200.12.12
1210	PE100 Pressure Blue	225	10.996	12	1210.225.12
1210	PE100 Pressure Blue	225	13.305	15	1210.225.16.15
1210	PE100 Pressure Blue	250	13.545	12	1210.250.12
1210	PE100 Pressure Blue	250	16.363	12	1210.250.16.12
1210	PE100 Pressure Blue	280	16.972	12	1210.280.12
1210	PE100 Pressure Blue	280	16.972	17	1210.280.12.17
1210	PE100 Pressure Blue	315	25.968	12	1210.315.16.12
1210	PE100 Pressure Blue	315	25.968	17	1210.315.16.17
1210	PE100 Pressure Blue	315	31.188	17	1210.315.20.17
1210	PE100 Pressure Blue	355	27.266	12	1210.355.12
1210	PE100 Pressure Blue	400	34.58	12	1210.400.12.12
1210	PE100 Pressure Blue	450	43.804	12	1210.450.12
1210	PE100 Pressure Blue	450	52.992	15	1210.450.16.15.WC
1210	PE100 Pressure Blue	450	52.992	18	1210.450.16.18.WC
1210	PE100 Pressure Blue	450	52.992	2	1210.450.16.2.WC
1210	PE100 Pressure Blue	500	54.048	17	1210.500.12.17
1210	PE100 Pressure Blue	90	1.76	100	1210.90.12.100
1210	PE100 Pressure Blue	90	1.76	50	1210.90.12.50
220	Effluent	110	2.162	100	220.110.100
220	Effluent	57	0.527	50	220.57.50.DRG
220	Effluent	63	0.715	100	220.63.100.DRG
220	Effluent	63	0.715	50	220.63.50.DRG
220	Effluent	75	1.009	100	220.75.100
220	Effluent	75	1.009	50	220.75.50
220	Effluent	90	1.453	100	220.90.100
220	Effluent	90	1.453	50	220.90.50
220	Effluent	90	1.453	6	220.90.6
300 9 bar	PE80 Pressure Black	25	0.122	1.5	300.25.9.1.5
300 9 bar	PE80 Pressure Black	25	0.122	100	300.25.9.100
300 9 bar	PE80 Pressure Black	25	0.122	200	300.25.9.200
300 9 bar	PE80 Pressure Black	25	0.122	50	300.25.9.50
300 6 bar	PE80 Pressure Black	32	0.16	1.5	300.32.6.1.5
300 6 bar	PE80 Pressure Black	32	0.16	100	300.32.6.100
300 6 bar	PE80 Pressure Black	32	0.16	200	300.32.6.200
300 6 bar	PE80 Pressure Black	32	0.16	50	300.32.6.50
300 9 bar	PE80 Pressure Black	32	0.186	1.5	300.32.9.1.5
300 9 bar	PE80 Pressure Black	32	0.186	100	300.32.9.100
300 9 bar	PE80 Pressure Black	32	0.186	200	300.32.9.200
300 9 bar	PE80 Pressure Black	32	0.186	50	300.32.9.50
300 6 bar	PE80 Pressure Black	40	0.236	1.5	300.40.6.1.5
300 6 bar	PE80 Pressure Black	40	0.236	100	300.40.6.100

Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
300 6 bar	PE80 Pressure Black	40	0.236	200	300.40.6.200
300 6 bar	PE80 Pressure Black	40	0.236	50	300.40.6.50
300 9 bar	PE80 Pressure Black	40	0.263	1.5	300.40.9.1.5
300 9 bar	PE80 Pressure Black	40	0.263	100	300.40.9.100
300 9 bar	PE80 Pressure Black	40	0.263	200	300.40.9.200
300 9 bar	PE80 Pressure Black	40	0.263	25	300.40.9.25
300 9 bar	PE80 Pressure Black	40	0.263	50	300.40.9.50
300 6 bar	PE80 Pressure Black	50	0.374	1.5	300.50.6.1.5
300 6 bar	PE80 Pressure Black	50	0.374	100	300.50.6.100
300 6 bar	PE80 Pressure Black	50	0.374	50	300.50.6.50
300 9 bar	PE80 Pressure Black	50	0.414	1.5	300.50.9.1.5
300 9 bar	PE80 Pressure Black	50	0.414	100	300.50.9.100
300 9 bar	PE80 Pressure Black	50	0.414	200	300.50.9.200
300 9 bar	PE80 Pressure Black	50	0.414	50	300.50.9.50
300 6 bar	PE80 Pressure Black	63	0.64	1.5	300.63.6.1.5
300 6 bar	PE80 Pressure Black	63	0.64	100	300.63.6.100
300 6 bar	PE80 Pressure Black	63	0.64	200	300.63.6.200
300 6 bar	PE80 Pressure Black	63	0.64	50	300.63.6.50
300 9 bar	PE80 Pressure Black	63	0.64	1.5	300.63.9.1.5
300 9 bar	PE80 Pressure Black	63	0.64	100	300.63.9.100
300 9 bar	PE80 Pressure Black	63	0.64	200	300.63.9.200
300 9 bar	PE80 Pressure Black	63	0.64	50	300.63.9.50
310	PE100 Pressure Black	110	2.183	100	310.110.10.100
310	PE100 Pressure Black	110	2.183	12	310.110.10.12
310	PE100 Pressure Black	110	3.177	100	310.110.16.100.CR.STR
310	PE100 Pressure Black	125	3.403	6	310.125.12.6
310	PE100 Pressure Black	125	4.122	100	310.125.16.100
310	PE100 Pressure Black	125	4.122	12	310.125.16.12
310	PE100 Pressure Black	160	5.563	12	310.160.12.12
310	PE100 Pressure Black	160	6.744	12	310.160.16.12
310	PE100 Pressure Black	180	5.772	12	310.180.10.12
310	PE100 Pressure Black	180	7.061	12	310.180.12.12
310	PE100 Pressure Black	180	8.524	12	310.180.16.12
310	PE100 Pressure Black	200	8.658	12	310.200.12.12
310	PE100 Pressure Black	200	10.511	12	310.200.16.12
310	PE100 Pressure Black	225	13.305	12	310.225.16.12
310	PE100 Pressure Black	225	13.305	12	310.225.16.12.CR.STR
310	PE100 Pressure Black	225	15.906	12	310.225.20.12
310	PE100 Pressure Black	250	13.545	12	310.250.12.12
310	PE100 Pressure Black	250	16.399	15	310.250.16.15
310	PE100 Pressure Black	250	16.399	15	310.250.16.15.WC
310	PE100 Pressure Black	250	16.399	18	310.250.16.18.WC
310	PE100 Pressure Black	250	16.399	2	310.250.16.2.WC
310	PE100 Pressure Black	280	19.672	17	310.280.12.17
310	PE100 Pressure Black	315	17.613	17	310.315.10.17.CREAM
310	PE100 Pressure Black	315	25.968	12	310.315.16.12
310	PE100 Pressure Black	315	25.968	15	310.315.16.15
310	PE100 Pressure Black	315	25.968	15	310.315.16.15.WC
310	PE100 Pressure Black	315	25.968	18	310.315.16.18.WC

Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
310	PE100 Pressure Black	315	25.968	2	310.315.16.2.WC
310	PE100 Pressure Black	315	25.968	3.25	310.315.16.3.25
310	PE100 Pressure Black	355	22.413	12	310.355.10.12
310	PE100 Pressure Black	355	27.266	12	310.355.12.12
310	PE100 Pressure Black	40	0.431	100	310.40.16.100.CR.STR
310	PE100 Pressure Black	40	0.431	50	310.40.16.50.CR.STR
310	PE100 Pressure Black	400	28.327	12	310.400.10.12
310	PE100 Pressure Black	400	34.58	12	310.400.12.12
310	PE100 Pressure Black	400	41.846	3.25	310.400.16.3.25
310	PE100 Pressure Black	450	43.804	6	310.450.12.6
310	PE100 Pressure Black	450	52.992	12	310.450.16.12
310	PE100 Pressure Black	450	52.992	15	310.450.16.15
310	PE100 Pressure Black	50	0.669	100	310.50.16.100.CR.STR
310	PE100 Pressure Black	50	0.669	50	310.50.16.50.CR.STR
310	PE100 Pressure Black	500	44.212	15	310.500.10.15
310	PE100 Pressure Black	500	44.212	6	310.500.10.6
310	PE100 Pressure Black	500	54.048	12	310.500.12.12
310	PE100 Pressure Black	560	67.803	12	310.560.12.12
310	PE100 Pressure Black	560	45.242	12	310.560.8.12
310	PE100 Pressure Black	63	1.059	100	310.63.16.100.CR.STR
310	PE100 Pressure Black	75	1.478	100	310.75.16.100.CR.STR
310	PE100 Pressure Black	90	2.143	100	310.90.16.100.CR.STR
310	PE100 Pressure Black	90	2.143	6	310.90.16.6.CR.STR
900	PE80Pressure Black Rural	15	0.09	1.5	900.15.1.5
900	PE80Pressure Black Rural	15	0.09	100	900.15.100
900	PE80Pressure Black Rural	15	0.09	25	900.15.25
900	PE80Pressure Black Rural	15	0.09	50	900.15.50
900	PE80Pressure Black Rural	20	0.138	1.5	900.20.1.5
900	PE80Pressure Black Rural	20	0.138	100	900.20.100
900	PE80Pressure Black Rural	20	0.138	25	900.20.25
900	PE80Pressure Black Rural	20	0.138	50	900.20.50
900	PE80Pressure Black Rural	25	0.215	1.5	900.25.1.5
900	PE80Pressure Black Rural	25	0.215	100	900.25.100
900	PE80Pressure Black Rural	25	0.215	25	900.25.25
900	PE80Pressure Black Rural	25	0.215	50	900.25.50
900	PE80Pressure Black Rural	32	0.256	25	900.32.25
900	PE80Pressure Black Rural	32	0.256	50	900.32.50
900	PE80Pressure Black Rural	40	0.313	25	900.40.25
900	PE80Pressure Black Rural	40	0.313	50	900.40.50
900	PE80Pressure Black Rural	50	0.53	100	900.50.100
900	PE80Pressure Black Rural	50	0.53	25	900.50.25
900	PE80Pressure Black Rural	50	0.53	50	900.50.50
950	PE80Pressure Black Rural	15	0.09	1.5	950.15.1.5
950	PE80Pressure Black Rural	15	0.09	100	950.15.100
950	PE80Pressure Black Rural	15	0.09	200	950.15.200
950	PE80Pressure Black Rural	15	0.09	25	950.15.25
950	PE80Pressure Black Rural	15	0.09	50	950.15.50
950	PE80Pressure Black Rural	20	0.138	1.5	950.20.1.5
950	PE80Pressure Black Rural	20	0.138	100	950.20.100

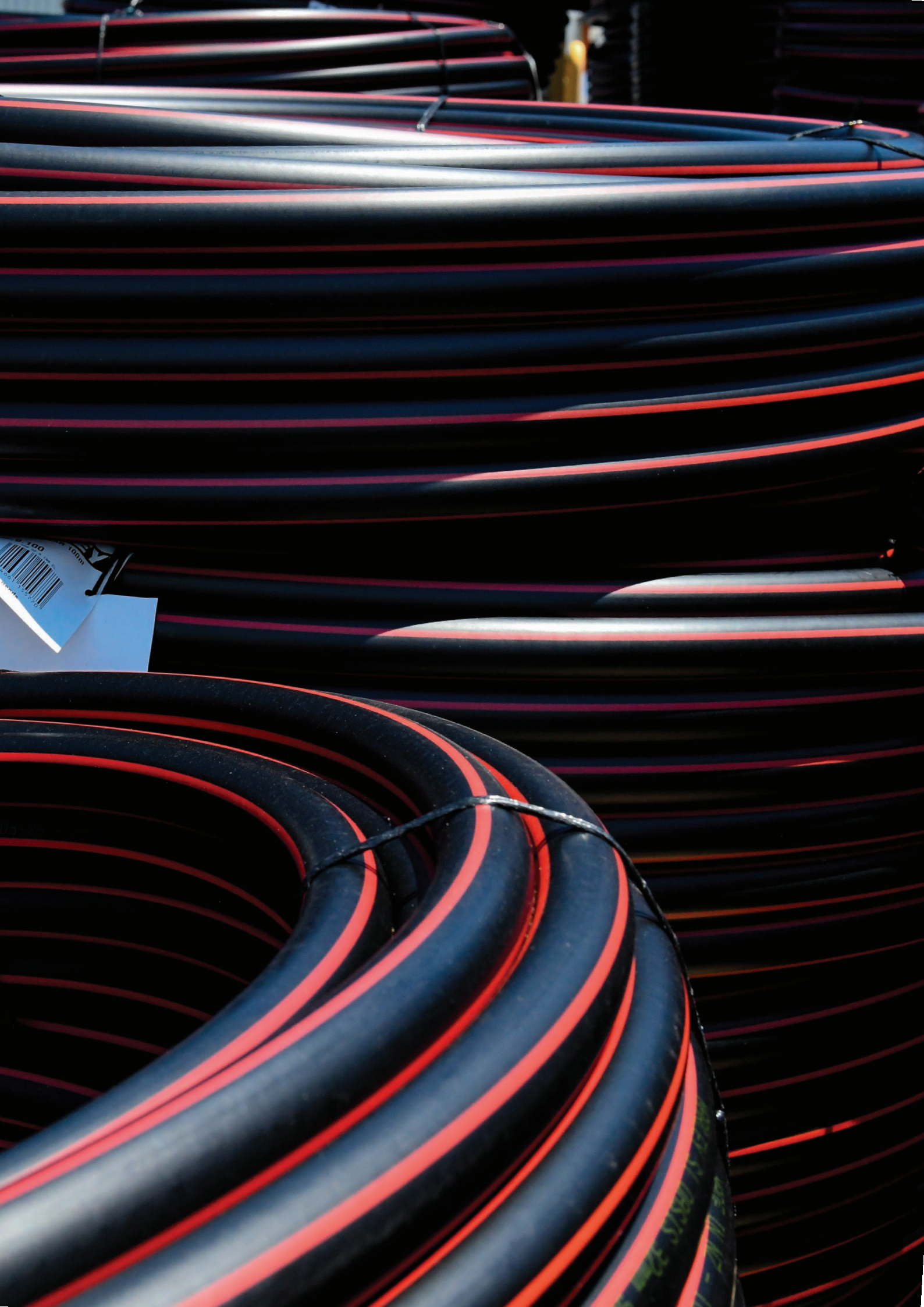
Series	Application	DN Nominal Size (mm)	Density (kg/m)	Length (m)	Product Code
950	PE80Pressure Black Rural	20	0.138	200	950.20.200
950	PE80Pressure Black Rural	20	0.138	25	950.20.25
950	PE80Pressure Black Rural	20	0.138	50	950.20.50
950	PE80Pressure Black Rural	25	0.215	1.5	950.25.1.5
950	PE80Pressure Black Rural	25	0.215	100	950.25.100
950	PE80Pressure Black Rural	25	0.215	200	950.25.200
950	PE80Pressure Black Rural	25	0.215	25	950.25.25
950	PE80Pressure Black Rural	25	0.215	50	950.25.50
950	PE80Pressure Black Rural	32	0.256	1.5	950.32.1.5
950	PE80Pressure Black Rural	32	0.256	100	950.32.100
950	PE80Pressure Black Rural	32	0.256	200	950.32.200
950	PE80Pressure Black Rural	32	0.256	25	950.32.25
950	PE80Pressure Black Rural	32	0.256	50	950.32.50
950	PE80Pressure Black Rural	40	0.313	1.5	950.40.1.5
950	PE80Pressure Black Rural	40	0.313	100	950.40.100
950	PE80Pressure Black Rural	40	0.313	200	950.40.200
950	PE80Pressure Black Rural	40	0.313	25	950.40.25
950	PE80Pressure Black Rural	40	0.313	50	950.40.50
950	PE80Pressure Black Rural	50	0.53	1.5	950.50.1.5
950	PE80Pressure Black Rural	50	0.53	100	950.50.100
950	PE80Pressure Black Rural	50	0.53	200	950.50.200
950	PE80Pressure Black Rural	50	0.53	25	950.50.25
950	PE80Pressure Black Rural	50	0.53	50	950.50.50





MARKET ST. 0.015S 32mm 384R 400V 100% 100%

100% PERCY 0.01 F



Sustainable Manufacturing

Marley is committed to creating environmentally sustainable processes and products and was the first plastics manufacturer in New Zealand to achieve ISO14001 registration. We are also Best Environmental Practice certified for our entire range of manufactured uPVC systems. This means we get our raw materials from sustainable and responsible sources, continuously work on our manufacturing processes to reduce our environmental footprint and accept our products back at the end of their useful life for recycling.

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