ECO-Duct; cable protection tube; 50x4,6

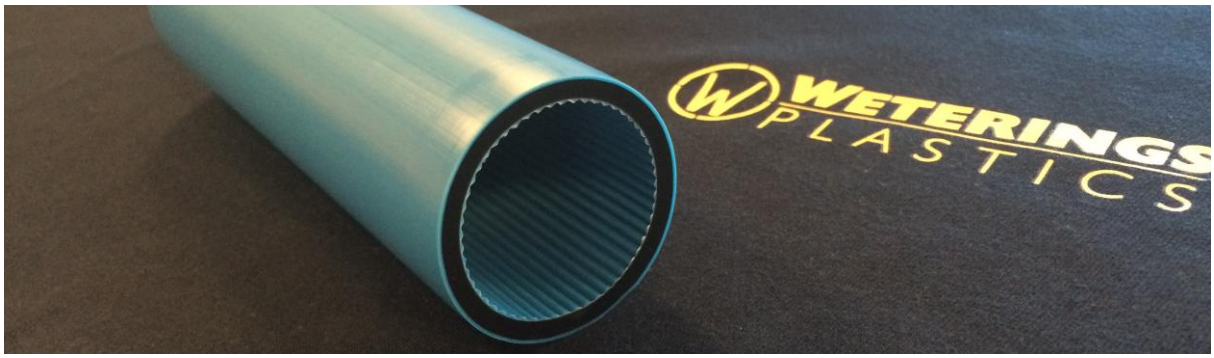
The requirements included in this specification are used by Weterings Plastics 's-Gravenzande in the production and supply of HDPE (three layers) cable protection pipes.

The products are used underground for the protection of telecommunication cable.

If desired, micro cable protection tubes can be prefabricated in different combinations either by preinstalling them into a bigger protection tube or by sheathing them into a multiduct. For detailed information, please refer to: HDPE prefab cable protection or Multiduct.

This product is manufactured in part by making use of recycled material. This allows the CO2 footprint of 40x3.7mm cable protective tube is reduced to 270 grams per meter. * This product is considered to meet the 'Direct Buried' requirements and can be used underground. Direct Buried is not a standardized qualification, thus no rights can be derived from this ruling.

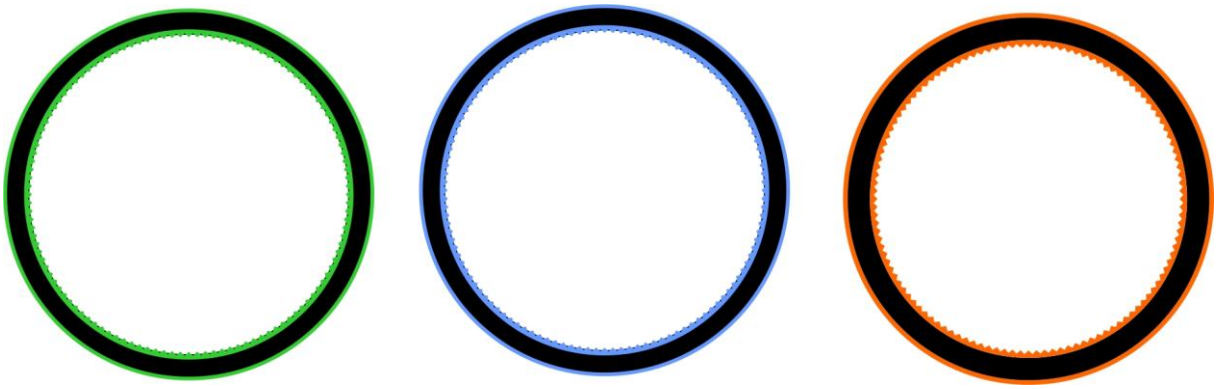
This product is supposed to be suited for 'Direct Buried' application and can as such be used underground. Direct Buried is a un normed qualification, therefore no legal rights can be claimed with regard to this statement.



Colour
Outer and inner layer equally coloured, According to client specification, middle layer black. Protection tube can be stored outside without any further protection if they are used within six months. The colour could fade however. If a longer storage time is expected, the products should be kept out of direct sun light.

Dimensions and appearance
Smooth, sound, clean and uniformly coloured on the outside and inside, as well as free of blisters, scratches, cavities, holes, impurities and other defects. Internally a longitudinal groove profile (so-called longitudinal grooves) are added to reduce the friction between Cable and Duct.

Specificatie



Outer Diameter		Wall thickness		Inner Diameter	Ovality (max)
min	max	min	max		
50.1	50.4	4.5	4.9	40.5	3.0

Packaging
Drums. Packaging units are equipped with a sticker or label that will at least show the specified material, tube size and length.

flange height	core diameter	width	capacity
Ø 180 cm	Ø 90 cm	108 cm	550 m

Printing
According to client specification with a minimum of the production code (ID/tracing) and length at one meter spacing.

Material
High Density Polyethylene with additives for improving production and application like pigment, UV Stabilizer and antioxidant.

Indoor quality tube (LFH) could have deviating properties for yield stress, elongation at break and hardness.

Property	Value	Unit
Density	≥ 940	kg/m³
MFI (5 kg – 190 °C)	0.35 - 1.10	g/10min
Yield stress	> 15*	N/mm²
elongation at break	> 350*	%
hardness	> 60*	Shore D
vicat softening point	126 - 132	°C
brittleness	< -100	°C

Technical Properties
Duct tubes are designed to have an operational lifetime of at least 50 years under normal operating conditions.

Installation guidelines
Those working with duct tubes made by H. Weterings Plastics B.V. should be familiar with the installation process of this type of product. Applicable national and/or local precautions should always be observed. Make sure the duct tube is suited for its intended purpose prior to installation. Conduct a visual inspection to check for flaws. Safeguard the duct tubes against damage, defects, or permanent deformations during installation.

- maximum depth 1 metre below the highest expected ground water level
- minimum bending radius of 45 cm
- maximum tractive force of 4.8kN
- maximum working pressure of 16 bar
- Environmental temperature between -10 °C and +40 °C during installation, -50 °C and +50 °C during use and storage

Pressure resistance
To ensure a possible operating pressure of 16 bar, tubes have to withstand a 20 bar water pressure at a temperature of 20 °C for four hours. This test is performed according to NEN-EN 921 and ISO 1167. Tubes can withstand an air pressure of 5 bar for a one hour period without permanent damage or distortion as a result.

Resistance to deformation
To be able to guarantee the protective character under normal operating conditions, tubes have to withstand a strength of 36.6 Nm at a temperature of 20 ° C. The test is carried out according to NEN-EN 744. For this purpose tube samples of at least 24 hours of age, with a length of 20 cm are placed on the drop ball impact test device. In the sample a copper gas / water pipe with a diameter Ø 15 mm is placed. The ram weighs 3.05 kg and has a chisel point with a knife-edge of 3 mm at a right angle to the tube. After each fall of 1.2 meters, the tube should not contain any visible cracks or fractures and the copper tube must not be deformed.

Blow-in properties
Out of our many years of experience follows that tubes made by Weterings Plastics have an excellent blow-in performance. The blow in characteristics are tested regularly by blowing in Ø 12mm tubes over a test distance of 1000 metres regularly . The properties that enable this are strictly monitored amongst others with the use of a continuous friction measure with a slide pen. This guarantees a reproducible blow-in performance as well as a calibrated inner diameter.

Chemical resistance
HDPE is not resistant to aromatic and chlorinated hydrocarbons or solvents.
In particular, contact with the following substances should be avoided: benzene, benzole, bromine, chlorine, chloroform, dichloroethylene, ether, fluorine, aqua regia, oleum, ozone, propane, nitric acid, tetrachloroethylene, trichloroethylene, vaseline, sulphuric acid, soap and soapy solutions.

Indoor (LFH)
This product is not available for indoor usage (Low Fire Hazard).

Storage
Both full and empty wooden drums need to be stored on a dry surface for the protection of the wood. HDPE ducts are preferably protected from direct (sun) light, for example by using a UV-proof foil.
For unprotected storage the maximum exposure to light is 6 months. Temperatures during storage and use are to be within a -50°C and +40°C range, please prevent rapid temperature changes.

Quality assurance
Product quality is monitored throughout the production process. Our machine operators and process computers conduct both visual and metrological checks after the start up release. Our Quality management team inspects these quality checks at random and also test materials. To this end they take raw material and product samples out of production and analyse and test these, respectively.
This is done according to standards and guidelines set by (inter)national organisations and Weterings Plastics. The frequency and performance of the tests and trials are described in internal quality documents.

Standards and Guidelines:
BRL K555-01 Kiwa beoordelingsrichtlijn - beschermbuizen van PE bestemd voor kabels t.b.v. telecommunicatie
DIN 16874:2012-07 Rohre aus Polyethylen hoher Dichte (PE-HD) für die erdverlegte Telekommunikation
ISO 1133 Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics
ISO 1167-1 Thermoplastics pipes, fittings and assemblies for the conveyance of fluids – determination of the resistance to internal pressure – part 1: general method
ISO 1167-2 Thermoplastics pipes, fittings and assemblies for the conveyance of fluids – determination of the resistance to internal pressure – part 2: preparation of pipe test pieces
ISO 3126 Plastics piping systems – plastics components - determination of dimensions
NEN-EN 12201-2 Plastics piping systems for water supply – polyethylene (PE) – part 2: pipes
NEN-EN 921 Plastics piping systems – thermoplastics pipes – determination of resistance to internal pressure at constant temperature
UL 94 Tests for flammability of plastic materials for parts in devices and appliances
NEN-EN-ISO 9001 Kwaliteitsmanagementsystemen - eisen

- Interne kwaliteitsdocumenten Weterings Plastics