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**Agrément Certificate**  
**89/2175**  
**Product Sheet 1**

**RIDGIDUCT DUCTING SYSTEM**

**RIDGIDUCT TWIN-WALLED HIGH DENSITY POLYETHYLENE DUCTING**

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Ridgiduct Twin-Walled High Density Polyethylene Ducting, for use as underground utility ducting for electricity, gas and water supply services, and for street lighting cables and fibre optic cabling for telecommunications.

(1) Hereinafter referred to as 'Certificate'.

**CERTIFICATION INCLUDES:**

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



**KEY FACTORS ASSESSED**

**Strength** — the product has adequate strength to resist the loads likely to be encountered during service (see section 6).

**Performance of joints** — the joints in the product have an adequate degree of resistance to solid foreign objects and the ingress of water (see section 7).

**Resistance to elevated temperatures** — the product has adequate resistance to long-term deformation at elevated temperatures (see section 8).

**Resistance to chemicals** — the product has an adequate resistance to attack from chemicals likely to occur in soils and groundwater (see section 9).

**Durability** — when used in the context of this Certificate, the product will have adequate durability (see section 11).

The BBA has awarded this Certificate to the company named above for the product described herein. The product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Brian Chamberlain  
Head of Technical Excellence

Claire Curtis-Thomas  
Chief Executive

**Date of First issue: 9 June 2016**

Originally certificated on 28 February 1989

Certificate amended on 10 August 2016 to update technical details.

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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# Regulations

In the opinion of the BBA, the use of Ridgiduct Twin-Walled High Density Polyethylene Ducting is not subject to the national Building Regulations.

## Construction (Design and Management) Regulations 2015

## Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 Delivery and site handling (3.2) of this Certificate.

# Technical Specification

## 1 Description

1.1 Ridgiduct Twin-Walled High Density Polyethylene Ducting comprises twin-walled high-density polyethylene (HDPE) ducting and polypropylene (PP) couplers.

1.2 The outer wall of the duct is corrugated and the inner wall is smooth-finished. Details and dimensions are given in Table 1 and Figure 1 of this Certificate.

Figure 1 Ridgiduct pipe

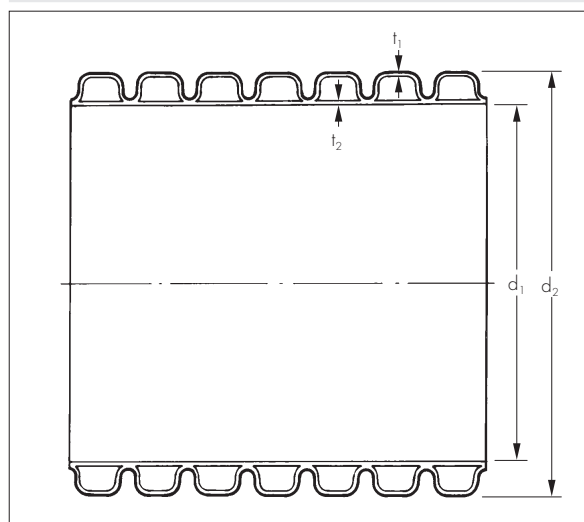


Table 1 Pipe dimensions

Manufacturer's code number	Internal diameter ( $d_1$ ) (mm)	External diameter ( $d_2$ ) (mm)	Thickness ( $t_1$ ) (mm)	Thickness ( $t_2$ ) (mm)	Length ( $l$ ) (m)
RB 94	94	110	0.70	0.60	1, 2, 3 and 6
RB 100	100	118	1.00	0.80	1, 2, 3 and 6
RB 125	125	148	1.00	0.90	1, 2, 3 and 6
RB 150	150	177	0.90	0.95	1, 2, 3 and 6

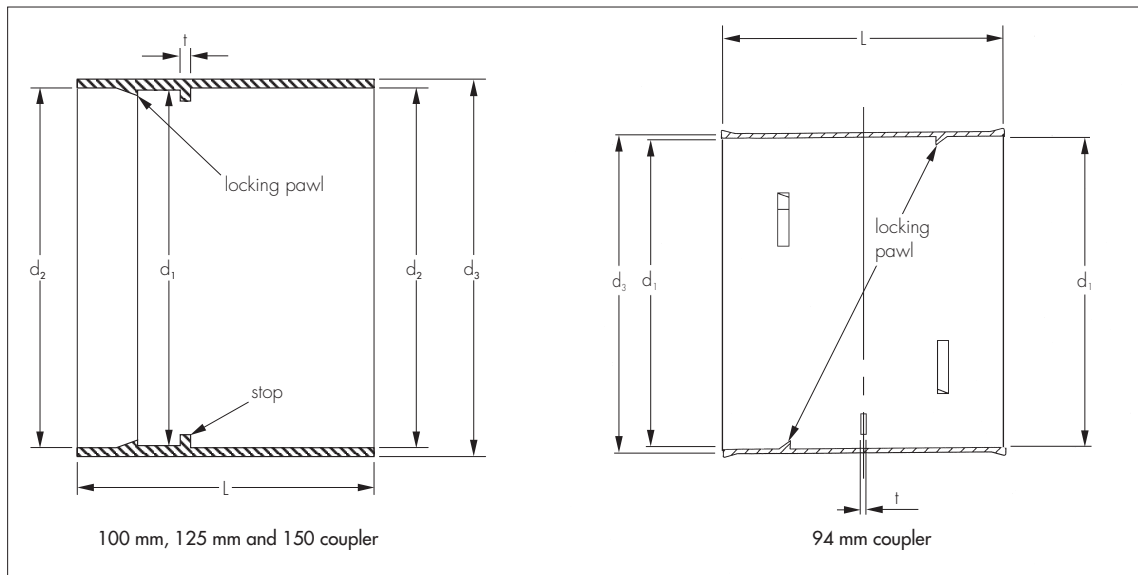
1.3 The ducts are available in black, purple, orange, green, blue, grey and yellow.

1.4 The couplers, which join the ducts, are supplied in black only. Details of coupler sizes are given in Table 2 and Figure 2. An optional sealed coupling is available from the Certificate holder.

Table 2 Coupler dimensions

Coupler (mm)	Internal diameter ( $d_1$ ) (mm)	Internal diameter ( $d_2$ ) tapered end (mm)	External diameter ( $d_3$ ) (mm)	Length ( $l$ ) (mm)	Thickness ( $t$ ) (mm)
94	111.6	111.25	114.5	100.00	2.0
100	117.5	119.40	125.0	97.25	2.5
125	147.5	148.25	155.0	101.60	2.5
150	177.0	178.50	185.0	123.00	2.5

Figure 2 Couplers



## 2 Manufacture

2.1 The ducts are manufactured from HDPE by a twin-extrusion process. Two tubes are extruded simultaneously, one inside the other and heat-welded together in one continuous process.

2.2 The couplers are manufactured from PP using a conventional injection-moulding technique.

2.3 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.4 The management system of Polypipe Civils has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate Q06225).

## 3 Delivery and site handling

3.1 The ducts are delivered to site strapped to pallets.

3.2 When used for electric cables, the ducts are marked with the legend 'electric cable duct'. The ducts are appropriately marked, in accordance with the customer's requirements.

3.3 The HDPE ducts and PP couplers have good resistance to UV degradation, but to avoid damage or deterioration in storage it is recommended that the ducts and couplers are protected from direct sunlight. If direct sunlight exposure is unavoidable, the following points should be considered:

- up to three months' daily exposure to direct sunlight will cause negligible UV degradation, but extreme surface temperatures of up to 80°C are possible on exposed surfaces and may cause some localised distortion
- three to 12 months' daily exposure to direct sunlight may have a significant effect on the impact resistance and physical properties of the duct
- over 12 months' daily exposure to direct sunlight will damage the ducts and couplers and must be avoided.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Ridgiduct Twin-Walled High Density Polyethylene Ducting.

## Design Considerations

### 4 General

4.1 Ridgiduct Twin-Walled High Density Polyethylene Ducting, when installed in accordance with the recommendations given in this Certificate, is satisfactory for use as underground utility ducting for electricity, gas and water supply services, and for street lighting cables and fibre optic cabling for cable television and telecommunications.

4.2 The product has a smooth internal surface and a static coefficient of less than 0.22. The ducts and their joints do not present any internal projection or impedance to the installation or withdrawal of cables through the duct run.

4.3 When used with the optional sealed coupling and an elastomeric seal, Ridgiduct RB 94, RB 100 and RB 150 are suitable for applications as a sealed system with a rating of IP67 as given in BS EN 60529 : 1992.

## 5 Practicability of installation

The product is designed to be installed by utility contractors experienced with this type of product.

## 6 Strength

6.1 The product has adequate strength to resist the loads likely to be encountered during service, when used and installed in accordance with the recommendations given in this Certificate.

6.2 The product will have adequate resistance to the impact loads normally encountered during handling and installation. The product meets the resistance to impact requirements defined as 'normal duty' and the resistance to compression requirements defined as 'type 450' of BS EN 61386-24 : 2010.

6.3 The product has adequate resistance to long-term deformation. When tested in accordance with BS 4962 : 1989, the product has an ultimate pipe stiffness (STES) value in excess of 1400 N·m<sup>-2</sup>.

## 7 Performance of joints

Joining of the ducts with the couplers produces a system with protection against penetration by solid foreign objects of 2.5 mm diameter or greater, ie an IP rating of 3 (first characteristic numeral) to BS EN 60529 : 1992 (see also section 4.3 of this Certificate).

## 8 Resistance to elevated temperatures

8.1 The maximum temperature which the ducts and couplers will be subject to in service as an electrical cable duct is dependent on the ground thermal conductivity, depth of burial, ground temperature and the heat load imposed by the electrical cable.

8.2 In general, cables with a surface temperature of up to 60°C will not affect the integrity of the product. For example, in a typical installation with a 300 mm<sup>2</sup> copper cable carrying a current of 600 amps imposing a heat load of 25 W·m<sup>-1</sup>, the cable would have a surface temperature of 60°C; this would result in a mean internal duct temperature of 45°C.

8.3 The product has adequate resistance to long-term deformation at an elevated temperature of 45°C.

## 9 Resistance to chemicals

The HDPE used to manufacture the duct and the PP used to manufacture couplers have an adequate resistance to attack from chemicals likely to occur in soils and groundwater. Details of the chemical resistance of HDPE and PP are given in D64/14117 DC.

## 10 Maintenance

As the product is buried and has suitable durability (see section 11), maintenance is not required.

## 11 Durability

When used in the context of this Certificate, the product will have adequate durability.

## 12 Reuse and recyclability

The components of the ducting system are manufactured from polyethylene and polypropylene, which can be recycled.

# Installation

## 13 General

13.1 Ridgiduct Twin-Walled High Density Polyethylene Ducting must be installed as for the equivalent size of PVC-U pipes to ENV 1401-3 : 2001.

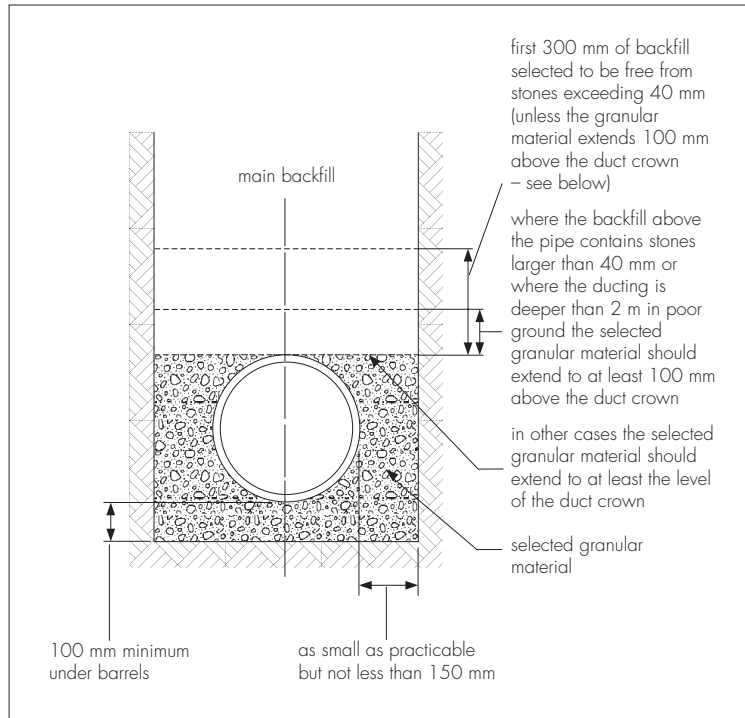
13.2 The duct must be adequately protected against damage from site construction traffic and from agricultural or similar operations.

## 14 Procedure

14.1 The trench is excavated to a depth of 100 mm below the invert level of the ducting, where a bedding of granular material is laid to a minimum depth of 100 mm.

14.2 After the duct has been laid, selected granular material should be placed evenly on both sides of duct up to the level of the duct crown. The backfill should be compacted in 300 mm layers (see Figure 4). Heavy compactors should not be used until the ducts have at least 300 mm cover. To aid compaction, suitable light vibration tampers may be used with discretion at any stage of the work.

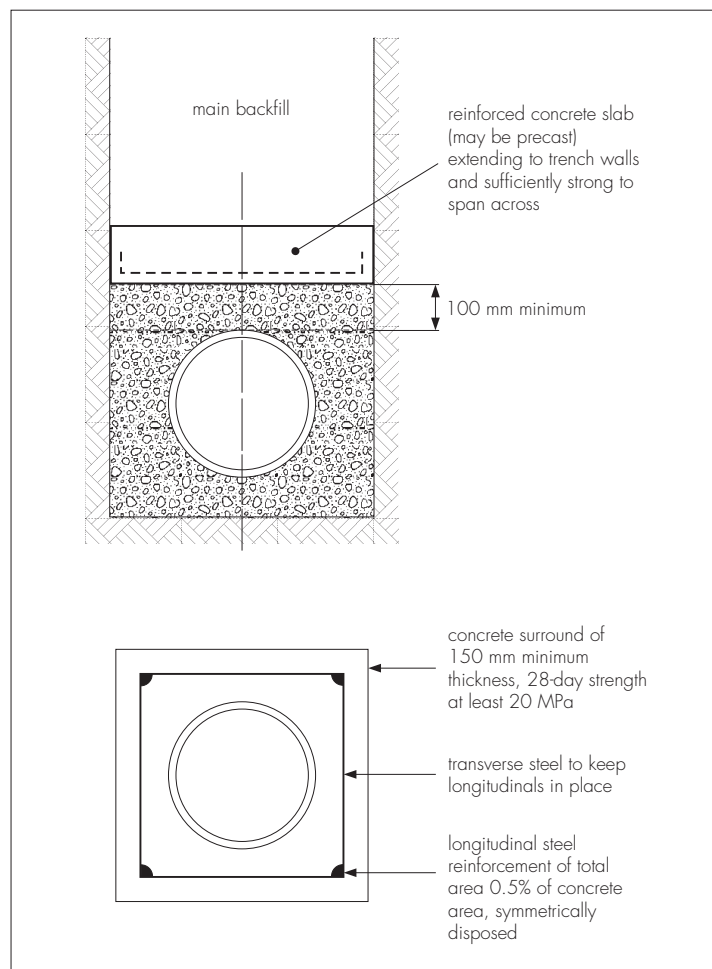
Figure 4 Bedding details for ducting in a narrow trench



14.3 When laid at depths of less than 0.6 m, the duct should be protected against risk of damage where necessary. This can be achieved by placing a layer of granular material not less than 75 mm, covered by a concrete paving slab.

14.4 When laid at depths of less than 0.9 m below a finished road surface, the duct should be suitably protected where necessary (an example is shown in Figure 5).

Figure 5 Bedding details for ducting laid at a depth less than 0.9 m below a finished road surface



14.5 Joints in the ducting are made by a simple push-fit of one duct length into the coupler attached to the adjacent length, ensuring that the connection is fully made.

14.6 Inspection joints can be made in the conventional manner, depending on the type of services to be installed.

## Technical Investigations

### 15 Tests

Tests were carried out to determine:

- dimensional accuracy
- resistance to compression
- impact strength at  $-5^{\circ}\text{C}$
- Vicat softening temperature
- static friction coefficient
- visual examination
- adhesion of printing
- resistance to long-term deformation
- ease of jointing
- resistance to penetration of simulated sharp aggregate
- resistance to sharp objects
- watertightness of joints
- degree of protection against foreign objects
- creep ratio
- degrees of protection by enclosure.

### 16 Investigations

16.1 An examination was made of data relating to:

- chemical resistance
- heat dissipation
- effect of temperature
- practicability of installation
- material properties
- durability.

16.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

## Bibliography

BS 4962 : 1989 *Specification for plastics pipes and fittings for use as subsoil field drains*

ENV 1401-3 : 2001 *Plastic piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinylchloride) (PVC-U) — Guidance for installation*

BS EN 60529 : 1992 + A2 :2013 *Degrees of protection provided by enclosures (IP code)*

BS EN 61386-24 : 2010 *Conduit systems for cable management — Particular requirements — Conduit systems buried underground*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

D64/14117 DC : *Pipework systems, Pipes, Pipe fittings, Thermoplastic polymers, Plastics, Polymers, Installation, Bending, Underground, Soils, Soil compaction tests, Chemical-resistance tests, Polyvinyl chloride, Unplasticized polyvinyl chloride, Polyethylene, Particle size distribution, Acrylonitrile butadiene styrene, Polyamides, Polypropylene, Pipe laying*

## 17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

17.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

17.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.