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Agrément Certificate  
**10/H163**  
Product Sheet 1

**EMTELLE PVC-U DUCTING**

**EMTELLE 'ITS' RINGSEAL DUCTS**

This Certificate is issued under the Highway Authorities' Products Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government; the Department for Regional Development, Northern Ireland); the Association of Directors of Environment, Economy, Planning and Transport (ADEPT); the Local Government Technical Advisers' Group and industry bodies. HAPAS Agrément Certificates are normally each subject to a review every five years.

**PRODUCT SCOPE AND SUMMARY OF CERTIFICATE**

This Certificate relates to Emtelle 'ITS' Ringseal Ducts, PVC-U piping for use as underground ducting in areas subject to the requirements of the MCHW, for electrical, gas and water supply services, and cabling for street lighting, telecommunications, television and other applications.

**AGRÉMENT CERTIFICATION INCLUDES:**

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five-yearly review.



**KEY FACTORS ASSESSED**

**Strength** — the ducts have adequate strength to resist the loads likely to be encountered during installation and service (see section 5).

**Tightness of joints** — the joints in the ducts will have an adequate degree of resistance to solid foreign objects and the ingress of water (see section 6).

**Resistance to elevated temperatures** — the ducts have adequate resistance to long-term deformation at elevated temperatures (see section 7).

**Resistance to chemicals** — the ducts have adequate resistance to the types and levels of chemicals likely to be found in soils in highway applications (see section 8).

**Durability** — the ducts will have adequate durability when installed and used in accordance with this Certificate (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This 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 Approvals — Engineering

Greg Cooper  
Chief Executive

Date of First issue: 19 August 2010

*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.*

# HAPAS Requirements

## Requirements

The requirements for ducting are contained in the Manual of Contract Documents for Highway Works (MCHW)<sup>(1)</sup>, Volumes 1 and 2, including any amendments.

Further requirements are contained in Volume 3, including any amendments.

Additional site requirements may be included in particular contracts.

(1) The MCHW is operated by the Overseeing Organisations: The Highways Agency (HA), Transport Scotland, the Welsh Assembly Government and the Department for Regional Development (Northern Ireland).

## Regulations

### Construction (Design and Management) Regulations 2007

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

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

See sections: 2 *Delivery and site handling* (2.3) and 11 *General (Installation)* of this Certificate.

## General

This Certificate relates to Emtelle 'ITS'<sup>(1)</sup> Ringseal Ducts, PVC-U pipes for use as underground ducting for services and cabling in highway applications. The product has been evaluated for this purpose only.

Installations incorporating the product must be designed and constructed in accordance with the requirements of the Highways Agency (HA) acting on behalf of the Department for Transport, the Scottish Executive, the Welsh Assembly Government and the Department for Regional Development, Northern Ireland, and the conditions set out in the *Design Considerations* and *Installation* parts of this Certificate.

(1) Intelligent transport system.

## Technical Specification

### 1 Description

1.1 Emtelle 'ITS' Ringseal Ducts are 6 m lengths of 110 mm outside diameter PVC-U piping (wall thickness 3.2 mm to 3.8 mm), which are joined together to form continuous ducting for the sub-ground conveyance and protection of water, gas and electricity supply services, and cabling for applications such as telecommunications, television, electronic signage and street lighting. The ducts are available in black, blue, green, grey, orange, purple, red, or white.

1.2 The ducts are manufactured to conform to the performance requirements of BS EN 50086-2.4 : 1994 (450 N) from PVC-U resin grades K66 to K68 with other additives necessary for the required properties of the finished product. The Certificate holder has a recycling facility and, in agreement with customers, can manufacture ducts from surplus reground material from the original manufacturing run (using virgin material). Ducts produced in this way are fully compliant with the test requirements for non-recycled products described in BS EN 50086-2.4 : 1994.

1.3 Joints between sections of ducting are made by integral push-fit spigot ends and sockets incorporating Forsheda F-582 110 mm watertight ringseals.

1.4 Quality control on the product includes impact, heat, chemical and compression resistance tests, dimensional checks and visual inspections. Finished ducts are individually printed or labelled according to customer requirements and to allow traceability in accordance with the Certificate holder's quality management system to BS EN ISO 9000 : 2005.

1.5 Various bends and other fittings associated with the ducts are available but are outside the scope of this Certificate.

### 2 Delivery and site handling

2.1 The products are delivered palletised on non-returnable wooden U-frames of appropriate sizes based on pack size and quantity. The ducts are secured into the frames using polyester strapping. All packaging is recyclable.

2.2 Each pallet bears a printed waterproof label containing details of:

- product barcode
- order number reference
- item code
- short product description
- number of duct lengths per frame
- total duct metreage per frame
- date.

2.3 Duct frames should be unloaded using a forklift with adequate lifting capacity and observing all necessary health and safety precautions, in line with good site practice.

2.4 Unloaded frames are designed to be stored on even, stable ground and should not be stacked more than two units high.

2.5 Direct contact between the ducts and sharp projections or abrasive surfaces should be avoided. Care should be taken to prevent damage to individual units by, for example, dropping or crushing.

2.6 Unpackaged units should be stored flat and away from the possibility of damage by, for example, site traffic. Measures should be taken to minimise possible contact with undiluted chemical elements.

2.7 The PVC-U pipes have good resistance to UV degradation but, to avoid damage or deterioration in storage, it is recommended that the ducts be protected from direct sunlight.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Emtelle 'ITS' Ringsal Ducts.

### Design Considerations

#### 3 Use

Emtelle 'ITS' Ringsal Ducts, when installed in accordance with the provisions of this Certificate and the MCHW, Volumes 1 and 2, are suitable for use in highways as underground ducting for electricity, gas and water supply services, and for cabling for such uses as street lighting, telecommunications, television and electronic signage.

#### 4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

#### 5 Strength

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

5.2 The ducts satisfy the requirements for structural wall thermoplastic pipes listed in the MCHW, Volume 1, Table 5/2 *Pipes for Ducts*.

5.3 The ducts will have adequate resistance to the impact loads normally encountered during handling and installation.

5.4 When tested in accordance with BS EN 743 : 1995, the ducts have adequate resistance to long-term deformation.

5.5 The ducts meet the impact and resistance to compression requirements defined in BS EN 50086-2.4 : 1994.

#### 6 Tightness of joints

Joints made in accordance with the Certificate holder's installation instructions and this Certificate will resist solid foreign objects and the ingress of water and will adequately protect services and cabling.

#### 7 Resistance to elevated temperatures

7.1 The maximum temperature to which the product will be subject in service when used as an electrical cable duct is dependent on the ground thermal conductivity, ground temperature and any heat imposed by the electrical cable.

7.2 In general, cables with a surface temperature of up to 60°C will not affect the integrity of the ducts. 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.

7.3 The ducts have adequate resistance to long-term deformation at an elevated temperature of 45°C.

#### 8 Resistance to chemicals

The PVC-U used in the manufacture has adequate resistance to attack from the quantities and types of chemicals typically found in soils and groundwater in civil engineering applications.

#### 9 Maintenance

As the ducts are buried underground and have adequate durability, maintenance is not required. However, damage (eg accidental during subsequent excavations) should be repaired immediately to maintain the integrity of the ducts and ensure continued protection to the services and cables therein.

#### 10 Durability

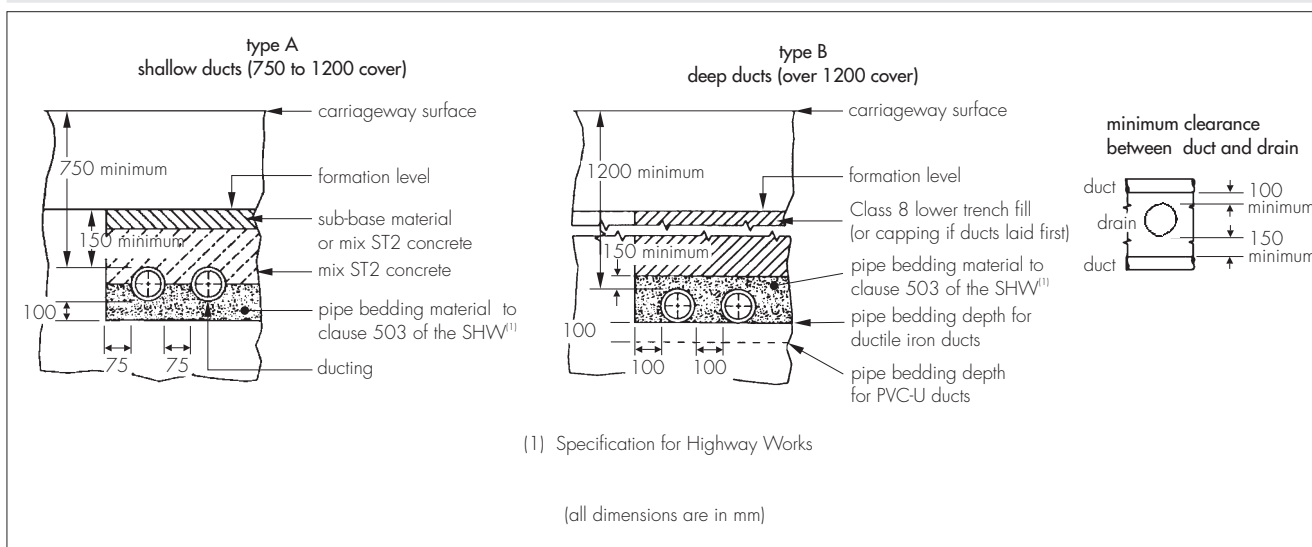
When installed and used in accordance with this Certificate, the material from which the ducts are manufactured will not significantly deteriorate and will have an anticipated lifespan in excess of 50 years.

## 11 General

11.1 The ducts must be installed in accordance with the general requirements and any additional site requirements.

11.2 The general requirements are to be in accordance with the MCHW, Volume 3, as shown in Figure 1.

Figure 1 Highway construction details



11.3 Ducting laid in depths of cover other than those specified in Figure 1 must be laid in accordance with the procedures described in the contract with the Highways Agency (HA).

11.4 The product must be adequately protected against damage from site construction traffic and from future excavations.

11.5 When used as ducts for fibre optic cabling, the recommendations in BS EN 50174-3 : 2003 should be followed.

## 12 Procedure

12.1 The trench is prepared in accordance with section 11.2, and any necessary bedding for the ducting is laid.

12.2 Precautions are taken to minimise the possibility of water entering the ducting and accumulating during installation. Ground water is pumped out and holes/chambers covered, especially if rain is likely. Incomplete duct ends are sealed, particularly if they are to be left for any length of time (eg overnight).

12.3 The laying of ducts must be in accordance with the Certificate holder's current literature. Ducting is cut using a coarse-toothed saw or heavy-duty jig-saw.

12.4 A check is made to ensure the spigot end is free of sharp edges, swarf and grit. Chamfering of the spigot end will assist the jointing process.

12.5 The socket to accept the spigot end is cleaned and all traces of dust and grit removed. The ringseal is cleaned and checked to ensure it is free from damage.

12.6 Lubricant is applied to the spigot end.

12.7 The spigot is inserted into the socket and pushed fully home.

12.8 When duct installation is complete, the trench is filled with as-dug backfill (CAT8 graded) in accordance with section 11.2.

12.9 Pipework and cables are pulled through the completed ducts by a suitable method recommended by the Certificate holder and via manholes and chambers incorporated into the installation.

## 13 Tests

Tests were carried out to determine:

- dimensional accuracy
- compression resistance to BS EN 50086-2.4 : 1994
- impact resistance to BS EN 50086-2.4 : 1994
- resistance to point loads to the MCHW, Volume 1, sub-clause 518.13
- resistance to foreign objects to BS EN 60529 : 1992
- resistance to ingress of water to BS EN 60529 : 1992
- marking of ducting to BS EN 50086-2.4 : 1994
- ease of jointing and airtightness of joints
- adhesion of printing to ENATS<sup>(1)</sup> 12-24
- static friction coefficient to ENATS 12-24
- creep resistance at elevated temperature to BS EN ISO 9967.

(1) Energy Networks Association Technical Specifications.

## 14 Investigations

14.1 An examination was made of data relating to:

- material properties
- durability.

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

## Additional Information

The quality management systems of Emtelle UK Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI Management Systems (Certificate No FM 14305).

## Bibliography

BS EN 743 : 1995 *Plastics piping and ducting systems — Thermoplastics pipes — Determination of the longitudinal reversion*

BS EN 50086-2.4 : 1994 *Specification for conduit systems for cable management — Particular requirements — Conduit systems buried underground*

BS EN 50174-3 : 2003 *Installation technology — Cabling installation — Installation planning and practices outside buildings*

BS EN 60529 : 1992 *Specification for degrees of protection provided by enclosures (IP code)*

BS EN ISO 9000 : 2005 *Quality management systems — Fundamentals and vocabulary*

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

BS EN ISO 9967 : 2007 *Thermoplastics pipes — Determination of creep ratio*

ENATS 12-24 *Plastic ducts for buried electric cables*

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works, August 1998 (as amended)*

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works, August 1998 (as amended)*

Manual of Contract Documents for Highway Works, Volume 3 *Highway Construction Details, March 1998 (as amended)*

## 15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

15.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.
- remain in accordance with the requirements of Highway Authorities' Product Approval Scheme.

15.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

15.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.