



NSAI
Agrément

CERTIFICATE NO. 02/0100

UNIDELTA, Idrosanitaria Savallese
S.p.a.,
25078 Vestone (Brescia), Italia, via Capparola,
Sotto 4
Tel. 0039 0365/878011
Fax 0039 0365/878090

UNIDELTA PLUMBPEX PLUMBING CENTRAL & UNDERFLOOR HEATING PIPE

Tubes et Raccords
 Rohre und Anschlusse

NSAI Agrément is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are 'proper materials' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2008**.



PRODUCT DESCRIPTION:

This Certificate relates to UNIDELTA PLUMBPEX Barrier and Non-Barrier pipes. UNIDELTA PLUMBPEX Plumbing pipes are manufactured from high density cross-linked polyethylene plastic developed for hot/cold water services (including potable water), central (radiator) and underfloor heating systems. The Barrier Pipes have an oxygen barrier layer (EVOH) in the mid-wall thickness of the pipes. PLUMBPEX pipes meet the requirements of Class S service conditions specified in Table 1 & 2 of BS 7291 :2006 which covers the specifications for both vented and sealed central heating systems. PLUMBPEX pipe also meets the requirements of Class 5 service conditions specified in Table 1 of IS EN ISO 15875-1 : 2003 for a service life of 50 years.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

Unidelta S.p.a.
Via Capparola Sotto,4, 25078 Vestone
Brescia, Italy.

Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting the NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9 or online at <http://www.n sai.ie/modules/certificates/uploads/pdf/020100.pdf>

1.1 ASSESSMENT

In the opinion of NSAI Agrément, the UNIDELTA PLUMBPEX Plumbing Central & Underfloor Heating Pipes when used in accordance with the provisions of this Certificate, is satisfactory for the purpose defined above and meets the requirements of the Building Regulations 1997 to 2008 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2008

REQUIREMENT:

Part D - Materials And Workmanship

D3 – UNIDELTA PLUMBPEX Hot & Cold Plumbing Central and Underfloor Heating Pipes as certified in this NSAI Agrément Certificate, are proper materials fit for their intended use (see Part 4 of this Certificate).

D1 – UNIDELTA PLUMBPEX Hot & Cold Plumbing, Central and Underfloor Heating Pipes, used in accordance with this NSAI Agrément Certificate meet the requirements for materials and workmanship.

Part G – Hygiene

G1 – Bathrooms and Kitchens in Dwellings

Hot and cold water systems using UNIDELTA PLUMBPEX barrier/non-barrier pipe and associated brass compression fittings and used in accordance with this NSAI Agrément Certificate, can meet the current requirements for hot and cold water services.

G2 – Sanitary Conveniences and Washing facilities

Hot and cold water systems using UNIDELTA PLUMBPEX barrier/non-barrier pipe and associated brass compression fittings and used in accordance with this NSAI Agrément Certificate, can meet the current requirements for the provision of hot and cold water services.

L1 - Conservation of Fuel and Energy

Heating and hot water systems using Unidelta PLUMBPEX Plumbing Central & Underfloor Heating Pipe can meet the current requirements for heating controls and the insulation of pipes and ducts. (see section 4.2 of this Certificate).

2.1 PRODUCT DESCRIPTION

UNIDELTA PLUMBPEX pipe is a high density crosslinked polyethylene plastic plumbing pipe developed for hot/cold water services - central and underfloor heating systems. PLUMBPEX pipe has been tested to and meets the requirements of Class ‘S’ service conditions as specified in BS 7291: Part 1: 2006 – *Thermoplastic pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings-General requirements*, which covers both vented and sealed central heating systems. PLUMBPEX pipes also meet the requirements for Class 5 service conditions specified in Table 1 of IS ISO EN 15875-1:2003 for a service life of 50 years. The pipe comprises a base cross-linked polyethylene (PE-X) pipe, with a wall thickness of between 1.7 and 2.70 mm depending on pipe size. The pipes have nominal diameters as shown in Table 1 of this Certificate.

The PLUMBPEX pipe is available with or without an oxygen barrier. The barrier pipes have an oxygen barrier (EVOH) layer in the mid-wall thickness of the pipes.

For installations in a solid floor (see section 2.4) the base pipe is protected with a minimum screed thickness of 35 mm or should be placed in black LDPE conduit pipe.

2.2 MANUFACTURE

The cross linked polyethylene pipe is produced by an extrusion process and is subsequently cross-linked.

2.2.1 QUALITY CONTROL:

Continuous quality control is carried out during manufacture, including checks on dimensional accuracy, degree of cross linking, heat reversion, pressure testing, thermostability and leak-tightness.

The management system of UNIDELTA PLUMBPEX have been assessed and registered as meeting the requirements of UNI EN: ISO 9001: 2000 – Quality Management System Requirements by the Italian Certification of Company Quality Systems (Certificate registration number 127).

2.3 DELIVERY, STORAGE AND MARKING

To maintain UNIDELTA PLUMBPEX pipe in the best possible condition for use it may be stored either horizontally or vertical but should be stored out of direct sunlight. The pipe should be supported throughout its length to avoid sagging. The pipe should be similarly supported in transit and protected from abrasion and crushing. Pipe lengths are delivered in protective wrapping for UV protection and pipe coils in protective cartons.

Nominal diameter	½"	¾"	1"	10mm	15mm	22mm	28mm
Outside diameter (mm)	14.63-14.74	20.98-21.09	27.33-27.44	10±0.1	15±0.1	22±0.1	28±0.1
Wall thickness (mm)	1.70±0.1	2.15±0.1	2.70±0.1	1.6±0.1	1.6±0.1	2.15±0.1	2.7±0.1
Weight (kg/100m)	6.7	12.3	20.0	4.41	6.9	12.9	20.4
Standard lengths	6m	6m	6m	-	6m	6m	6m
Standard coils	100m	50m	50m	100m	100m	50m	50m
Colour	Beige and white						

(Other diameter and lengths available to order)

Table 1: PRODUCT RANGE

ANCILLARY ITEMS:

- Compression fittings to IS EN 1254 Part 3: 1998
- Standard pipe clips
- Standard trunking systems.

The pipe is supplied in coils of 50 – 100 m and 6m lengths, depending on pipe diameter. The pipe bears a continuous mark showing the manufacturer's trade mark, dimension, maximum operating temperature and pressure, manufacturing code and year and week of production. Each coil shows the manufacturer's name and product description. Every package shows the NSAI Agrément identification mark and Certificate number and contains instructions on storage and installation.



FIGURE 1

2.4 INSTALLATION PROCEDURE

Installation must be carried out in accordance with the manufacturer's instructions (UNIDELTA) and BS 5955: Part 8: 2001- *Specification for the installation of thermoplastics pipes and associated fittings for use in domestic hot and cold water services and heating systems*, and BS 6700: 2006 + A1:2009 - *Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages*. If a joint beneath the floor is unavoidable, eg due to local damage, a compression fitting complying with IS EN 1254 Part 3: 1998 must be used for the purpose.

As all plastics materials expand and contract with temperature changes, due allowance in pipe runs shall be made on installation, to accommodate expansion and contraction of the pipe.

Procedure

Cutting:

To ensure successful jointing, UNIDELTA PLUMBPEX pipe ends should be cut smoothly and squarely. This can be achieved with purpose-made pipe secateurs, or

copper pipe cutters. A hacksaw may be used but the pipe ends may then need trimming or filing to allow easy insertion of the UNIDELTA PLUMBPEX pipe support sleeve.

Jointing:

A UNIDELTA PLUMBPEX support sleeve/insert is placed into the pipe (see fig.1). UNIDELTA PLUMBPEX pipe may be used with any standard IS EN 1254 (Irish Size) compression fitting. Place the nut and olive on the outside diameter of the pipe. Push the pipe and olive into the fitting and hand tighten the nut thus securing the olive into position. The nut is further tightened a half turn with the correct size of spanner to complete the compression joint. Check that the joint is fully secure by pulling on it.

Bending:

For sharp bends, standard elbow fittings should be used. Where bends of 80 mm radius are required in 1/2" UNIDELTA PLUMBPEX it is often quicker and neater to use a standard 15 mm x 90° angle bracket. Gentle bends of 175 mm minimum radii may be made by the use of pipe clips on either side of the bend, positioned to maintain the bend radius. Minimum bend radii are shown in table 2.

The pipe should not be heated with a blow lamp or hot-air gun.

10mm PLUMBPEX	45mm using pipe clips
12mm PLUMBPEX	80mm using pipe clips
15mm / 1/2" PLUMBPEX	80mm using angle brackets 175mm using pipe clips
22mm / 3/4" PLUMBPEX	225mm using pipe clips
28mm / 1" PLUMBPEX	300mm using pipe clips

TABLE 2: Minimum Bend radii

Clipping:

Clips should be positioned adjacent to fittings wherever possible, making due allowance for expansion and contraction of the pipe work. Where UNIDELTA PLUMBPEX pipe is to be surface mounted and visible the following clipping distances are recommended:

Clipping Distances (Metric/Imperial Pipe Sizes)			
Average service temperature	20°C	60°C	80°C
10mm, 12mm, 15mm, 1/2" PLUMBPEX - horizontal - vertical	500mm 800mm	400mm 600mm	300mm 500mm
22mm, 3/4" PLUMBPEX - horizontal - vertical	800mm 1200mm	600mm 1000mm	500mm 800mm
28mm, 1" PLUMBPEX - horizontal	800mm	600mm	500mm

TABLE 3: Clipping Distances

Where UNIDELTA PLUMBPEX pipe is to be boxed-in or installed under floors or in loft spaces etc., clipping distances can be increased or the clips omitted altogether if the pipe is adequately supported by other means.

Protection:

UNIDELTA PLUMBPEX pipe is a tough material that needs no greater protection from accidental damage when installed than conventional copper. As with copper UNIDELTA PLUMBPEX pipe should be sleeved when passing through walls and protected from nails, etc., when placed under floorboards or buried under plaster.

UNIDELTA PLUMBPEX pipe is stabilised to withstand limited exposure to ultraviolet radiation or sunlight, but is not designed for permanent direct exposure. Under such conditions painting with water based paints or lagging is required.

Installation in a screed:

The system should be pressure tested before the concrete screed or sand/cement is laid over the pipe or conduit. Should pressure testing take place in sub-zero temperatures all necessary precautions should be taken to avoid frost damage to the pipes or heating system. Screeds should be laid in accordance with the relevant requirements of BS 8204: Part 1: 2002 *In-situ floorings – Code of practice for concrete bases and screeds to receive in-situ floorings.*

Installation in a suspended timber floor:

Pipe runs are secured to joists using UNIDELTA PLUMBPEX pipe clips. The recommended spacing of supports is shown in Table 3.

The pipes are secured beneath the joists. Structural timbers should be notched only with the permission of the architect or structural engineer and in accordance with BS 6700: 2006 + A1:2009 - *Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.* The system should be pressure tested before nailing down the floor deck.

Commissioning the system:

When commissioning the system it must be flushed with water, the pump started and residual air removed by opening the bleed valves in each circuit. The system must be checked for leaks after all the air has been removed and before the pipes are covered.

A notice should be displayed in buildings where the system is installed. drawing attention to the risks of damage associated with nailing through floor decks. To minimise this risk the pipe runs should be kept clear of room perimeters and where possible doorways.

Boiler connections:

UNIDELTA PLUMBPEX pipe should not be joined directly to a boiler or similar heat source. It is important to ensure that such a connection is made with a minimum of one metre of copper pipe. UNIDELTA PLUMBPEX pipe can be joined to this.

Gas pipe:

UNIDELTA PLUMBPEX pipe has not been assessed for use as gas piping.

Electrical connections:

Since it is extruded from plastics material, UNIDELTA PLUMBPEX is an insulator and is **NOT** suitable for earthing electrical appliances. Alternative arrangements must be made to earth metal items such as sinks, baths etc. as required by the 'National Rules for Electrical Installations (ETCI) - Document No. ET 101 (current version) published by the Electrical Technical Council of Ireland. This is particularly important where refurbishing/extensions are being carried out to existing buildings.

3 GENERAL

The heating demands for particular rooms are designed in accordance with the CIBSE Guide A : 2006 (7th edition).

To calculate the pressure drop in the pipes connected to each radiator or underfloor heating coil, the total length of pipe is defined as the sum of the lengths of flow and return pipes from the boiler.

The flow characteristics of the UNIDELTA PLUMBPEX pipes are calculated in accordance with BS 6700: 2006 + A1: 2009. *Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.*

3.1 Structural design

Floor constructions must be designed to comply with the relevant technical specifications selected from:

I.S. 326: 2004 *Code of Practice for the Structural Use of Concrete.*

BS 5268: Part 2: 2002 - *Structural use of timber – Code of practice for permissible stress design, materials and workmanship.*

TGD document to Part B of Building Regulations 1997 to 2008.

3.2 Safe working temperatures and pressures

The pipe meets the requirements for Class 5 service conditions specified in Table 1 of IS ISO EN 15875-1: 2003 for a service life of 50 years. These conditions include operating temperatures of 60°C for 25 years operation, 80°C for 10 years and 100°C for 100 hours at a working pressure of 4 bar. The pipe is also suitable for cold water services for a period of 50 years at temperatures of 20°C and an operating pressure of 10 bar. UNIDELTA PLUMBPEX pipe has also been tested and meets the requirements of Class 'S' service conditions specified in Tables 1 & 2 of BS7291 of 12 Bar at 20°C 4Bar at 92°C and short term overload temperatures up to 114°C.

3.3 Chemical resistance

The materials used in the UNIDELTA PLUMBPEX pipe will not be adversely affected by accidental contact with linseed oil based sealing compounds or soldering flux, although these materials should not normally be used in making joints to the pipe.

3.4 Effect on water quality

The use of this product in domestic plumbing installations will not give rise to any degradation in water quality (Ref. SI81/1988) and PLUMBPEX pipes are hygienically and toxicologically suitable for the conveyance drinking water. The pipe has been tested in accordance with BS 6920-1:2000.

3.5 Flow characteristics

The bore of the UNIDELTA PLUMBPEX pipe is less than copper or steel pipe of the equivalent outside diameter.

The consequent reduction in flow rate for a given pressure head should be considered when designing the central heating system. See tables 4 & 5 for design flow rates, head losses & velocities for UNIDELTA PLUMBPEX pipe.

3.6 Note on System Design

In systems where low water content gas boilers with cast iron heat exchangers are used, it is recommended that the balancing valve for the hot water circuit be a brass lockshield gate valve (Conforming to BS 5154: 1991 *Specification for copper alloy globe, globe stop and check, check and gate valves*). This lockshield valve is important so as to prevent the valve being inadvertently turned off while the boiler is on and so avoid the pipe work being exposed to excessive temperatures by providing an open circuit for water to circulate between the boiler flow and return.

4.1 BEHAVIOUR IN FIRE

Properties in relation to fire Where the UNIDELTA PLUMBPEX pipe passes through an element of structure or cavity barrier the opening should be fire-stopped in a way that will permit thermal movement.

4.2 THERMAL INSULATION

Heating controls and pipe insulation must meet the minimum requirements of Part L Conservation of Fuel and Energy of the Building Regulations 1997 to 2008. Guidance is given in Section 2 –3 of the Technical Guidance Document to Part L.

4.3 DURABILITY

The UNIDELTA PLUMBPEX Pipe has been marketed successfully in other European countries for twenty years. Experience with the system has been favourable.

For central and underfloor heating applications, in accordance with good practice, it is recommended that a corrosion inhibitor is used and its concentration checked and maintained.

As with all plumbing and heating systems the control fittings, i.e. thermostatic radiator valves may require replacement within the lifetime of the UNIDELTA PLUMBPEX pipe.

The UNIDELTA PLUMBPEX Pipe will have a life at least equivalent to that expected from a traditional installation with metal pipes and fittings.

4.4 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- dimensional accuracy
- effect of thermal cycling on pipes and fittings
- degree of cross-linking
- long-term hydrostatic pressure resistance of pipe
- hydrostatic pressure resistance of fittings
- resistance to pull-out of assembled joints
- short-term hydrostatic pressure resistance of pipes at 20°C
- short-term hydrostatic pressure resistance of pipes at 95°C
- effect of water quality on drinking water - tested to BS 6920-1:2000

4.5 OTHER INVESTIGATIONS

(i) PLUMBPEX pipe has been tested to and meets the requirements of Class 'S' service conditions as specified in BS 7291: Part 1 2006 – *Thermoplastic pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings-General requirements*, which covers both vented and sealed central heating systems.

(ii) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on chemical resistance, mechanical strength/stability and durability were assessed.

(iii) 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.

(iv) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

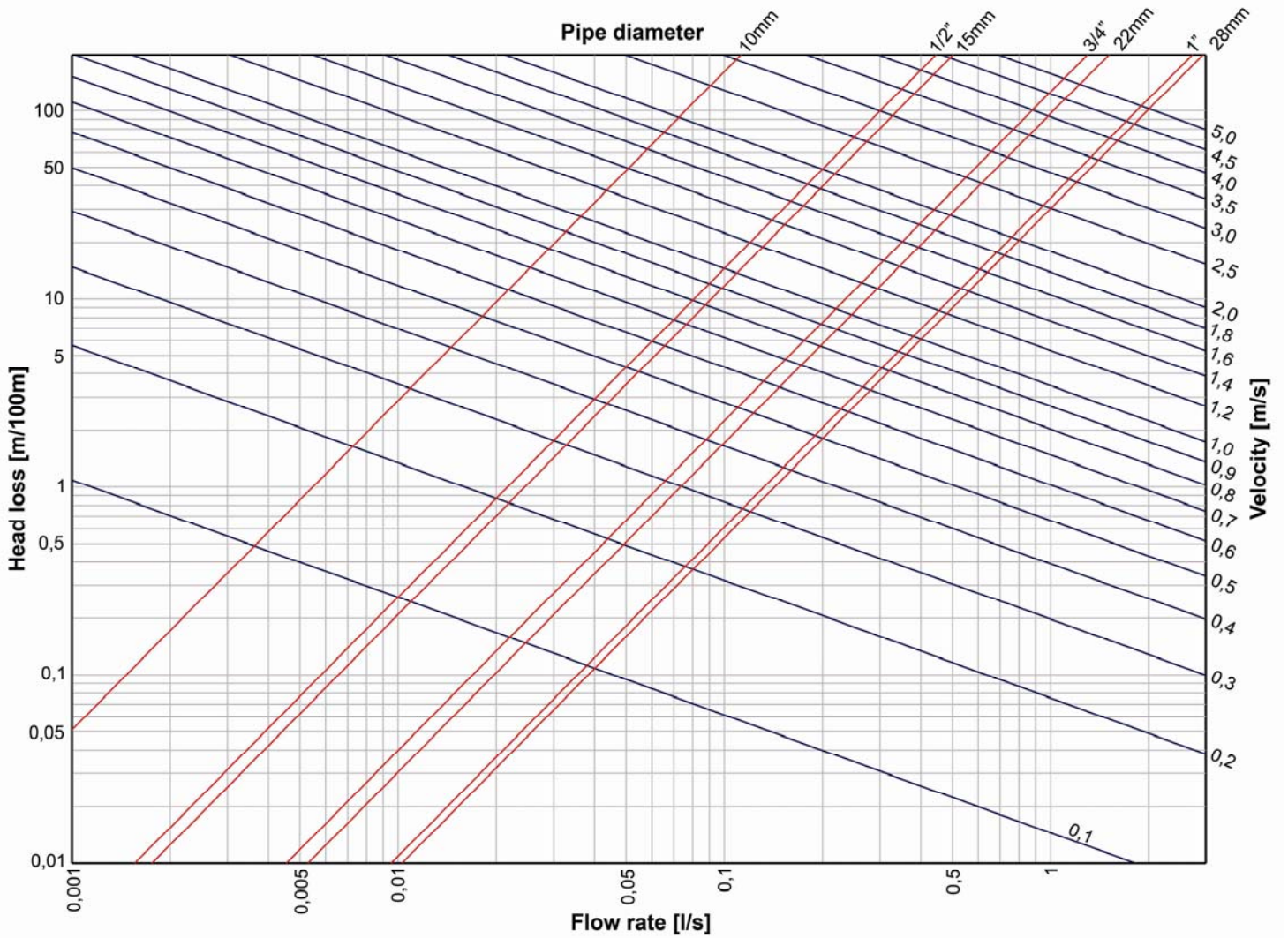


TABLE 4. Cold Water Services (12.8°C)

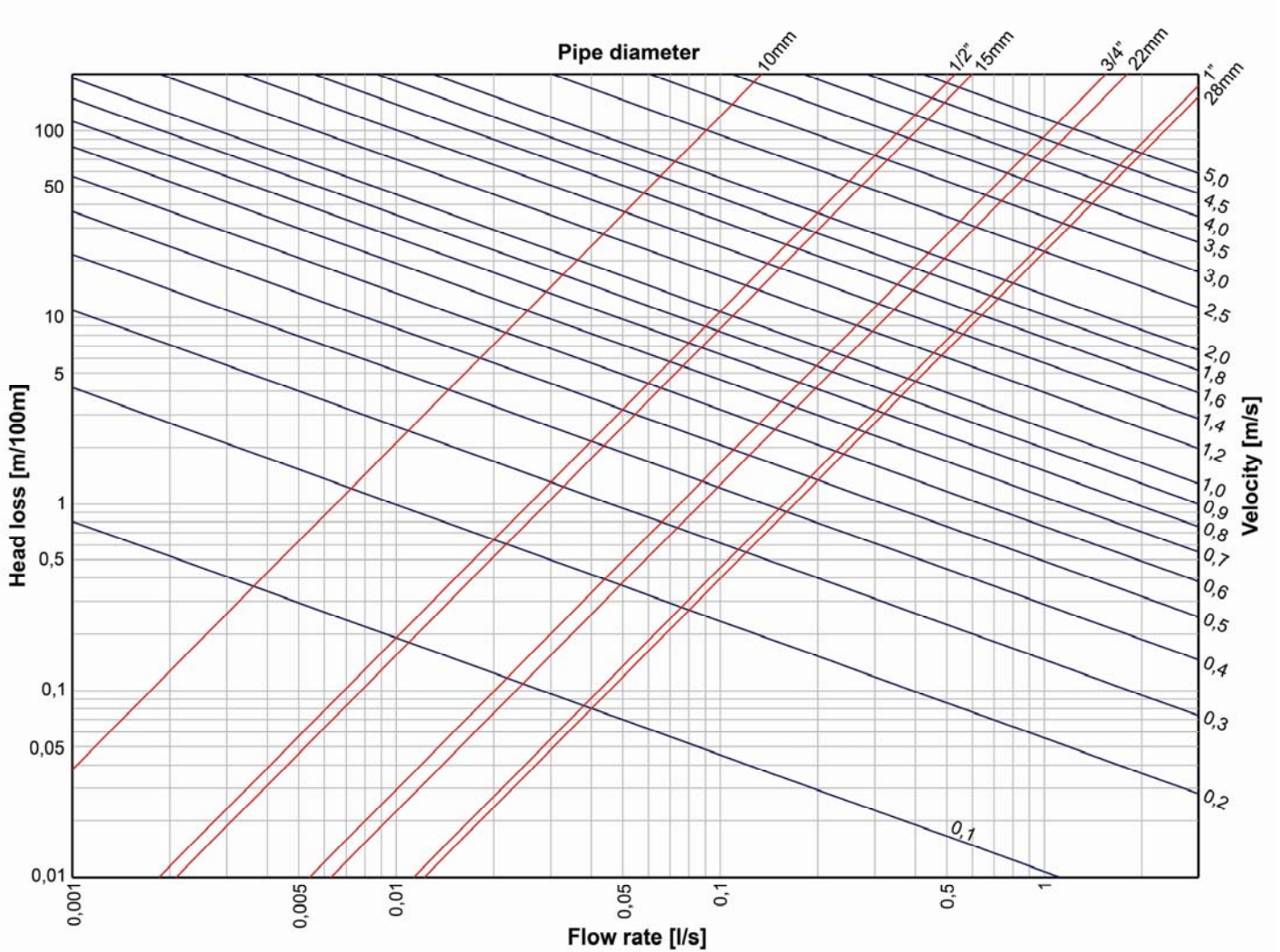


TABLE 5. Hot Water Services (80°C)

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2008 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI Agrément are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

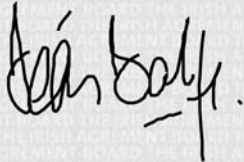
5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **02/0100** is accordingly granted by the NSAI to UNIDELTA on behalf of NSAI Agrément.

Date of Issue: **July 2003**

Signed



Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément , NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.n Sai.ie

Updated and revised: August 2009