

The Irish Agrément Board operates in association with the National Standards Authority of Ireland (NSAI) as the National Member of UEAtc.



PRODUCT DESCRIPTION AND USE

This Certificate relates to **Pexgol** High Density Polyethylene Cross-Linked PEX Pipes. Pexgol 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 Pexgol PEX white/red (Barrier Pipe) pipe, developed for central and underfloor heating systems, meets the requirements of Class 5 service conditions specified in Table 1 of prEN 12318-1 : 1998 for a service life of 50 years. Where the temperature does not exceed 50°C and the pressure does not exceed 8.3 bar, then, in accordance with DIN 16893 : 1988, a service life of up to 100 years can be

expected. The Pexgol beige (Non-Barrier) pipe developed for hot/cold water services (including potable water) also meets the requirements of Class 5 service conditions specified in Table 1 of prEN 12318-1 : 1998 for a service life of 50 years.

MANUFACTURE AND MARKETING

The product is manufactured by Golan Plastic Products, Kibbutz Shaar Hagolan, Jordan Valley, 15145 Israel.

The **Pexgol** pipes are marketed in Ireland by: Heatlink Ireland, Cappincur, Tullamore, Co. Offaly Tel: 0506-24062/24118 Fax: 0506-24063

SPECIMEN COPY

PART

1

CERTIFICATION

1.1 ASSESSMENT

In the opinion of the Irish Agrément Board (IAB), the **Pexgol** PEX Hot and Cold Plumbing, Central (radiator) and Underfloor Heating Pipe, 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 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 REQUIREMENTS:

D1 & D3 - Materials And Workmanship

D3 - Pexgol PEX Hot and Cold Plumbing, Central (radiator) and Underfloor Heating Pipe, as certified in this Irish Agrément Board Certificate, are proper materials fit for their intended use, (See Part 4 of this Certificate.

shows the manufacturer's name and product description, the IAB identification mark and Certificate number and contains instructions on storage and installation.

2.4 INSTALLATION PROCEDURE

Installation must be carried out in accordance with the manufacturer's instructions and BS 5955: Part 8: 1990 (1995) *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: 1997 *Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages*. General installation details are shown in Figs. 1 and 2. If a joint



Figure 1

Procedure

Cutting:

To ensure successful jointing, **PEXGOL** 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 **PEXGOL** pipe support sleeve.

Jointing:

PEXGOL pipe may be used with any standard IS (Irish Size) compression fitting. Place the nut and olive on the outside diameter of the pipe. Push the pipe and olive into the fitting. Screw the nut tight to complete the compression joint.

Bending:

For sharp bends (<80mm in radius), standard elbow fittings should be used. Where bends of 80 mm radius are required in 1/2" and 10mm **PEXGOL** it is often quicker, neater and cheaper to use a standard 15 mm x 90 angle bracket. Gentle bends (Radii ≥ 175mm) may be made by the use of pipe clips on either side of the bend, positioned to maintain the bend radius. Tables 2A and 2B give guidelines on minimum bend radii.

The use of pipe bending springs and skilled manipulation is not required. Hot air may be used in order to facilitate bending of the pipe. However, a direct flame should not be used.

Clipping

Clips should be positioned adjacent to fittings wherever possible, making due allowance for expansion and contraction of the pipework. Where

PEXGOL pipe is to be surface mounted and visible the following clipping distances are recommended:



Figure 2

Where **PEXGOL** 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:

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

PEXGOL pipe is stabilised to withstand limited exposure to ultraviolet radiation or sunlight, but is not designed for permanent direct exposure. Under such conditions lagging or other suitable protection is required.

Installation in a screed:

The system should be pressure tested to 1.5 times the working pressure for a period of 24 hours 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: 1987 In-situ floorings – Code of practice for concrete bases and screeds to receive in-situ floorings.

Figure 3 shows a typical underfloor heating installation with manifold using **PEXGOL** pipe.

Table 2A - Minimum Bend Radii Imperial sizes

1/2" PEXgol	80 mm using angle brackets 175 mm using pipe clips
3/4" PEXgol	225 mm using pipe clips
1" PEXgol	300 mm using pipe clips

Table 2B - Minimum Bend Radii Metric sizes

10/15 mm dia Pexgol	80 mm using angle brackets 175 mm using pipe clips
22 mm dia Pexgol	225 mm using pipe clips
22 mm dia Pexgol	300 mm using pipe clips
28 mm dia Pexgol	375 mm using pipe clips

Installation in a suspended timber floor:

Pipe runs are secured to joists using **PEXGOL** pipe clips. The recommended spacing of supports is shown in Tables 3A and 3B.

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: 1987: cl. 13.7.9. 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:

PEXGOL pipe should not be joined directly to a boiler or similar heat source. It is important to ensure that such a



Figure 3

connection is made with a minimum of one metre of copper pipe. **PEXGOL** pipe can be joined to this.

Gas pipe:

PEXGOL pipe has not been assessed for gas piping.

Electrical connections:

Since it is extruded from plastics material, **PEXGOL** 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 ET 101/1991.

Table 3A : Clipping Distances : Imperial pipe sizes

	Average service temperature		
	20 °C	60 °C	80 °C
1/2" Pexgol			
- horizontal	500mm	400mm	300mm
- vertical	800mm	600mm	500mm
3/4" Pexgol			
- horizontal	800mm	600mm	500mm
- vertical	1200mm	1000mm	800mm
1" Pexgol			
- horizontal	800mm	600mm	500mm
- vertical	1200mm	1000mm	800mm

Table 3B : Clipping Distances : Metric pipe sizes

	Average service temperature		
	20 °C	60 °C	80 °C
10/15 mm dia Pexgol			
- horizontal	500mm	400mm	300mm
- vertical	800mm	600mm	500mm
16/20 mm dia Pexgol			
- horizontal	800mm	600mm	500mm
- vertical	1200mm	1000mm	800mm
22 mm dia Pexgol			
- horizontal	800mm	600mm	500mm
- vertical	1200mm	1000mm	800mm

3 GENERAL

The heating demands for particular rooms are designed in accordance with the CIBSE Guide 1980: Part A.

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 **PEXGOL** pipe are calculated using accepted classical techniques.

3.1 Structural design

Floor constructions must be designed to comply with the relevant technical specifications selected from: *I.S.* 326

1988 Code of Practice for the Structural Use of Concrete.

BS 5268: Part 2: 1996 Structural use of timber - Code of practice for permissible stress design, materials and workmanship

TGD document to Part B of Building Regulations 1997.

3.2 Safe working temperatures and pressures

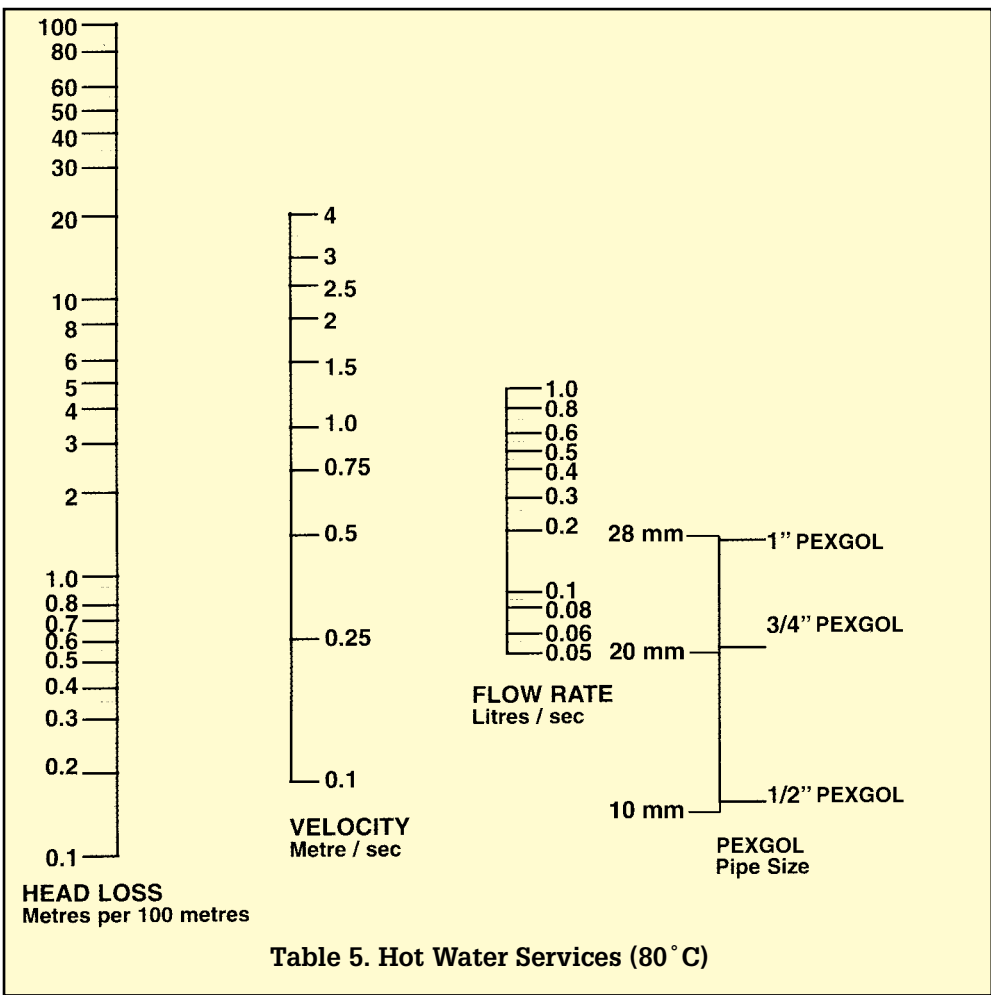
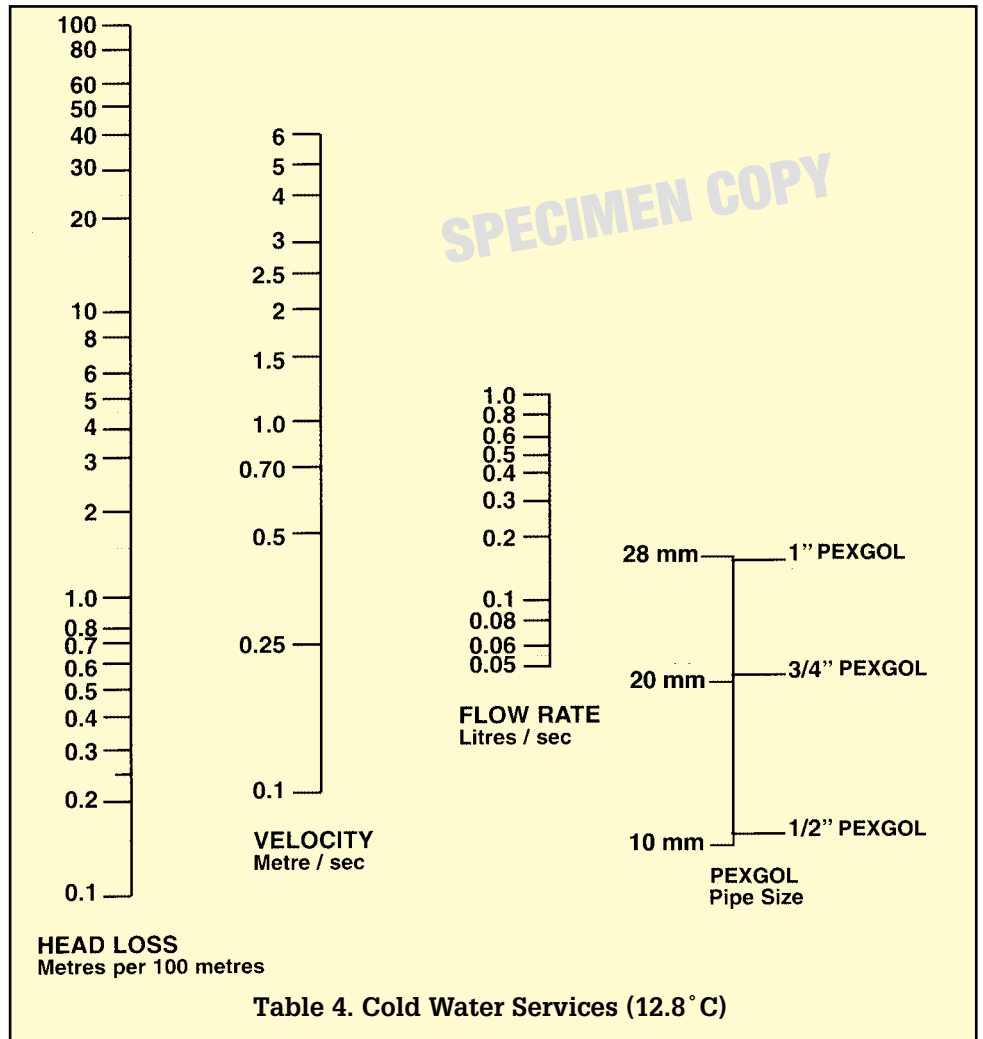
The pipe meets the requirements for Class 5 service conditions specified in Table 1 of pr EN 12318-1 : 1998 for a service life of 50 years. These conditions include operating temperatures of 60 °C for 25 years operation, 80 °C for 10 years and 100 °C for 100 hours at a working pressure of 4 bar. The pipe is also suitable for cold water

PIPE SIZING METHOD

1. Start by assuming a particular diameter of **PEXGOL** pipe.
2. Draw a straight line from the assumed pipe size through the design flow rate required.
3. Continue this line across the Velocity and Head Loss scales.
4. Check that the head loss does not exceed the permissible loss of head per 100m =

$$\frac{\text{Available head} \times 100}{\text{Effective pipe length}}$$

5. Ensure that the flow velocity is not too high i.e. maintain flow velocity below 3m/s.
6. If the checks in 4 and 5 are not valid for the pipe size chosen, then choose the next largest diameter of **PEXGOL** and repeat steps 1 through 5.



NOTES:

1. To determine the flow rate that will result from the selected pipe draw a line from the pipe size selected to the permissible loss of head on the left hand Head Loss Axis. (See step 4 in Pipe Sizing Method above for calculation). The flow rate is where this line cuts the Flow Rate Axis.
2. To determine the residual head available in that pipe join the pipe size chosen to the flow rate required using a straight line and continue the line through to the Head Loss Axis. The difference between the permissible loss of head and this mark is the residual head in the pipe, in metres per 100 metres.

services for a period of 50 years at temperatures of 20 °C and an operating pressure of 10 bar. There is an adequate safety factor to ensure that damage to the pipe will not occur in the event of boiler thermostat or other control failure.

3.3 Chemical resistance

The materials used in the **PEXGOL** 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. SI 81/1988) when installed in accordance with the manufacturer's instructions.

3.5 Flow characteristics

The bore of the **PEXGOL** 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 and 5 for design flow rates, head losses and velocities for **PEXGOL** pipe.

PART

4

TECHNICAL INVESTIGATIONS

4.1 BEHAVIOUR IN FIRE

Properties in relation to fire:

Where the **PEXGOL** 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. Guidance is given in Section 2 -3 of the Technical Guidance Document to Part L.

4.3 DURABILITY

Durability:

PEXGOL Pipe has been marketed in other European countries for twenty years. Experience with the system has been favourable.

Pexgol pipes are supplied both with an EVOH layer (barrier type) which reduces oxygen permeability and without an EVOH layer (non-barrier type). See Tables 1A and 1B.

When using **PEXGOL** pipes for central and underfloor heating applications, in accordance with good practice, it is recommended that a corrosion inhibitor is used to combat the effects of oxygen and its concentration checked and maintained.

As with all plumbing and heating systems and control fittings, i.e. thermostatic radiator valves may require replacement within the lifetime of the **PEXGOL** Pipe.

PEXGOL 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 pipes at 20 °C
- short-term hydrostatic pressure resistance pipes at 95 °C

4.5 OTHER INVESTIGATIONS

- (i) 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.
- (ii) 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.
- (iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.

5.1 CONDITIONS OF CERTIFICATION

The National Standards Authority of Ireland (“NSAI”) following consultation with the Irish Agrément Board (“IAB”) 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 so long as:

- (a) the specification of the product is unchanged;
- (b) the Building Regulations, 1997 and any other regulation or standard applicable to the product/process, its use or installation remain 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.

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

5.3 In granting this certificate, the NSAI makes no representation as to:

- (a) the presence or absence 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 or 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, 1989 or of any other current or future statute or 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.

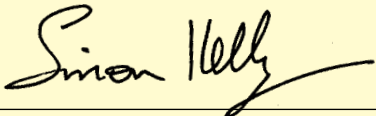
5.7 Where reference is made in this certificate to any Act of the Oireachtas, regulation made thereunder, statutory instrument, code of practice, national standards, manufacturer’s instructions or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this certification.

SPECIMEN COPY

THE IRISH AGRÉMENT BOARD

This Certificate No. 00/0090 is accordingly granted to Golan Plastic Products on behalf of The Irish Agrément Board.

Date of Issue: November 2000

Signed: 

Chief Executive, NSAI.

Readers may check that the status of this Certificate has not changed by contacting the Irish Agrément Board, NSAI, Glasnevin, Dublin 9. Ireland.

Telephone: (01) 807 3800.

Telefax: (01) 807 3842.

SPECIMEN COPY

First edition: April 1997
Revised: November 2000



BUILDING PRODUCT CERTIFICATION

**Irish Agrément Board,
NSAI,
Glasnevin,
Dublin 9.
Ireland.
Telephone: (01) 807 3800.
Telefax: (01) 807 3842.**