SCHOOLS

HOSPITALS

HOTELS

SPORTS STADIA

Durapipe HTA®

Hot and Cold Water

Technical Data & Dimensions

Durapipe HTA®
Hot and Cold Water

HOT AND COLD WATER

Durapipe HTA® is a complete C-PVC pipework system for domestic hot and cold water services, providing secure, quicker and easier installations. Durapipe HTA® is a cost-effective alternative to copper.

Significant cost savings can be achieved against copper due to the installed time savings available via the simple jointing method and the product being lightweight.

Durapipe HTA® offers a 50 year design-life and due to the high quality material the system remains limescale free and corrosion resistant, leading to a continual smooth bore and subsequent system efficiency through optimum water flow.

In addition, Durapipe HTA® offers excellent fire resistance and also helps combat the growth of biofilms.

Key Product Information

- Size Range: 20mm to 160mm
- Pressure Rating: PN25 up to 63mm and PN16 25mm to 160mm
- Temperature Rating: +5°C to +90°C* (PN16 +70°C at 6bar) (PN25 +70°C at 10bar)

Key Product Features

- Lightweight and easy to install
- Limescale and corrosion free
- No power or hot works required
- Fully WRAS Approved for drinking water
- Suitable for chemical and heat (bacterial) treatment for both hot and cold water
- Smooth bore providing optimum water flow
- Dedicated bracketing
- European fire classification – BS1d0 (Non-flammable, no smoke, no flaming droplets)

Typical Applications

- Hospitals and other healthcare facilities
- Schools
- Commercial buildings
- Hotels and residential buildings
- Sports stadia
- Shipbuilding

WRAS APPROVED PRODUCT

*For advice on heating applications please refer to our technical support team.

Durapipe HTA®
Hot and Cold Water

CONTENTS

Durapipe HTA®
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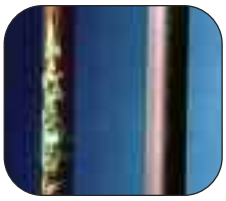
Why use Durapipe HTA®?

Reduced Installation Costs

Due to the many factors that make Durapipe HTA® easier to install on site, Durapipe HTA® can deliver installed cost savings when compared to a traditional copper pipe system.

Corrosion and Limescale Resistant

Both limescale and corrosion can become a problematic feature of any metal-based pipework system. However, the smooth bore lining of Durapipe HTA® pipework prohibits any limescale build-up throughout the life of the system, maintaining consistent flow rates.



Copper pipe vs HTA® pipe

Corroded steel pipe

Plastic pipe

No Security Issues

As plastic has no scrap value, there are no security issues with HTA® and thus no risk of thefts of pipework from site.

Metal Threaded Fittings

HTA® brass ended fittings provide reliable connections between pipework and ancillary equipment across a range of building services applications.

Superior Flow

Low fluid friction allows higher flow velocities than metal pipes and also inhibits the formation of scale, with consequent savings in pump energy consumption, and reduced pressure drops.

Fast, Simple and High Integrity Jointing

Solvent welding is a simple process which produces a permanent joint of strength equal to, or exceeding, the pipe itself. No special tools, equipment or hot works permits are required.

- No electricity required
- No flame or combustible gas bottles required on-site
- No site downtime due to electricity shut down
- No hot works permits or need for site segregation
- Permanent, secure jointing
- No special tools needed
- Easy transition to other systems
- Reduced installation time
- Reduced installation costs
- Light and easy to handle

Flexible Braided Hoses

HTA® flexible hoses can be used to take up expansion/contraction in a HTA® system.

Lightweight

Durapipe HTA® is approximately one-sixth of the weight of steel pipework.

Therefore, Durapipe HTA® is much easier to handle, especially during installation on-site.

Sustainability and Environment

The energy used to make Durapipe HTA® from raw material compares favourably with, for example, steel pipe manufacture, because lower conversion temperatures are needed. Furthermore, our processes are clean with low process emissions.

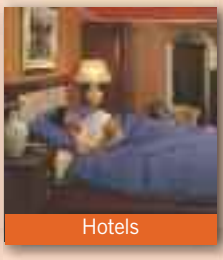
Durapipe HTA® pipe and fittings are cheaper and easier to transport because they are lighter in weight than the equivalent metal products. They can be recycled into other products at the end of their life, and scrap during the manufacturing process can also be recycled and reused. This minimises the need for any thermoplastic pipe scrap entering the waste stream.

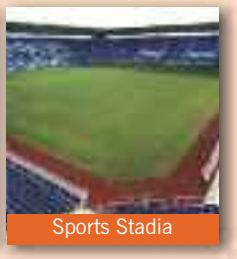
Market Sector Applications

Durapipe HTA® has been used for hot and cold water applications, within the building services sector for many years. The system is commonly installed to provide pipework benefits for hospitals, schools, hotels, sports stadia, commercial and public buildings.


Hospitals


Schools


Hotels


Sports Stadia

Flange Connections

The HTA® range includes stub flanges for connection to metal valves and ancillary equipment.

Global Distribution Network

Durapipe HTA® is available from an extensive network of distributors and stockists. Please contact us for details of your nearest outlet.

Quality Manufacturing

Quality is central to the operation with BS EN ISO9001 certification and within an environmental management system which operates in accordance with the requirements of ISO14001.

Technical Support

We offer an unrivalled level of technical support where our experienced team can provide product training and installation advice on any given project. They also provide material take-off advice from architects' drawings.

FREE Practical Jointing Advice

One of the many benefits of using HTA® pipework instead of traditional materials is the simplicity of the jointing process when using plastic.

Furthermore, our team can advise pipework installers on methods of best practice when jointing plastic piping. We offer **FREE** practical product jointing advice on our HTA® range, including jointing demonstrations, installation advice and even material and product selection.

This can be done either on site as part of our on-site support service or at our UK office.

Unrivalled Third Party Standards and Approvals

Durapipe HTA® is manufactured to the highest level and meets with the requirements of many international standards and approvals.

This unrivalled level of third-party approval offers total assurance to the designer, installer and end user that Durapipe HTA® is a consistent and reliable pipework system.

Industry Affiliations

We are members of a number of independent industry affiliation bodies and support various specific building services related organisations.

CIBSE PATRONS · iphe · Summit SKILLS · BSRIA · IHEEM · GBC

Fire Classification

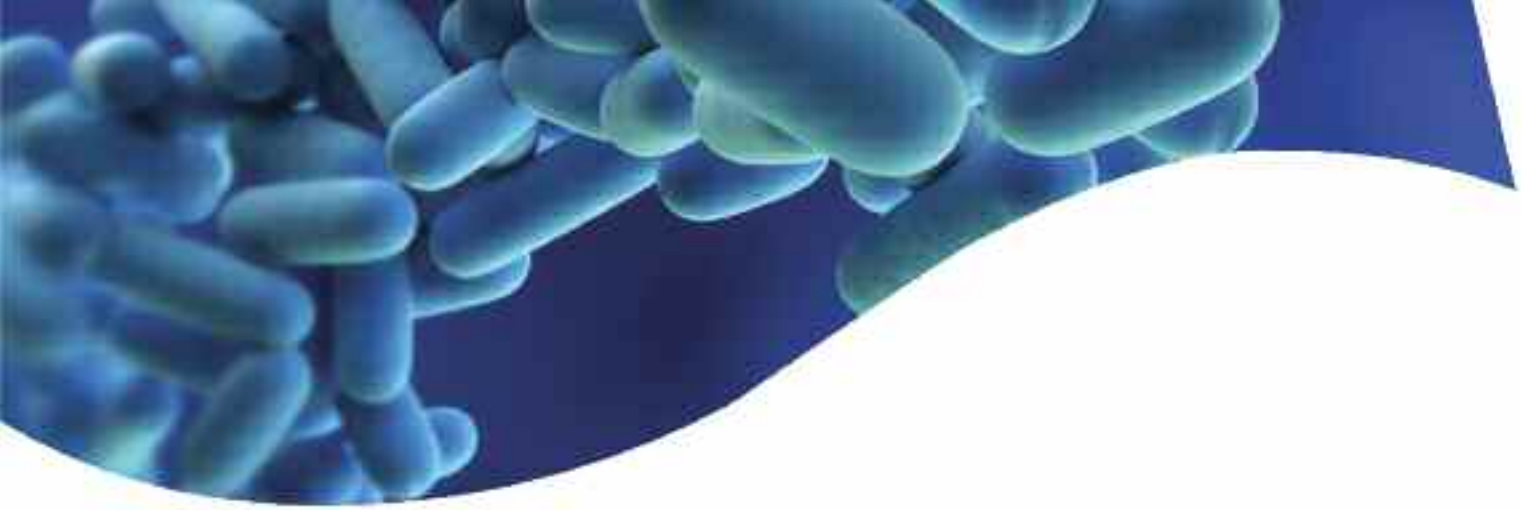
Durapipe HTA® is Bs1d0 rated (Euroclasses). Non-flammable, no smoke, no flaming drops.

Thermal Conductivity

A lower rate of thermal conductivity results in energy savings and enhanced engineering value.

Helps Fight Bacteria

C-PVC pipework can help in the fight against the build-up of bacteria by being a poor promoter of biofilm.



Plastics and Healthy Pipework Systems

The natural characteristics of plastics can help combat growth of Biofilms and other bacteria; they cannot prevent microbiological growth but can limit and slow the growth process. In addition certain plastics also accommodate thermal shock and chemical treatments to kill bacteria and clean systems.

What is a Bio-film?

Formation of a bio-film, an aggregate of slime and micro-organisms, begins with the attachment of free-floating micro-organisms to a surface. If they are not immediately separated from the surface, they can anchor themselves more permanently using cell adhesion structures.

In building services pipework there are two common forms of bacteria; *Pseudomonas* and *Legionella*.

Pseudomonas aeruginosa bio-films

Pseudomonas aeruginosa is a rugged and aggressive bacteria and is a major reason for persistence of infection in hospitals. Pseudomonas offers no threat in the planktonic (water borne) state; only in the sessile (fixed by its stalk) form will it occur on heating or cooling system surfaces.

Legionella / Pheumophila

Legionella infections are caused by a bacterium, 'legionella' which has always existed in water and remains inert at temperatures below 25°C. It proliferates in water circuits at temperatures fluctuating between 25°C and 45°C (Sanitary Hot Water and Air Conditioning circuits).

Infection by Legionnaires' disease occurs when inhaling water mists containing Legionella bacteria. However, to drink such water is not dangerous. These water mists can occur anywhere where water is taken from pipes.

Showers are considered the most common way of spreading the disease, other risk areas include cooling towers, spas, high-pressure washers and humidifiers. You CANNOT catch Legionnaires' disease by drinking water.

Bio-films and Pipework systems

Biofilm attaches itself to sharp or jagged parts of the pipes surface; the rougher the surface the better 'foothold' for the bio-film, subsequently providing a strong platform upon which to grow and increase its size/spread.

Factors impacting on Microbiological growth of Bio-film:

Surface material – "The smoother the better"

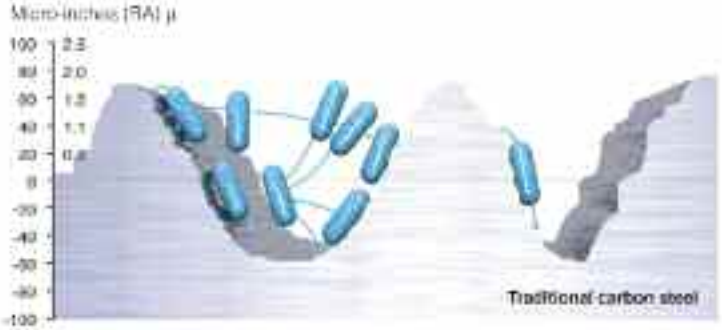
It is not so much the specific material that restricts biological growth/bio-film development but the smoothness of the material surface. By the very nature of plastics pipes, the surface is smooth, conversely the surface of some metallic pipes is rough; therefore the ability for growth generation is limited in plastics pipes.

It is accepted that copper has natural anti-microbial properties (as does silver), however, as limescale builds on the gradually corroding pipe surface, the biofilm then clings to the limescale and begins to colonise.

This surface roughness harbors more microbiological growth for 2 reasons:

1. Rough surfaces have more surface area.
One major factor influencing biofilm development in purified-water systems is surface area. Industrial water piping systems, unlike most natural environments (lakes and rivers) offer a tremendous amount of surface area for attachment suitable for bacterial attachment and growth (Mittelman 1985).

2. Rough surfaces provide more shielding from shear forces (flow)
In general, smooth surfaces foul at a slower initial rate than do rough ones, but biofilm formation after a period of days is inevitable. (Meltzer 1993). Therefore, the rate of growth is slower in smooth bore plastics than traditional copper or steel pipe bores.



The images above show the relative surface smoothness profiles of traditional carbon steel and plastic, and highlights how bacteria clings more easily to the spikes of the undulating and jagged surfaces of carbon steel.

Factors assisting the potential for bacteria

- Stagnant water
- Dead volumes/loops
- Temperature from 25 to 45°C
- Bio-film formation
- Scale deposits & concentration
- Sludge & sediments caused by corrosion
- Concentration of some metals such as iron, zinc and chemicals such as potassium
- Ageing installation
- Poor maintenance

How to combat bacterial growth and bio-film

Many effective methods can be used to prevent the risk of bio-film proliferation in piping circuits.

Good Practice

Chilled water and heating systems can be protected from bacterial growth initially by correct flushing and treatment programs as soon as the pipework is installed.

Flushing

Flushing will limit bio-film thickness in water systems; shear forces caused by flushing will remove bio-film which extends out into the turbulent flow in the centre of a pipe. Plastic pipework should be flushed out in accordance with BS5955 part 6.

Thermal Shock

A temperature of 70°C must be reached and maintained throughout the entire piping system over a period of around ten minutes (legionella dies above 60°C), the water is then cooled down to 55°C.

This solution is the most natural and is very effective on circuits in good condition and is suitable for our plastic pipework systems.

Chlorine Shock

Another common method is water disinfection. Circuit chlorination measure with hyperchlorination of tanks for 24 hours with chlorine at a concentration of 15mg/litre in cold water (or 50 mg/litre for 12 hours) followed by draining and thorough rinsing of all piping.

(HTA) C-PVC has exceptional resistance to chlorine, but Chlorine Shock is not suitable for (SuperFlo) ABS.

Prevention is the best cure.

To ensure pipe system safety you need:

- a good design;
- the correct pipework materials;
- preventative measures applied on a continuous basis;
- thorough installation maintenance, sampling, cleaning and treatment.
- No water stagnation and allow good water circulation.

GENERAL CHARACTERISTICS

PHYSICAL CHARACTERISTICS

Characteristics	Standards	Units	Values
Physical aspect	NF EN 15 877	–	Complies
Fire classification	EN 13501-1 – EN 15015	–	Bs1d0
Density (volumic mass)	NF EN ISO 1183-1	g/cm³	1.45 to 1.65
Linear expansion coefficient	ASTM D 696-70	mm/m.°C	0,065
Thermal conductivity λ	ASTM C 177-76	W/m.°K	0,16
Shrinkage at 150°C (pipes)	NF EN 743	%	≤ 5%
Shrinkage at 150°C (fittings)	NF EN 580	–	Complies

MECHANICAL CHARACTERISTICS

Characteristics		Standards	Units	Values
Bending under load temperature	(pipe) (fittings)	NF EN ISO 75-1	°C	≥ 97 ≥ 90
VICAT softening temperature (5 daN load)	(pipe) (fittings)	NF EN 727	°C °C	≥ 110 ≥103
Tensile elasticity modulus	(pipe)	NF EN ISO 6259-1	MPa	3400
Tensile strength at yield limit	(pipe)	NF EN ISO 6259-1	MPa	≥ 60
Breaking tensile strength	(pipe)	NF EN ISO 6259-2	MPa	≥ 50
Breaking elongation		NF EN ISO 6259-2	%	≥ 40
Hardness: Shore D		NF EN ISO 868	–	85
Resistance to static pressure				
Pipe at 20°C time ≥1 h		–	MPa	σ = 46
Pipe at 80°C time ≥170 h		ATEC 14/03-831	MPa	σ = 13
Pipe at 80°C time ≥1000 h		NF EN 921	MPa	σ = 10
Fittings at 20°C time ≥1 h		NF EN ISO 15 877	–	–
Fittings at 80°C time ≥3000 h		ATEC	–	–
Resistance to alternating pressure				
(On fittings and glued jointings)		NF T 54 094	–	–
Pressure		NF T 54 034	–	20/60 bar
Diameters 16 to 90 = Frequency 1 Hz		ATEC 14/03-831	Cycles	≥ 5000
Diameters 110 and 160 = Frequency 0,42 Hz		–	Cycles	≥ 2500

1 MPa = 10 bar

GENERAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

Characteristics	Standards	Units	Values
Transversal resistivity (under 1000 V)	ASTM/D 257/76	Ohm.cm	10^{15}
Dielectric constant (10^3 Hz)	ASTM/D 150/74	–	3
Angle of loss tangent (10^3 Hz)	ASTM/D 150/74	–	10^{-2}
Dielectric strength	ASTM/ 149/75	KV/mm	25

CHEMICAL RESISTANCE

Any fluid or water containing chemical agents (in suspension or in solution) other than those permitted by the standards and regulations concerning drinking water are considered as chemical products. Therefore, their compatibility with HTA® must be verified. If in doubt, please contact the Durapipe technical support team.

PRODUCT QUALITY

The physical and mechanical characteristics of HTA® pipes and fittings are determined by the control regulations imposed by international standards.

To guarantee the maximum reliability level in actual operating conditions, additional tests are carried out as per NF T 54-094 standard.

An alternate pressure test (on complete joint sections) is regularly carried out. This test simulates pressure shocks to which our products are submitted in live pipeworks (such as pressure hammers, flow speed variations). The couplings are subjected to water hammer pressure cycles (20/60 bar) at 3,600 cycles/hour for diameters 12 to 90 and 1,500 cycles/hour for diameters 110 to 160.

Furthermore, operational tests are constantly carried out on our laboratory's testing rigs. This enables us to better guarantee the adaptation of each component in the pipework to its own function.

The ISO 9001 V2000 certified procedures applied at all stages guarantees the technical performances of HTA® products (industrial processes, logistics) and our Service quality (deliveries, technical assistance).

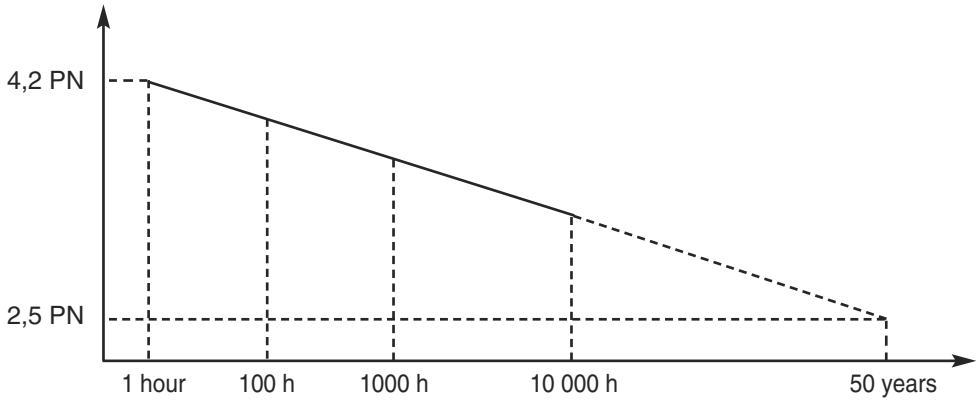
GENERAL CHARACTERISTICS

DESIGN LIFE

The working pressures and temperatures indicated in the following tables are determined for a working life of **50 years without interruption.**

Working pressures according to working temperatures are calculated out by using regression curves as per standard NF EN ISO 9080.

TESTING PRESSURE



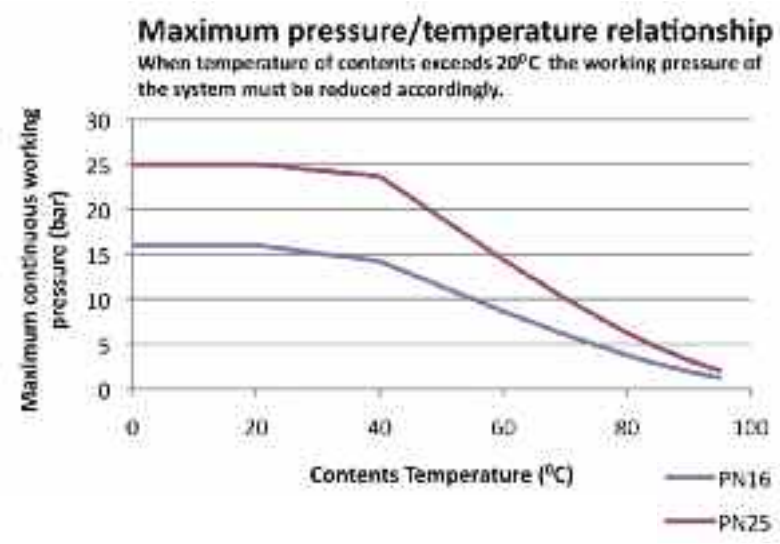
A pressure pipework can be classified as PN16 or PN25 (with a safety factor of 2.5 after 50 years) if it can tolerate, during one hour, a pressure equal to 4.2 times this PN.

The readings for the breaking pressures for HTA® are evaluated as shown in the above regression curve represented by a straight line with logarithmic scale.

This straight line is drawn on the basis of 1hour, 100 h, 1000 h and 10,000 h tests, at 20°C, 60°C, 70°C and 95°C, according to ISO 9080 standard.

OPERATING PARAMETERS

	HTA® Ø 16 to Ø 63 PN25 Series 4	HTA® Ø 32 to Ø 160 PN16 Series 6.3
Temperature °C	Working pressure bar	Working pressure bar
5	25.0	16.0
20	25.0	16.0
40	23.6	14.1
60	14.3	8.6
80	6.2	3.7
85	4.5	2.7
90	3.1	1.9



The above table shows maximum working pressures for installations working continuously at the above temperatures for a duration of 50 years. The pressures indicated were calculated by using the corresponding regression curves with a safety coefficient superior to 2.

OPERATING CONDITIONS

APPLICATION CLASSES

Covered by CSTB's ATEC certificate, in PN25 and PN16.

- European and international standards have modernised the application classes by incorporating operating periods at stabilised working conditions, but also overheating/malfunction periods for the heating appliances. For instance, Class 2 (HCWS) incorporates: a stabilised working period of 49 years at 70°C, a total of 1 year at 80°C for overheating periods, and a total of 100 hours at 95°C for malfunction situations.

International Classes	Service Conditions	Maximal Conditions	Malfunction Conditions	Typical corresponding application
Class 2	70°C for 49 years	80°C for 1 year	95°C for 100 h	Domestic Hot and Cold Water Services

- Application Class 2 is in compliance with ISO 10508. According to that standard, it is reminded that, whatever the application class used, the system must also allow for the transportation of cold water at 20°C for a duration of 50 years, at a working pressure of 10 bar.

CERTIFIED FIELDS OF APPLICATION

- Class 2: domestic hot and cold water services (70°C).

  Pipe PN16 6 bar
  Pipe PN25 10 bar

OTHER FIELDS OF APPLICATION

- LTHW (Low Temperature Hot Water)

For advice on heating applications please refer to our technical support department. Any warranties are invalid if Durapipe's technical support department has not been consulted prior to specification/installation.

CAUTION

HTA® should be selected, stored, installed and used for applications in strict accordance with this technical documentation, and with good practice rules.

Careful consideration should be given to:
- The nature and the type of installation for which the products are being used
- Supporting methods
- Insulation methods (see technical sheets 6.5 and 6.6)
- Installation and working conditions (flushing, etc.)
- The nature of the fluids to be transported, and the working temperature-pressure ratios to be respected

Durapipe UK does not take responsibility for the hydraulic design of piping networks, namely as far as pipe dimensioning is concerned.

HTA® RANGE

Description	20	25	32	40	50	63	75	90	110	125	160	Technical Sheet
C-PVC PIPES 	■	■ ■	■ ■	■ ■	■ ■	■ ■	 ■	 ■	 ■	 ■	 ■	8.1 8.1
ELBOWS 90° 	■	■	■	■	■	■	■	■	■	■	■	8.2
ELBOWS 45° 	■	■	■	■	■	■	■	■	■	■	■	8.2
COUPLINGS 	■	■	■	■	■	■	■	■	■	■	■	8.2
CAPS 	■	■	■	■	■	■	■	■	■	■	■	8.3
EQUAL TEES 90° 	■	■	■	■	■	■	■	■	■	■	■	8.3
REDUCING TEES 90° 	16	16 20	16 20 25	20 25 32	20 25 32 40	20 25 32 40 50	20 25 32 40 50 63	32 40 50 63 75	40 50 63 75 90			8.4
REDUCING BUSHES LONG PATTERN 		16	16 20	16 20 25	20 25 32	20 25 32 40	20 25 32 40 50	25 32 40 50 63	50 63 75	90	75 90 110	8.5
REDUCING BUSHES SHORT PATTERN 	■	■	■	■	■	■	■	■	■	■		8.6
REDUCING BUSHES SHORT PATTERN 								25 32		63 75	110 125	8.6
ADAPTOR NIPPLES WITH BRASS THREAD 	■ ■	■ ■	■	■	■	■	■	■				8.6 8.6
ADAPTOR NIPPLES WITH STAINLESS STEEL THREAD 	■	■	■									8.7
ADAPTORS FOR MEASURING ACCESSORIES WITH 1/2" OR 3/4" THREAD 									■			8.7
HALF SHELL ANCHORS 		■	■	■	■	■						8.7
3 PIECE UNIONS C-PVC & BRASS FEMALE THREAD 	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"						8.8
3 PIECE UNIONS C-PVC & BRASS MALE THREAD 	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"						8.8
SERRATED STUB FLANGES 		■	■	■	■	■	■	■	■	■	■	8.10
THREADED ADAPTORS WITH BRASS INSERT 	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"				8.10

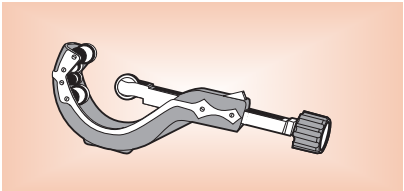
HTA® RANGE

Description	20	25	32	40	50	63	75	90	110	125	160	Technical Sheet
THREADED ADAPTORS WITH STAINLESS STEEL INSERT 	1/2"	3/4"	1"									8.10
PLAIN NIPPLES 	■	■	■	■	■	■	■					8.11
TAP CONNECTORS WITH BRASS NUTS 	3/4"	1"	1 1/4"	1 1/2"	2"							8.11
THREADED ELBOWS 90° WITH BRASS INSERT 	1/2"	3/4"										8.12
THREADED ELBOWS 90° WITH BACK PLATE BRASS INSERT 	1/2"	3/4"										8.12
THREADED 90° TEES WITH BRASS INSERT 				3/4"	3/4"	3/4"	3/4"					8.12
EXPANSION JOINTS 	1/2"	3/4"	1"	1 1/4"	1 1/2"							8.12
MONOKLIP® BRACKETS 	■											8.13
MONOKLIP® BRACKETS 		■	■	■	■	■	■	■	■	■	■	8.14
FLANGE KIT FOR COMP BELLOWS 				■	■	■	■	■	■	■	■	8.15
SOLVENT CEMENT 												8.15
CLEANER 												8.15
CHAMFERING TOOL 												8.15
PIPE CUTTER 												8.15
FLAT GASKETS FOR FLANGE ADAPTORS 		20	25	32	40	50	65	80	100	125	150	8.16
GRP BACKING RINGS (POLYESTER) 		20	25	32							150	8.16
GRP BACKING RINGS (POLYAMIDE) 					40	50	60	80	100	125		8.16
UNION BALL VALVES 	■	■	■	■	■	■						9.1
FLANGED BALL VALVES 							■	■	■			9.3
LINEAR EXPANSION COMPENSATOR 				■	■	■	■	■	■	■	■	5.4

GENERAL RULES OF INSTALLATION
SITE WORKING/INSTALLATION

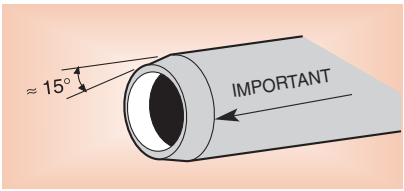
HANDLING AND STORAGE

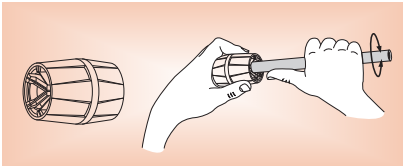
- Pipes and fittings must be stored separately on an even area, away from dust and sun.
- In all cases, take special care to avoid rough handling and impacts, namely with indenting, cutting or heavy objects, especially in cold weather.
- Take special care to avoid risks of contamination (projections of dirt, dust) during storage on site and during the installation of the pipes and fittings.
- Pipes are wrapped in plastic sleeving (colour coded according to their PN rating) and capped in order to limit contamination before assembly. Remove both sleeves and caps prior to installation.



CUTTING

- **Roller plastic pipe-cutter**
  Allows for neat, clean cuts to be carried out.
- **The use of disc saws or secateurs to cut pipes is strictly prohibited.**

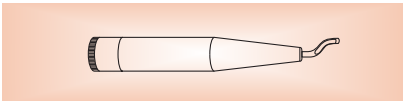


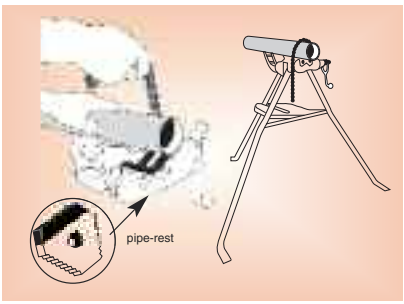


TRIMMING - CHAMFERING

After cutting, the pipe must be trimmed inside and **a chamfer must be made on the outside.** These operations can be performed by means of the following tools:

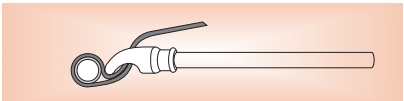
- **Trimming and chamfering cone**
  This tool can be used to trim the inside of the pipe, and on the other side, it chamfers the outside.
  Ref. GIRPI CONE50U for pipes Ø 20 to 50 mm
- **Chamfering tool**
  This tool chamfers the pipe outside from Ø 63 to Ø 160.
  Ref. FT 55 05 10
- **Reamer**
  This reams the inside of pipes of all diameters.
  Ref. FT 80 00 08 Ø 20 to 160 mm
- **The use of tools including cutting or abrading disks to chamfer pipes is strictly prohibited.**

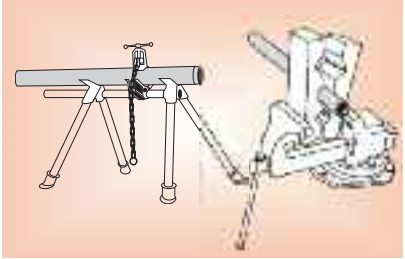




HOLDING TOOLS (not supplied by Durapipe)

- **Chain vice**
  Polyurethane pipe-rests hold the pipe without any scratching.
- **Strap wrench**
  Maximum gripping power, with no risk of deforming the pipes or fittings (braided nylon strap).
- **Bench vice**
  When using such traditional vices, it is mandatory to clamp the pipes by means of wooden notched pipe-rests.





GENERAL RULES OF INSTALLATION
JOINTING PROCEDURE

1. Equipment required.

2. Cut pipe square to required length.

3. Chamfer and trim end of pipe.

4. Measure socket depth.

5. Mark on pipe the socket depth and a known value.

6. Stir solvent cement.

7. Apply solvent cement to fitting and pipe.

8. Push fitting straight home and hold for a few seconds.

9. Final joint.

CHECKS PRIOR TO WELDING

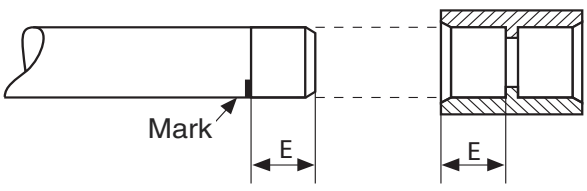
The priming operation can be replaced by the cleaning of pipes and fittings with a clean cloth if the pipes and fittings are clean and dry. Otherwise, the priming will be made with D171P cleaner to eliminate all traces of grease (finger marks, greasy dirt etc).

Before welding it is important to make certain checks:

- Pipes and fittings: see that they contain no sign of impact, deep scratches, etc.
- Solvent cement: it must be fluid, homogeneous, check expiry date on base of container.
- Pipes: check that they are chamferred to approximately 50% of the pipe wall.

MARKING OF THE SOCKET LENGTH

- Using a thick pencil or felt maker, draw a mark on the pipe at a distance equal to the corresponding socket depth plus 10mm.



This mark enables the application of the solvent cement over the necessary length, and helps the installer to check whether the penetration length of the male end in the socket is correct.

GENERAL RULES OF INSTALLATION
WELDING PROCEDURE

SOLVENT CEMENT APPLICATION

- Once the checks and marking have been done, apply RERFIX solvent cement, available in 250ml or 1 litre pots.
- To apply the solvent cement, use the applicator provided with the pot.
- Rollers provided with 250ml pots are fit for use with sizes 20 to 40mm.
- Rollers provided with 1 litre pots are fit for use with sizes 40 to 160mm.

For sizes equal or larger than 90 mm, a suitable brush can be used.

The use of any other means or method is prohibited, namely: fingers, wood sticks, or any other utensil. Dipping the pipes or fittings directly into the solvent cement pots is prohibited (such practices lead to the creation of thick solvent cement deposits, which can cause obstruction of small bore pipeworks).

Apply the cement to the complete socket depth insertion depth of the pipe. The cement should be applied so as to obtain a uniform, homogeneous coat, well spread over the complete joint interface.

Note: Due to manufacturing tolerances it is possible for a variety of fit to exist between pipes and fittings ranging from an interference fit to that of a looser (or slide) fit. It is important to ensure that sufficient solvent cement is applied to both joint surfaces – if necessary by applying a second coat of cement to the outside of the pipe.

Note: modifying the solvent cement's composition by dilution or by any other means is prohibited.

JOINTING

- Immediately after applying the solvent cement, joint the two elements right home (as far as the marks previously traced) by pushing longitudinally and without twisting.
- Keep held together for 5 seconds.

Note: In certain cases it is necessary to mark the position of one element in relation to the other. On large sizes, 2 fitters must operate simultaneously, ie one fitter will coat the male end, while the other fitter will be coating the female end with solvent cement. This method enables a quick jointing procedure, required for a strong weld.

SOLVENT CEMENT CONSUMPTION

Approximate quantity of joints per litre:

Pipe size (mm)	20-25-32	40-50-63	75	90-110	160
Quantity of Joints	500	100	50	30	15

Note: *These figures were estimated from laboratory tests. Because of the many variables on construction sites, these figures are only indicative.*

IMPORTANT

- Water impairs the solvent cement and subsequently the welding quality. No cold welding will therefore be made if the parts to be assembled are damp (prior drying required).
- RERFIX can be applied when the temperature is over +5°C and under + 35°C. Welding can take place at 0°C ambient temperature with a solvent cement kept at 20°C.
- The atmospheric conditions (temperature, humidity) considerably affect the curing time (drying, evaporation of solvents) of the solvent cement.
- At low temperature, the parts when assembled should be held together for 20 to 30 seconds.
- In hot weather, the adhesive should be applied rapidly and the parts immediately jointed.
- So as to avoid evaporation of the solvent cement, the pot must be closed after each welding operation, and it must be used as quickly as possible once opened, especially under warm climatic conditions.

DRYING TIMES

The drying times will vary with fit, amount of solvent cement applied, ambient temperature and working pressure. It is recommended that, wherever possible, joints are allowed to dry for at least 24 hours. These guidelines are based on an ambient temperature of between 10°C to 40°C. Longer drying times will be required at lower and higher ambient temperatures.

DRYING TIMES BEFORE PRESSURE TESTS:		6 bar • C-PVC = 60°C		
		ø16 - 63	ø75 - 110	ø125 - 160
Ambient temperature	5 - 10°C	2 h	4 h	24 h
	11 - 35°C	1 h	2 h	24 h

GENERAL RULES OF INSTALLATION
RECOMMENDATIONS

NETWORK FLUSHING PROCEDURE

Flushing will limit bio-film thickness in water systems; shear forces caused by flushing will remove bio-film which extends out into the turbulent flow in the centre of a pipe. HTA® should be flushed out in accordance with BS 5955 Part 8.

THERMOFORMING

Thermoforming of pipes is **strictly prohibited on the work site** and involves cancellation of the HTA® guarantees.
For all direction changes, make use of standard HTA® fittings only. Contact Durapipe technical support regarding factory-made special bends.

CONNECTIONS BETWEEN HTA® AND THREADED METAL COMPONENTS

Fittings equipped with threaded metal components can be used for connections to metal threaded components. They allow for the use of traditional sealants. PTFE tape/ thread (eg. Loctite 55) is preferred.
Anaerobic thread sealants must not be used.

Excluding connection to wall plates (namely our reference GAAP), obtained by means of tap connectors (HDR reference), connections between HTA® and metal pipes, fittings and equipment featuring male or female threads (conical/taper or cylindrical/parallel) must be made by means of the CPVC/metal couplings provided for this purpose.

GENERAL RULES OF INSTALLATION
COMMISSIONING, TESTS AND PUTTING INTO SERVICE

GENERAL

HTA® pipes and fittings are inspected throughout their manufacture and are guaranteed for a use complying with their design, within the limits indicated.

During the installation and before putting the HTA® network into service, it is advisable to make a certain number of checks, as with all other materials.

Refer to best practices and recommendation given in BS 5955 Part 8 and CEN/TR12108:2012.

INSPECTION

a) Visual inspection

During and after installation, pipes and fittings should be inspected for abnormalities such as impacts and deep scores caused by unsuitable handling. Before the tests, the whole network will be visually inspected to eliminate any pipework section containing deep cuts or notches, large deformations due to sudden impacts, traces of blow torch burns, etc.
Any damaged part should be replaced before putting into service. The aim of the visual inspection is also to ensure that the installation complies with the drawings and hence the correct installation of all the components (connection, supports, monitoring and safety mechanisms, etc).

b) Leak tests

After installation of the network, a leak test will be carried out (all parts of the network should be visible and accessible during that test).

c) Pressure test

The network shall be filled with water (purge the air from all high points) and kept under pressure long enough to enable visual control of all joints, and no less than 30 minutes. (For large installations, test by sections).
The testing pressure will amount to 1.5 times the maximum working pressure, with a minimum of 10 bar for hot and cold water services.

- If a leak is detected on a welded joint, replace the leaking section and test again.
- If a leak is detected on a mechanical joint, tighten the connection or replace gasket.

d) Temperature test

When raising the pipework's temperature for the first time, the absence of leaks must be checked for all valves and joints.

TEST BEFORE PUTTING INTO SERVICE

Once the leak tests have been made, it is advisable, in order to remove all foreign matter, to clean the inside of the network. All applicable tests and controls before putting into service must be carried out, according to all relevant regulations, rules and codes of practice.

OPERATING CONDITIONS

Whatever the use, the safety mechanisms necessary for the traditional protection of networks (regulation, pressure reduction and limitation, temperature regulation and limitation, shut off mechanisms, etc), should be planned, installed and kept in perfect working order throughout the life of the installation.

a) Vibrations

Vibrations can be a source of disorders on both pipework and supports; it is highly advisable to install a suitable system preventing vibrations from spreading.

b) Sources of heat and UV

Being made from thermoplastic material, HTA® should in no case be installed close to a source of heat causing a rise in temperature greater than its limits of use, and must be protected from exposure to ultraviolet rays.

c) Prevention of impacts

As with all networks conveying pressurised fluids, HTA® pipework systems must be protected from impacts which might occur in passage ways used by handling machinery or suspended loads in movement (use of safety barriers, railings, etc).

d) Chemical compatibility

We draw your attention to potential compatibility problems if chemicals are introduced into the pipework. The suitability of any additives, inhibitors or biocides must be confirmed by Durapipe UK prior to introduction into the system.

e) Air conditioning networks

The introduction of monopropylene glycol (MPG) antifreeze is prohibited.

f) Bracketing

The use of MONOKLIP® brackets or Durapipe rubber lined clips is recommended.

Note: Some rubbers contain phthalates that when heated may migrate and chemically attack HTA material, causing failures. Any other makes of clip require approval by the Durapipe technical support team before use.

g) Insulation materials

Electric cable insulation materials contain substances that can potentially damage HTA® pipes. Therefore, it is advised not to store or install HTA® pipes near electric cables.

EXPANSION - CONTRACTION
CALCULATIONS

THE ISSUE

All materials whatsoever:
- expand when the temperature rises,
- contract when the temperature drops.

CALCULATION PARAMETERS FOR HTA®

The linear expansion coefficient of HTA® is: α = 0,065 millimeter per meter per °C (mm/m.°C)

The installation of the system must take the elongation or contraction of the pipe into account, which is calculated by this formula in which:

$$\Delta L = \alpha \times L \times \Delta T$$

α = expansion-contraction coefficient (linear)
L = length of the piping when installed, in meters
Δ**T** = temperature deviation in degrees Celsius/Centigrade (°C)
(difference between the maximum or minimum temperature in service and the installation temperature).
Δ**L** = length variation in millimeters (mm)
(difference in length between L on installation and L in operation, ie. elongation or shrinkage length).

Ex 1 : installation temperature ***+ 10°C***
installed length ***10m***
working temperature (fluid or room) ***+ 60°C***
ΔT = 60 - 10 = **50°C**
ΔL = 0.065 x 10 x 50 = **33mm**

Ex 1 : installation temperature (fluid or room) ***+ 15°C***
installed length ***30m***
working temperature (fluid or room) ***+ 5°C***
ΔT = 15 - 5 = **10°C**
ΔL = 0.065 x 30 x 10 = **19mm**

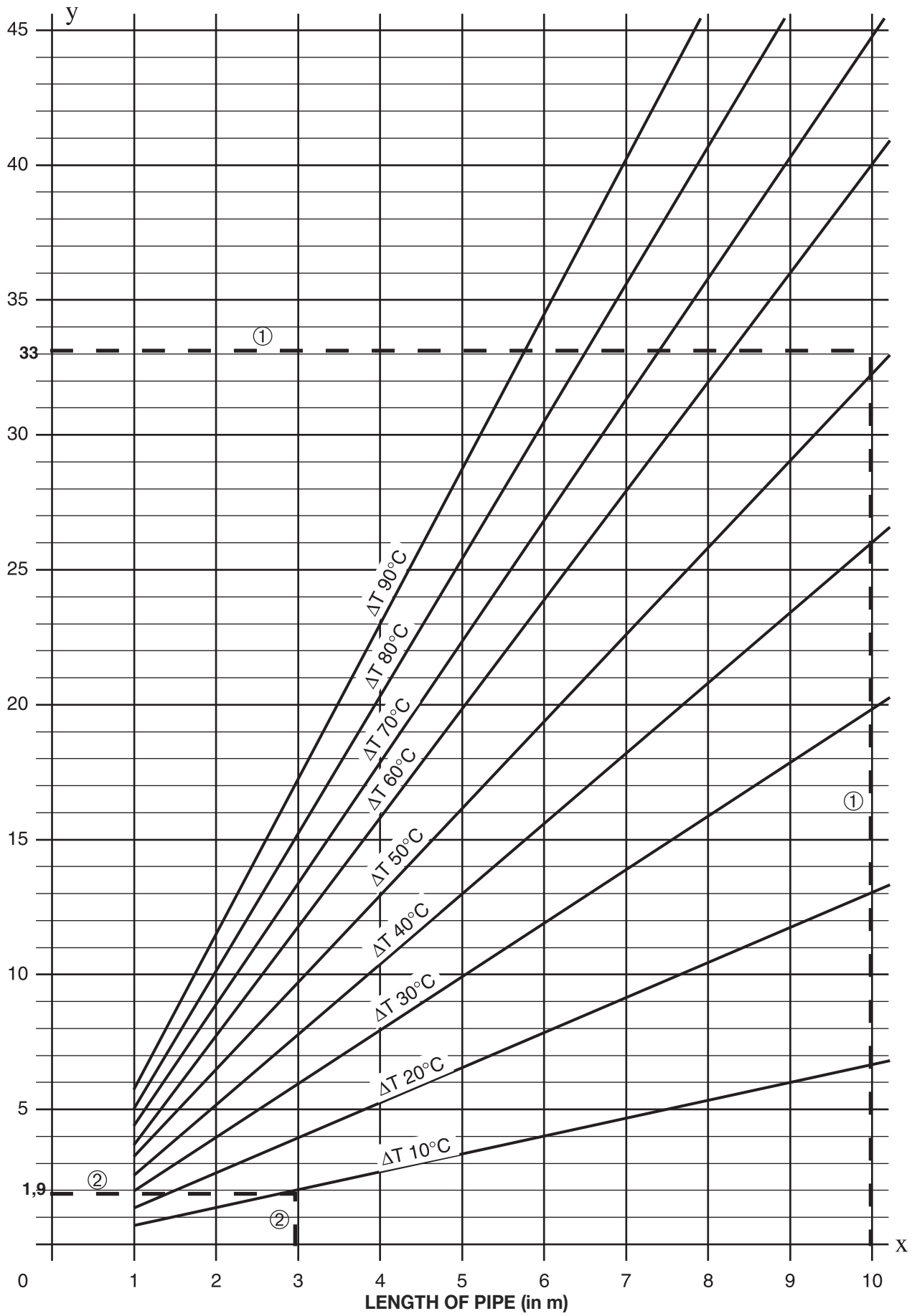
Use the chart to work out the ΔL resulting from the above formula (see descriptive sheet 5.2)

Example 1: Find the ΔL of a 10 m long pipe section for a ΔT = 50°C
Answer: 33 mm

Example 2: Find the ΔL of a 30 m long pipe section for a ΔT = 10°C
Answer: 19 mm to find that result take 3,0 m on Ox and read 1,9 on Oy passing by ΔT 30°C and multiply the result by 10 = 1.9 mm x 10.

HTA® expansion slide rules will enable you to calculate expansion loop dimensions and bracket positioning in changes of direction. These are available on request.

EXPANSION - CONTRACTION
CALCULATIONS



EXPANSION - CONTRACTION
CONSEQUENCES

CONSEQUENCES OF CONTRACTION-EXPANSION AND SOLUTIONS

Under certain conditions, the elongation due to the expansion causes compression of the pipe resulting in buckling. Conversely, the shortening due to the contraction of the pipe cause it to be tensioned. The sketches below illustrate a number of cases of compression or tension, which cause abnormal stress on the material and may cause serious disorders.

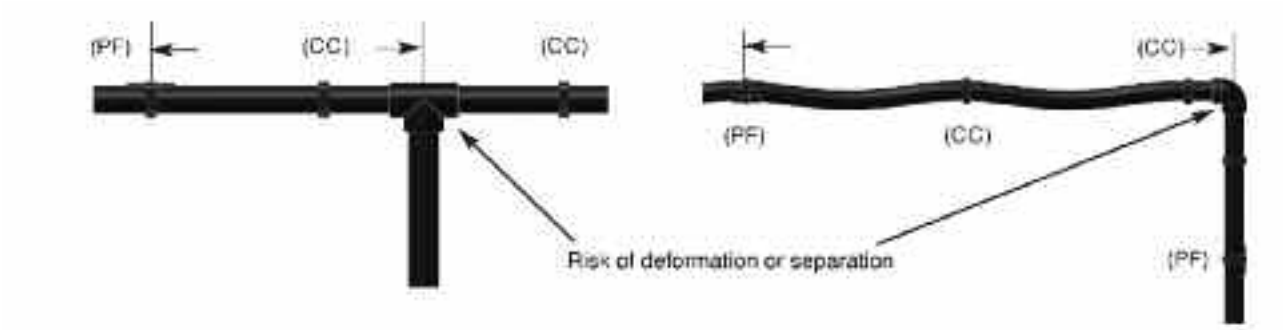
When installing, it is necessary, in order to avoid disorders which may be caused by variations in length, to recognise them and address them.

EXPANSION (compression between fixed points).

PF : Anchor point
CC : Guide (bracket)
→ : Direction of the expansion movement

DON'Ts:

Buckling of the pipe between anchors

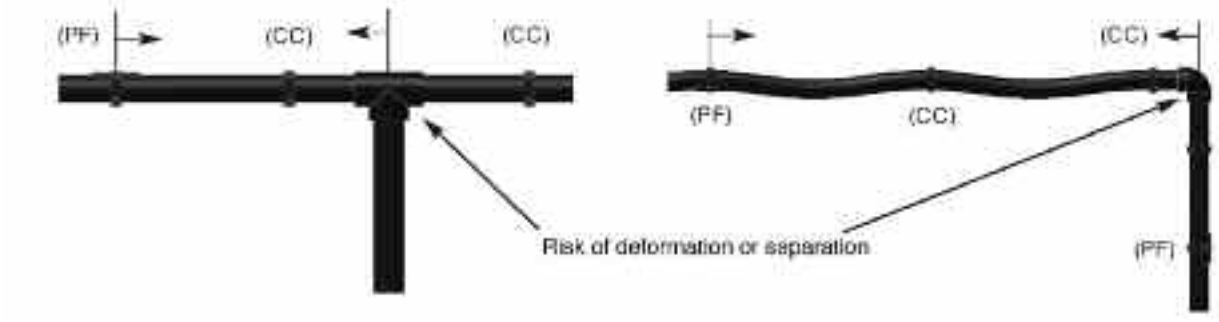


CONTRACTION (tension between fixed points)

DON'Ts:

Tensioning of pipes, mechanical couplings, jointings between anchors

Tensioning between walls, obstacles, jointings or material forming an anchor



(1) PF: ANCHOR: This is a support blocking the pipework system at one point, in order to 'orientate' the movements caused by expansion and contraction.
(2) CC: GUIDE: They support the pipes while allowing them to expand and contract freely.

EXPANSION - CONTRACTION
REMEDIES

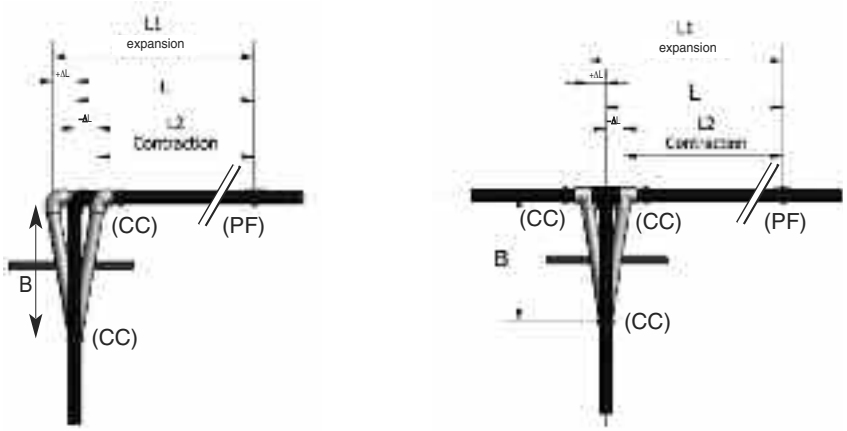
THE REMEDIES

Pipe should be able to expand and contract freely.

It is therefore necessary to:
- Use pipe brackets allowing the longitudinal movements of the pipe to be guided (GUIDES).
- See to it that there never is a straight length of pipe between 2 anchors, either by using a change in direction, or by making a loop (see illustration below).

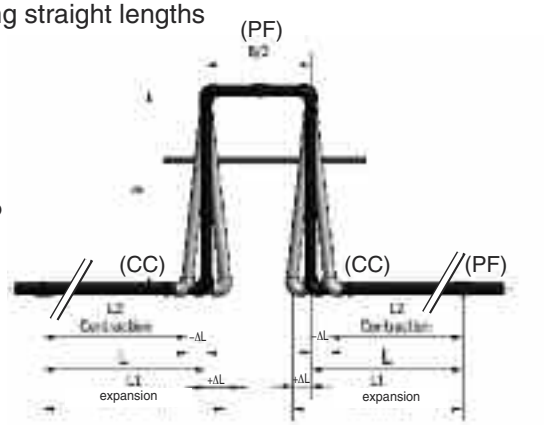
1. **Change in direction**, which **is generally effective in most cases**

CHANGE IN DIRECTION

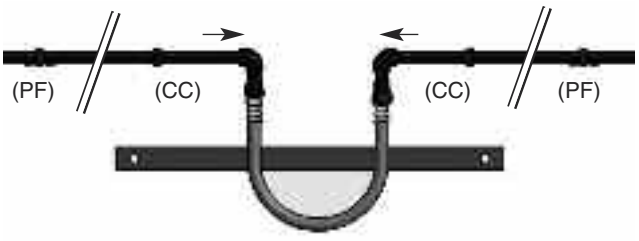


2. **Loop** made with HTA® pipes and fittings, usually installed on long straight lengths

LOOP



3. **Expansion joints** (HCD/G flexibles)



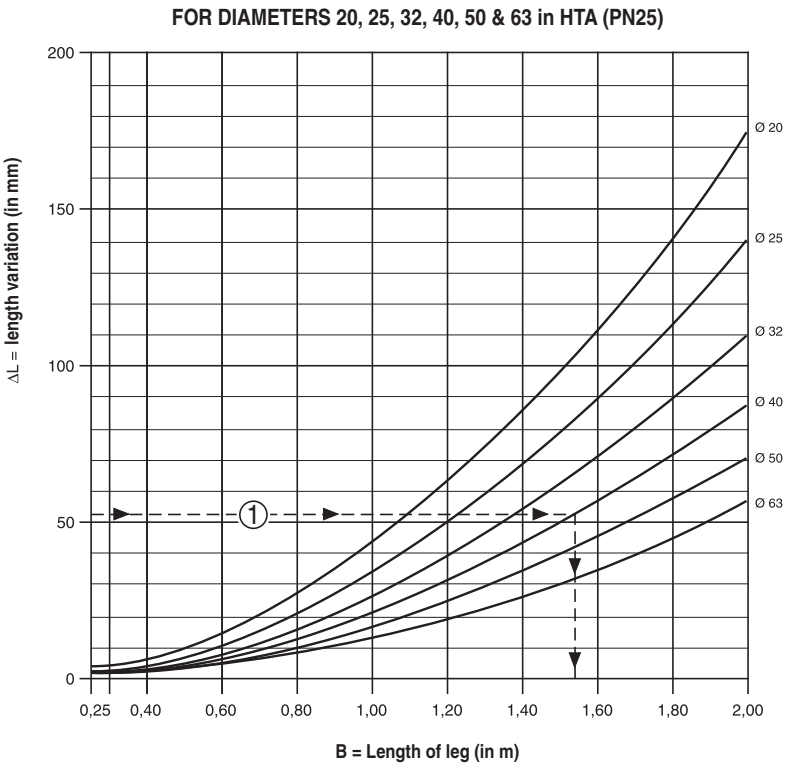
L	: Length of pipe section during installation.
L1	: Length at maximum temperature.
L2	: Length at minimum temperature.
ΔL	: Length difference between L1 or L2 and L.
B	: Length of loop's arm.

LINEAR COMPENSATORS (COMP BELLOWS)

Bellows and flexibles are elements which need no maintenance, but they are subject to wear. As such, they need to be checked at regular intervals. It must be possible to inspect them, dismantle them, and replace them without having to dismantle the elements next to them. For installation refer to technical sheet 5.8.

CONTRACTION - EXPANSION
CALCULATION OF LEG B

EXAMPLE ①
Determine **B**
for a Ø 40 mm pipe and
a ΔL of 53 mm
Result: **B** = 1,55 m.



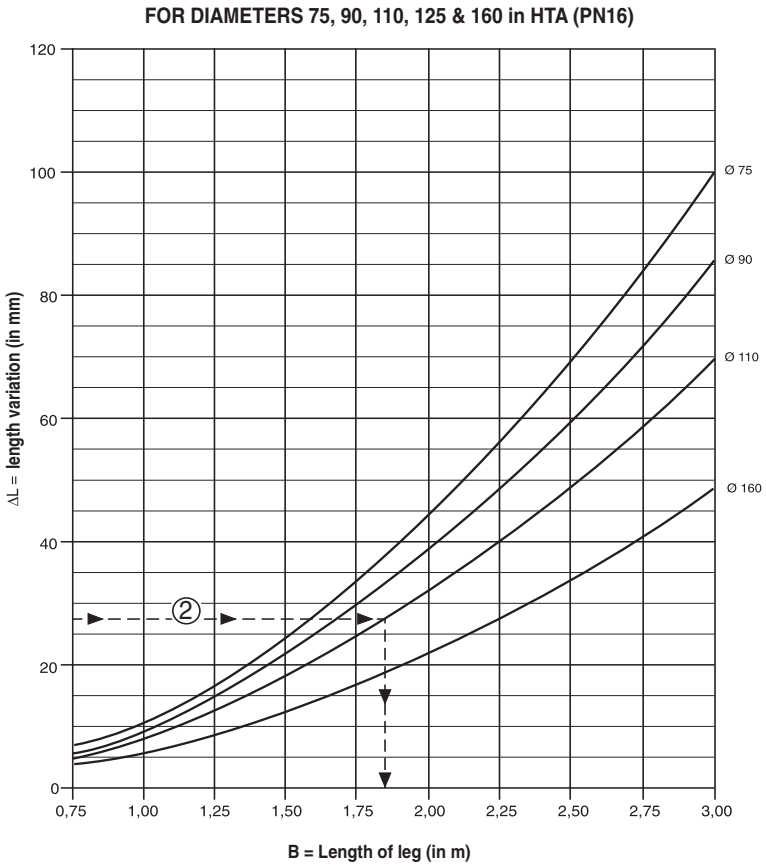
Calculation formula of loop leg:

$$B = 34 \sqrt{Ø \times \Delta L}$$

34: constant material value

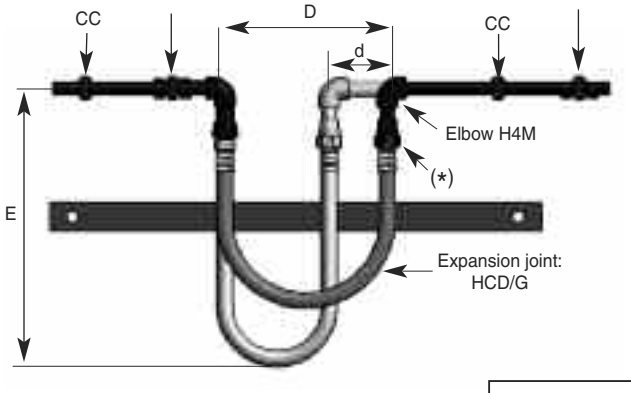
Ø: external diameter

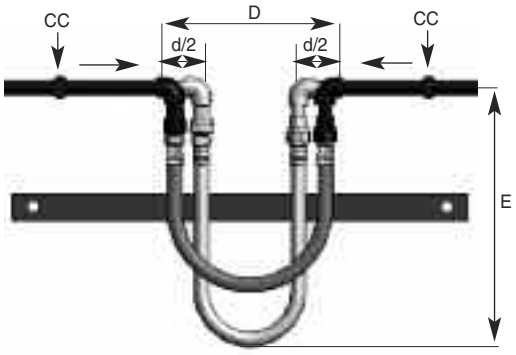
ΔL: length variation



EXAMPLE ②
Determine **B**
for a Ø 110 mm pipe and
a ΔL of 28 mm
Result: **B** = 1,85 m

CONTRACTION - EXPANSION
FLEXIBLE EXPANSION JOINTS





* Depending on the type of flexible: male or female threaded adaptor.
Threaded adaptors: HMML
Adaptor nipples: HEAL

➡	: Direction of the expansion movement
D :	Distance at time of installation (open position)
d :	Amount of expansion absorbed
E :	Maximum distance between main pipe and end of flexible (closed position)
PF :	Anchor point
CC :	Guide (bracket)

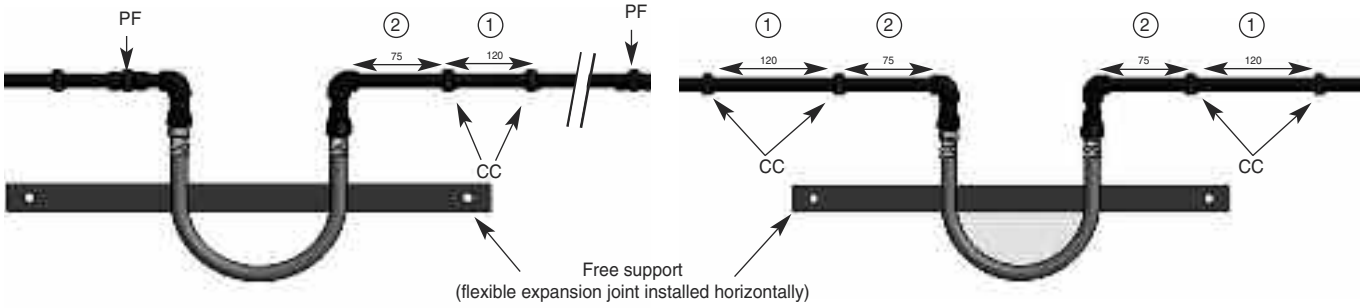
FLEXIBLE EXPANSION JOINTS SUPPORTING

1) The first guide will be at distance ② ≈ 75 mm (maximum distance), the next bracket in line will be at a distance ① ≈ 120 mm from the first.

2) The surface finish of the free support supporting the expansion joint will be such that the braiding is not deteriorated by friction.

Ø pipe HTA®	Article	D	d	E	Ø pipe HTA®	Article	D	d	E
16	**GHCD/G16**	180	100	230	32	**GHCD/G32**	350	100	407
20	**GHCD/G20**	220	100	282	40	**GHCD/G40**	420	100	442
25	**GHCD/G25**	280	100	338	50	**GHCD/G50**	500	100	591

EXPANSION JOINTS WITH BRASS THREADS



WORKING PRESSURE FOR FLEXIBLE EXPANSION JOINTS FROM 5°C TO 100°C

Ø pipe HTA®	16	20	25	32	40	50
Article	GHCD/G16	GHCD/G20	GHCD/G25	GHCD/G32	GHCD/G40	GHCD/G50
Working pressure (bar)	18	18	14	10	10	7

CONTRACTION - EXPANSION
FLEXIBLE EXPANSION JOINTS

IMPLEMENTATION OF FLEXIBLE EXPANSION JOINTS

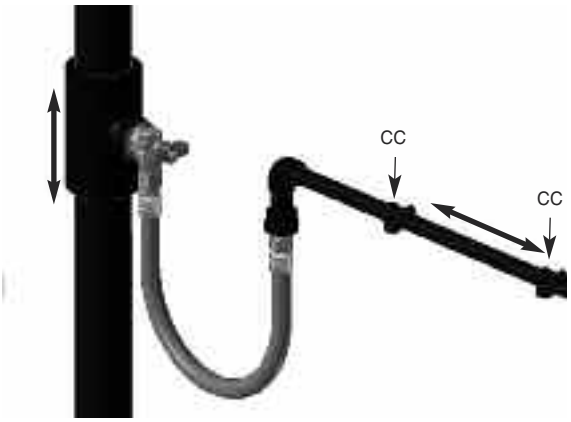
To guarantee correct operation, the following rules must be respected when designing/installing the flexible expansion joints:

a) respect the clearances defined on sheet 5.6
b) ensure that the flexible expansion joint is not subjected to twisting during installation or during operation
c) provide appropriate supporting in situations where the flexible expansion joint is overhanging.

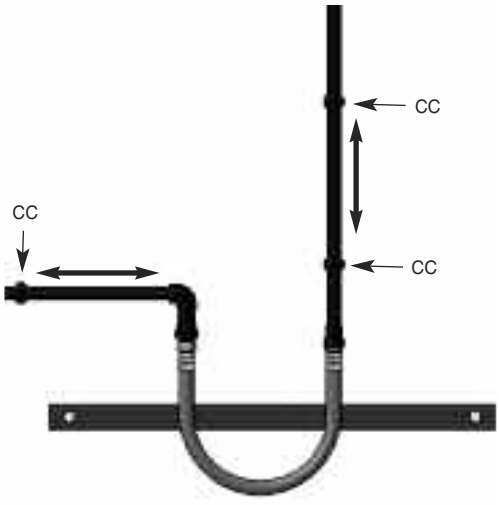
INSTALLATION EXAMPLES:

in line

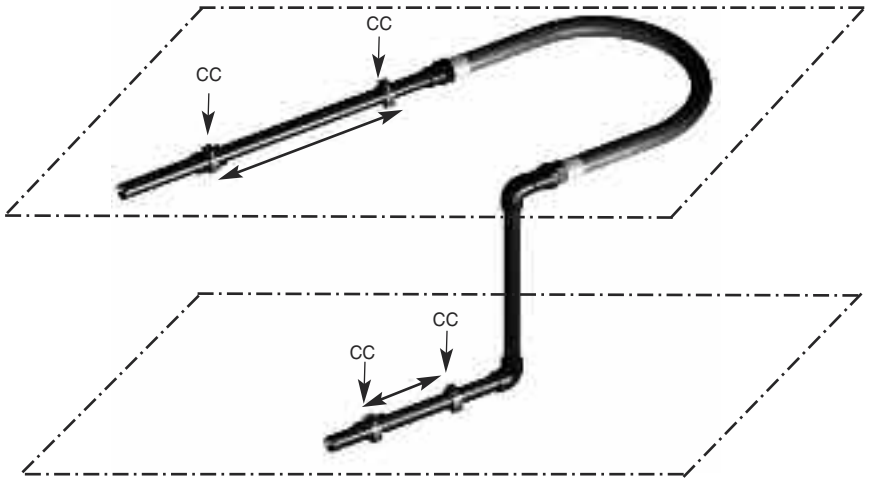
branch



direction change
on same level



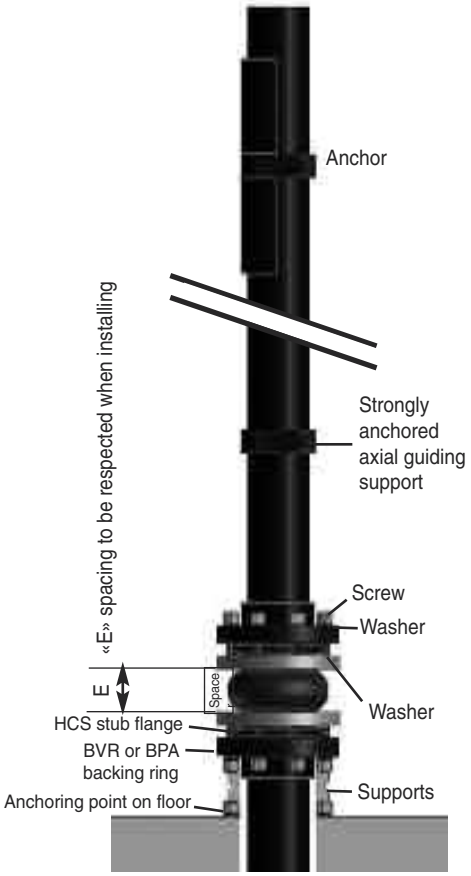
direction change on two
different levels



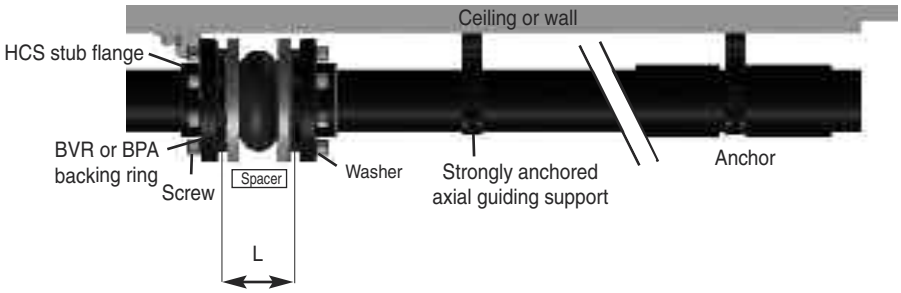
PF	: Anchor point
CC	: Guide (bracket)
➡	: Direction of the expansion movement

EXPANSION - CONTRACTION
LINEAR EXPANSION COMPENSATORS

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION



Please refer to sheet 5.1 to calculate expansion or contraction.

Absorption of expansion/contraction of pipework

Ref. Dilaplast	Extension of Bellows mm	Compression of Bellows mm	Length mm	E Spacing mm	Backing Ring Ref	Stub Flange Ref	Screw Dim.
GCOMP 40	20	30	100	62	GBVR32B	GHCS40	M 16x50
GCOMP 50	20	30	100	62	GBVR40B	GHCS50	M 16x50
GCOMP 63	20	30	100	62	GBVR50B	GHCS63	M 16x50
GCOMP 75	20	30	100	62	GBPA65	GHCS75	M 16x50
GCOMP 90	20	30	100	58	GBPA80	GHCS90	M 16x55
GCOMP 110	20	30	100	58	GBPA100	GHCS110	M 16x55
GCOMP 125	20	30	100	58	GBPA125	GHCS125	M 16x60
GCOMP 160	20	30	100	54	GBVR150	GHCS160	M 20x70

See technical sheet 8.15 for flanging kit details.

INSTALLATION

Never work with sharp tools which may damage the rubber bellows.

The flange screws must not protrude towards the bellow. Under operating conditions, the spherical bellow rolls on the smooth disks of the flange. All parts must be fully deburred and cleaned (otherwise, there is a risk of damaging the bellows).

Rubber parts must not be painted (solvents and chemical products have a negative effect).

We recommend that you use spacer wedges when you install the DILAPLAST compensator. This will maintain the spacing defined at installation temperature (E). Spacers need to be removed upon completion of installation and testing of pipework.

PIPEWORK ENVIRONMENT
MONOKLIP® BRACKETS – GENERAL DESCRIPTION SUPPORTING SPACING

GENERAL DESCRIPTION

MONOKLIP® brackets have been especially designed to support HTA® pipeworks. The pipe is allowed to move freely inside the bracket as it expands and contracts. They are offered with M8 female threaded brass inserts.

In all cases, the supports:

- shall continue to support their load even under temperature variation effects
- shall allow the pipeworks to expand freely
- shall keep the pipeworks which they support at enough clearance from any wall or obstacle so as to allow for the expansion movements and also for the assembly and disassembly of the mechanical couplings and accessories (unions, flanges, valves, pressure limiters, etc)
- shall in no event damage the pipeworks

SPACING OF SUPPORTS (FOR FILLED PIPEWORKS)

DISTANCE BETWEEN SUPPORTS (HORIZONTAL PIPES)

Ø pipe	Ambient or fluid temperature (°C)				
	≤ 20°	40°	60°	80°	90°
20	0.85	0.80	0.70	0.65	0.55
25	0.90	0.85	0.75	0.70	0.60
32	1.00	0.95	0.85	0.75	0.65
40	1.10	1.05	0.95	0.80	0.75
50	1.25	1.15	1.05	0.90	0.80
63	1.40	1.30	1.20	1.10	1.00
75	1.50	1.40	1.25	1.10	1.00
90	1.75	1.60	1.35	1.15	1.05
110	1.85	1.75	1.60	1.35	1.10
125	1.90	1.80	1.65	1.35	1.15
160	2.00	1.90	1.75	1.40	1.20

Note: For vertical pipes, the above distances can be multiplied by 1.3 up to 60°C and 1.2 for temperatures over 60°C. When taps or heavy accessories are installed on a pipe, these must be supported independently.

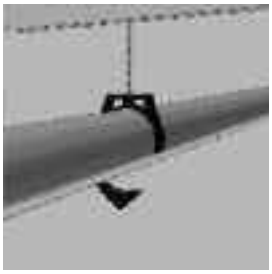
SUPPORT OF HEAVY EQUIPMENT

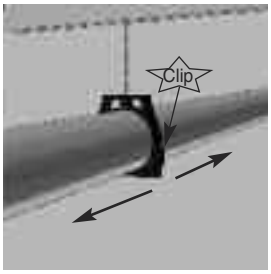
Large valves, strainers and other heavy equipment should always be independently supported to prevent undue loading onto the HTA® system.

PIPEWORK ENVIRONMENT
MONOKLIP® BRACKETS EXAMPLES

EXAMPLES OF SUPPORTS

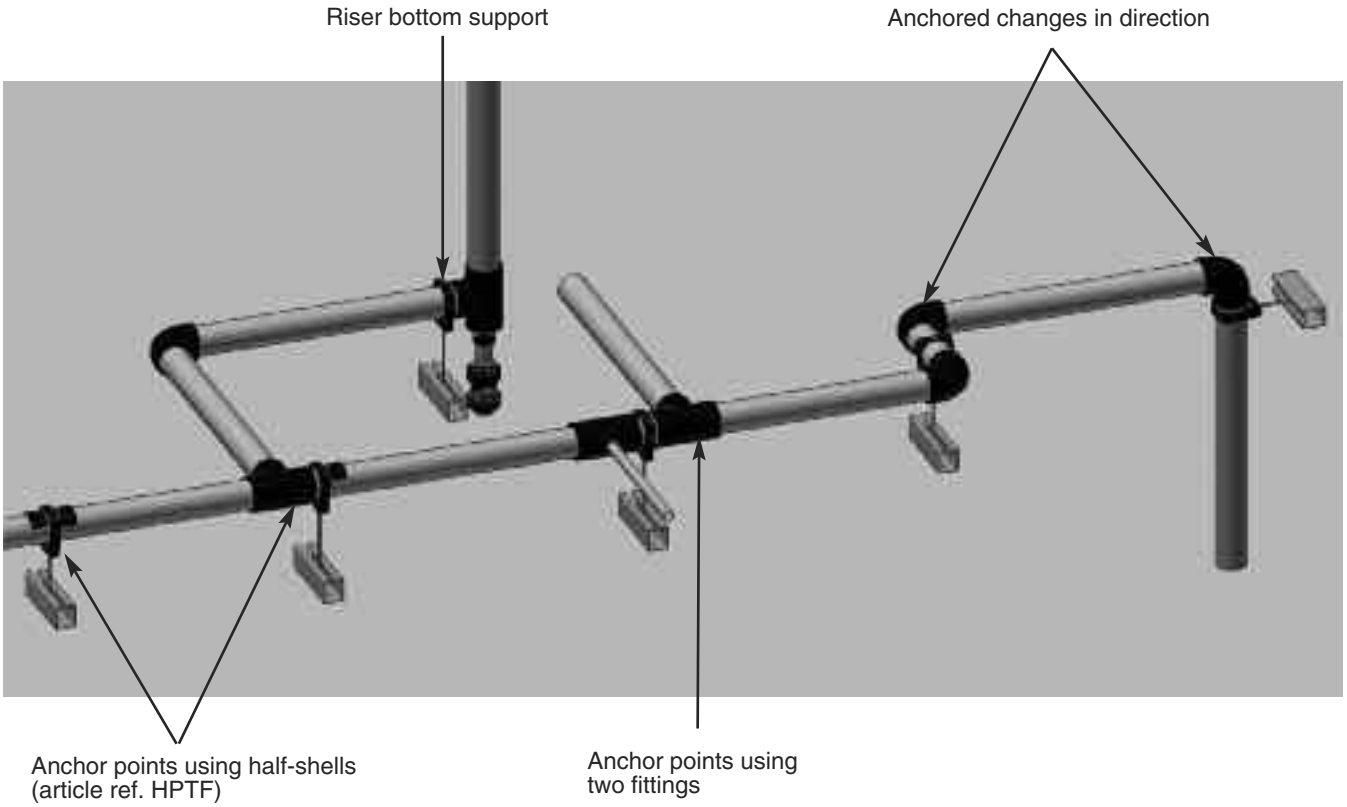
MONOKLIP® brackets





Bracket which works as a guide to ensure free movement of the pipes

EXAMPLES OF ANCHORS

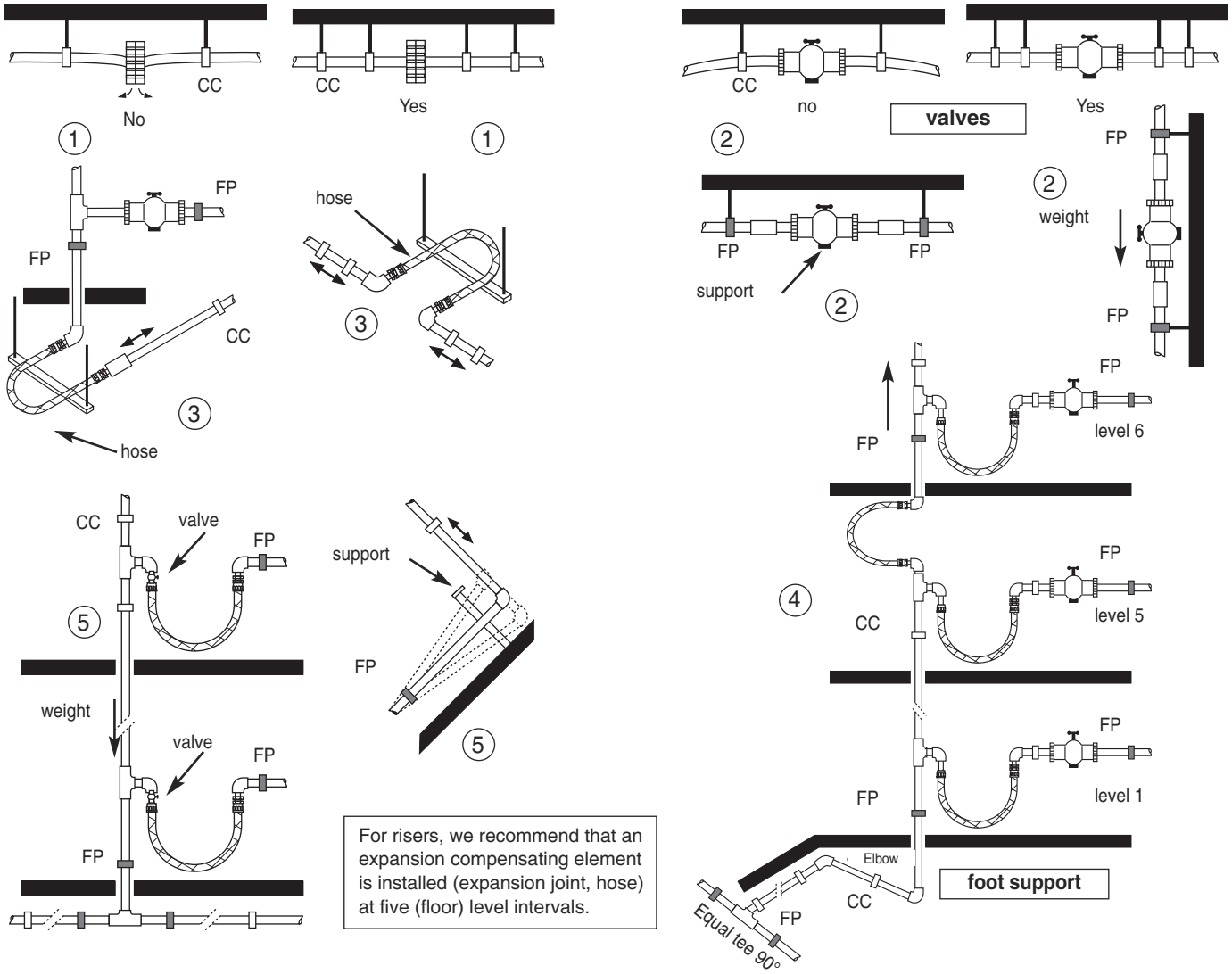


PIPEWORK ENVIRONMENT
MONOKLIP® BRACKETS ACCESSORIES – SPECIAL POINT

Various accessories or special points require specific supporting: this supporting must be carefully designed in each case, to prevent the pipes from being subjected to mechanical forces.

	CASE	TYPES OF SUPPORT	REASONS
1	• C-PVC male and female threaded fittings and hose nozzles	Free or fixed on either side (double support)	To avoid tension on threads due to movement out of axis
2	• Valves and fittings	On either side and often with fixed point (double support)	Weight, must operate without twisting on pipe and threads
3	• Hoses/Expansion joints	(See technical sheet 5.6)	To allow movement without rotation, without moving out of axis and without chaffing
4	• Riser bottom	Free or fixed depending on the case	To support the weight of the riser
5	• Direction changes	Forming a right angle	To allow translation of the loop arm, to prevent sag and wear

IMPORTANT
The sliding supports must be positioned in such a way that the couplings or accessories do not come in contact with them when the pipes expand and contract.



PIPEWORK ENVIRONMENT
THERMAL INSULATION

INSULATION

The low thermal conductivity coefficient (λ = 0.16 W/mK) of CPVC and the high thermal resistance of HTA® helps reduce heat losses and delay condensation. Like all other materials, HTA® must be insulated to be protected against frost, to reduce heat losses and to avoid condensation when the outside pipe temperature is below dew point. Although C-PVC has lower thermal diffusivity than copper, insulation requirements are the same and should be in accordance with BS 5422, BS 8558, Water Byelaws and Building Regulations.

Most insulation products can be used, except those whose installation requirements (eg. use of certain adhesives) or chemical composition are not compatible with HTA®. If in doubt, the user must check the insulation product's compatibility with Durapipe UK. Some insulation products can contain substances capable of having a detrimental effect on thermoplastic pipework eg. Certain types of foam rubber insulations can cause pipes to fail where the HTA® is conveying liquids at temperatures above 30°C. Recommended insulation – a list of some of the common types of insulation materials known to be suitable with HTA® pipework are as follows; Fibre wool, such as 'Rockwool', Armaflex Class 1 HT, Koolphen K Phenolic foam and Polystyrene.

Note: The above list is not exhaustive – please contact our Technical Support Department if further assistance is required. Some adhesives can also be detrimental. Do not bond insulation to HTA®. (The comment also applies to any tapes, adhesives, or other substances used to secure heating tape to the pipework.) Tapes used for service and flow marking should be suitable for use with plastic pipe systems.

Condensation resulting from the circulation of fluids colder than ambient temperature have no physical or chemical influence on HTA®. Therefore, insulation is not systematically required. The decision will be made according to the installation's specific characteristics, and to the consequences of potential condensation on the environment around the pipework. In comparison with traditional metal pipeworks, HTA® delays condensation. HTA® does not require any anti-corrosion treatment before insulation. The fire rating of the insulating products must comply with the security standards against fire in public buildings.
It is better not to glue the insulating materials directly on the HTA® pipes and fittings.

SURFACE TEMPERATURE

The table hereunder, showing various surface temperatures, shows that the low thermal conductivity of HTA® provides you with a security margin in situations such as: underdimensionned insulation, incorrectly jointed insulation sections, insulation's accidental failure. Example:

		Surface temperature (non insulated)		
		Metallic pipe	HTA® pipe	HTA® coupling
Fluid temperature = 7°	ø25	7°C	9°C	12°C
Ambient temperature = 23°C	ø50	7°C	11°C	14°C
he = 8 W/m^2	ø110	7°C	12°C	15°C
Dew point = 16.1°C				

he: external surface exchange coefficient

The following table shows the heat losses (expressed in W/m) of HTA® pipeworks (with or without insulation):

Fluid temperature = 50°C Ambient temperature = 20°C he = 10/Wm^{2}K	No insulation	Insulation material (λ=0.039W/mK) Thickness = 9mm	Insulation material (λ=0.039W/mK) Thickness = 13mm	Insulation material (λ=0.039W/mK) Thickness = 19mm	Insulation material (λ=0.039W/mK) Thickness = 32mm
ø25	19.5	9.3	7.9	6.6	5.2
ø50	37.3	15.9	13.1	10.6	7.9
ø110	66.4	29.1	23.8	18.9	13.5

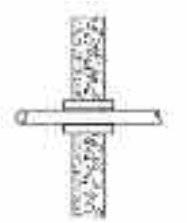
APPLICATIONS

Application	Temperature	Recommended Insulation material	Recommended thickness for internal use (mm)*
Hot & Cold Water Services	+ 60°C/+ 70°C	Mineral wool	25 - 30

*The above thicknesses are given as an indication only, and can vary according to the project's location (ie. dew point, ambient humidity, ambient temperature will vary according to location) and to the network's configuration (length, network loop design, fluid velocity). It is the user's responsibility to have thicknesses checked by a specialised consulting engineer.

PIPEWORK ENVIRONMENT
SPECIAL CASES

Passing through partitions and floors

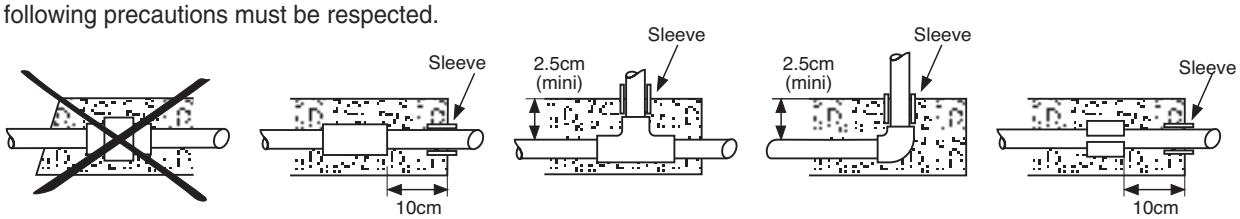


When HTA® pipe goes through a wall or a floor, it must be protected by a rigid sleeve made of synthetic material, and preferrably C-PVC.

The sleeve internal diameter is chosen with enough tolerance to allow the pipes to expand and contract freely. The sleeve must be long enough to protrude on both sides of the finished masonry element.

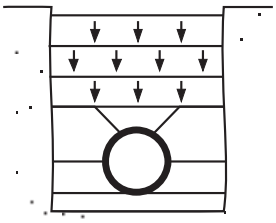
Built-in or embedded installations

HTA® can be built or embedded in the masonry as long as there is no disconnectable coupling in that pipework section. The following precautions must be respected.



- The pipe must be made integral with the masonry either by means of the couplings making up the system or using half-shells onto the wall of the pipe.
- Each time the pipe enters the masonry it must be protected against shearing by a sleeve which protrudes from the finished surface of the masonry.
- The chase will be filled with a homogeneous material without sharp gravel which could damage the pipe.
- The commissioning tests must be carried out before filling the chase or pouring the concrete.

BURIED INSTALLATIONS



HTA® pipework can be buried if the following precautions are respected:

- The bottom of the excavation must be levelled and free of large grained materials and have no surface hard spots.
- A carefully compacted bed of 10cm minimum will be made of clean sand 0/10 containing less than 10% of fines.
- The backfill directly in contact with the pipe (comprised of sand containing less than 12% of fines and free of gravel with diameter greater than 30mm) will cover the pipe to a depth of 15cm minimum and will be compacted.
- The covering backfill will be compacted in successive layers comprised of materials removed from the trench and which contain less than 30% of elements greater than 20mm.
- The minimum total height of the backfill above the pipe will be:
  - general case: 60cm
  - under road/rail traffic: 80 cm
  - under concrete slab: 40cm

TRACE HEATING

HTA® can be equipped with trace heating systems, however an aluminium/foil barrier should be put between the PVC-C pipe and the trace heating tape to prevent any harmful plasticisers migrating into the PVC-C material, and to assist heat conduction – failure to do so can result in the pipe cracking. The surface temperature of the heating strips must not exceed 70°C.

It should be ensured that only such trace heating systems are used as are suitable for plastic piping. All trace heating systems should comply with BS 6351 specification for electric surface heating devices.

Part 1: Requirements; Part 2: Guide to System Design; and Part 3: Code of Practice for Installation. Also refer to IEC 60800. Trace heating is used on both hot and cold water piping to prevent the pipes from freezing.

Note: Guidance should be sought from Durapipe UK technical support department before installation.

PRESSURE LOSSES
CALCULATION RULES

CALCULATION OF PRESSURE LOSSES

The quality of the internal surface condition of HTA® pipes and fittings guarantees a flow rate higher (for an equivalent section) than the one provided by metal pipes.

To calculate the pressure loss in HTA® pipes, refer to pressure loss nomograms at 20°C, 60°C and 80°C (Technicals sheet 7.3 to 7.6).

These nomograms have been established using the formula:

$$J = \lambda \frac{U^2}{2gD}$$

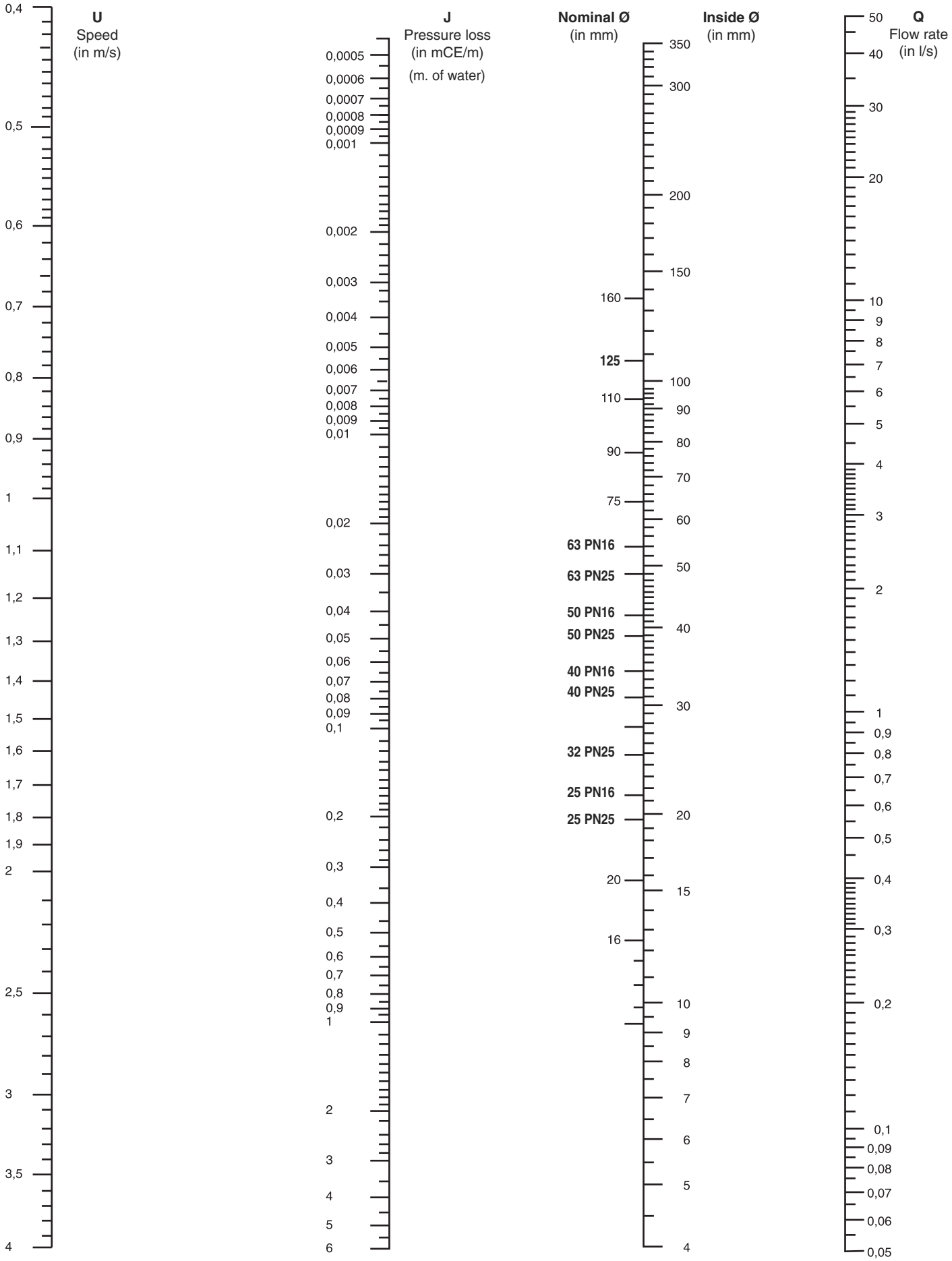
with Colebrooks λ calculated as follows:

$$\frac{1}{\sqrt{\lambda}} = -2 \log \left(\frac{\varepsilon}{3{,}7\ D} + \frac{2{,}51}{Re\sqrt{\lambda}} \right)$$

J = pressure losses (mCE/m)
U = flow speed (m/s)
D = pipe internal diameter (m)
g = gravity acceleration (9,81 m/s²)
λ = Colebrook factor (no measurement unit)
Re = Reynold's factor (no measurement unit) = $\frac{UD}{V}$
ε = rugosity = 0,001 mm
V = flow kinematic viscosity (m²/s)

When using antifreeze or additives, the viscosity of the resulting fluid must be taken into consideration to calculate pressure drops.

PRESSURE LOSSES ON PIPES NOMOGRAM AT 20°C

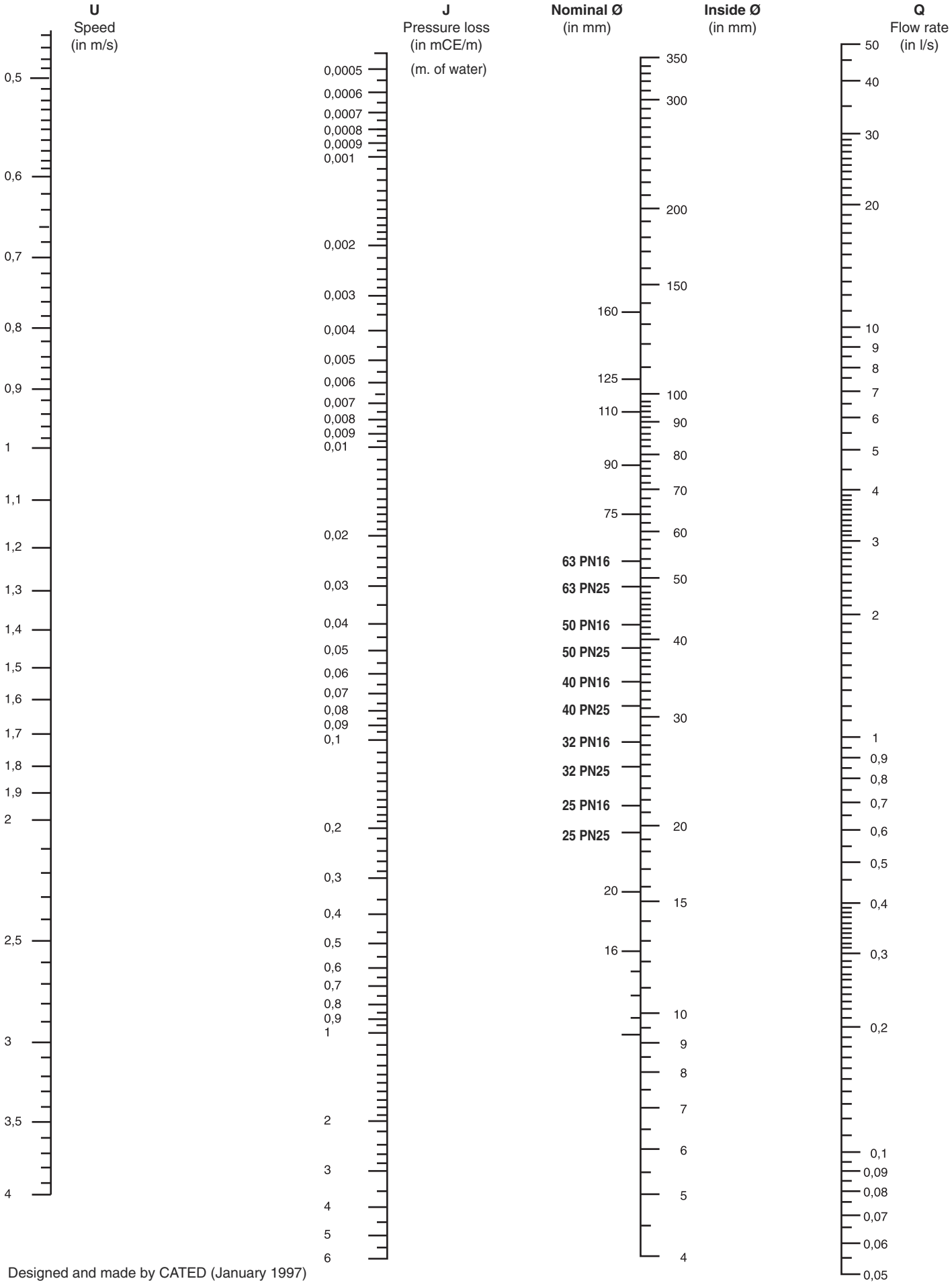


Designed and made by CATED (January 1997)

Durapipe HTA®
Hot and Cold Water

TECHNICAL SHEET
7.5

PRESSURE LOSSES ON PIPES NOMOGRAM AT 60°C

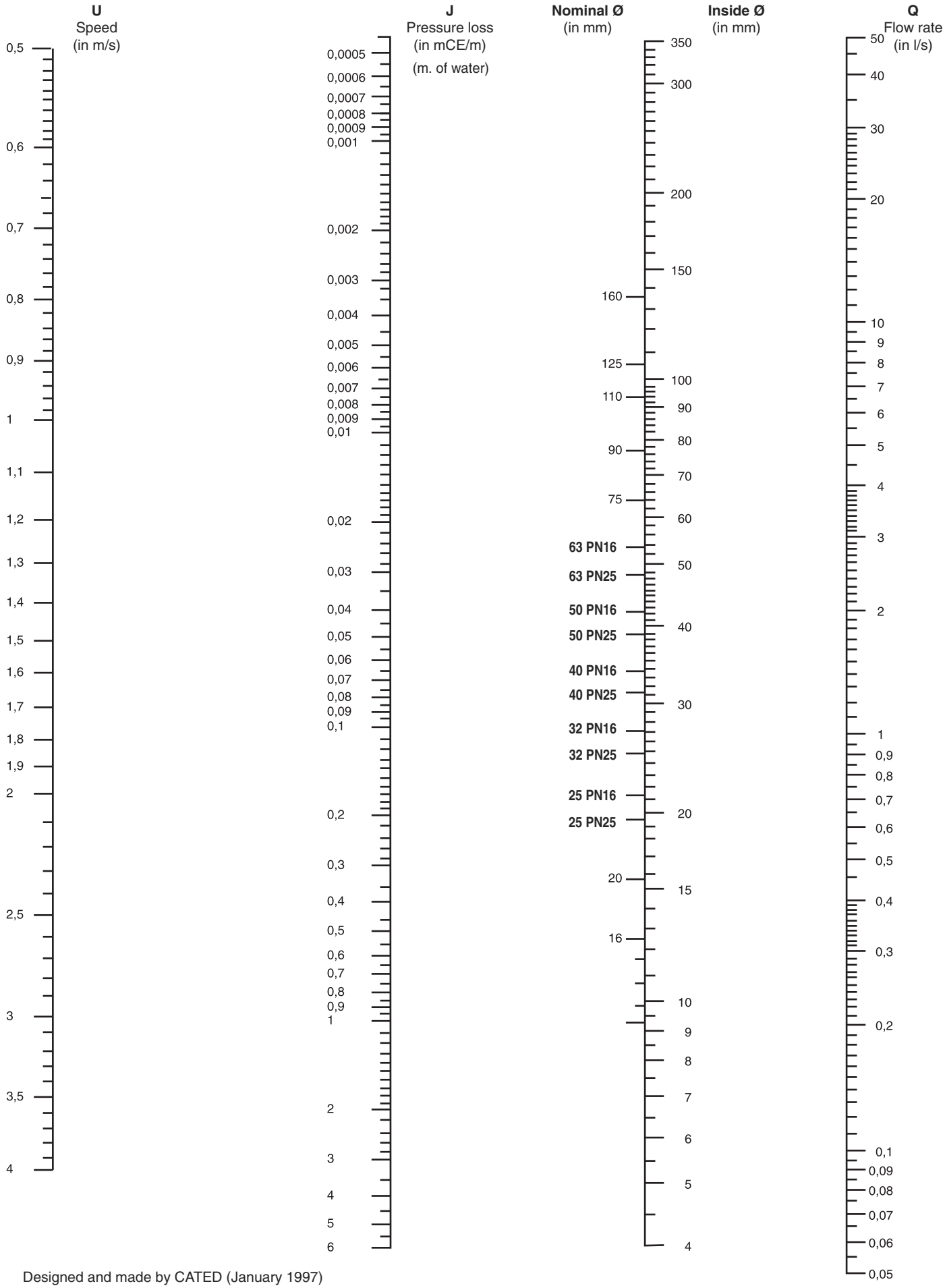


Designed and made by CATED (January 1997)

Durapipe HTA®
Hot and Cold Water

TECHNICAL SHEET
7.6

PRESSURE LOSSES ON PIPES NOMOGRAM AT 80°C

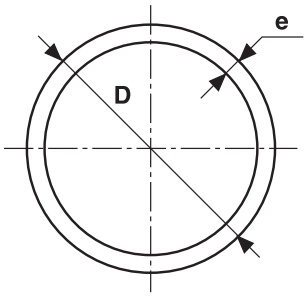


Designed and made by CATED (January 1997)

DIMENSION SHEET

HTA® C-PVC Pipe

Ø ≤ 50: 3m lengths with chamferred ends - Ø ≥ 63: 4m lengths with chamferred ends



PN25

D	Dn	Reference	Pack (*)	PN	Mini. thick	Weight kg/ml	internal Ø	Cont. l/m
20	15	GUBHT203	10	25	2.3	0.220	15.4	0.19
25	20	GUBHT253	10	25	2.8	0.330	19.4	0.29
32	25	GUBHT323	10	25	3.6	0.540	24.8	0.48
40	32	GUBHT403	10	25	4.5	0.840	31.0	0.75
50	40	GUBHT503	5	25	5.6	1.307	38.8	1.18
63	50	GTHT6325	5	25	7.1	1.945	48.8	1.87

PN16

D	Dn	Reference	Pack (*)	PN	Mini. thick	Weight kg/ml	internal Ø	Cont. l/m
25	20	GTHT2516	10	16	1.9	0.22	21.2	0.35
32	25	GTHT3216	10	16	2.4	0.360	27.2	0.58
40	32	GTHT4016	10	16	3.0	0.559	34.0	0.91
50	40	GTHT5016	5	16	3.7	0.908	42.6	1.42
63	50	GTUBHT63	5	16	4.7	1.440	53.6	2.25
75	65	GTUBHT75	1	16	5.5	1.960	64.0	3.21
90	80	GTUBHT90	1	16	6.6	2.760	76.8	4.58
110	100	GUBHT110	1	16	8.1	4.310	93.8	6.91
125	110	GUBHT125	1	16	9.2	5.56	106.6	8.92
160	150	GUBHT160	1	16	11.8	9.200	136.4	14.6

Differentiated colours of marking and cover according to the PN:

- yellow marking and yellow packaging for PN16
- white marking and orange packaging for PN25

CAUTION:

- All the sizes indicated in the dimension sheets are in millimeters, when not specified.
- All the threaded fittings are BSP. All metal threads are cylindrical (parallel)

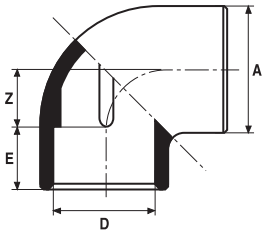
IMPORTANT

With the constant concern to improve the range and quality of its products within the context of the standards used at present, Durapipe reserves the right to modify the dimensional characteristics of its pipes and fittings together with the scope of its ranges, without prior notice.

DIMENSION SHEET

Elbows 90°

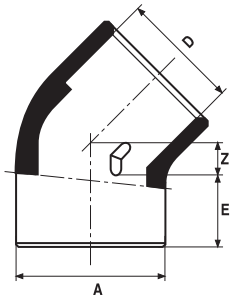
SOC.



D	Dn	Reference	Z	E	A
20	15	GH4M20	11	16	30
25	20	GH4M25	14	19	37
32	25	GH4M32	17	23	44
40	32	GH4M40	21.5	27	54
50	40	GH4M50	27	32	65
63	50	GH4M63	31	38	80
75	65	GH4M75	38	44	92
90	80	GH4M90	46	52	112
110	100	GH4M110	57	62	136
125	110	GH4M125	63.5	69	147
160	150	GH4M160	81	86	190

Elbows 45°

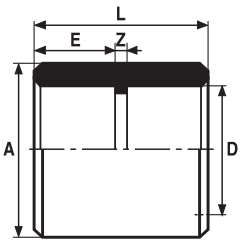
SOC.



D	Dn	Reference	Z	E	A
20	15	GH8M20	5	17	28
25	20	GH8M25	6	19	34
32	25	GH8M32	7.5	24	45
40	32	GH8M40	9.5	28	54
50	40	GH8M50	11	32	65
63	50	GH8M63	12.5	39	80
75	65	GH8M75	18	44	92
90	80	GH8M90	19.5	52	115
110	100	GH8M110	23.5	61.5	135
125	110	GH8M125	28	69	152
160	150	GH8M160	34.5	86.5	190

Couplings

SOC.

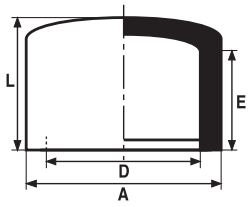


D	Dn	Reference	Z	E	L	A
20	15	GHMA20	3.5	17	37.5	27
25	20	GHMA25	3.5	19.5	42	33
32	25	GHMA32	3.5	23	49.5	42
40	32	GHMA40	3	27	57	53
50	40	GHMA50	3.5	31	67	63
63	50	GHMA63	3	38	80	78
75	65	GHMA75	4.5	45	94.5	90
90	80	GHMA90	5	51.5	108	106
110	100	GHMA110	4	61.5	127	132
125	110	GHMA125	6	69	144	147
160	150	GHMA160	10	86	182	185

DIMENSION SHEET

Caps

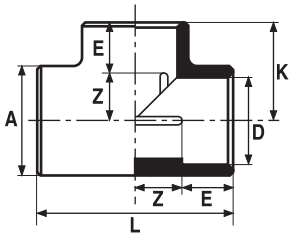
SOC.



D	Dn	Reference	E	L	A
20	15	GHB020	16	23	30
25	20	GHB025	20	28	37
32	25	GHB032	24	33	45
40	32	GHB040	28	38	54
50	40	GHB050	33	44	65
63	50	GHB063	39	54	80
75	65	GHB075	44.5	60	90
90	80	GHB090	54	72	111
110	100	GHB0110	62	88.5	140
125	125	GHB0125	70	102	160
160	150	GHB0160	87	144.5	187

Equal Tees 90°

SOC.

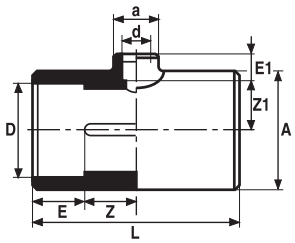


D	Dn	Reference	Z	E	L	A	K
20	15	GHTE20	11	16	54	30	27
25	20	GHTE25	13.5	18	64	37	32
32	25	GHTE32	17	22	78	45	39
40	32	GHTE40	21	26	96	54	48
50	40	GHTE50	26	31	116	65	58
63	50	GHTE63	33	38	143	86	71
75	65	GHTE75	39	44	167	92	83
90	80	GHTE90	46	52	196	112	98
110	100	GHTE110	56	62	235	133	118
125	110	GHTE125	84	69	306	150	153
160	150	GHTE160	84	86	340	191	170

DIMENSION SHEET

Reducing Tees 90°

SOC.

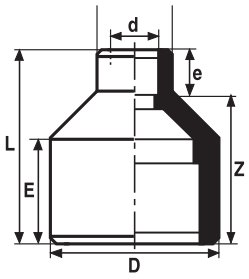


D-d	Dn	Reference	Z	Z1	E	E1	L	A	a
25-20	20-15	GHTR2520	12.5	13.5	18.5	16.5	62	36.5	30
32-20	25-15	GHTR3220	17	18	23	16	80	44.5	30
32-25	25-20	GHTR3225	17	19	23	18,5	80	44.5	37
40-20	32-15	GHTR4020	22	23	26.5	16	97	54	30
40-25	32-20	GHTR4025	22	23	26.5	19	97	54	37
40-32	32-25	GHTR4032	22	21	26.5	23	97	53.5	45
50-20	40-15	GHTR5020	27	29	32	17	118	61.5	33
50-25	40-20	GHTR5025	26	26	31.5	19	115	65	37
50-32	40-25	GHTR5032	26	26	31.5	22.5	115	65	45
50-40	40-32	GHTR5040	26	26	31.5	26.5	115	65	53.5
63-20	50-15	GHTR6320	32	31.5	37.5	17.5	139	80	30.5
63-25	50-20	GHTR6325	32	31.5	37.5	20	139	80	37
63-32	50-25	GHTR6332	32	32	37.5	23	139	80	45.5
63-40	50-25	GHTR6340	32	32	37.5	26	139	80	54
63-50	50-40	GHTR6350	32	32	37.5	31	139	80	65
75-20	65-15	GHTR7520	38.5	38	44.5	16	166	80	35
75-25	65-20	GHTR7525	38.5	38	44.5	19	166	92.5	35
75-32	65-25	GHTR7532	38.5	38	44.5	22.5	166	92.5	45
75-40	65-32	GHTR7540	38.5	38	44.5	26.8	166	92.5	54
75-50	65-40	GHTR7550	38.5	38.5	44.5	32	166	93	65
75-63	65-50	GHTR7563	38.5	38.5	44.5	38	166	93	80
90-32	80-25	GHTR9032	46	46	52	23.4	196	114	45
90-40	80-32	GHTR9040	46	46	52	26	196	114	54
90-50	80-40	GHTR9050	46	46	52	32.5	196	114	65
90-63	80-50	GHTR9063	46	46,5	52	38	196	114	80
90-75	80-63	GHTR9075	46	46	52	44	196	114	93
110-40	100-32	GHTR1140	56	56	62	26	236	135	54
110-50	100-40	GHTR1150	56	56	62	31	236	135	65
110-63	100-50	GHTR1163	55.5	56.5	62	38	235	135.5	80
110-75	100-63	GHTR1175	56	56	62	45.5	235	135	93
110-90	100-80	GHTR1190	56	56	62	51	235	135	108

DIMENSION SHEET

Reducing Bushes Long Pattern

Ø Spig - (øR) Soc.

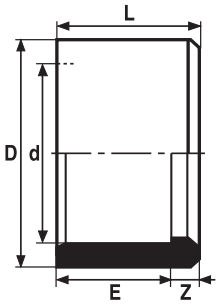


D-d	Dn	Reference	Z	E	e	L
32-20	25-15	GHRD3220	31	22.5	16.5	53.5
40-20	32-15	GHRD4020	36	27	16	63
40-25	32-20	GHRD4025	36	27	19	63
50-20	40-15	GHRD5020	44	32	17	76
50-25	40-20	GHRD5025	44	32	19.5	76
50-32	40-25	GHRD5032	44	32	23	76
63-20	50-15	GHRD6320	55	39	17	94
63-25	50-20	GHRD6/25	55	39	19	94
63-32	50-25	GHRD6332	55	39	23	94
63-40	50-32	GHRD6340	55	39	27	94
75-20	65-15	GHRD7520	63	45.5	17	108.5
75-25	65-20	GHRD7525	63	45.5	18.5	108.5
75-32	65-25	GHRD7532	63	45.5	23	108.5
75-40	65-32	GHRD7540	63	45.5	26.5	108.5
75-50	65-40	GHRD7550	61	45	32	106
90-25	80-20	GHRD9025	75	52.5	19.5	127.5
90-32	80-25	GHRD9032	75	52.5	23	127.5
90-40	80-32	GHRD9040	75	52.5	26.5	127.5
90-50	80-40	GHRD9050	75	52.5	32	127.5
90-63	80-50	GHRD9063	74	52	39	126
110-50	100-40	GHRD1150	91.5	61.5	31	153
110-63	100-50	GHRD1163	90	62	38	152
110-75	100-65	GHRD1175	90.5	61.5	44.5	152
125-90	110-80	GHRD1290	99.5	68.5	52	168
160-75	150-65	GHRD1675	127	86.5	44	171.5
160-90	150-80	GHRD1690	126	87	51	213
160-110	150-100	GHRD1611	128	86.5	62	214.5
160-125	110-150-110	GHRD1612	120	86	68.5	206

DIMENSION SHEET

Reducing Bushes Short Pattern

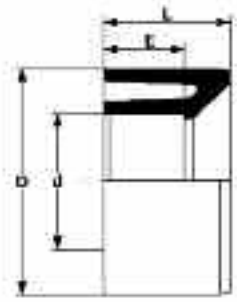
Ø Spig - (øR) Soc.



D-d	Dn	Reference	Z	E	L
25-20	20-15	GHRS25	3	17	20
32-25	25-20	GHRS32	4.5	19	23.5
40-32	32-25	GHRS40	5.5	23	28.5
50-40	40-32	GHRS50	6.5	26	32.5
63-50	50-40	GHRS63	8	31	39
75-63	65-50	GHRS75	7	37.5	44.5
90-75	80-65	GHRS90	7.5	44	51.5
110-90	100-80	GHRS110	10	52	62
125-110	110	GHRS125	8	63	71

Reducing Bushes Short Pattern

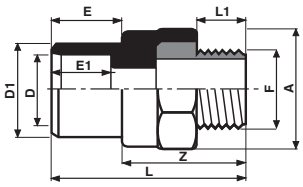
Ø Spig - (øR) Soc.



D-d	Dn	Reference	E	L
125-63	110-50	GRDC1263	38.5	69.5
125-75	110-65	GRDC1275	44.5	69.5
160-110	150-100	GRDC1611	62	87
160-125	150-110	GRDC1612	69	87

Adaptor Nipples A

SPIG./SOC. x Male parallel brass thread



D-F	Reference	D1	Z	E	E1	A	L	L1
20-1/2"	GHEAL20	25	41	19	17	36	60	15
25-3/4"	GHEAL25	32	43	22.5	19.5	41	65.5	16
32-1"	GHEAL32	40	49	27	23	49.5	76	19.5
40-1 1/4"	GHEAL40	50	55	31	26	60	86	22
50-1 1/2"	GHEAL50	63	55	37.5	31	66	92.5	22
63-2"	GHEAL63	75	63	43.5	37,5	82	106.5	26
75-2 1/2"	GHEAL75	90	71	51	43,5	100	122	30.5
90-3"	GHEAL90	110	83	61	51	117	144	35.5

Adaptor Nipples B

SPIG./SOC. x Male parallel brass thread

D-F	Reference	D1	Z	E	E1	A	L	L1
20-3/4"	GHEBL20	25	43	19.5	17	41	62.5	16
25-1"	GHEBL25	32	45.5	23	19	49.5	68.5	19.5

DIMENSION SHEET

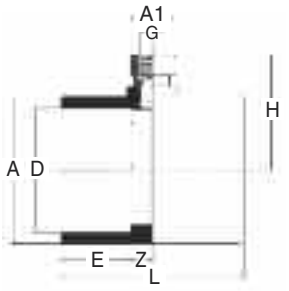
Adaptor Nipples with 316L grade stainless steel threaded insert

SOC./SPIG. x Male parallel stainless steel thread

D-F	Reference	D1	Z	E	E1	A	L	L1
20-1/2"	GHEAS20	25	41	19	17	36	60	15
25-3/4"	GHEAS25	32	43	22.5	19.5	41	65.5	16
32-1"	GHEAS32	40	49	27	23	49.5	76	19.5

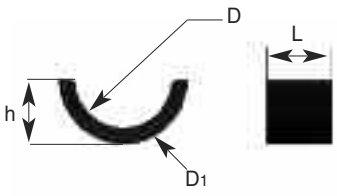
Adaptor for Measuring Accessories with brass thread

SOC. x Female parallel thread branch



D-F	Reference	A1	Z	E	L	A	H
110-1/2"	GML11012	36	20	61	163	132	100
110-3/4"	GML11034	41	20	61	163	132	101

Anchor Points

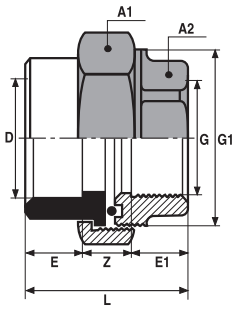


D	Reference	L	D1	h
25	GHPTF25	19	33	20
32	GHPTF32	22	42	27
40	GHPTF40	26	53	31
50	GHPTF50	30	65	38
63	GHPTF63	37	78	48

DIMENSION SHEET

3 Piece Union C-PVC & Brass with EPDM gasket

C-PVC SOC. x BRASS Female parallel thread

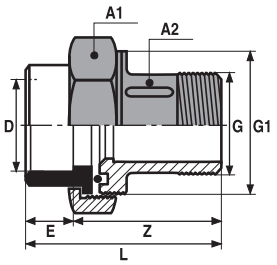


D-G	Dn	Reference	Z	E	E1	G1	A1	A2	L
20-1/2"	15	GH3G/L20	8	18	14	1"	36	27	40
25-3/4"	20	GH3G/L25	9	19	15	1 1/4"	45	32	43
32-1"	25	GH3G/L32	11	23.5	16	1 1/2"	52	38	50.5
40-1 1/4"	32	GH3G/L40	12	27	20	2"	66	47	59
50-1 1/2"	40	GH3G/L50	13	32	18	2 1/4"	72	53	63
63-2"	50	GH3G/L63	12	38	22	2 1/2"	89	65	72

Assembling: see technical sheet 4.4

3 Piece Union C-PVC & Brass with EPDM gasket

C-PVC SOC. x BRASS Male parallel thread



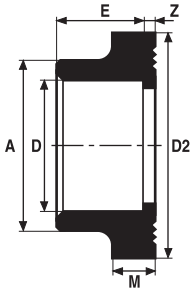
D-G	Dn	Reference	Z	E	L	G1	A1	A2
20-1/2"	15	GH3F/L20	33	18	51	1"	36	21
25-3/4"	20	GH3F/L25	51	19	70	1 1/4"	45	28
32-1"	25	GH3F/L32	56	23	79	1 1/2"	52	33
40-1 1/4"	32	GH3F/L40	58	27	85	2"	66	42
50-1 1/2"	40	GH3F/L50	63	32	95	2 1/4"	72	48
63-2"	50	GH3F/L63	70	38	108	2 3/4"	89	60

Assembling: see technical sheet 4.4

DIMENSION SHEET

Serrated Stub Flanges to be used with flat gasket, delivered without gasket

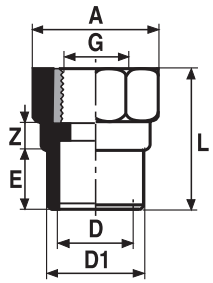
SOC.



D	Dn	Reference	Z	E	D2	M	A
25	20	GHCS25	3	20	41	7	33
32	25	GHCS32	3	23	50	7	41
40	32	GHCS40	3	27	61	8	50
50	40	GHCS50	3	32	73	8	61
63	50	GHCS63	3	39	90	9	76
75	65	GHCS75	3	44	106	10	90
90	80	GHCS90	5	51.5	125	11	108
110	100	GHCS110	5	62	150	12	131
125	125	GHCS125	5.5	67.5	170	13	147
160	150	GHCS160	6	86	212	16	187

Threaded Adaptors

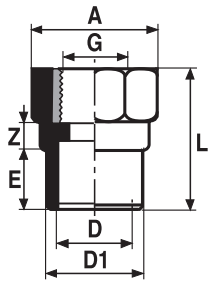
SOC./SPIG x Female parallel brass thread



D-G	Dn	Reference	D1	Z	E	L	A
20-1/2"	15	GHMML20	25	9	16.5	44	36
25-3/4"	20	GHMML25	32	9.5	19.5	49	41.5
32-1"	25	GHMML32	40	9.5	23	56.5	49.5
40-1 1/4"	32	GHMML40	50	7	31	64	60
50-1 1/2"	40	GHMML50	63	7	37.5	69.5	66
63-2"	50	GHMML63	75	8	43.5	80.5	82
75-2 1/2"	65	GHMML75	90	13.5	51	91.5	100
90-3"	80	GHMML90	110	18.5	61	108.5	117

Threaded Adaptors 316L

SOC./SPIG x Female parallel thread stainless steel

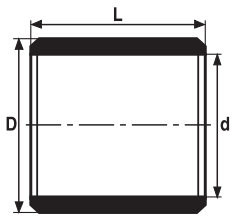


D-G	Dn	Reference	D1	Z	E	L	A
20-1/2"	15	GHMMS20	25	9	16.5	44	36
25-3/4"	20	GHMMS25	32	9.5	19.5	49	41.5
32-1"	25	GHMMS32	40	9.5	23	56.5	49.5

DIMENSION SHEET

Plain Nipples

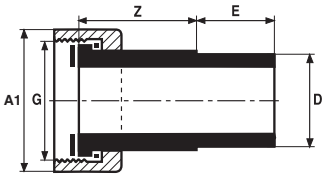
SPIG. x SPIG.



D	Dn	Reference	L	d
20	15	GHMC20	37	15.5
25	20	GHMC25	42	19.5
32	25	GHMC32	49	25
40	32	GHMC40	57	31
50	40	GHMC50	67	39
63	50	GHMC63	80	49
75	65	GHMC75	92	64

Tap Connectors delivered with flat gasket, anti-friction ring and brass loose nut

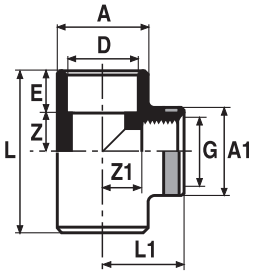
SPIG. x Female parallel brass thread



D-G	Dn	Reference	Z	E	A1
16-1/2"	10	GHDR16	20	15	24
20-3/4"	15	GHDR20	22	17	29.5
25-1"	20	GHDR25	23	20	36
32-1 1/4"	25	GHDR32	26	23	45
40-1 1/2"	32	GHDR40	29	27	52
50-2"	40	GHDR50	31	32	65.5

Threaded 90° Tees Reduced

SOC. x Female parallel thread branch



with metal reinforcing ring outside

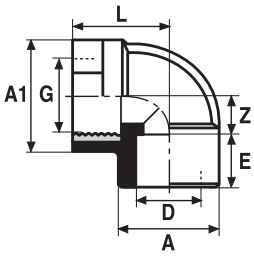
D	G	Reference	Dn	Z	E	A	A1	L	Z1	L1
32	3/4"	GHTGRL32	25	17	23	43	46	80	28	47
40	3/4"	GHTGRL40	32	21.5	26.5	54	47	96.5	28	47
50	3/4"	GHTGRL50	40	26	33	65	47	118.5	28.5	47
63	3/4"	GHTGRL63	50	33.0	38.5	79.5	47	142.5	35	53.5

Assembling: see technical sheet 4.4

DIMENSION SHEET

Threaded Elbows 90° for high torque

SOC. x Female parallel brass thread

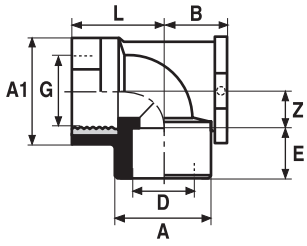


D-G	Dn	Reference	Z	E	A	A1	L
20-1/2"	15	GH4GL20	16	16.5	29	36	32
25-3/4"	20	GH4GL25	17	19.5	35	41	37.5

Especially adapted for connection with metal threaded fittings and high torque
Assembling: see technical sheet 4.4

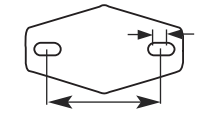
Threaded Elbows 90° with back plate

SOC. x Female parallel brass thread



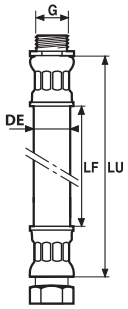
D-G	Dn	Reference	Z	E	A	A1	L	B
20-1/2"	15	GH4GP20	16	16.5	29	36	32	21
25-3/4"	20	GH4GP25	17	19.5	35	41	37.5	20.5

Assembling: see technical sheet 4.4



Expansion/Contraction Braids

Flexible, with one male threaded brass end and one loose female threaded nut



DI: Internal diameter
of the expansion joint

D-G	Dn	Reference	LF	LU	DE	DI
20-1/2"	15	GHCD/G20	410	457	22	13
25-3/4"	20	GHCD/G25	520	592	28	17
32-1"	25	GHCD/G32	640	720	35	22
40-1 1/4"	32	GHCD/G40	760	825	42	28
50-1 1/2"	40	GHCD/G50	980	1067	50	34

Internal hose made from WRAS approved EPDM rubber

DIMENSION SHEET

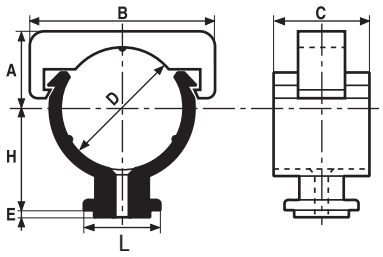
MONOKLIP® BRACKETS

Specially designed to support pipes. They are highly resistant, corrosion-proof, fitted instantly and allow the pipe to expand freely.
Max spacing between supports: see technical sheet no 6.1
Monoklip® brackets with drilled bases can be used with countersunk-head screws Ø 4 and 5mm.

MONOKLIP® Brackets in black polypropylene

with metal threaded insert M8

20mm
Polypropylene
black

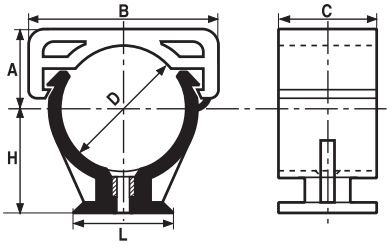


D	Dn	Reference	H	A	B	C	L	E
20	15	GHCK20/8	20	14	32	22	16	1

MONOKLIP® Brackets in black polypropylene

with metal threaded insert M8

Ø 25 to 63
Polypropylene
black



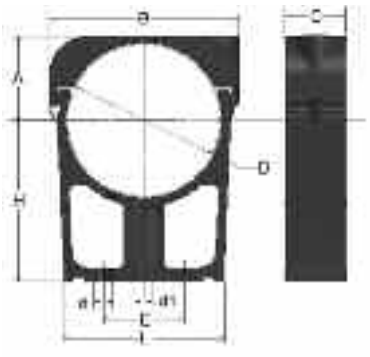
Diameter 25 to 63

D	Dn	Reference	H	A	B	C	L
25	20	GHCKC258	22	16	38.5	25	16
32	25	GHCKC328	28	20	44	24.5	34
40	32	GHCKC408	32	24	55	24.5	34
50	40	GHCKC508	35	30	65.6	24.5	52
63	50	GHCKC638	35	41	79.5	24.5	52

MONOKLIP® Brackets in black polypropylene

with metal threaded insert M8

Diameter 75 to 160



D-dn	Reference	d1	H	A	B	C	L	d	E	J
75-65	GHCKC758	M8	80	42	96	30	80	9	40	7
90-80	GHCKC908	M8	80	49	113	30	80	9	40	7
110-100	GHCKC110	M8	80	60	130	30	80	9	40	7
125-125	GHCKC125	M8	120	70	159	30	190	9	170	7
160-150	GHCKC160	M8	120	85	194	30	230	9	210	7

Note: Two part rubber lined clips with M10 thread are also available.

DIMENSION SHEET

Flange Kits for 'Comp' Bellows

stub flange + backing ring + nuts + bolts

	Quantity per kit			
Reference	Stub Flanges	Backing Rings	Bolts	Nuts
GCOMPK40	2	2	8	8
GCOMPK50	2	2	8	8
GCOMPK63	2	2	8	8
GCOMKP75	2	2	8	8
GCOMPK90	2	2	16	16
GCOMPK11	2	2	16	16
GCOMPK12	2	2	16	16
GCOMPK16	2	2	16	16

Solvent Cement

Size	Product code
250ml	GRERFIXP
1ltr	GRERFIXB

Cleaner

Size	Product code
1ltr	GD171P

Chamfering Tool

Size	Product code
Up to 50mm	GCONE50U
63-160mm	FT 55 05 10

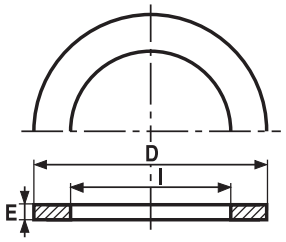
Pipe Cutter

Size	Product code
16-50mm pipe cutter	FT 80 00 01
50-125mm pipe cutter	FT 80 00 03
16-63mm spare cutter wheel	FT 80 00 02
50-125mm spare cutter wheel	FT 80 00 04

To cut 160mm pipe we recommend Rothenberg's Rocut 160 pipe cutter.

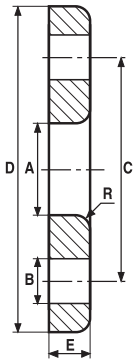
DIMENSION SHEET

Flat Gaskets for Flange Adaptors EPDM



Reference	Dn	D	I	E
GJPNCS25	20	39	25	2
GJPNCS32	25	48	32	2
GJPNCS40	32	59	40	3
GJPNCS50	40	71	50	3
GJPNCS63	50	88	63	3
GJPNCS75	65	104	75	3
GJPNCS90	80	123	90	3
GPNCS110	100	148	110	4
GPNCS125	125	168	125	4
GPNCS140	140	186	140	4
GPNCS160	150	211	160	5

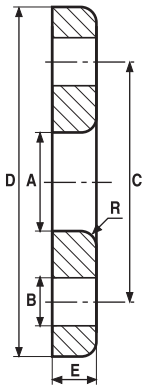
Flanges PN16 according to DIN 16-966 (glass fibre reinforced polyester) - colour: white



Drilled GN 10/16

Pipe Ø	Flange Dn	Reference	A	B	C	D	E	R	No. of holes	Torque
25	20	GBVR20	34	14	75	105	18	1.5	4	0.5 to 1 mkg
32	25	GBVR25	42	14	85	115	20	1.5	4	0.5 to 1 mkg
40	32	GBVR32B	52	18	100	140	20	2	4	2 to 4 mkg
160	150	GBVR150	190	22	240	285	30	4	8	3 to 4 mkg

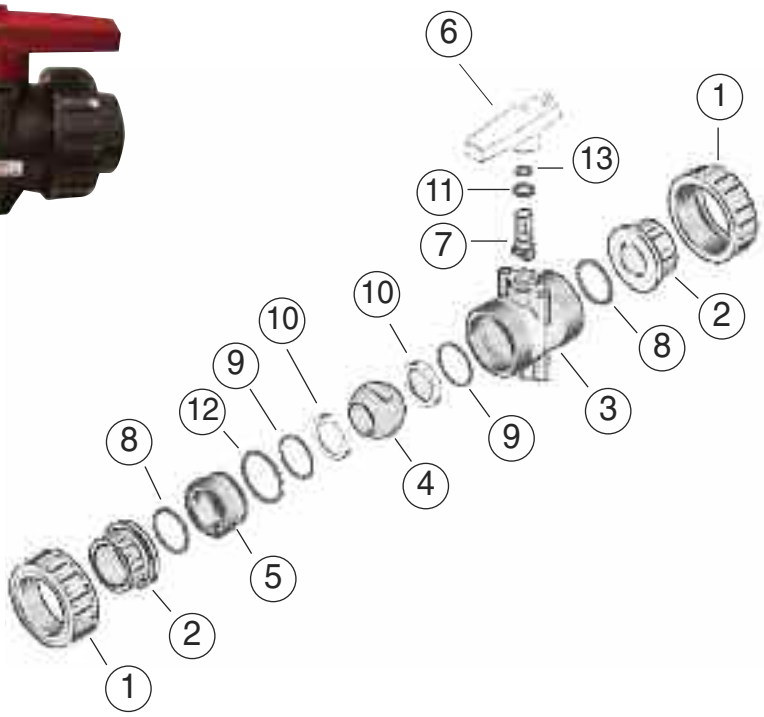
Flanges PN16 according to DIN 16-966 (glass fibre reinforced polyamide) - colour: black



Pipe Ø	Flange Dn	Reference	A	B	C	D	E	R	No. of holes	Torque
50	40	GBPA40	62.5	18	110	150	18	2.5	4	3 mkg
63	50	GBPA50	78.5	18	125	165	19	2.5	4	3 mkg
75	65/60	GBPA65	92	18	145	185	22	2.5	4	4 mkg
90	80	GBPA80	110	18	160	200	22	2.5	8	4 mkg
110	100	GBPA100	133	18	180	218	24	3	8	5 mkg
125	125	GBPA125	150	18	210	250	26	3	8	5 mkg

DIMENSION SHEET
DOUBLE UNION C-PVC BALL VALVES – CEMENTED SOCKET ENDS

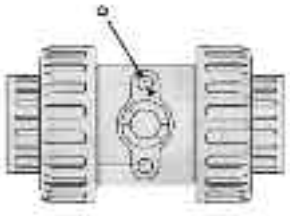
ø 20 to 63 PN16



1. Nut
2. Welded/threaded socket end union
3. Body
4. Ball
5. Ball seat support
6. Handle
7. Spindle
8. Socket O-Ring
9. Seat gasket
10. Ball seat
11. Spindle O-Ring
12. Ball seat support O-Ring
13. Spindle O-Ring

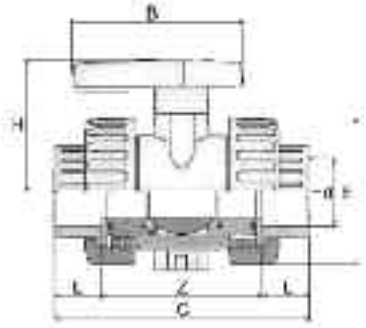
ANCHORING SYSTEM

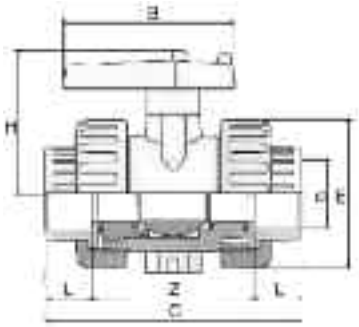
These ball valves have a built-in anchoring system.
There are two holes underneath fitted with threaded brass inserts (use screw in accordance with data below).
These valves are solvent cemented to pipes, and can be dismantled thanks to their double union concept.



d	Reference	DN	L	Z	C	E	H	B	g	X	Ø	Fig.
20	GVHCEP20	15	16	70	102	47	45	66	160	31	5.5	A
25	GVHCEP25	20	19	82	120	57	55	78	260	31	5.5	A
32	GVHCEP32	25	22	87	131	68	67	86	380	40	6.5	A
40	GVHCEP40	32	26	98	150	86	83	100	655	45	8	B
50	GVHCEP50	40	31	101	163	98	91	110	925	50	8	B
63	GVHCEP63	50	38	121	197	122	11	130	1695	50	8	B

Ball valve Ø	Screw Ø for brass insert (mm)
20	5.5
25	5.5
32	6.5
40	8
50	8
63	8

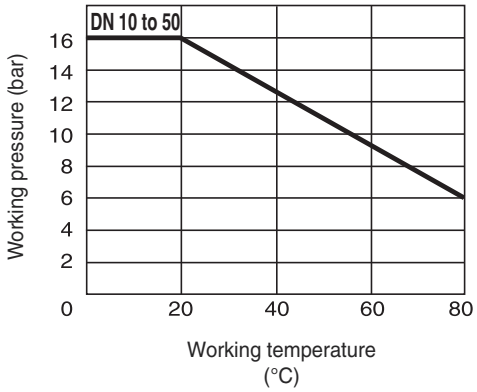




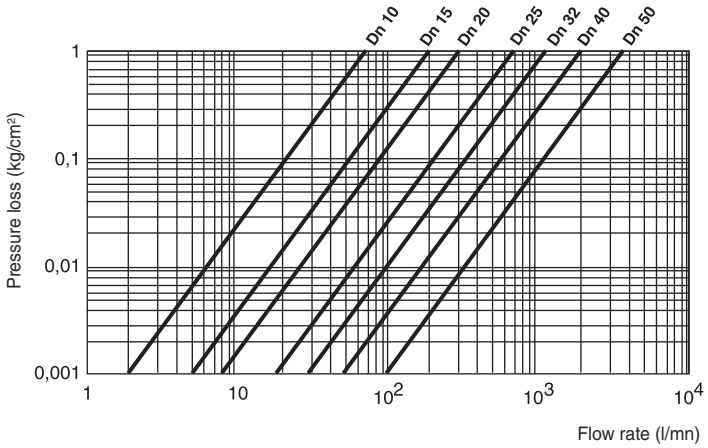
DIMENSION SHEET
DOUBLE UNION C-PVC BALL VALVES – CEMENTED SOCKET ENDS

ø 20 to 63 PN16

WORKING PRESSURE



PRESSURE LOSSES ACCORDING TO FLOW RATES



FLOW COEFFICIENT AT FULL OPENING

d-G	16-3/8"	20-1/2"	25-3/4"	32-1"	40-1 1/4"	50-1 1/2"	63-2"
Dn-G	10-3/8"	15-1/2"	20-3/4"	25-1"	32-1 1/4"	40-1 1/2"	50-2"
KV	70	190	350	700	1000	1650	3100

FIELD OF APPLICATION

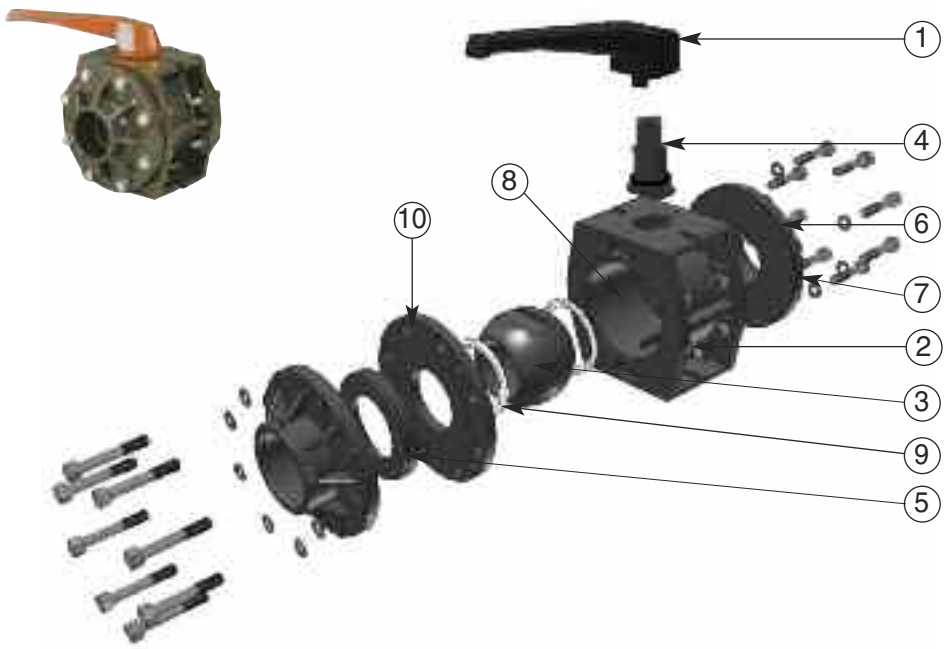
- The same as that of CPVC HTA® fittings (drinking water, food liquids, various fluids).
- Max. temperature of use: 80°C
- The nominal pressure (PN) in normal use, ie. for water at maximum 20°C is: 16 bar for Ø 20 to 63mm.

OPERATION TORQUE (PRESSURE 16 BAR)

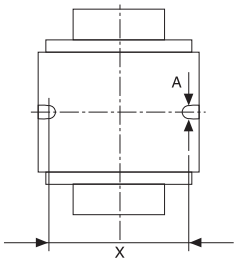
Ø	20	25	32	40	50	63
Torque Nm	3.0	3.0	5.0	6.0	9.0	9.0

DIMENSION SHEET
FLANGED C-PVC BALL VALVES – CEMENTED SOCKET FLANGES

ø 75 to 110 PN16



1. Handle
2. Body
3. Ball
4. Spindle
5. Ball seat support
6. Cemented socket end
7. Nuts
8. Ball seat
9. O-Rings
10. Counterplate



Ball valve Ø	A	X (mm)
75	11	110
90	11	110
110	11	135

ANCHORING SYSTEM

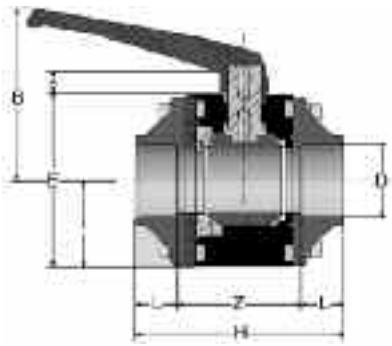
The weight of the ball valve and its correct use require its anchoring on a convenient support.

There are two slots underneath the valve body which allow to hang it with bolts on the correct support.

The table opposite gives the width of the holes and their spacing.

Valves in ø 75 to 110 are carefully assembled in our workshops. It is strongly recommended NOT to dismantle the backing plates which ensure good valve operation. The socket flanges may be dismantled.

Dimensions										
d	Reference EPDM	l	z	h	e	b	c	a	i	Weight kg
75	G VHFEP75	43	148	234	211	177	210	25	105	7
90	GVHFEP90	52	148	252	211	177	210	25	105	7
110	GVHFEP11	63	174	300	252	220	255	30	121	11



FIELD OF APPLICATION

- The same as that of CPVC HTA® fittings (drinking water, food liquids, various fluids).
- Max. temperature of use: 80°C
- The nominal pressure (PN) in normal use, ie. for water at maximum 20°C is: 16 bar for Ø 20 to 63mm.

TREATMENT
TREATMENT OF PIPEWORK

Bacteria which are potentially harmful to human beings and which contaminate pipeworks for hot and cold water services must be eradicated using two treatment procedures: temperature elevation and chemical attack. The recommendations hereunder originate from the French Ministry of Health (DGS). Preventative and curative cleaning treatments are also listed in HSE L8 and HTM04-01.

CURATIVE SPOT TREATMENT

USED FOR CURATIVE SPOT TREATMENTS IN DISRUPTED PIPEWORKS

(Concentration levels of decontamination agents are given as an indication.
It must be ensured before use that the pipework materials are compatible with the recommended decontamination agents, at the concentration levels indicated).

Chlorinated agents generating hypochlorites: Sodium hypochlorite NaOCl, Molecular, Chlorine Cl_2, Calcium hypochlorite, $Ca(ClO)_2$)	100mg/l free chlorine for 1h Or 50mg/l free chlorine for 12h Or 15mg/l free chlorine for 24h
Hydrogen peroxide mixed with silver	100 to 1,000mg/l hydrogen peroxide, for up to 12h according to the concentration of disinfectants
Peracetic acid mixed with H_2O_2	1,000 ppm in H_2O_2 equivalent, for 2h
Temperature elevation (thermal shock) in hot water distribution networks	70°C for at least 30 minutes

This table was made according to the recommendations of the French High Council for Public Hygiene, taking into account the specific requirements of health establishments. The decontamination processes recommended for spot treatments are not approved for large pipeworks. Therefore, those spot treatments are not quoted in the guide.

It must be checked that the silver based stabilisers used are authorised.

CONTINUOUS TREATMENT

USED IN CONTINUOUS TREATMENT

(Concentration levels of disinfectants must remain compatible with potability and other human consumption requirements).

Chlorinated agents generating hypochlorites: Sodium hypochlorite NaOCl, Molecular, Chlorine Cl_2, Calcium hypochlorite, $Ca(ClO)_2$	Free Chlorine concentration equal or superior to 0.3 mg/l according to the pipework, and to the water's quality and pH (concentration must not remain below 1mg/l at all times).
Chlorine dioxide	Chlorine dioxide concentration equal or superior to 0.3 mg/l according to the network, and the water's quality and pH (the concentration must remain below 1 mg/l).

This table was made according to the recommendations of the French High Council for Public Hygiene, taking into account the specific requirements of health establishments.

* These are recommendations, given for information purpose only, and which can be modified by the competent authorities at any time.

Durapipe cannot be held responsible for the efficiency of those recommendations as far as network pollution or disinfection results are concerned.

TREATMENT
REFRIGERATION FLUIDS AND OTHER

In general, heating / cooling (8°C / 50°C) so-called 'reversible' 2-pipe air conditioning networks do not require the addition of any antifreeze fluid, since the use of such fluids would dictate the increase of some network components' sizes.

Should the network require the use of an antifreeze, an anticorrosion or a bactericide fluid, the compatibility of such fluids with HTA® must be checked with their manufacturers or with Durapipe's technical assistance.

Monopropyleneglycol (MPG) is not compatible with CPVC material.

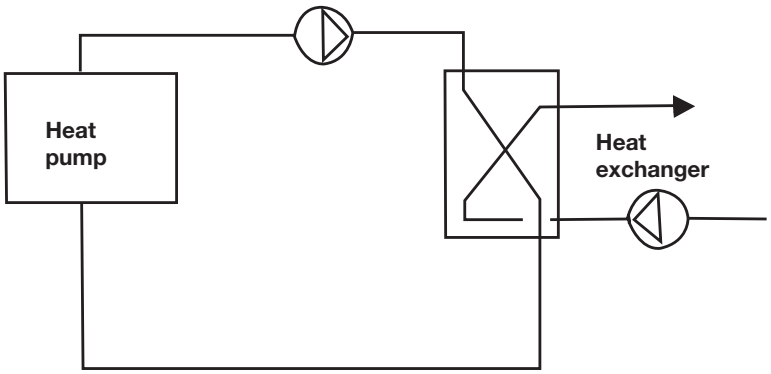
- Air cooling terminal units (e.g. fan coil units, cooling panels, cooling beams) may contain residual quantities of metal machining synthetic lubricating oils (generally located in the coils). Such oils are not compatible with CPVC and can cause the pipework to suffer from major disorders. It is your responsibility to get your supplier to guarantee the coils' cleanliness before installation.
- Products containing: esters, ethoxyles, amines are not compatible with CPVC.
- Silica and Phosphate based anticorrosion fluids are known to corrode the EPDM components of the flexible expansion joints. Their use is prohibited. More generally, the compatibility of such anticorrosion fluids with flexible expansion joints must be checked with their manufacturers.

HEAT PUMPS
ADVICE AND PRECAUTIONS CONCERNING NETWORKS FEATURING HEAT PUMPS

GENERAL PRECAUTIONS VALID FOR ALL INSTALLATIONS

In every case, particular attention should be paid to the cleanliness and absence of any oil trace on the terminal units (fan coil units, cooling beams, etc.). It is the installer's responsibility to make contact with his supplier or to clean the terminal units.

In order to avoid the accidental introduction of synthetic oil or traces of synthetic oil into the HTA® pipework, the HTA® network must be separated from the heat pump by means of a 'heat exchanger' installed between a primary CHW network made from another material than HTA® (eg. metal) and a secondary CHW network made from HTA®, following the diagram below:



DESCRIPTION FOR SPECIFICATION

Piping system made from synthetic material (CPVC) for the transportation of hot and cold pressurised fluids.

FIELDS OF APPLICATION
Domestic Hot Water Services and Cold Water Services (DHCWS).

SPECIFICATION
The CPVC pipes and fittings shall be qualified for use in DHCWS applications as per class 2 (according to the ISO 10508 standard) at temperatures of 70°C for 50 years, at 6bar pressure for PN16 pipes and 10bar pressure for PN25 pipes.

IDENTIFICATION - RANGE
Pipes & fittings shall be coloured brown.

Only one solvent cement (HTA® orange) shall be used.

The range of pipes for HCWS shall be:
- PN25 from diameter 16 to 63 - series 4.
- PN16 from diameter 25 to 160 - series 6.3

Supporting of the pipe shall be done by using brackets acting as guides, by taking expansion and contraction factors into account, and by respecting the manufacturer's recommendations.

In order to enable safe connections to metallic threads (valves, water meters, etc.), the manufacturer shall offer a range of CPVC fittings with brass threaded inserts and CPVC fittings with stainless steel threaded inserts.

QUALITY – CERTIFICATIONS
The system shall come from an ISO 9001, ISO 14001 and ISO 18001 certified company.

The system's fire resistance rating according to EUROCLASSES shall be B-s1-d0 (non flammable – no smoke – no flaming drops), certified according to EN 13501-1 standard.

All components of the system (including fittings and welded joints) shall pass pressure cycling tests of 20/60 bar, at a rate of:
- 5000 cycles at 1 hertz frequency for diameters 16 to 90,
- 2500 cycles at 0.42 hertz frequency for diameters 110 to 160,
according to NF T 54-094 standard.

The pipe shall bear the product's quality certification markings, as well as the information enabling to trace its production.

In order to ensure a good level of cleanliness until installation, the pipes shall be delivered with protection caps and protected by plastic bags.

The system shall be WRAS certified for drinking water.

SOLVENT CEMENT
In order to enable a quick and reliable assembly, the joints between the system's various elements shall be performed without any abrading/dulling or priming/scouring, according to the manufacturer's recommendations.

In order to allow quick reinstatement of water services further to repair works on the system, curing times before the reinstatement of a 6 bar pressure shall be guaranteed by the manufacturer and shall vary between 1 and 2 hours, according to the ambient temperature and the pipe's diameter.

TREATMENTS FOR THE PREVENTION OF BACTERIA AND DECONTAMINATION OF SAME
In consideration of the existing development of certain bacteria in DHCWS networks, the CPVC pipes and fittings shall be able to withstand, without any alteration of their mechanical properties, preventive and curative cleaning treatments as listed in the manufacturer's recommendations and in HSE L8 & HTM04-01.

ASSISTANCE
The manufacturer or his approved representative shall be able to provide professional training courses for the implementation of his system, on site or on his own premises.

The manufacturer's or his approved representative's Technical Assistance Department shall be able to produce an execution drawing made from the general drawings supplied by the contracting company in charge of a project, or to propose solutions to address the expansion and contraction phenomena encountered on the network.

TESTING PROCEDURE
The network shall be filled with water (purge the air from high points) and kept under pressure long enough to enable visual control of all joints, and no less than 30 minutes. (For large installations, test by sections).

The testing pressure will amount to 1.5 times the maximum working pressure, with a minimum of 10bar for hot & cold water services.

ENVIRONMENT
The system shall be recyclable through an existing recovery network.

The manufacturer shall be able to supply reliable environmental and sanitary data sheets according to the NF P 01-010 standard.

DURAPIPE UK PIPEWORK SYSTEMS

BUILDING SERVICES

Vulcathene
- Safe chemical drainage pipework
- Two easy jointing methods - Mechanical or Enfusion
- Ideal for schools, universities and colleges, hospitals and clinics

SuperFLO
- Pipe system for chilled and cold water applications
- Ductile and robust down to minus 40ºC
- Lightweight, non-corrosive and limescale resistant

Duracool
- Pre-insulated ABS pipework system
- Lightweight and easy to install
- Unique shells for cost-efficient installation

Durapipe HTA®
- Pipework for hot and cold water
- Limescale and corrosion resistant
- WRAS approved
- Installed cost saving versus traditional materials

PLX
- Specialist pipework system for the safe conveyance of fuel
- Suitable for pressure and vacuum applications
- Ideal for emergency power supply, uninterrupted power supply and transport refuelling applications

Friaphon
- Sound attenuated drainage system
- Superb sound insulation with no lagging required
- Ideal for hospitals, hotels, office suites and apartments

Durapipe HTA®
Hot and Cold Water

DURAPIPE UK CONDITIONS OF SALE

1. DEFINITIONS:
'Seller' shall mean Glynwed Pipe Systems Limited, registered in England under number 1698059. 'Buyer' shall mean any company, organisation or individual to whom a quotation is offered, or whose order is accepted by the Seller.

2. CONDITIONS:
All offers, quotations, estimates, acceptances and contracts are subject to these Conditions of Business and any terms or conditions which any other person shall seek to impose or make part of any contract shall, so far as is inconsistent with these Conditions of Business, not apply unless expressly agreed by the Seller in writing. The headings in these conditions are for convenience only and shall not affect their interpretation.

3. QUOTATIONS AND PRICE VARIATION:
a) Any quotation given by the Seller is an invitation to the Buyer to make an offer only and no order of the Buyer placed with the Seller in pursuance of a quotation or otherwise shall be binding on the Seller unless and until it is accepted in writing by the Seller.

b) Unless stated otherwise, all quotations and published price lists are ex works, exclusive of VAT and shall remain valid for 30 days or such a period as may be quoted but nevertheless the Seller may amend or withdraw any quotation by written or oral notice. Quotations may be varied if the Buyer makes variations in his specifications.

4. STATEMENTS OR REPRESENTATIONS TO THE BUYER:
If any statement or representation has been made to the Buyer upon which the Buyer relies other than in the documents enclosed with the Seller's quotation, the Buyer must set out that statement or representation in a document to be attached to or endorsed on the order in which case the Seller may submit a new quotation.

5. DELIVERY - TIME:
a) Any period for delivery given at any time and in any manner by the Seller is an estimate only and is not binding on the Seller. Delivery periods are normally calculated from the later of:

i) acceptance of order; or

ii) where applicable, the receipt by the Seller of a detailed specification or drawings.

b) Time shall not be deemed to be of the essence of the contract. Failure by the Seller to meet any quoted delivery period for any part or the whole of the order shall not entitle the Buyer to rescind the contract or to claim damages of any nature.

c) The Seller will endeavour to comply with reasonable requests by the Buyer for postponement of delivery but shall be under no obligation to do so. Where delivery is postponed otherwise than due to default by the Seller the Buyer shall pay all costs and expenses including a reasonable charge for storage and transportation occasioned thereby and an extra charge for split delivery if applicable.

d) The Buyer will receive delivery of any consignment between the hours of 8.00am and 4.00pm Monday to Friday inclusive, unless otherwise agreed in writing. Cost incurred by the Seller arising from the Buyer's refusal to accept consignments within the agreed hours shall be borne by the Buyer.

6. DELIVERY AND RISK:
a) Except where stated to the contrary in the contract, delivery shall be made as follows:

i) where the Buyer provides the transport, delivery shall be made ex the Seller's works;

ii) where the Seller provides the transport, delivery shall be made to the premises of the Buyer, or the premises of the Buyer's customer or works site if the Buyer has requested delivery to be so made but where the Buyer has made such a request the Seller will make a first delivery to the Buyer's customer or works site as so much of the goods as is available for that delivery but subsequent deliveries will be made to the premises of the Buyer.

b) The Seller may at its discretion make partial delivery of orders and invoice the same.

c) Risk in the goods shall pass on delivery.

d) Where goods are sent FOB the Seller's responsibility shall cease when the goods are placed on board ship or aircraft without the need for the Seller to give notice to the Buyer and the provisions of Section 32(3) of the Sale of Goods Act 1979 shall not apply.

7. OWNERSHIP OF GOODS:
a) The goods shall remain the sole and absolute property of the Seller as legal and equitable owner until such time as the Buyer shall have paid to the Seller the contract price together with the full price of any other goods the subject of any contract between the Seller and the Buyer.

b) The Buyer acknowledges that until such time as the property in the goods passes to the Buyer he is in possession of the goods as a bailee and fiduciary agent for the Seller and the Purchaser shall store the goods in such a manner that they are clearly identifiable as the property of the Seller.

c) Until payment due under all contracts between the Buyer and the Seller had been made in full, in the event of sale of the goods by the Buyer:

i) the Seller shall be entitled to trace all proceeds of sale received by the Buyer through any bank or other account maintained by the Buyer; and

ii) the Buyer shall if requested by the Seller in writing to so assign its rights to recover the selling price of the goods from the third parties concerned. Such monies to be held separately by the Buyer as agent on behalf of the Seller.

d) The Seller may for the purpose of recovery of its goods enter upon any premises where they are stored or where they are reasonably thought to be stored and may repossess the same.

8. TERMS OF PAYMENT:
In the event of default in payment according to the agreed payment terms between the Seller and the Buyer – i.e. by the end of the month following the month of despatch of the goods the Seller shall be entitled without prejudice to any other right or remedy to suspend all further deliveries and to charge interest on any amount outstanding at the rate of 2% per month until payment in full is made (a part of a month being treated as a full month for the purpose of calculating interest).

9. SHORTAGES AND DEFECTS APPARENT ON DELIVERY:
a) It shall be the responsibility of the Buyer to inspect or arrange for an inspection of the goods on delivery whether the goods are delivered to the Buyer's premises or to the premises of the Buyer's customer or to a works site. If no such inspection is made the Buyer shall be deemed to have accepted the goods.

b) The Buyer shall have no claim for shortages or defects apparent on inspection unless:

i) a written complaint is made to the Seller within three days of receipt of the goods specifying the shortage or defect; and

ii) the Seller is within seven days of receipt of the complaint given an opportunity to inspect the goods and investigate the complaint before any use is made of the goods.

c) If a complaint is not made to the Seller as herein provided then in respect of such shortages or defects the goods shall be deemed to be in all respects in accordance with the contract and the Buyer shall be bound to pay for the same accordingly.

10. CLAIMS FOR DEFECTS NOT APPARENT ON INSPECTION:
a) The Buyer shall have no claim for defects not apparent on inspection unless the Seller is notified of defective workmanship or materials within twelve months from delivery of the goods. Provided that the goods have been installed and applied in accordance with any relevant recommendations made by the Seller, the Seller will at its option replace the goods or refund the net invoiced price in respect of the goods which have been shown to be defective. If the Seller does so supply substitute goods the Buyer shall be bound to accept such substituted goods in full satisfaction of the obligations of the Seller under the contract.

b) The Buyer shall in any event have no claim or set-off in respect of defects unless a written complaint is sent to the Seller as soon as the defect is noticed and no use is made of the goods thereafter or alteration made thereto by the Buyer before the Seller is given an opportunity to inspect the goods.

c) The Buyer is responsible for ensuring that the goods are fit for any particular purpose, and no warranty or condition of fitness for any particular purpose is to be implied into the contract.

11. LIABILITY:
Save as stated in Conditions 9 and 10 (and save in respect of death or personal injury resulting from the negligence of the Seller its servants or agents) the Seller shall not be liable for any claim or claims for direct or indirect consequential or incidental injury loss or damage made by the Buyer against the Seller whether in contract or in tort (including negligence on the part of the Seller its servants or agents) arising out of or in connection with any defect in the goods or their fitness or otherwise for any particular purpose or any act omission neglect or default of the Seller its servants or agents in the performance of the contract.

12. FORCE MAJEURE:
Notwithstanding anything herein contained neither the Buyer nor the Seller is to be held liable for any delay or failure to carry out the contract due wholly or in part to an act of God action by any Government whether British or foreign civil war strikes and/or lockouts wheresoever occurring fire trade disputes floods or unfavourable weather or any material becoming unavailable or irreplaceable (whether at all or at commercially acceptable prices) or any other circumstances beyond the control of the Seller.

13. SUB-CONTRACTING:
The Seller reserves the right to sub-contract the fulfilment of any order or any part thereof.

14. INSOLVENCY AND BREACH OF CONTRACT:
In the event that:

a) the Buyer commits any breach of the contract and fails to remedy such breach (if capable of remedy) within a period of thirty days from receipt of a notice in writing from the Seller requesting such remedy; or

b) any distress or execution is levied upon any of the goods or property of the Buyer; or

c) the Buyer offers to make any arrangements with or for the benefit of its creditors or (if an individual) becomes subject to a petition for a bankruptcy order or (being a limited company) has a receiver appointed of the whole or any part of its undertaking property or assets; or

d) an order is made or a resolution is passed or analogous proceedings are taken for the winding up of the Buyer (save for the purpose of reconstruction or amalgamation with insolvency and previously approved in writing by the Seller) the Seller shall thereupon be entitled without prejudice to its other rights hereunder forthwith to suspend all further deliveries until the default has been made good or to determine the contract and any unfulfilled part thereof or at the Seller's option to make partial deliveries. Notwithstanding any such termination the Buyer shall pay to the Seller at the contract rate for all the goods delivered up to and including the date of termination.

15. INDUSTRIAL PROPERTY RIGHTS:
If goods supplied by the Seller to the Buyer's design or specifications infringe or are alleged to infringe any patent or registered design right or copyright the Buyer will indemnify the Seller against all damages, costs and expenses incurred by the Seller as a result of the infringement or allegation. The Buyer will give the Seller all possible help in meeting any infringement claim brought against the Seller.

16. BUYER'S ERROR IN ORDERING:
In the event the Buyer orders incorrectly the Seller will be under no obligation to the Buyer to rectify or assist in rectifying the error.

17. LAW AND JURISDICTION:
The contract shall be subject in all respects to English Law and to the jurisdiction of the English Courts.

For further information on all Durapipe UK products and services contact our Customer Services Department as detailed below.

Customer Services
Tel: 0844 800 5509
Fax: 0800 317875

Registered office:

Durapipe UK
Walsall Road
Norton Canes
Cannock
Staffordshire
WS11 9NS
United Kingdom
Tel: +44 (0)1543 279909
Fax: +44 (0)1543 279450
email: enquiries@durapipe.co.uk
web: www.durapipe.co.uk

Distributor

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