HTA® and HTA®-E SYSTEMS

CPVC PIPES AND FITTINGS FOR HOT AND COLD FLUIDS UNDER PRESSURE

EDITION
JANUARY 2006

TECHNICAL
DOCUMENTATION

GIRPI

safety for your pipeworks

CERTIFICATION

AFAQ

N° QUAL/1995/3526a

GIRPI

CONCEPTION, FABRICATION PAR INJECTION, FACONNAGE
ET VENTE DE PIECES ET ACCESSOIRES EN MATIERES PLASTIQUES
POUR LE BATIMENT ET L'INDUSTRIE.

DESIGN, MANUFACTURING BY INJECTION MOULDING, SHAPING
AND SALES OF PLASTIC PARTS AND ACCESSORIES
FOR BUILDING AND INDUSTRY.

Rue Robert Ancel BP 36 F-76700 HARFLEUR

AFAQ certifie que pour les activités et les sites référencés ci-dessus toutes les dispositions mises en oeuvre pour répondre aux exigences requises par la norme internationale :
AFAQ certifies that all the arrangements covering the above mentioned activities and locations are established to meet the requirements of the international standard :

ISO 9001 : 2000

ont été examinées et jugées conformes.
have been examined and found conform.

2003-11-03

(année/mois/jour) Il est valable jusqu'au* / *It is vaild until** 2006-11-02 (year/month/day)

DG/X/0998.2 - 2002/08 - Document contractuel. ® AFAQ est une marque déposée

Le Président du Comité de Certification / *The President of the Certification Committee* — P. LATY

Le Directeur Général d'AFAQ / *The Managing Director of AFAQ* — O. PEYRAT

Le Représentant de l'Entreprise / *On Behalf of the Firm* — M. DIVANACH

*Sauf suspension notifiée entre temps par AFAQ à l'entreprise désignée ci-dessus. Le présent document n'a donc qu'une valeur indicative. Seule fait foi la base de données des certificats AFAQ accessible à l'adresse internet : http://www.afaq.org
L'organisation AFAQ est conforme aux normes internationales en vigueur (guide ISO/IEC 62 - norme EN 45012). Les accréditations détenues par AFAQ et ses filiales sont disponibles à l'adresse internet : http://www.afaq.org/accreditations
AFAQ se réserve le droit de modifier, à tout moment et sans préavis la forme de ce document de certification. Ce document, et notamment le logo y figurant, ne peut être utilisé par son titulaire que dans le respect des obligations légales et d'une communication claire et sincère.
*Excepting notification by AFAQ to the above-mentioned company of its suspension. This document is for information purposes only. For up-to-date information, the only official source is the AFAQ certificates database at http://www.afaq.org
The AFAQ organization complies with the international standards in force (ISO/IEC Guide 62 - EN 45012 standard). Information on the accreditations held by AFAQ and its subsidiaries is available at: http://www.afaq.org/accreditations
AFAQ reserves the right to modify, at anytime and without any notice, the shape of this certification document. This document and most specifically the logo featuring on this document can only be used by its holder in the frame respecting the legal requirements and a clear and sincere communication.

AFAQ - 116, AVENUE ARISTIDE BRIAND - BP 40 / F-92224 BAGNEUX CEDEX FRANCE

The main HTA® certifications

UBAtc
Belgium

ATEC
France

CSTBat
France

WRc
Great Britain

Germanischer Lloyd
Germany

RINA

AENOR
Spain

ITC
Tchéquie

Véritas Marine
France

The HTA® system is made from CPVC, which is totally recyclable

TECHNICAL DOCUMENTATION
CONTENTS

IMPORTANT DETAIL: the date on each page of this documentation is not a printing date but an updating date.

APPLICATIONS

GIRPI is part of an international group present in a lot of countries (Aliaxis).

GIRPI applied all of its know-how to design and develop the HTA® system, in order to provide solutions for a wide range of applications at temperatures between 5° and 100°C, depending on pressure (see data sheet 1.7):

- Domestic hot and cold water services
- Air conditioning
- Swimming pools
- Greenhouse heating
- Geothermy
- Shipbuilding
- Spas

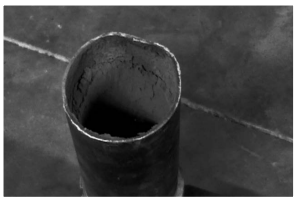
LEGIONELLA INFECTIONS PREVENTION IS THE BEST CURE

FIGHTING LEGIONELLA INFECTION: in the short term or long term, it is up to you...

Legionella development is accelerated under certain conditions.
Circuit design and the choice of materials are decisive factors to fight this bacterium.

GIRPI'S HTA® SYSTEM: EASIER MAINTENANCE

- *Made of neutral and inert material, GIRPI's HTA® system is completely corrosion-proof and limits scaling.*
- *In addition, the **very nature of the material** makes it possible to remove scale from the pipe if required by using corrosive products which do not damage its surface.*
- ***Impermeable to oxygen**, it prevents sludge formation resulting in bacterial proliferation.*


SCALE AND CORROSION FAVOUR INFECTION

PREVENTION IS THE BEST CURE. TO ENSURE CIRCUIT SAFETY, YOU NEED:

- *A GOOD DESIGN*
- *TO CHOOSE THE RIGHT MATERIALS*
- *TO APPLY PREVENTIVE MEASURES ON A CONTINUOUS BASIS*
- *THOROUGH INSTALLATION MAINTENANCE: SAMPLING - CLEANING - TREATMENT*

CHEMICAL COMPATIBILITY:

HTA has an excellent resistance to many chemicals: However, it cannot resist all chemicals. Please refer to technical sheets, and consult GIRPI for technical advice when in doubt.

HTA®

A GUARANTEE AGAINST CORROSION AND SCALE

To solve corrosion problems, GIRPI brings you **HTA®**, a complete system of pipes, fittings and valves, particularly suited to hot and cold plumbing networks.

HTA® is a synthetic material, designed to remain **unaffected by corrosion** problems met in building services pipeworks.
The product's chemical inertness relieves decision-makers from the headache of expensive post-sale corrosion-related problems. Furthermore, its light weight and easy installation method (flame-free cold welding) make HTA® an economical system for contractors.

The **HTA®** system has been approved by the CSTB testing centre in France (ATEC), and has been approved for use in most European countries.

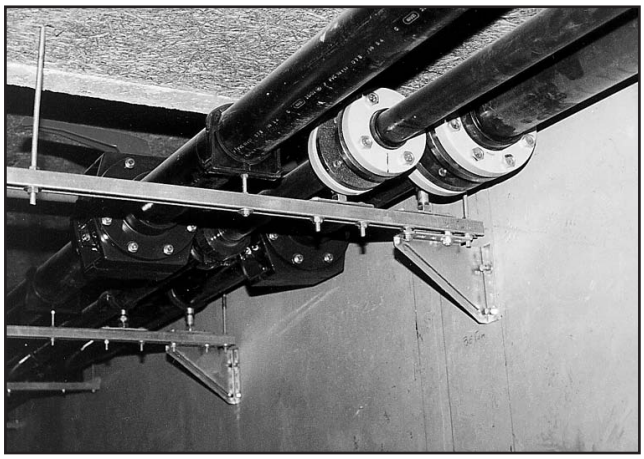
LNE also gave **HTA®** Bs1d0, European fire rating (non-flammable, no flame spread, no smoke, and no flaming drops),

HTA® has Véritas Marine and Germanischer Lloyds approvals.

Finally, **HTA®** is certified for contact with potable water (A.C.S.) by CRECEP.

HTA®

AN EFFICIENT, COST-EFFECTIVE, EASILY INSTALLED SYSTEM



BENEFITS

The HTA® system offers a lot of benefits against traditional materials:

❑ **Corrosion resistant:**	HTA® remains unaffected by atmospherical agents (damp or salty air) and aggressive waters (i.e. very pure or acid). Because HTA® is by nature non-corrodible, expensive film-forming treatments usually required with metal pipework can be avoided.
❑ **Resistant to scaling**:	Due to the nature of its material, HTA® is less subject to scaling than metals.
❑ **Food safe**:	All the components in HTA® appear in the list of substances approved for contact with foodstuffs for human consumption, issued by the French Health Ministry (brochure 1227). HTA® is food safe certified (ACS) delivered by CRECEP.
❑ **Fire classification**:	The HTA® system is non-flammable. The HTA® system is classified B-S1-d0 by L.N.E. (no smoke, no contribution to heat transmission, no flaming droplets) HTA® is Véritas Marine class 1 certified, and Germanischer Lloyd approved.
❑ **Permeability**:	HTA® is non-permeable to oxygen, thus eliminating the formation of sludge inside the pipes.
❑ **Smooth surfaces**:	The smooth internal surface of HTA® reduces frictional losses, and prevents fouling and scaling. In the long term, this main tains a greater capacity for a given diameter than with conven tional products.
❑ **Low thermal conductivity**:	Energy savings. Reduced heat losses.
❑ **Chemical resistance:**	Excellent compatibility with most chemicals used in building services (see chemical resistance tables).
❑ **Condensation:**	Reduced problems against traditional materials.
❑ **Installation:**	HTA® is quick and easy to install: lightweight, few tools needed, no flames needed. HTA® can be built in or embedded (in masonry or underground) (except for mechanical jointings).

The HTA® system has been approved by the CSTB testing centre in France, and has been approved for use in most European countries. In France, HTA® pipes and fittings have been awarded ATEC recommendation No. 14+15/98-516 for pipe diameters : PN 25 from Ø 16 to 63
PN 16 from Ø 32 to 160 .

Application validated by this technical recommendation:

- heating systems (class 2) including air conditioning
- domestic and commercial hot and cold water distribution (class HCWS)
- industrial kitchen waste disposal

The ATEC approval also includes the using of RERFIX welding polymer (no abrading and no degreasing). The ATEC approval replaces NF-certificates when no NF standard exists to describe the performances of the product to be approved.

GENERAL CHARACTERISTICS

1. PHYSICAL CHARACTERISTICS

Characteristics	Standards	Units	Values
Physical aspect	NF EN 15 877	—	—
Fire classification	EN 13501-1	B-S1-do	
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
Heat pertaining to weight capacity		Cal./g°C	0,29
Thermal conductivity	ASTM C 177-76	W/m.°C	0,16
Water absorption (24h at 100°C) (pipes)	ISO 8361		
(fittings)	NF EN 743	%	≤ 5 %
Shrinkage at 150°C	NF EN 580	—	conforme

2. MECHANICAL CHARACTERISTICS

Characteristics	Standards	Units	Values
Bending under load temperature (Pipe)	NF EN ISO 75-1	°C	≥ 97
(Fittings)			≥ 90
VICAT softening temperature		°C	≥ 110
(5 daN load) (Pipe)	NF EN 727		
(Fittings)		°C	≥103
Tensile elasticity modulus (Pipe)	NF EN ISO 527	MPa	3400
Tensile strength at yield limit (Pipe)	NF EN ISO 527	MPa	≥ 60
Breaking tensile strength (Pipe)	NF EN ISO 527	MPa	≥ 50
Breaking elongation	NF EN ISO 527	%	≥ 40
Hardness: ball			1400
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	Bar	4,2 x PN
• Fittings at 80° C: time ≥ 1000 h		MPa	2,5
Resistance to alternating pressure			
(On fittings and glued jointings)	NF T 54 094		
Pressure: min. 20 bar/max. 60 bar	NF T 54 034		
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

3. 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

4. CHEMICAL RESISTANCE

Any fluid or water containing chemical agents (in suspension or in solution) other (or in different quantities) than those permitted by the standards and regulations concerning drinking water are considered as chemical products. Their compatibility must thus be verified with the HTA® system.

Refer to our table indicating the performance of CPVC with respect to chemical agents.

If in doubt, please contact both the product supplier and GIRPI technical services.

5. QUALITY CONTROLS

To provide a normal quality level for its products and to guarantee its users that the stated performances are respected, GIRPI has implemented the control regulations imposed by the different French and international standards.

The controls concern the physical and mechanical characteristics of the couplings.

However, in addition to the above verifications and to guarantee the maximum reliability level in actual operating conditions, GIRPI has developed and carries out additional tests, one of which is currently undergoing standardization (NF T 54-094 standard).

Thus, a crushing operation on the couplings associated with an alternate pressure test (on complete joint sections) is regularly carried out. The couplings are subjected to fluid hammer pressure cycles (20/60 bar) at 3600 cycles/hour for diameters 12 to 90 and 1500 cycles/hour for diameters 110 and 160.

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

The ISO 9001 V2000 certified procedures at all stages (production, quality, control etc...) globally guarantee the quality of GIRPI's products.

ISO 9001
VERSION 2000
CERTIFIED
COMPANY

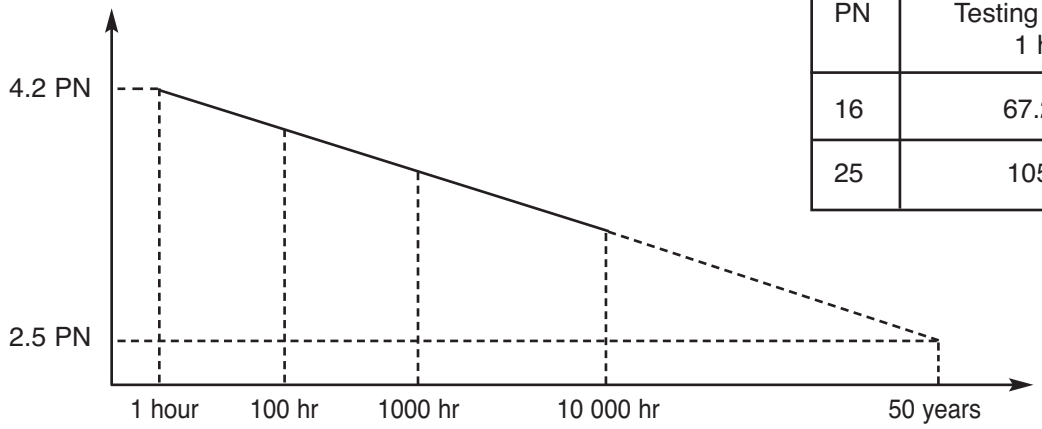
OPERATING CONDITIONS

■ WORKING LIFETIME:

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 figured out by using regression curves as per standard NF T 54-091.

■ TESTING PRESSURE



PN	Testing pressure 1 hour
16	67.2 bar
25	105 bar

A pressure pipework can be classified as PN 16 or PN 25 (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 characteristics of the system can only be guaranteed to 50 years by combining these two parameters.

The readings for the breaking pressures for HTA® change, as shown in the above straight line with logarithmic scale.
Considering the safety coefficients, the pressure ratio between 50 years and one hour ranges from 4.2 to 2.5. This straight line is drawn on the basis of the 1hr, 100 hr, 1000 hr and 10,000 hr tests, and is then extrapolated to 50 years.

OPERATING CONDITIONS

■ WORKING PRESSURES:

	Ø 12 to Ø 63 - PN 25 Series 4	Ø 32 to Ø 160 - PN 16 Series 6.3
Temperature °C	Working pressure bar	Working pressure bar
20	25	16
40	20	12
60	13	8
80	6	4
90	4	2
100	Drainage (no pressure)	Drainage (no pressure)

Quoted working pressures are **for a 50 year lifetime, with a safety coefficient of 2.5**.

■ BUILDING SERVICES APPLICATIONS

• As approved in France according to the ATEC certificate delivered by CSTB, in PN 25 and PN 16. Please cousuet us for other countries.

• HCWS class (hot & cold water services): pipeworks with water temperatures up to 80°C, but able to withstand accidental peaks at 100°C.

Reminder: in France, low (23 June 1978) limits water temperature at 60°C at final delivery points.

• Class 2: LTWH (Low Temperature Water Heating) including reversible air conditioning.

Heating pipeworks (excluding floor heating) whose temperature normally does not exceed 50°C, but able to withstand accidental peaks at 65°C.

• Centralized kitchens: drainage pipeworks in industrial laundries and kitchens, condensate drainage in boiler rooms, up to 100°C, ending at grease separator inlet,or cooling tank inlet. For all of the above applications, drainage is always exclusively carried out by natural gravity.

■ GUARANTEES

• For all applications specified in the technical documentation, regardless of pipe diameter, GIRPI has an insurance to guarantee installations which are carried out in accordance with its own general recommendations, and which respect the temperature and pressure conditions and the nature of fluid specified above.

GIRPI

HTA® SYSTEM

RANGE

Technical Sheet

2.1

2005

Description	Ref.	Diameters in mm												Technical Sheet
		16	20	25	32	40	50	63	75	90	110	125	160	
HTA® PIPE	TUBHT	PN25	PN25	PN25	PN25	PN25	PN25	PN25						7.1
	THT				PN16	PN16	PN16	PN16	PN16	PN16	PN16	PN16	PN16	7.1
ELBOWS 90°	H4M													7.2
ELBOWS 45°	H8M													7.2
STRAIGHT COUPLINGS	HMA													7.2
CAPS	HBO													7.3
BENDS 90°	H4C													7.3
EQUAL TEES 90°	HTE													7.3
EQUAL TEES 45°	HYT													7.4
REDUCED TEES 90°	HTR		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			7.5
REDUCING BUSHES long pattern	HRD			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	7.6
REDUCING BUSHES short pattern	HRS		16	20	25	32	40	50	63	75	90	110		7.7
ADAPTOR NIPPLES BRASS THREADED	HEAL HEBL													7.7
ADAPTOR NIPPLES	HEAS													7.7
ADAPTOR NIPPLES	HEA		1/2”	3/4”	1”	1”1/4	1”1/2	2”						7.8
	HEB	1/2”		1”	1”1/4	1”1/2	2”							7.8
ADAPTORS FOR MEASURING INSTRUMENTS	HMIL													7.8
FIX POINT	HPTF													7.8
3-PIECE UNIONS	H3G/L	3/8”	1/2”	3/4”	1”	1”1/4	1”1/2	2”						7.9
3-PIECE UNIONS M brass/F CPVC	H3F/L	3/8”	1/2”	3/4”	1”	1”1/4	1”1/2	2”						7.9
3-PIECE UNIONS	H3P													7.9
3-PIECE UNIONS	H3F/P		1/2”	3/4”										7.10
	H3F/PB	1/2”	1/2”	3/4”										7.10
HOZE TAILS socket	HDC													7.10
THREADED INSERTS	HFT			1/2”	3/4”									7.10
SERRATED STUB FLANGES	HCS													7.11

GIRPI

HTA® SYSTEM

Technical Sheet

2.2

RANGE

2005

Description	Ref.	Diameters in mm												Technical Sheet
		16	20	25	32	40	50	63	75	90	110	125	160	
THREADED ADAPTORS for high torque	HMML	3/8”	1/2”	3/4”	1”	1”1/4	1”1/2	2”						7.11
THREADED ADAPTORS 316 L for high torque	HMMS		1/2”	3/4”	1”									7.11
COUPLINGS	HMM		1/2”	3/4”	1”	1”1/4	1”1/2	2						7.12
PLAIN NIPPLES length in mm	HMC TUBHT													7.12 7.12
TAP CONNECTORS WITH BRASS NUTS	HDR		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		7.12
THREADED 90° TEES	HTG	1/2”	1/2”	3/4”										7.13
THREADED 90° TEES	HTGR				3/4”	3/4”	3/4”	3/4”						7.13
THREADED ELBOWS 90°	H4GL	1/2”	1/2”	3/4”										7.13
THREADED ELBOWS 90°	H4GP	1/2”	1/2”	3/4”										7.14
EXPANSION JOINTS	HCD/G		1/2”	3/4”	1”	1”1/4	1”1/2							7.14
MONOKLIP BRACKETS DRILLED BASE Ø 5,5	HCKP	With metal insert												7.15
MONOKLIP BRACKETS THREADED INSERT M8	HCK	M6, M8 ou 7 x 150												7.15
MONOKLIP BRACKETS THREADED INSERT M6	HCKC	Drilled Ø 5,5												7.16
BRACKETS	A9C													7.16
FLAT GASKETS	JPVCS (FPM) JPNCS (EPDM)													7.17 7.17
FLANGES	BVR		Dn15	Dn20	Dn25	Dn32 Dn40	Dn40 Dn50	Dn60 Dn65	Dn75	Dn80	Dn100	Dn125	Dn150	7.17
FLANGES	BPA						Dn40	Dn50 Dn80	Dn60 Dn85	Dn80	Dn100	Dn125		7.17

HTA®-E RANGE - ACCESSORIES

2005

Description	Ref.	Diameters in mm												Technical Sheet
		16	20	25	32	40	50	63	75	90	110	125	160	
ELBOWS 90°	H4M													7.18
ELBOWS 45°	H8M													7.18
ELBOWS 87°30	HEC													7.18
ELBOWS 67°30	HECO													7.18
STRAIGHT COUPLINGS	HMA													7.19
CAPS	HBO													7.19
BENDS	H4C													7.19
EQUAL TEES 45°	HYT													7.20
EQUAL TEES 90°	HTE													7.20
TEES REDUCED 90°	HTR		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			7.20
REDUCING BUSHES long pattern	HRD			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	7.21
REDUCING BUSHES short pattern	HRS		16	20	25	32	40	50	63	75	90	110		7.21
3-PIECE UNIONS CPVC	H3P													7.21
PLAIN NIPPLES	HMC													7.22
THREADED INSERTS	HFT													7.22
ACCESS PLUGS	HETV													7.22
FLEXIBLE CONNECTORS	HESG													7.22
RUBBER FITTINGS FOR STAINLESS STEEL TRAPS	HESI													7.22
FITTINGS FOR STAINLESS STEEL TRAPS	HET													7.22

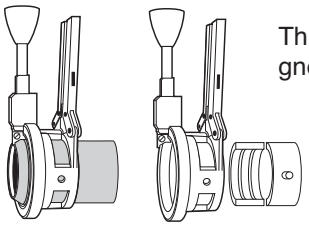
WORKS ON PIPES AND FITTINGS
TOOLS

■ CUTTING

• **The roller plastic pipe-cutter**

Ref. GIRPI **CT1240** Ø 12 to 40 mm
Ref. GIRPI **CT1263** Ø 12 to 63 mm
Ref. GIRPI **CT50110** Ø 50 to 110 mm

• **The chamfering pipe-cutter**



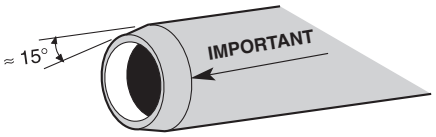
This tool cuts and chamfers the pipe after cutting, in one single operation. It is designed to cut the Ø 160 pipes without accessories.

Ref. GIRPI **CTC63** Ø 32 to 63 mm
Ref. GIRPI **CTC110** Ø 75 to 110 mm

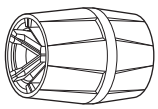
• **The use of disk saws to cut pipes is specifically not recommended.**

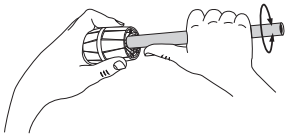
■ TRIMMING - CHAMFERING

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 a 1/2-round bastard file.



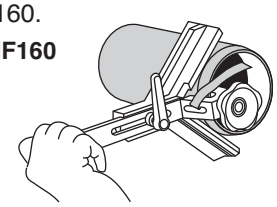
• **Trimming and chamfering cone** : This tool can be used to trim the inside of the pipe, and on the other side it chamfers the outside. Ref. GIRPI **CONE 50 U** for pipes Ø 12 to 50 mm.





Chamfering pipe-cutter *See cutting section.*

Chamfering tool
This tool chamfers the pipe outside from Ø 50 to Ø 160.
Ref. GIRPI **CHANF160**

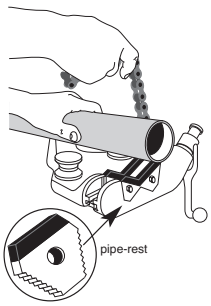


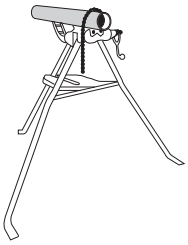
Trimmer
This reams the inside of pipes of all diameters.
Ref. GIRPI **EBAV1** Ø 12 to 160 mm

• **The use of tools including cutting or abrading disks to chamfe pipes is specifically not recommended.**

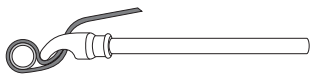
■ HOLDING TOOLS

Chain vice
Polyurethane pipe-rests hold the pipe without any scratching.

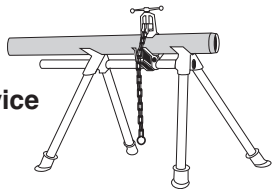


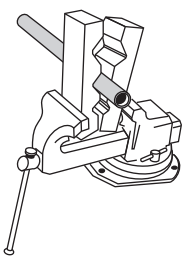


Strap wrench
Maximum gripping power, with no risk of deforming the pipes or fittings (braided nylon strap).



Chain bench vice





Vice (traditional) In this case all the necessary precautions must be taken so that the pipe is neither crushed nor scratched by the jaws. For this purpose, a “hard wood tool” can be cheaply produced. The pipe should be placed in the corresponding notch ; by tightening up the vice the tool clamps the pipe.

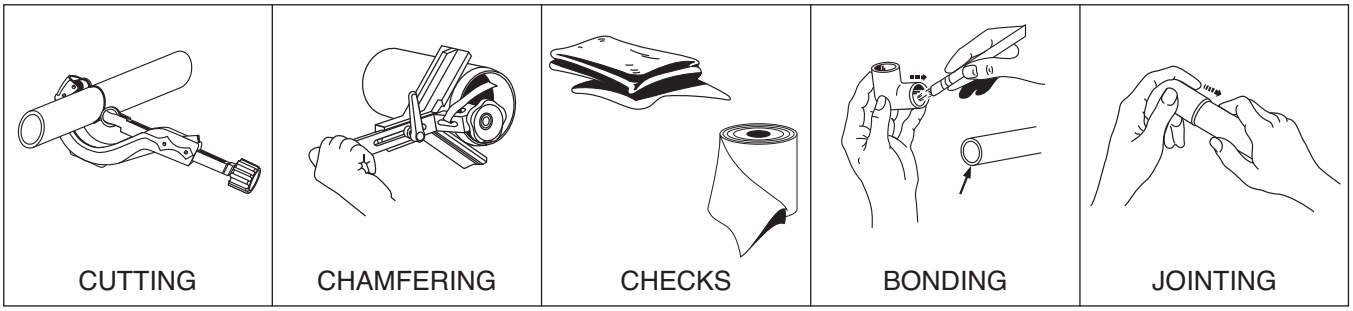
GIRPI

HTA® SYSTEM

WORKS ON PIPES AND FITTINGS
WELDING PROCEDURE

Technical Sheet

3.2



■ CHECKS BEFORE JOINTING

The cleaning/scouring and abrading operations are no longer required.
However, pipes and fittings imperatively must be clean and perfectly dry. Otherwise, jointing surfaces must be cleaned with a clean cloth, or by using our D171P cleaner (that is particularly important for longer diameters).

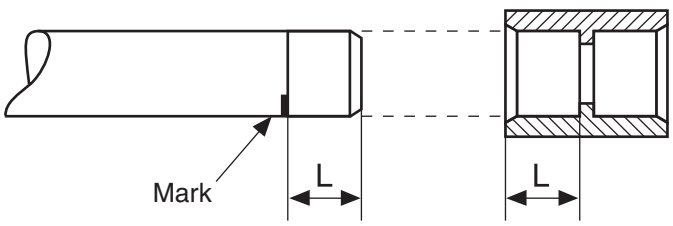
Before jointing, a few points must be checked :
a) on pipes & fittings: check that they are free from impacts, deep scratches, etc...
b) welding polymer: cement check that it is homogeneous and not too fluid or too tacky, free from crusts or inclusions.

⚠
IMPORTANT

- **Water neutralizes the cement** and subsequently impairs the welding quality. Therefore no cold welding will succeed if the parts to be assembled are damp (dry before welding).
- With **RERFIX** the assembly can be made when the ambient temperature is over +5°C and under +35°C. Jointings at ambient temperatures between 0°C and +5°C are possible provided that the cement is kept at 20°C.
- The atmospheric conditions (temperature, humidity) considerably affect the curing time (drying, evaporation of solvents) of the cement.
- At low temperatures, the jointed parts should be held together for 20 to 30 seconds.
- In hot weather, the cement should be applied rapidly and the parts immediately jointed.
- So as to avoid evaporation of the solvent contained in the cement, the pot must be closed after each jointing. It is essential that the cement is used shortly after having opened the pot, mainly in hot ambient temperatures.

■ MARKING OF THE SOCKET LENGTH

- It is useful to mark the pipe (using a thick pencil or felt marker) at a distance equal to the corresponding socket depth.



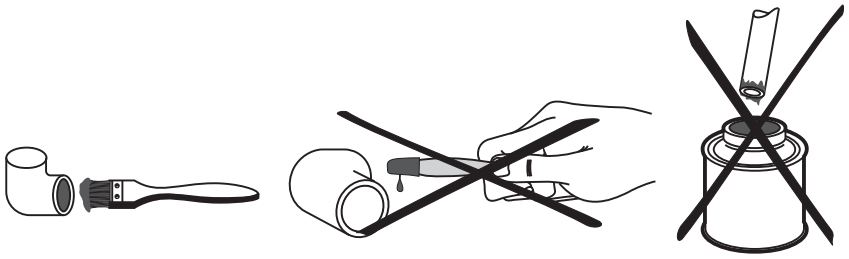
This mark enables you to:
1) apply the cement over the necessary length
2) check whether the penetration length of the male end into the socket is correct or not.

GENERAL CHARACTERISTICS
JOINTING PROCEDURE

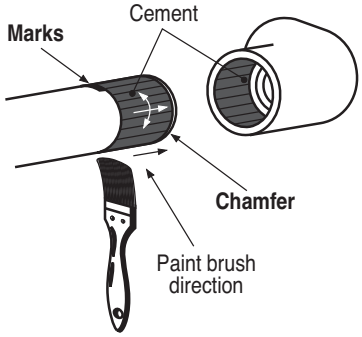
■ COLD WELDING

- When the checks and marking have been done, then apply the cement.
- **RERFIX** cement must be employed, in 250 ml pots or 1 l cans. Do not use any other cement.

- To apply the cement, use a suitable brush (also according to diameters). Do not use: your fingers, a piece of wood or any other utensil; dipping the pipe or couplings in the cement is prohibited (this way of doing things creates a bead of cement at the bottom of the socket and for small diameters, a film obstructing the bore).



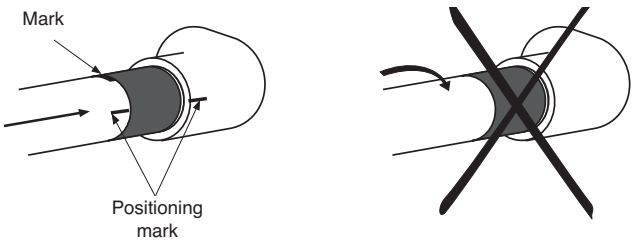
- First apply the cement moderately (in a thin coat) over the whole socket (female) interlock length, and afterwards over the whole length of the spigot (male) end (marked on pipe). The cement should be applied in 2 thin cross-coats, the first radially, the second longitudinally. See NF T 54-035 standard.



Owing to the standardized tolerance ranges of the male ends and the sockets, some slackness may appear.
In this case, double quantities of cement must be applied. This consists in coating the male end once, then the socket and the male end a second time, then jointing them.

■ JOINTING

Immediately after applying the cement, joint the two elements right home (as far as the marks previously traced) pushing longitudinally and, above all, **without twisting**. Hold together and motionless for 5 seconds. For large diameters, two people must be present in order to perform jointings (an operator coats the socket part while the other operator coats the spigot part). This working method enables a quick jointing, which in turn is necessary to ensure the jointing's mechanical resistance.



NB: In certain cases it is necessary to mark the position of one element in relation to the other (see sketch above). This mark should be done before scouring.
- After jointing and in the case of surplus cement resulting in a bead of cement, it is necessary to reduce it without completely eliminating the trace of cement. This bead should be reduced using a clean cloth or cotton wool.

GIRPI

HTA® SYSTEM

WORKS ON PIPES AND FITTINGS
RECOMMENDATIONS - DETERMINING CEMENT AND CLEANER QUANTITIES

Technical Sheet

3.4

■ DRYING TIME
With RERFIX cement, the drying times before pressure tests are the following:

- HCWS applications:
- new networks: 24 h
- maintenace/repair: see table hereunder.

- Other applications (LTWH, reversible A/C, etc...): see table hereunder

Ø (in mm)	16 - 63	75 - 110	125 - 160
Ambient temperature	**for 6 bar pressure test, at 60°C**		
5 to 10°C	2 h	4 h	24 h
11 to 35°C	1 h	2 h	24 h

■ FLUSHING (RINCAGE)
- Potable water networks: for potable water applications, before reinstatement, some principles should systematically be followed, i.e. fill the network with water, rinse them and empty them (e.g. French Hospital Regulations from CHSPF, 8 Th July 2003) and similar applicable regulations in other countries).
- Hence, in HCWS networks: for new networks, reinstatement of water must follow 3 flushing cycles (24 h stagnation and complete eruptying for each cycle).
- for renovated networks/repaired networks, water rein statement must follow or flushing operation where by the quantity of water drained from the valve/tap down stream from the section of pipework which has been repaired represents approximately 10 times the volume of water contained between the repaired section and the draining point (valve tap).
- Air conditioning networks: fan coil units and heat pumps may contain residual amounts of lubricants which are not compatible with HTA. Therefore, those devices should be rinsed before starting the network.

■ HANDLING AND STORAGE
Like all building materials, the final quality of the installation depends on the conditions in which the materials are transported, handled and stored. The pipes and fittings will be stored separately on an evenly flat area, away from dust and sun light. In all cases, take special care to avoid rough handling and impacts (especially with sharp, cutting or heavy objects) particularly in cold weather.

■ THERMOFORMING
Thermoforming of the HTA® pipes is **strictly prohibited on the building site** and voids GIRPI'S guarantee. For all changes in direction, make use of standard HTA® fittings only. In case of specific problems, please contact GIRPI'S for technical assistance.

■ CONNECTIONS BETWEEN HTA AND THREADED METAL COMPONENTS
The fittings with male and female threaded brass inserts moulded from a casting : HMML, HEAL, HEBL, H4GL, H4GP must be used for strong tightening torques on metallic fittings. The waterproofing may be then carried out by traditional means, **except for anaerobic resins**, which are totally incompatible with HTA.
Excluding connection to wall plates (GAAP), obtained by means of tap connectors (HDR), connections of HTA to metal pipes, fittings and equipment, with male or female thread (tapered/conical or cylindrical), must be made by means of CPVC/metal couplings provided for this purpose. In no case what seeven should CPVC pipes and fittings from GIRPI'S HTA system be threaded by mechanical intervention. All plastic HTA threaded fittings (e.g. HEA, HE, HMM) can be connected with cylindrical (parallel) metal threaded fittings.
If such all-plastic HTA® fittings are used, they will be screwed by hand, only the last quarter turn (if necessary) will be made preferrably by using a strap wrench. **In this case, the use of sealants like tow or similar, or anaerobic resins is forbidden,** as excessive tightening may provoke irremediable damages.

The following sealants may be used:
- Teflon tape type sealing materials, preferrably high density. On male threads, apply 5 layers of Teflon tape clock wise, starting from 1st thread;
- Silicone paste (e.g. SILICOMET JS 533 by Loctite or Filetplast by GEB). Drying time: 24h. For Ø 1/2" and 3/4", drying times of 3 hours are sufficient.

Before using any other sealant than those listed here under please contact GIRPI for technical assistance.

SILICONE PASTES	
BRAND	NAME
LOCTITE	SILICOMET JS 533
GEB	FILETPLAST

Sealant manufacturers are responsible for ean firming the pressure resistance and sealing properties under pressure

■ APPROXIMATIVE CEMENT QUANTITIES FOR 100 JOINTINGS DEPENDING ON PIPE DIAMETER

pipe Ø	16-20	25-32	40-50	63-75	90-110	125	160
Quantity welding polymer	60 ml	200 ml	0,5 L	1,5 L	3 L	4,5 L	6 L

GIRPI

HTA® SYSTEM

COMMISSIONING INSPECTIONS, TESTS AND PUTTING INTO SERVICE

Technical Sheet

3.5

2005

GENERAL

The HTA® system pipes and fittings are inspected throughout their manufacturing process, and are guaranteed for a use complying with their design within the limits indicated.
During installation and before putting the HTA® network into service, it is advisable to make a certain number of checks, as with any other material. In France, consult DTU 60-31-(NF P41-211), DTU 60-1-(NF P40-201). Outside France, please refer to applicable texts

INSPECTION

a) Visual inspection
When assembling, the pipes and fittings should be inspected so as to eliminate doubtful elements containing abnormalities such as impacts or deep scratches 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 (connections, supports, monitoring and safety mechanisms, etc.).

b) Leak tests
Before completing the network, a leak test will be made (all the parts of the network should be visible and accessible during the test).

c) Pressure test
The network is filled with water (drive the air out of all the high points), then held under pressure throughout the time necessary for the visual inspection of all the junctions, with a minimum of 30 minutes (for large scale installations, proceed by sections).

The pressure test will be made at with cold water (ambient temperature), at 1,5 times **the maximum service pressure** with a minimum of:
- 6 bar for LTHW and reversible A/C or cooling.
- 10 bar for HCWS.
- except for drainage up to 100°C for collective and centralized kitchen (refer to applicable texts).

• in case of a leak on a cemented joint, replace the faulty section then recommence the test
• in case of a leak on a screwed joint, tighten up the fitting and replace the joint

PUTTING INTO SERVICE

When the leak tests have been made, it is advisable, in order to remove all foreign matter, to clean the inside of the network. Before putting into service, all the tests and inspections must be made in accordance with the rules of the trade and the regulations applicable to the installation whilst taking into account the characteristics of the material.

OPERATING CONDITIONS

Whatever the case of use, the safety mechanisms necessary for the traditional protection of networks (regulating, anti water hammer, pressure reduction and limitation, temperature regulation and limitation, isolating mechanisms, etc). should be provided, installed and kept in perfect working order during the operation.

a) Vibrations:
Vibrations can be a source of disorders both on the piping and on the supports; it is highly advisable to install a suitable system preventing their propagation when necessary.

b) Hot sources and UV:
Being made from a thermoplastic material, the HTA® System should in no case be installed close to a source of heat causing a rise in temperature greater than its limits of use, nor in places continuously exposed to the sun (ultraviolet rays). If this type of installation proves to be inevitable, a minimum number of precautions must be taken such as applying reflecting paint or interposing a protective screen impermeable to ultraviolet or heat rays.

c) Pipework pollution
In air conditioning networks, fan coil units may contain esther-based lubricants, which must be removed by cleaning/rinsing before installation.

d) Prevention of impacts:
As with all networks conveying pressurised fluids, the piping in the HTA® System should be protected against impacts which might occur in passages used by vehicles (e.g. forklift trucks) or suspended loads in movement (use of safety barriers, railings, etc.).

e) Air conditioning networks:
The use of MPG (Monopropylene glycol) based antifreeze liquid is prohibited.

CONTRACTION - EXPANSION
PHENOMENON - CALCULATIONS

THE PHENOMENON

All materials not specially stressed, under the effect of thermal variations in relation to a reference temperature (installation temperature):
- expand when the temperature rises
- contract when the temperature drops

CALCULATION PARAMETERS FOR HTA®

The linear expansion coefficient of the 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 the relation:

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

in which α = expansion-contraction coefficient (linear)

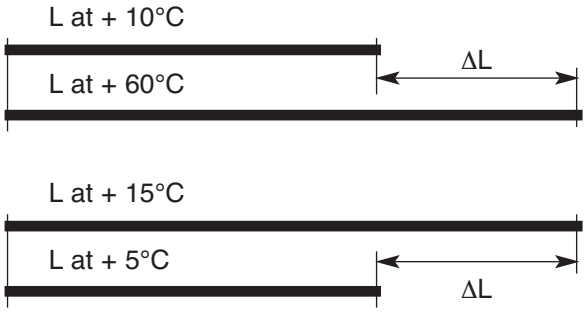
L = length of the piping when installed, in meters

Δ**T** = temperature deviation in degrees Celsius/Centigrade (°C)
(difference between the maximum or minimum temperature in service and the installlation temperature)

Δ**L** = length variation in millemetres (mm)
(difference in length between L on installation and L in operation, i.e. elongation or shrinkage length).

Ex 1 : installation temperature ***+ 10°C***
L = ***10 m***
working temperature (fluid or room) ***+ 60°C***
ΔT = 60 - 10 = **50°C**
ΔL = 0,065 x 10 x 50 = **33 mm**

Ex 2 : installation temperature ***+ 15°C***
L = ***30 m***
working temperature (fluid or room) ***+ 5°C***
ΔT = 15 - 5 = **10°C**
ΔL = 0,065 x 30 x 10 = **19 mm**



ABACUS to determinate quickly the ΔL resulting from the above formula (See descriptive sheet 4.2)

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

Example ② : Find the ΔL of a tube 30 m long 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.

GIRPI

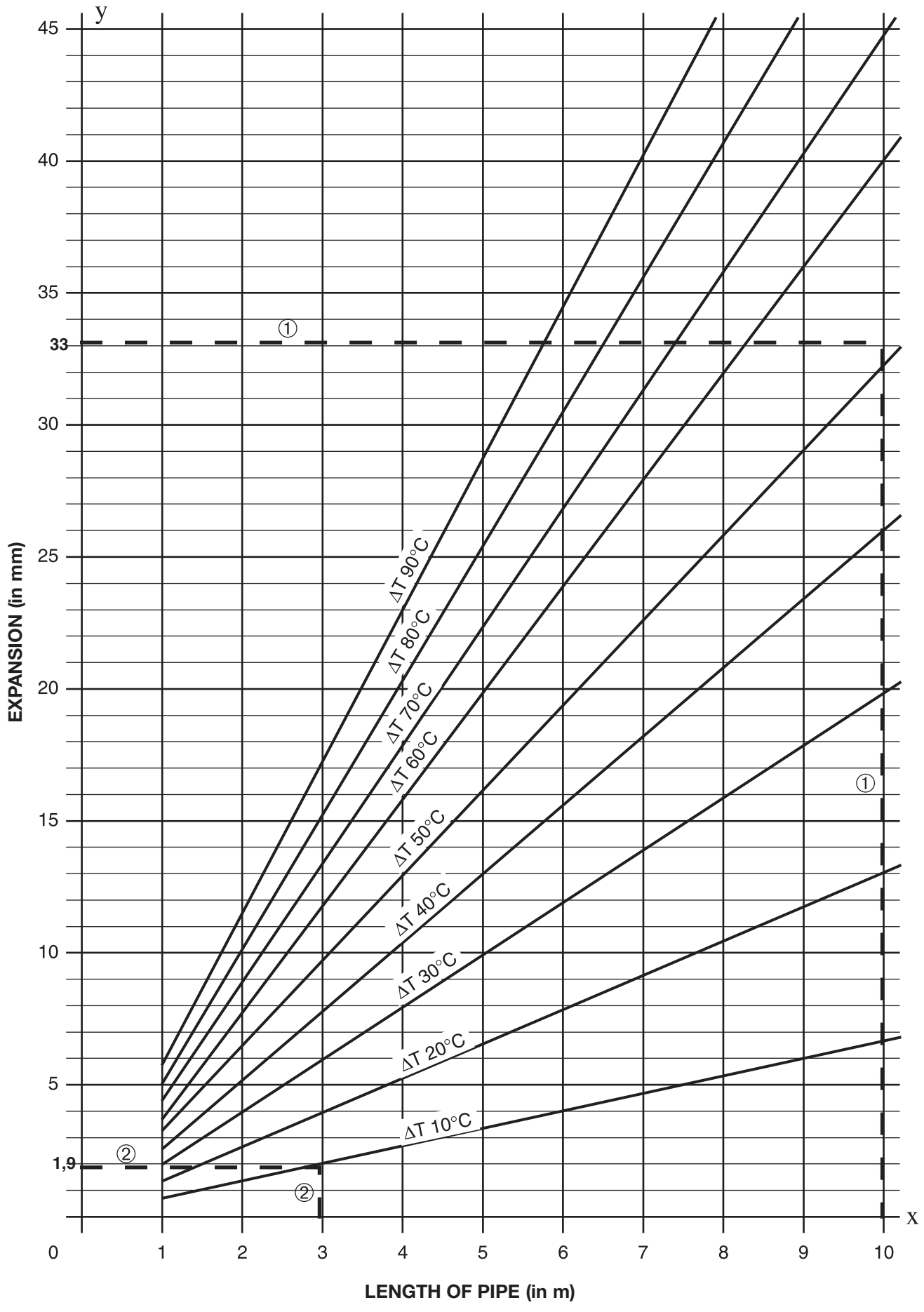
HTA® SYSTEM

EXPANSION - CONTRACTION
PHENOMENON - CALCULATIONS

Technical Sheet

4.2

2004



EXPANSION - CONTRACTION
CONSEQUENCES

CONSEQUENCES OF CONTRACTION-EXPANSION AND SOLUTIONS

In 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 is the origin of its being tensioned. The sketches below illustrate a number of cases of compression or tension, which cause abnormal stress on the material and may cause large-scale disorders.

The DTU, ATEC, and various guides concerning the installation of piping, whatever their nature, generally indicate that «when installing, it is necessary, in order to avoid disorders which may be caused by variations in length, to know about them and remedy them».

: Fixed Point (1) FP

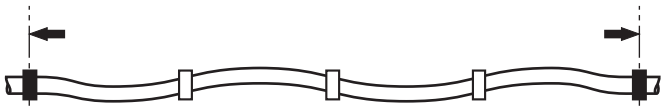
: Longitudinal Guide (2) LG

: Action on the stops and couplings

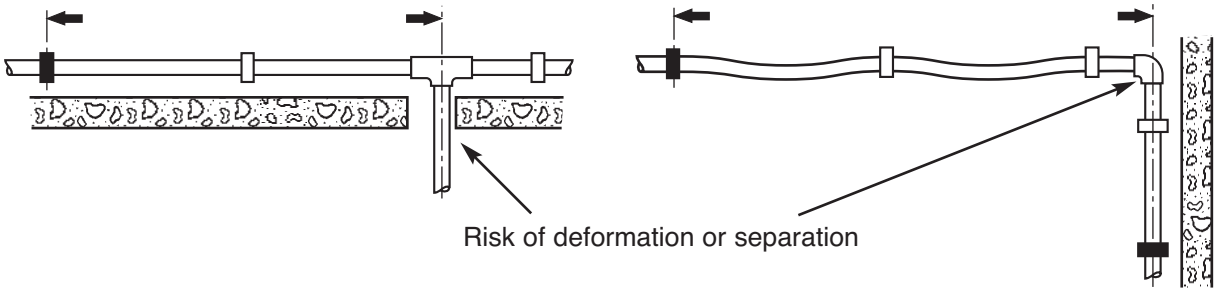
: Free Support

a) Expansion (compression between fixed points)

■ buckling of the pipe between fixed points

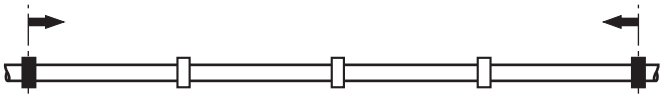


■ Thrust on the walls, obstacles, jointings or on the materials forming a fixed point.

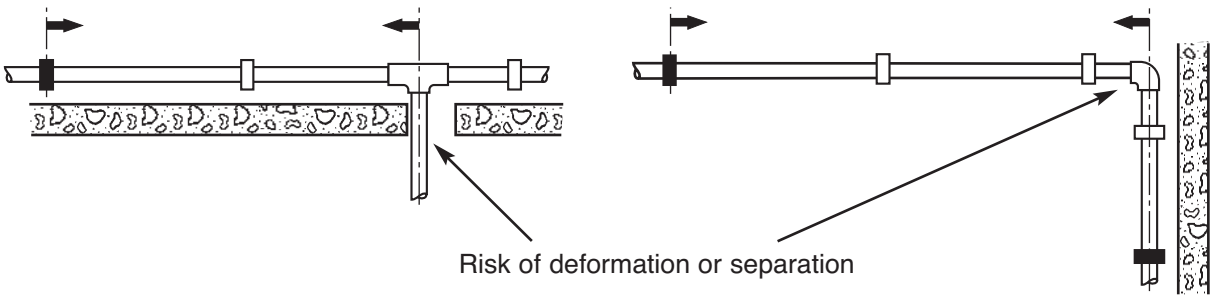


b) Contraction (tension between fixed points)

■ Tensioning of pipes, mechanical couplings, jointings between fixed points



■ Tensioning between walls, obstacles, jointings or material forming a fixed point



(1) PF :This is a support blocking the pipework system at one point, in order to “orientate” the movements caused by expansion and contraction.

(2) LG : They support the pipes while allowing them to lenghten and shrink freely (expansion and contraction).

EXPANSION - CONTRACTION
REMEDIES

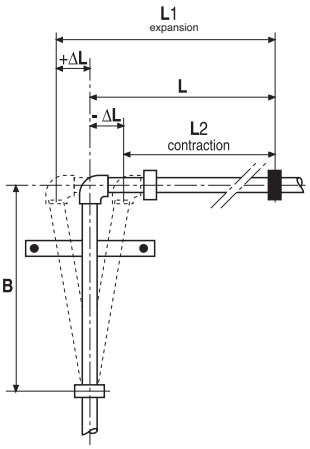
c) The remedies

In order to avoid the disorders subsequent to the movements of the pipe, it is necessary to let the latter expand and contract freely.

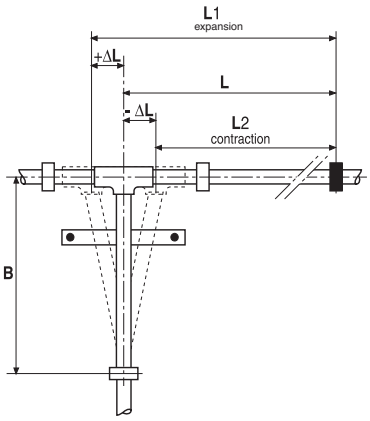
It is therefore necessary to:
- use supports whereby the longitudinal movements of the pipe can be guided
- see that there is never a straight length of pipe between 2 fixed points, either by using a change in direction, or a loop (see illustration below).

1° <u>Change in direction</u>, which is generally efficient in most cases

CHANGE IN DIRECTION

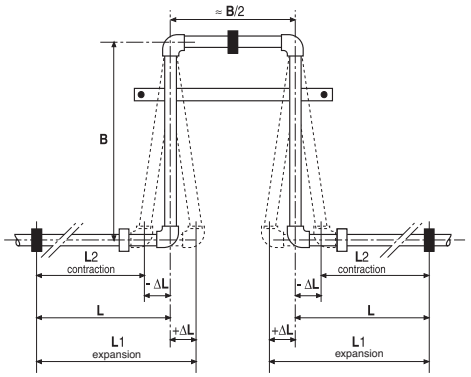


BRANCH

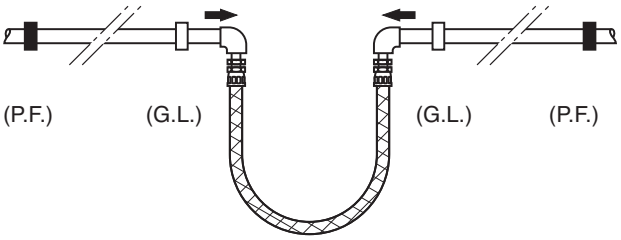


2° <u>Loop</u> made with HTA® pipes and fittings

LOOP

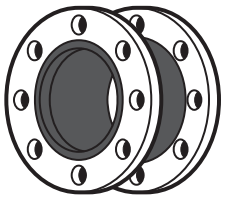


3° <u>Expansion joints</u> (HCD/G)



L : Length of piping during installation.
L1 : Length at Max temperature.
L2 : Length at Min temperature (fluid or).
ΔL : Length difference between L1 (or L2) and L.
B : Length of loop's arm.

4° **<u>Compensators</u>**



Compensators and flexibles are elements which need no maintenance but they are subject to wear. As such, they need to be checked at regular intervals (see corresponding DTU - French building specifications - and NF - French building standard or equivalent relevant texts outside France). It must be possible to inspect them, dismantle them, and replace them without dismantling the elements next to them.

GIRPI

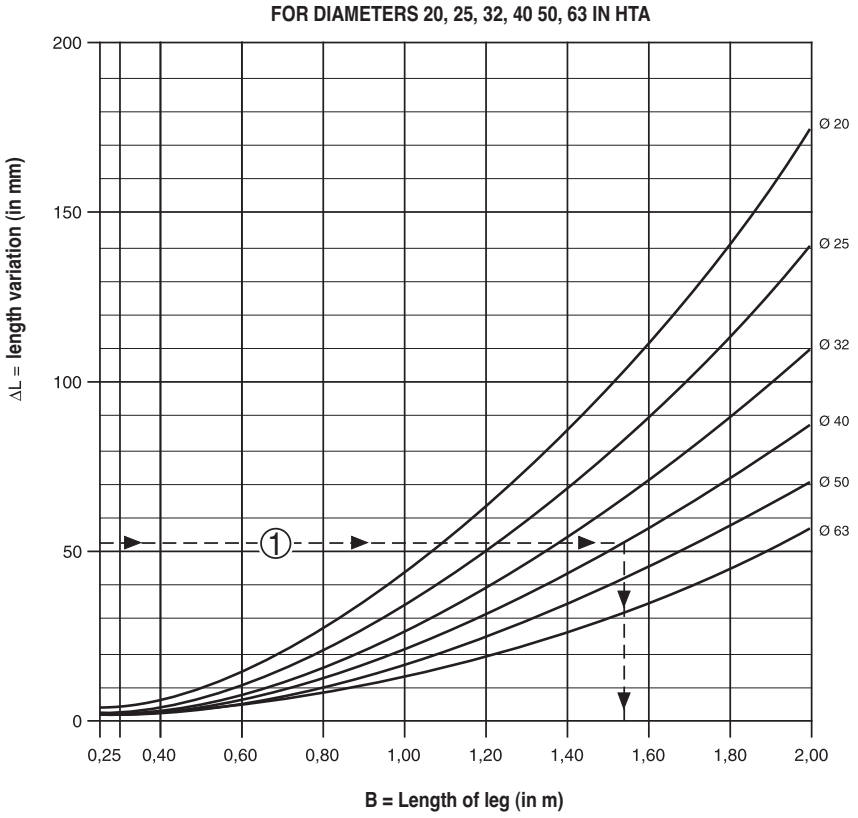
HTA® SYSTEM

CONTRACTION - EXPANSION CALCULATION OF LEG B

Technical Sheet

4.5

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 arm :

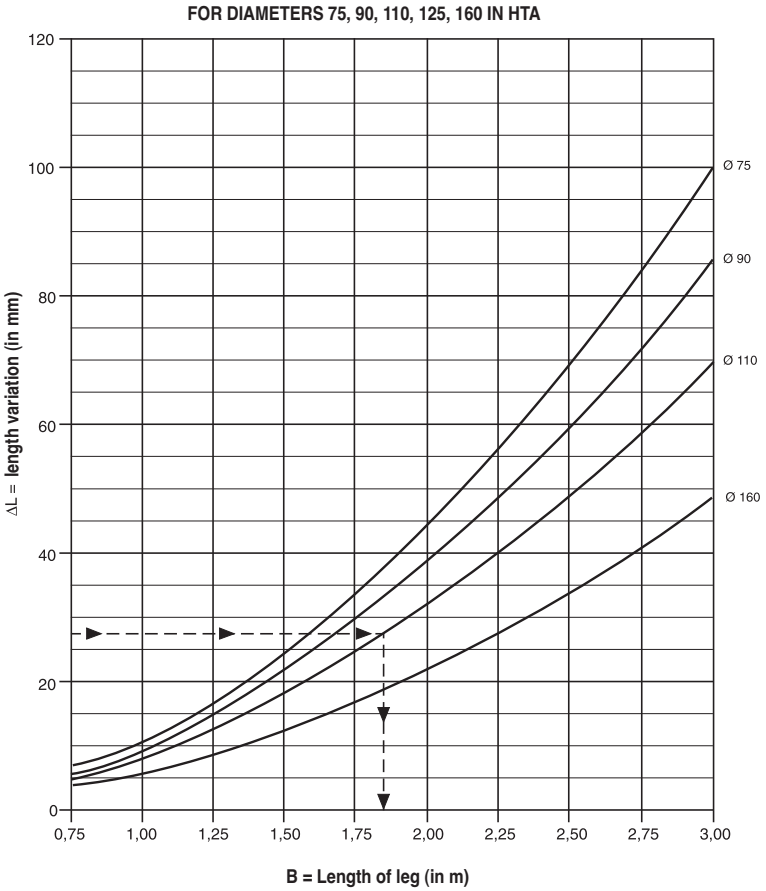
$$\mathbf{B} = 34 \sqrt{\text{Ø} \times \Delta\mathbf{L}}$$

with 34 : constant for HTA®

Ø : external diameter

Δ**L** : length variation

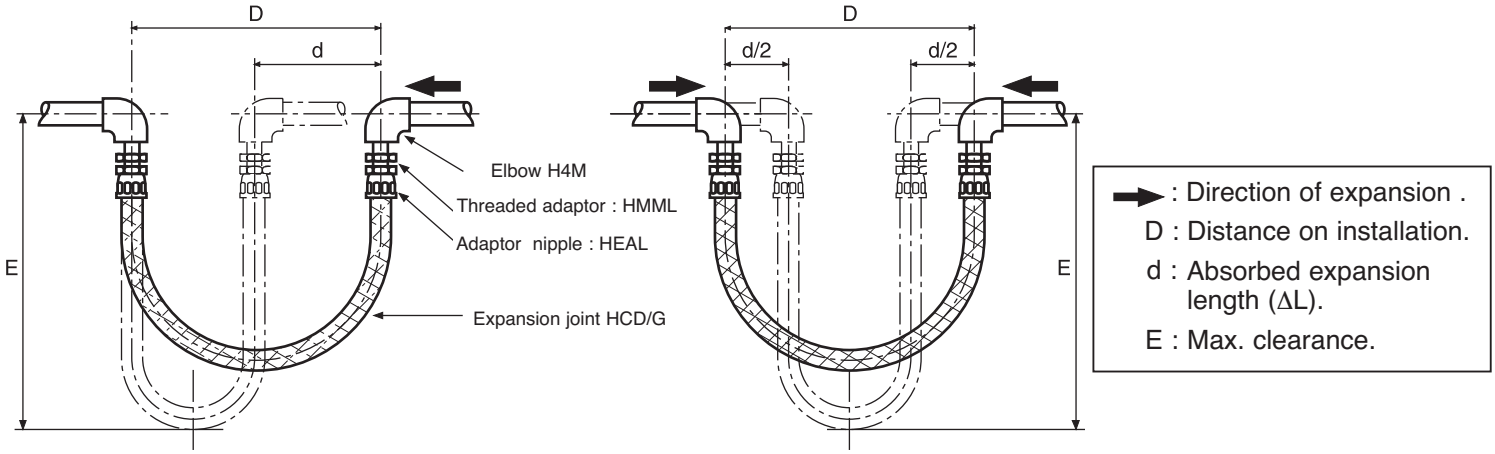
EXAMPLE ② :
Determine **B** for a Ø 110 mm pipe and a ΔL of 28 mm
Result : **B** = 1,85 m



CONTRACTION - EXPANSION
REMEDIES - EXPANSION JOINTS

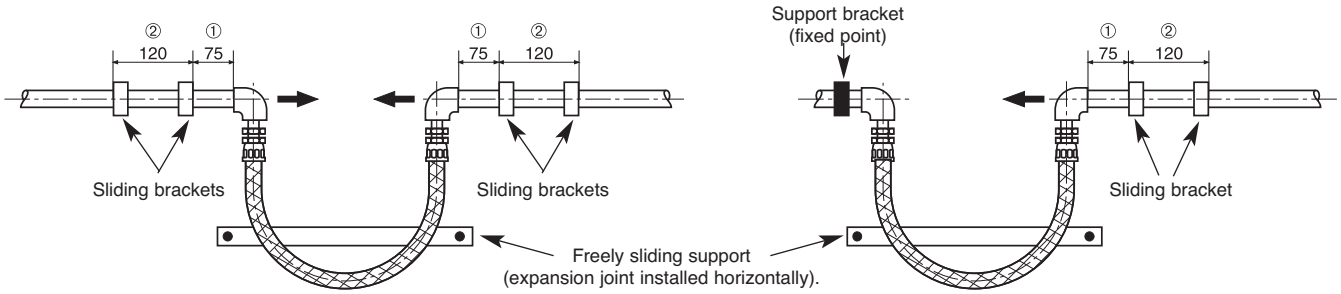
■ EXPANSION JOINTS SUPPORTING :

Ø pipe HTA	Article	D	d	E	Ø pipe HTA	Article	D	d	E
16	**HCD/G 16**	180	100	230	32	**HCD/G 32**	350	100	407
20	**HCD/G 20**	220	100	282	40	**HCD/G 40**	420	100	442
25	**HCD/G 25**	280	100	338	50	**HCD/G 50**	500	100	591



Expansion joints supporting :

1) The first sliding brackets will be at distance ① ≈ 75 mm (maximum distance), the next bracket in line will be at a distance ② ≈ 120 mm from the first.
2) The surface finish of the sliding support supporting the expansion joint will be such that the hose braiding is not deteriorated by friction.



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

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

GIRPI

HTA® SYSTEM

EXPANSION - CONTRACTION
REMEDIES - EXPANSION JOINTS

Technical Sheet

4.7

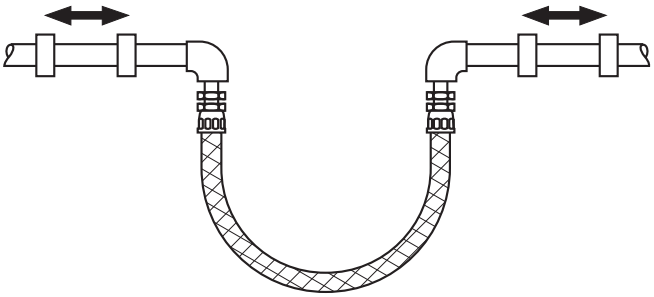
IMPLEMENTATION OF EXPANSION JOINTS:

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

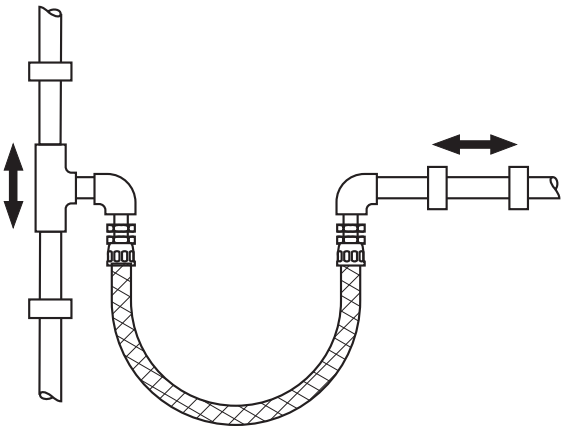
a) respect the clearances defined on sheet 4.6
b) ensure that the hose is not subjected to twisting during installation or during operation
c) provide appropriate supporting in cases where the joint is overhanging.

INSTALLATION EXAMPLES :

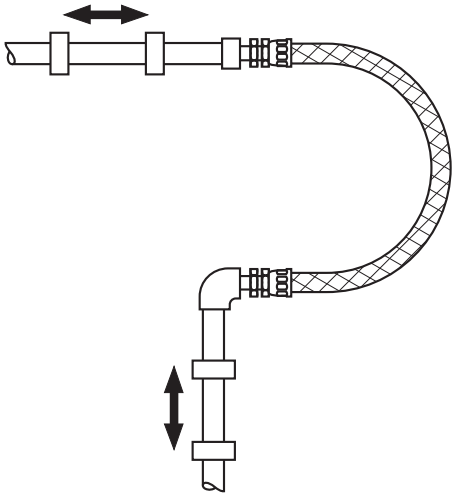
in line



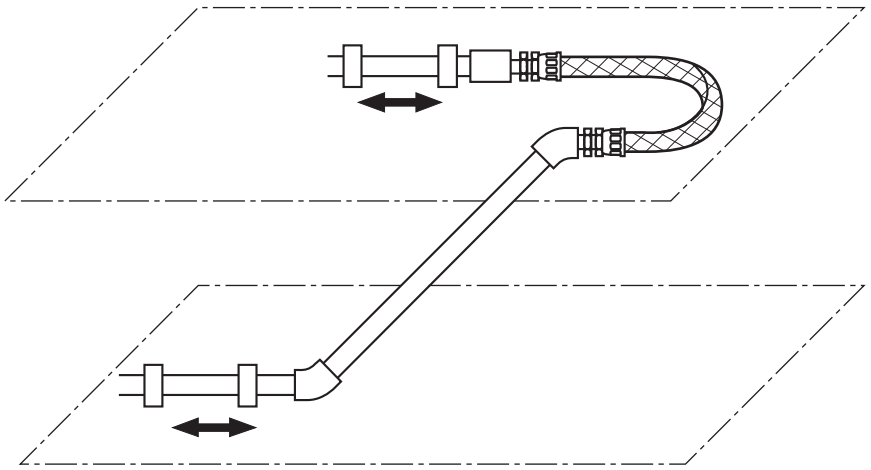
branch



direction change on same level



direction change on two different levels



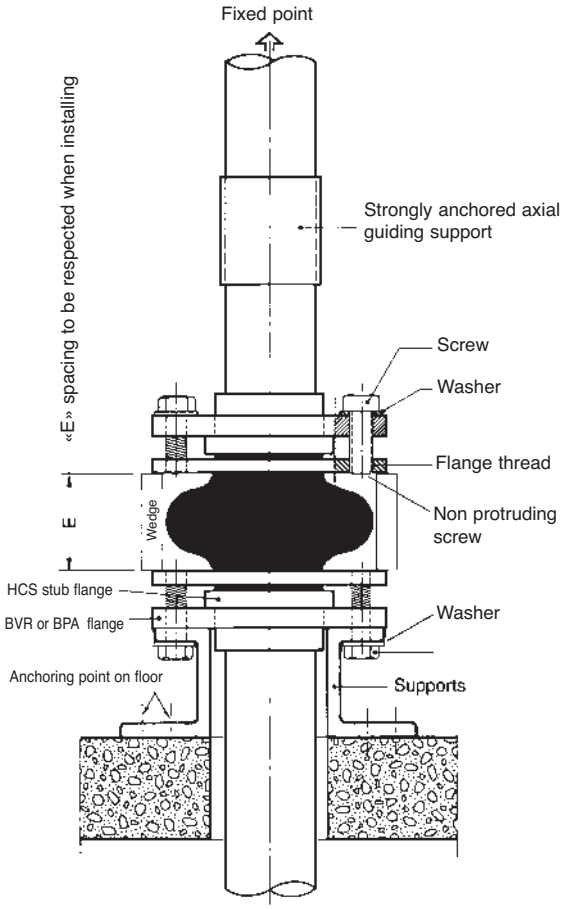
: Fixed Point

: Sliding bracket

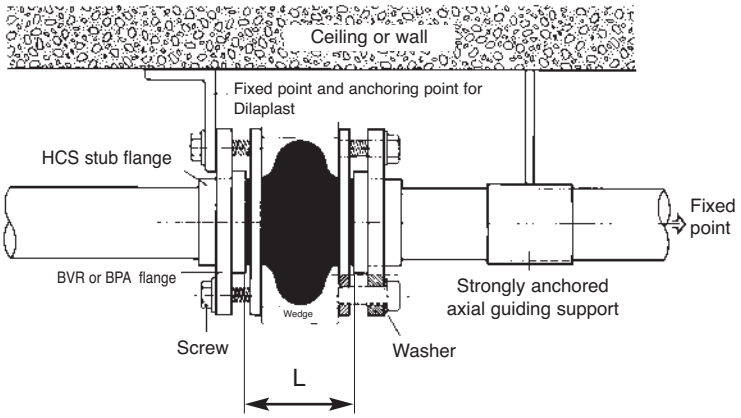
: Action on the stops and couplings

«DILAPLAST» LINEAR EXPANSION COMPENSATOR

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION



Please refer to sheet 4.1 to reckon expansion or contraction.

Absorption of expansion/contraction					BACKING	STUB	
REF. DILAPLAST	Contraction mm +	Expansion mm -	Length mm	E mm	FLANGE REF	FLANGE REF	SCREW DIM.
COMP 40	20	30	100	62	BVR 32 B	HCS 40	M 16x50
COMP 50	20	30	100	62	BPA 40	HCS 50	M 16x50
COMP 63	20	30	100	62	BPA 50	HCS 63	M 16x50
COMP 75	20	30	100	62	BPA 65	HCS 75	M 16x55
COMP 90	20	30	100	58	BPA 80	HCS 90	M 16x60
COMP 110	20	30	100	58	BPA 100	HCS 110	M 16x60
COMP 125				58	BPA	HCS	M
COMP 160	20	30	100	54	BPA 150	HCS 160	M 20x70

INSTALLATION

Never work with sharp tools, which many 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 adjustment wedges when you install the DILAPLAST compensator. This will maintain the spacing defined at installation temperature (E).

Torque : refer to sheet 7.10 about borcking flanges. For more information about DILAPLAST compensators, please consult GIRPI for technical assistance.

MONOKLIP BRACKETS
GENERAL - SPACING

GENERAL
Monoklip brackets are designed to be used with HTA pipes. They enable pipes to glide freely during expansion and contraction. They are offered with M6/M8 or 7 x 150 threaded inserts.
As concerns other supports, the choice of the material of which they are made, their shape, closing and fastening systems are the responsibility of the installer;

The supports:
- should in no event either injure or damage the pipes
- should continue to support their load even under temperature variation effects,
- should keep enough clearance from any wall or obstacle so as to provide for the expansion movements and also the assembly and disassembly of the mechanical couplings and accessories (unions, flanges, valves, pressure limiters, etc...).

IMPORTANT
Since metal brackets or any other bracket than MONOKLIP may notch pipes, a protective sleeve must be fitted between pipe and bracket. It is prohibited to make a fixed point by tightening the pipe with a metallic bracket.

SPACING OF SUPPORTS (for filled pipes)
The longitudinal thrust exerted on the brackets during expansion and contraction can bend or destroy fixed points. Also, if suppports between fixed points are not installed at correct intervals, the pipe may buckle and cause mechamical jointings to fall out of linear adjustment. Howere, such forces are lowe than those exerted by metal pipes, and even more to if you consider that CPVC'S modulus of elasticity decreases when its temperature increases.

DISTANCE BETWEEN SUPPORTS (HORIZONTAL PIPES)					
Ø pipe	Ambient or fluid temperature (°C)				
	≤ 20°	40°	60°	80°	90°
16	0,75	0,70	0,65	0,60	0,50
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
160	2,00	1,90	1,75	1,40	1,20

NB:
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.

■ WEDGES

The monoklips from 16 to 25 may be heightened by wedges (ref wedge 1225) 20 mm high made for that purpose.
For the monoklips from 32 to 63 use the wedges (ref wedge 3263) 20 mm or 4 mm high which can be piled up.
For the monoklips from 75 to 110 use the wedges (ref wedge 75110) 20 mm high which can be piled up.

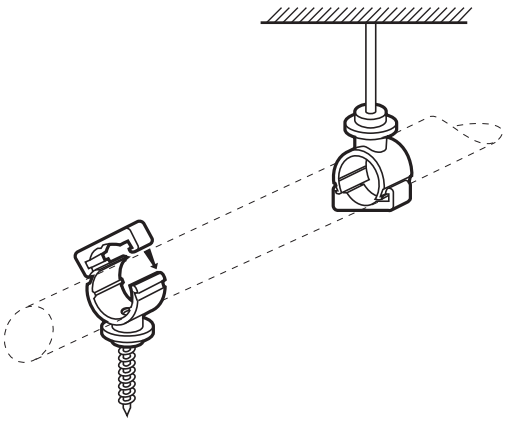
■ CENTRALIZED KITCHEN WASTE DISPOSAL APPLICATION (EMPTY PIPES)

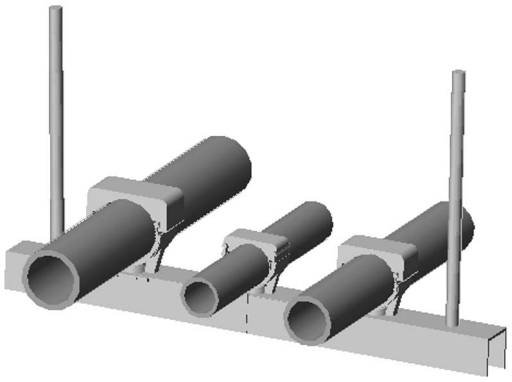
Ø pipe	≤ 50	63 to 90	≥ 110
Distance between supports	0,6 m	0,8 m	1 m

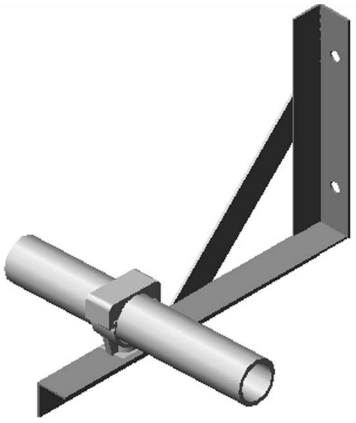
MONOKLIP BRACKETS
EXAMPLES

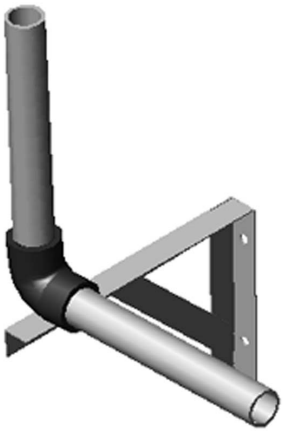
■ EXAMPLES OF SUPPORTS :

MONOKLIP brackets





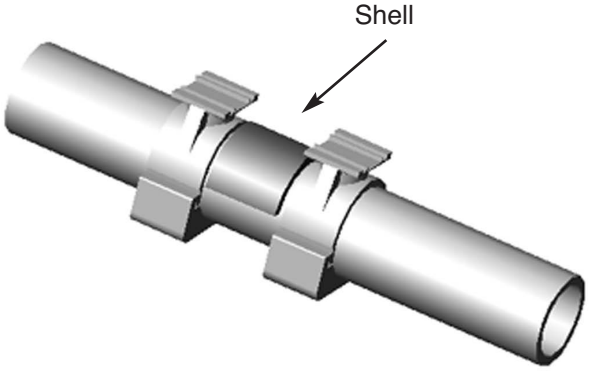




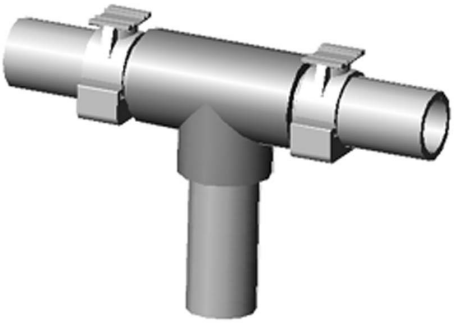
■ FIXED POINT

The shells are comprised of sections of two half HTA® couplings whose internal stops have been removed, and which are cleaned, coated with RERFIX, welded onto the pipes of same diameter as the couplings, also cleaned and coated with RERFIX.

• Fixed point on a pipe



• Fixed point on a tee



GIRPI

HTA® SYSTEM

MONOKLIP BRACKETS
ACCESSORIES - SPECIAL POINTS

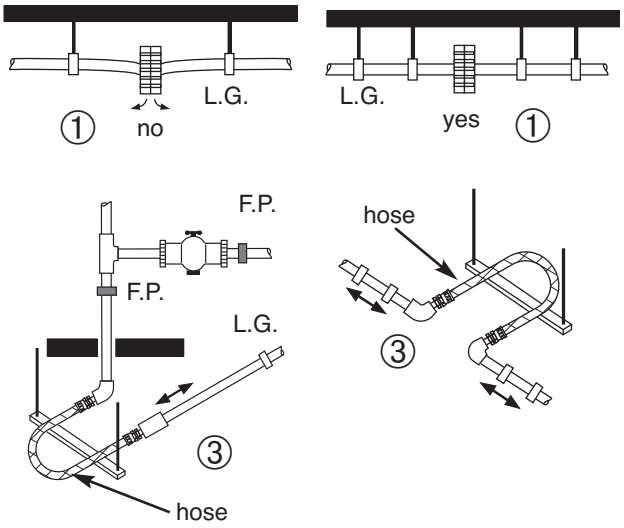
Technical Sheet

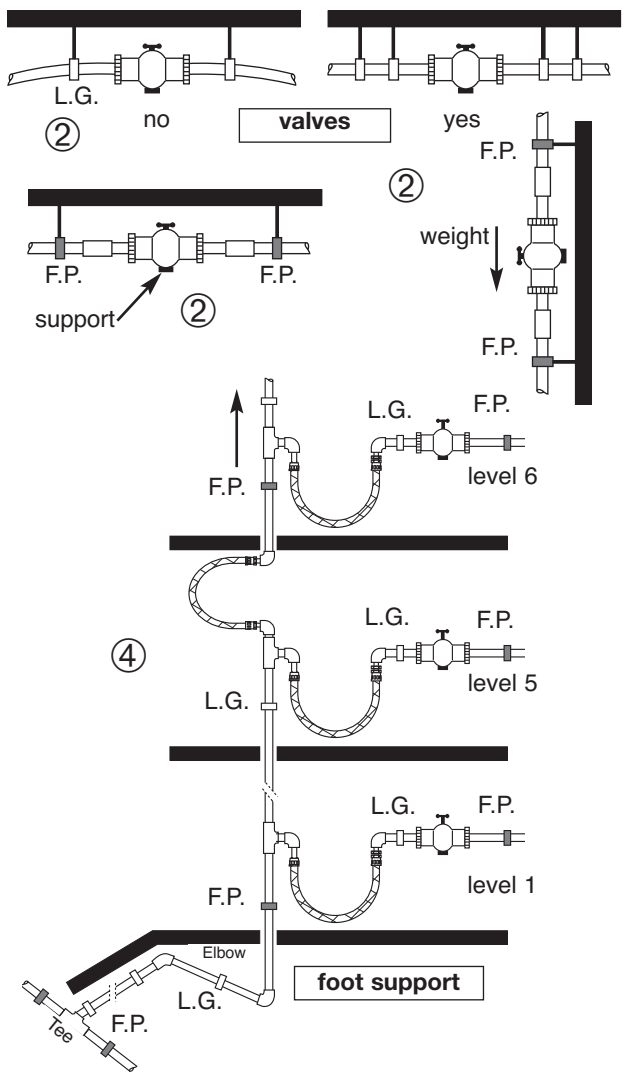
5.3

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	• CPVC 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 4.6)	to allow movement without rotation, without moving out of axis and without chaffing
④	• Riser feet	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.

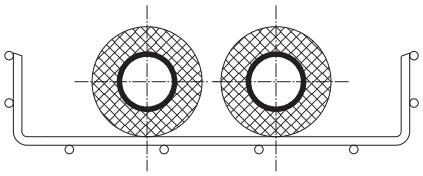




For risers, we recommend that an expansion compensating element is installed (expansion joint, hose) at five (floor) level intervals.

BASKET TRAYS - GIRFIL

■ GENERAL



In some cases :
- insulated HTA® networks,
- need to keep parallel pipeworks remote from each other,

the use of GIRFIL basket trays is an excellent solution.

GIRFIL was designed to answer the needs (load, contraction, expansion, branches,...) met on HTA® networks.

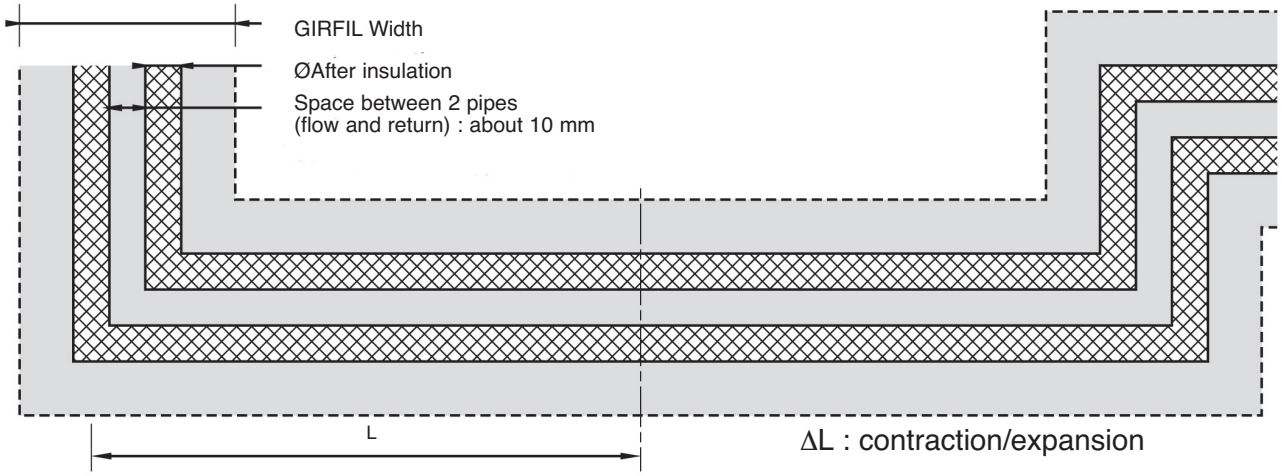
The standard version allows for supporting at 2.50 m intervals, whilst keeping the pipework as straight as possible.

The standard surface treatment (GIRFIL is galvanized) allows an internal use in many environnements. Therefore it can safely be used indoors in most environments.

GIRFIL basket trays (length : 3 meters) are easily clipped to each other.

■ DETERMINATION OF GIRFIL WIDTH

- The total load must be centered on the basket tray.
- Allow for enough clearance (for contraction and expansion) at the changes in direction.
- Make clean openings (no sharpedges) to avoid damaging the insulating material and the pipe.

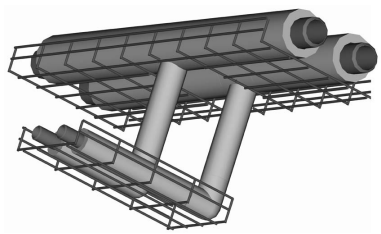


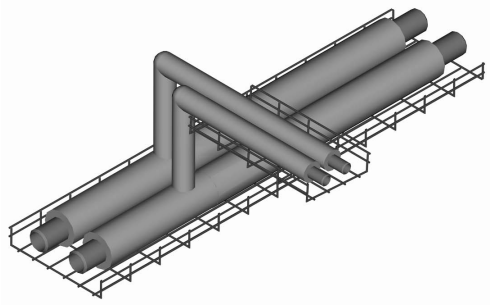
GIRFIL width ≥ (2ø + E) + 2ΔL maxi

If the space between the pipe and the basket tray is not enough to compensate the contraction or the expansion, (e.G. at changes indirection), use one of the solutions presented on sheet 4-4 :
- loop
- expansion joint
- bellow compensator

■ BRANCHES

When basket trays are used, branches can be made above or below the pipes provided that a sufficiently large opening is made, without sharp edges in order not to damage the insulating material or the pipe during expansion and contraction movements.





GIRPI

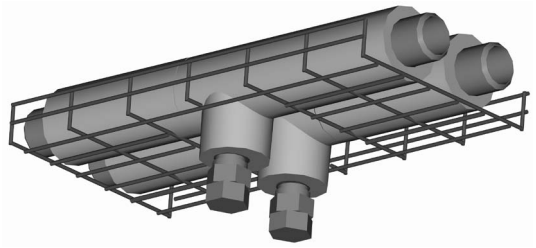
HTA® SYSTEM

BASKET TRAY - GIRFIL
EXAMPLES - RANGE

Technical Sheet

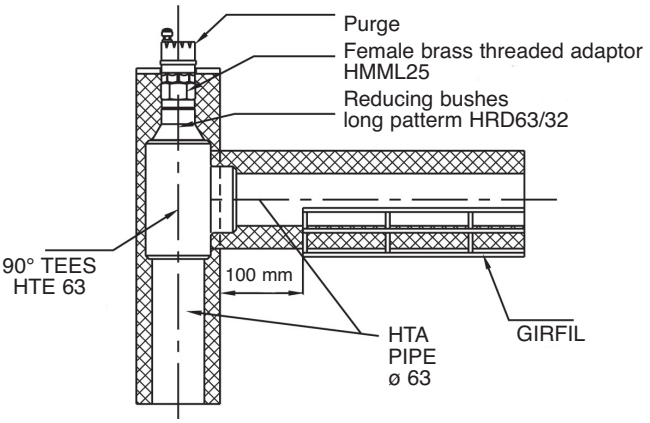
5.5

■ DRAINS

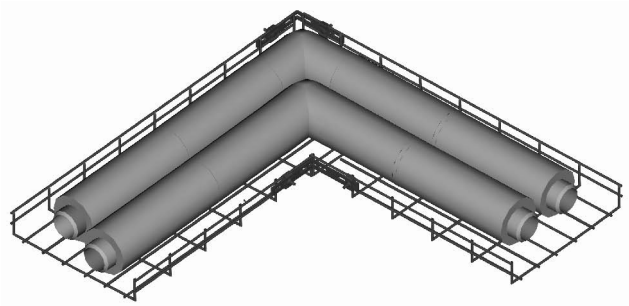


Make a sufficiently large opening to allow for expansion and contraction movements without damaging the insulating material.

■ PURGE

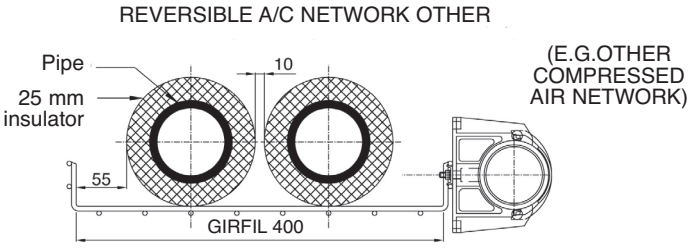


■ CHANGE IN DIRECTION (FILKIT)

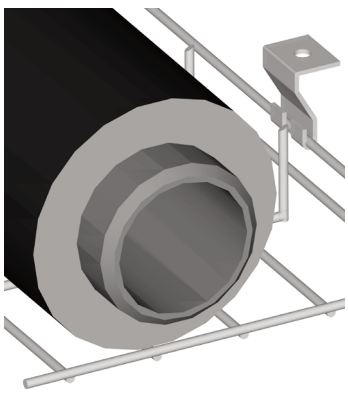


The change in direction is made with the “FILKIT”.

■ BASKET TRAY + MONOKLIP



■ HANGING CLIP (FATT)



This hanging clip allows for the use of chains or M8 threaded suspension rods. Their shapes facilitate hanging up and down during installation.

■ SUPPORTING CLIP (FSUP)

This support allows for direct fastening outs walls or even ceilings (versions 200 & 300).

INSULATION
INSULATED PIPEWORKS

■ INSULATION

The low thermal conductivity cœfficient (λ = 0.16 W/mK) of HTA® helps reduce heat losses and delay the condensation phenomena.

Like other materials, HTA® must be insulated to be protected against frost, to reduce the heat losses and to avoid condensation when the outside pipe temperature is betow dew point.

Most insulation products can be used if the adhesive needed for their implementation or if their chemical composition are compatible with HTA®.
Check with the insulation product's manufacturer or with GIRPI for the compatibility.

Condensation phenomena have no physical action with HTA®. Therefore, insulation is not systematically required. This must be decided according to installation conditions and the consequences of potential condensation on the environment around the pipework. CPVC properties reduce condensation in comparison with metallic materials.

■ The calculation of the surface temperature shows that HTA® provides you with a security margin in case of insulation failure.

Example :

		Surface temperature (non insulated)		
		Metallic pipe	**HTA® pipe**	**HTA® coupling**
T_{fluid} = 7°	ϕ25	7°C	9°C	12°C
$T_{ambient}$: 23°C	ϕ50	7°C	11°C	14°C
he = 8 W/m²K $T_{dew\ point}$ = 16,1°C	ϕ110	7°C	12°C	15°C

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

T_{fluid} = 50°C $T_{ambient}$ = 20°C he = 10/Wm²K	No insulation	Insulation material (λ=0.039W/mK) Thickness = 9mm	Insulation material (λ=0.039W/mK) Thickness = 19mm	Insulation material (λ=0.039W/mK) Thickness = 32mm
ϕ25	19,5	7,9	6,6	5,2
ϕ50	37,3	13,1	10,6	7,9
ϕ110	66,4	23,8	18,9	13,5

■ APPLICATIONS : Building, Offices, Industry, Food industry, dwellings

Applications	Temperature	Recommended Insulation product	Recommended thickness internal use (mm)*
Sanitary networks	+ 60 °C	Rockwood	25 - 30
Cooling	• + 15°C summer • + 35°C winter	Foam rubber	0 - 9
Air conditioning (reversible networks) 2 pipes	• + 7°C cold water • + 50°C hot water	Foam rubber μ > 5000	13 - 19

* The thicknesses are only indicative and depend on each part of the building and on each part of the network. Check with a specialised consultant.
Ask GIRPI for detailed technical sheets for each application and for a personalised heat loss study.

N.B. : μ : material permeability.
he : external superficial exchange cœfficient (average value : 8).

GIRPI

HTA® SYSTEM

LAGGING
BASIC IMPLEMENTATION RULES

Technical Sheet

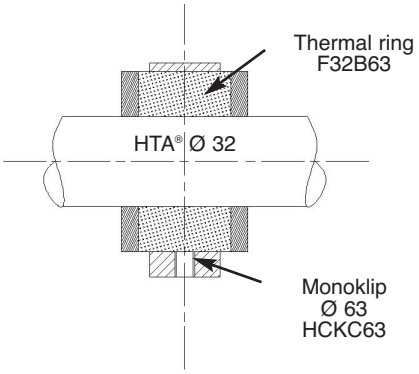
5.7

The lagging must be done according to the DTU 61.1 (thermal insulation of refrigerating pipeworks) and to the DTU 65.20. Outside France, please refer to applicable rules.
The HTA® system does not require need any anti-corrosion treatment before insulation.
The fire resistance of the insulating products must comply with the security standards against fire in the public buildings.
It is better not to glue directly the insulating materials on the HTA® pipes and fittings.

■ THERMAL RINGS

To prevent the insulating material from crushing at collar level, a thermal ring must be used. They allow HTA® pipes to expand and contract freely.

Example for 32 mm Ø



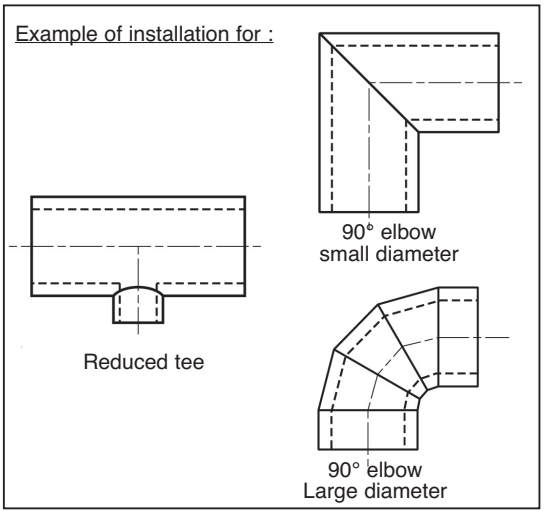
Thermal ring Reference	Ø pipe HTA® (inside ring diameter)	Ø monoklip (outside ring diameter)	Theoretical Thickness
F16B40	16	40	12
F20B50	20	50	13
F25B50	25	50	13
F32B63	32	63	16
F40B75	40	75	18
F50B90	50	90	20
F63B110	63	110	24
F75B125	75	125	25
F90B140	90	140	25
F110B160	110	160	25

■ LAGGING PROCEDURE = FOAM RUBBER

The procedure to install this kind of insulator must comply with the manufacturers documentation.

When the couplings of unsplit foam rubber are directly put over the HTA® pipes just before the welding with the fittings, it is compulsory to insulate the fittings after the pressure test. During the pressure test all the jointings must be controlled visually in order to check possible leaks.

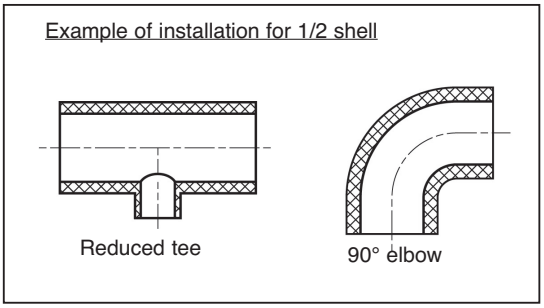
- No stretching of the foam, but work it by compression during jointing.
- Respect the drying time between each part as recommended by the manufacturer.
- This kind of insulation has to be protected against UV rays and weathering in case of an outdoor installation.



■ LAGGING PROCEDURE : EXTRUDED AND CUT POLYSTYRENE

This high quality insulation is particularly adapted to outdoor installations or high profile applications.

- The straight bars are delivered presplit, with a vapour proof adhesive coating.
- The shells on the fittings are cut out at dimension and need the application of a vapour proof glue and glass reinforced fabric.
- The transversal and longitudinal jointings are made with an adapted mastic.
- The rigidity of this kind of insulator must be taken in consideration for the contraction and the expansion of the HTA® pipework.



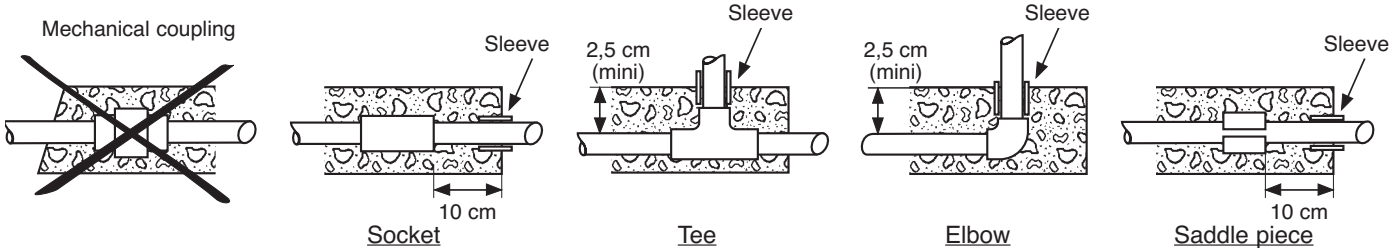
SUPPORTS
SPECIAL CASES

■ Passing through partitions and floors

When a CPVC pipe goes through a wall or a floor, it must be protected by a rigid sleeve preferably made of synthetic material (CPVC, UPVC, …).
The sleeve internal diameter is chosen with enough tolerance to allow the pipes to slide freely technical (see Sheet 7.1).
The sleeve must be long enough to protrude on both sides of the finished masonry element.

■ Built-in or embedded installations

The CPVC pipes and couplings can be built into or embedded in the masonry on condition that they do not have disconnectable couplings on this part of the circuit. The following precautions must be respected.

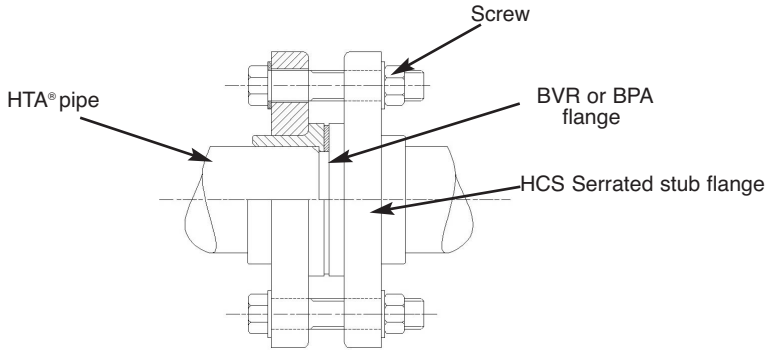


• The pipe must be made integral with the masonry either by means of the couplings making up the system or using saddle pieces bonded onto the wall of the pipe.
• Each time the pipe enters the masonry it must be protected against shearing by a sleeve which protrudes from the finished surface of the masonry.
• 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.

■ Heat cable

To maintain the temperature of sanitary hot water, or protect pipes from freezing, the heat cable has to be self-regulating with a temperature limit of 65°C. Refer to manufacturer's recommendations for implementation.

■ Mounting with flanges



Ø pipe	20	25	32	40	50	63	75	90	110	160
Screw length	70	80	90	100	100	100	110	110	110	130
Nber of screws	4	4	4	4	4	4	4 or 8*	8	8	8
Screw Ø	14	14	14	18	18	18	18	18	18	22

* according to the type of flanges in use.

■ Loop system

In larger networks, loops must be planned at early design stage. Loops allow for emergency and continuous water treatments especially in the event of an epidemic. Furthermore, loops help keep water, at a constant temperature, and ensure constant water flow.

HTA-E SYSTEM
DRAINAGE UP TO 100°C

■ FOR WASTE WATER DRAINAGE IN CENTRALIZED KITCHENS, UP TO 100°C

- Non flammable (BS1d0),
- Internally, and externally, corrosion free,
- Quick installation,
- Limited condensation.
- Low thermal conductivity, resulting in lower pipe surface temperatures.
- The HTA® system is certified by CSTB for building applications (ATEC n° 14/03-831)

■ MAIN APPLICATIONS

Centralized kitchens in :

- schools,
- Hospitals,
- Retirement homes,
- Shipyards,
- Condensate drainage,
- Hotels,
- Laundries.

■ Specific parts

Girpi developped a specific range for this application :

• access plug, stainless steel trap connection, 45° branch...

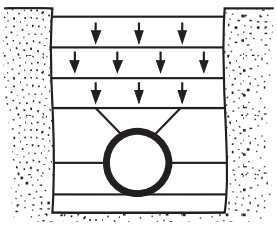
For further information, contact Girpi's technical services.

All HTA® items are compatible with this application.
On the other hand, HTA®-E products cannot be used for pressure applications.

■ Buried installations

The CPVC fittings can be buried on condition that the following usual 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 10 cm 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 30 mm) will cover the pipe to a depth of 15 cm 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 20 mm.

• The minimum total height of the backfill above the pipe will be:
- general case: 60 cm
- under road/rail traffic: 80 cm
- under concrete slab: 40 cm

PRESSURE LOSSES
CALCULATION RULES

CALCULATION BASES

The quality of the internal surface condition of the 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 CPVC pipes, owing to the perfect internal surface condition (hence their low friction coefficient), GIRPI has had pressure loss Nomograms at 20°C, 45°C, 60°C, 80°C, 90°C produced by the CATED (TS 8.1 to 8.5).

These nomograms have been established using the formula : $J = \lambda \frac{U^2}{2gD}$

with the Colebrook λ and k = 0,001 mm

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

J = pressure losses (m/m)
V = flow speed (m/s)
D = pipe internal diameter (m)
g = gravity acceleration (9,81 m/s^2)
λ = Colebrook's factor (no measurement unit)
Re = Reynold's factor (no measurement unit)
k = rugosity = 0,001 mm

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

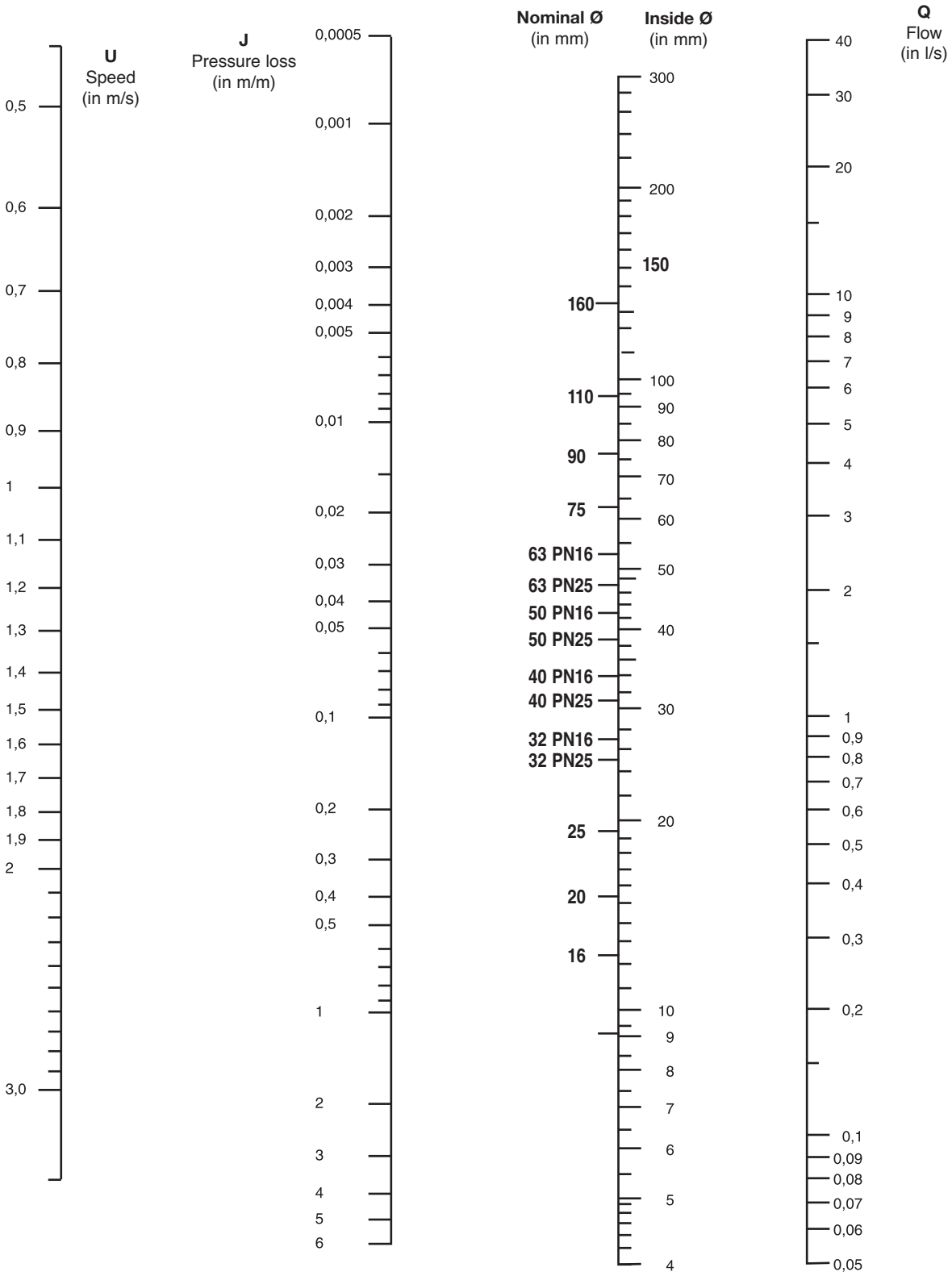
GIRPI

HTA® SYSTEM

PRESSURE LOSSES ON PIPES
NOMOGRAM AT 7°C

Technical Sheet

6.2



Designed and produced by the CATED (January 1997)

GIRPI

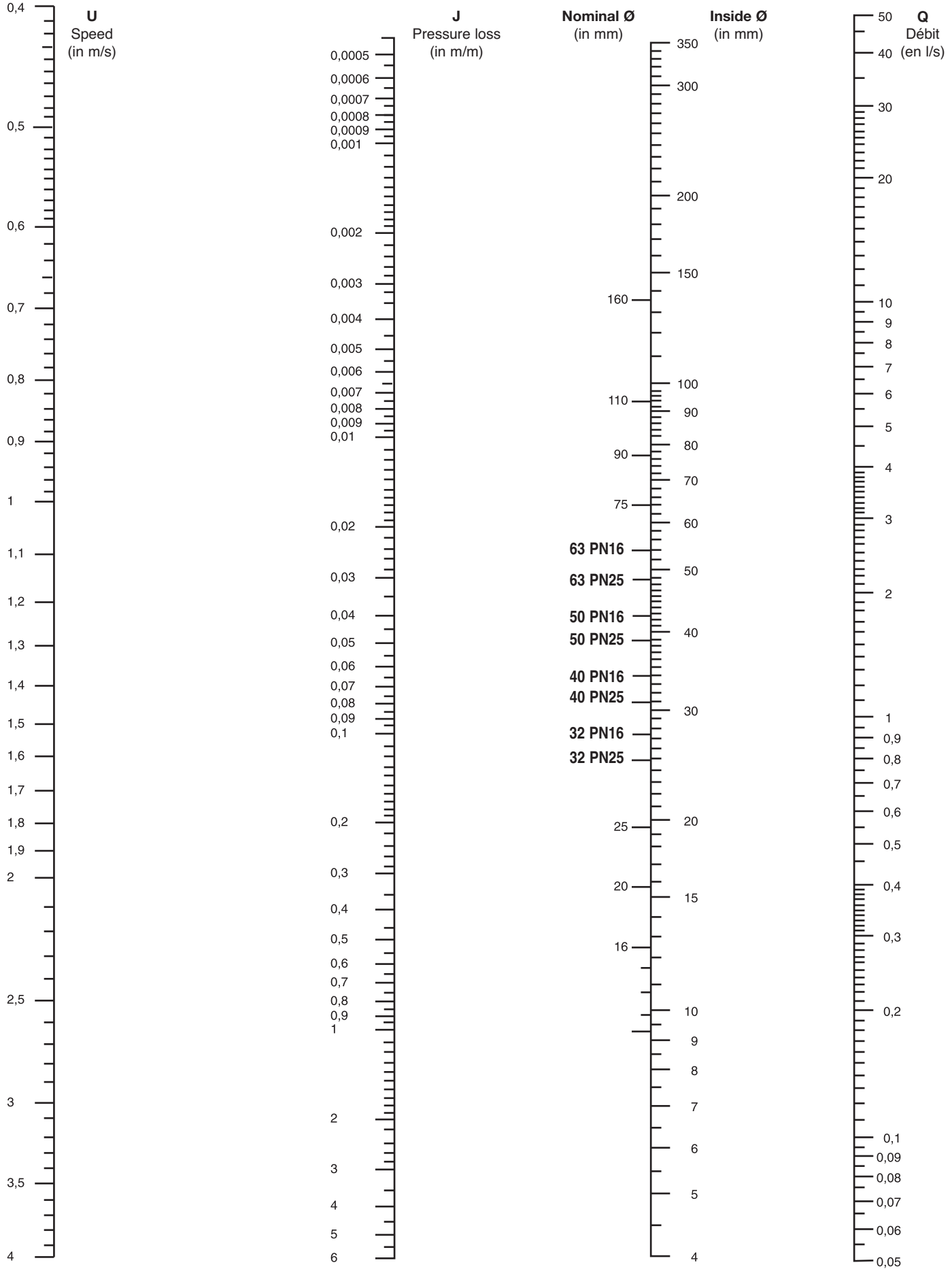
HTA® SYSTEM

PRESSURE LOSSES ON PIPES
NOMOGRAM AT 20°C

Technical Sheet

6.3

2004



Designed and produced by the CATED (January 1997)

GIRPI

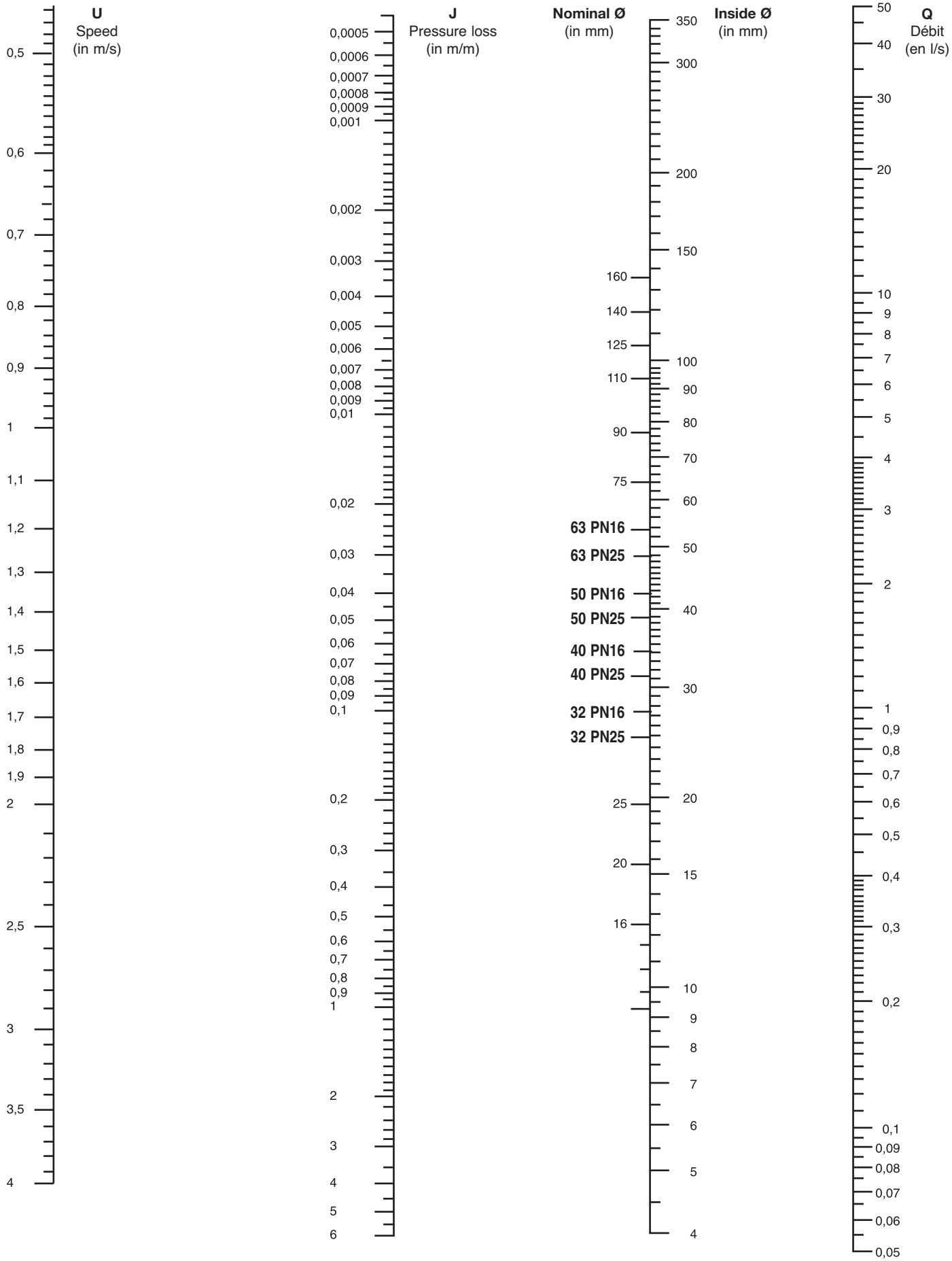
2004

HTA® SYSTEM

PRESSURE LOSSES ON PIPES
NOMOGRAM AT 45°C

Technical Sheet

6.4



Designed and produced by the CATED (January 1997)

GIRPI

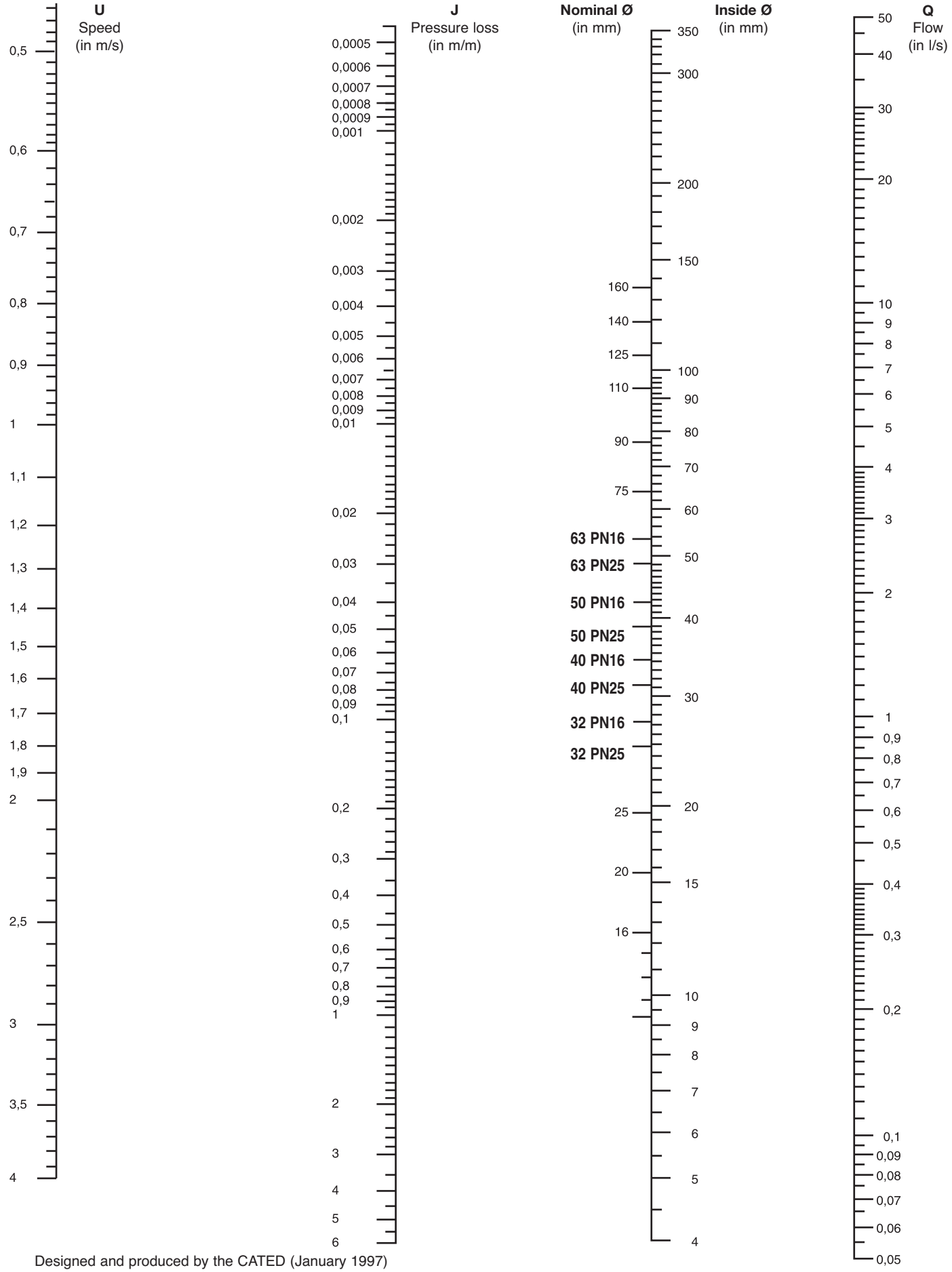
HTA® SYSTEM

PRESSURE LOSSES ON PIPES
NOMOGRAM AT 60°C

Technical Sheet

6.5

2004



Designed and produced by the CATED (January 1997)

2004

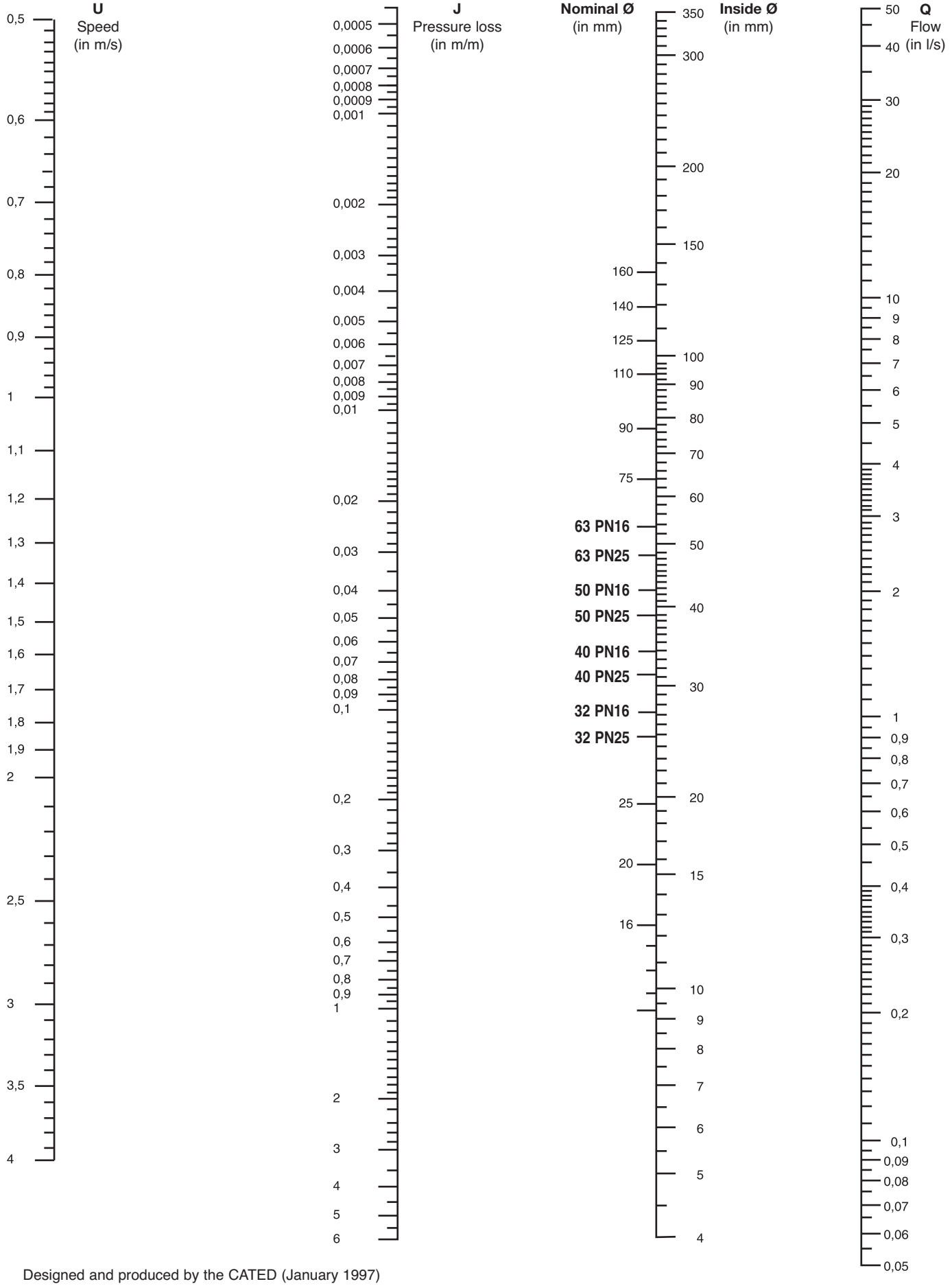
GIRPI

HTA® SYSTEM

PRESSURE LOSSES ON PIPES
NOMOGRAM AT 80°C

Technical Sheet

6.6

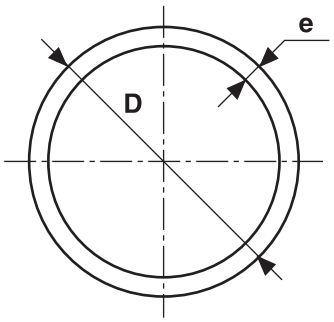


Designed and produced by the CATED (January 1997)

DIMENSION SHEET

HTA PIPES

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



PN 25

D	Dn	Reference	Pack (*)	PN	mini thick	Weight kg/m	internal Ø	Cont. l/m
16	10	TUBHT 163	10	25	1,8	0,140	12,4	0,12
20	15	TUBHT 203	10	25	2,3	0,220	15,4	0,19
25	20	TUBHT 253	10	25	2,8	0,330	19,4	0,29
32	25	TUBHT 323	10	25	3,6	0,540	24,8	0,48
40	32	TUBHT 403	10	25	4,5	0,840	31,0	0,75
50	40	TUBHT 503	5	25	5,6	1,307	38,8	1,18
63	50	THT 6325	5	25	7,1	1,945	48,8	1,87

(*) Number of pipes per bundle

PN 16

D	Dn	Reference	Pack (*)	PN	mini thick	Weight kg/m	internal Ø	Cont. l/m
32	25	THT 3216	10	16	2,4	0,360	27,2	0,58
40	32	THT 4016	10	16	3,0	0,559	34,0	0,91
50	40	THT 5016	5	16	3,7	0,908	42,6	1,42
63	50	TUBHT 63	5	16	4,7	1,440	53,6	2,25
75	65	TUBHT 75	1	16	5,5	1,960	64,0	3,21
90	80	TUBHT 90	1	16	6,6	2,760	76,8	4,58
110	100	TUBHT 110	1	16	8,1	4,310	93,8	6,91
125	110	TUBHT 125	1	16	9,2	5,56	106,6	8,92
160	150	TUBHT 160	1	16	11,8	9,200	136,4	14,6

Differentiated colours of marking and cover according to the PN :

- yellow marking and yellow cover for PN16,
- white marking and orange cover for PN25.

CAUTION :

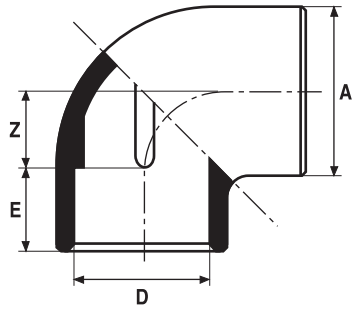
- All the sizes indicated in the dimension sheets are in millimeters, when not specified.
- All the threaded fittings are BSP :
  - On HTA®, male threads are conical (tapered) and female threads are cylindrical (parallel).
  - On brass, all threads are cylindrical (parallel).

IMPORTANT NOTE :

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

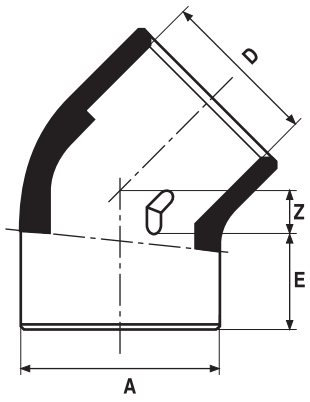
DIMENSION SHEET

ELBOWS 90°



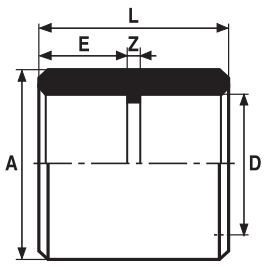
D	Dn	Reference	Z	E	A					
16	10	H4M 16	8,8	15	24,5					
20	15	H4M 20	11	16,5	30,5					
25	20	H4M 25	14	19,5	37					
32	25	H4M 32	16,7	23,5	44,5					
40	32	H4M 40	21,5	27	54					
50	40	H4M 50	27	32	64,8					
63	50	H4M 63	31	38	80					
75	65	H4M 75	38	44	92,5					
90	80	H4M 90	46	52,5	112					
110	100	H4M 110	57,1	62,7	136					
125	110	H4M 125	63,5	69,5	147,6					
160	150	H4M 160	81	86,5	190					

ELBOWS 45°



D	Dn	Reference	Z	E	A					
16	10	H8M 16	4,5	14,5	24,1					
20	15	H8M 20	5	17	30					
25	20	H8M 25	6	19	36,7					
32	25	H8M 32	7,5	24	45					
40	32	H8M 40	9,5	28	54					
50	40	H8M 50	11	32	65					
63	50	H8M 63	12,5	39	80					
75	65	H8M 75	18	44	92					
90	80	H8M 90	19,5	52	115					
110	100	H8M 110	23,5	61,5	135,5					
125	110	H8M 125	28	69	151,6					
160	150	H8M 160	34,5	86,5	190					

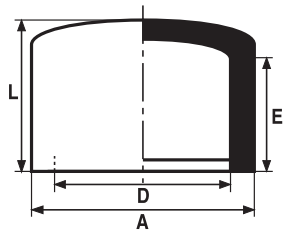
STRAIGHT COUPLINGS



D	Dn	Reference	Z	E	L	A				
16	10	HMA 16	3,5	14,8	33	21,8				
20	15	HMA 20	3,3	16,9	37	26,8				
25	20	HMA 25	3,3	19,4	42,1	33,3				
32	25	HMA 32	3,4	22,8	49	42,4				
40	32	HMA 40	3	27	57,5	53,5				
50	40	HMA 50	3,5	31	68,7	64,8				
63	50	HMA 63	3	38	80,7	78,2				
75	65	HMA 75	4,5	45	94	90				
90	80	HMA 90	5	51,5	108	106,5				
110	100	HMA 110	4	61,5	127	132				
125	110	HMA 125	6,1	68,9	143,9	147,6				
160	150	HMA 160	10	86	185	185				

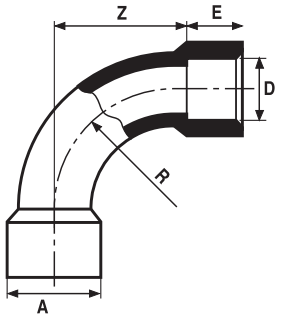
DIMENSION SHEET

CAPS



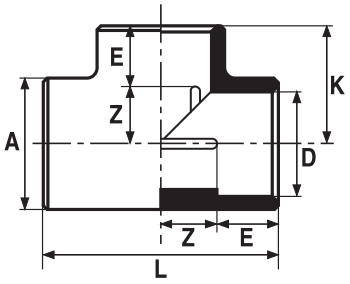
D	Dn	Reference	E	L	A					
16	10	HBO 16	16	21	24,2					
20	15	HBO 20	16	23,4	30					
25	20	HBO 25	20	28	36,8					
32	25	HBO 32	24	32,9	45					
40	32	HBO 40	28	37,8	54,1					
50	40	HBO 50	33	44	65,2					
63	50	HBO 63	39	54	79,7					
75	65	HBO 75	44,5	60	90					
90	80	HBO 90	54	72	111					
110	100	HBO 110	62	88,5	140					
125	125	HBO 125	70	102	160					
160	150	HBO 160	87	144,5	187					

BENDS 90°



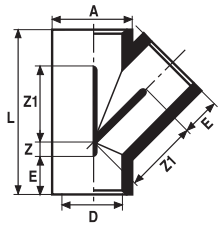
D	Dn	Reference	Z	E	A	R			
20	15	H4C 20	40	16	28	40			
25	20	H4C 25	50	19	32,5	50			
32	25	H4C 32	64	22	40	64			
40	32	H4C 40	80	26	52	80			
50	40	H4C 50	100	31	64,5	100			
63	50	H4C 63	126	37,5	79,5	126			

EQUAL TEES 90°



D	Dn	Reference	Z	E	L	A	K			
16	10	HTE 16	9	14	48	23,9	24			
20	15	HTE 20	11	16	56,2	29,9	27,8			
25	20	HTE 25	13,5	18,5	66	37	33			
32	25	HTE 32	17	22	82,5	44,7	41			
40	32	HTE 40	21,5	26,5	99,6	53,8	49			
50	40	HTE 50	26,5	31,5	118,5	65,4	58,7			
63	50	HTE 63	33,5	38	143	86	71,5			
75	65	HTE 75	39	44,5	167	92	83,5			
90	80	HTE 90	46	52	196,5	112,5	98			
110	100	HTE 110	55,7	62	235	132,9	118			
125	110	HTE 125	84	69	266	150,4	133			
160	150	HTE 160	84	86	342	191	170			

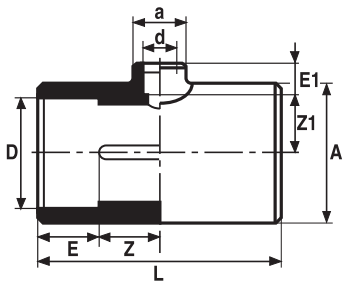
EQUAL TEES 45°



D	Dn	Reference	Z	E	A	L	Z1			
32	25	HYT 32	7	22	41	91	39			
40	32	HYT 40	8,5	26	51	110,5	48			
50	40	HYT 50	11	31	63	134	60			
63	50	HYT 63	14	37,5	77,5	166	76,5			

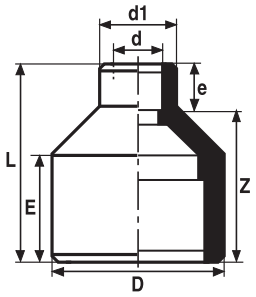
DIMENSION SHEET

REDUCED TEES 90°



D-d	Dn	Reference	Z	Z1	E	E1	L	A	a
20-16	15-10	HTR 20/16	10	11	17	14	56,1	30	24
25-16	20-10	HTR 25/16	14	14	18,5	14	66	36,7	24
25-20	20-15	HTR 25/20	12,5	13,5	18,5	16,5	66	36,7	30
32-16	25-10	HTR 32/16	17	18	23	14	82,5	44,7	24
32-20	25-15	HTR 32/20	17	18	23	16	82,5	44,7	30
32-25	25-20	HTR 32/25	17	19	23	18,5	82,5	44,7	37
40-20	32-15	HTR 40/20	22	23	26,5	16	99,2	54	30
40-25	32-20	HTR 40/25	22	23	26,5	19	99,2	54	36,8
40-32	32-25	HTR 40/32	22	21	26,5	23	99,2	53,6	45
50-20	40-15	HTR 50/20	27,2	29,2	31,8	17	119	61,7	33,2
50-25	40-20	HTR 50/25	26	26	31,5	19	119,3	64,8	37
50-32	40-25	HTR 50/32	26	26	31,5	22,5	119,3	64,8	44,8
50-40	40-32	HTR 50/40	26	26	31,5	26,5	119	64,7	53,6
63-20	50-15	HTR 63/20	32	31,5	37,5	17,5	143	79,9	30,5
63-25	50-20	HTR 63/25	32	31,5	37,5	20	143	79,8	37
63-32	50-25	HTR 63/32	32	32	37,5	23	143,1	79,9	45,5
63-40	50-25	HTR 63/40	32	32	37,5	26	143	79,9	54
63-50	50-40	HTR 63/50	32	32	37,5	31	143	79,9	65
75-20	65-15	HTR 75/20	38,5	38	44,5	16	166	79,9	35
75-25	65-20	HTR 75/25	38,5	38	44,5	19	166	92,6	35
75-32	65-25	HTR 75/32	38,5	38	44,5	22,5	166	92,6	45
75-40	65-32	HTR 75/40	38,5	38	44,5	26,8	166	92,6	53,9
75-50	65-40	HTR 75/50	38,5	38,5	44,5	32	166	93	65
75-63	65-50	HTR 75/63	38,5	38,5	44,5	38	166	93	80
90-32	80-25	HTR 90/32	46	46	52	23,4	197	114	45
90-40	80-32	HTR 90/40	46	46	52	26	197	114	54
90-50	80-40	HTR 90/50	46	46	52	32,5	197	114	65
90-63	80-50	HTR 90/63	46	46,5	52	38	197	114	80
90-75	80-63	HTR 90/75	46	46	52	44	197	114	93
110-40	100-32	HTR 11/40	56	56	62	26	237	135	54
110-50	100-40	HTR 11/50	56	56	62	31	237	135	65
110-63	100-50	HTR 11/63	55,5	56,5	62	38	237,5	135,4	80,2
110-75	100-63	HTR 11/75	56	56	62	45,5	237	135	92,8
110-90	100-80	HTR 11/90	56	56	62	51	237	135	108

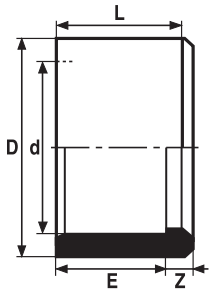
REDUCING BUSHES LONG PATTERN (D Spig. x d Soc.)



D-d	Dn	Reference	Z	E	e	L	d1
25-16	20-10	HRD 25/16	25,5	19	14,5	40	
32-16	25-10	HRD 32/16	30,5	23	15	45,7	
32-20	25-15	HRD 32/20	31	22,5	16,5	48	
40-16	32-10	HRD 40/16	36	27	14	51	
40-20	32-15	HRD 40/20	36	27	16	53	
40-25	32-20	HRD 40/25	36	27	19	55,6	
50-20	40-15	HRD 50/20	44	32	17	61	
50-25	40-20	HRD 50/25	44	32	19,5	63,5	
50-32	40-25	HRD 50/32	44	32	23	66,5	
63-20	50-15	HRD 63/20	55	39	17	72	
63-25	50-20	HRD 63/25	55	39	19	74,5	
63-32	50-25	HRD 63/32	55	39	23	78	
63-40	50-32	HRD 63/40	55	39	27	82	
75-20	65-15	HRD 75/20	63	45,5	17	80	
75-25	65-20	HRD 75/25	63	45,5	18,5	83	
75-32	65-25	HRD 75/32	63	45,5	23	85	
75-40	65-32	HRD 75/40	63	45,5	26,3	89	
75-50	65-40	HRD 75/50	61	45	32	93	
90-25	80-20	HRD 90/25	75	52,7	19,5	95	
90-32	80-25	HRD 90/32	75	52,7	23	98	
90-40	80-32	HRD 90/40	75	52,7	26,7	101,5	
90-50	80-40	HRD 90/50	75	52,7	32	107	
90-63	80-50	HRD 90/63	74	52	39	112	
110-50	100-40	HRD 11/50	91,3	61,7	31,1	122,4	
110-63	100-50	HRD 11/63	90	62	38	128	
110-75	100-65	HRD 11/75	90,5	61,7	44,3	134,8	
125-90	110-80	HRD 12/90	99,3	68,5	52	151,3	
160-110	150-100	HRD 16/11	128	86,5	62	190	
160-125	110-150-110	HRD 16/12	120	86	68,5	188,5	
160-90	150-80	HRD 16/90	126	87	51	177	
160-110	150-100	HRD 16/11	128	86,5	62	190	

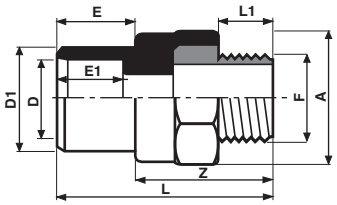
DIMENSION SHEET

REDUCING BUSHES SHORT PATTERN



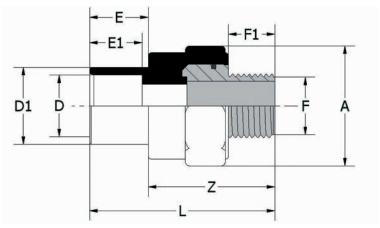
D-d	Dn	Reference	Z	E	L					
20-16	15-10	HRS 20	2,5	15	17,5					
25-20	20-15	HRS 25	3	17	20					
32-25	25-20	HRS 32	4,5	19	24,3					
40-32	32-25	HRS 40	5,5	23	28,5					
50-40	40-32	HRS 50	6,5	26	32,5					
63-50	50-40	HRS 63	8	31	39					
75-63	65-50	HRS 75	7	37,5	44,5					
90-75	80-65	HRS 90	7,5	44	51,5					
110-90	100-80	HRS 110	10	52	62					
125-110	110	HRS 125	8	63	65,5					

ADAPTOR NIPPLES BRASS THREADED



D-F	Reference	D1	Z	E	E1	A	L	L1	Number sides
16-3/8”	HEAL 16	20	32,5	17	15	32,2	49,5	11	8
20-1/2”	HEAL 20	25	41	19	17	36	60	15	8
25-3/4”	HEAL 25	32	43	22,5	19,5	41	65	16	8
32-1”	HEAL 32	40	49	27	23	49,5	76	19,5	8
40-1”1/4	HEAL 40	50	55	31	26	60	87	22	8
50-1”1/2	HEAL 50	63	55	37,5	31	66	92	22	8
63-2”	HEAL 63	75	63	43,5	37,5	82	106	26	8
16-1/2”	HEBL 16	20	36,5	16,5	14,5	32,2	53,5	13,5	8
20-3/4”	HEBL 20	25	43	19,5	17	41	62,5	16	8
25-1”	HEBL 25	32	45,5	23	19	49,5	68,5	19,5	8

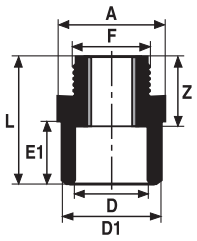
ADAPTOR NIPPLES



D-F	Reference	D1	Z	E	E1	A	L	L1	Number sides
20-1/2”	HEAS20	25	41	19	17	36	60	15	8
25-3/4”	HEAS25	32	43	22,5	19,5	41	65	16	8
32-1”	HEAS32	40	49	27	23	49,5	76	19,5	8

DIMENSION SHEET

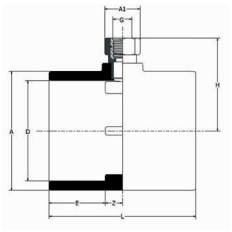
ADAPTOR NIPPLES



D-F	Dn	Reference	D1	Z	E1	A	L			
20-1/2”	15	HEA 20	27,3	28	16,9	29,8	45			
25-3/4”	20	HEA 25	32	34	23	36	53			
32-1”	25	HEA 32	40	42	22,5	47	65			
40-1”1/4	32	HEA 40	49,8	44	26,9	55,3	71			
50-1”1/2	40	HEA 50	62,8	45,5	31,7	68	77,2			
63-2”	50	HEA 63	75	49,5	38,3	78,3	87,7			

D-F	Dn	Reference	D1	Z	E1	A	L			
16-1/2”	10	HEB 16	23	27,5	16	24	43			
25-1”	20	HEB 25	32	35,5	23,5	36,5	55,5			
32-1”1/4	25	HEB 32	39,8	39,7	23,5	47,1	63,1			
40-1”1/2	32	HEB 40	50,0	43,5	26	54,5	69,5			
50-2”	40	HEB 50	63,0	49,5	32	68	82			

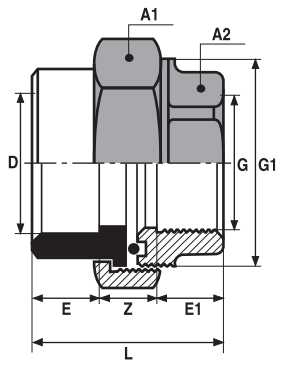
ADAPTORS FOR MEASURING INSTRUMENTS



D-G	Reference	A1	Z	E	L	A	H	Number sides
110	HMIL110/12	36	20	61	163	132	100	8
160	HMIL160/12	36	20,5	86	213	185	125	8
110	HMIL110/34	41	20	86	213	185	101	8
160	HMIL160/34	41	20,5	86	213	185	126	8

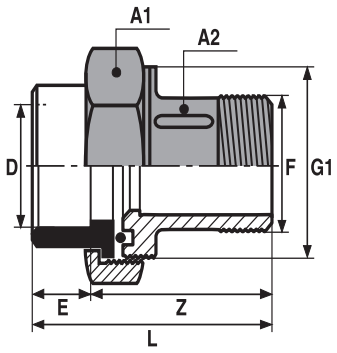
DIMENSION SHEET

3-PIECE UNIONS



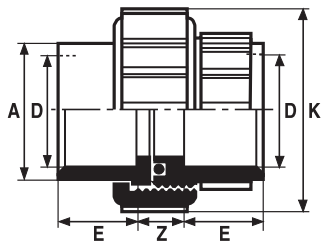
D-G	Dn	Reference	Z	E	E1	G1	A1	A2	L	
16-3/8”	10	H3G/L 16	10	15	11,5	3/4”	29	27	36,5	
20-1/2”	15	H3G/L 20	8	18	14	1”	36	27	40	
25-3/4”	20	H3G/L 25	9	19	15	1“1/4	45	32	43	
32-1”	25	H3G/L 32	11	23,5	16	1”1/2	52	38	50,5	
40-1”1/4	32	H3G/L 40	12	27	20	2”	66	47	59	
50-1”1/2	40	H3G/L 50	13	32	18	2”1/4	72	53	63	
63-2”	50	H3G/L 63	12	38	22	2”1/2	89	65	72	

3-PIECE UNIONS - M brass/F CPVC



D-G	Dn	Reference	Z	E	L	G1	A1	A2		
16-3/8”	10	H3F/L 16	34	15	49	3/4”	29	18		
20-1/2”	15	H3F/L 20	33	18	51	1”	36	21		
25-3/4”	20	H3F/L 25	51	19	70	1”1/4	45	28		
32-1”	25	H3F/L 32	56	23	79	1”1/2	52	33		
40-1”1/4	32	H3F/L 40	58	27	85	2”	66	42		
50-1”1/2	40	H3F/L 50	63	32	95	2”1/4	72	48		
63-2”	50	H3F/L 63	70	38	108	2”3/4	89	60		

3-PIECE UNIONS



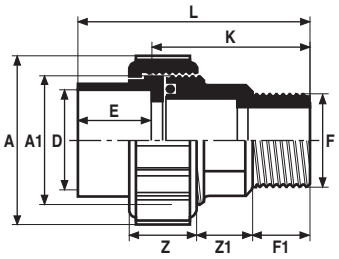
D	Dn	Reference	Z	E	A	K	L			
16	10	H3P 16	14	15	22	34,5	44			
20	15	H3P 20	14	16,5	27,5	42,7	47			
25	20	H3P 25	13,5	19	35,8	54,5	51,5			
32	25	H3P 32	14,5	22,5	41,4	62,5	60			
40	32	H3P 40	15	27	52,8	75,3	69			
50	40	H3P 50	19	31,5	58,8	82,8	82			
63	50	H3P 63	22	38,5	74	100,5	99			

DIMENSION SHEET

3-PIECE UNIONS - CPVC

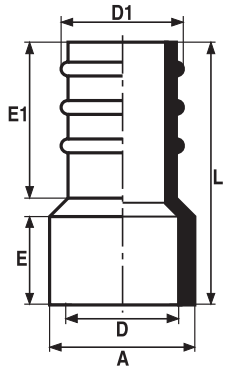
Soc. x Male thread
(wiht EPDM gasket)

- H3F/P or H3F/PB 3-piece unions have a CPVC socket and a male CPVC thread..
- They can be connected with CPVC and metal fittings (brass, maleable iron, stainless steel, carbon steel).
- Only use TEFLON (PTFE) tape as a sealant (no tow).
Alternatively, approved sealing pastes may be used.
- The male thread is conical (tapered).



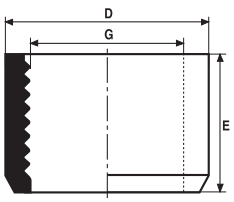
D	F	Reference	Z	Z1	F1	L	A	A1	K	E
16	1/2”	H3F/PB 16	19	15	15	58,5	36	3/4”	13	15,5
20	1/2”	H3F/P 20	22	13	15	60,5	44	1”	43	17,5
20	3/4”	H3F/PB 20	22	17	16,5	66,5	44	1”	49	17,5
25	3/4”	H3F/P 25	25	18,5	16,5	71,5	56	1”1/4	52	19,5
25	1”	H3F/PB 25	25	20	19	75,5	56	1”1/4	56	19,5

HOSE TAILS (socket)



D	Dn	Reference	D1	E	E1	L	A			
16	10	HDC 16	16,3	16	27	48	24			
20	15	HDC 20	20,9	18	35	59	30			
25	20	HDC 25	27,5	20	35	62	36,7			
32	25	HDC 32	33,1	23	36	67,5	45			
40	32	HDC 40	42	26	45	80,5	53,6			
50	40	HDC 50	52,9	31	50	91,5	64,5			

FITTINGS FOR STAINLESS STEEL TRAPS (D spig.)

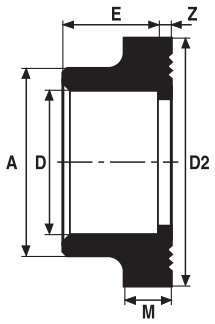


D-G	Dn	Code	E							
25-1/2”	20	HFT 25	19							
32-3/4”	25	HFT 32	23							

The HFT transforms a welded jointing into a threaded jointing in order to fasten accessories (such as thermometers, pressure gauges, etc…) excluding any operating mechanism (taps, valves, etc…) or any moving part (hoses, for example).

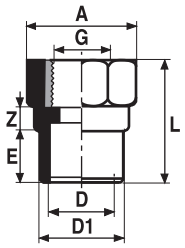
DIMENSION SHEET

SERRATED STUB FLANGES



D	Dn	Reference	Z	E	D2	M	A			
25	20	HCS 25	3	20	41	7	33			
32	25	HCS 32	3	23	50	7	41			
40	32	HCS 40	3	27	61	8	50			
50	40	HCS 50	3	32	73	8	61			
63	50	HCS 63	3	39	90	9	76			
75	65	HCS 75	3	44	106	10	90			
90	80	HCS 90	5	51,5	125	11	108			
110	100	HCS 110	5	62	150	12	131			
125	125	HCS 125	5,5	67,5	170	13	147			
160	150	HCS 160	6	86	212	16	187			

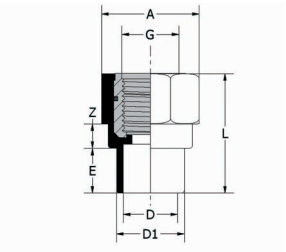
THREADED ADAPTORS (Soc. x female brass thread)



D-G	Dn	Code	D1	Z	E	L	A	Number sides
16-3/8”	10	HMML 16	20	9	17	38,5	32,2	8
20-1/2”	15	HMML 20	25	9	16,5	44	36	8
25-3/4”	20	HMML 25	32	9,5	19,5	49	41,4	8
32-1”	25	HMML 32	40	9,8	23	56,4	49,6	8
40-1”1/4	32	HMML 40	50	7	31	64	60	8
50-1”1/2	40	HMML 50	63	7	37,5	69,5	66	8
63-2”	50	HMML 63	75	8	43,5	80,5	82	8

Especially adapted for connection with metal threaded fittings and high torque.

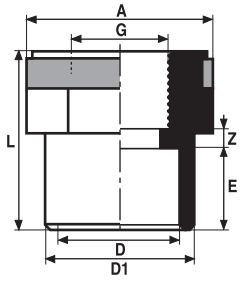
THREADED ADAPTORS (Soc. x female brass thread)



D-G	Reference	D1	Z	E	L	A	Number sides
20-1/2”	HMMS20	25	9	16,5	44	36	8
25-3/4”	HMMS25	32	9,5	19,5	49	41,4	8
32-1”	HMMS32	40	9,8	23	56,4	49,6	8

DIMENSION SHEET

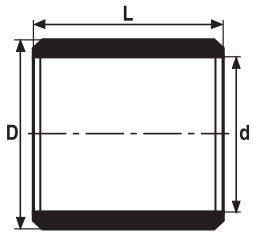
COUPLINGS



D-G	Dn	Reference	Z	E	L	D1	A	Nb sides		
20-1/2"	15	HMM 20	5,5	16	38,5	25	34	6		
25-3/4"	20	HMM 25	5,5	19	42,5	32	40	6		
32-1"	25	HMM 32	5	22	48	40	50	6		
40-1"1/4	32	HMM 40	6,7	27,6	58,5	50	55	6		
50-1"1/2	40	HMM 50	8,3	31,5	63,5	63	64,9	6		
63-2"	50	HMM 63	8,9	41,5	78,3	75	76,7	6		

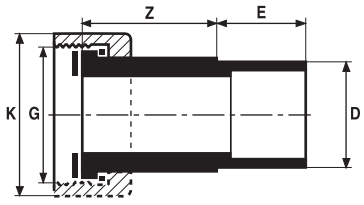
Assembling : see Technical Sheet 3.4

PLAIN NIPPLES (Spig. x Spig.)



D	Dn	Reference	L	d						
16	10	HMC 16	33	12,4						
20	15	HMC 20	37	15,4						
25	20	HMC 25	42	19,4						
32	25	HMC 32	49	24,8						
40	32	HMC 40	57	31						
50	40	HMC 50	67	38,8						
63	50	HMC 63	80	48,8						
75	65	HMC 75	92	64						

TAP CONNECTORS WITH BRASS NUTS Spig. / Soc. x Female thread for use with flat gasket

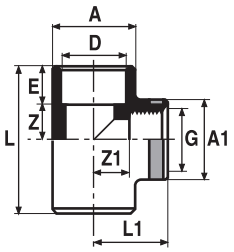


D-G	Dn	Reference	Z	E	A1					
16-1/2"	10	HDR 16	20	15	24					
20-3/4"	15	HDR 20	22	17	29,5					
25-1"	20	HDR 25	23	20	36					
32-1"1/4	25	HDR 32	26	23	45					
40-1"1/2	32	HDR 40	29	27	52					
50-2"	40	HDR 50	31	32	65,7					

Assembling : see Technical Sheet 3.3
Rem : The joint must be in contact with a flat surface

DIMENSION SHEET

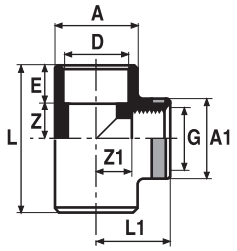
THREADED 90° TEES EQUAL Soc. x Female thread branch (with metal reinforcing ring outside)



D-G	Dn	Reference	Z	E	L	A	Z1	A1	L1	
16-1/2”	10	HTG 16	9	15	48	30	13	24	29	
20-1/2”	15	HTG 20	13,5	17	61	30	12	30	30	
25-3/4”	20	HTG 25	13,5	19,5	66	40	18	36	35	

Assembling: see Technical Sheet 3.4

THREADED 90° TEES, REDUCED Soc. x Female thread branch (with metal reinforcing ring outside) reduced threaded branch

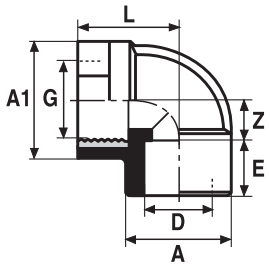


with metal reinforcing ring outside

D	G	Reference	Dn	Z	E	A	A1	L	Z1	L1
40	3/4”	HTGR 4034	32	21,7	26,5	54,1	40	96,4	24	42,3
50	3/4”	HTGR 5034	40	26,2	33	64,8	40	118,4	28,7	46,9
63	3/4”	HTGR 6334	50	33,0	38,3	79,7	40	142,7	34,8	53,5

Assembling: see Technical Sheet 3.4.

THREADED ELBOWS 90° (Soc. x Female brass thread)

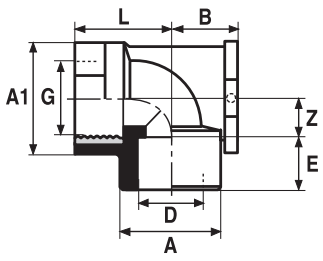


D-G	Dn	Reference	Z	E	A	A1	L			
16-1/2”	10	H4GL 16	12	15	24	36	32			
20-1/2”	15	H4GL 20	16	16,5	29	36	32			
25-3/4”	20	H4GL 25	17	19,5	35	41	37,5			

Especially adapted for connection with metal threaded fittings and high torque.

Assembling: see Technical Sheet 3.4

THREADED ELBOWS 90° WITH BACKPLATE (Soc. x Female brass thread)



D-G	Dn	Reference	Z	E	A	A1	L	B		
16-1/2”	10	H4GP 16	12	15	24	36	32	17		
20-1/2”	15	H4GP 20	16	16,5	29	36	32	21		
25-3/4”	20	H4GP 25	17	19,5	35	41	37,5	20,5		

Assembling: see Technical Sheet 3.4

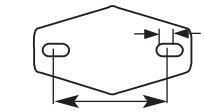
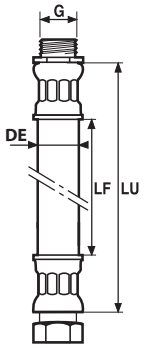


Plate hole size:
8 mm

Distance between plate holes:
50 mm

EXPANSION JOINTS
(Brass male threaded ends)



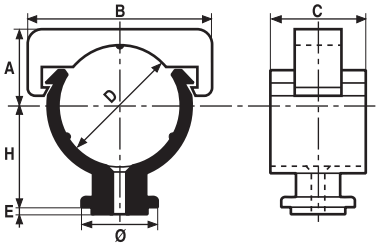
DI : Internal diameter
of the expansion joint

D-G	Dn	Reference	LF	LU	DE	DI				
16-1/2”	10	HCD/G16	330	380	18	10				
20-1/2”	15	HCD/G20	410	457	22	13				
25-3/4”	20	HCD/G25	520	592	28	17				
32-1”	25	HCD/G32	640	720	35	22				
40-1”1/4	32	HCD/G40	760	825	42	28				
50-1”1/2	40	HCD/G50	980	1067	50	34				

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. 5.1.
Monoklip brackets with drilled bases can be used with countersunk-head screws Ø 4 and 5 mm.
Wedges enable to increase clearance from wall/ceiling/floor.

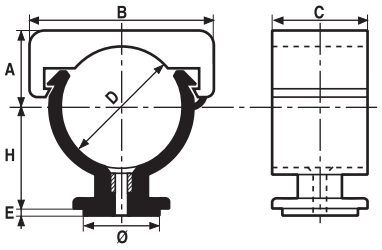
MONOKLIP BRACKETS in black polypropylene with drilled base Ø 5,5



Remark :
Suitable with
CALE 1225 wedges.

D	Dn	Reference	H	A	B	C	Ø	E		
16	10	HCKP 16/5	18	12	27	20	16	1		
20	15	HCKP 20/5	22	14	32	22	16	1		
25	20	HCKP 25/5	22	16	39	25	16	1		

MONOKLIP BRACKETS in black polypropylene with threaded metal insert M6, M8 or 7 x 150



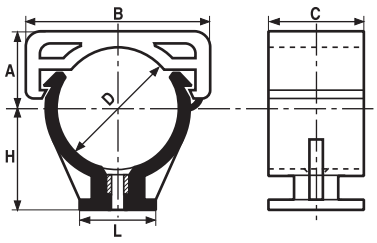
Diameter 16 to 25

Remark :
Suitable with
CALE 1225 wedges.

D	Dn	Reference	H	A	B	C	Ø	E		
with THREADED INSERT M6										
16	10	HCK 16/6	18	12	27	20	16	1		
20	15	HCK 20/6	22	14	32	22	16	1		
25	20	HCK 25/6	22	16	39	25	16	1		
with THREADED INSERT M8										
16	10	HCK 16/8	18	12	27	20	16	1		
20	15	HCK 20/8	22	14	32	22	16	1		
25	20	HCK 25/8	22	16	39	25	16	1		
with THREADED INSERT 7 x 50										
16	10	HCK 16/7	18	12	27	20	16	1		
20	15	HCK 20/7	22	14	32	22	16	1		
25	20	HCK 25/7	22	16	39	25	16	1		

DIMENSION SHEET

MONOKLIP BRACKETS in black polyamide with threaded metal insert M6, M8 or 7 x 150

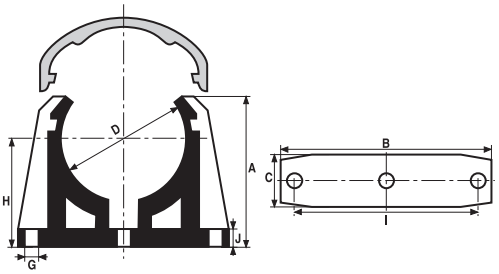


Diameter 32 to 63

Remark :
Suitable with CALE 3263 wedges (4 or 20 mm high)
Suitable with CALE 75110 wedges (20 mm high)

D	Dn	Reference	H	A	B	C	L			
with THREADED INSERT M6										
32	25	HCKC 32/6	28	20	45	25	30			
40	32	HCKC 40/6	32	24	55	25	30			
50	40	HCKC 50/6	36	30	68	25	52			
63	50	HCKC 63/6	40	37	82	25	52			
with THREADED INSERT M8										
32	25	HCKC 32/8	28	20	45	25	30			
40	32	HCKC 40/8	32	24	55	25	30			
50	40	HCKC 50/8	36	30	68	25	52			
63	50	HCKC 63/8	40	37	82	25	52			
		HCKC 75/8								
		HCKC 90/8								
		HCKC 110/8								
		HCKC 125/8								
with THREADED INSERT M8										
32	25	HCKC 32/7	28	20	45	25	30			
40	32	HCKC 40/7	32	24	55	25	30			
50	40	HCKC 50/7	36	30	68	25	52			
63	50	HCKC 63/7	40	37	82	25	52			

PIPE BRACKETS (HDPE black)



D	Dn	Reference	H	A	B	C	G	I	J	
140	125	A9C 140	130	170	197	40	8,5	179	10	

GIRPI

HTA® SYSTEM

Technical Sheet

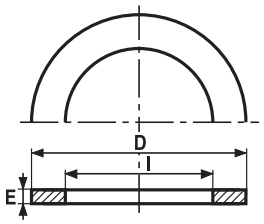
DIMENSION SHEET

7.17

2005

FLAT GASKETS FPM

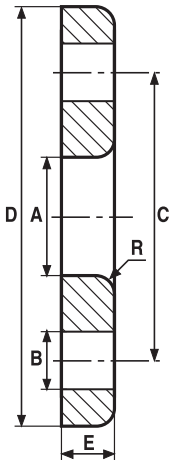
Reference	Dn	D	I	E
JPVCS 20	15	32	20	2
JPVCS 25	20	39	25	2
JPVCS 32	25	48	32	3
JPVCS 40	32	59	40	3
JPVCS 50	40	71	50	3
JPVCS 63	50	88	63	3
JPVCS 75	65	104	75	3
JPVCS 90	80	123	90	3
JPVCS 110	100	148	110	4
JPVCS 125	125	168	125	4
JPVCS 140	125	186	140	4
JPVCS 160	150	211	160	5
JPVCS 200	200	272	200	4



FLAT GASKETS EPDM

Reference	Dn	D	I	E
JPNCS 20	15	32	20	2
JPNCS 25	20	39	25	2
JPNCS 32	25	48	32	3
JPNCS 40	32	59	40	3
JPNCS 50	40	71	50	3
JPNCS 63	50	88	63	3
JPNCS 75	65	104	75	3
JPNCS 90	80	123	90	3
JPNCS 110	100	148	110	4
JPNCS125	125	168	125	4
JPNCS140	125	186	140	4
JPNCS160	150	211	160	5
JPNCS200	200	272	200	4

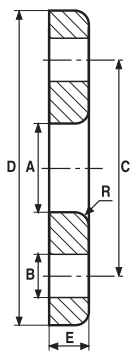
FLANGES PN16 according to DIN 16-966 (glass fibre reinforced polyester) - Color : white



Drilled GN 10/16

Pipe Ø	Flange Dn	Reference	A	B	C	D	E	R	Nbr of holes	Torque
20	15	BVR 15	28	14	65	95	14	1,5	4	0,5 à 1 mkg
25	20	BVR 20	34	14	75	105	18	1,5	4	0,5 à 1 mkg
32	25	BVR 25	42	14	85	115	20	1,5	4	0,5 à 1 mkg
40	32	BVR 32 B	52	18	100	140	20	2	4	2 à 4 mkg
40	40	BVR 40 A	54	18	110	150	20	2	4	2 à 4 mkg
50	40	BVR 40 B	63	18	110	150	20	2	4	2 à 4 mkg
50	50	BVR 50 A	65	18	125	165	22	2,5	4	2 à 4 mkg
63	50	BVR 50 B	78	18	125	165	22	2,5	4	2 à 4 mkg
63	60	BVR 60 A	78	18	135	175	22	2,5	4	2 à 4 mkg
63	65	BVR 65 A	81	18	145	185	22	2,5	4	2 à 4 mkg
75	80	BVR 80 A	94	18	160	200	24	3	8	2 à 4 mkg
90	80	BVR 80 B	110	18	160	200	24	3	8	3 à 4 mkg
110	100	BVR 100	133	18	180	220	26	3	8	3 à 4 mkg
110	110	BVR 110 A	133	18	190	230	24	3	8	3 à 4 mkg
125	125	BVR 125 A	150	18	210	250	28	4	8	3 à 4 mkg
160	150	BVR 150	190	22	240	285	30	4	8	3 à 4 mkg

FLANGES PN16 according to DIN 16-966 (glass fibre reinforced polyamide) - Color : black



Pipe Ø	Flange Dn	Reference	A	B	C	D	E	R	Nbr of holes	Torque
50	40	BPA 40	62,5	18	110	150	18	2,5	4	3 mkg
63	50	BPA 50	78,5	18	125	165	19	2,5	4	3 mkg
63	60	BPA 60	78,5	18	135	175	19	2,5	4	3 mkg
75	65/60	BPA 65	92	18	145	185	22	2,5	4	4 mkg
90	80	BPA 80	110	18	160	200	22	2,5	8	4 mkg
110	100	BPA 100	133	18	180	218	24	3	8	5 mkg
125	125	BPA 125	150	18	210	250	26	3	8	5 mkg
140	125	BPA 140	167	18	210	250	28	4	8	5 mkg

GIRPI

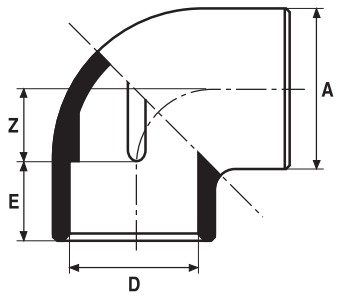
HTA®-E SYSTEM

Technical Sheet

DIMENSION SHEET

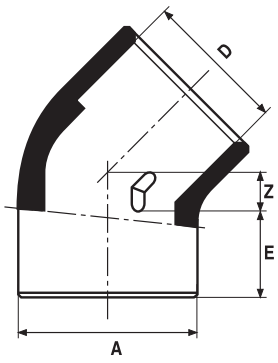
7.18

ELBOWS 90°



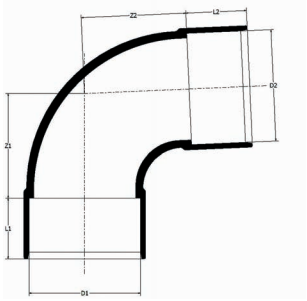
D	Dn	Reference	Z	E	A					
40	32	H4M 40	21,5	27	54					
50	40	H4M 50	27	32	64,8					
63	50	H4M 63	31	38	80					
75	65	H4M 75	38	44	92,5					
90	80	H4M 90	46	52,5	112					
110	100	H4M 110	57,1	62,7	136					
125	110	H4M 125	63,5	69,5	147,6					
160	150	H4M 160	81	86,5	190					

ELBOWS 45°



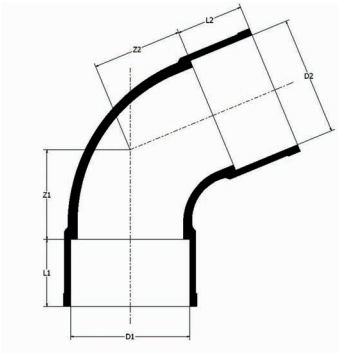
D	Dn	Reference	Z	E	A					
40	32	H8M 40	9,5	28	54					
50	40	H8M 50	11	32	65					
63	50	H8M 63	12,5	39	80					
75	65	H8M 75	18	44	92					
90	80	H8M 90	19,5	52	115					
110	100	H8M 110	23,5	61,5	135,5					
125	110	H8M 125	28	69	151,6					
160	150	H8M 160	34,5	86,5	190					

ELBOWS 87°30



Reference	D1	D2	Z1	Z2	L1	L2			
HEC5FF	110	110	85	85	61	61			
HEC6FF	125	125	97	97	68	68			

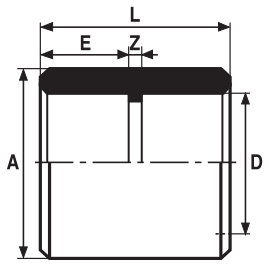
ELBOWS 67°30



Reference	D1	D2	Z1	Z2	L1	L2			
HECO5FF	110	110	59	59	61	61			

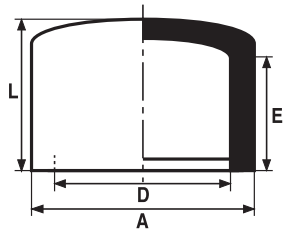
DIMENSION SHEET

STRAIGHT COUPLINGS



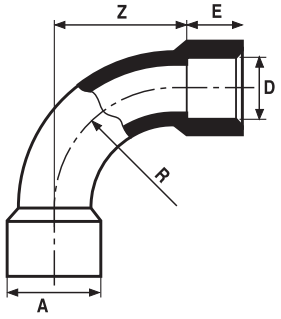
D	Dn	Reference	Z	E	L	A				
40	32	HMA 40	3	27	57,5	53,5				
50	40	HMA 50	3,5	31	68,7	64,8				
63	50	HMA 63	3	38	80,7	78,2				
75	65	HMA 75	4,5	45	94	90				
90	80	HMA 90	5	51,5	108	106,5				
110	100	HMA 110	4	61,5	127	132				
125	110	HMA 125	6,1	68,9	143,9	147,6				
160	150	HMA 160	10	86	185	185				

CAPS (Female)



D	Dn	Reference	E	L	A					
40	32	HBO 40	28	37,8	54,1					
50	40	HBO 50	33	44	65,2					
63	50	HBO 63	39	54	79,7					
75	65	HBO 75	44,5	60	90					
90	80	HBO 90	54	72	111					
110	100	HBO 110	62	88,5	140					
125	125	HBO 125	70	102	160					
160	150	HBO 160	87	144,5	187					

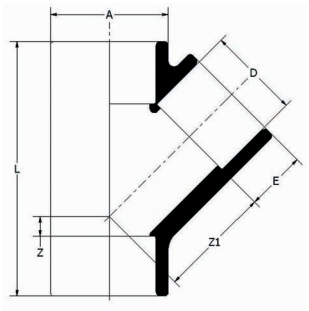
BENDS 90°



D	Dn	Reference	Z	E	A	R			
40	32	H4C 40	80	26	52	80			
50	40	H4C 50	100	31	64,5	100			
63	50	H4C 63	126	37,5	79,5	126			

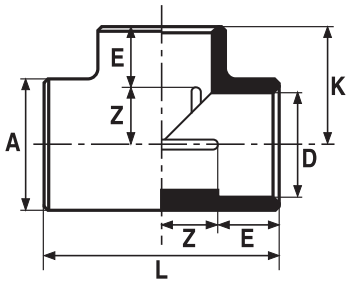
DIMENSION SHEET

EQUAL TEES 45°



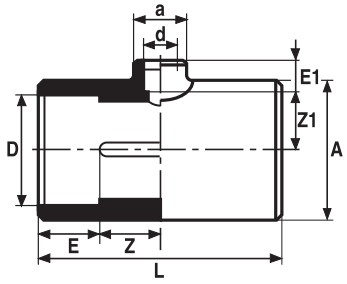
D	Reference	Z	E	A	L	Z1		
32	HYT 32	7	22	41	91	39		
40	HYT 40	8,5	26	51	110,5	48		
50	HYT 50	11	31	63	134	60		
63	HYT 63	14	37,5	77,5	166	76,5		

EQUAL TEES 45°



D	Dn	Reference	Z	E	L	A	K			
40	32	HTE 40	21,5	26,5	99,6	53,8	49			
50	40	HTE 50	26,5	31,5	118,5	65,4	58,7			
63	50	HTE 63	33,5	38	143	86	71,5			
75	65	HTE 75	39	44,5	167	92	83,5			
90	80	HTE 90	46	52	196,5	112,5	98			
110	100	HTE 110	55,7	62	235	132,9	118			
125	110	HTE 125	84	69	266	150,4	133			
160	150	HTE 160	84	86	342	191	170			

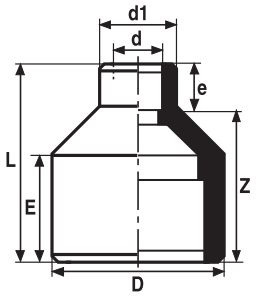
TEES REDUCED 90°



D-d	Dn	Référence	Z	Z1	E	E1	L	A	a
50-40	40-32	HTR 50/40	26	26	31,5	26,5	119	64,7	53,6
63-40	50-25	HTR 63/40	32	32	37,5	26	143	79,9	54
63-50	50-40	HTR 63/50	32	32	37,5	31	143	79,9	65
75-40	65-32	HTR 75/40	38,5	38	44,5	26,8	166	92,6	53,9
75-50	65-40	HTR 75/50	38,5	38,5	44,5	32	166	93	65
75-63	65-50	HTR 75/63	38,5	38,5	44,5	38	166	93	80
90-40	80-32	HTR 90/40	46	46	52	26	197	114	54
90-50	80-40	HTR 90/50	46	46	52	32,5	197	114	65
90-63	80-50	HTR 90/63	46	46,5	52	38	197	114	80
90-75	80-63	HTR 90/75	46	46	52	44	197	114	93
110-40	100-32	HTR 11/40	56	56	62	26	237	135	54
110-50	100-40	HTR 11/50	56	56	62	31	237	135	65
110-63	100-50	HTR 11/63	55,5	56,5	62	38	237,5	135,4	80,2
110-75	100-63	HTR 11/75	56	56	62	45,5	237	135	92,8
110-90	100-80	HTR 11/90	56	56	62	51	237	135	108

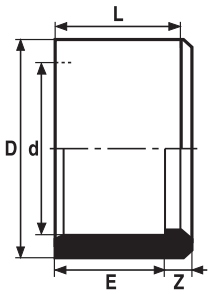
DIMENSION SHEET

REDUCING BUSHES (D male, d female)



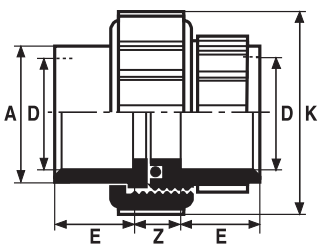
D-d	Dn	Reference	Z	E	e	L	d1
63-40	50-32	HRD 63/40	55	39	27	82	
75-40	65-32	HRD 75/40	63	45,5	26,3	89	
75-50	65-40	HRD 75/50	61	45	32	93	
90-40	80-32	HRD 90/40	75	52,7	26,7	101,5	
90-50	80-40	HRD 90/50	75	52,7	32	107	
90-63	80-50	HRD 90/63	74	52	39	112	
110-50	100-40	HRD 11/50	91,3	61,7	31,1	122,4	
110-63	100-50	HRD 11/63	90	62	38	128	
110-75	100-65	HRD 11/75	90,5	61,7	44,3	134,8	
125-90	110-80	HRD 12/90	99,3	68,5	52	151,3	
160-90	150-80	HRD 16/90	126	87	51	177	
160-110	150-100	HRD 16/11	128	86,5	62	190	

REDUCING BUSHES (D male, d female)



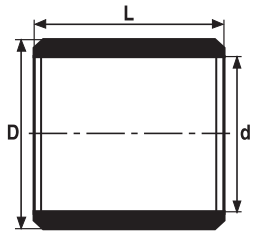
D-d	Dn	Reference	Z	E	L					
50-40	40-32	HRS 50	6,5	26	32,5					
63-50	50-40	HRS 63	8	31	39					
75-63	65-50	HRS 75	7	37,5	44,5					
90-75	80-65	HRS 90	7,5	44	51,5					
110-90	100-80	HRS 110	10	52	62					
125-110	110	HRS 125	8	63	65,5					

3-PIECE UNIONS (EPDM)



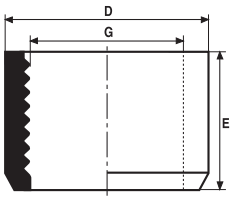
D	Dn	Reference	Z	E	A	K	L			
40	32	H3P 40	15	27	52,8	75,3	69			
50	40	H3P 50	19	31,5	58,8	82,8	82			
63	50	H3P 63	22	38,5	74	100,5	99			

PLAIN NIPPLES (Male-Male)



D	Dn	Reference	L	d						
40	32	HMC 40	57	31						
50	40	HMC 50	67	38,8						
63	50	HMC 63	80	48,8						
75	65	HMC 75	92	64						

THREADED INSERTS Spig. x Female thread

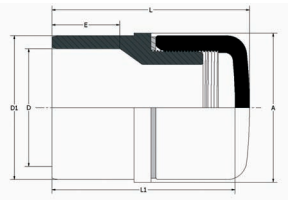


Assembling : see Technical Sheet 3.4

D-G	Dn	Reference	E							
25-1/2"	20	HFT 25	19							
32-3/4"	25	HFT 32	23							

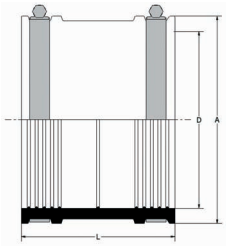
The HFT transforms a welded jointing into a threaded jointing in order to fasten accessories (such as thermometers, pressure gauges, etc…) excluding any operating mechanism (taps, valves, etc…) or any moving part (hoses, for example).

ACCESS PLUGS



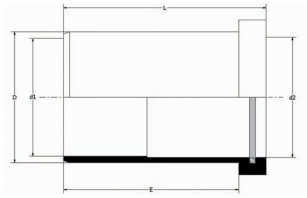
D	Reference	A	D1	E	L	L1		
90	HETV 110	114	110	52	152	141		

FLEXIBLE CONNECTORS EPDM to fit with a grease separator



D	Reference	A	L					
115	HESG 110	135	100					
165	HESG 160	185	120					

RUBBER FITTINGS FOR STAINLESS STEEL TRAPS with EPDM o-ring to connect with stainless steel trap outlet



D	Reference	A	E	D1	L	Z		
40	HESI 40	53,5	27	41	57,5	3		
50	HESI 50	64,8	31	51	68,7	3,5		
63	HESI 63	78,2	38	64	80,7	4,5		
90	HESI 90	106,5	51,5	81	108	5		
110	HESI 110	132	61,5	101	127	4		

GIRPI

HTA® SYSTEM

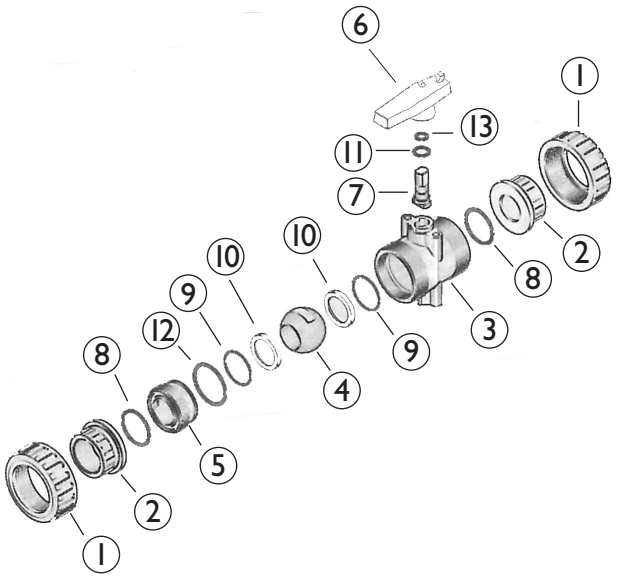
DOUBLE UNION CPVC BALL VALVES
CEMENTED SOCKET ENDS

Technical Sheet

8.1

2005

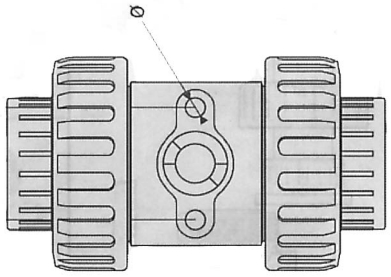
ø 16 to 63



KEY

①	Nut	CPVC
②	Welded/threaded socket end union	CPVC
③	Body	CPVC
④	Ball	CPVC
⑤	Support	CPVC
⑥	Handle	CPVC
⑦	Stem	CPVC
⑧	Socket o'ring	EPDM
⑨	Seat o'ring	EPDM
⑩	Ball seat	PTFE
⑪	Stem o'ring	EPDM
⑫	Body o'ring	EPDM
⑬	Stem o'ring	EPDM

ANCHORING SYSTEM

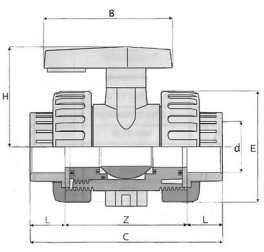


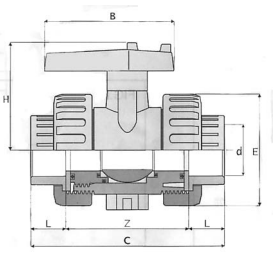
These ball valves have a built-in anchoring system.

There are two holes underneath fitted with threaded brass inserts (use screw in accordance with data below).

Ball valve Ø	**screw Ø for brass insert**
16	5,5
20	5,5
25	5,5
32	6,5
40	8
50	8
63	8

d	G	DN	L	Z	C	E	H	B	g	X	Ø	Fig.
16	3/8"	10	14	69	97	47	45	66	160	31	5,5	A
20	1/2"	15	16	70	102	47	45	66	160	31	5,5	A
25	3/4"	20	19	82	120	57	55	78	260	31	5,5	A
32	1"	25	22	87	131	68	67	86	380	40	6,5	A
40	1 1/4"	32	26	98	150	86	83	100	655	45	8	B
50	1 1/2"	40	31	101	163	98	91	110	925	50	8	B
63	2"	50	38	121	197	122	11	130	1695	50	8	B





GIRPI

HTA® SYSTEM

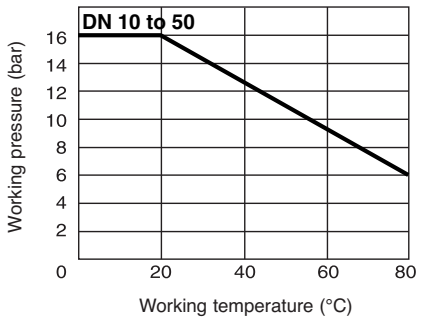
DOUBLE UNION CPVC BALL VALVES
CEMENTED SOCKET ENDS

Technical Sheet

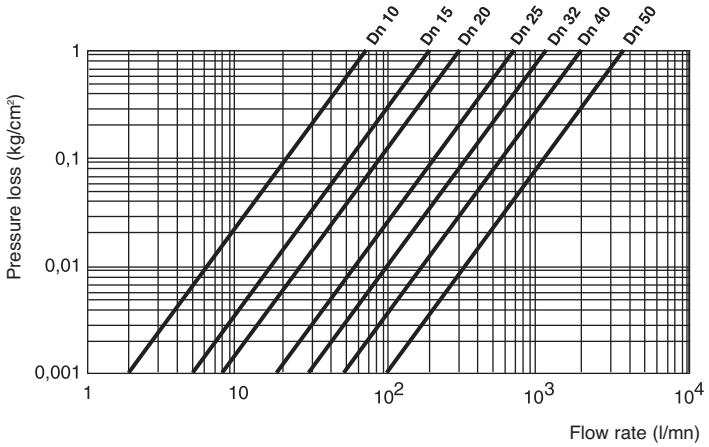
8.2

ø 16 to 63

WORKING PRESSURE



PRESSURE LOSSES ACCORDING TO THE FLOW RATES



COEFFICIENT OF FLOW 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 at a working pressure of 4 bars
- The nominal pressure (PN) in normal use, that is for water at maximum 20°C, is :
  - 16 bar for Ø 16 to 63 mm.

OPERATION TORQUE (PRESSURE 16 BAR)							
Ø	16	20	25	32	40	50	63
Torque Nm	2.0	3.0	3.0	5.0	6.0	9.0	9.0

Fitting procedure:

By solvent cementing :
female socket Ø 16 to 63 mm according to standards NF T 54-028, DIN 8063, ISO 727.

- Completely unscrew the nuts (7 and 7 bis) and slide them along pipes
- joint the sockets (6) with the pipes
- insert the body (2) between the sockets (6) and, if necessary, fix it with the anchoring system (8)
- screw the nut home (7), placed opposite to marking “ADJUST”, then progressively tighten the nut (7bis) placed nearby “ADJUST” until complete waterproofness is achieved.

Procedure of dismantling:

- put the valve in closed position
- completely unscrew the nuts (7 and 7 bis)
- remove the handle (1) by pulling it up
- insert the lugs placed under the handle in the corresponding notches of the ball seat support (5), and unscrew the ball seat support (5) by turning the handle anticlockwise
- take the ball out (3)
- push down the spindle (4) and extract it by the body’s inside (2)
- remove PTFE seats (9) from ball seat support (5) and from the body (2)
- change, if necessary, the EPDM or FPM O-rings (10)
- reassembly is achieved by carrying out the same operations in opposite sequence.

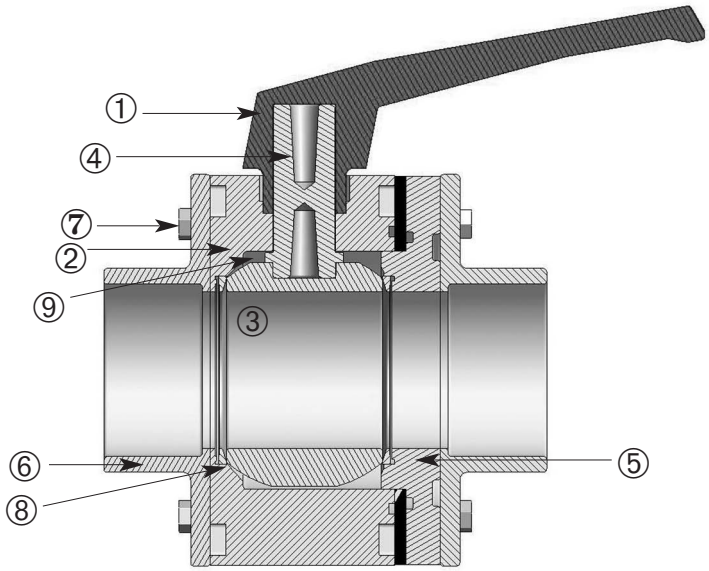
UNION CPVC BALL VALVES
CEMENTED SOCKET ENDS

Technical Sheet

8.3

2005

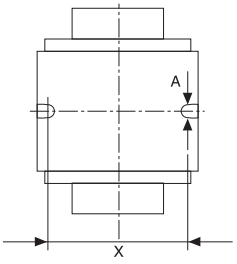
ø 75 to 110



LEGEND

①	Handle	CPVC
②	Body	CPVC
③	Ball	CPVC
④	Spindle	CPVC
⑤	Ball seat support	CPVC
⑥	Cement socket end	CPVC
⑦	Nuts	inox
⑧	Ball seat	PTFE
⑨	O-rings	EPDM

ANCHORING SYSTEM



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

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

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

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

Valves in Ø 75 to 110 are carefully assembled in our worhshops. It is not recommemded to dismantle the backing plates which ensure good valve operation. The socket flanges may be dismantled.

cement socket ends											**Mass**
d	**Dn**	**Ref. EPDM**	**l**	**z**	**h**	**e**	**b**	**c**	**a**	**i**	**(kg)**
75	65	VHFEP 75	44	145,0	233,0	211	180	209	25	105	5,8
90	80	VHFEP 90	52	147,5	251,5	211	180	209	25	105	5,8
110	100	VHFEP 110	63	169,0	295,0	248	220	258	31	124	9

GIRPI

HTA® SYSTEM

UNION CPVC BALL VALVES
CEMENTED SOCKET ENDS

Technical Sheet

8.4

ø 75 to 110

Field of application:

- the same as that of CPVC HTA fittings (drinking water, food liquids, various fluids, according to standard NFT 54-014)
- max. working temperature : 80 °C at a working pressure of 4 bars
- the nominal pressure (PN) in normal use, i.e. for water at maximum 20°C, is :
  -16 bar for Ø 75 to 110 mm.

Assembly:

N.B. : there is an arrow on the valve's body showing the direction of flow (the arrow's head is located close to the fixed ball seat support).

- insert O-ring (9) and PTFE ball seat (8) into their own seats inside the body
- insert the spindle (4), via the inside part of the,body, equipped with O-ring (17) in a slot, two PTFE bearings (16 and 15) and an O-ring (14) placed at the spindle's base.
- the spindle's pivot being located in alignment of the valve, place the ball (3)
- fit out the moving ball seat support (5) with the O-ring (9) and the PTFE ball seat (8)
- place the equipped moving ball seat support inside the body (2)
- put O-ring (11) into the front of the slot located between body and moving ball seat support
- assemble flange end with 8 stainless steel bolts including screw (8) washer (12) and nut (13)

Attention : there is a mark on the body of the valve and an other one on the flange end to know the right position of assembly

- assemble the handle (1), taking care to put it correctly with regard to the ball (on spindle's top, a furrow shows the piping's direction).

Diassembling:

- **N.B.** : there is an arrow on the valve's body showing the direction of flow (the moving ball seat support is located on the back side of the arrow).
- put the handle (1) in the closed position of the valve
- unscrew the screws (7)
- remove the flange end (6)
- take off the ball seat support (5) by pulling it out or by pushing the ball by the opposite side with the help of a tool not risking to damage it (take care not to lose the O-ring (11))
- take the ball out (3)
- take the spindle out (4) after removing the handle (1), by pushing it towards the inside of the body (2).

PNEUMATICALLY ACTUATED BALL VALVES

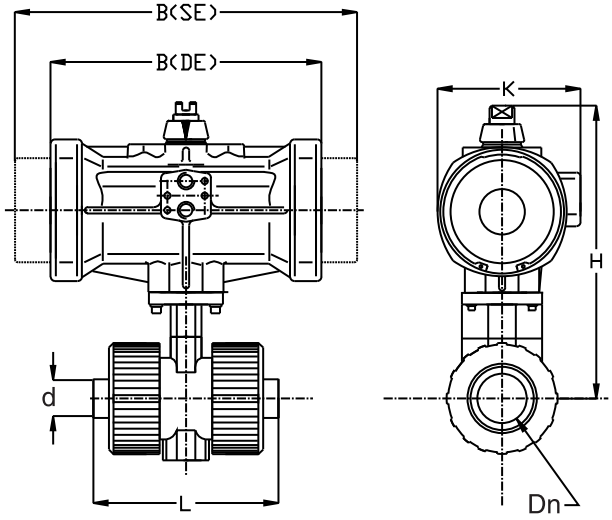
DESCRIPTION

2-way full bore valve, pneumatically actuated, single or double action.
- **Fluid temperature :** 5°C to + 60°C
- **Max. working pressure :** 10 bar to 20°C
- **Jointing :** Cementing.

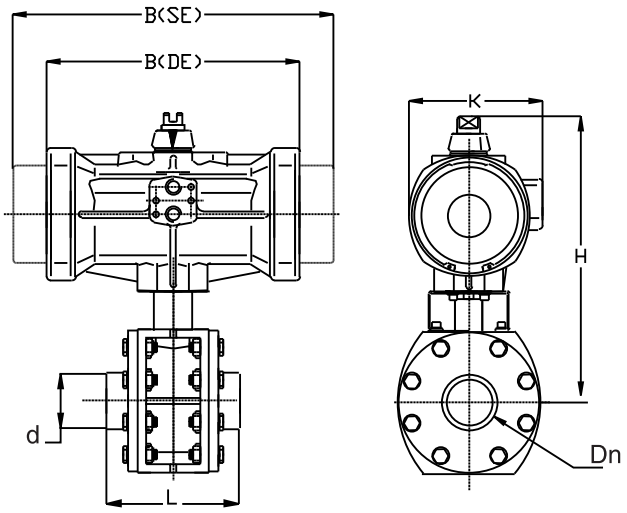
MATERIALS
- **Valves :** CPVC
- **Seals :**EPDM
- **Ball seats :** PTFE
- **Actuator :** polyamide FV.

ACCESSORIES
- **Electrical limit switch box**
- **Electrical solenoid valve**

Ø 16 to 63



Ø 75 to 110



DIMENSIONS

			Pneumatically actuated ball valves							
			Double action (DE)				Simple action (SE)			
D	DN	L	B(DE)	K	H	Réf. HTA	B(SE)	K	H	Réf. HTA
16	10	101	107	68	144	VAPHDE16	141	68	144	VAPHSE16
20	15	101	107	68	144	VAPHDE20	141	68	144	VAPHSE20
25	20	122	107	68	159	VAPHDE25	141	68	159	VAPHSE25
32	25	131	107	68	154	VAPHDE32	149	80	179	VAPHSE32
40	32	149	125	80	186	VAPHDE40	149	80	186	VAPHSE40
50	40	164	125	80	194	VAPHDE50	222	97	211	VAPHSE50
63	50	195	125	80	204	VAPHDE63	222	97	221	VAPHSE63
75	65	223	178	97	302,5	VAPHDE75	292	125	336,5	VAPHSE75
90	80	241,5	178	97	302,5	VAPHDE90	292	125	336,5	VAPHSE90
110	100	285	178	97	321	VAPHDE11	292	125	355	VAPHSE11

BALL VALVES
WITH ELECTRIC ACTUATOR

DESCRIPTION

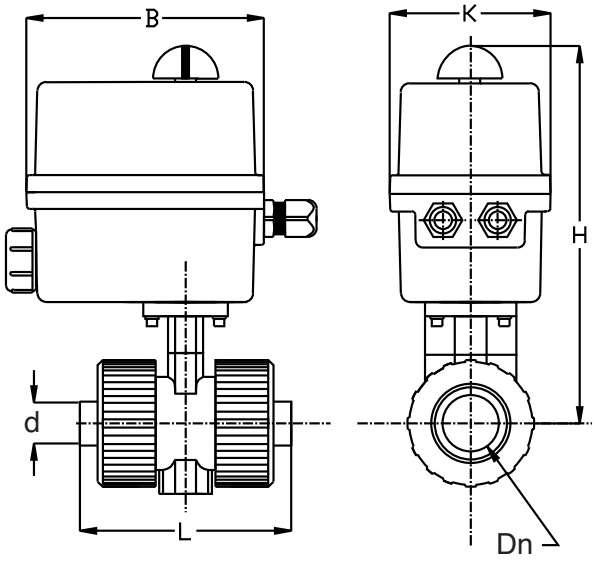
2-way full bore valve, electrical actuator 230V 50 Hz with emergency manual actuation by extended spindle + position indicator.

- **Fluid temperature :** 5°C to + 60°C
- **Max. working pressure :** 10 bar to 20°C
- **Jointing :** cementing
- **Actuator temperature :** -10°C to +55°C
- **Voltage :** 230V 50/60Hz
- **Protection :** IP65 / 2PG11 IP67.

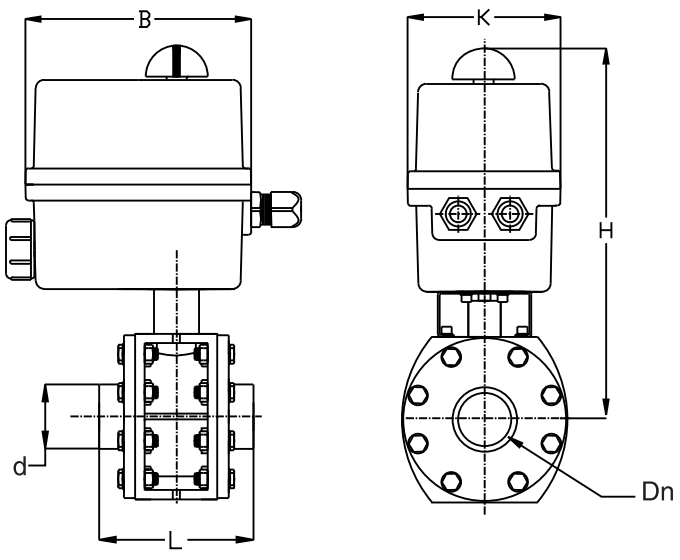
MATERIALS

- **Valves :** CPVC
- **Seals :** EPDM
- **Ball seats :** PTFE
- **Actuator :** carter = nylon FV
  cover = ABS

Ø 16 to 63



Ø 75 to 110



DIMENSIONS

BALL VALVES WITH ELECTRIC ACTUATOR						
D	**DN**	**K**	**H**	**L**	**B**	**Réf. HTA**
16	10	90	205	101	135	VAEH16
20	15	90	205	101	135	VAEH20
25	20	90	220	122	135	VAEH25
32	25	90	215	131	135	VAEH32
40	32	90	222	149	135	VAEH40
50	40	90	230	164	135	VAEH50
63	50	90	240	195	135	VAEH63
75	65	127	321,5	223	150	VAEH75
90	80	127	321,5	241,5	150	VAEH90
110	100	127	340	285	150	VAEH110

GIRPI

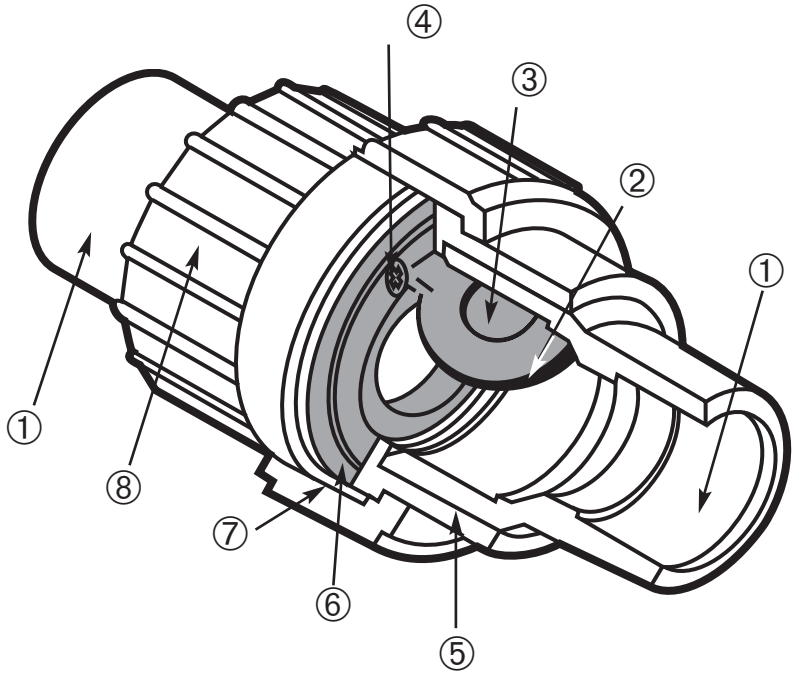
HTA® SYSTEM

NON-RETURN VALVES
FOR COLD WELD - UNION TYPE

Technical Sheet

9.1

2004



① Reduction at ext. Dn of tube
② Disc O-ring
③ Disc
④ Disc locking screw
⑤ Rotating part
⑥ Gasket
⑦ Nut
⑧ Threaded body

GENERAL CHARACTERISTICS

Materials:

- The different components of the GIRPI non return valves (disc type) are made of brown foodstuff quality injected CPVC.
- Disc ③ is made of brown CPVC.
- Joints ② and ⑥ are made of EPDM.
- Disc locking screws are made of stainless steel 18-6.

Dimensions:

- See table below.

Assembly:

- By bonding: female socket Ø 20 to 40 mm, meeting NF T 54-048, DIN 8063 and ISO 727 standards.

Operating field:

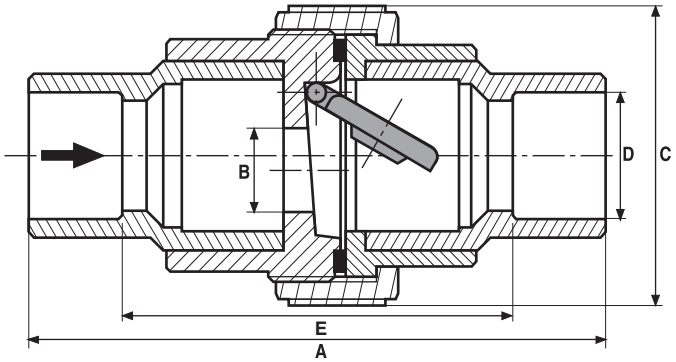
- The operating field of these non return valves is identical to that of our HTA® system in CPVC (drinking water, foodstuff liquids, industrial fluids, water treatment, swimming pools).

Operating limits:

- Maximum service temperature: 90°C.
- PN16 at 20°C.

Installation:

- GIRPI non return valves can be installed horizontally or vertically.



D	Reference	A	B	C	E
20	HCB 3P 20	123,5	17	76,5	89,5
25	HCB 3P 25	129	17	76,5	90
32	HCB 3P 32	155	21	84	109
40	HCB 3P 40	189	32	102	135

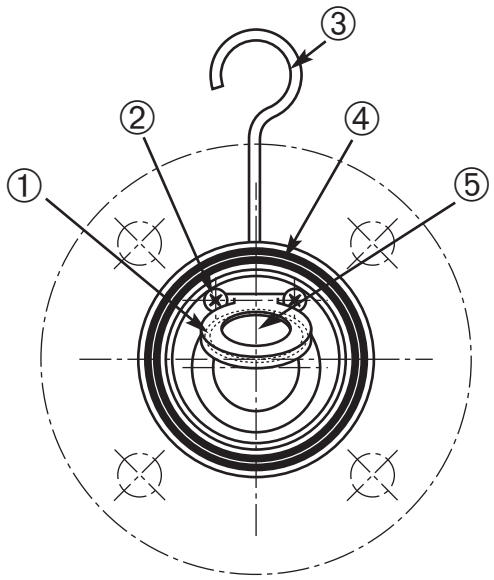
GIRPI

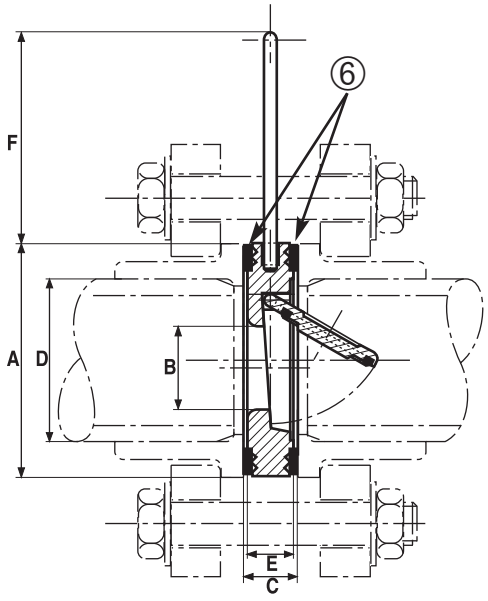
HTA® SYSTEM

NON-RETURN VALVES
FOR COLD WELD - UNION TYPE

Technical Sheet

9.2





D	Reference	A	B	C	E	F	
50	HCBS 50	73	21	18	15	81	
63	HCBS 63	90	32	18	15	81	

① Disc O-ring
② Disc locking screw
③ Hanger
④ Valve body
⑤ Disc
⑥ Gasket (thick. 3 mm)

GENERAL CHARACTERISTICS

Materials:
• Body ④ of the GIRPI check (wafer type) is made of brown foodstuff quality injected CPVC.
• Disc ⑤ is made of brown CPVC.
• Joints ① and ⑥ are made of EPDM.
• Disc locking screws are made of stainless steel 18-6.
• Hanger ③ is made of zinc plated steel.

Dimensions:
• See above table.

Assembly:
• By flange: - the two flat joints ⑥ are supplied with the check valve.
- Use GIRPI stub flanges (ref. HCS), glass fibre reinforced polyester flanges (ref. BVR) and glass fibre reinforced polyamid flanges (ref. BPA).

Operating field:
• The operating field of these check valves is identical to that of our HTA system in CPVC (drinking water, foodstuff liquids, industrial fluids, water treatment, swimming pools).

Operating limits:
• Maximum service temperature: 90 °C.
• PN16 at 20 °C.

Installation:
• GIRPI check valves can be installed horizontally or vertically upward fluids).

GIRPI

HTA® SYSTEM

CHEMICAL RESISTANCE TABLES

Technical Sheet

10.1

2005

The indications given in the tables below are extracts from French or foreign documents or the result of our own experiments.

They cannot be considered to be absolute or guaranteed, as they are not valid in all specific operating conditions. It must also be noted that the nature of chemical agents and their mixtures, the presence of impurities, and the degree of vulcanisation of elastomers, can lead to large variations in these indications; only practical tests in these cases can provide valid results.

We cannot be held liable for the indications given.

The chemical agents are classified in alphabetical order.

Meaning of symbols:
2: Good resistance
1: Limited resistance (depending on conditions of use)
0: Not resistant (use not recommended)

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Acetaldehyde		0	0	0	-	-	-	-
Acetic acid (vapour)		2	0	0	2	-	-	0
Acetic acid	0-20%	2	2	2	2	-	2	-
Acetic acid	20-30%	2	-	0	1	1	2	-
Acetic acid	30-60%	2	-	0	-	-	-	-
Acetic acid	80-100%	2	-	0	-	-	0	0
Acetic anhydride		0	0	0	-	-	-	-
Acetone		0	0	0	-	-	-	-
Acetylene		2	2	-	2	-	2	-
Acid raw oil		2	2	2	-	-	-	-
Acid water for washing minerals		2	2	2	-	-	2	-
Adipic acid		2	2	2	2	2	2	2
Allyl alcohol	96%	2	-	-	-	-	-	0
Allyl chloride		0	0	0	-	-	-	-
Alum		2	2	2	2	2	2	2
Aluminium chloride		2	2	2	2	2	2	2
Aluminium fluoride		2	2	2	2	-	2	-
Aluminium hydroxide		2	2	2	-	-	-	-
Aluminium nitrate		2	2	2	-	-	2	2
Aluminium oxychloride		2	2	2	-	-	-	-
Ammonia (dry gas)		2	2	2	2	1	0	-
Ammonia (liquid)		-	0	0	2	-	0	-
Ammonium bifluoride		2	2	2	-	-	2	0
Ammonium carbonate		2	2	2	2	2	2	2
Ammonium chloride		2	2	2	2	2	2	2
Ammonium fluoride		2	-	-	2	2	2	-
Ammonium hydroxide	28%	0	0	0	-	-	-	-
Ammonium nitrate		2	2	2	2	2	2	2
Ammonium persulphate		2	2	2	-	-	2	2
Ammonium phosphate		2	2	2	2	2	2	2
(ammoniacal and neutral)		2	2	2	2	2	2	2
Ammonium sulphate		2	2	2	2	2	2	2
Ammonium sulphite		2	2	2	-	-	2	2

REACTIVE	CPVC - HTA			EPDM		"Viton" FPM	
	20°C	60°C	80°C	20°C	60°C	20°C	60°C
Ammonium thiocyanate	2	2	2	-	-	-	-
Amyl acetate	0	0	0	1	-	0	0
Amyl acid	2	2	2	2	2	1	1
Amyl chloride	0	0	0	-	-	2	-
Anhydrous nitric acid	0	0	0	-	-	-	-
Aniline	0	0	0	-	-	-	-
Aniline chlorate	2	0	0	-	-	-	-
Aniline hydrochloride	0	0	0	-	-	-	0
Aniline hydrochloride	0	0	0	-	-	1	0
Anthraquinone	2	-	-	-	-	2	2
Antimony trichloride	2	2	2	2	2	2	2
Aqua regia (nitrohydrochloric acid)	2	2	2	0	-	-	-
Arsenic acid 80%	2	2	2	2	2	2	2
Asphalt	2	2	2	0	-	-	-
Barium carbonate	2	2	2	-	-	2	2
Barium chloride	2	2	2	2	2	2	2
Barium hydroxide	2	2	2	2	2	-	-
Barium sulphate	2	2	2	2	2	2	2
Barium sulphite	2	2	2	-	-	2	2
Beer	2	2	2	2	-	2	2
Beetroot (sweet liqueur)	2	2	2	-	-	2	2
Benzaldehyde	0	0	0	-	-	-	-
Benzine	0	0	0	-	-	-	-
Benzoic acid	2	0	0	2	2	2	2
Benzol	0	0	0	-	-	-	-
Borax	2	2	2	2	2	2	2
Boric acid	2	2	2	2	2	2	2
Boric trifluoride	2	2	2	-	-	-	-
Brine	2	2	2	2	2	2	2
Bromic water	2	2	2	-	-	-	-
Bromoethyl	0	0	0	-	-	-	-
Butadiene	2	2	2	0	0	2	2
Butyl acetate	0	0	0	1	-	0	0
Butyl alcohol	2	-	-	2	2	2	2
Butylene	2	-	-	2	-	-	-
Butylnediol (erythritol)	2	0	0	2	-	2	-
Butylphenol 100%	2	0	0	-	0	-	-
Butyric acid	2	0	0	1	-	2	1
Calcium carbonate	2	2	2	-	-	2	2
Calcium chlorate	2	2	2	-	-	2	-
Calcium hydroxide	2	2	2	-	-	-	-
Calcium nitrate	2	2	2	2	2	2	2
Calcium sulphate	2	2	2	2	2	2	2
Cane sugar melasses	2	2	2	-	-	-	-
Carbon dioxide in aqueous solution	2	2	2	2	-	2	-
Carbon monoxide	-	-	-	2	2	-	-
Carbon sulphide	1	0	0	0	-	-	2
Carbon tetrachloride	1	0	0	0	0	2	2
Carbonic acid	2	2	2	2	2	2	2
Castor oil	2	2	2	-	-	2	2
Caustic potash	2	2	2	2	2	-	0

GIRPI

HTA® SYSTEM

CHEMICAL RESISTANCE TABLES

Technical Sheet

10.3

2005

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Caustic soda		2	2	2	2	2	1	0
Cellosolve		2	-	-	-	-	0	0
Chloral hydrate		2	2	2	-	-	0	-
Chloric gas (dry)		-	-	-	0	0	-	-
Chloric gas (wet)		-	-	-	2	-	-	-
Chlorinated lime		2	2	2	2	2	2	2
Chlorine water		2	2	2	2	-	-	-
Chloroacetic acid		2	-	-	-	-	1	0
Chlorobenzine		0	0	0	-	-	-	-
Chloroform		0	0	0	-	-	-	-
Chlorosulphonic acid	100%	2	-	-	-	-	0	0
Chromic acid	10%	2	2	2	-	-	2	2
Chromic acid	30%	2	-	-	-	-	2	2
Chromic acid	40%	2	-	-	-	-	2	2
Chromic acid	50%	2	-	-	-	-	2	2
Chromic alum		2	2	2	2	2	2	2
Citric acid	20%	2	2	0	2	2	2	2
Coke oven gas		-	-	-	1	-	-	-
Copper chloride		2	2	2	2	2	2	2
Copper fluoride		2	2	2	2	-	2	-
Copper nitrate		2	2	2	2	2	2	2
Copper sulphate		2	2	2	2	2	2	2
Core oil		2	2	2	-	-	-	-
Cottonseed oil		2	2	2	-	-	2	-
Cresol	90%	2	0	0	-	-	2	-
Cyclohexanol		0	0	0	-	-	-	-
Cyclohexanon		0	0	0	-	-	-	-
Demineralised water		2	2	2	2	2	2	2
Dextrin	18%	2	2	2	2	2	2	2
Dextrose		2	2	2	-	-	2	2
Diazotization salts		2	2	2	-	-	-	-
Diglycolic acid	30%	2	2	2	2	-	2	2
Dimethylamine		0	0	0	-	-	-	-
Dioctyl phthalate		0	0	0	-	-	-	-
Disodic phosphate		2	2	2	-	-	2	2
Distilled water		2	2	2	2	2	2	2
Dry sulphurous gas		-	-	-	2	-	-	-
Ether		0	0	0	-	-	-	-
Ethyl acetate		0	0	0	-	-	-	-
Ethyl acrylate		0	0	0	-	-	-	-
Ethyl alcohol		2	2	2	2	2	2	0
Ethyl chloride		0	0	0	-	-	-	-
Ethyl chlorohydrine		0	0	0	-	-	-	-
Ethyl ether		0	0	0	-	-	-	-
Ethylenoxide		0	0	0	-	-	-	-
Fatty acid		2	2	2	-	-	2	2
Ferric chloride		2	2	2	2	2	2	2
Ferric nitrate		2	2	2	2	2	2	2
Ferrous chloride		2	2	2	2	2	2	2
Fluoboric acid		2	2	2	-	-	-	-
Fluosilicic acid		2	2	2	-	-	1	0

CHEMICAL RESISTANCE TABLES

2005

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Formaldehyde		0	0	0	2	2	-	-
Formic acid		2	0	0	2	2	2	0
Freon 12		2	-	-	1	-	1	1
Fresh water		2	2	2	2	2	2	2
Fructose		2	2	2	-	-	2	2
Fruit juice and pulp		2	2	2	-	-	2	2
Fuel (containing SO4 H2)		2	2	2	0	0	2	-
Furfural		0	0	0	-	-	-	-
Gallic acid		2	2	2	-	-	2	2
Gelatine		2	2	2	2	-	2	2
Glacial acetic acid		2	0	0	1	1	0	0
Glucose		2	2	2	2	2	2	2
Glycerine		2	2	2	2	2	2	2
Glycol		2	2	2	2	2	2	2
Glycol ether		2	2	2	2	2	2	2
Glycolic acid		2	2	2	2	-	2	2
Heptane		-	-	-	1	-	-	-
Hexane		2	-	-	-	-	2	2
Hydrobromic acid	10%	2	2	2	2	2	2	2
Hydrochloric acid	0-25%	2	2	2	2	2	2	2
Hydrochloric acid	20%	2	2	2	2	2	2	2
Hydrochloric acid	25-40%	2	2	2	-	-	2	-
Hydrocyanic acid		2	2	2	-	-	2	2
Hydrofluoric acid	40%	2	2	2	-	0	2	2
Hydrofluoric acid	60%	2	0	0	-	0	2	-
Hydrofluosilicic acid		2	2	-	-	-	2	0
Hydrogen		-	-	-	2	2	-	-
Hydrogen peroxide	50%	2	2	2	-	-	2	-
Hydrogen peroxide	90%	2	2	2	-	-	-	
Hydrogen phosphorus		2	2	2	-	-	-	-
Hydroquinone		2	2	2	-	-	2	-
Hydroxylamine sulphate	12%	2	2	2	2	2	2	-
Hypochlorous acid		2	2	2	-	-	2	2
Iodine		-	-	-	1	1	-	-
Iron sulphate (copperas)		2	2	2	2	2	2	2
Iron sulphate		2	2	2	2	2	2	2
Kerosene		2	2	2	-	0	2	2
Lactic acid	28%	2	2	-	-	-	2	2
Lard		2	2	2	-	-	-	-
Lauric acid		2	2	2	-	-	-	-
Lauryl chloride		2	2	2	-	-	-	-
Lauryl sulphate		2	2	2	-	-	-	-
Lead acetate		2	2	2	2	2	1	1
Lime sulphide		2	2	2	2	-	-	-
Linoleic acid		2	2	2	-	-	2	2
Linseed oil		0	0	0	-	-	2	2
Liqueurs (beverages)		-	-	-	2	-	-	-
Liquid bromine		0	0	0	-	-	-	-

GIRPI

HTA® SYSTEM

CHEMICAL RESISTANCE TABLES

Technical Sheet **10.5**

2005

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Lubricating oil		2	2	2	-	-	2	-
Magnesium carbonate		2	2	2	-	-	2	2
Magnesium chloride		2	2	2	2	2	2	2
Magnesium hydroxide		2	2	2	-	-	-	-
Magnesium nitrate		2	2	2	2	2	-	-
Magnesium sulphate		2	2	2	2	2	2	2
Maleic acid	35%	2	2	2	2	2	2	2
Malic acid		2	2	2	2	-	2	2
Melasses		2	2	2	2	2	2	2
Mercuric chloride		2	2	2	2	2	2	2
Mercuric cyanide		2	2	2	2	-	2	2
Mercury		2	2	2	2	2	2	2
Mercury nitrate		2	2	2	2	2	-	-
Methyl alcohol	10%	2	2	2	2	2	2	0
Methyl chloride		0	0	0	-	-	-	-
Methyl sulphate		2	2	2	-	-	-	-
Methylene chloride		0	0	0	-	-	-	-
Methylethylcetone		0	0	0	-	-	-	-
Milk		2	2	2	2	-	2	2
Mineral oil		2	2	2	-	-	2	2
Naphtha		2	2	2	-	-	2	2
Naphthalene		0	0	0	-	-	-	-
Natural gas (dry)		-	-	-	1	-	-	-
Natural gas (wet)		-	-	-	1	-	-	-
Nickel chloride		2	2	2	2	2	2	2
Nickel nitrate		2	2	2	2	2	2	2
Nickel sulphate		2	2	2	2	2	2	2
Nicotine		2	2	2	2	-	2	2
Nicotinic acid		2	2	2	-	-	-	-
Nitric acid	30-50%	2	-	-	-	-	2	-
Nitric acid	50-60%	2	0	0	0	0	-	0
Nitric acid	60%	2	0	0	0	0	0	0
Nitric acid	68%	2	0	0	0	0	0	0
Ocenol (non-saturated alcohol)		2	2	2	-	-	-	-
Oils and fats		2	2	2	-	-	2	2
Oleic acid		2	2	2	-	0	2	2
Oleum		0	0	0	-	-	-	-
Oxalic acid		2	2	-	2	2	2	2
Oxygen		-	-	-	2	2	-	-
Ozone		2	2	2	2	2	1	1
Palmitic acid	100%	2	2	2	-	-	2	2
Peracetic acid	40%	2	0	0	-	-	-	-
Perchloric acid	10%	2	-	-	2	2	2	2
Perchloric acid	70%	2	0	0	2	2	2	2
Phenol		2	-	-	0	0	-	-
Phenylhydrazine		0	0	0	-	-	-	-
Phenylhydrazine hydrochloride		2	0	0	2	-	-	-
Phosgene (gas)	100%	2	-	-	2	2	-	-
Phosgene (liquid)		0	0	0	-	-	-	-

CHEMICAL RESISTANCE TABLES

2005

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Phosphoric acid	0-25%	2	2	2	2	2	2	2
Phosphoric acid	25-50%	2	2	2	2	2	2	2
Phosphoric acid	50-85%	2	2	2	2	-	2	2
Phosphorus		-	-	-	-	-	-	-
Phosphorus pentoxide		2	-	-	2	2	2	2
Phosphorus trichloride		0	0	0	-	-	-	-
Photographic baths		2	2	2	2	2	2	2
Picric acid	1%	0	0	0	2	-	2	2
Potassium bicarbonate		2	2	2	2	2	2	2
Potassium bichromate		2	2	2	2	-	2	-
Potassium borate		2	2	2	2	2	2	2
Potassium bromate		2	2	2	2	2	2	2
Potassium bromide		2	2	2	2	2	2	2
Potassium carbonate		2	2	2	2	-	2	2
Potassium chlorate		2	2	2	2	2	2	2
Potassium chloride		2	2	2	2	-	2	2
Potassium chromate		2	2	2	2	-	2	-
Potassium cyanide		2	2	2	2	-	2	2
Potassium dichromate		2	2	2	-	-	2	-
Potassium ferrocyanide		2	2	2	2	2	2	2
Potassium ferrocyanide		2	2	2	2	2	2	2
Potassium fluoride		2	2	2	2	-	2	-
Potassium hydroxide		2	2	2	-	-	-	-
Potassium nitrate		2	2	2	2	2	2	2
Potassium perborate		2	2	2	-	-	-	-
Potassium permanganate	10%	2	2	2	2	2	2	2
Potassium persulphate		2	2	2	2	2	2	2
Potassium sulphate		2	2	2	2	2	2	2
Primary butanol		2	-	-	2	2	2	2
Propane		-	-	-	1	1	-	-
Propargyl alcohol		2	2	2	2	2	-	-
Propyl alcohol		2	2	2	2	2	2	2
Propylene dichloride		0	0	0	-	-	-	-
Raw ethyl acetate		0	0	0	1	1	0	-
Raw petrol		2	2	2	0	-	2	2
Rayon coagulating bath		2	2	2	-	-	-	-
Refined petrol		2	-	-	0	-	2	2
Saline		2	2	2	2	2	2	2
Secondary butanol		2	0	0	2	2	2	2
Selenic acid		2	-	-	-	-	-	-
Silicic acid		2	2	-	2	2	2	2
Silver cyanide		2	2	2	2	-	2	2
Silver nitrate		2	2	2	2	2	2	2
Silvering solutions		2	2	2	-	-	-	-
Soaps		2	2	2	2	2	-	-
Sodium acetate		2	2	2	-	-	1	1
Sodium acid phosphate		2	2	2	2	2	2	2
Sodium Arsenite		2	2	2	-	-	2	2
Sodium benzoate		2	2	2	2	2	2	2
Sodium bicarbonate	36%	2	2	2	2	2	2	2
Sodium bisulphate		2	2	2	-	-	-	-

CHEMICAL RESISTANCE TABLES

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Sodium bisulphite		2	2	2	2	2	2	2
Sodium bromide		2	2	2	-	-	2	2
Sodium carbonate (soda ashes)		2	2	2	2	2	2	2
Sodium chlorate		2	2	2	2	2	2	2
Sodium chloride		2	2	2	2	2	2	2
Sodium chlorite		2	2	2	2	-	2	2
Sodium cyanide		2	2	2	2	-	2	2
Sodium dichromate		2	2	2	-	-	2	-
Sodium ferrocyanide		2	2	2	2	2	2	2
Sodium ferrocyanide		2	2	2	2	2	2	2
Sodium fluoride		2	2	2	2	-	2	-
Sodium hydroxide		2	2	2	2	2	-	0
Sodium nitrate		2	2	2	2	2	2	2
Sodium nitrite		2	2	2	2	2	2	-
Sodium silicate		2	2	2	2	2	2	2
Sodium sulphate		2	2	2	2	2	2	2
Sodium sulphide		2	2	2	2	2	0	0
Sodium sulphite		2	2	2	-	-	2	2
Sodium thisulphate (or hypo-)		2	2	2	2	2	2	2
Soft raw oil		2	2	2	-	-	-	-
Stannic chloride		2	2	2	2	2	2	2
Stannous chloride		2	2	2	2	2	2	2
Stearic acid		2	2	2	2	2	2	2
Stoddard solvent		2	2	2	-	-	-	-
Sulphur		2	2	2	2	2	2	2
Sulphuretted hydrogen (dry)		-	-	-	2	2	-	-
Sulphuretted hydrogen in aqueous solution		2	2	2	2	2	1	0
Sulphuric acid	0-40%	2	2	2	2	2	2	2
Sulphuric acid	40-80%	2	2	0	2	-	2	2
Sulphuric acid	80-90%	2	0	0	0	0	2	2
Sulphuric acid	95%	2	0	0	0	0	-	0
Sulphuric anhydride		2	0	0	-	-	0	-
Sulphurous acid		2	0	0	-	-	2	2
Tannic acid		2	2	2	-	-	2	2
Tartaric acid		2	2	2	2	-	2	2
Tertiary hexanol		2	2	2	2	-	-	-
Tetraethyl lead		2	2	2	-	-	-	-
Tetrahydrofurane		0	0	0	-	-	-	-
Thionyl chloride		0	0	0	-	-	-	-
Titanium tetrachloride		2	0	0	0	0	-	-
Toluol or toluene		0	0	0	-	-	-	-
Town gas		-	-	-	1	-	-	-
Tributyl phosphate		0	0	0	-	-	-	-
Trichlorethylene		0	0	0	2	-	2	-
Tricresylphosphate		0	0	0	-	-	-	0
Triethanolamine		0	0	0	-	-	-	-
Triethylamine		2	2	-	-	-	2	2
Trimethylolpropane	10%	2	2	2	2	2	2	2
Trisodic phosphate		2	2	2	-	-	2	2
Turpentine essence		2	2	2	1	-	-	-

CHEMICAL RESISTANCE TABLES

2005

REACTIVE		CPVC - HTA			EPDM		"Viton" FPM	
		20°C	60°C	80°C	20°C	60°C	20°C	60°C
Urea	30%	2	2	0	2	2	2	2
Urine		2	2	2	2	2	2	2
Vinegar		2	2	2	2	2	-	-
Vinyl acetate		0	0	0	-	-	-	-
Wet carbon dioxide		-	-	-	2	2	-	-
Wet sulphurous gas		-	-	-	2	-	-	-
Whisky		2	2	2	2	-	2	2
Wines		2	2	2	2	-	2	2
Xylene or Xylol		0	0	0	-	-	-	-
Zinc chloride		2	2	2	2	2	2	2
Zinc chromate		2	2	2	2	-	2	-
Zinc cyanideinc		2	2	2	2	-	2	2
Zinc nitrate		2	2	2	2	2	2	2
Zinc sulphate		2	2	2	2	2	2	2

COMPATIBLE ANTIFREEZE LIQUIDSAVANTAGES

As a rule, to operate a double pipe reversible conditioning system (8°C - 50°C), it is not necessary to use an antifreeze agent, for it results in overdimensioning some parts of the equipment.

If it is necessary to use an antifreeze agent or a corrosion inhibitor or a germ inhibitor, it is advisable to check with the manufacturer or Girpi's technical services that those products are compatible with HTA®.

COMPATIBLE ANTIFREEZE	
BRAND	REFERENCE
DEHON-SOTRAGAL	NEUTRAGEL (M.E.G.)
ALPHACAN	HELIOGEL C580 RETIFLUIDE
BRITISH PETROLEUM	BP ANTIGEL
FINA	FINA ANTIGEL SE FINA ANTIGEL CC
TOTAL	INIGEL
DOWCHEMICAL	DOWCAL 10

Monopropyleneglycol (M.P.G.) is not compatible with CPVC material.

For cold or chilled fluids GIRPI'S, KRYOCLIM® system is perfectly adapted.

• Fan coil units may contain remnants of machining oils (coming from coils, inside the cooling units). These oils are not compatible with CPVC and may cause disorders in the system.
It is your responsibility to check with your supplier the perfect cleanliness of the coils before implementation.

• Products containing :

- Esthers,
- Ethoxyles,
- Amines,

are not compatible with CPVC.

• Anticorrosion fluids based upon Silicium and Phosphates destroy EPDM (gaskets, expansion joints, compensators) and must therefore be rejected.
Always enquire as to rubber components chemical compatibility with anticorrosion fluids.

• If you wish to use CPVC for commercial cleaning units (i.e. to couvey detergents), please check chemical compatibility first.

• If there are any doubts about HTA chemical compatibility with some fluids, refer to GIRPI's technical services.
It is the user's responsability to check the chemical nature of the products in use with their supplier.

NOTES

2005

NOTES

TECHNICAL SPECIFICATION AND IMPLEMENTATION

Material technical specification:

The pipes and fittings must be approved by C.S.T.B. (ATEC) and/or guaranteed in writing by the manufacturer. They will comply with applicable standards. The products must come from an ISO 9001 certified company.

The pipes, fittings and valves must be from the GIRPI HTA® system or equivalent.

Fire resistance rating: Bs1d0 (report n°80.16707 by C.S.T.B.).
Potable water quality/foodstuff quality (report n°909/JN), certified (A.C.S.).
When needed, the manufacturer must be able to provide professional training courses on their premises.

Working conditions:

Domestic hot and cold water, and central heating with temperatures and pressures as follows:

- cold water: 20°C / 16 or 25 bar.
- hot water: 60°C / 6 bar.
- central heating: 80°C / 4 bar.
- reversible air conditioning (7 to 55°C)/4bar.

Assembly of CPVC pipes and fittings:

Please refer to ATEC French, guidelines 60.31 et 60.33, local guidelines, and to the manufacturer's current technical documentation.

The pipes shall be exclusively jointed by chemical cold welding:

- cut pipe with plastic pipe cutters
- trim and chamfer with chamfering tool
- scour with D 171 Plus cleaner, using a clean brush, if needed (otherwise wipe with a clean cloth)
- bond with welding polymer using an adapted brush.

Implementation, expansion, contraction:

- Alpha coefficient = 0.065 mm/m/°C.

Linear variations between fixed points shall be absorbed by:

- changes in direction,
- expansion loops made from pipes and fittings,
- flexible expansion joints,
- Dilaplast bellows (linear expansion compensators).

Pressure tests:

- In compliance with French guideline n° 60.1. or with the manufacturer's technical documentation.

MORE Services from GIRPI

Yours problem is ours. Training centre, analysis of your needs, specification work, adaptation and development of specific fabricated products are daily services offered to facilitate sales and installation of our products.

- NETWORK DESIGN

Our technical assistance and design service can help optimize network drawings.

- ✓ Drawing with reference of all the fittings
- ✓ List of the necessary fittings
- ✓ Supporting calculation...

❷ - TRAINING CENTRE

Our training centre (officially recognized for vocational training) gives installers and decision-markers modular training courses about intallation techniques.

❸ - CUSTOM-MADE ITEMS

Our fabrication workshop can manufacture your special items as per your requirements and can also prefabricate pipework section.
Please consult us for prices and deliveries.

TRAINING

YOU ARE INTERESTED IN OUR

HTA® SYSTEM

BRAVO, BUT...
HOW CAN YOU IMPLEMENT
THEM WITH SUCCESS ?

SAVE TIME WITH OUR

INSTALLATION SCHOOL HTA®

Detailed program on request

NO GREAT THEORIES
BUT ESSENTIAL PRACTICAL WORK

GIRPI

safety for your pipeworks

Head Office :
GIRPI
B.P. 36 - Rue Robert Ancel
76700 Harfleur - France
Tél : 33 (0)2 32 79 60 00
Fax : 33 (0)2 32 79 60 28
www.girpi.com - e-mail : export.girpi@aliaxis.com

Stockist

Réf. HDTECA - RCS Le Havre B 719 803 249 01/06 - 2 500 exemplaires