



DET NORSKE VERITAS

QUALITY SYSTEM CERTIFICATE

Certificate No. **CERT-00192-94-AQ-MIL-SINCERT**

Si attesta che / This is to certify that

IL SISTEMA QUALITA' DI / THE QUALITY SYSTEM OF

VALSIR S.p.A.

Località Merlaro, 2 - 25078 Vestone (BS) – Italy

Località Piani di Mura – 25070 Casto (BS) – Italy

Via Comunale, 125 - Frazione Carpeneda – 25079 Vobarno (BS) – Italy

*E' CONFORME AI REQUISITI DELLA NORMATIVA
HAS BEEN FOUND TO CONFORM TO THE QUALITY SYSTEM STANDARD*

UNI EN ISO 9001: 2000 (ISO 9001: 2000)

*Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following product or service ranges:*

**Progettazione e produzione di cassette di risciacquamento per incasso ed esterne.
Produzione di tubi e raccordi per scarico in polipropilene copolimero e omopolimero
autoestinguente. Produzione di tubi e raccordi in polietilene ad alta densità per scarico.
Produzione di tubi e raccordi fonoassorbenti per scarico. Produzione di tubo e raccordi
multistrato per impianti sanitari e di riscaldamento. Commercializzazione di sifoni ed
accessori**

Design and production of in-wall and external flush cisterns. Production of copolymer and homopolymer self-extinguishing polypropylene pipes and fittings for waste systems. Production of high-density-polyethylene pipes and fittings for waste systems. Production of acoustically insulated pipes and fittings for waste systems. Production of multi-layer pipes and fittings for sanitary and heating systems. Trade of traps and accessories

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Place and date*

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Det Norske Veritas Italia S.r.l.

Lead Auditor: VALENTINA SALVI

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SINCERT

Registrazione N. 003A

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*La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
The validity of this certificate is subjected to periodical audits (every 6, 9 or 12 month) and complete re-assessment of the system every three years*

The aim of this technical handbook is to pass on all vital information necessary in laying waste systems in high density polyethylene for carrying household, industrial and commercial waste.

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POLYETHYLENE

History

Polyethylene was first obtained in the ICI laboratories in England by E.W. Fawcett and R.O.G. Gibson, who discovered traces of polyethylene in the form of white powder obtained by polymerising ethylene at extremely high temperatures and pressures. In 1933 ICI was granted a patent and industrial production of low-density polyethylene commenced in 1938. This material was initially used in the manufacture of household articles.

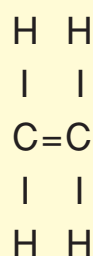
In the mid Fifties, two new patents for obtaining polyethylene were registered by Professor Ziegler and the Phillips Petroleum Company: a new industrial process allowed the realisation of a polyethylene with the same chemical composition but with a higher density through the use of catalysts and by working at low temperatures and pressures.

Over the years, other methods were introduced and the material was improved thanks to ongoing research, experimentation and changing technical and commercial requirements. The result today is a highly reliable, long-lasting and versatile material which is used in the manufacture of a wide range of applications, such as fuel tanks, electric wire sheathing, gas pipelines, drainage and sewer systems, bottles, food containers, stretch film and packaging.

What is polyethylene ?

Polyethylene is a thermoplastic resin obtained through the polymerisation of ethylene (C_2H_4), an unsaturated hydrocarbon normally occurring, under normal conditions, as a gas.

Structure of an ethylene molecule



C = Carbon H = Hydrogen

The polymerisation process consists of linking ethylene molecules in long chains to give solid compounds which are base resins called polymers.

The molecules forming polymers can be more or less ramified, close together or far apart, and long or short.

These features determine the properties of polyethylene.

The main characteristics are therefore:

- density (which depends on the distance between the molecules)
- molecular weight (which depends on the length of the molecules)
- molecular weight distribution (which depends on the distance between and the length of the molecules).

Polyethylene is usually divided into two types:

- low-density polyethylene (920 - 930 kg/m³)
- high-density polyethylene (945 - 965 kg/m³)

There is also a medium-density polyethylene which lies between the above.

Low-density polyethylene is characterised by a highly ramified structure, whereas high-density polyethylene is more linear.

Additives are added to the base resins which further define the final characteristics of the material and make it suitable for the various applications and uses in the manufacturing process.

Properties

High-density polyethylene (945 - 965 kg/m³) which is characterised by a very crystalline structure (slightly ramified molecules very close together) is also used for producing waste pipes and fittings.

Building Regulations allow use in private and industrial buildings for non-pressure waste at temperatures as high as 95°C from:

- sanitary appliances;
- washing machines and dish-washers;
- large-scale kitchens and industrial plants;
- and for aggressive fluids from chemical laboratories and technological processes (see table

enclosed for compatibility with chemical agents).

Compared to metal piping it is easier to connect, more flexible and more resistant to corrosion.

The reasons for the rapid spread of this material in so many different applications are apparent on examination of the material's properties:

- high mechanical resistance;
- flexibility;
- shock resistance (even at low temperatures);
- resistance to corrosion;
- easy to install;
- high versatility;
- high resistance to chemical agents.

Compared to other plastics it offers a wider working temperature (-40°C to +95°C), greater flexibility, and improved mechanical and shock resistance.

HDPE is not self-extinguishing which means that fire stop sleeves must be installed at each subdivision.

Polyethylene has a low thermal conductivity [40 - 60 W/m K (0.35 - 0.50 Kcal/h m °C)] and a linear expansion coefficient of $\lambda = 2 \times 10$

Fluid concentration classifications used in the chemical resistance charts are:

Sat.Sol. = Saturated water solution prepared at 20°C.

Sol. = Diluted water solution, concentration over 10%, unsaturated

Dil.Sol. = Diluted water solution, concentration less than 10%, unsaturated

W.Conc. = Working concentration, i.e. normal concentration for industrial use.

TABLE OF FLUIDS WHICH CAN BE CONVEYED THROUGH HDPE PIPES & FITTINGS, NO INTERNAL PRESSURE, TEMPERATURE UP TO 60°C AND NO MECHANICAL STRESS.

INORGANIC COMPOUNDS	CONCENTRATION
Acetic Acid	10%
Adipic Acid	Sat. Sol.
Allyl alcohol	96%
Alum	Sol.
Aluminium Chloride	Sol.
Aluminium Fluoride	Sat. Sol.
Aluminium Sulphate	Sat. Sol.
Ammonia (gas)	100%
Ammonia (liquid)	100%
Ammonia (solution)	Dil. Sol.
Ammonium Chloride	Dil. Sol.
Ammonium Fluoride	Sol.
Ammonium Nitrate	Sat. Sol.
Ammonium Sulphate	Sat. Sol.
Ammonium Sulphide	Sol.
Antimonous (III) Chloride	90%
Arsenic Acid	Sat. Sol.

INORGANIC COMPOUNDS	CONCENTRATION
Barium Carbonate	Sat.Sol.
Barium Chloride	Sat.Sol.
Barium Hydroxide	Sat.Sol.
Barium Sulphate	Sat.Sol.
Benzoic Acid	Sat.Sol.
Beer	
Borax	Sat.Sol.
Boric Acid	Sat.Sol.
Butane (gas)	100%
Butanol	100%
Calcium Carbonate	Sat.Sol.
Calcium Chlorate	Sat.Sol.
Calcium Chloride	Sat.Sol.
Calcium Hydroxide	Sat.Sol.
Calcium Hypochlorite	Sol.
Calcium Nitrate	Sat.Sol.
Calcium Sulphate	Sat.Sol.

TABLE OF FLUIDS WHICH CAN BE CONVEYED THROUGH HDPE PIPES & FITTINGS, NO INTERNAL PRESSURE, TEMPERATURE UP TO 60°C AND NO MECHANICAL STRESS.

INORGANIC COMPOUNDS	CONCENTRATION
---------------------	---------------

Carbon Dioxide (dry)	100%
Carbon Monoxide	100%
Chloroacetic Acid (mono)	Sol.
Citric Acid	Sat.Sol.
Copper (II) Chloride	Sat.Sol.
Copper (II) Nitrate	Sat.Sol.
Copper (II) Sulphate	Sat.Sol.
Cyclohexanol	100%
Dextrin	Sol.
Dioxane	100%
Fluosilicic Acid	40%
Formaldehyde	40%
Formic Acid	50%
Formic Acid	98 to 100%
Glucose	Sat.Sol.
Glycerine	100%
Glycol	100%
Glycolic Acid	Sol.
Hydrobromic Acid	50%
Hydrobromic Acid	100%
Hydrochloric Acid	10%
Hydrochloric Acid	Conc.
Hydrocyanic Acid	10%
Hydrofluoric Acid	4%
Hydroquinone	Sat.Sol.
Hydrogen	100%
Hydrogen Peroxide	30%
Hydrogen Sulphide	100%
Iron (II) Chloride	Sat.Sol.
Iron (III) Chloride	Sat.Sol.
Iron (III) Nitrate	Sol.
Iron (II) Sulphate	Sat.Sol.
Lactic Acid	100%
Magnesium Carbonate	Sat.Sol.
Magnesium Chloride	Sat.Sol.
Magnesium Hydroxide	Sat.Sol.
Magnesium Nitrate	Sat.Sol.
Maleic Acid	Sat.Sol.
Milk	
Molasses	W.Conc.
Mercury	100%
Mercury (II) Cyanide	Sat.Sol.
Mercury (II) Chloride	Sat.Sol.
Mercury (I) Nitrate	Sol.
Methanol (See Methyl Alcohol)	
Methyl Alcohol	100%

INORGANIC COMPOUNDS	CONCENTRATION
---------------------	---------------

Nickel Chloride	Sat.Sol.
Nickel Nitrate	Sat.Sol.
Nickel Sulphate	Sat.Sol.
Nitric Acid	25%
Oxalic Acid	Sat.Sol.
Phenol	Sol.
Phosphoric Acid (ortho)	50%
Photographic Developers	Work Conc.
Potassium Bicarbonate	Sat.Sol.
Potassium Bichromate	Sat.Sol.
Potassium Bisulphate	Sat.Sol.
Potassium Bisulphite	Sol.
Potassium Bromate	Sat.Sol.
Potassium Bromide	Sat.Sol.
Potassium Carbonate	Sat.Sol.
Potassium Cyanide	Sol.
Potassium Chlorate	Sat.Sol.
Potassium Chromate	Sat.Sol.
Potassium Ferricyanide	Sat.Sol.
Potassium Ferrocyanide	Sat.Sol.
Potassium Fluoride	Sat.Sol.
Potassium Phosphate (ortho)	Sat.Sol.
Potassium Hydroxide	10%
Potassium Hydroxide	Sol.
Potassium Nitrate	Sat.Sol.
Potassium Perchlorate	Sat.Sol.
Potassium Permanganate	20%
Potassium Persulphate	Sat.Sol.
Potassium Sulphate	Sat.Sol.
Potassium Sulphide	Sol.
Propionic Acid	50%
Salicylic Acid	Sat.Sol.
Silver Acetate	Sat.Sol.
Silver Cyanide	Sat.Sol.
Silver Nitrite	Sat.Sol.
Sodium Benzoate	Sat.Sol.
Sodium Bicarbonate	Sat.Sol.
Sodium Bisulphite	Sol.
Sodium Bromide	Sat.Sol.
Sodium Carbonate	Sat.Sol.
Sodium Chlorate	Sat.Sol.
Sodium Cyanide	Sat.Sol.
Sodium Ferricyanide	Sat.Sol.
Sodium Ferrocyanide	Sat.Sol.
Sodium Fluoride	Sat.Sol.
Sodium Phosphate (ortho)	Sat.Sol.
Sodium Hydroxide	40%

TABLE OF FLUIDS WHICH CAN BE CONVEYED THROUGH HDPE PIPES & FITTINGS, NO INTERNAL PRESSURE, TEMPERATURE UP TO 60°C AND NO MECHANICAL STRESS.

INORGANIC COMPOUNDS	CONCENTRATION
Sodium Hydroxide	Sol.
Sodium Hypochlorite	15% chlorine
Sodium Nitrate	Sat.Sol.
Sodium Nitrite	Sat.Sol.
Sodium Sulphate	Sat.Sol.
Sodium Sulphide	Sat.Sol.
Sulphur Dioxide (dry)	100%
Sulphuric Acid	10%
Sulphuric Acid	50%
Sulphurous Acid	30%
Tannic Acid	Sol.
Tartaric Acid	Sol.

INORGANIC COMPOUNDS	CONCENTRATION
Tin Chloride (II)	Sat.Sol.
Tin Chloride (III)	Sat.Sol.
Urea	Sol.
Urine	
Vinegar	
Water	
Wine & Spirits	
Yeast	Sol.
Zinc Carbonate	Sat.Sol.
Zinc Chloride	Sat.Sol.
Zinc Oxide	Sat.Sol.
Zinc Sulphate	Sat.Sol.

TABLE OF FLUIDS WHICH CAN BE CONVEYED THROUGH HDPE WASTE PIPE & FITTINGS, NO INTERNAL PRESSURE, TEMPERATURE UP TO 20°C AND NO MECHANICAL STRESS

INORGANIC COMPOUNDS	CONCENTRATION
Acetaldehyde	100%
Acetic Dioxide	100%
Amylacetate (1-pentanol acetate)	100%
Amyl Alcohol (1-pentanol)	100%
Aniline	100%
Benzaldehyde	100%
Benzene (Aliphatic Hydrocarbons)	
Butyric Acid	100%
Cyclohexane	100%
Chromic Acid	20%
Chromic Acid	50%
Decaline	100%
Diethyl-phthalate	100%
Ethanol (see ethylic alcohol)	
Ethylic Alcohol (ethanol)	40%
Ethyl Acetate	100%
Furfuryl Alcohol	100%
Glacial Acetic Acid	>96%

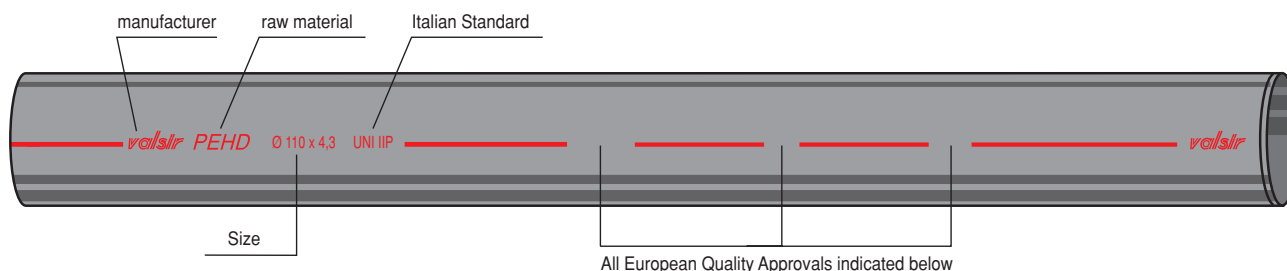
INORGANIC COMPOUNDS	CONCENTRATION
Heptane	100%
Hydrogen Peroxide	90%
Hydrofluoric Acid	60%
Lead Acetate	Sat.Sol.
Mineral Oils	
Nicotinic Acid	Dil.Sol.
Oils and Fats	
Oleic Acid	100%
Oxygen	100%
Phosphoric Acid (Ortho)	95%
Phosphorus Trichloride	100%
Picric Acid	Sat.Sol.
Potassium Hypochlorite	Sol.
Propionic Acid	100%
Pyridine	100%
Sulphuric Acid	98%
Triethanolamine	Sol.

TABLE OF FLUIDS UNSUITABLE FOR CONVEYANCE IN HDPE WASTE PIPES OR FITTINGS

INORGANIC COMPOUNDS	CONCENTRATION
Aqua Regia	HCl / HNO ₃ = 3/1
Bromium (liquid)	100%
Bromium (dry steam)	100%
Carbon Sulphite	100%
Carbon Tetrachloride	100%
Chlorine (gas) Dry	100%
Chlorine Water	Sat.Sol.
Chloroform	100%
Cresylic Acid (methyl-benzoic)	Sat.Sol.
Fluorine	100%
Fuming Sulphuric Acid (oleum)	

INORGANIC COMPOUNDS	CONCENTRATION
Methylene Chloride	100%
Nitric Acid	50%
Nitric Acid	75%
Nitric Acid	100%
Ozone	
Sulphur Dioxide	100%
Thionyl Chloride	100%
Toluene	100%
Trichloroethylene	100%
Xylene	100%

2 PRODUCT CHARACTERISTICS



Material

The pipes and fittings are produced with high density polyethylene, the characteristics of which are in compliance with the European Standards currently in force.

Colour

The polyethylene pipes and fittings are black in colour, as recommended by the Standards.

Marking

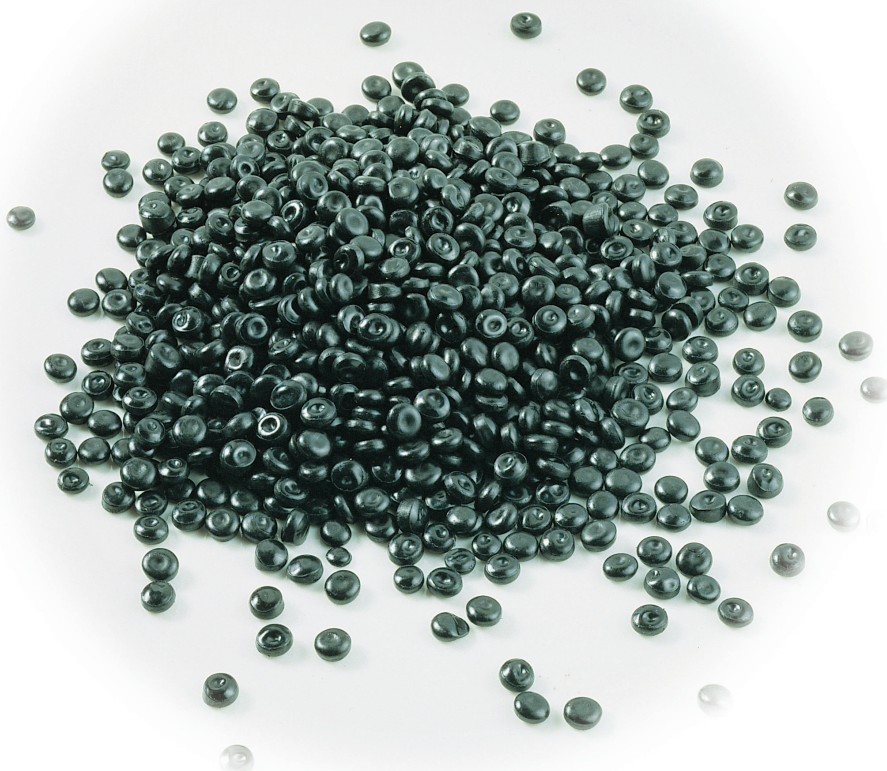
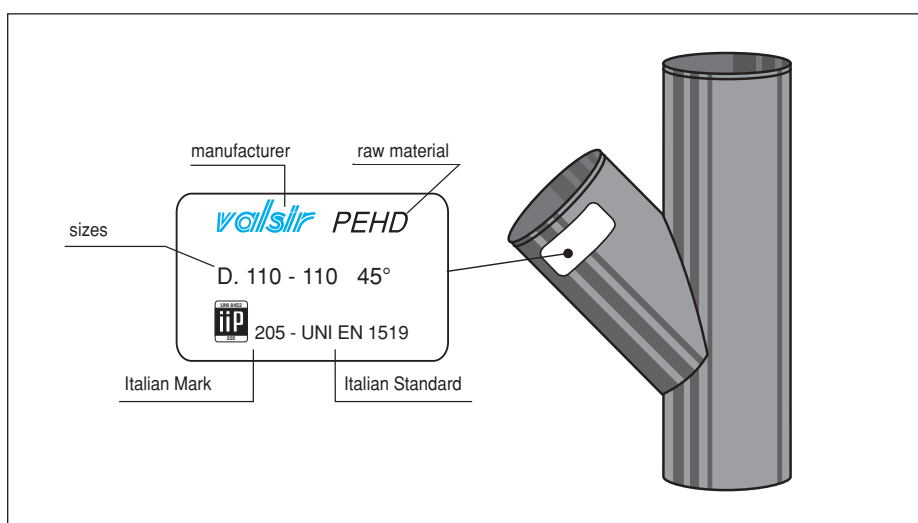
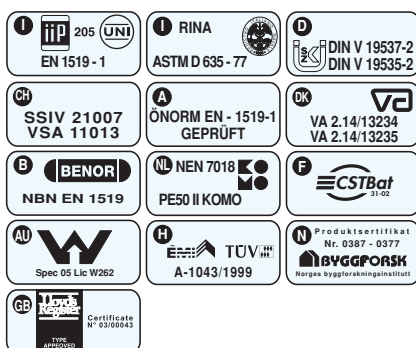
As in compliance with the Italian Standard currently in force, VALSIR pipes carry the following indications:

- Material (HDPE)
- Application Type
- Outside Diameter and Wall Thickness
- Series
- Trade-mark
- Pipe series

The nominal diameter (DN) is also indicated as are the Quality Approvals attained for each country.

Quality Standards

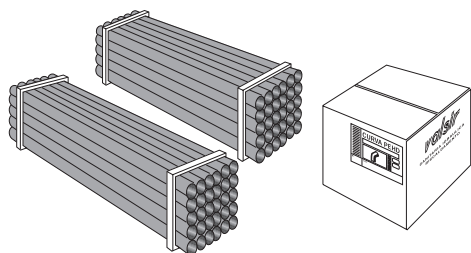
The Standards dealing with the production of pipes and fittings in high-density polyethylene are the following:



Sizes

The diameters, wall thicknesses and relative tolerances of the pipes are indicated in the table.

The values are in compliance with the Standards currently in force.



Outside Diameter D	Average Outside Diameter D		Thickness t
	min.	max.	
32	32,0	32,3	3,0 $+0,5_0$
40	40,0	40,4	3,0 $+0,5_0$
50	50,0	50,5	3,0 $+0,5_0$
56	56,0	56,5	3,0 $+0,5_0$
63	63,0	63,6	3,0 $+0,5_0$
75	75,0	75,7	3,0 $+0,5_0$
90	90,0	90,9	3,5 $+0,6_0$
110	110,0	111,0	4,3 $+0,7_0$
125	125,0	126,2	4,9 $+0,7_0$
160	160,0	161,5	6,2 $+0,9_0$
200	200,0	201,8	6,2 $+0,9_0$
250	250,0	252,3	7,8 $+1,0_0$
315	315,0	317,9	9,8 $+1,2_0$

Packaging

To facilitate and ensure correct transportation and storage, packaging is arranged as follows:

Pipes: in light reinforced brackets

Fittings: in cardboard boxes.



CODE	DESCRIPTION	QUANTITY	LENGTH	WIDTH	HEIGHT	PACKAGING
300001	Tubo PEHD D.32 l.5000	50	5000	370	220	telaio
300003	Tubo PEHD D.40 l.5000	50	5000	445	260	telaio
300005	Tubo PEHD D.50 l.5000	50	5000	545	310	telaio
300006	Tubo PEHD D.56 l.5000	40	5000	495	345	telaio
300007	Tubo PEHD D.63 l.5000	35	5000	495	375	telaio
300009	Tubo PEHD D.75 l.5000	30	5000	495	435	telaio
300011	Tubo PEHD D.90 l.5000	20	5000	495	425	telaio
300013	Tubo PEHD D.110 l.5000	15	5000	600	395	telaio
300015	Tubo PEHD D.125 l.5000	10	5000	680	315	telaio
300017	Tubo PEHD D.160 l.5000	1	5000	160	160	telaio
300019	Tubo PEHD D.200 l.5000	1	5000	200	200	telaio
300021	Tubo PEHD D.250 l.5000	1	5000	250	250	telaio
300023	Tubo PEHD D.315 l.5000	1	5000	315	315	telaio
301000	Tubo PEHD D.32 l.3000	50	3000	370	220	telaio
301001	Tubo PEHD D.40 l.3000	50	3000	445	260	telaio
301003	Tubo PEHD D.50 l.3000	50	3000	545	310	telaio
301004	Tubo PEHD D.56 l.3000	40	3000	495	345	telaio
301005	Tubo PEHD D.63 l.3000	35	3000	495	375	telaio
301007	Tubo PEHD D.75 l.3000	30	3000	495	435	telaio
301009	Tubo PEHD D.90 l.3000	20	3000	495	425	telaio
301011	Tubo PEHD D.110 l.3000	15	3000	600	395	telaio
301013	Tubo PEHD D.125 l.3000	10	3000	680	315	telaio
301015	Tubo PEHD D.160 l.3000	1	3000	160	160	telaio

3 APPLICATION

Valsir's Polyethylene pipes and fittings can be used in the field of soil, waste and rainwater discharge inside domestic and industrial buildings.

The existing Standards specify the purposes of polyethylene pipes:

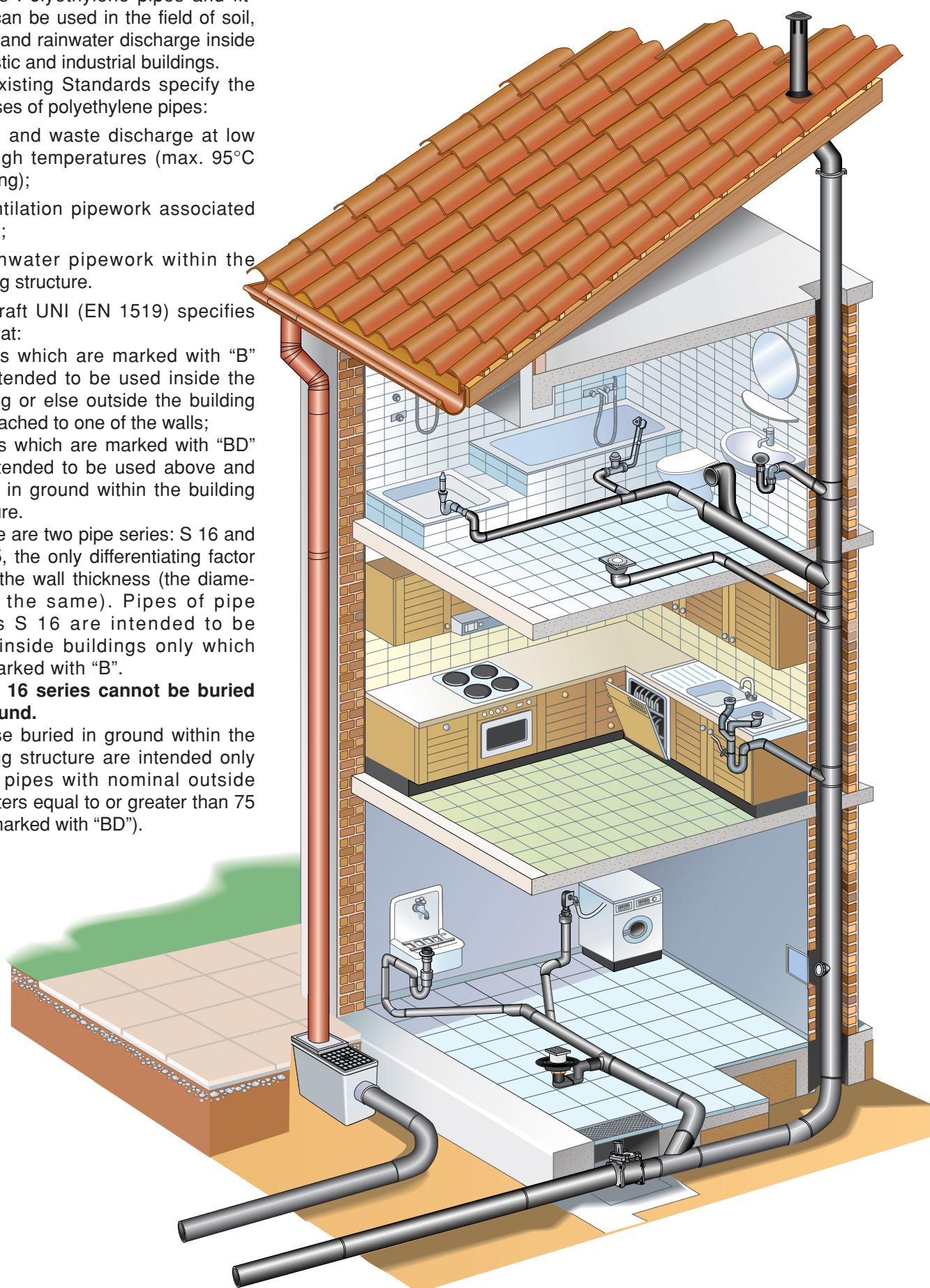
- a) soil and waste discharge at low and high temperatures (max. 95°C on-going);
- b) ventilation pipework associated with a);
- c) rainwater pipework within the building structure.

The draft UNI (EN 1519) specifies also that:

- Pipes which are marked with "B" are intended to be used inside the building or else outside the building but attached to one of the walls;
- Pipes which are marked with "BD" are intended to be used above and buried in ground within the building structure.
- There are two pipe series: S 16 and S 12,5, the only differentiating factor being the wall thickness (the diameter is the same). Pipes of pipe series S 16 are intended to be used inside buildings only which are marked with "B".

The S 16 series cannot be buried in ground.

For use buried in ground within the building structure are intended only those pipes with nominal outside diameters equal to or greater than 75 mm (marked with "BD").



4 PIPEWORK SIZING

The predominant factor to be considered in the design of a waste system is the discharge unit (DU). Other factors of equal importance, such as ventilation, thermal movement and pipe support will be dealt with later.

Function

The capacity of the sanitary system should be large enough to carry the expected flow at any point. Waste water must be conveyed through the pipes by gravity drainage and must not occupy the entire section of the pipe or fitting as this causes pressure fluctuations within the system.

Sizing

The Discharge Unit Method provides a system of determining the discharge stack and branch discharge pipe sizes required where a large number of appliances discharge into individual stacks. The discharge unit traditionally assumes a value of 0.25 l/s as a function of the flow rate of each sanitary appliance, the geometrical characteristics, its function and its contemporary use with other appliances. The values are indicated in two Standards DIN 1986/2 and SN 565010.

Branch Discharge Pipes

Branch discharge pipes connect the descending part of each sanitary appliance with the vertical stack. The appropriate sizes should be chosen from the following pipe sizing tables in order to avoid pressure fluctuations.

DISCHARGE UNIT VALUES AND FLOW RATES FOR COMMON APPLIANCES

Type of Appliance	DU	l/s
Basin	1	0.25
Sink	2	0.5
Bidet	2	0.5
Shower tray	2	0.5
Bath	4	1
Kitchen sink	4	1
Sink with garbage disintegrator	4	1
Dishwasher	4	1
Washing machine (as big as 6kg)	4	1
Sink with trough	4	1
Urinal	4	1
Floor waste outlet	4	1
Washing machine (6 to 12kg)	6	1.5
Industrial dishwasher	6	1.5
Wash sink	6	1.5
WC	10	2.5
Industrial washing machine (13 to 40 kg)	10	2.5
Floor trap (as large as dia.110)	10	2.5

DISCHARGE BRANCHES: SIZING OF BRANCHES BASED ON THE DISCHARGE UNIT VALUE DU OF EACH APPLIANCE

With primary ventilation		
Max. no. of DUs allowed per appliance	l/s	diameter in mm (branch)
1	0.25	40
2	0.5	40
2	0.5	50
4	1	63
6	1.5	75
6	1.5	90
10	2.5	110

With Parallel Ventilation (see page 14, figures 5 and 6)			
Max. no. of DUs allowed per appliance	l/s	diameter in mm (branch)	diameter in mm parallel ventilation
1	0.25	40	32
2	0.5	40	32
2	0.5	50	40
4	1	63	50
6	1.5	75	50
6	1.5	90	63
10	2.5	110	75

Vertical Stacks

The vertical stacks collect the discharged water from the branches and convey it to the collector pipelines. The unit values for all branch discharge pipes discharging into the stack should be added and appropriate discharge pipe size chosen; this size should remain the same all the way from the top to the base of the stack.

Q_p in l/s is the project flow rate which must be used in choosing the pipework:

a) for home and office:

$$Q_p = 0.5 \times \sqrt{Q_t}$$

b) for restaurants, hospitals, community centres:

$$Q_p = 0.7 \times \sqrt{Q_t}$$

c) for establishments and laboratories:

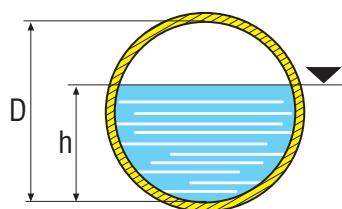
$$Q_p = 1.2 \times \sqrt{Q_t}$$

Where Q_t in l/s is the total volume to be discharged and results from adding the unit values for all branch discharge pipes discharging into the stack.

If the axis of the stack is moved at an angle greater than 45° in relation to the vertical stack, the parts which are at such an angle must be considered as horizontal collector pipelines and sized accordingly.

Collector pipelines for mixed and rainwater make up the horizontal parts of the system and are connected to the vertical stacks.

They should be sized according to the flow of water conveyed by the vertical stacks.



Example

Sizing of Vertical Stack in a 10 storey building, into which the following sanitary appliances are discharged.

SIZING OF STACKS

With Primary Ventilation (see pag.13, Fig.3)					
appliances such as WC, bidet, bath, sink					
Diameter in mm	Q_t in l/s	DU	Total	Total for floor	Q_p allowed in l/s (*)
63	3	4			1.3
75	7	4			3.0
90	20	6			3.0
110	70	10	14	6	4.2
125	100	10	20	7	5.0
160	400		80	22	10.0

* maximum 2 appliances with 4 DUs

With Parallel Ventilation (see pag.14, Fig.5 and 6)					
appliances such as WC, bidet, bath, sink					
Diameter in mm	Q_t in l/s	total	Total for floor	Q_p allowed in l/s	Parallel ventil. dia. in mm
90	64	-	-	4.2	63
110	150	30	6	5.9	75
125	200	40	7	7.0	90
160	800	160	20	14.0	110

With Secondary Ventilation (see pag.15, Fig.8)					
appliances such as WC, bidet, bath, sink					
Diameter in mm	Q_t in l/s	total	Total for floor	Q_p allowed in l/s	Parallel ventil. dia. in mm
90	100	-	-	5.4	63
110	240	50	8	7.6	75
125	300	75	10	9.0	90
160	1200	260	30	18.0	110

Sizing of Internal Collector pipelines for Rainwater and Mixed Water

Filling Coefficient (*) 0.7	Gradient in %				
	1.0	1.5	2.0	2.5	3.0
Diameter in mm	Flow rate Q_t in l/s				
63	0.9	1.2	1.4	1.6	1.7
75	1.7	2.0	2.4	2.6	2.9
90	2.5	3.0	3.5	4.0	4.3
110	4.5	5.4	6.3	7.1	7.8
125	6.5	7.9	9.3	10.3	11.3
160	13.4	16.1	18.7	21.0	23.0
200	23.8	29.2	33.7	37.7	41.4
250	43.2	53.0	61.2	68.5	75.0
315	79.8	97.8	113.0	126.5	138.6

* Relation h/D between level of filling and the internal diameter of pipe. (Drawing on the left)

Calculation of Q_t :

$$Q_t = 220 \times 0.25 \text{ l/s} = 55 \text{ l/s}$$

Being a civil house, the Q_p is calculated as follows:

$$Q_p = 0.5 \times \sqrt{55} = 3.71 \text{ l/s}$$

Supposing that there is primary ventilation and consulting the first table on page 11, a diameter of 110 mm is obtained.

Sanitary Appliances	DU per floor	Total DUs
N°1 WC	10	100
N°1 bidet	2	20
N°1 sink	2	20
N°1 bath	4	40
N°1 washing machine	4	40
Total	22	220

Ventilation

Discharge systems are ventilated in order to avoid pressure fluctuations within the pipes which would hinder the correct discharge. To appreciate how this can happen, take the model system in Fig.1 in which the soil stack, for simplicity, has been connected to the pans only.

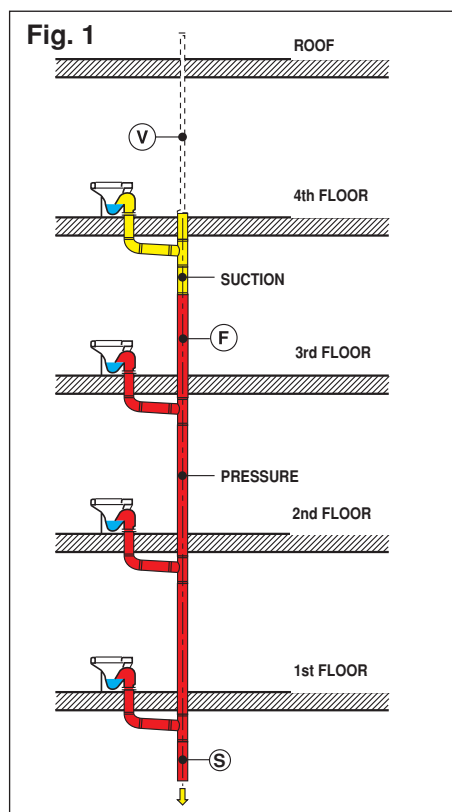


Fig. 1 Soil stack "S" without ventilation or with ventilating pipe of reduced diameter.

- Ⓥ Primary ventilating pipe (small diameter, or inexistant).
- ⓕ Discharged fluid

When the pan on the fourth floor is flushed, the water fills the underlying section and flows down the pipe. In doing so, it acts as a plunger and creates pressure underneath and suction above. If this plunger is in position F for example, pressure is created in the system and the water seals in the underlying traps are drawn and consequently foul air enters the building. As the plunger descends down the soil pipe and passes by each branch pipe, it produces a suction effect which tends to suck the water contained in each trap.

As in the previous case, although the cause is not same, the water seal is lost and the result is the admission of foul air.

These phenomena are also influenced by the height of the water seal in the trap. Obviously if a trap does not contain sufficient water, it will be more susceptible to the above problem.

The above phenomena are further influenced if the soil stack is not large enough to carry the flow, or if it ends at the connection with the highest sanitary appliance instead of terminating above the roof top.

The discharge conditions are also determined by the presence of traps at the base of the soil stack. If this is the case, the pressure effect in the traps of the appliances is greater than the pressure in a soil stack without a trap.

Furthermore, it must be remembered that the pipes discharge not only liquids but also organic materials in a semi-solid state.

It is difficult for these materials to follow the various loops in the trap and tend to leave deposits or sediment in the trap itself.

Traps should not be installed at the base of the soil stack. Connection to the horizontal piping must be carried out with the use of two 45° bends.

It is also a good idea to install a straight access pipe wherever there is a change of direction in the piping which allows for maintenance in case of blockage in the bend.

Another negative phenomenon is auto-suction. This occurs when the horizontal branch pipe of the appliances is too long. In this case the waste water which fills the section of the branching entirely, produces a suction pressure which also draws the water contained in the trap. The longer the branch and the smaller the diameter, the worse the phenomenon of auto-suction. This suction is also influenced by other factors, such as the form of the

section of the appliances. In order to prevent these phenomena it is therefore necessary to introduce systems which compensate the pressure below the water seals. The above is achieved by installing a correct network of ventilation piping. A waste system without ventilation or with a badly sized ventilation system can immediately be identified by the noise emissions during discharge of the sanitary appliances. When water is being discharged from an appliance and a sound similar to human snoring is created, this means the appliance is susceptible to autosuction. If the water creates a "snoring" sound, even when the appliance has not been discharged, this means that another appliance which is connected to it, is subject to autosuction. A trap which gurgles indicates pressure. When a system has been correctly ventilated, the discharge of each appliance will be completely silent. The above phenomena and the variation in the water level in the traps can be seen in Fig.2.

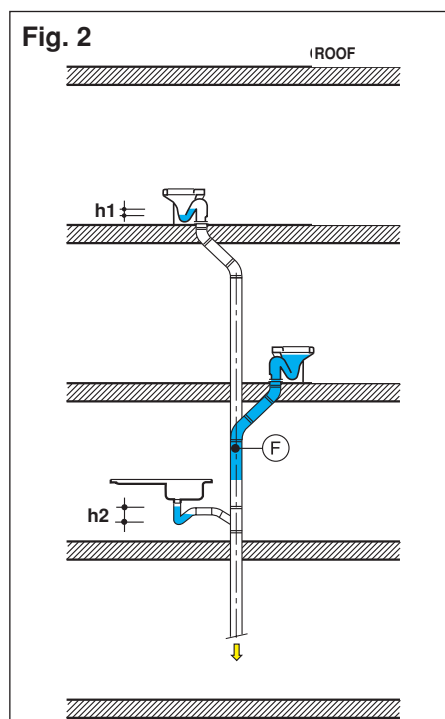


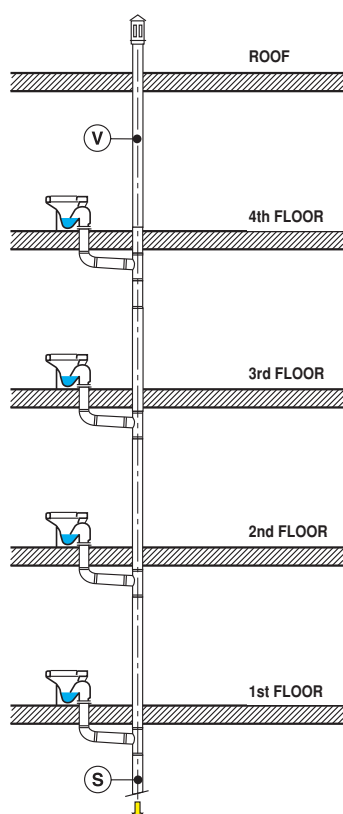
Fig. 2 Effects of suction/pressure: note the difference in water level

- ⓕ Fluid being discharged
- h1 suction
- h2 pressure

Primary Ventilation

Primary ventilation is fundamentally the extension of the soil stack which terminates on the roof top (fig.3).

Fig. 3



It is essential that the diameter of the pipe above the last sanitary appliance is the same as the diameter of the soil stack (usually 110 mm) (fig.4).

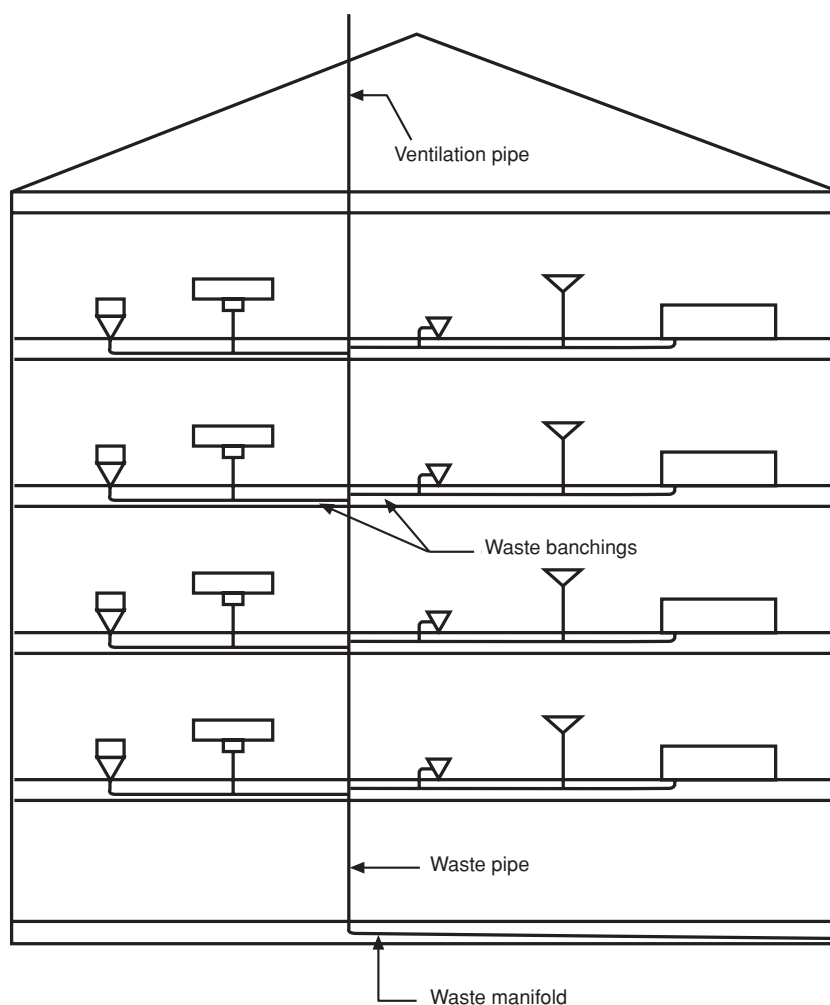
There are no particular indications regarding the pipe terminating on the roof, except for the fact that in winter it is necessary to make sure that it does not become covered with snow. This system is usually adopted in buildings of moderate height, however, it is not a true ventilation system (a more correct name for it is an exhalation system) in that, although it may have the capacity to reduce or even eliminate suction, it will not be able to eliminate pressure within the system.

Primary ventilation has the double purpose of controlling the pressure in the waste system and permitting an effective aeration to avoid the formation of mould.

This is achieved by ventilating the soil stack to the open air. If necessary, the soil stack can be united in one or more manifolds before passing to the outside. In this case, the section of the manifolds must be the same as or bigger than the sum of the sections of all the soil pipes which are connected up with the manifold.

A correctly sized waste system with primary ventilation generally excludes the possibility of the formation of pressure or hydrostatic suction inside the pipes.

Fig. 4 Plan of Primary Ventilation.



14

Fig. 3 Waste stack (S) with primary ventilation only or with exhalation in point V, in a correct installation, both pipings will have the same diameter..

valsir

Parallel Ventilation

Parallel ventilation consists of a vertical pipe which runs parallel to the soil stack (Figures 5 and 6).

The diameter of the second pipe is smaller than the soil stack's diameter (about 2/3 the size), however it can have the same diameter in certain circumstances. The lower end of the ventilating stack is inserted at the base of the soil stack, while the top of the ventilating stack is left exposed on the roof of the building as in the previous case. A variation of this system can be seen in Fig. 6 which

shows the insertion of the top of the ventilating stack into the soil stack.

In any case, as previously stated, the ventilating stack must have a constant diameter along the whole length of the pipe. From the point of view of the operation of this system, it is evident that the hydraulic plunger, made up of the water which descends down the soil pipe, no longer produces suction behind as air can be drawn in from the opening at the top of the pipe and in the same way, the descending water no longer produces pressure ahead of the water as the air which is pushed towards the lower part of the soil

stack can escape through the ventilating stack. In the case of taller buildings, due to the number of pressure fluctuations in the soil stack, it is recommended to carry out intermediate connections with the soil pipe and the relative ventilating pipes as shown in Fig. 7.

These connections are normally made on each storey and are intended to compensate for the differences between the existing pressures at the various altitudes of the soil stack, especially in the case of simultaneous discharge of the sanitary appliances on the various storeys of the building.

Fig. 5

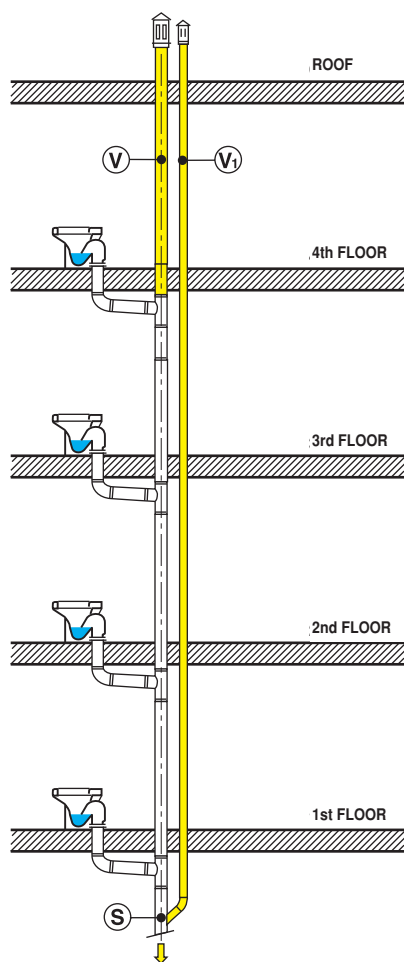


Fig. 5 Soil pipe (S) with primary ventilation (V), and parallel ventilation (V₁) terminating on the roof.

Fig. 6

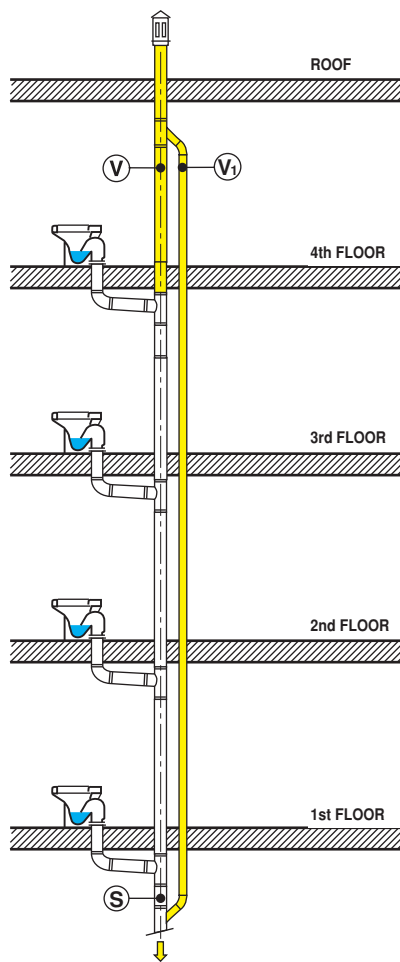


Fig. 6 Variation of previous example with secondary ventilating stack inserted into the top of soil stack.

Fig. 7

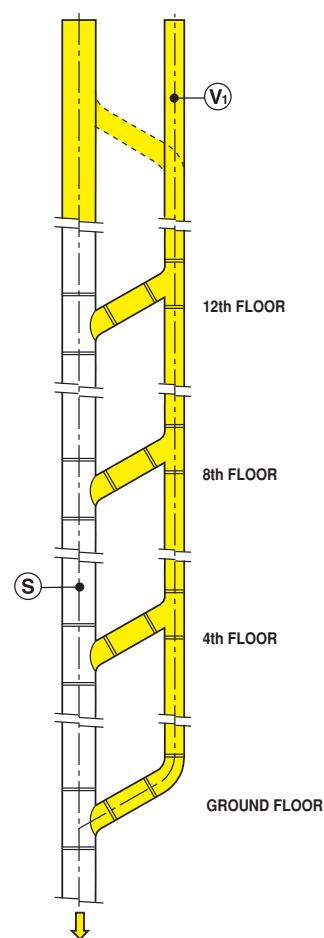


Fig. 7 Compensatory connections between ventilating (S) and soil stack (V).

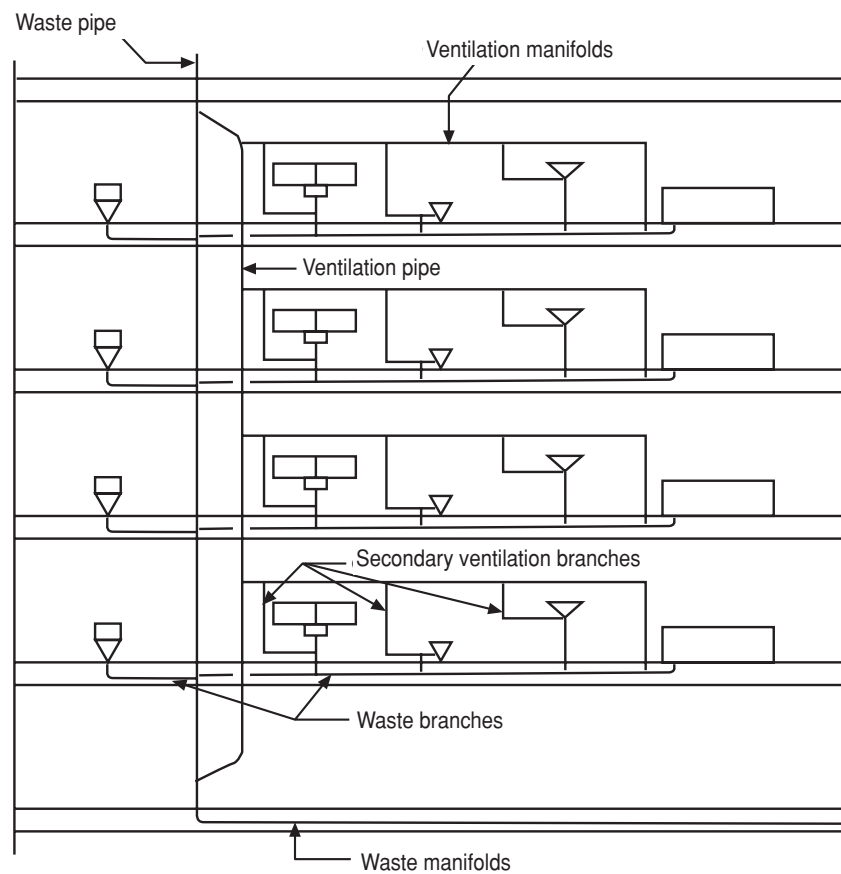
Secondary ventilation

An example of secondary ventilation is represented in Figure 8. This type of ventilation is not commonly used, probably due its elevated cost.

Each sanitary appliance is ventilated by means of a pipe which connects the appliance with the ventilation stack.



Fig. 8



Thermal Movement

Like all materials, HDPE expands and contracts when the temperature changes. It has a linear expansion coefficient of $2 \times 10^{-4} \text{ } ^\circ\text{C}^{-1}$ which means that one metre of HDPE pipe will expand by 0.2mm for every degree increase in temperature. It is important, therefore, that this movement is allowed for by providing expansion sockets within the system. This is done by pushing the spigot into the centre of the body as it is sufficiently long enough to allow for the most common expansion conditions. It is advisable however to calculate the expansion rate. The variation in length can easily be determined from the following formula:

$$\Delta l = L \times \lambda \times \Delta t$$

Where:

Δl is the change in length (mm)

L is the initial pipe length (m)

λ is the linear expansion coefficient
 $\left(\frac{\text{mm}}{\text{m } ^\circ\text{C}} \right)$ equal to 0.20

Δt is the difference between the lower and higher working temperatures (in $^\circ\text{C}$).

In drainage systems it is evident that the temperature of the fluid conveyed varies considerably. For instance, the same type of pipe can be used for an outdoor rain pipe or for draining hot water from dishwashers or kitchen sinks.

In the first case the temperature may only fluctuate from -10° in winter to 35°C in summer but in the second case, pipe which is normally at 15 to 25°C can suddenly be required to drain water at 70°C and over.

Similarly the pipes can be laid during winter with the temperature at -10°C or in summer at 35°C , or anywhere in between.

For all these reasons it is very important to calculate the variation in length (Δl) due to the difference (Δt) in the working temperatures. Remember that Δl may be negative which means contraction rather than expansion.

Calculation Examples:

a) Installation of an outdoor drainage pipe during summer.

- Possible winter temperature: -10°C
- Summer laying temperature: $+35^\circ\text{C}$
- Pipe length: 6m

therefore:

$$\Delta t = -10 - (+35) = -45^\circ\text{C}$$

$$\Delta l = 6 \times 0.2 \times (-45) = -54 \text{ mm}$$

which is a contraction of 54mm.

b) Installation of a dishwasher drainage pipe for water at 70°C .

- Working temperature: 70°C
- Laying temperature: 20°C
- Pipe length: 3m

therefore:

$$\Delta t = 70 - 20 = 50^\circ\text{C}$$

$$\Delta l = 3 \times 0.2 \times 50 = 30 \text{ mm}$$

which is an expansion of 30mm.

It is also reasonable to assume that the working temperature is 10 to 20°C lower than the real calculated value if one considers that vertical waste pipes are never completely full, HDPE is a poor heat conductor, drainage times can be relatively short and a certain amount of air always circulates within the pipe.



5 INSTALLATION

A waste system should be installed in order to permit:

- easy maintenance in all parts of the system;
- possibility of extension of the system and easy connection to other systems.

Straight sections of horizontal pipes must be in perfect alignment with the pipe's axis, parallel to the wall. The vertical parts of the pipes must be in perfect alignment with the axis. Right angle bends must be used only to connect horizontal and vertical pipes and must not be used in horizontal piping systems.

Branches in the soil stack must be obtained with fittings at an angle of less than 90°. When the pipe diameter varies in the horizontal branch pipes, eccentric reductions must be used so that the axis line of the pipes to be connected is centered. Changes in direction in horizontal and vertical pipework must be kept to a minimum and must be carried out with bends of a large radius in order to avoid reductions in speed and other negative effects. The stack vent should not be less than 0.3 m above the roof, or else, if it can be carried out by a person, it should protrude by 2 m above the roof of the building structure. The distance between the pipe ends and window must be more than 3 m and the distance between the head of the window and pipe end must be greater than 0.6 m. The access pipes must have the same opening as all pipes up to diameter 110. The diameter of the access pipes connected to pipes of diameter greater than 110 must be at least 110. Access pipes should be installed in the following cases:

- at the base of every internal soil stack and at the beginning of the main manifolds in the waste system;
- along a linear stretch of pipe of diameter less than or equal to 110, access pipes should be installed every 15 m and every 30 m for larger pipes;
- wherever two or more branches

come together.

All access pipes must be easily accessible and there must be sufficient space to allow use of utensils to clean the pipes.

Use of HDPE Waste Pipe and Fittings

The characteristics of the HDPE waste pipe and fittings system lead to significant benefits in comparison with more traditional materials.

These benefits are:

- HDPE is easier and faster to install as it is light and the joints can be made quickly;
- Transport and handling are facilitated due to the light weight and limited incumbrance;
- HDPE is resistant to a broad range of chemicals;
- HDPE will not corrode. The system has a long life;
- Due to its smooth inner surface it is more resistant to build up or scaling;
- Alterations to a completed system are very simple;
- HDPE is impact resistant;
- HDPE welded joints will not break down with time as there are no other materials or solvents involved;
- HDPE is not subject to electrolytic action and will therefore not interfere with other nearby systems or installations;
- Valsir's program offers a large range of special items.

Valsir HDPE waste pipes with butt welded or electrofusion welded joints are very well suited to below ground applications (this will be dealt with on page 19 and 20).

Valsir offers a whole range (over 800 items on catalogue) of HDPE pipes and fittings as well as articles for various applications such as drains, traps, hoses and adaptors for the connection of HDPE to other materials such as PVC, cast iron and cement pipes.

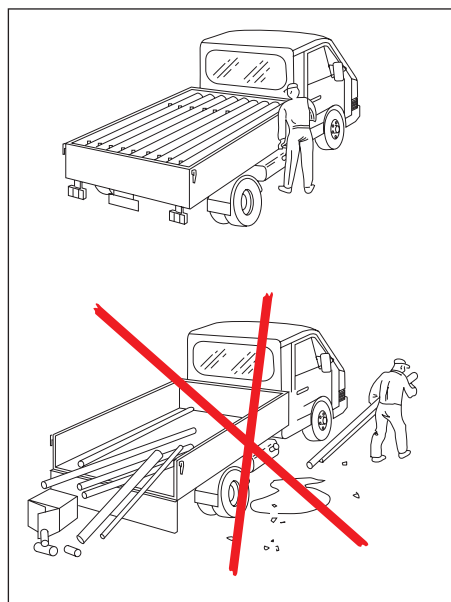
Transport, Storage and Handling

HDPE waste pipes and fittings are very resilient but as with most systems, trouble free installations can be assured with just a little attention to the correct transportation, storage and handling techniques.

Wherever possible the pipes should be transported on a flat surface and when socketed they should be suitably distanced. While handling the pipes or fittings they must not be thrown, scratched against hard surfaces or dragged along the ground. Protection should also be provided if chains are used to tie down the load.

Attention should be paid on the building site to avoid alteration of the items by placing heavy material on top of the pipes and also to avoid that dirt, gravel or mud enters the pipe or fitting as this could cause damage to the ring seals inside the sockets.

Pipes and fittings must be placed on a flat surface to avoid deformities over a period of time. The maximum stacking height for pipes which are stored for a prolonged period of time should not be more than 1.7 metres whatever the diameter. Open storage where the pipes are exposed to direct sunlight must not be for excessively long periods of time (more than 18 months).



HDPE Pipe Supports

Since these pipes are subject to considerable expansion, where Δt values are high, very long sections of pipe cannot be used (at least for visible overhead piping) without taking necessary measures to prevent excessive deformation or stress. To reduce expansion, the values used in the equation above should be reduced.

But this is not always possible for the following reasons:

- The expansion coefficient of a particular material cannot be reduced.

- The Δt values are difficult to modify because it takes into account objective thermal conditions which are closely connected to use and laying conditions. For instance it can be reduced in the case of a rain pipe which is embedded in the wall instead of on the outside.

Thus, the only value that can be altered is the length of the pipe. This means that it is necessary to divide the pipe into sections of acceptable length, each with its own expansion socket. The sleeve must be joined firmly to the bearing structure to obtain a "fixed point" that can be reinforced with an additional anchor point (electro-weld sleeve coupling) (Fig.1 and 1/b).

Valsir HDPE pipes are to be fixed with anchor brackets and guide brackets. The main purpose of guide brackets is to support the pipe and allow axial movement caused by the effects of expansion and contraction. The main purpose of the anchor bracket is to prevent any movement of the expansion socket.

The section of pipe between couplings must be joined to the structure by supports allowing a certain amount of axial movement and acting as a guide (Fig.2).

As a general rule, each expansion socket needs to be fixed with one anchor bracket.

The distance between one support and the next is normally 10 times the diameter. The most common type of fixing is with two half collars, fixing plates and threaded connecting rod or pipe.

In so far as the pipe inclination

allows, the distance between it and the structure to which it is fixed should be as small as possible to prevent high bending movements on the connecting rod or pipe (Fig.3).

In the case of stacks with floor branches, one Valsir expansion socket is required at each floor level.

The pipe must be fastened between the expansion socket and the branch and it must act as a fixed point (Fig.4: Free-standing stack).

A sliding collar is fitted between one slab and the next to act as a pipe guide.

Fig. 1

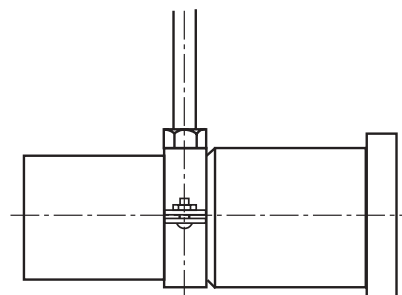


Fig. 1 Rigid fastening realised with expansion socket and bracket.

Fig. 1/b

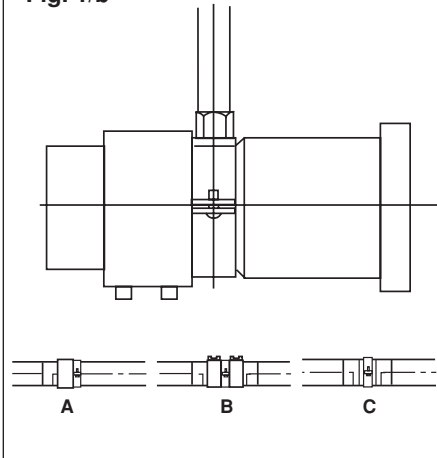


Fig. 1/b Rigid fastening of expansion socket with bracket and electro weld socket. Instead of an expansion socket, the following all act as anchor points:
A = electro weld sleeve coupling
B = 2 electro weld sleeve couplings
C = collar bush

Fig. 2

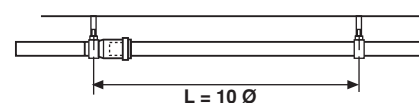


Fig. 2 Spacing of guide brackets. Distance is equal to 10 times the pipe diameter

Fig. 3

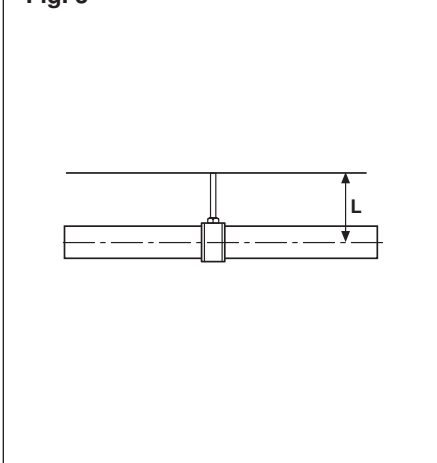


Fig. 3 Distance "L" should be kept reduced

Fig. 4

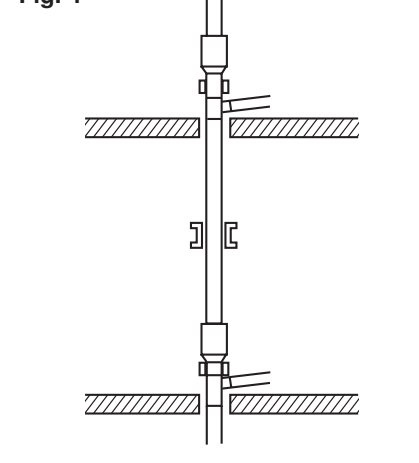


Fig. 4 Free-standing stack with branch

Where the stack and branch are the same diameter and are both embedded in cement, the branch itself acts as a fixed point and no further anchoring is required (Fig.5).

Reduced small branches of large pipe diameters must be secured by

an additional anchor point to prevent shearing off of the branch (Fig.5/1).

Where the pipes are embedded in concrete, the fixed point can also be created by a collar bush (Fig.6).

For other cases not dealt with here, Valsir's Technical Office remains at your complete disposal.

Non Pressure Underground Installation

Polyethylene pipes (BD) can also be used in underground applications.

Particular attention must be paid to the trench which is to hold the pipes and it should be carried out with the recommended sizes as illustrated below.

The bed of the trench where the pipe is to be laid must be completely flat and should be free from stones or sharp objects. The pipe bedding material needs to be a minimum of 10cm of sand to provide a continuous support along the whole length of the pipe. The first 15-20cm of cover over the pipe should be of the same material. The cover must be compressed to prevent pipe movement. Sand compacting should be carried out immediately after the pipe has been covered. The depth of the trench will depend on the presence of heavy vehicles or also the possibility of freezing temperatures. For calculation the following indications in Figures 7 to 10, the official guidelines, standards and regulations should be observed.

A minimum of 80cm must cover the top of the pipe (see Fig.7); if heavy vehicles are to pass over the top it is recommended to cover the layer of sand with light concrete casting in order to evenly distribute the ground pressure (see Fig.8).

If two or more pipes are to be laid in the same trench, they should not come into contact. A distance of 10 to 15 cm should be left between the two pipes to allow for future maintenance work. This space should be filled with sand and compacted on both sides at the same time.

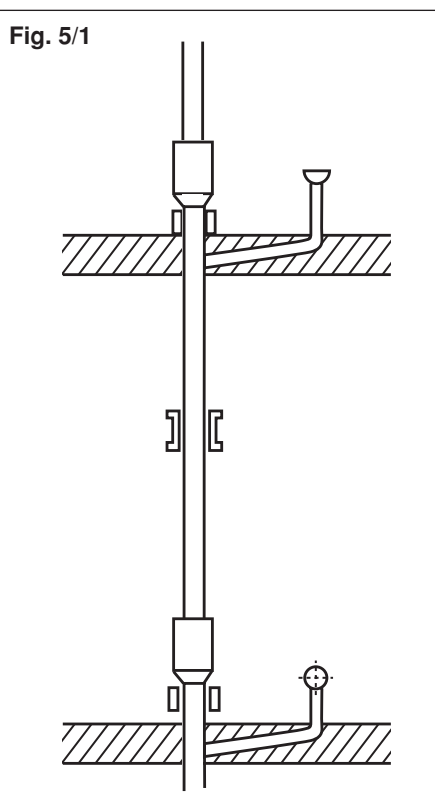
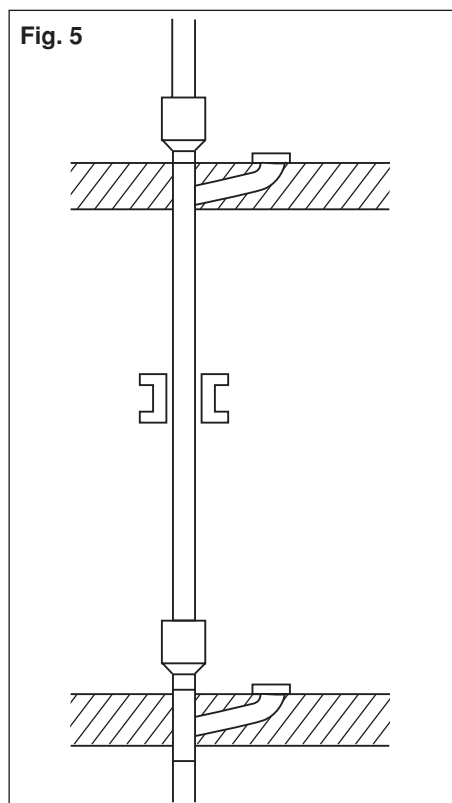


Fig. 5/1 Embedded waste pipe on a level with the floor slabs.

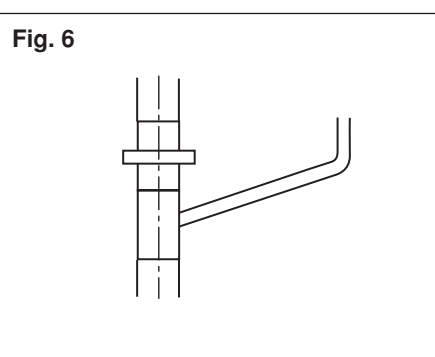


Fig. 6 Waste pipe with collar.

The examples indicated represent normal laying conditions. Figure 9 shows a trench where the pipe is covered with concrete; here the behaviour of the pipeline will be rigid and will not undergo deformations; whereas Figures 7 and 8 represent flexible installations.

In underground installations, the ambient temperature is fairly stable and the fluid temperatures from many inlets have usually mixed and stabilised through the above ground pipework. Expansion sockets are therefore not required every 6 metres.

Figure 10 indicates an underground pipe which has been pushed into the expansion socket; in this case it is not necessary to follow the indications concerning insertion depth (0-20).

Fig. 7 Light Traffic

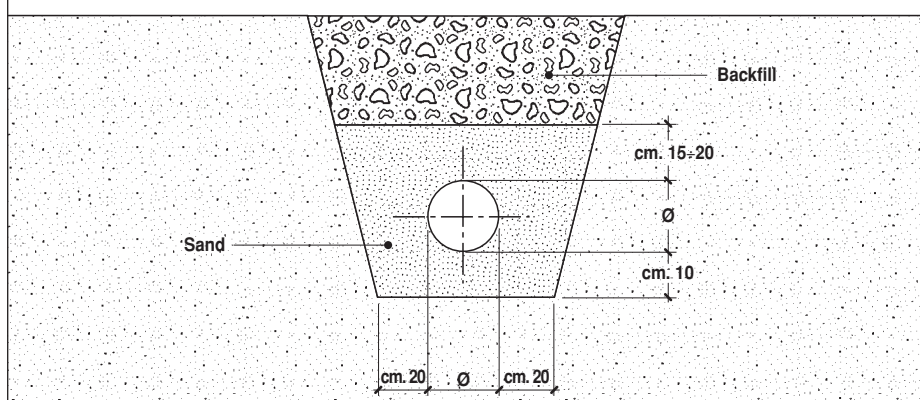


Fig. 8 Heavy Traffic

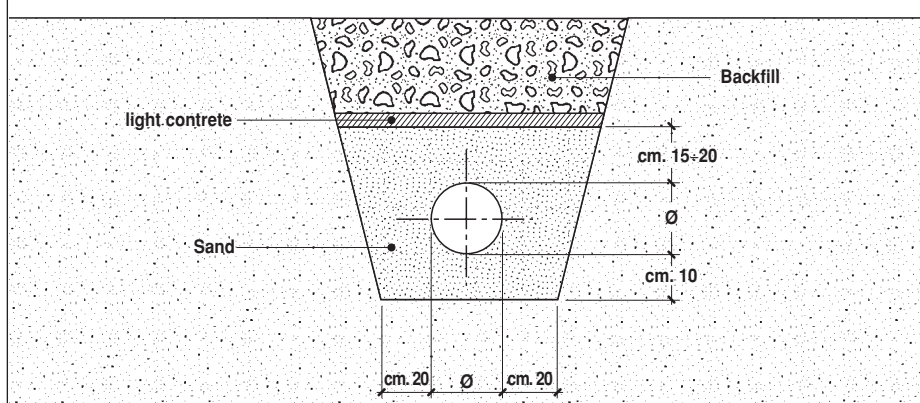


Fig. 9 Rigid installation

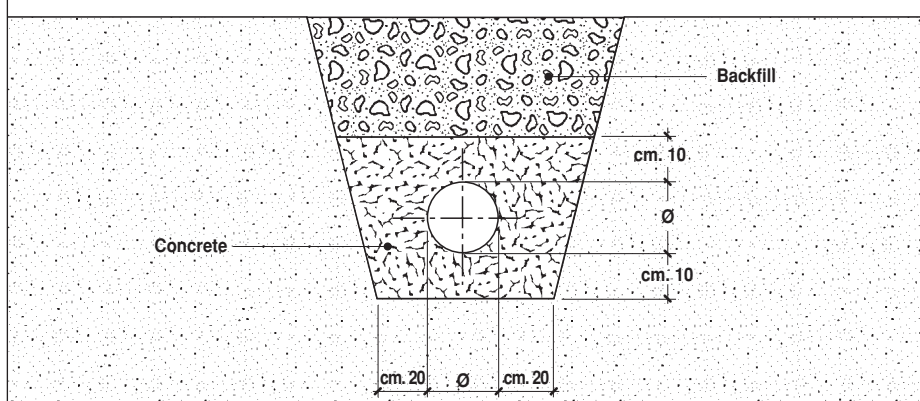
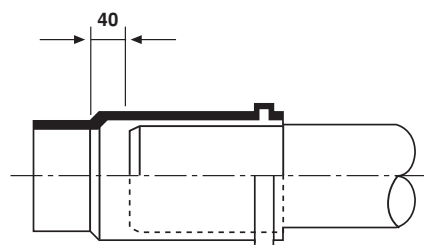


Fig. 10



N.B.: The spigot should be pushed fully into the expansion socket, marked at the socket edge and withdrawn by 40mm.

6 JOINTING METHODS

Valsir's HDPE offers solutions to all situations thanks to the many jointing methods. These connections have different properties, and are therefore classified according to the way in which they are assembled as follows:

a) Removable

Connections which can be disconnected after assembly.

b) Non-removable

Connections which cannot be disconnected after assembly.

c) Tension-resistant

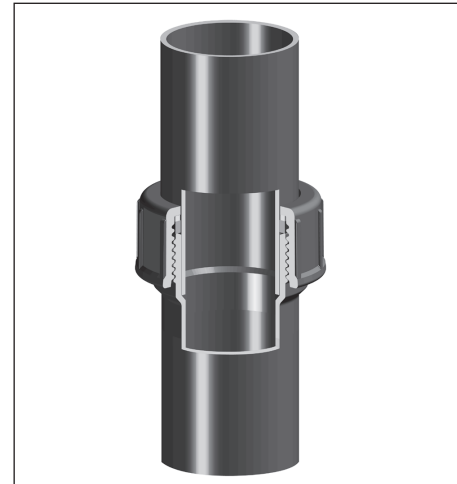
Connections which cannot be disconnected by tensional forces.

d) Non-tension-resistant

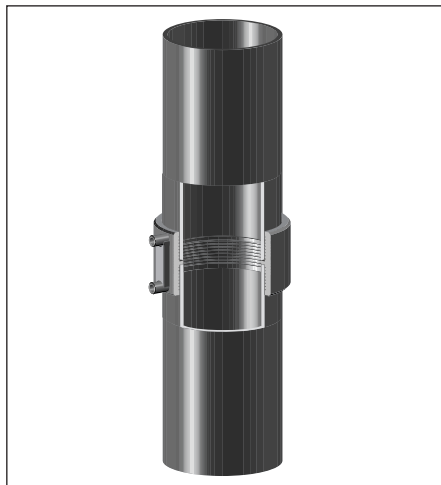
Connections which can be disconnected by tensional forces.



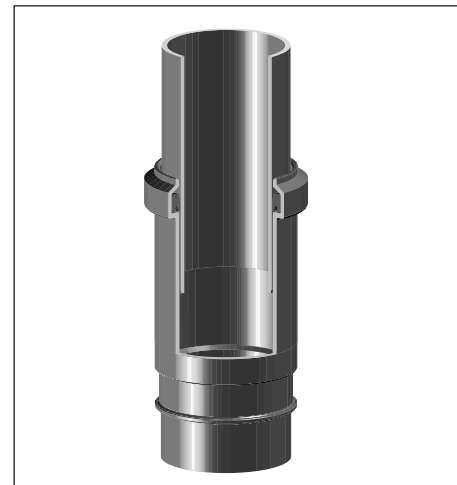
Butt weld



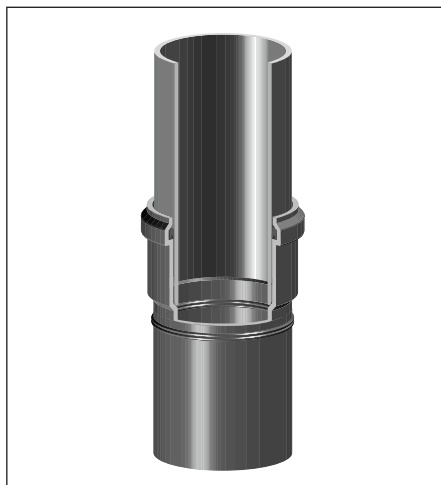
Screw-threaded coupling



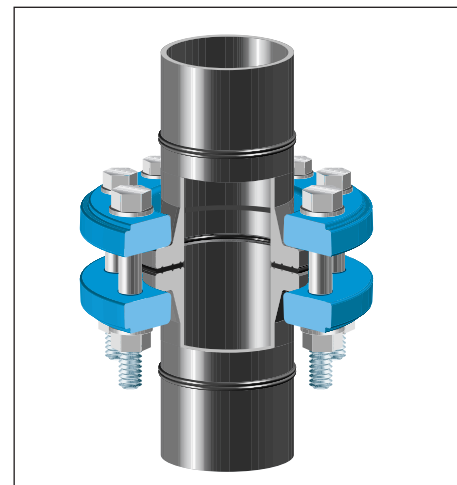
Electro weld sleeve coupling



Expansion socket



Ring-seal socket



Flange joint

BUTT WELDING

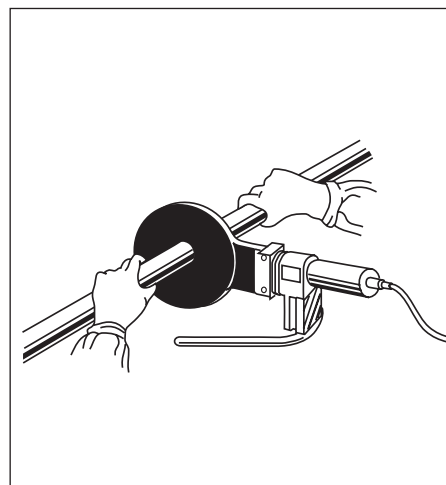
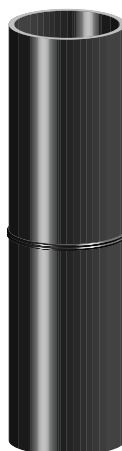
All diameters from Ø 32 to 315 mm can be welded.

Connection properties

- a) Non removable
- b) Tension-resistant

Use

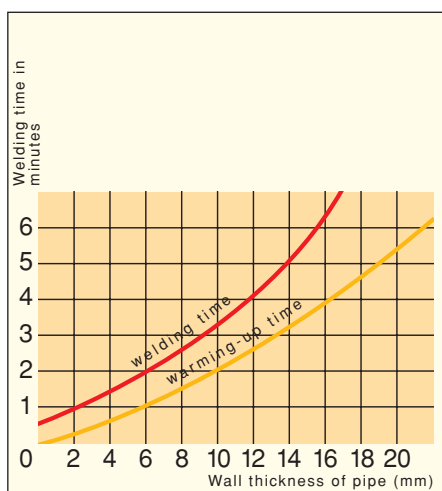
It can be used in all circumstances where prefabrication is used on site or in the workshop.



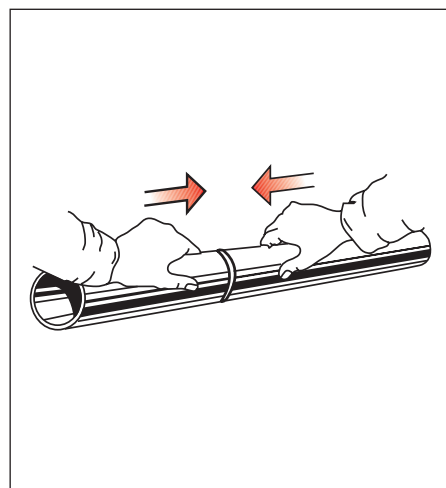
Guide values for welding pressure

Ø	Kg	Ø	Kg
40	6	125	28
50	7	140	35
56	8	160	45
63	9	200	57
75	10	250	90
90	15	315	140
110	22		

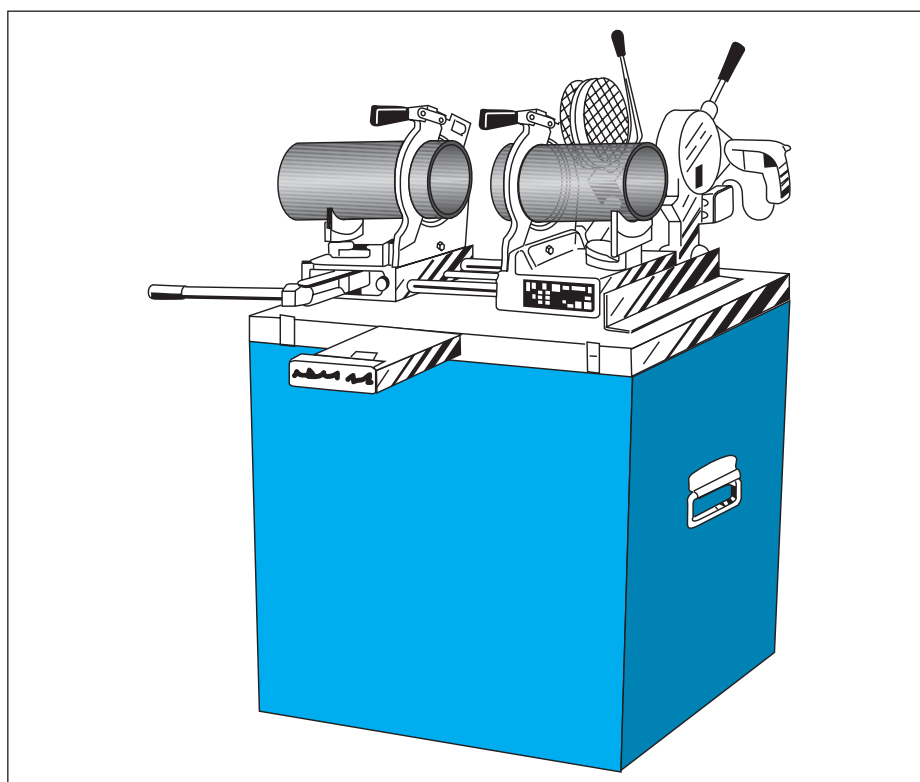
Butt welding takes up little space. It is also safe, strong, economical and quick. Furthermore, the welded edges do not obstruct the pipe.



Warming-up and welding times



Manual welding up to Ø 63 mm



Machine welding for all diameters

ELECTRO WELD SLEEVE COUPLING

Available from Ø 40 to 315 mm.

Connection Properties

- a) Non-removable
- b) Tension-resistant

Use

On-site welding, modifications, additional installations, repair work. The heating and melting area are divided into two fields due to absence of electrical resistances in the centre of the sleeve. This provides excellent safety conditions.

The pressure required for welding is obtained from the shrinking effect of the sleeve when it is heated, and is equally distributed over the entire weld. This shrinkage has a compensating effect on pipe diameter measurement tolerances.

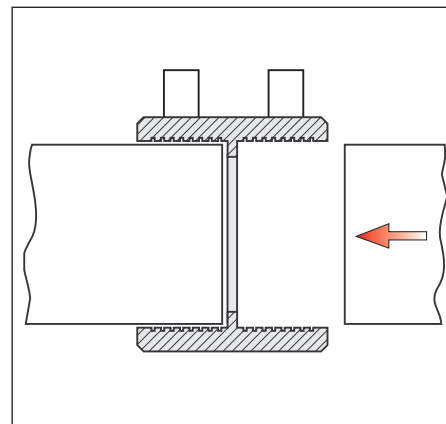
By removing the central stop ring, the electrical sleeves can be made to



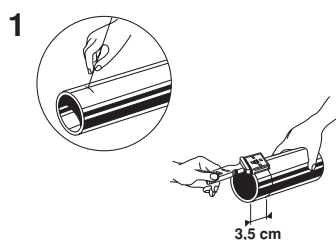
slide, thus facilitating system modifications and repairs.

The electrical resistance wires will not corrode, as they are completely covered by HDPE after welding.

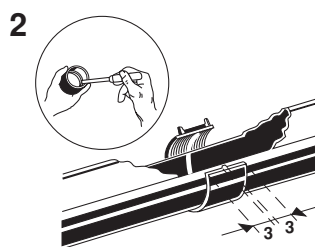
The electro weld sleeve couplings should be used with the welding equipment described in chapter 7.



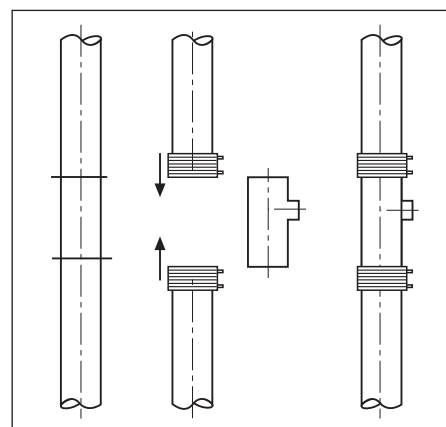
Stop ring



1. Cut the pipe squarely, dry, clean and scrape the welding surface. The surface must remain dry and clean during the whole welding process, therefore do not touch with your hands.



2. Insert pipe or fitting into the sleeve coupling. If the stop ring in the sleeve needs to be removed, mark the depth at 30mm.



Use in repair work or modifications.

EXPANSION SOCKET

24

Available from Ø 32 to 315 mm.

Connection Properties

- c) Removable
- d) Non-tension-resistant

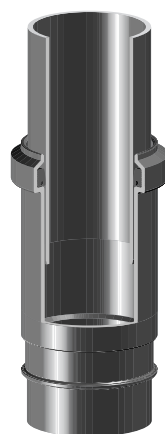
Use

Expansion sockets must be provided on vertical stacks running from floor to floor, for rainwater pipes both inside and outside the building.

They can be used in underground pipe-work as normal push-fit fittings (by simply inserting the pipe fully inside the sleeve).

Installation

It can be used both in vertical and horizontal applications. The depth of the sleeve facilitates the assembly of stacks and collector pipelines. The special shape of the seal allows for



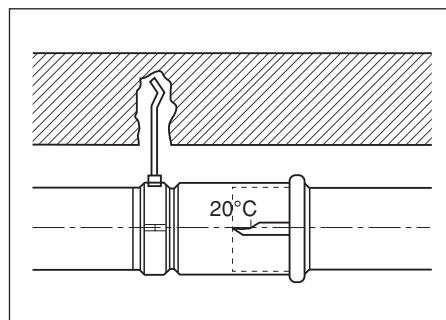
pipe movement during expansion and contraction, ensuring that the connection remains perfectly watertight even under heavy hydraulic load.

Important conditions to ensure perfect and easy assembly of the sleeve:

a) Chamfer the inserted pipe end to approximately 15°.

b) Lubricate the pipe end with suitable lubricating material.
N.B. Do not use oil or grease which can damage the rubber seal.

c) Observe the indications on the outer surface of the expansion socket for insertion depth.



Horizontal assembly (e.g. at an ambient temperature of 20°C).



RING-SEAL SOCKET

Available from Ø 32 to 315 mm.

Connection properties

- a) Removable
- b) Non-tension-resistant

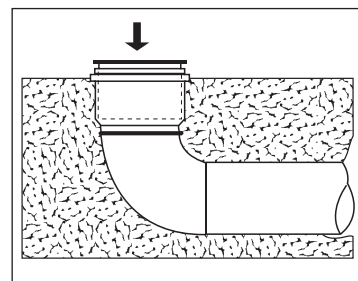
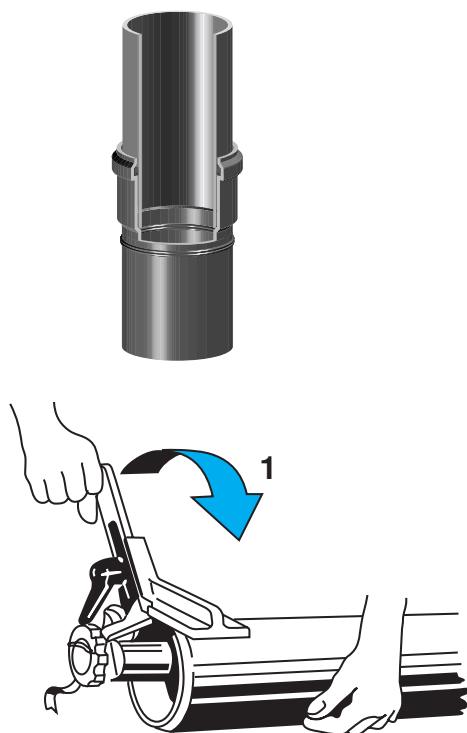
Use

Ring-seal socket facilitate the assembly of prefabricated sections.

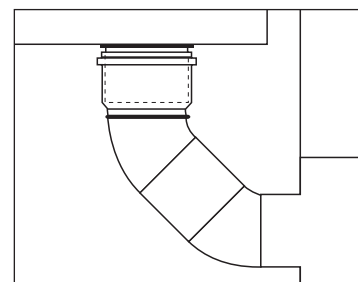
Assembly

Can be used either horizontally or vertically. The small dimensions provide an advantage where space is limited. Ring seal sockets are provided with a cap to protect against the entrance of dirt on the building site. Assembly instructions are the same for both ring-seal sockets as screw-threaded joints, the insertion depth is the same for corresponding diameters. The pipe must be fully inserted into the socket, because the socket is not intended to act as an expansion socket.

A perfect fitting is obtained by chamfering the pipe end to approximately 15° and lubricating it with Valsir silicone oil. Do not use oil or grease which can damage the rubber seal.



Protection cap



The pipe should be chamfered to approximately 15° and lubricated with suitable Valsir product. Do not use oil or grease which can damage the rubber seal.

SCREW-THREADED JOINT

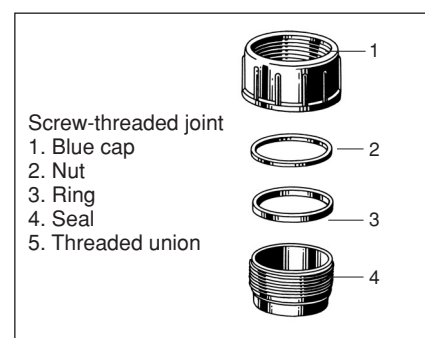
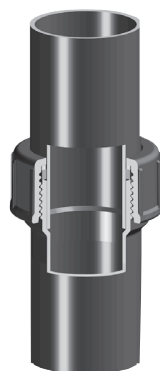
Available from Ø 40 to 110 mm.

Connection properties

- a) Removable
- b) Non-tension-resistant

Use

Screw-threaded joints are used for assembly of various prefabricated parts when they need to be dismantled easily.



Screw-threaded joint

1. Blue cap
2. Nut
3. Ring
4. Seal
5. Threaded union

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SCREW-THREADED JOINT WITH FLANGE BUSHING

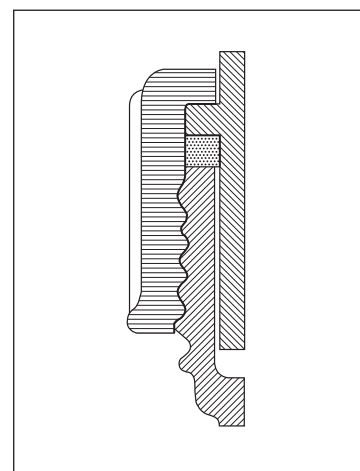
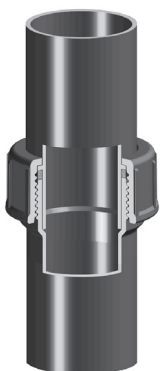
Available from Ø 40 to 110 mm.

Connection properties

- c) Removable
- d) Tension-resistant

Use

Wherever there are axial tensile forces and there is the possibility that the pipe can be pulled out of the screw-threaded joint, the flange bushing must also be used to ensure that the connection will resist these forces. It is also recommended that a screw-threaded joint with flange bushing should be used when installing in floors or slabs, where the length of pipe between two connections is longer than 2 metres.



FLANGED JOINT

Available from Ø 50 to 315mm.

Connection properties

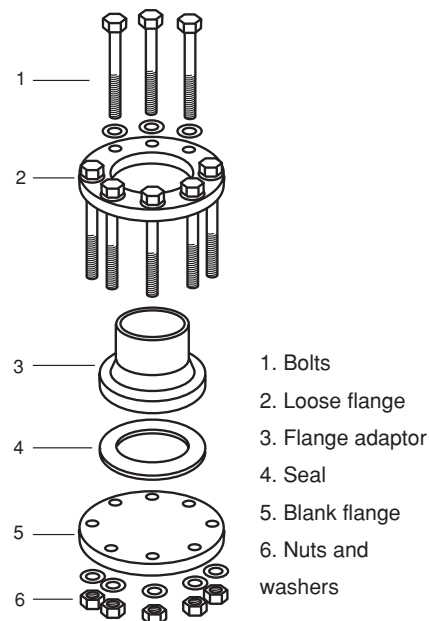
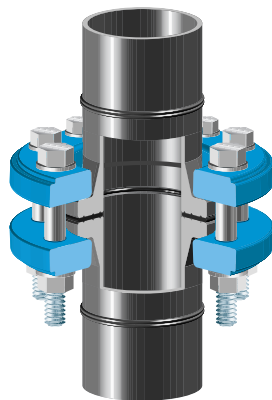
- a) Removable
- b) Tension-resistant

Use

Flanges are normally used to create a removable connection in industrial plants.

The flanges are made of a special aluminium alloy which is painted, and have standard measures (PN 10 and 16).

By using a blank flange, it is possible to create an inspection access opening for large diameter pipes (200, 250 and 315).



CONTRACTION SLEEVE

Available from Ø 50 to 125 mm.

Connection properties

- c) Non-Removable
- d) Non-tension-resistant

Use

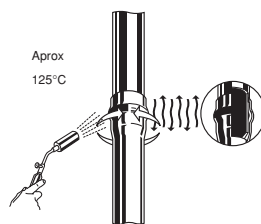
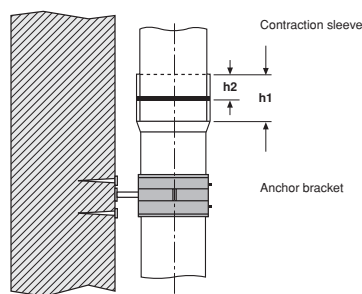
The contraction sleeve is a convenient connection possibility for vast majority of irregular or special materials.

A common use is the connection of HDPE to different clay ware apparatus, e.g. for laboratory sinks.

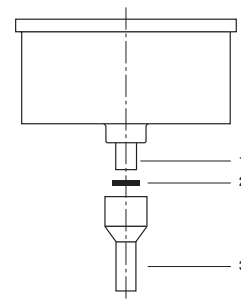
Installation

The enclosed rubber ring must be placed over the pipe end. Make sure that the rubber ring is positioned exactly halfway along the length of the sleeve (h2). Push the contraction sleeve over the pipe end. Apply a uniform low heat (approximately 125°C) to the socket by constantly moving the blow lamp.

The sleeve will tighten, resulting in a completely watertight connection. The contraction sleeve and pipe should then be tightened with an anchor bracket.



For 125mm diameters use two low flames



Laboratory sink

- 1. Pipe end
- 2. Seal
- 3. Contraction sleeve

SPECIAL ARTICLES

VALSIR HDPE VENTILATION BRANCH

The ventilation branch is a special piece which is assembled on the stack of each floor (fig.1).

The use of this branch automatically excludes the necessity of installing a separate ventilation pipe. It offers the following characteristics:

- A reduction in speed of the descending water;
- Ventilation at each branch;
- Several connection possibilities.

Joints are made by butt welding.

This branch is particularly advantageous in high rise buildings (> 10

storeys).

It allows connection on each floor to 2 WCs, 2 bath tubs, shower trays and other sanitary appliances.

The 110 mm diameter branch (Fig.2) has:

- three 110 mm attachments and
- three 75 mm attachments.

It is recommended to avoid connecting 1 and 6 or 3 and 4 (Fig.2).

The branch is delivered with the attachments closed. Following the orientation of the stack, only 2 attachments are used per branch.

Connections are made by butt-welding after the closed ends have been cut.

Figure 3 shows how connection to the horizontal pipework should be made.

It is important to create a ventilation system at the foot of the stack.

Figure 4 shows a number of installation examples using a ventilation branch which should be positioned axially under the WC.

Fig. 1

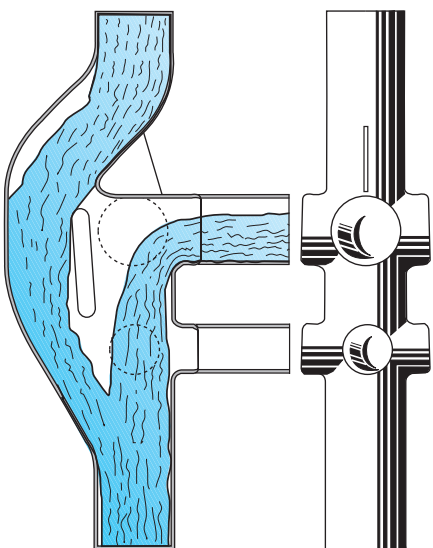


Fig. 3

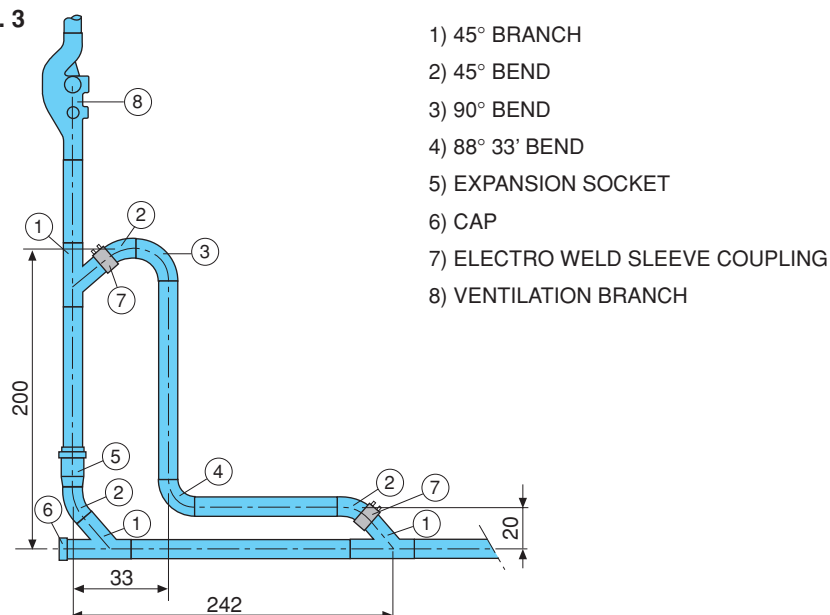


Fig. 2

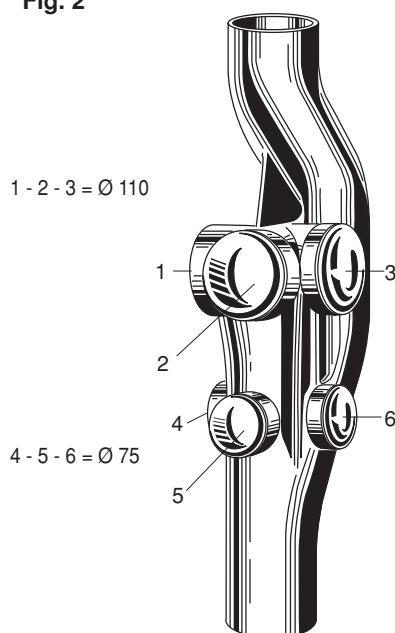
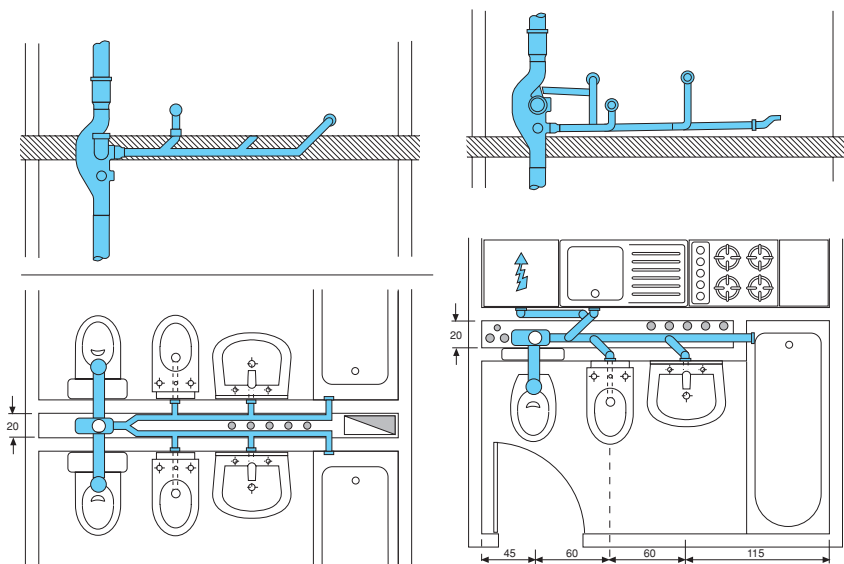


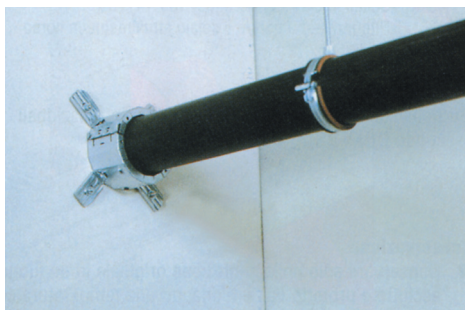
Fig. 4



FIREPROOF SYSTEMS FIRE COLLAR

1. DESCRIPTION

Ready to use fire collars with an expansion ratio exceeding 1:10, made in galvanised steel sheet containing an internal lining of intumescent material, consisting of intumescent graphite wrapped in a polyethylene mesh, including anchoring hooks.



2. USES

To seal crossings of inflammable pipes with wall thickness ranging from 1.8 to 16.2 mm and diameters between 40 and 315 mm through fire-barrier walls and floors.

Suitable for:

- PVC, PP, PE, ABS pipes
- wall installation: two collars, one on each side;
- floor installation: one collar at the floor surface.

Designed for:

fire-proof concrete, brickwork and cellular concrete floors and walls, plaster-board walls, etc.

Discharge water outlet pipes, clean water pipes.

Inlet ducts (dust)

Can be installed in a recessed area to minimise overall dimensions.

4. HOW TO INSTALL THE FIRE COLLAR

Drill hole through the wall/floor using a corer and crown bit of appropriate size.

Install the plastic pipe.

Seal the gap between the hole and the pipe.

If there is a wide gap between the pipe and the hole, the space must be sealed using fire-proof mortar, alternatively a fire-proof intumescent sealing agent can be used.

5. PIPE CLEANING

Expansion of the intumescent material during the fire completely seals the plastic pipes. This sealing effect can be delayed if the pipes are very dirty and, for example, are covered with mortar residue. The surface of the plastic pipes must therefore be cleaned at the point where the fire collar is to be fitted.

6. CLOSURE AND SEAL AGAINST SMOKE AND GAS

The remaining gap between the plastic pipe and the opening must be sealed on one side of the wall using a sealing agent to avoid the spread of smoke or gas during the first minutes of the fire. The intumescent material on the fire collar will seal the gap when activated by high-temperature and fire.

7. FIXING THE ANCHORING HOOKS

The anchoring hooks can be applied to different points of the collar's metal structure. This feature enables the anchoring points to be positioned according to the space available. The hooks must be spaced as symmetrically as possible.

8. CLOSING THE FIRE COLLAR

Position the fire collar around the plastic pipe and tighten the closing device by pressing firmly until the mechanism snaps into place. No tools, pins or screws are required to close the fire collar. Ensure the collar is positioned correctly to enable the anchoring hooks to be fixed.

9. LOCKING THE FIRE COLLAR

The fire collar can only protect against fire if it is adequately fixed in place.

- Mark the anchoring points
- Use of anchoring devices is recommended to anchor the collar.

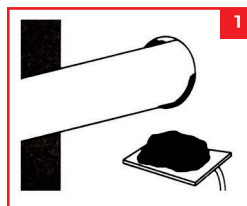
10. RECESSED INSTALLATION

Ensuring that the hole is sufficiently wide to accommodate the external diameter of the fire collar, insert the fire collar into the opening.

The fire collar must be installed flush with the lower surface when installed at ceiling level. Insert one collar on each side in the case of a wall installation, if a gap remains around the installed collar, this must be filled with mortar.

code reference	suitable for pipes with an external diameter (mm)	External diameter (mm)	Thickness (mm)	No. of hooks and anchoring pieces
410001-410003	36 - 51	70	22,4	2
410005-410007	52 - 64	86	32,4	2
410009	65 - 91	122	42,4	3
410011-410013	92 - 115	152	47,4	3
410015	110 - 125	162	92,5	4
410017	135 - 160	209	112,5	6
410019	200	255	175	7
410021	250	315	230	9
410023	315	395	330	6

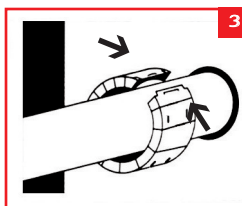
FIRE COLLAR INSTALLATION INSTRUCTIONS



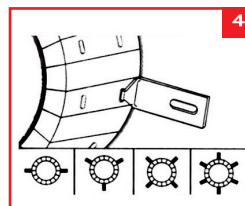
Close off the remaining gap to ensure a seal is formed against smoke and gas



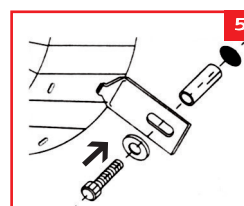
Clean the plastic pipe



Close the collar



Fix the anchoring hooks



Anchor the collar and fix the identification tag (if required)

PRINCIPAL ITALIAN AND INTERNATIONAL PRODUCT CERTIFICATIONS

Italy: Wall REI 180 No. 90175/1420; No. 121044/1868; Floor REI 180 No. 89718/1417; REI 120 No. 121043/1867.

Great Britain: Warres Test Reports: Nos. 62293 /A: 62293/ B: 62293/ C: 60300 A: 60300 B:C 81542: 69750/ A: 69751/B: 69752: 69853.

Germany: DIBt Approval Guidelines: Nos. Z – 19.17-835; IBMB test reports: 3833/4215 – Mer 3828/4185 – Mer 092/96 – Mer 3471/2676 – Mer

France: CTICM test reports No. 95 – P – 206; 95 – P – 210:95 – P – 224.

NOTES REGARDING THE CERTIFICATIONS

In principle, one must comply with the provisions of the national certificates issued for the product when a fire-proof seal is made for the passage of pipes using fire-proof intumescent collars. We recommend that you refer to the certificates to verify the limitations established with regard to the size of the opening, the type and the thickness of the wall or floor and the maximum diameter of the pipes, etc.

LIMITATIONS

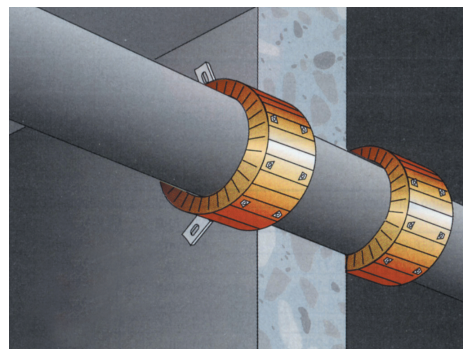
Unsuitable for sealing the passage of metal pipes.
Use in highly corrosive environments is not recommended.
Do not use anchoring/clamping devices that are not fireproof.

SAFETY MEASURES

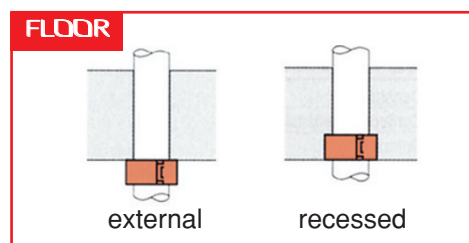
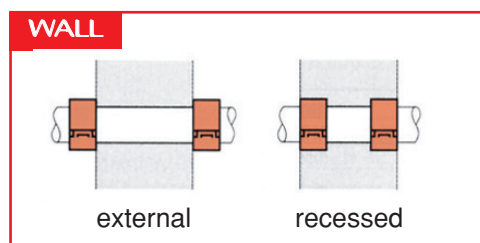
Keep out of the reach of children.
Comply with the EC technical safety data sheet.

PRESERVATION

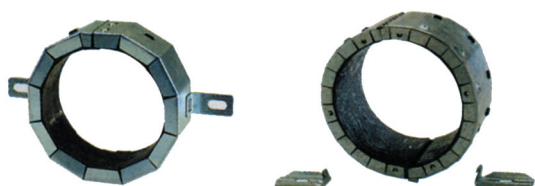
Preserve only in the original package in a dry place.



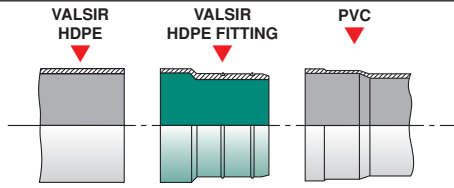
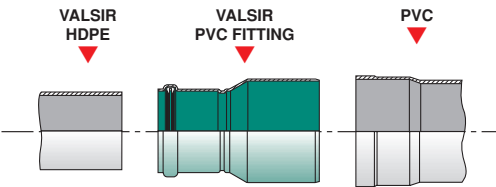
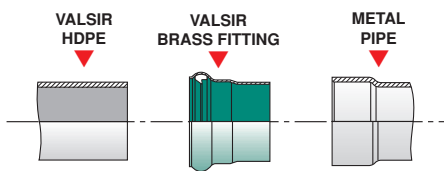
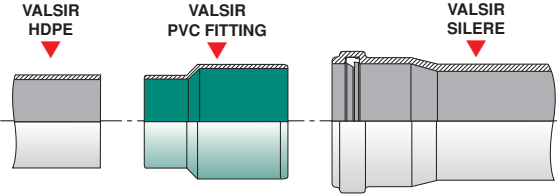
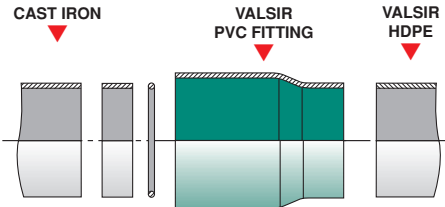
APPLICATIONS:



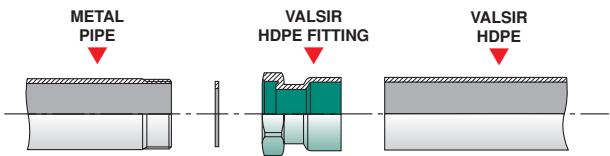
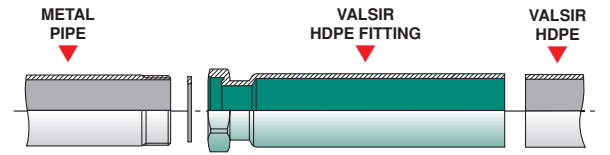
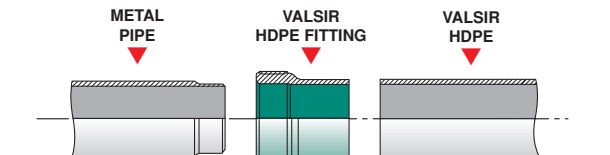
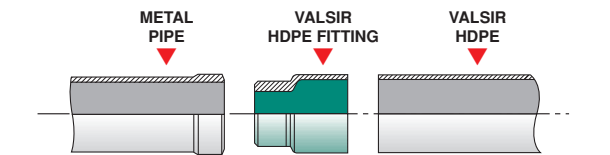
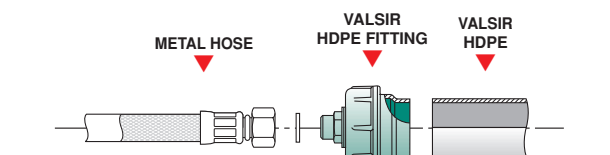
FIRE COLLAR



CONNECTING TO OTHER SYSTEMS

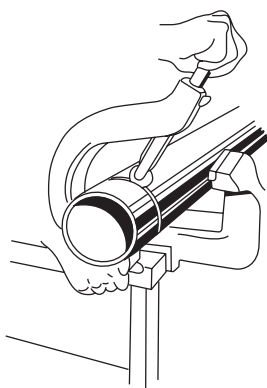
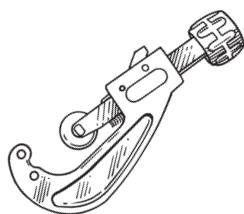
MATERIAL	CONNECTION	HDPE CODE	SIZES	
PVC		353001 353003	PVC Ø 100 Ø 100	VALSIR Ø 90 Ø 110
		564121 564123 564150 564075 564131 564182 564175 564190 564251	PVC Ø 40 Ø 50 Ø 100 Ø 75 Ø 80 Ø 82 Ø 100 Ø 100 Ø 125	VALSIR Ø 40 Ø 50 Ø 50 Ø 75 Ø 75 Ø 75 Ø 75 Ø 90 Ø 110
METAL PIPE		570001 570002 570003 570005	METAL PIPE Ø 32 Ø 32 Ø 40 Ø 50	VALSIR HDPE Ø 32 Ø 40 Ø 40 Ø 50
SILERE		336061 336063	SILERE Ø 58 Ø 78	VALSIR Ø 56 Ø 63
CAST IRON		383001 383003 383005 383007 383009 383011 383013 383015 383017 383019 383021 383023 383025 383027 383029 383031 383033	CAST IRON Ø 48 Ø 58 Ø 58 Ø 83 Ø 83 Ø 48 Ø 58 Ø 58 Ø 83 Ø 83 Ø 58 Ø 83 Ø 83 Ø 83 Ø 58 Ø 83 Ø 83	VALSIR Ø 50 Ø 50 Ø 50 Ø 50 Ø 50 Ø 56 Ø 56 Ø 56 Ø 56 Ø 56 Ø 63 Ø 63 Ø 63 Ø 63 Ø 75 Ø 75 Ø 75
		382001 382003 382005 382007	Ø 83 Ø 125 Ø 135 Ø 135	Ø 90 Ø 110 Ø 110 Ø 125

CONNECTING TO OTHER SYSTEMS

MATERIAL	CONNECTION	HDPE CODE	SIZES	
METAL PIPE		700038	METAL PIPE	VALSIR
		700043	1" 1/4 Ø G	Ø 32
		700045	1" 1/4 Ø G	Ø 40
		700044	1" 1/2 Ø G	Ø 40
		700046	1" 1/4 Ø G	Ø 48
		700046	1" 1/2 Ø G	Ø 48
		700062	1" 1/4 Ø G	Ø 50
		700063	1" 1/2 Ø G	Ø 50
		700051	METAL PIPE	VALSIR
		700053	1" 1/4	Ø 40
		700053	1" 1/2	Ø 40
		700054	1" 1/4	Ø 48
		700056	1" 1/2	Ø 48
		700058	1" 1/4	Ø 50
		700060	1" 1/2	Ø 50
	FEMALE 	384001	METAL PIPE	VALSIR
		384003	1/2"	Ø 40
		384003	3/4"	Ø 40
		384005	1"	Ø 40
		384007	1/2"	Ø 50
		384009	3/4"	Ø 50
		384011	1"	Ø 50
		384013	1" 1/4	Ø 50
		384015	1" 1/2	Ø 50
		384017	2"	Ø 56
		384019	2"	Ø 63
		384021	2" 1/2	Ø 75
	MALE 	385013	METAL PIPE	VALSIR
		385015	1" 1/4	Ø 50
		385015	1" 1/2	Ø 50
		385017	2"	Ø 56
		385019	2"	Ø 63
		385021	2" 1/2	Ø 75
		387001	METAL PIPE	VALSIR
		387003	1/2"	Ø 40
		387003	3/4"	Ø 40
		387007	1/2"	Ø 50
		387009	3/4"	Ø 50
		387011	1"	Ø 50

7 PREPARATION

PIPE CUTTER



Ø	Mod.	Code	Quantity
6 to 63	T 1	458001	1
50 to 140	T 2	458003	1
100 to 168	T 3	458005	1

Pipe cutters are instruments for cutting plastic pipes; by changing blades the pipe cutter may also be used for cutting copper pipes.

GENERAL PROPERTIES

Mod.T1

- Weight 0.6 Kg.
- Dimensions 222 x 95 x 30 mm
- Application field Ø 6 to Ø 63 th. max 7

Mod.T2

- Weight 1.4 Kg.
- Dimensions 351 x 155 x 45 mm
- Application field Ø 50 to Ø 140 th. max 19

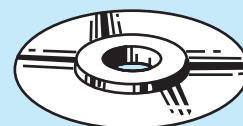
Mod.T3

- Weight 1.6 Kg.
- Dimensions 372 x 200 x 50 mm
- Application field Ø 100 to Ø 168 th. max 15,5

SPARES

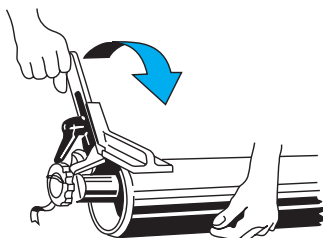
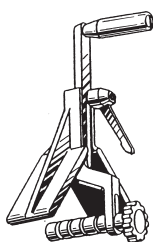
SPARE BLADES

Ø	Mod.	Code	Quantity
6 to 63	T 1	459001	1
50 to 140	T 2	459003	1
100 to 168	T 3	459005	1



BEVELLING TOOLS

32



Ø	Mod.	Code	Quantity
32 to 160	1	460001	1
40 to 250	2	460003	1

Valsir beveling tools mod. 1 and 2 offer economical and easy use. Two sizes are available.

GENERAL PROPERTIES

Mod. 1

- Weight 0.8 Kg.
- Dimensions 240 x 76 x 107 mm
- Application field Ø 32 to Ø 160

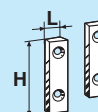
Mod. 2

- Weight 1.4 Kg.
- Dimensions 330 x 195 x 140 mm
- Application field Ø 40 to Ø 250

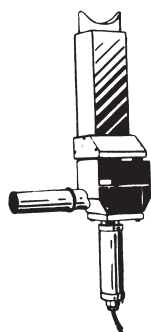
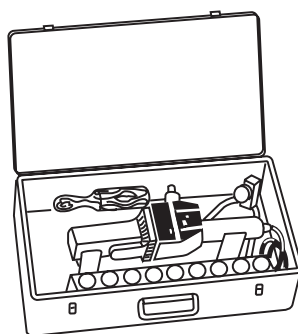
SPARES

SPARE BLADES

Ø	H	L	Code	Quantity
32 to 160	32	13	460110	1
40 to 250	34	12	460111	1



REPAIR TOOL WITH STEEL BOX



Ø	Code	Quantity
40 to 160	455001	1

Repair tool with steel box. Includes wooden grip and disk holder. Female shaped bushing, diameter 40-160. Adjustable temperature 50-300°C. Temperature warning light and fork support.

GENERAL PROPERTIES

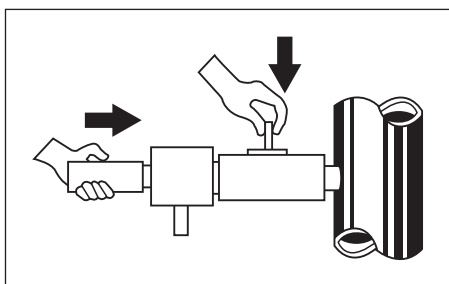
Application Field	Ø 40 to Ø 160
Temperature Regulation	from 50 to 300°C
Sizes	360 x 130 x 50 mm
Weight without accessories	2.17 Kg.
Power supply	230 V 50 Hz
Absorbed power	1000 W

In order to repair a hole in a waste system it is necessary to cut the damaged area of the pipe and to weld the two parts by means of a electro weld sleeve coupling or by butt welding. This type of repair work

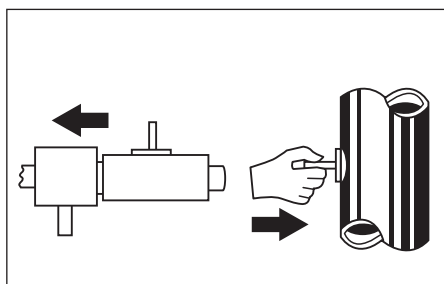
is, however, time consuming. These problems are avoided by using the above tool. The area surrounding the hole and the material to be used is heated simultaneously. This appliance is supplied with a

special bush (to heat the pipe) from diameter 40 to 160, a fork support, a hexagonal wrench for holding the heater, steel box with 20 repair patches and wooden stick for applying the patch.

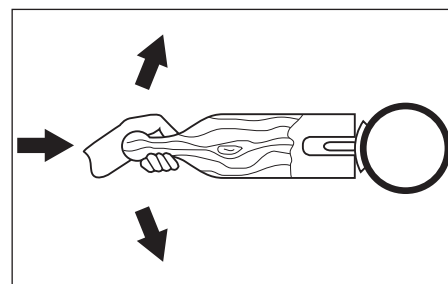
REPAIR EXAMPLES



STEP 1
Clean the repair area with a scraper, knife or emery paper. Screw a suitable bush onto the heater. Heat simultaneously the repair area and patch.



STEP 2
Remove the repair tool from the pipe. Remove the patch for the repair tool and place it over the repair area on the pipe.



STEP 3
Press the softened patch quickly onto the repair area. Cut off the projecting tail.

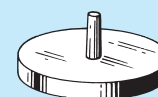
33

valsir

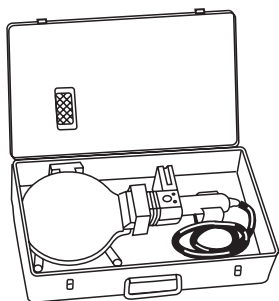
SPARES

PATCH FOR REPAIRING HOLES

Code	Quantity
455050	20

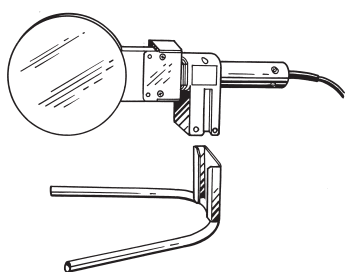


WELDING PLATE WITH STEEL BOX



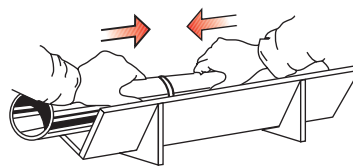
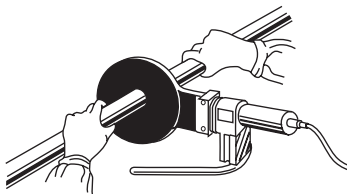
Ø	Mod.	Code	Quantity
40 to 160	1	450001	1
110 to 300	2	450003	1

Thermal plate with steel box (fixed temperature 210°C), teflon surfaces, temperature warning light, fork support. For butt welding by hand



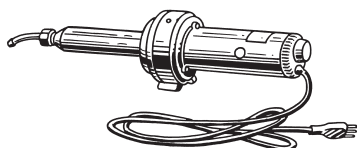
GENERAL PROPERTIES

Mod. 1	Total weight	Kg. 3 approx.
	Sizes	440 x 200 x 50 mm
	Application field	up to Ø 160
	Power supply	230 V / 50 Hz
	Absorbed power	1200 W
Mod. 2	Temperature	210° ± 5°C
	Total weight	Kg. 5 approx.
	Sizes	550 x 300 x 50 mm
	Application field	up to Ø 250
	Power supply	230 V / 50 Hz
	Absorbed power	1300 W
	Temperature	210° ± 5°C



For diameters greater than 63mm, it is recommended to use a butt welding machine

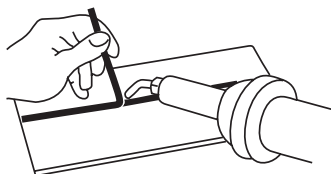
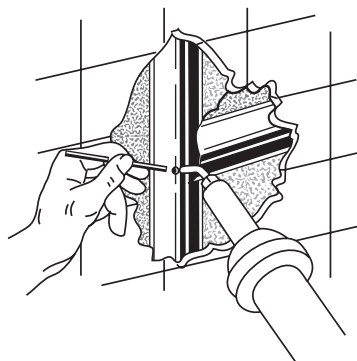
WARM AIR BLOWER



Watt	Code	Quantity
700	476001	1

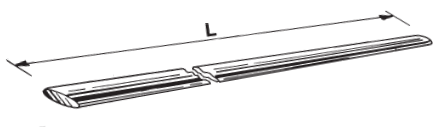
GENERAL PROPERTIES

Temperature Regulation	200 to 700°C
Air supply	max 280 l/min.
Weight	1.4 Kg.
Power	1600 W
Power supply	230 V 50 Hz



Instructions are supplied with each product

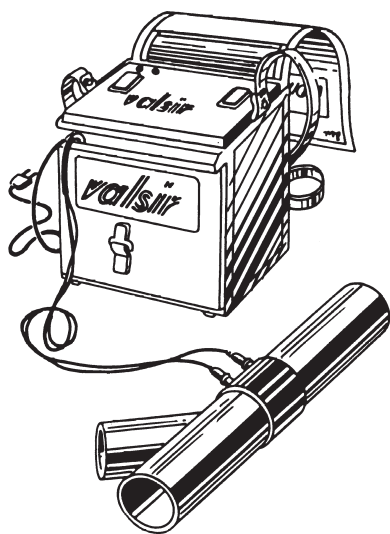
PLASTIC STRAP FOR WARM AIR BLOWER



L	Material	mm	Code	Quantity
cm. 100	HDPE	5,5 x 3	477001	Kg 2

VALSIR HDPE ELECTROFUSION WELDING MACHINE

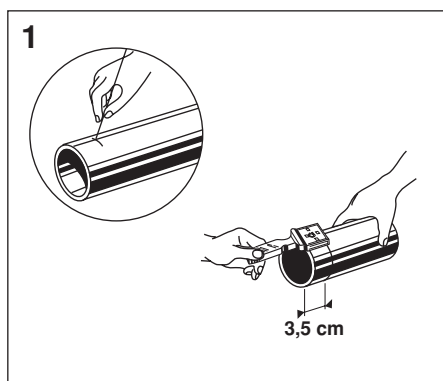
Ø	Code	Quantity
40 to 160	464001	1



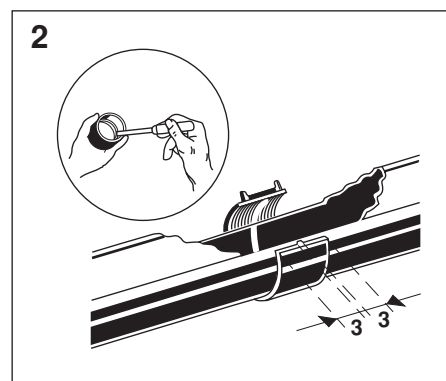
This electric machine is for welding electro weld sleeve couplers and HDPE waste pipes from diameter 40 to diameter 160.

GENERAL PROPERTIES

Application Field	Ø 40 to Ø 160
Power supply	230 V 50 Hz
Power absorbed	900 W
Sizes	255 x 215 x 110 mm
Weight	2.5 Kg.



1. Cut the pipe ends square and mark how far each pipe goes into the coupler. Deoxidise all of the pipe surface that will be in contact with electro weld coupler.

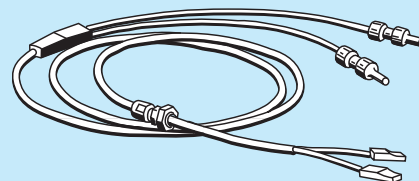


2. Insert the pipes into the electro weld sleeve coupler.

35



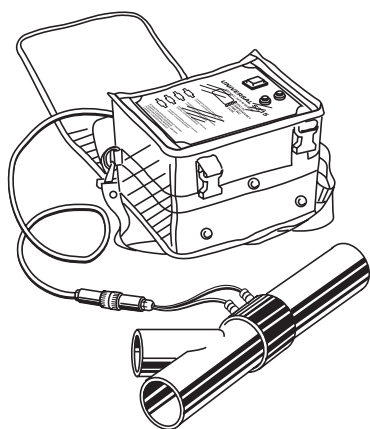
SPARES



Cable and plugs

Code	Quantity
464222	1

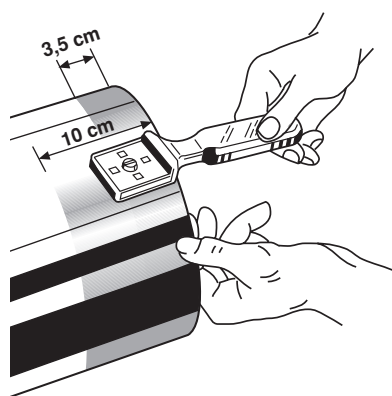
VALSIR UNIVERSAL ELECTROFUSION MACHINE WITH SCRAPER



Ø	Code	Quantity
40 to 315	464333	1
40 to 315	464331*	1

* Model for Switzerland

This electrofusion machine can be used for connecting all HDPE pipes as well as waste fittings produced by Valsir and by other producers as indicated in table 1. The instructions in compliance with DVS 2207-1 and listed in the instructions manual provided with each machine should be observed.



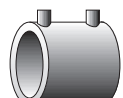
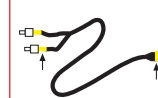
1. The parts to be connected must be scraped.

- The length of pipe to be scraped with diameters 40 to 160mm is 3.5cm.
- The length of pipe to be scraped with diameters 200, 250 and 300mm is 10cm.

GENERAL PROPERTIES

Power supply	230V-50 Hz
Power absorbed	10A max.
Capacity	2300W max.
Fuse	T10A HRC 250 ceramic
Working temperature	from -5° to +40°C
Total weight	3.9 Kg.
Sizes	238 mm x 110 mm x 47,5 mm (control unit) 255 mm x 127 mm x 205 mm (case)
Cycle	For safety reasons, maximum run per hour, 40 minutes. Cooling 20 minutes

TABLE 1

	Ø (mm)		
			
VALSIR - GEBERIT - WAVIN (WAVIDUO line) COES-AK - EUROFUSION	40-160		cod. A00
VALSIR - EUROFUSION AKATHERM-VR, WAVIN-VR	200-315		cod. A01
GEBERIT	200-315		cod. A02
AKATHERM-VR, WAVIN-VR WAVIN (WAVISOLO line)	40-160		cod. A03

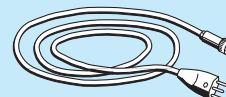
36



SPARES

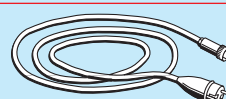
Cable for Swiss version, connection to mains

Code	Quantity
464431	1



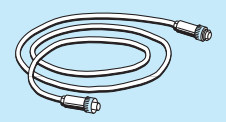
Universal cable, connection to mains

Code	Quantity
464433	1



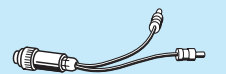
Universal cable, connection to plugs

Code	Quantity
464435	1

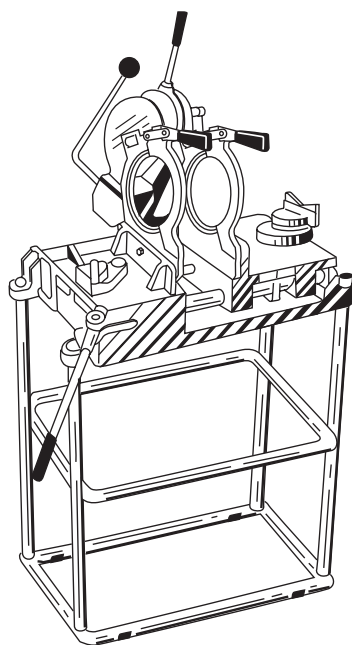


Plugs

Ø	Colour	Code	Quantity
40 ÷ 160	Yellow A00	464334	1
200 ÷ 315	Blue A01	464335	1
200 ÷ 315	Red A02	464336	1
40 ÷ 160	Green A03	464337	1

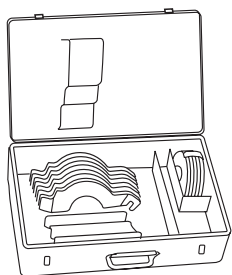


PORTABLE WELDING MACHINE, "PRATICA"



Ø	Mod.	Code	Quantity
40 to 110	1	466001	1
40 to 160	2	466003	1

This butt welding machine consists of a heating plate, a facing miller and set of clamps mounted on a carriage. The pipe is held firmly during each operation which ensures the most accurate butt weld. This machine offers the possibility of milling both on the right and left hand side.

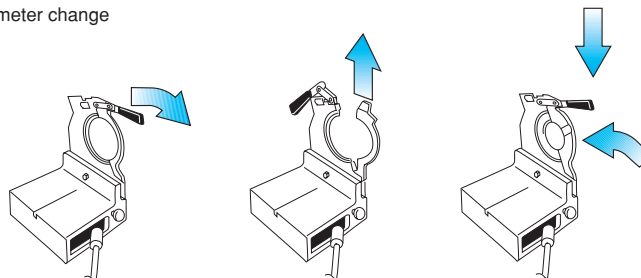


REDUCERS

GENERAL PROPERTIES

Mod. 1	Application field	Ø 40 to Ø 110 up to PN6
	Sizes when transported	660 x 535 x 530 mm
	Sizes for operation	1100 x 535 x 380 mm
	Weight	46 Kg.
	Temperature regulation	20°C ± 5°C
	Power supply	220 V 50 Hz
	Power absorbed by miller	500 W
Mod. 2	Power absorbed by heating plate	800 W
	Application field	Ø 40 to Ø 160 up to PN6
	Sizes when transported	660 x 535 x 580 mm
	Sizes for operation	1100 x 535 x 380 mm
	Weight	54 Kg.
	Temperature regulation	Constant 220°C
	Power supply	220 Volt 50 Hertz
	Power absorbed by miller	500 Watt
	Power absorbed by heating plate	800 Watt

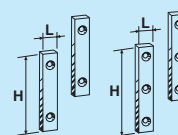
Example of diameter change


37

SPARES

Spare blade

H	L		Code	Quantity
65	12	Pratica 110	477505	1
75	12	Pratica 160	477515	1



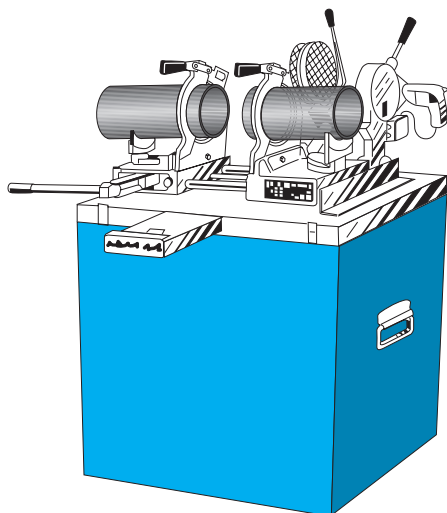
Driving belt

	Code	Quantity
Pratica 110	477495	1
Pratica 160	477500	1



PORTABLE WELDING MACHINE, "STANDARD"

Ø	Code	Quantity
40 to 160	468160	1

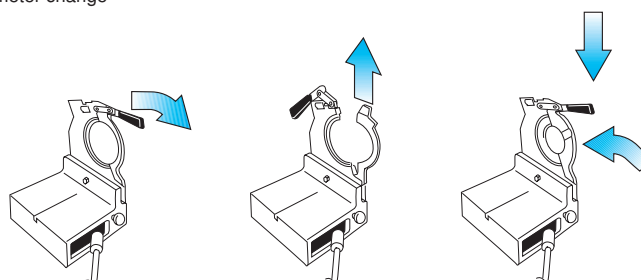


This butt welding machine consists of a heating plate, a facing miller and set of clamps mounted on a carriage. The pipe is held firmly during each operation which ensures the most accurate butt weld. This machine offers the possibility of milling both on the right and left hand side.

GENERAL PROPERTIES

Application field	Ø 40 to Ø 160 up to PN6
Sizes when transported	800x760x520 mm
Sizes for operation	1320 x 1030 x 800 mm
Weight without accessories	76 Kg.
Temperature regulation	20°C ± 5°C
Power supply	230 V 50 Hz
Power absorbed by miller	400 Watt
Power absorbed by heating plate	1200 Watt
Cable	3 m

Example of diameter change

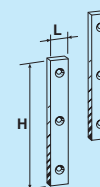


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SPARES

Spare blade

H	L		Code	Quantity
75	12	Standard	477515	1



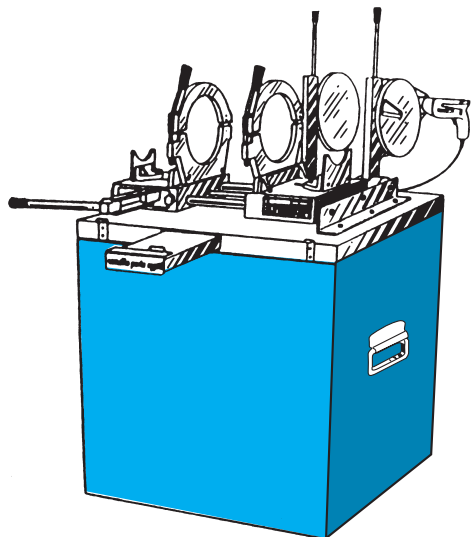
Driving belt

	Code	Quantity
Standard	477500	1



PORTABLE WELDING MACHINE, "SUPER"

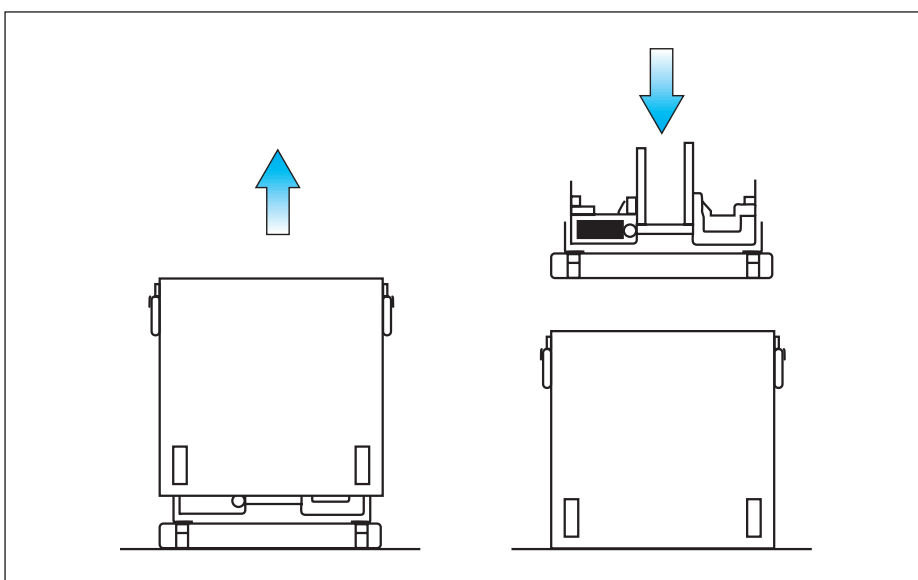
Ø	Code	Quantity
75 to 250	470001	1



The Super 250 welding machine is suitable for butt welding large waste pipes in HDPE. Reducers are provided for diameters 75. Special single clamps are available on request for welding 45° branches.

GENERAL PROPERTIES

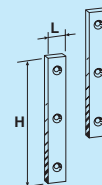
Application field	Ø 75 to Ø 250 up to PN6
Sizes when transported	800 x 760 x 520 mm
Sizes for operation	1350 x 1030 x 800 mm
Weight without accessories	87 Kg.
Temperature regulation	180° to 280°C
Power supply	220 V 50 Hz
Power absorbed by miller	700 W
Power absorbed by heating plate	2000 W


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SPARES

Spare blade

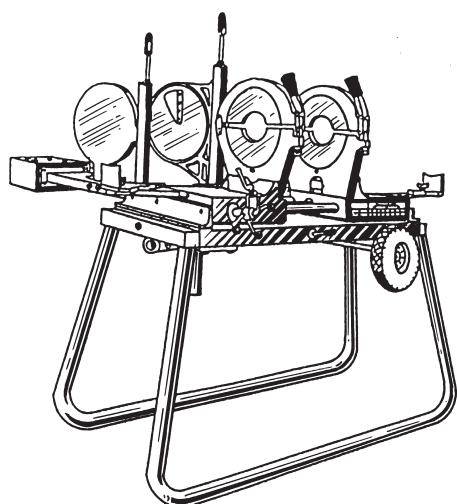
H	L		Code	Quantity
130	15	Super	477525	1



Driving belt

	Code	Quantity
Super	477520	1



WELDING MACHINE, "MAXI"

Ø	Code	Quantity
90 to 315	470005	1

The Maxi 315 welding machine is suitable on building sites for butt welding large waste pipes in HDPE. Reducers and clamps are provided for diameters 90.

The following accessories are available on request: series of reducing clamps in diameters: 140 – 180 – 225 – 280; series of single steel clamps for welding 45° branches, available in diameters 90 to 315mm and waterproof plate cover.

GENERAL PROPERTIES

Application field	Ø 90 to Ø 315 up to PN6
Sizes for operation	1460 x 1210 x 780* mm
Sizes when transported	1040 x 1210 x 780* mm
Sizes when on wheels	950 x 900 x 780* mm
Weight without accessories	157 Kg.
Temperature regulation	electronic from 180°-280°C
Power supply	220 V 50 Hz
Power absorbed by miller	800 W
Power absorbed by heating plate	2300 W

* dimensions without towing handle

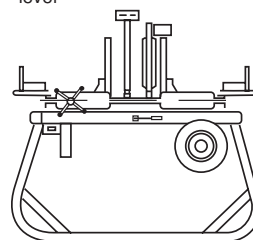
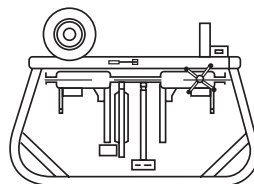
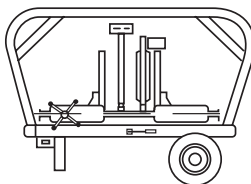
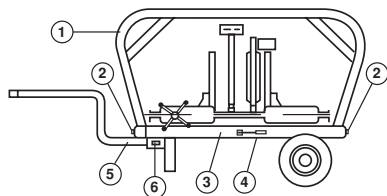
PREPARATION

1. SLIDE
2. FASTENING SCREW
3. FRAME
4. STOP LEVER
5. TOWING HANDLE
6. FASTENING SCREW FOR TOWING HANDLE

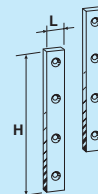
Remove handle 5 and unscrew screw 2.

Overturn the machine by 180°.

Unblock lever 4. Overturn the frame by 180°, block the lever

**40****SPARES****Spare blade**

H	L		Code	Quantity
160	20	Maxi	477535	1

**Driving belt**

	Code	Quantity
Maxi	477540	1



Clamp D and S in special alloy for branches

For welding machines, previous models MINI, MEC, MAXI

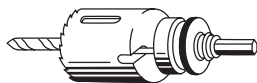
Ø		Code	Quantity
40	Right and left	471001	1
50	"	471003	1
56	"	471004	1
63	"	471005	1
75	"	471007	1
90	"	471009	1
110	"	471011	1
125	"	471013	1

Kit with clamps in special alloy for branches

For welding machines, previous models MIN, MEC, MAXI



Ø	Code	Quantity
40 - 50 - 63 - 75 - 90 - 110 - 125	472001	1

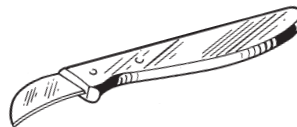
Miller

Ø	connections Ø	Code	Quantity
33	40	465001	1
43	50	465003	1

Lubricant

Plastic tube

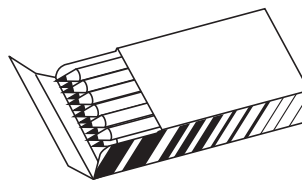
gr.	Code	Quantity
150	900001	50
250	900003	50

Knife

Code	Quantity
473001	12

Pipe scraper

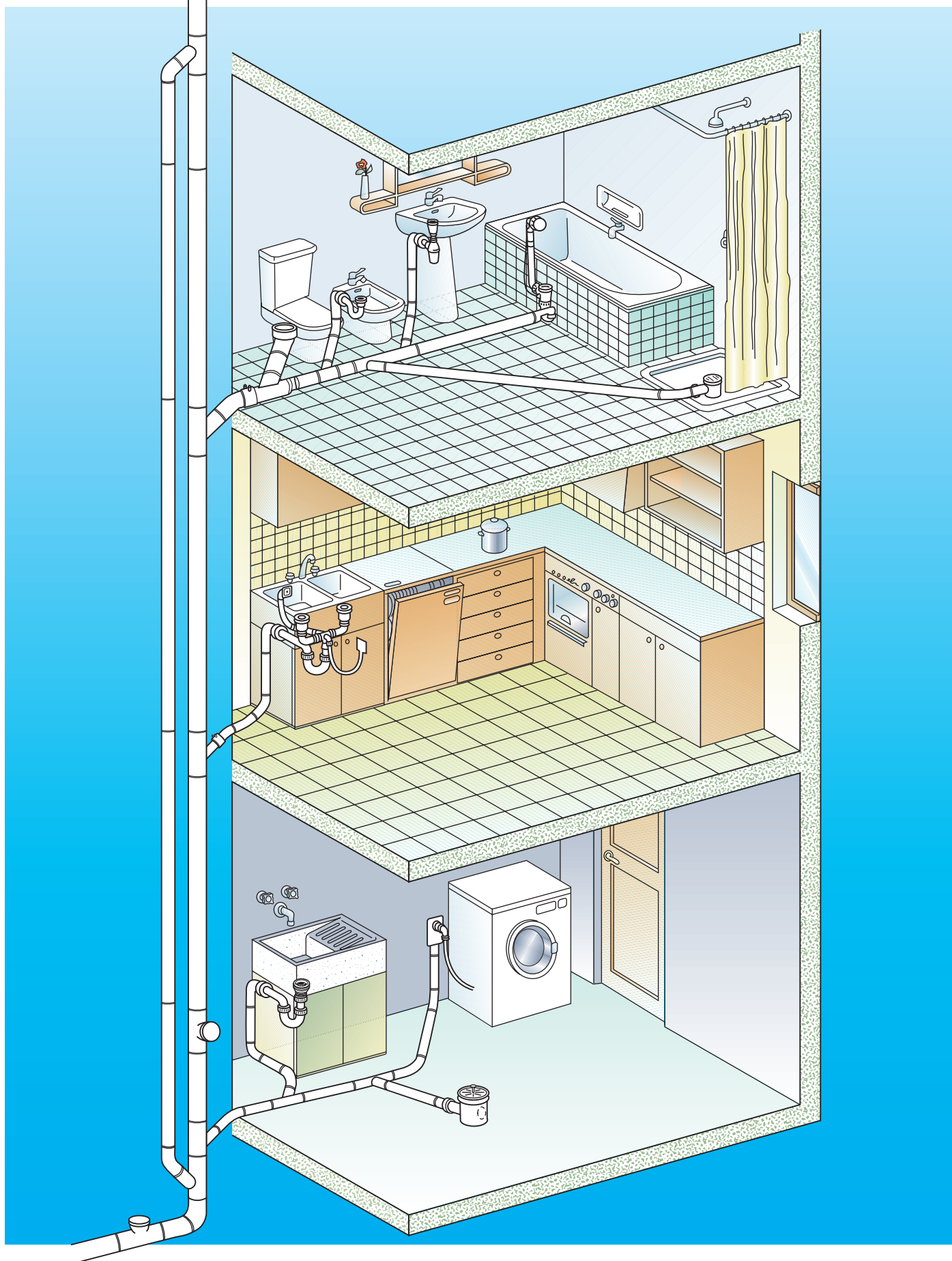
Code	Quantity
465333	1

Pencils

Code	Quantity
474001	12

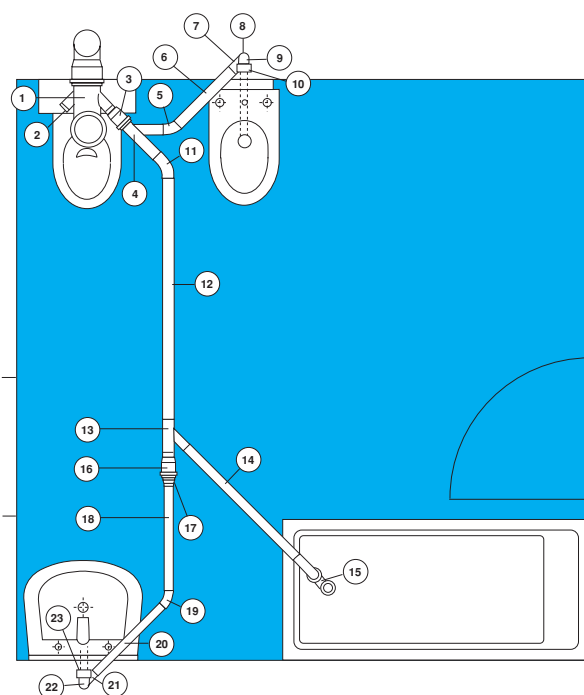
8

INSTALLATION EXAMPLES

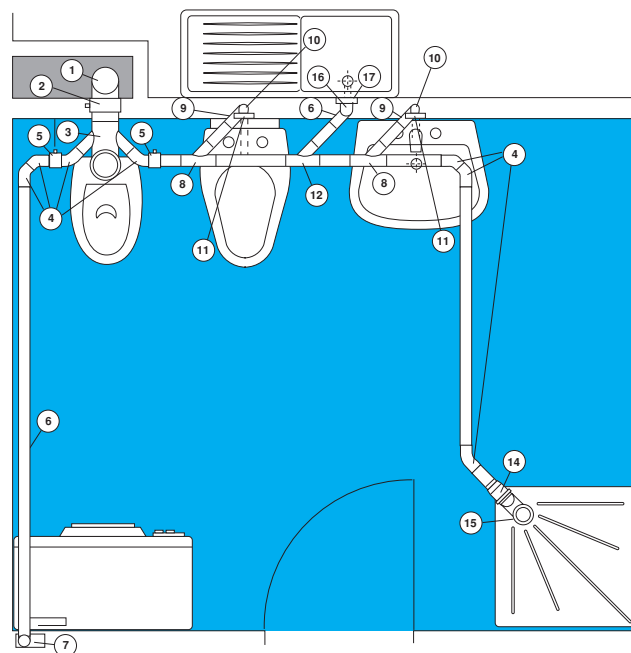


Bathroom drainage systems in HDPE

- | | |
|---|---|
| 1) Cod. 381007
Pan Connector, 2 Branches Ø 110/50 | 13) Cod. 309005
45° branch Ø 50 |
| 2) Cod. 342005
Cap Ø 50 | 14) Cod. 300005
Pipe Ø 50 |
| 3) Cod. 324003
Ring Seal Adaptor Ø 50 | 15) Cod. 700106
Bath tub trap Ø 40-50/1"1/2 |
| 4) Cod. 310003
45° reduced branch Ø 50/40 | 16) Cod. 324003
Ring Seal adaptor Ø 50 |
| 5) Cod. 306003
45° bend Ø 40 | 17) Cod. 336001
Concentric reducers Ø 50/40 |
| 6) Cod. 300003
Pipe Ø 40 | 18) Cod. 300003
Pipe Ø 40 |
| 7) Cod. 302003
90° bend Ø 40 | 19) Cod. 306003
45° bend Ø 40 |
| 8) Cod. 300003
Pipe Ø 40 | 20) Cod. 300003
Pipe Ø 40 |
| 9) Cod. 330003
Spigot bend Ø 40 | 21) Cod. 302003
90° bend Ø 40 |
| 10) Cod. 334003
Gasket Ø 1" | 22) Cod. 330003
Spigot bend Ø 40 |
| 11) Cod. 306005
45° bend Ø 50 | 23) Cod. 304003
Gasket Ø 1" |
| 12) Cod. 300005
Pipe Ø 50 | |

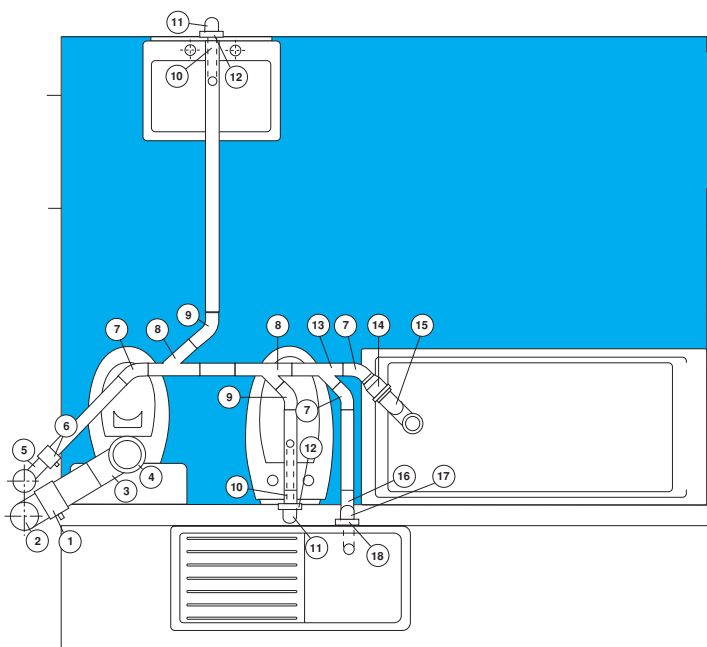


- | | |
|--|--|
| 1) Cod. 312013
88°30' branch Ø 110 (1) | 9) Cod. 302003
90° bend Ø 40 (2) |
| 2) Cod. 350011
Electro weld sleeve coupling Ø 110 (1) | 10) Cod. 330003
Spigot bend Ø 40 (2) |
| 3) Cod. 381007
Pan Connector, 2 branches Ø 110/50-50 (1) | 11) Cod. 334003
Rubber gasket (2) |
| 4) Cod. 306005
45° bend Ø 20 (7) | 12) Cod. 309005
45° branch Ø 50 (1) |
| 5) Cod. 350003
Electro weld sleeve coupling Ø 50 (2) | 14) Cod. 324003
Ring seal adaptor Ø 50 (1) |
| 6) Cod. 302005
90° bend (2) | 15) Cod. 700114
Shower trap 40 - 50 |
| 7) Cod. 700035
Washing machine trap 40 - 50 | 16) Cod. 330005
Spigot bend Ø 50 (1) |
| 8) Cod. 310003
45° reduced branch Ø 50/40 (2) | 17) Cod. 334005
Rubber gasket |



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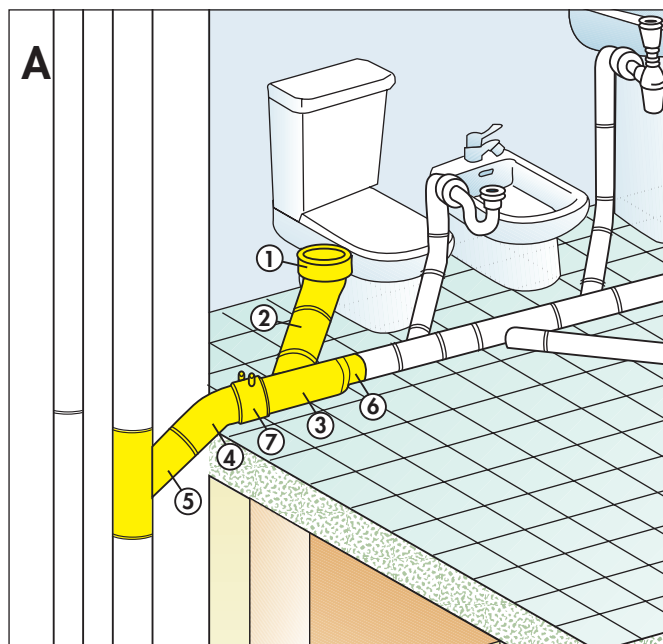
- | | |
|---|--|
| 1) Cod. 350011
Electro weld sleeve coupling Ø 110 (1) | 12) Cod. 334003
Rubber gasket (2) |
| 2) Cod. 312013
88°30' branch Ø 110 (1) | 13) Cod. 309005
45° branch Ø 50 (1) |
| 3) Cod. 360003
WC Bend Ø 110 (1) | 14) Cod. 324003
Ring seal adaptor Ø 50 (1) |
| 4) Cod. 386001
Seal for WC bend (1) | 15) Cod. 700106
Trap Ø 40 - 50/1" 1/2 (1) |
| 5) Cod. 313005
88°30' reduced branch Ø 75/50 (1) | 16) Cod. 302005
90° bend Ø 50 (1) |
| 6) Cod. 350003
Electro weld sleeve coupling Ø 50 (1) | 17) Cod. 330005
Spigot bend Ø 50 (1) |
| 7) Cod. 306005
45° branch Ø 50 (3) | 18) Cod. 334005
Rubber gasket (1) |
| 8) Cod. 310003
45° reduced branch Ø 50/40 (2) | 300.....
Pipe Ø 40 |
| 9) Cod. 306003
45° bend Ø 40 (2) | 300.....
Pipe Ø 50 |
| 10) Cod. 302003
90° bend Ø 40 (2) | 300.....
Pipe Ø 110 |
| 11) Cod. 330003
Spigot bend Ø 40 (2) | |



CONNECTION TO VARIOUS SANITARY APPLIANCES

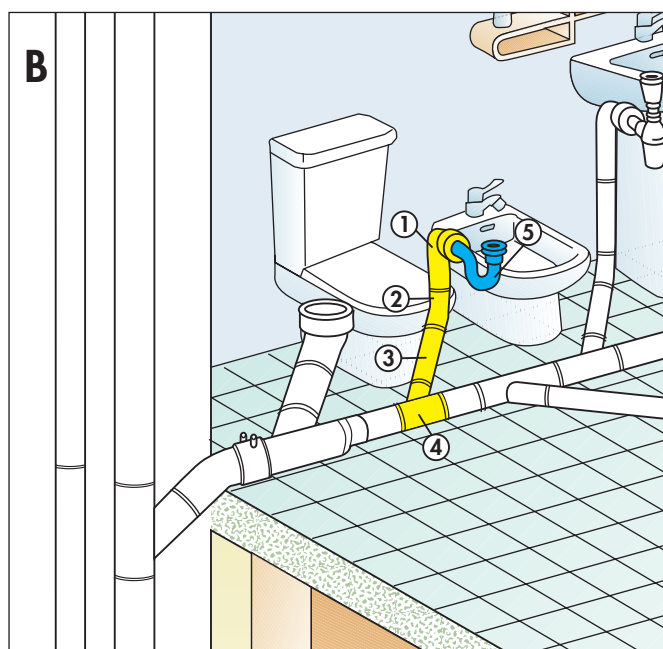
A = PAN

1. PAN CONNECTOR
2. PIPE
3. 45° BRANCH
4. 45° BEND
5. 45° BRANCH
6. ECCENTRIC REDUCER
7. ELECTRO WELD SLEEVE COUPLING



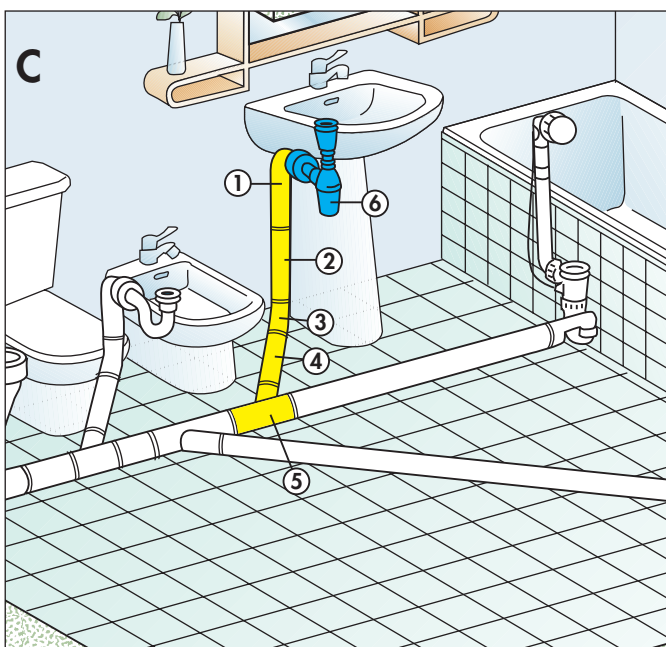
B = BIDET

1. SPIGOT BEND WITH GASKET
2. 88°30' BEND
3. PIPE
4. 45° BRANCH
5. TRAP



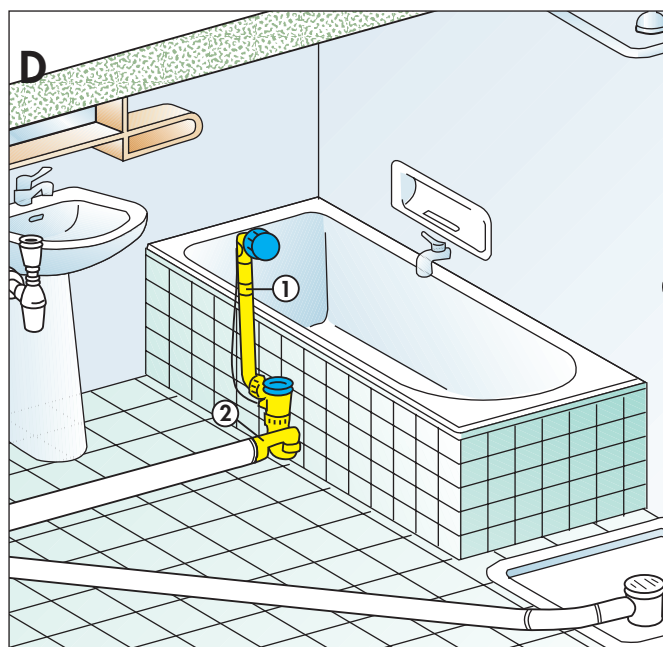
C = WASHBASIN

1. SPIGOT BEND WITH GASKET
2. PIPE
3. 88°30' BEND
4. BRANCH
5. TRAP



D = BATHTUB

1. OVERFLOW
2. BATHTUB TRAP



E = SHOWER

1. SHOWER TRAP
2. 45° BEND
3. PIPE
4. RING SEAL ADAPTOR

F = SINK

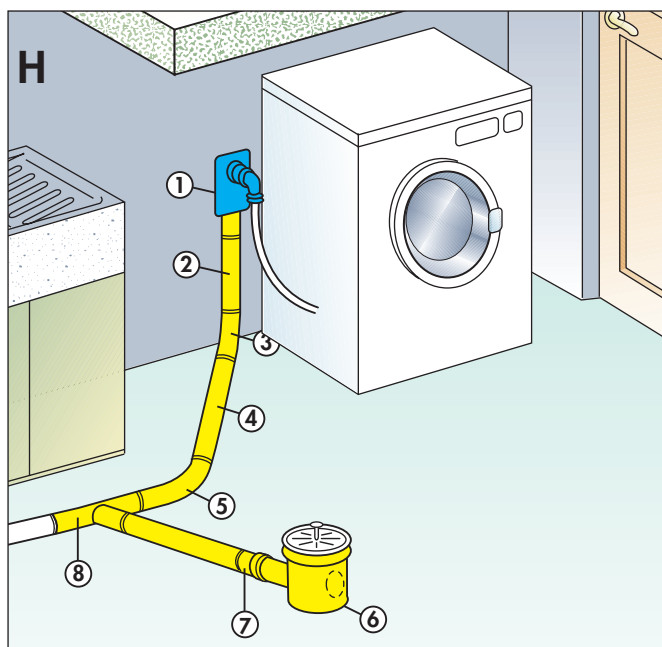
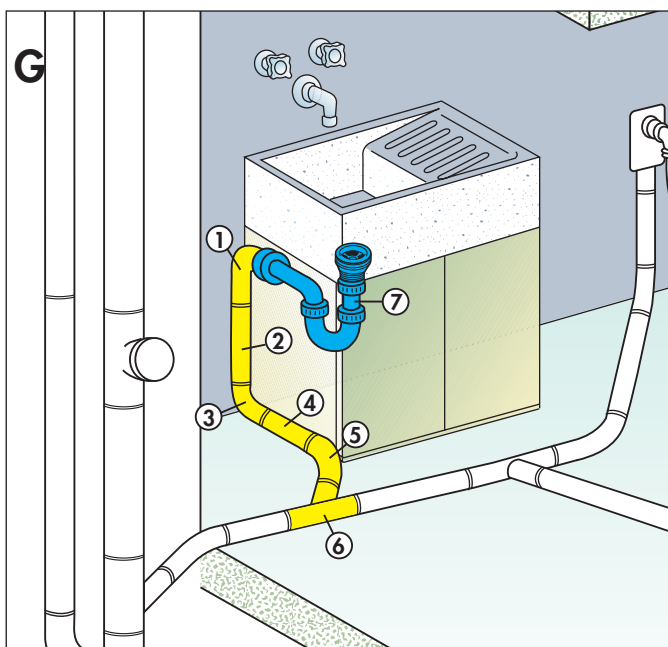
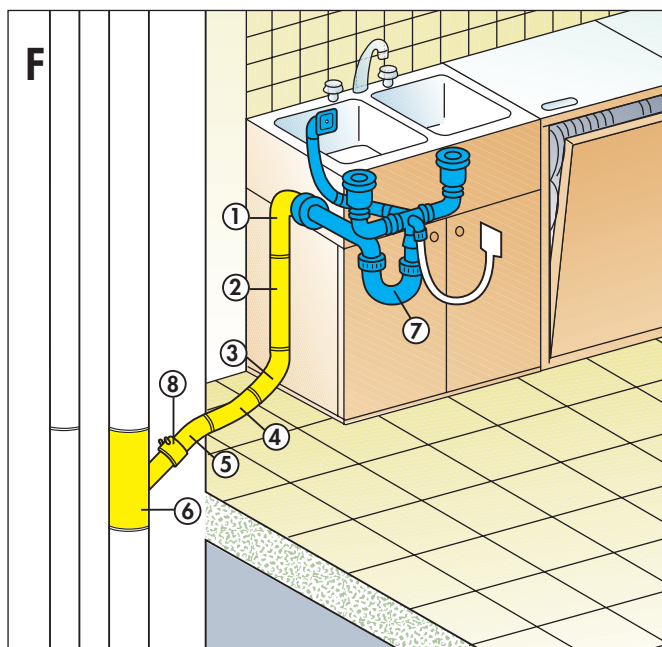
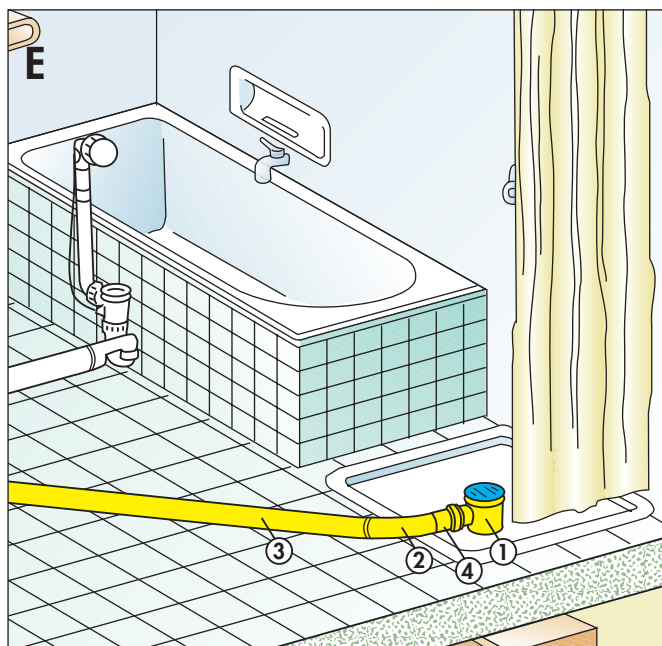
1. SPIGOT BEND WITH GASKET
2. PIPE
3. 88°30' BEND
4. PIPE
5. 45° BEND
6. 45° BRANCH
7. SINK TRAP WITH WASHING MACHINE ATTACHMENT
8. ELECTRO WELD SLEEVE COUPLING

G = WASHROOM SINK

1. SPIGOT BEND WITH GASKET
2. PIPE
3. 88°30' BEND
4. PIPE
5. 45° BEND
6. 45° BRANCH
7. SINK TRAP WITH DRAIN

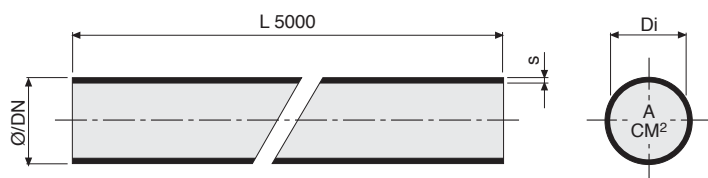
H = WASHING MACHINE / DISHWASHER

1. WASHING MACHINE / DISHWASHER TRAP
2. PIPE
3. 88°30' BEND
4. PIPE
5. 45° BEND
6. DRAIN
7. RING SEAL ADAPTOR
8. 45° BRANCH



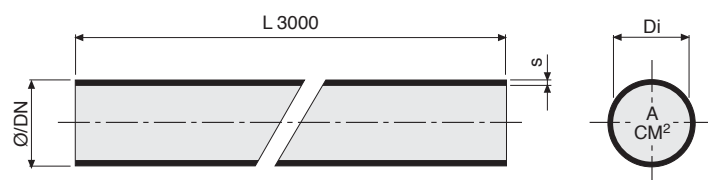
9 PIPES AND FITTINGS: SIZES

PIPE L = 5m



Ø	DN	CODE	Di	S	A cm ²	PN	Kg m	Qty/Pack	Mt/Pack
32	25	300001	26	3	5.3	10	0.305	50	250
40	32	300003	34	3	9	8	0.370	50	250
50	40	300005	44	3	15.2	6.4	0.460	50	250
56	50	300006	50	3	19.6	5.7	0.530	40	200
63	50	300007	57	3	25.4	5	0.595	35	175
75	70	300009	69	3	37.3	4.1	0.740	30	150
90	80	300011	83	3.5	54.1	4	0.980	20	100
110	100	300013	101.4	4.3	80.7	4	1.450	15	75
125	125	300015	115.2	4.9	104.5	4	1.860	10	50
160	150	300017	147.6	6.2	171.1	4	3.080	1	5
200	200	300019	187.6	6.2	276.4	3.2	4.100	1	5
250	250	300021	234.4	7.8	431.5	3.2	6.100	1	5
315	300	300023	295.4	9.8	685.3	3.2	9.510	1	5

PIPE L = 3m



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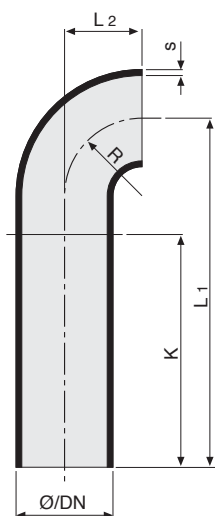
NB. The PN values have been obtained with the following formula:

$$PN = \frac{2\delta \cdot s}{D - s}$$

Ø	DN	CODE	Di	S	A cm ²	PN	Kg m	Qty/Pack	Mt/Pack
32	25	301000	26	3	5.3	10	0.305	50	150
40	32	301001	34	3	9	8	0.370	50	150
50	40	301003	44	3	15.2	6.4	0.460	50	150
56	50	301004	50	3	19.6	5.7	0.530	40	120
63	50	301005	57	3	25.4	5	0.595	35	105
75	70	301007	69	3	37.3	4.1	0.740	30	90
90	80	301009	83	3.5	54.1	4	0.980	20	60
110	100	301011	101.4	4.3	80.7	4	1.450	15	45
125	125	301013	115.2	4.9	104.5	4	1.860	10	30
160	150	301015	147.6	6.2	171.1	4	3.080	1	3

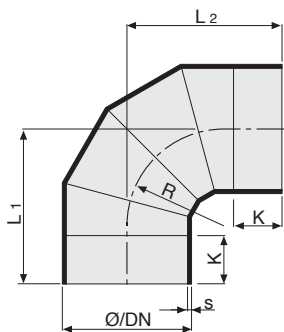
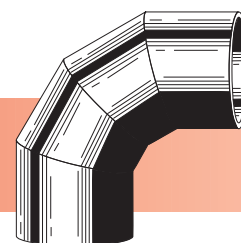
The K value indicates maximum shortening

BEND 90°



Ø	DN	CODE	S	L ₁	L ₂	R	K	Kg	Quantity
40	32	302003	3	150	30	30	120	0.070	50
50	40	302005	3	180	40	40	140	0.095	25
56	50	302006	3	210	40	40	170	0.120	25
63	50	302007	3	210	50	50	160	0.145	20
75	70	302009	3	210	70	70	140	0.180	25
90	80	302011	3.5	240	90	90	150	0.280	15
110	100	302013	4.3	270	100	100	170	0.490	10
125	125	302015	4.9	200	110	110	90	0.490	10
160	150	302017	6.2	140	140	140	-	0.690	1

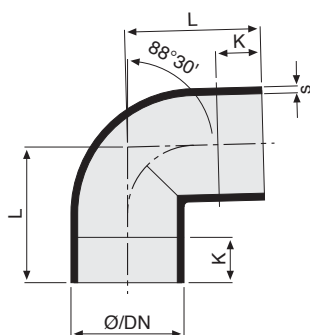
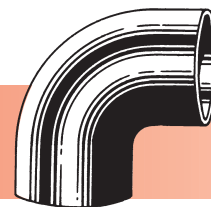
90° WIDE RADIUS BEND



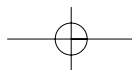
Ø	DN	CODE	S	L ₁	L ₂	R	K	Kg	Quantity
* 200	200	302019	6.2	300	300	240	75	1.745	1
* 250	250	302021	7.8	335	335	320	30	3.400	1
* 315	300	302023	9.8	370	370	350	30	5.890	1

* Segmented

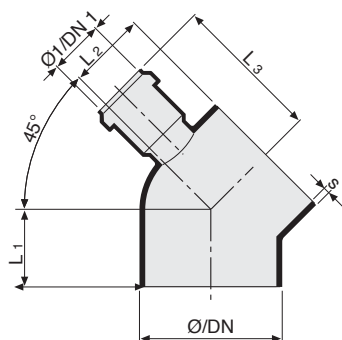
88° 30' BEND



Ø	DN	CODE	S	L	K	Kg	Quantity
32	25	304000	3	48	20	0.025	50
40	32	304001	3	50	20	0.035	50
50	40	304003	3	60	20	0.050	20
56	50	304004	3	65	20	0.060	20
63	50	304005	3	70	20	0.075	25
75	70	304007	3	75	20	0.095	20
90	80	304009	3.5	80	20	0.135	15
110	100	304011	4.3	95	25	0.230	15
125	125	304013	4.9	103	35	0.330	10
160	150	304015	6.2	123	35	0.700	1

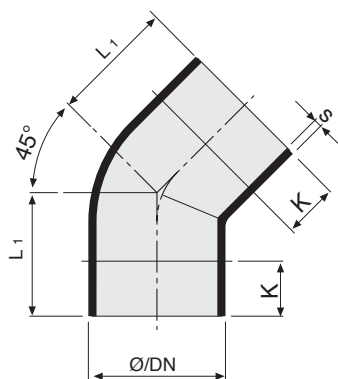


45° BEND WITH SOCKET BRANCH



Ø/Ø ₁	DN ₁ /DN ₂	CODE	S	L ₁	L ₂	L ₃	Kg	Quantity
90/40	80/32	305003	3.5	55	45	100	0.150	20
110/40	100/32	305001	4.3	60	55	110	0.210	20
110/50	100/40	305005	4.3	60	55	110	0.210	20

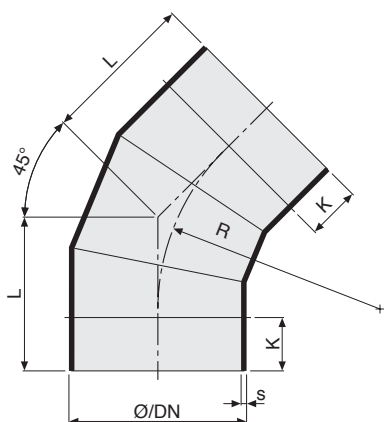
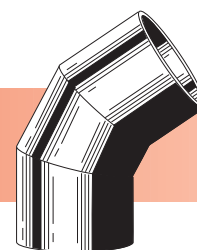
45° BEND



Ø	DN	CODE	S	L ₁	K	Kg	Quantity
32	25	306001	3	37	20	0.020	50
40	32	306003	3	45	20	0.030	40
50	40	306005	3	45	20	0.040	30
56	50	306006	3	45	20	0.045	25
63	50	306007	3	50	20	0.060	30
75	70	306009	3	50	20	0.070	25
90	80	306011	3.5	55	20	0.110	20
110	100	306013	4.3	60	25	0.170	25
125	125	306015	4.9	65	25	0.245	15
160	150	306017	6.2	69	20	0.430	1

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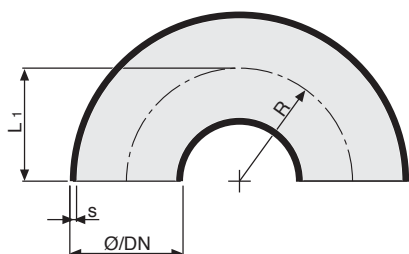
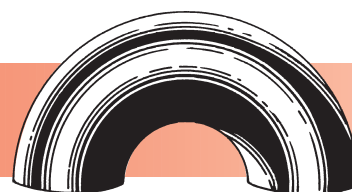
45° WIDE RADIUS BEND



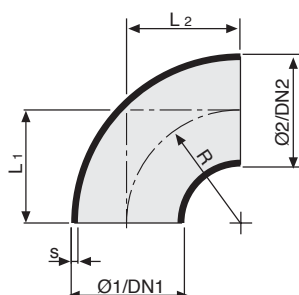
Ø	DN	CODE	S	L ₁	R	K	Kg	Quantity
200	200	306019	6.2	180	420	75	1.330	1
250	250	306021	7.8	185	430	30	2.150	1
315	300	306023	9.8	185	440	30	3.400	1

*
*
*

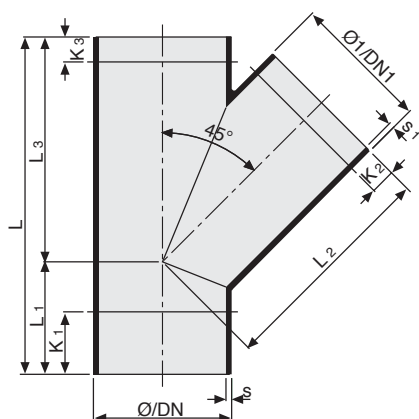
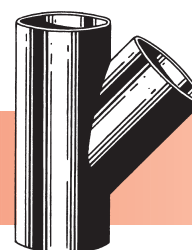
* Segmented

180° BEND

Ø	DN	CODE	S	L	R	Kg	Quantity
40	32	307001	3	40	40	0.045	40
50	40	307003	3	49	50	0.070	20
56	50	307004	3	49	49	0.085	20
63	50	307005	3	63	64	0.115	20
75	70	307007	3	75	74	0.210	10
90	80	307009	3.5	90	88	0.330	10
110	100	307011	4.3	103	99	0.450	10

90° REDUCING BEND

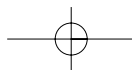
Ø ₁ /Ø ₂	DN ₁ /DN ₂	CODE	S	L ₁	L ₂	R	Kg	Quantity
50/40	40/32	308001	3	40	40	40	0.025	40
63/50	50/40	308003	3	50	50	50	0.045	20

45° EQUAL BRANCH

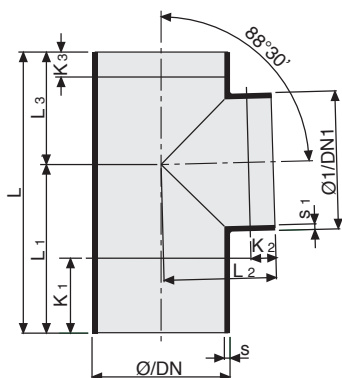
Ø / Ø ₁	DN/DN ₁	CODE	S/S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
32/32	25/25	309001	3	110	35	75	20	20	20	0.045	50
40/40	32/32	309003	3	135	45	90	25	30	30	0.070	50
50/50	40/40	309005	3	165	55	110	35	20	20	0.105	20
56/56	50/50	309006	3	180	60	120	40	25	25	0.130	20
63/63	50/50	309007	3	195	65	130	40	25	25	0.155	15
75/75	70/70	309009	3	210	70	140	40	25	25	0.205	20
90/90	80/80	309011	3.5	240	80	160	50	20	20	0.320	15
110/110	100/100	309013	4.3	270	90	180	55	20	20	0.530	10
125/125	125/125	309015	4.9	300	100	200	60	20	20	0.765	10
160/160	150/150	309017	6.2	375	125	250	75	25	25	1.475	1

Ø	DN	CODE	S/S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
* 200/200	200/200	309019	6.2	540	180	360	85	10	10	2.990	1
* 250/250	250/250	309021	7.8	660	220	440	115	55	55	5.80	1
* 315/315	300/300	309023	9.8	840	280	560	160	95	95	11.1	1

* Segmented



88° 30' EQUAL BRANCH

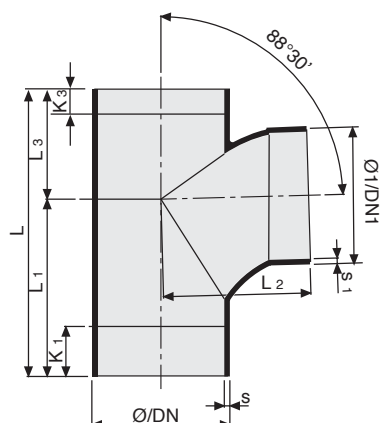


Ø / Ø ₁	DN/DN ₁	CODE	S/S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
32/32	25/25	312001	3	85	50	35	25	10	10	0.025	50
40/40	32/32	312003	3	130	75	55	45	20	20	0.060	50
50/50	40/40	312005	3	150	90	60	55	25	25	0.085	25
56/56	50/50	312006	3	175	105	70	65	30	30	0.105	25
63/63	50/50	312007	3	175	105	70	60	25	25	0.120	20
75/75	70/70	312009	3	175	105	70	55	25	25	0.145	15
90/90	80/80	312011	3.5	200	120	80	65	25	25	0.220	20
110/110	100/100	312013	4.3	225	135	90	65	20	20	0.365	15
125/125	125/125	312015	4.9	250	150	100	70	20	20	0.510	15
160/160	150/150	312017	6.2	350	210	140	105	30	30	1.190	1

	Ø	DN	CODE	S/S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
*	200/200	200/200	312019	6.2	360	180	180	25	30	25	1.705	1
*	250/250	250/250	312021	7.8	440	220	220	40	40	40	3.10	1
*	315/315	300/300	312023	9.8	560	280	280	70	65	70	6.15	1

* Welded

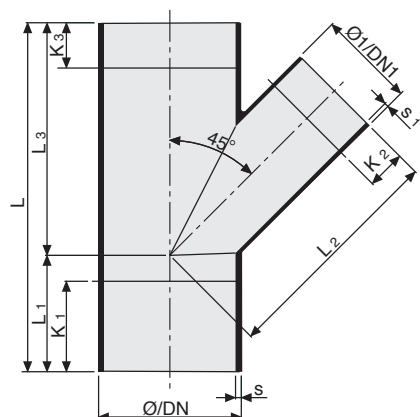
88° 30' SWEPT BRANCH



Ø	DN	CODE	S/S ₁	L	L ₁	L ₂	L ₃	K ₁	K ₂	K ₃	Kg	Quantity
110/110	100/100	312025	4.3	230	140	120	90	90	40	20	0.415	15



45° REDUCING BRANCH



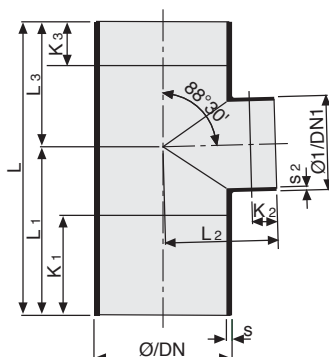
Ø / Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
40/32	32/25	310001	3	3	135	45	50	25	30	30	0.095	50
50/40	40/32	310003	3	3	165	55	110	40	45	45	0.100	20
56/50	50/40	310004	3	3	180	60	120	40	30	30	0.125	20
63/40	50/32	310005	3	3	195	65	130	40	30	30	0.105	15
63/50	50/40	310007	3	3	195	65	130	40	30	30	0.150	15
63/56	50/50	310008	3	3	195	65	130	40	25	25	0.180	15
75/40	70/32	310009	3	3	210	70	140	60	30	40	0.150	25
75/50	70/40	310011	3	3	210	70	140	60	30	40	0.190	25
75/56	70/50	310012	3	3	210	70	140	55	25	35	0.190	25
75/63	70/50	310014	3	3	210	70	140	55	25	35	0.190	25
90/40	80/32	310013	3.5	3	240	80	160	80	40	50	0.270	15
90/50	80/40	310015	3.5	3	240	80	160	80	40	50	0.275	15
90/56	80/50	310006	3.5	3	240	80	160	75	35	45	0.275	20
90/63	80/50	310018	3.5	3	240	80	160	65	30	25	0.275	15
90/75	80/70	310010	3.5	3	240	80	160	65	30	25	0.300	15
110/40	100/32	310017	4.3	3	270	90	180	95	50	55	0.450	10
110/50	100/40	310019	4.3	3	270	90	180	95	50	55	0.440	10
110/56	100/50	310020	4.3	3	270	90	180	90	40	45	0.455	10
110/63	100/50	310021	4.3	3	270	90	180	80	35	40	0.455	10
110/75	100/70	310023	4.3	3	270	90	180	75	30	35	0.470	10
110/90	100/80	310025	4.3	3.5	270	90	180	65	25	30	0.485	10
125/40	125/32	310027	4.9	3	300	100	200	95	45	50	0.610	10
125/50	125/40	310029	4.9	3	300	100	200	95	45	50	0.630	10
125/56	125/50	310030	4.9	3	300	100	200	95	45	50	0.630	10
125/63	125/50	310031	4.9	3	300	100	200	95	40	50	0.585	10
125/75	125/70	310033	4.9	3	300	100	200	95	40	50	0.630	10
125/90	125/80	310035	4.9	3.5	300	100	200	80	35	30	0.650	10
125/110	125/100	310037	4.9	4.3	300	100	200	70	25	25	0.700	10
160/110	150/100	310039	6.2	4.3	375	125	250	110	45	55	1.25	1
160/125	150/125	310041	6.2	4.9	375	125	250	100	40	50	1.30	1

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	Ø	DN	CODE	S	S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
*	200/110	200/100	310043	6.2	4.3	540	180	360	150	140	65	2.40	1
*	200/125	200/125	310045	6.2	4.9	540	180	360	140	130	55	2.50	1
*	200/160	200/150	310047	6.2	6.2	540	180	360	115	85	35	2.70	1
*	250/110	250/100	310049	7.8	4.3	660	220	440	215	185	150	4.40	1
*	250/125	250/125	310051	7.8	4.9	660	220	440	205	175	140	4.75	1
*	250/160	250/150	310053	7.8	6.2	660	220	440	180	130	50	4.85	1
*	250/200	250/200	310055	7.8	6.2	660	220	440	150	50	90	5.00	1
*	315/110	300/100	310057	9.8	4.3	840	280	560	305	260	235	8.60	1
*	315/125	300/125	310059	9.8	4.9	840	280	560	290	250	220	9.15	1
*	315/160	300/150	310061	9.8	6.2	840	280	560	270	205	200	9.15	1
*	315/200	300/200	310063	9.8	6.2	840	280	560	240	125	175	9.45	1
*	315/250	300/250	310065	9.8	7.8	840	280	560	205	130	140	9.25	1

* Welded



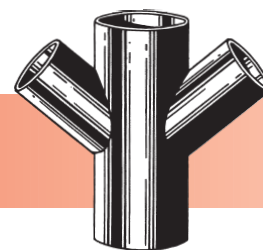
88° 30' REDUCING BRANCH

Ø / Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
40/32	32/25	313001	3	3	130	75	55	50	20	25	0.050	50
50/40	40/32	313003	3	3	150	90	60	60	25	30	0.080	25
56/50	50/40	313002	3	3	175	105	70	70	30	35	0.105	25
63/40	50/32	313008	3	3	175	105	70	70	30	35	0.115	20
63/50	50/40	313012	3	3	175	105	70	70	30	35	0.125	20
63/56	50/50	313032	3	3	175	105	70	60	30	30	0.125	20
75/40	70/32	313004	3	3	175	105	70	75	25	35	0.140	25
75/50	70/40	313005	3	3	175	105	70	70	25	35	0.140	20
75/56	70/50	313006	3	3	175	105	70	65	25	30	0.140	20
75/63	70/50	313010	3	3	175	105	70	60	25	25	0.145	20
90/40	80/32	313007	3.5	3	200	120	80	85	25	45	0.205	20
90/50	80/40	313009	3.5	3	200	120	80	85	25	45	0.410	20
90/56	80/50	313034	3.5	3	200	120	80	85	25	35	0.410	20
90/63	80/50	313028	3.5	3	200	120	80	75	25	35	0.410	20
90/75	80/70	313036	3.5	3	200	120	80	70	25	30	0.430	20
110/40	100/32	313011	4.3	3	225	135	90	100	25	60	0.345	15
110/50	100/40	313013	4.3	3	225	135	90	95	25	50	0.345	15
110/56	100/50	313014	4.3	3	225	135	90	90	25	45	0.345	15
110/63	110/50	313015	4.3	3	225	135	90	95	25	35	0.340	15
110/75	100/70	313017	4.3	3	225	135	90	85	25	35	0.345	15
110/90	100/80	313019	4.3	3.5	225	135	90	75	25	30	0.360	15
125/110	125/100	313021	4.9	4.3	250	150	100	80	20	30	0.490	15
160/110	150/100	313023	6.2	4.3	350	210	140	135	45	60	1.120	1
160/125	150/125	313025	6.2	4.9	350	210	140	125	45	50	1.145	1

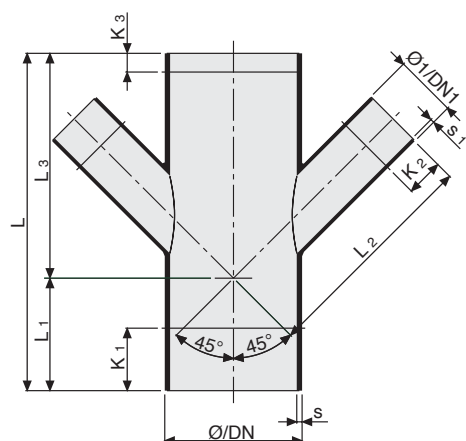
52

	Ø / Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
*	200/110	200/100	313027	6.2	4.3	360	180	180	70	60	70	1.510	1
*	200/125	200/125	313029	6.2	4.9	360	180	180	65	60	65	1.460	1
*	200/160	200/150	313031	6.2	6.2	360	180	180	45	50	45	1.600	1
*	250/110	250/100	313033	7.8	4.3	440	220	220	110	75	110	2.715	1
*	250/125	250/125	313035	7.8	4.9	440	220	220	105	75	105	2.420	1
*	250/160	250/150	313037	7.8	6.2	440	220	220	85	65	85	2.800	1
*	250/200	250/200	313039	7.8	6.2	440	220	220	65	60	65	2.820	1
*	315/110	300/100	313041	9.8	4.3	560	280	280	170	100	170	5.315	1
*	315/125	300/125	313043	9.8	4.9	560	280	280	165	100	165	5.420	1
*	315/160	300/150	313045	9.8	6.2	560	280	280	145	90	145	5.370	1
*	315/200	300/200	313047	9.8	6.2	560	280	280	120	65	120	5.570	1
*	315/250	300/250	313049	9.8	7.8	560	280	280	95	65	95	5.620	1

* Welded

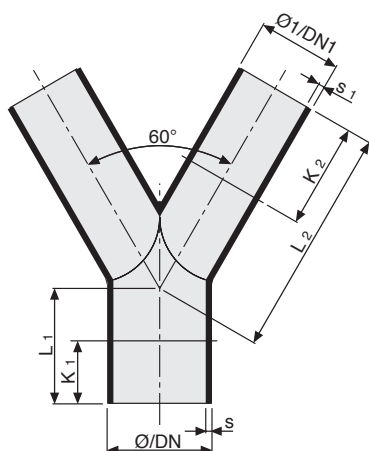
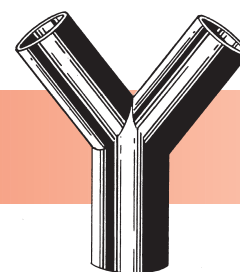


45° DOUBLE REDUCING BRANCH

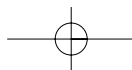


Ø / Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂ /L ₃	K ₁	K ₂	K ₃	Kg	Quantity
110/110	100/100	314005	4.3	4.3	270	90	180	50	15	15	0.630	10
110/40	100/32	314001	4.3	3	270	90	180	95	30	15	0.435	10
110/50	100/40	314003	4.3	3	270	90	180	95	30	15	0.455	10

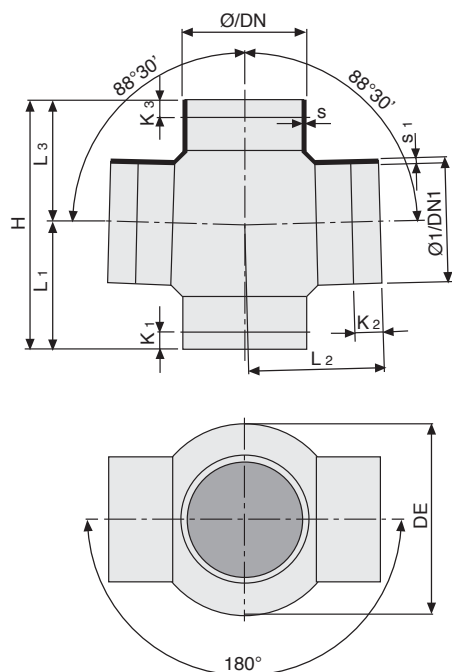
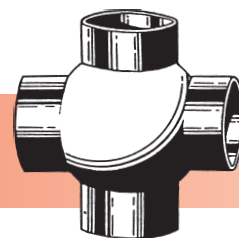
60° DOUBLE BRANCH



Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L ₁	L ₂	K ₁	K ₂	Kg	Quantity
50/40	40/32	316001	3	3	55	110	40	50	0.093	25
63/50	50/40	316003	3	3	65	130	50	40	0.141	25
110/110	100/100	316011	4.3	4.3	90	120	50	-	0.393	10

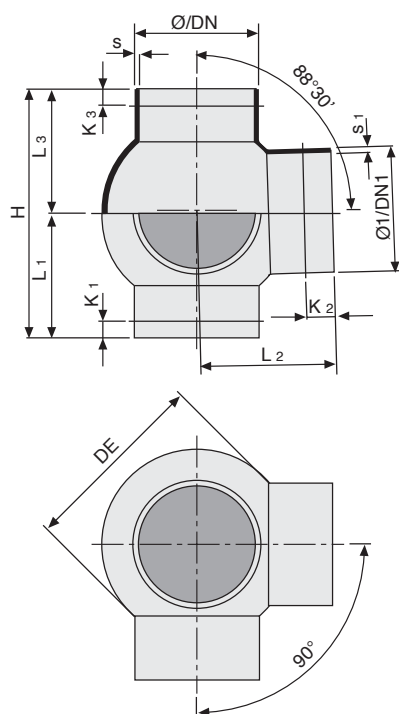
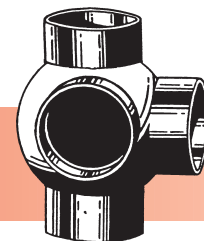


180° 2-WAY BALL FITTINGS

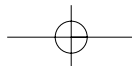


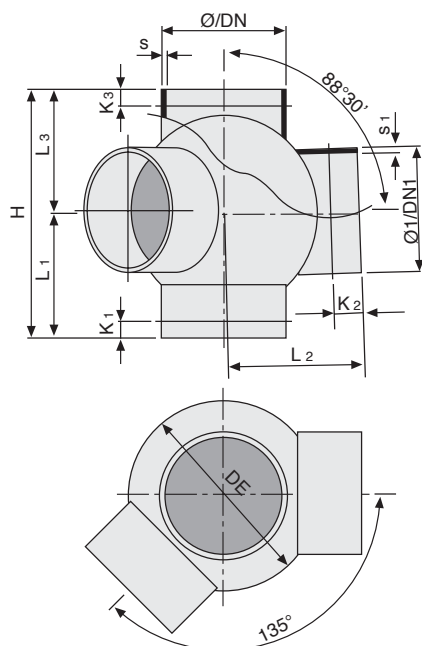
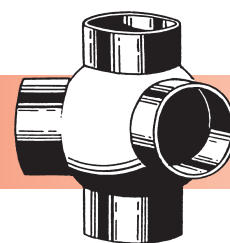
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	H	DE	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	318001	4.3	3	220	170	105	120	15	15	0.440	5
110/56	100/50	318002	4.3	3	220	170	105	120	15	15	0.450	5
110/75	100/70	318003	4.3	3	220	170	105	120	15	15	0.430	5
110/90	100/80	318004	4.3	3.5	220	170	105	120	15	15	0.470	5
110/110	100/100	318005	4.3	4.3	220	170	105	120	15	15	0.480	5
125/50	125/40	318007	4.9	3	220	190	110	125	15	15	0.495	5
125/56	125/50	318008	4.9	3	220	190	110	125	15	15	0.500	5
125/75	125/70	318009	4.9	3	220	190	110	125	15	15	0.555	5
125/90	125/80	318010	4.9	3.5	220	190	110	125	15	15	0.555	5
125/110	125/100	318011	4.9	4.3	220	190	110	125	15	25	0.565	5
125/125	125/125	318013	4.9	4.9	220	190	110	125	15	25	0.625	5

90° 2-WAY BALL FITTINGS

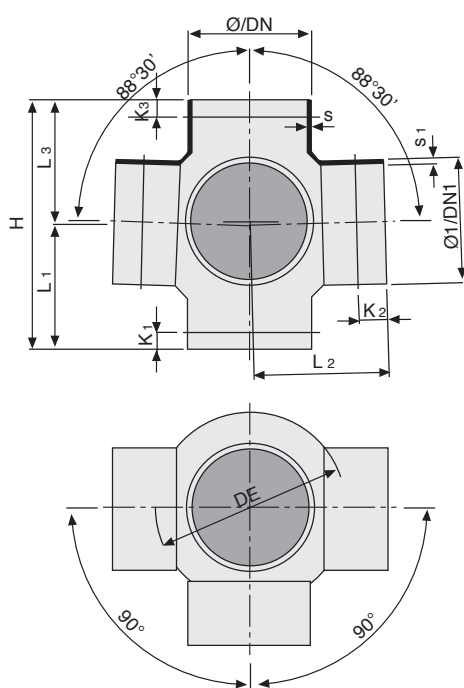
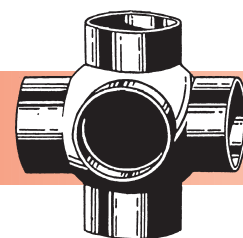


Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	H	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	318015	4.3	3	220	105	120	15	15	0.450	5
110/56	100/50	318016	4.3	3	220	105	120	15	15	0.425	5
110/75	100/70	318017	4.3	3	220	105	120	15	15	0.500	5
110/90	100/80	318020	4.3	3.5	220	105	120	15	15	0.465	5
110/110	100/100	318019	4.3	4.3	220	105	120	15	15	0.505	5
125/50	125/40	318021	4.9	3	220	110	125	15	15	0.500	5
125/56	125/50	318022	4.9	3	220	110	125	15	15	0.500	5
125/75	125/70	318023	4.9	3	220	110	125	15	15	0.530	5
125/90	125/80	318026	4.9	3.5	220	110	125	15	15	0.540	5
125/110	125/100	318025	4.9	4.3	220	110	125	15	25	0.605	5
125/125	125/125	318031	4.9	4.9	220	110	125	15	25	0.620	5



135° 2-WAY BALL FITTINGS

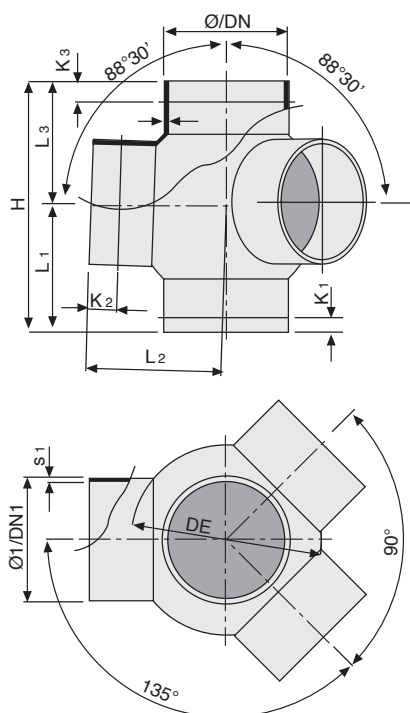
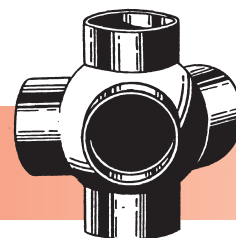
$\varnothing/\varnothing_1$	DN/DN ₁	CODE	S	S ₁	H	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	318033	4.3	3	220	105	120	15	15	0.440	5
110/56	100/50	318034	4.3	3	220	105	120	15	15	0.445	5
110/75	100/70	318035	4.3	3	220	105	120	15	15	0.455	5
110/90	100/80	318036	4.3	3.5	220	105	120	15	15	0.470	5
110/110	100/100	318037	4.3	4.3	220	105	120	15	25	0.500	5
125/50	125/40	318039	4.9	3	220	110	125	15	15	0.490	5
125/56	125/50	318040	4.9	3	220	110	125	15	15	0.555	5
125/75	125/70	318041	4.9	3	220	110	125	15	15	0.565	5
125/90	125/80	318042	4.9	3.5	220	110	125	15	15	0.575	5
125/110	125/100	318043	4.9	4.3	220	110	125	15	25	0.600	5
125/125	125/125	318045	4.9	4.9	220	110	125	15	25	0.740	5

90° 3-WAY BALL FITTINGS

$\varnothing/\varnothing_1$	DN/DN ₁	CODE	S	S ₁	H	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	320001	4.3	3	220	105	120	15	15	0.320	5
110/56	100/50	320002	4.3	3	220	105	120	15	15	0.470	5
110/75	100/70	320003	4.3	3	220	105	120	15	15	0.460	5
110/90	100/80	320006	4.3	3.5	220	105	120	15	15	0.510	5
110/110	100/100	320005	4.3	4.3	220	105	120	15	15	0.545	5
125/50	125/40	320007	4.9	3	220	110	125	15	15	0.570	5
125/56	125/50	320008	4.9	3	220	110	125	15	15	0.515	5
125/75	125/70	320009	4.9	3	220	110	125	15	15	0.515	5
125/90	125/80	320012	4.9	3.5	220	110	125	15	15	0.525	5
125/110	125/100	320011	4.9	4.3	220	110	125	15	25	0.595	5
125/125	125/125	320013	4.9	4.9	220	110	125	15	25	0.670	5

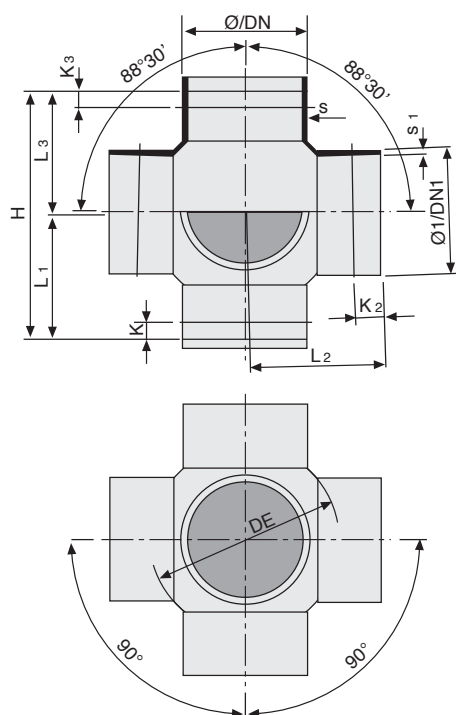
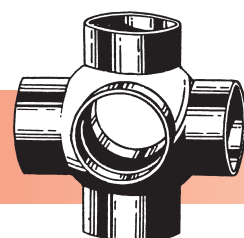


135° 3-WAY BALL FITTINGS

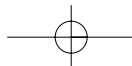


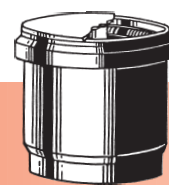
$\varnothing/\varnothing_1$	DN/DN ₁	CODE	S	S ₁	H	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	320015	4.3	3	220	105	120	15	15	0.465	5
110/56	100/50	320016	4.3	3	220	105	120	15	15	0.455	5
110/75	100/70	320017	4.3	3	220	105	120	15	15	0.440	5
110/90	100/80	320018	4.3	3.5	220	105	120	15	15	0.450	5
110/110	100/100	320019	4.3	4.3	220	105	120	15	15	0.540	5
125/50	125/40	320021	4.9	3	220	110	125	15	15	0.630	5
125/56	125/50	320022	4.9	3	220	110	125	15	15	0.515	5
125/75	125/70	320023	4.9	3	220	110	125	15	15	0.620	5
125/90	125/80	320024	4.9	3.5	220	110	125	15	15	0.630	5
125/110	125/100	320025	4.9	4.3	220	110	125	15	25	0.620	5
125/125	125/125	320027	4.9	4.9	220	110	125	15	25	0.670	5

4-WAY BALL FITTINGS

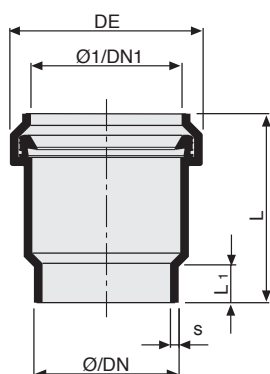


$\varnothing/\varnothing_1$	DN/DN ₁	CODE	S	S ₁	H	L ₁ /L ₃	L ₂	K ₁ /K ₃	K ₂	Kg	Quantity
110/50	100/40	322001	4.3	3	220	105	120	15	15	0.480	5
110/56	100/50	322002	4.3	3	220	105	120	15	15	0.480	5
110/75	100/70	322003	4.3	3	220	105	120	15	15	0.475	5
110/90	100/80	322004	4.3	3.5	220	105	120	15	15	0.535	5
110/110	100/100	322005	4.3	4.3	220	105	120	15	15	0.575	5
125/50	125/40	322007	4.9	3	220	105	125	15	15	0.530	5
125/56	125/50	322008	4.9	3	220	105	125	15	15	0.485	5
125/75	125/70	322009	4.9	3	220	105	125	15	15	0.425	5
125/90	125/80	322010	4.9	3.5	220	105	125	15	15	0.680	5
125/110	125/100	322011	4.9	4.3	220	105	125	15	25	0.690	5
125/125	125/125	322013	4.9	4.3	220	105	125	15	25	0.740	5





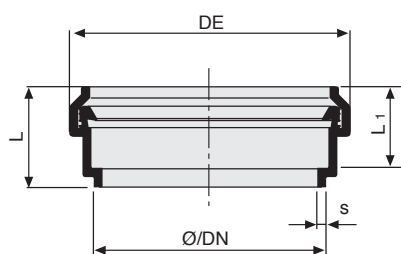
RING SEAL ADAPTOR WITH CAP



Ø/Ø ₁	DN/DN ₁	CODE	S	DE	L	L ₁	Kg	Quantity
32	25	324000	3	46	46	8	0.020	50
40	32	324001	3	56.5	65	13	0.040	40
50	40	324003	3	66.5	65	13	0.050	30
56	50	324004	3	72.5	65	13	0.050	30
56-63	50	324006	3	72.5	50	-	0.050	20
63	50	324005	3	79	65	11	0.065	20
75	70	324007	3	92	90	17	0.110	20
90	80	324009	3,5	108	90	17	0.150	25
110	100	324011	4,3	130	95	17	0.220	10
125	125	324013	4,9	149	95	15	0.230	10
160	150	324015	6,2	188	130	30	0.530	1
200	200	324017	6,2	225	170	18	1.075	1
250	250	324019	7,8	278	170	22	1.370	1
315	300	324021	9,8	350	180	22	1.970	1

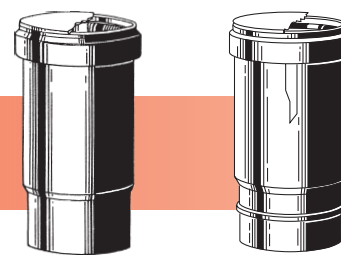
◦ Without plug

SHORT RING SEAL ADAPTOR WITH CAP

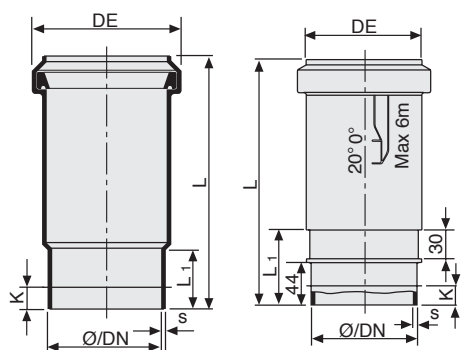


Ø/Ø ₁	DN/DN ₁	CODE	S	DE	L	L ₁	Kg	Quantity
90	80	326001	3,5	108	42	31,5	0,070	25
110	100	326003	4,3	130	42	31,5	0,115	25
90/110	80/100	326111	4,3	110	43,5	-	0,140	20

EXPANSION JOINT WITH CAP



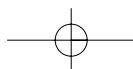
57

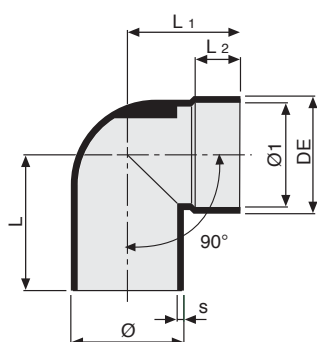
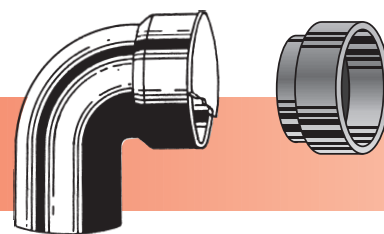


* Ø 110 only

Ø	DN	CODE	S	DE	L	L ₁	K	Kg	Quantity
32	25	328000	3	40	93	9	-	0.040	50
40	32	328001	3	73	235	60	40	0.160	20
50	40	328003	3	81	235	56	40	0.200	15
56	50	328004	3	90	235	50	40	0.220	15
63	50	328005	3	96	235	56	40	0.250	15
75	70	328007	3	109	235	56	40	0.300	10
90	80	328009	3,5	117	235	54	40	0.335	15
110	100	328012	4,3	140	255	46	20	0.500	10
125	125	328013	4,9	154	235	53	40	0.625	10
160	150	328015	6,2	192	260	72	40	1.010	1
200	200	328017	6,2	228	350	80	40	1.850	1
250	250	328019	7,8	280	440	183	100	3.380	1
315	300	328021	9,8	350	480	183	100	6.100	1

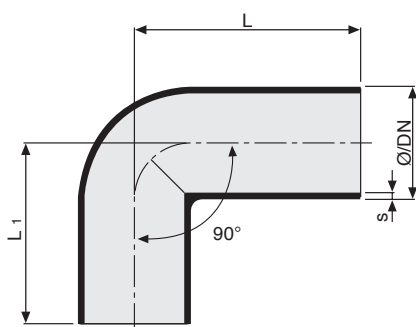
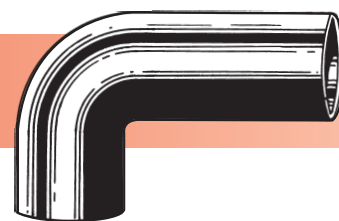
◦ Without plug



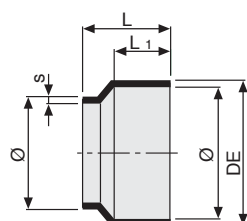
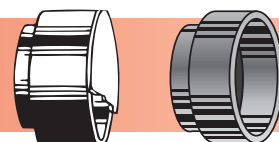
SPIGOT BEND WITH CAP

Ø/Ø ₁	CODE	S	DE	L	L ₁	L ₂	Kg	Quantity
32/46	330001	3	52	55	47	23	0.050	40
40/46	330003	3	52	60	51	22	0.055	40
50/46	◆ 330005	3	52	62	51	22	0.060	40
50/58	330007	3	64	68	55	24	0.070	20
56/46	◆ 330009	3	52	64	60	22	0.070	20
56/58	330011	3	64	65	60	22	0.075	20

◆ with protective plug for socket

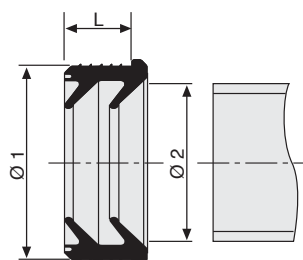
EXTENDED SPIGOT BEND

Ø	DN	CODE	S	DE	L	L ₁	Kg	Quantity
50	40	331005	3	44	100	80	0.075	20
56	50	331006	3	50	100	80	0.085	20

SLEEVE

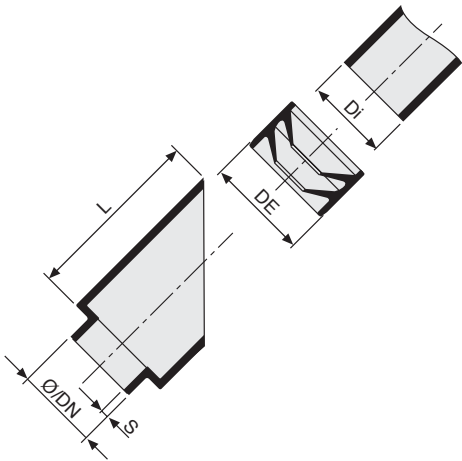
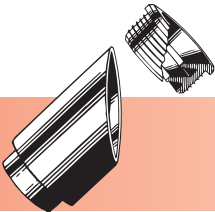
Ø	CODE	S	DE	L	L ₁	Kg	Quantity
32/46	332000	3	52	30	20	0.020	40
40/46	332001	3	52	30	20	0.015	40
50/46	332003	3	52	30	20	0.015	40
50/58	◆ 332005	3	64	38	20	0.020	20
56/46	332007	3	52	38	20	0.020	20
56/58	◆ 332009	3	64	38	20	0.025	20

◆ with protective plug for socket

GASKET

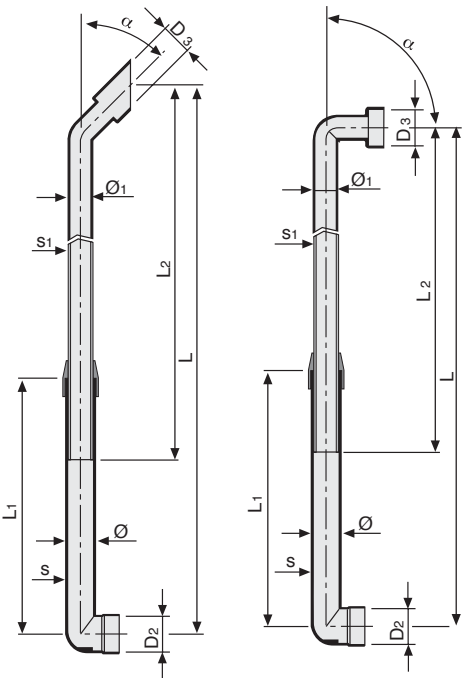
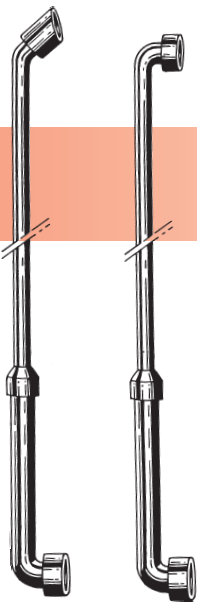
Ø1	Ø2	CODE	L	FOR CODES	Kg	Quantity
46	24-32	334003	22	330-331-332-335003	0.020	100
46	36-40	334005	22		0.010	100
58	36-40	334007	22		0.20	100
58	47-50	334009	22		0.30	100
40	24-32	334021	22	333-335001	0.020	20

SLEEVE FOR HIGH-LEVEL CISTERN WITH GASKET



Ø	DN	CODE	S	DI	DE	L	Kg	Quantity
32	25	333001	3	24-32	40	70	0.015	20

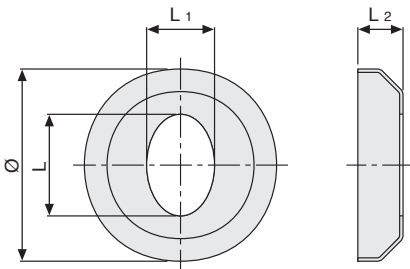
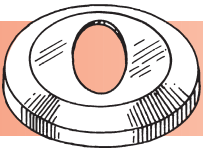
TELESCOPIC PIPE FOR HIGH-LEVEL CISTERN



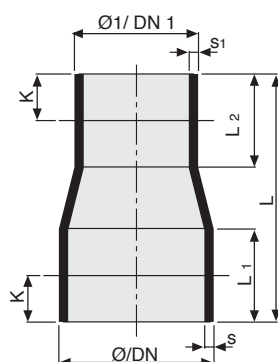
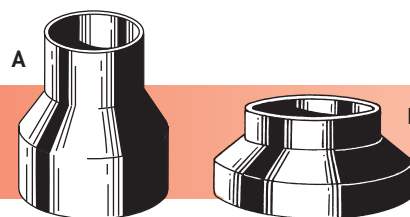
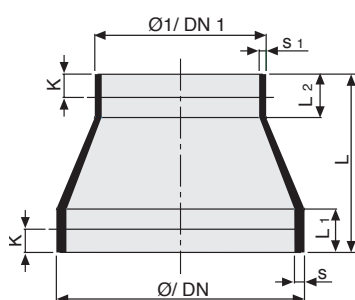
ØØ ₁	α	CODE	S	S ₁	D ₂	D ₃	L	L ₁	L ₂	Kg	Quantity
40/32	45°	335001	3	3	46	40	1900 max	550	1370	0.695	20
40/32	90°	335003	3	3	46	46	1900 max	550	1370	0.785	20

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CHROME SHIELD



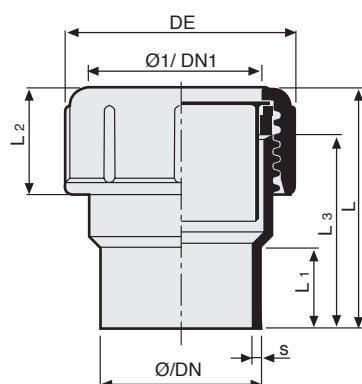
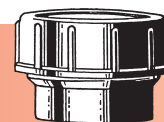
Ø	CODE	L	L ₁	L ₂	Kg	Quantity
85	337001	44	31	21	0.015	20

CONCENTRIC REDUCERS**A****B****MOD. A**

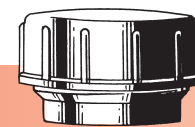
Ø / Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂	K	Kg	Quantity
40/32	32/25	336000	3	3	80	30	30	15	0.025	50
50/40	40/32	336001	3	3	80	30	30	15	0.040	50
56/50	50/40	336002	3	3	80	30	30	15	0.040	50
58/56	50/50	336061	3	3	95	60	30	15	0.046	20
63/40	50/32	336003	3	3	80	30	30	15	0.040	40
63/50	50/40	336005	3	3	80	30	30	15	0.050	40
63/56	50/50	336006	3	3	80	30	30	15	0.045	40
78/63	70/50	336063	3	3	100	60	30	15	0.062	20
75/40	70/32	336007	3	3	80	30	30	15	0.045	40
75/50	70/40	336009	3	3	80	30	30	15	0.050	30
75/56	70/50	336010	3	3	80	30	30	15	0.060	30
75/63	70/50	336011	3	3	80	30	30	15	0.060	30
90/40	80/32	336013	3.5	3	80	30	30	15	0.085	20
90/50	80/40	336015	3.5	3	80	30	30	15	0.065	20
90/56	80/50	336016	3.5	3	80	30	30	15	0.070	20
90/63	80/50	336017	3.5	3	80	30	30	15	0.090	20
90/75	80/70	336019	3.5	3	80	30	30	15	0.095	20
110/40	100/32	336021	4.3	3	80	30	30	15	0.090	25
110/50	100/40	336023	4.3	3	80	30	30	15	0.115	25
110/56	100/50	336024	4.3	3	80	30	30	15	0.095	25
110/63	100/50	336025	4.3	3	80	30	30	15	0.105	25
110/75	100/70	336027	4.3	3	80	30	30	15	0.125	20
110/90	100/80	336029	4.3	3.5	80	30	30	15	0.125	20
125/50	125/40	336031	4.9	3	80	30	30	15	0.125	20
125/56	125/50	336032	4.9	3	80	30	30	15	0.125	20
125/63	125/50	336033	4.9	3	80	30	30	15	0.125	20
125/75	125/70	336035	4.9	3	80	30	30	15	0.135	20
125/90	125/80	336037	4.9	3.5	80	30	30	15	0.255	20
125/110	125/100	336039	4.9	4.3	80	30	40	20	0.325	20

MOD. B

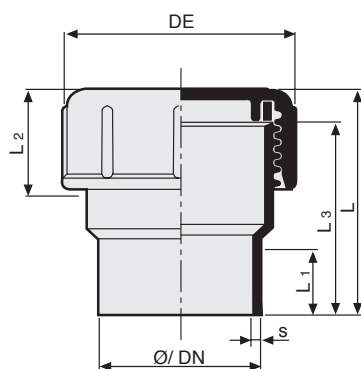
160/110	150/100	336041	6.2	4.3	115	30	30	15	0.255	1
200/160	200/150	336049	9.2	6.2	180	60	60	20	0.325	1

THREADED COUPLING

Ø/Ø ₁	DN/DN ₁	CODE	S	L	L ₁	L ₂	L ₃	DE	Kg	Quantity
40	32	338001	3	74	30	34	66	60	0.075	30
50	40	338003	3	76	30	33	66	70	0.080	30
56	50	338004	3	46	30	34	66	80	0.120	20
56/63	50	338006	3	48	-	34	66	80	0.100	20
63	50	338005	3	79	30	43	66	85	0.130	20
75	70	338007	3	106	30	45	87	109	0.250	20
90	80	338009	3.5	86	30	46	88	128	0.340	15
110	100	338011	4.3	113	30	65	89	144	0.470	10

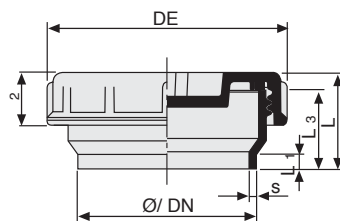


SCREWED END CAP



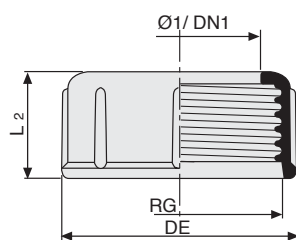
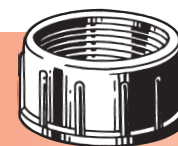
Ø	DN	CODE	S	L	L ₁	L ₂	L ₃	DE	Kg	Quantity
40	32	340001	3	75	30	34	66	60	0.075	30
50	40	340003	3	75	30	33	66	70	0.080	30
56	50	340004	3	77	30	34	66	80	0.120	20
63	50	340005	3	76	30	43	66	85	0.135	20
75	70	340007	3	103	30	45	87	109	0.280	20
90	80	340009	3.5	103	30	46	88	128	0.355	15
110	100	340011	4.3	106	30	65	89	144	0.500	10

SHORT SCREWED END CAP



Ø	DN	CODE	S	L	L ₁	L ₂	L ₃	DE	Kg	Quantity
110	100	340111	4.3	63	12	33	50	149	0.315	15

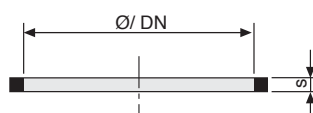
NUT



Ø ₁	DN ₁	CODE	RG	DE	L ₂	Kg	Quantity
40	32	338840	52	60	34	0.025	10
50	40	338850	62	70	33	0.030	10
56	50	338856	71	80	34	0.050	10
63	50	338863	76	85	43	0.060	10
75	70	338875	96	109	45	0.100	10
90	80	338890	112	128	46	0.145	10
110	100	338811	132	144	65	0.210	10

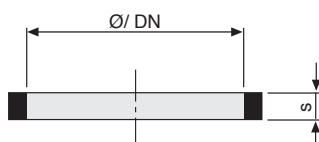
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RING

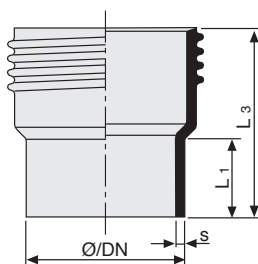


Ø	DN	CODE	S	Kg	Quantity
40	32	338041	4	0.001	10
50	40	338051	3	0.0015	10
56	50	338058	4	0.002	10
63	50	338065	4	0.002	10
75	70	338076	4	0.004	10
90	80	338091	3	0.002	10
110	100	338111	4	0.006	10

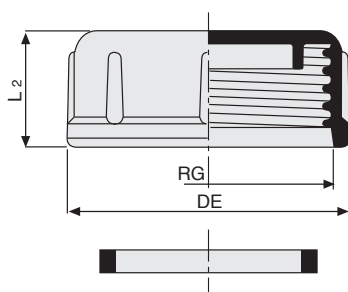


RUBBER SEAL

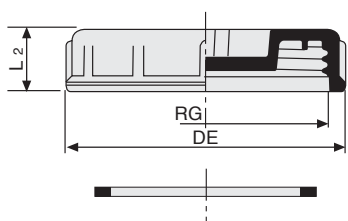
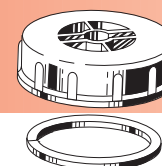
Ø	DN	CODE	s	Kg	Quantity
40	32	338040	6	0.0040	1
50	40	338050	6	0.0040	1
56	50	338056	6	0.0050	1
63	50	338063	7	0.006	1
75	70	338075	10	0.020	1
90	80	338090	7	0.010	1
110/A	100	338110	10	0.025	1
110/B	100	338121	5	0.015	1

THREADED UNION

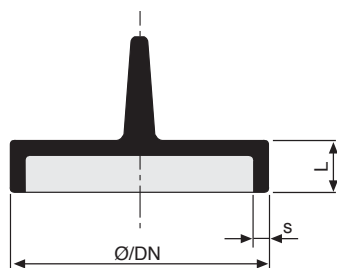
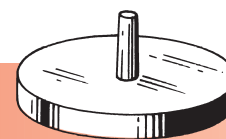
Ø	DN	CODE	s	L ₁	L ₃	Kg	Quantity
40	32	340340	3	30	66	0.025	10
50	40	340350	3	30	66	0.030	10
56	50	340356	3	30	66	0.025	10
63	50	340363	3	30	66	0.040	10
75	70	340365	3	30	87	0.095	10
90	80	340375	3.5	30	88	0.085	10
110	100	340310	4.3	30	89	0.170	10

END CAP WITH SEAL

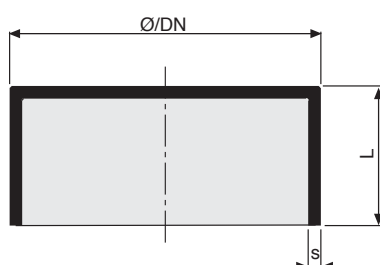
Ø	DN	CODE	RG	DE	L ₂	Kg	Quantity
40	32	340840	57	60	34	0.030	10
50	40	340850	63	70	33	0.035	10
56	50	340856	71	80	34	0.075	10
63	50	340863	77	85	43	0.085	10
75	70	340875	97	109	45	0.160	10
90	80	340890	113	128	46	0.215	10
110	100	340811	132	144	65	0.300	10

SHORT END CAP WITH SEAL

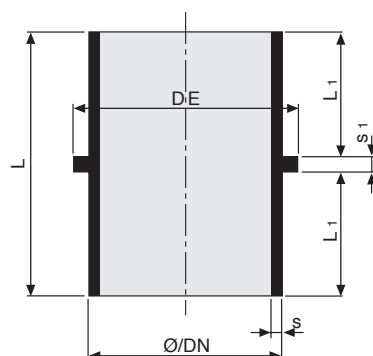
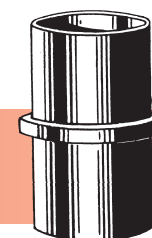
Ø	DN	CODE	RG	DE	L ₂	Kg	Quantity
110	100	340210	132	149	33	0.215	10

BLANK END

Ø	DN	CODE	S	L	Kg	Quantity
32	25	342001	3	5	0.002	100
40	32	342003	3	10	0.010	100
50	40	342005	3	10	0.010	100
56	50	342006	3	10	0.010	100
63	50	342007	3	10	0.015	50
75	70	342009	3	10	0.020	30
90	80	342011	3.5	10	0.030	30
110	100	342013	4.3	10	0.050	30
125	125	342015	4.9	10	0.070	20

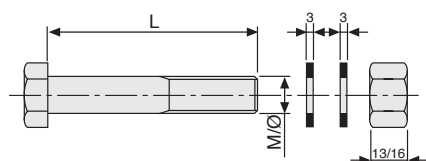
BLACK END - HIGH TYPE

Ø	DN	CODE	S	L	Kg	Quantity
160	150	342017	6.2	72	0.310	1
200	200	342019	6.2	110	0.560	1
250	250	342021	7.8	93	0.750	1
315	300	342023	9.2	117	1.420	1

63**ANCHOR PIPE**

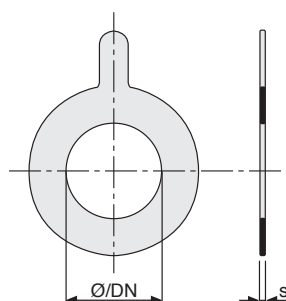
Ø	DN	CODE	S	S ₁	DE	L	L ₁	Kg	Quantity
40	32	344001	3	4	46	64	30	0.025	50
50	40	344003	3	4	57	68	32	0.030	40
56	50	344004	3	4	64	68	32	0.035	20
63	50	344005	3	4	71	72	34	0.045	20
75	70	344007	3	5	84	83	39.5	0.060	20
90	80	344009	3.5	5	100	100	47.5	0.100	15
110	100	344011	4.3	6	120	112	53.5	0.165	10

GALVANISED BOLT WITH WASHER FOR FLANGE



CODE	M/Ø	L	FOR FLANGE	Kg	Quantity
341003	16	90	50-56	0.215	1 (4 Pcs.)
341005	16	100	63-75	0.230	1 (4 Pcs.)
341006	16	100	90	0.230	1 (8 Pcs.)
341007	16	100	110-125-140	0.250	1 (8 Pcs.)
341009	20	110	160	0.410	1 (8 Pcs.)
341011	20	130	200-250-315	0.450	1 (12 Pcs.)

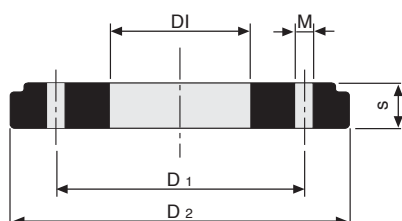
FLAT RUBBER SEAL FOR FLANGE



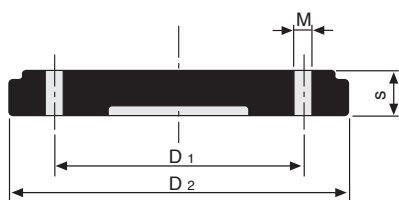
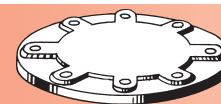
Ø	DN	CODE	S	Kg	Quantity
50	40	343003	3	0.020	1
56	50	343005	3	0.020	1
63	50	343007	3	0.020	1
75	70	343009	3	0.030	1
90	80	343011	3	0.040	1
110	100	343013	3	0.045	1
125	125	343015	3	0.035	1
140	140	343017	3	0.060	1
160	150	343019	3	0.070	1
200	200	343021	3	0.110	1
250	250	343023	3	0.140	1
315	300	343025	3	0.140	1

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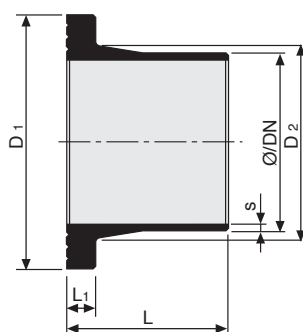
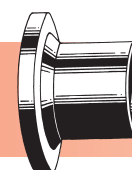
PAINTED ALUMINIUM BACKING FLANGE



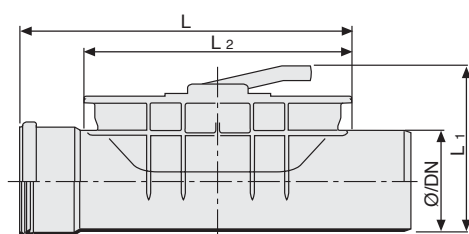
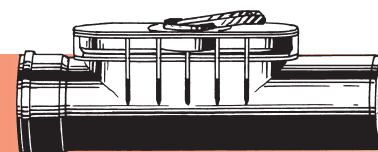
Ø	DN	CODE	S	D1	D	D2	M	Foro N°	Kg	Quantity
50	40	345003	20	62	120	150	8	4	0.625	1
56	50	345005	20	64	123	159	8	4	0.710	1
63	50	345007	17	78	128	165	18	4	0.650	1
75	70	345009	21	93	148	185	18	4	0.885	1
90	80	345011	22	108	160	200	17	8	1.005	1
110	100	345013	22	128	182	220	19	8	1.050	1
125	125	345015	22	136	176	220	18	8	1.150	1
140	140	345017	22	160	210	250	18	8	1.360	1
160	150	345019	25	179	240	285	22	8	1.840	1
200	200	345021	26	235	295	337	22	8	2.325	1
250	250	345023	30	285	350	396	22	12	3.780	1
315	300	345025	30	340	400	444	22	12	3.945	1

PAINTED ALUMINIUM BLANK FLANGE

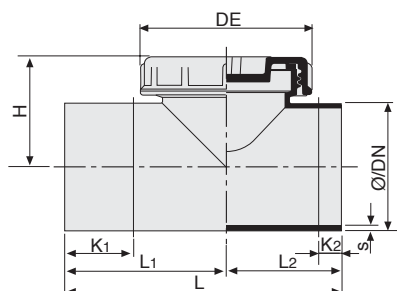
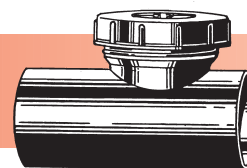
Ø	DN	CODE	S	D ₁	D ₂	M	Hole No.	Kg	Quantity
50	40	346003	20	120	150	8	4	0.760	1
56	50	346005	20	123	159	8	4	0.865	1
63	50	346007	17	128	165	18	4	1.020	1
75	70	346009	21	148	185	18	4	1.305	1
90	80	346011	22	162	200	17	8	1.525	1
110	100	346013	22	176	220	18	8	1.700	1
125	125	346015	22	182	280	19	8	1.800	1
140	140	346017	22	210	250	18	8	2.385	1
160	150	346019	25	240	285	22	8	2.945	1
200	200	346021	26	295	337	22	8	4.485	1
250	250	346023	30	350	396	22	12	7.495	1
315	300	346025	30	400	444	22	12	9.345	1

STUB END

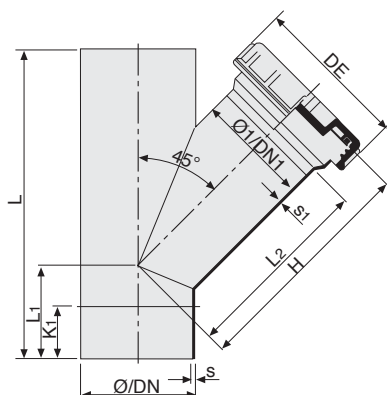
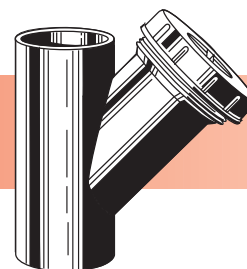
Ø	DN	CODE	S	D ₁	D ₂	L	L ₁	Kg	Quantity
50	40	347003	3	88	61	52	12	0.075	1
56	50	347005	3	94	72	90	12	0.115	1
63	50	347007	3	102	75	90	15	0.125	1
75	70	347009	3	122	89	90	15	0.185	1
90	80	347011	3.5	138	106	90	15	0.215	1
110	100	347013	4.3	158	120	100	18	0.335	1
125	125	347015	4.9	158	128	100	18	0.340	1
140	140	347017	4.9	188	150	100	18	0.450	1
160	150	347019	6.2	212	175	100	18	0.585	1
200	200	347021	6.2	268	232	100	20	0.920	1
250	250	347023	7.8	320	285	100	20	1.480	1
315	300	347025	9.8	370	236	100	20	1.720	1

65**ABS ACCESS PIPE WITH COVER**

Ø	DN	CODE	L	L ₁	L ₂	Kg	Quantity
125	125	349003	380	192-262	300	1.770	1
160	150	349005	400	230-300	300	2.275	1

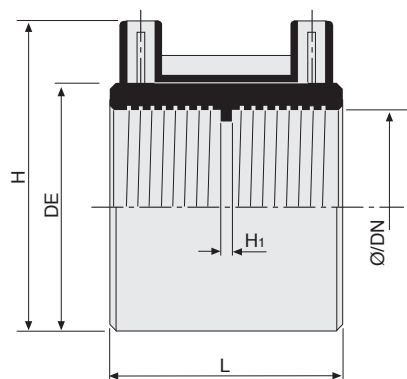
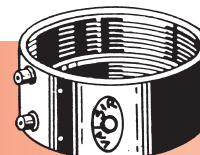
ACCESS PIPE WITH SCREW CAP

Ø	DN	CODE	S	L	L ₁	L ₂	H	DE	K ₁	K ₂	Kg	Quantity
40	32	348001	3	130	75	55	69	54	45	20	0.085	20
50	40	348003	3	150	90	60	75	70	55	25	0.130	20
56	50	348004	3	175	105	70	84	85	65	30	0.195	15
63	50	348005	3	175	100	75	80	82	60	25	0.175	15
75	70	348007	3	175	105	70	117	117	55	25	0.365	10
90	80	348009	3.5	200	120	80	125	123	65	25	0.520	10
110	100	348011	4.3	240	140	100	94	146	65	20	0.620	10
125	125	348013	4.9	250	150	100	124	146	70	20	0.770	5
160	150	348015	6.2	350	210	140	145	146	105	30	1.355	1
200	200	348017	6.2	360	180	180	165	146	180	25	1.710	1
250	250	348019	7.8	440	220	220	190	146	220	40	3.075	1
315	300	348021	9.8	560	280	280	225	146	280	70	5.500	1

45° ACCESS PIPE WITH SCREW CAP

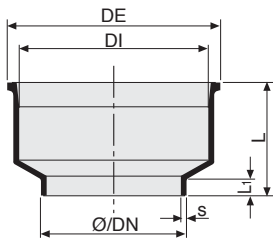
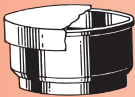
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂	H	DE	K ₁	Kg	Quantity
110/110	100/100	348110	4.3	4.3	270	90	180	220	150	55	0.840	1
125/110	125/100	348125	4.9	4.3	300	100	200	230	150	70	1.240	1
160/110	150/100	348160	6.2	4.3	375	125	275	280	150	110	1.760	1

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ELECTRO WELD COUPLER

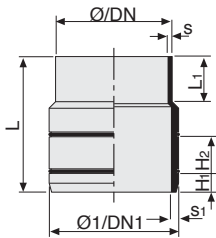
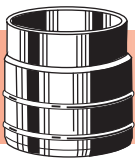
Ø	DN	CODE	L	DE	H	H ₁	Kg	Quantity
40	32	350001	64	52	68	3	0.055	10
50	40	350003	60	63	80	3	0.070	10
56	50	350004	60	70	86	3	0.085	10
63	50	350005	60	77	92	3	0.080	10
75	70	350007	60	90	105	3	0.105	10
90	80	350009	60	106	121	3	0.135	10
110	100	350011	60	126	143	3	0.165	10
125	125	350013	60	142	158	3	0.210	5
160	150	350015	60	178	194	3	0.260	5
200	200	350117	153	233	248	3	1.705	1
250	250	350119	153	285	300	3	2.135	1
315	300	350121	153	350	365	3	2.610	1

WC PAN CONNECTOR WITH CAP



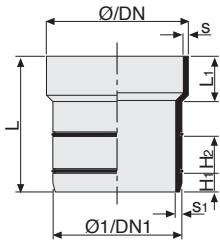
Ø	DN	CODE	S	DI	DE	L	L ₁	Kg	Quantity
90	80	352001	3.5	120	131	67	12	0.120	20
110	100	352003	4.3	120	131	68	15	0.130	20

MALE PVC ADAPTOR WITH RING SEAL

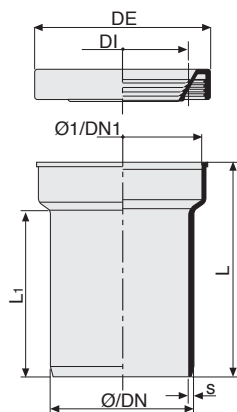
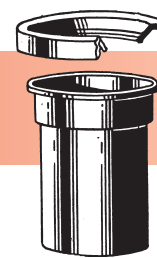


Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	H ₁	H ₂	Kg	Quantity
80/100	90/100	353001	3.5	6	115	30	15	24	0.140	15

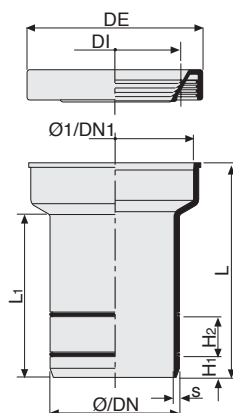
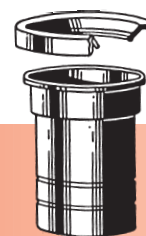
MALE PVC ADAPTOR WITH RING SEAL



Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	H ₁	H ₂	Kg	Quantity
110/100	100/100	353003	4.3	6	105	30	25	25	0.162	10

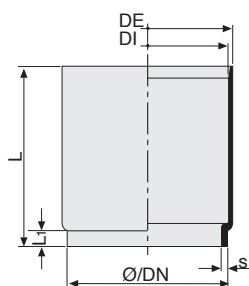
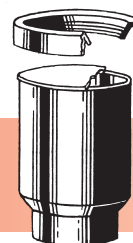
FEMALE PVC ADAPTOR

Ø/Ø ₁	DN/DN ₁	CODE	S	DI	DE	L	L ₁	Kg	Quantity
90/100	80/100	353005	3.5	102±5	140	166	130	0.280	10
110/100	100/100	353007	4.3	102±5	140	166	130	0.390	10

WC CONNECTOR FOR PVC WITH RING SEAL

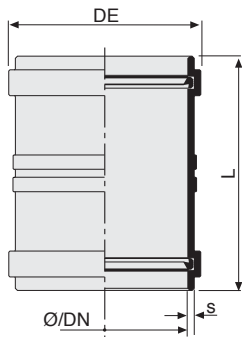
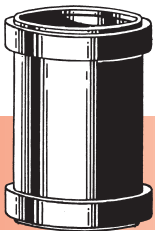
Ø	DN	CODE	S	DI	DE	L	L ₁	H ₁	H ₂	Kg	Quantity
100	100	354001	4.3	102±5	140	166	125	17	30	0.350	10

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EXTENDED WC PAN CONNECTOR WITH CAP

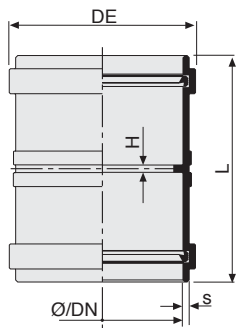
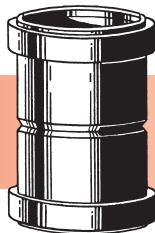
Ø	DN	CODE	S	DI	DE	L	L ₁	Kg	Quantity
90	80	356001	3.5	110	117	125	9	0.175	20
110	100	356003	4.3	110	117	125	11	0.170	20

SLIDING CONNECTOR



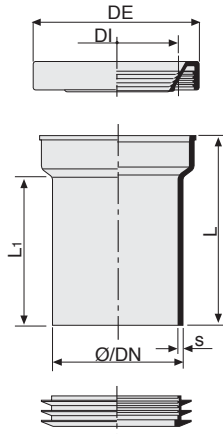
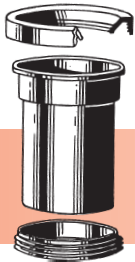
Ø	DN	CODE	S	L	DE	Kg	Quantity
160	150	355017	6.7	230	185	1.225	1
200	200	355019	6.7	270	226	1.445	1
250	250	355021	8.3	300	284	2.910	1
315	300	355023	10.4	320	354	5.100	1

RING SEAL SOCKET

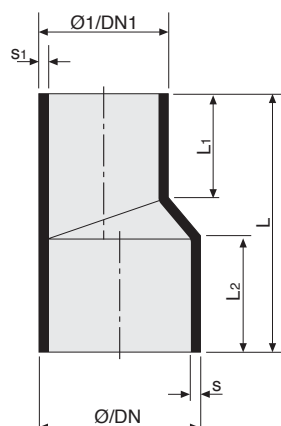
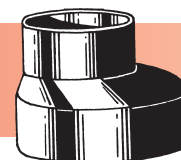


Ø	DN	CODE	S	L	H	DE	Kg	Quantity
160	150	357017	6.7	230	6	185	1.240	1
200	200	357019	6.7	270	6	226	1.815	1
250	250	357021	8.3	300	7	284	5.140	1
315	300	357023	10.4	320	9	354	7.330	1

EXTENDED FLOOR PAN CONNECTOR WITH 2 SEALS

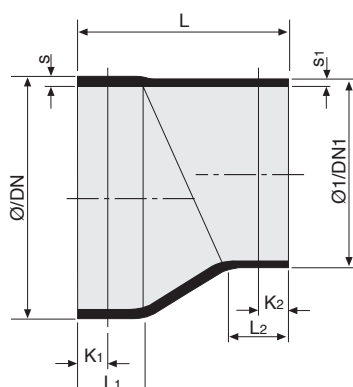
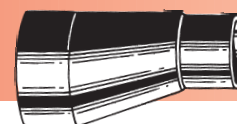


Ø	DN	CODE	S	DI	DE	L	L ₁	Kg	Quantity
110	100	361001	4.3	102±5	140	166	125	0.420	10

ECCENTRIC REDUCER

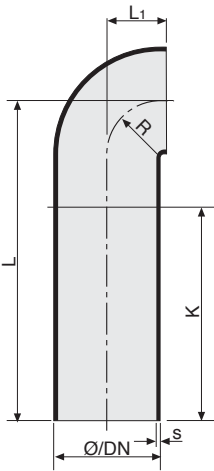
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂	K	Kg	Quantity
50/40	40/32	358001	3	3	80	35	35	20	0.035	50
56/50	50/40	358002	3	3	80	37	35	20	0.040	30
63/40	50/32	358003	3	3	80	37	35	20	0.040	30
63/50	50/40	358005	3	3	80	37	35	20	0.040	30
63/56	50/50	358006	3	3	80	40	35	20	0.045	30
75/40	70/32	358007	3	3	80	37	35	20	0.055	30
75/50	70/40	358009	3	3	80	37	35	20	0.050	30
75/56	70/50	358010	3	3	80	37	35	20	0.050	30
75/63	70/50	358011	3	3	80	35	35	20	0.055	30
90/40	80/32	358013	3.5	3	80	37	35	20	0.065	20
90/50	80/40	358015	3.5	3	80	37	35	20	0.065	20
90/56	80/50	358016	3.5	3	80	37	35	20	0.075	20
90/63	80/50	358017	3.5	3	80	37	35	20	0.070	20
90/75	80/70	358019	3.5	3	80	37	35	20	0.095	20
110/40	100/32	358021	4.3	3	80	37	35	20	0.095	20
110/50	100/40	358023	4.3	3	80	37	35	20	0.100	20
110/56	100/50	358024	4.3	3	80	37	35	20	0.100	20
110/63	100/50	358025	4.3	3	80	37	35	20	0.105	20
110/75	100/70	358027	4.3	3	80	37	35	20	0.105	20
110/90	100/80	358029	4.3	3.5	80	37	35	20	0.140	20
125/50	125/40	358031	4.9	3	80	37	35	20	0.130	10
125/56	125/50	358032	4.9	3	80	37	35	20	0.125	10
125/63	125/50	358033	4.9	3	80	37	35	20	0.125	10
125/75	125/70	358035	4.9	3	80	37	35	20	0.130	10
125/90	125/80	358037	4.9	3.5	80	37	35	20	0.130	10
125/110	125/100	358039	4.9	4.3	80	37	35	20	0.135	10
160/110	150/100	358038	6.2	4.3	80	37	35	20	0.230	5
160/125	150/125	358040	6.2	4.9	80	37	35	20	0.220	5

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LONG ECCENTRIC REDUCER

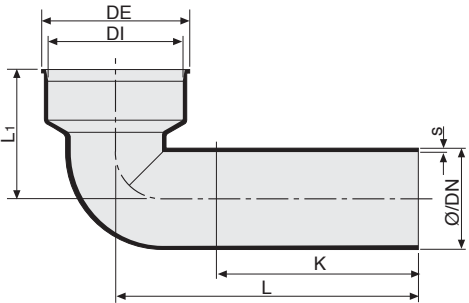
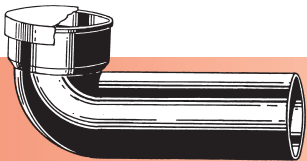
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂	K ₁	K ₂	Kg	Quantity
160/110	150/100	358041	6.2	4.3	215	35	37	20	20	0.430	5
160/125	150/125	358043	6.2	4.9	140	45	40	20	20	0.330	5
200/110	200/100	358045	6.2	4.3	285	80	40	50	10	0.940	1
200/125	200/125	358047	6.2	4.9	285	80	40	50	10	0.910	1
200/160	200/150	358049	6.2	6.2	210	80	37	50	10	0.720	1
250/200	250/200	358055	7.8	6.2	405	160	140	100	100	1.965	1
315/200	300/200	358061	9.8	6.2	540	160	140	100	100	3.490	1
315/250	300/250	358063	9.8	7.8	450	160	150	100	100	3.295	1

BEND



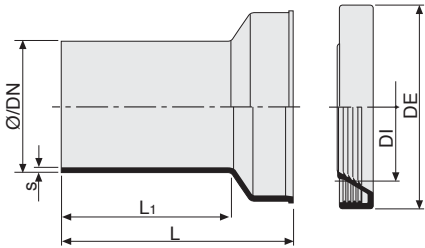
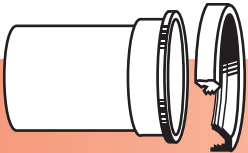
Ø	DN	CODE	S	L	L ₁	R	K	Kg	Quantity
90	80	359001	3.5	270	50	50	200	0.300	10
110	100	359003	4.3	300	60	60	220	0.500	10

WC BEND WITH CAP



Ø	DN	CODE	S	DI	DE	L	L ₁	K	Kg	Quantity
90	80	360001	3.5	120	132	270	115	200	0.420	10
110	100	360003	4.3	120	132	300	125	220	0.600	10

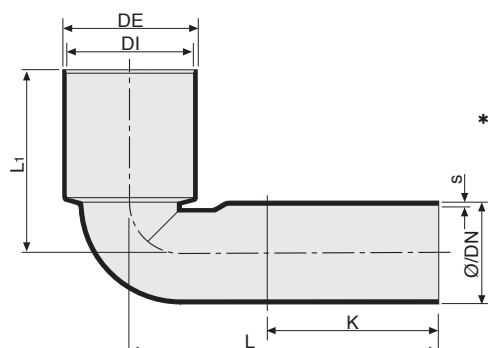
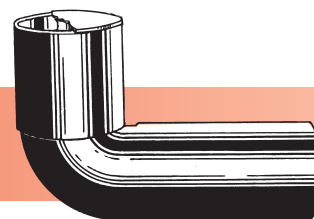
WC PAN CONNECTOR, WITHE PE



Ø	DN	CODE	S	DI	DE	L	L ₁	Kg	Quantity
90	80	365001	3.5	102 ± 5	140	166	130	0.285	10
110	100	365003	4.3	102 ± 5	140	166	130	0.355	10



WC EXTENDED BEND WITH CAP

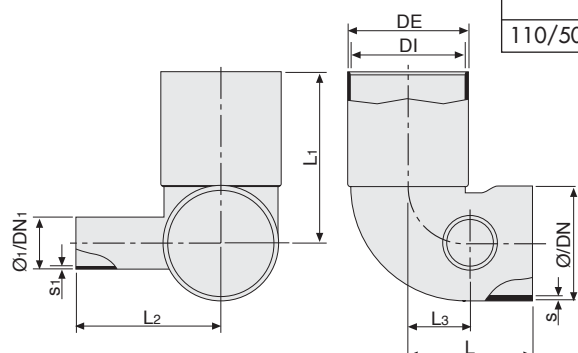
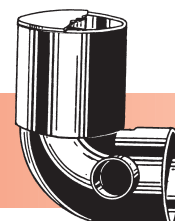


Ø	DN	CODE	S	DI	DE	L	L ₁	K	Kg	Quantity
90	80	362001	3.5	110	116	270	160	200	0.490	15
110	100	362003	4.3	110	116	300	170	220	0.670	10
* 110	100	362125	4.3	125	132	300	190	220	0.705	10

* To be used with seal code 386001

* Without cap

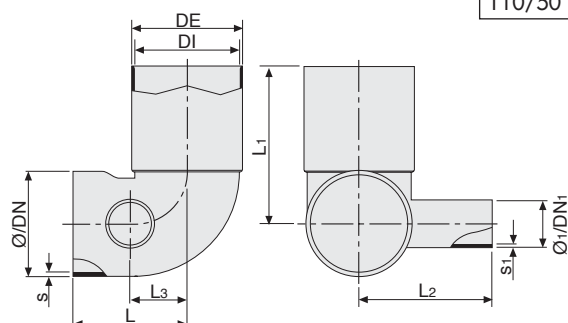
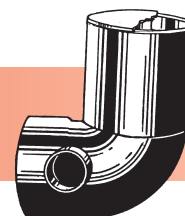
WC EXTENDED BEND WITH CAP, BRANCH ON RIGHT



Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	Kg	Quantity
110/50	100/40	363001	4.3	3	110	116	120	165	140	60	0.455	15

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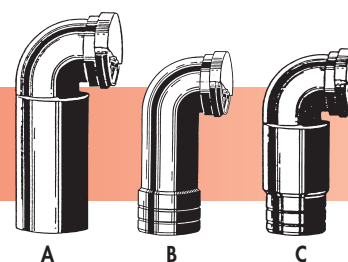
WC EXTENDED BEND WITH CAP, BRANCH ON LEFT



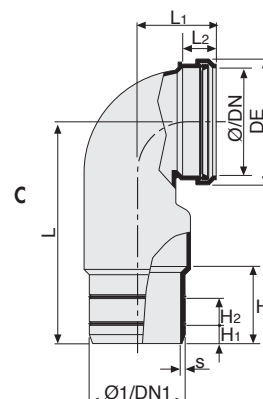
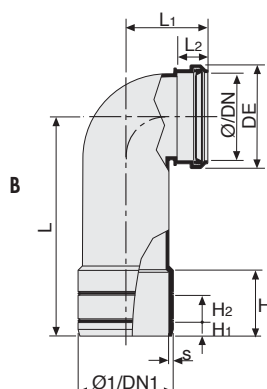
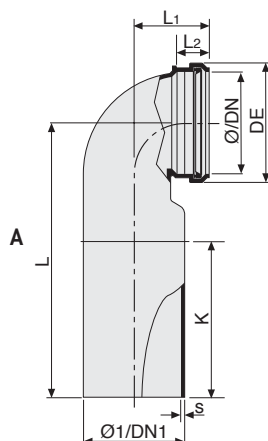
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	Kg	Quantity
110/50	100/40	363003	4.3	3	110	116	120	165	140	60	0.455	15



WC BEND HANGING PAN WITH SEAL AND CAP

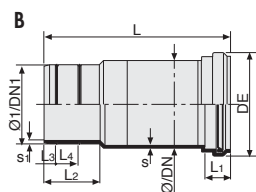
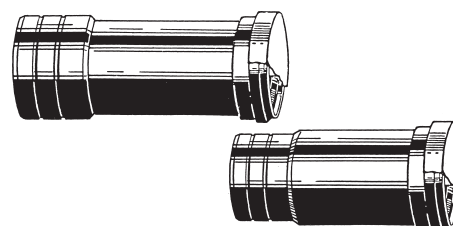
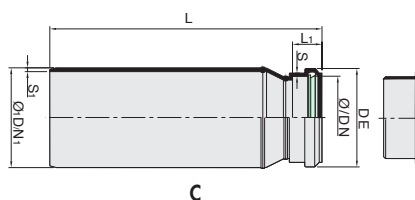
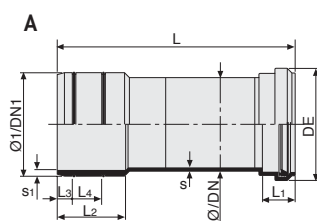


$\emptyset/\emptyset_1$	DN/DN ₁	CODE	Mod	S	L	L ₁	L ₂	DE	H	H ₁	H ₂	K	Kg	Quantity
90/90	80/80	364001	A	3.5	270	90	40	108	-	-	-	150	0.398	10
110/110	100/100	364003	A	4.3	300	87	40	130	-	-	-	180	0.596	10
90/110	80/100	364111	A	4.3	300	90	40	108	-	-	-	180	0.530	10
90/100	80/100	364090	B	4.3	230	90	40	108	74	24	15	-	0.360	10
110/100	100/100	364100	C	4.9	230	87	40	130	76	25	25	-	0.526	10



STRAIGHT WC PAN CONNECTOR WITH SEAL AND CAP, CONNECTION TO PVC

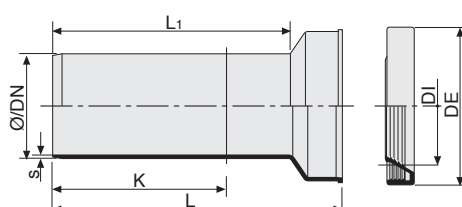
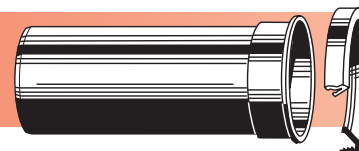
(MOD. A - B)



$\emptyset/\emptyset_1$	DN/DN ₁	CODE	Mod	S	S ₁	DE	L	L ₁	L ₂	L ₃	L ₄	Kg	Quantity
90/100	80/100	366090	A	3.5	5.5	109	232	31	70	15	28	0.332	10
110/100	100/100	366110	B	4.3	6.6	131	236	32	70	15	28	0.390	10
90/100	90/110	366113	C	4.3	4.3	109	300	31	180	-	-	0.480	10

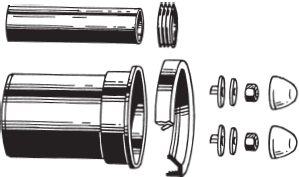
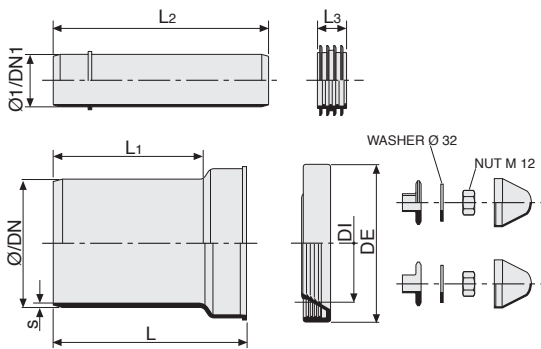
73

LONG WC PAN CONNECTOR WITH SEAL



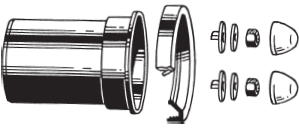
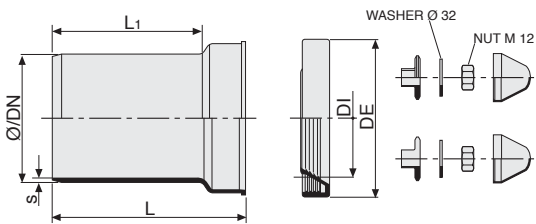
$\emptyset$	DN	CODE	S	DE	DI	L	L ₁	K	Kg	Quantity
90	80	366125	3.5	140	102±5	250	200	150	0.360	10
90	80	366133	3.5	140	102±5	300	260	200	0.420	10

WC CONNECTOR FOR HANGING PAN WITH SEAL AND WHITE COVERINGS



Ø/Ø1	DN	CODE	S	DI	DE	L	L1	L2	L3	Kg	Quantity
90/45	80	366001	3.5	102±5	132	166	122	195	24	0.450	10
110/45	100	366003	4.3	102±5	132	166	129	199	24	0.530	10

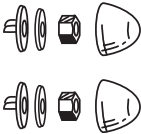
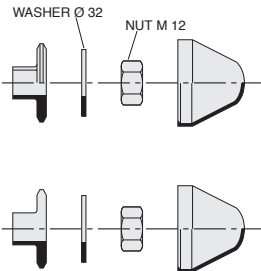
WC CONNECTOR FOR HANGING PAN WITH SEAL AND WHITE COVERINGS



Ø	DN	CODE	S	DI	DE	L	L1	Kg	Quantity
90	80	367001	3.5	102±5	133	166	128	0.380	10
110	100	367003	4.3	102±5	131	166	128	0.440	10

74

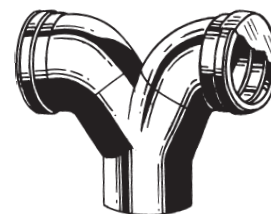
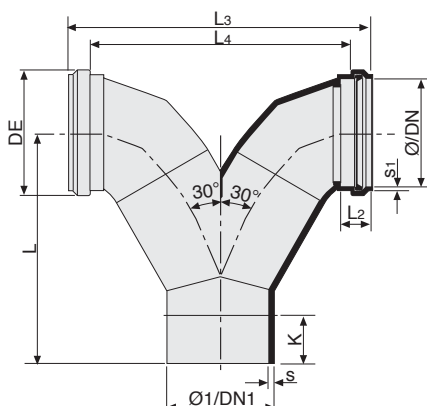
SET OF COVERINGS (2 PER PACK) WITH NUT AND WASHER



COLORE	CODE	Kg	Quantity
WHITE	805421	0.080	1
POLISHED CHROME	805423	0.080	1
SATIN CHROME	805425	0.080	1
GOLD	805428	0.080	1
WHITE	805411	0.080	1

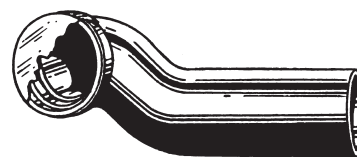
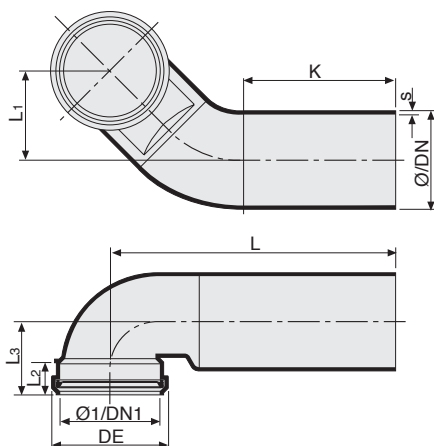
- Only coverings

DOUBLE WC PAN CONNECTOR WITH 1-LIP SEALS AND CAPS



Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DE	L	L ₂	L ₃	L ₄	K	Kg	Quantity
90/110	80/100	368003	4.3	3.5	108	210	-	270	-	50	0.764	5
110/110	100/100	368001	4.3	4.3	130	205	37	285	240	50	0.816	5

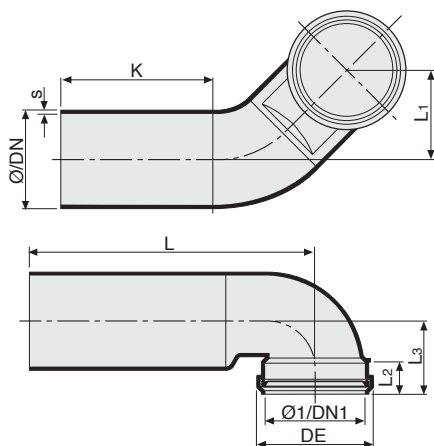
WC BEND FOR HANGING PAN WITH 1-LIP SEAL AND CAP, LEFT



Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DE	L	L ₁	L ₂	L ₃	K	Kg	Quantity
90/90	80/80	370002	3.5	3.5	108	290	100	35	85	150	0.442	5
110/90	100/80	370003	4.3	3.5	108	315	100	35	85	170	0.616	5
110/110	100/100	370001	4.3	4.3	130	320	100	35	85	170	0.720	5

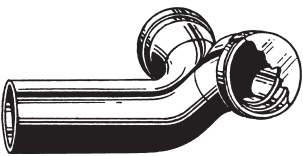
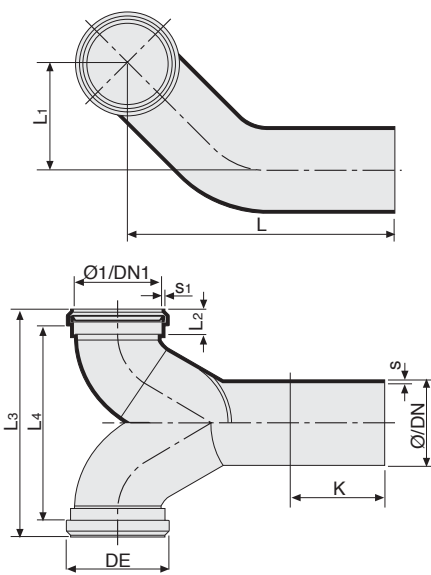
75

WC BEND FOR HANGING PAN WITH 1-LIP SEAL AND CAP, RIGHT



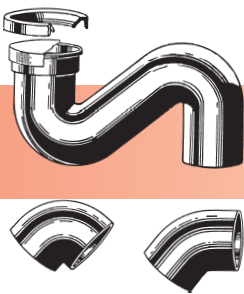
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DE	L	L ₁	L ₂	L ₃	K	Kg	Quantity
90/90	80/80	372002	3.5	3.5	110	290	100	35	85	150	0.442	5
110/90	100/80	372003	4.3	3.5	108	315	100	35	85	170	0.616	5
110/110	100/100	372001	3.5	4.3	130	340	100	35	85	170	0.720	5

WC DOUBLE BEND FOR HANGING PAN
WITH 1-LIP SEALS AND CAPS

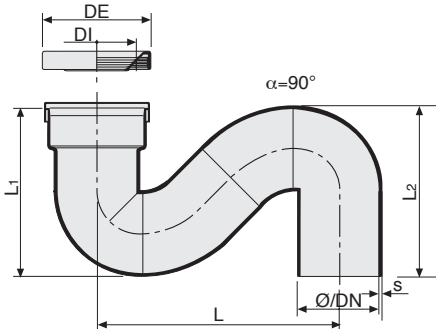
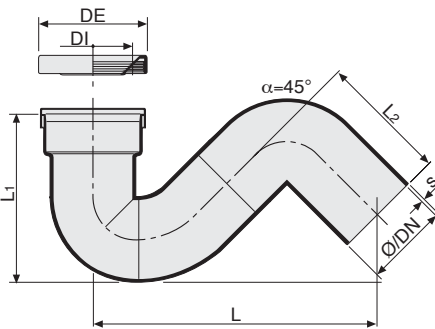
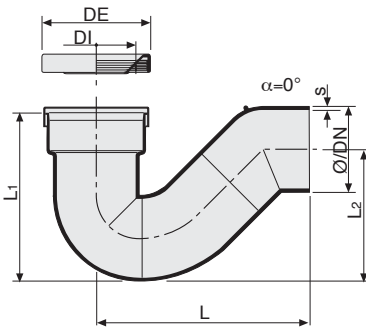


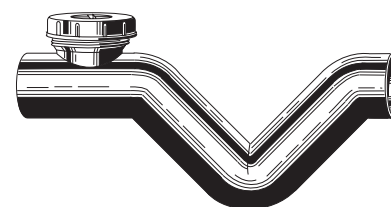
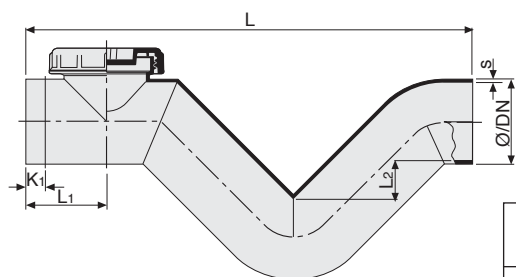
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DE	L	L ₁	L ₂	L ₃	L ₄	K	Kg	Quantity
110/90	100/80	374003	4.3	3.5	108	335	100	-	285	-	120	1.020	5
110/110	100/100	374001	4.3	4.3	130	340	95	37	285	240	120	1.090	5

TRAP WITH SEAL AND CAP

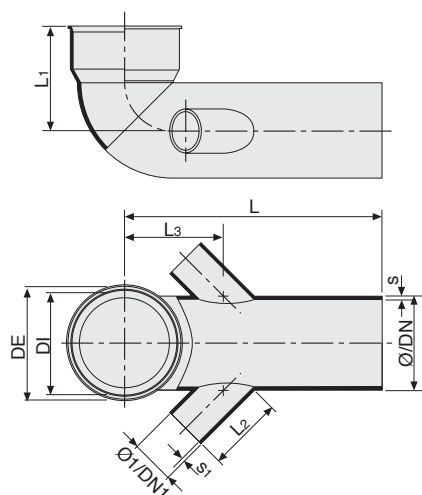
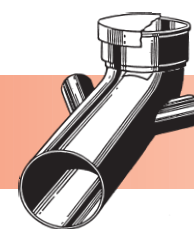


Ø	DN	CODE	α	S	DI	DE	L	L ₁	L ₂	Kg	Quantity
110	100	375001	0°	4.3	102 ± 5	140	270	215	170	0.720	5
110	100	375003	45°	4.3	102 ± 5	140	240	225	160	1.002	5
110	100	375005	90°	4.3	102 ± 5	140	340	225	220	0.990	5

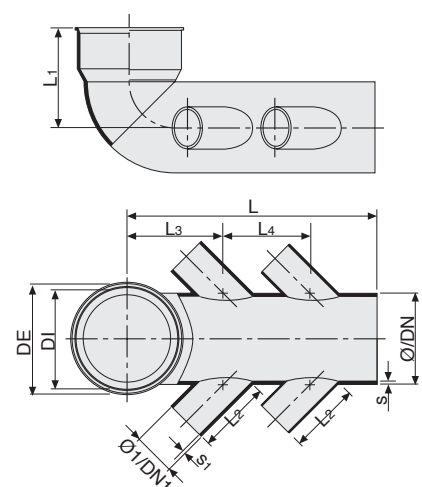
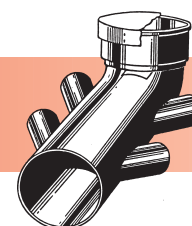


TRAP WITH ACCESS Ø 110

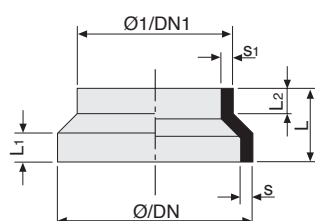
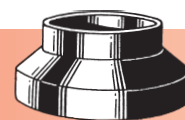
Ø	DN	CODE	S	L	L ₁	L ₂	K ₁	Kg	Quantity
110	100	375110	4.3	580	105	50	20	1.320	1
125	125	375125	4.9	650	100	50	20	1.810	1
160	150	375160	6.2	870	140	50	30	3.560	1

FLOOR PAN CONNECTOR, 2 BRANCHES

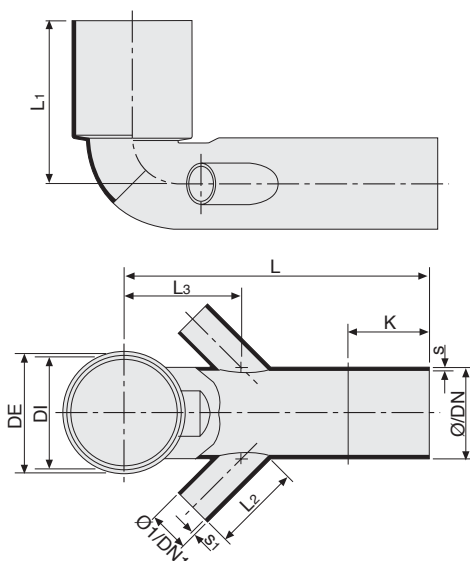
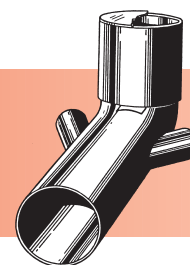
Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	Kg	Quantity
90/40	80/32	380001	3.5	3	120	130	270	120	87	112	0.465	5
90/50	80/40	380003	3.5	3	120	130	270	120	87	112	0.470	5
110/40	100/32	380005	4.3	3	120	130	300	117	87	115	0.750	5
110/50	100/40	380007	4.3	3	120	130	300	117	87	115	0.645	5

FLOOR PAN CONNECTOR, 4 BRANCHES

Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	L ₄	Kg	Quantity
110/40	100/32	378001	4.3	3	120	130	300	117	87	115	107	0.680	5
110/50	100/40	378003	4.3	3	120	130	300	117	87	115	107	0.705	5

SHORT REDUCER

Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	L	L ₁	L ₂	Kg	Quantity
50/40	40/32	377111	3	3	20	9	7	0.010	50

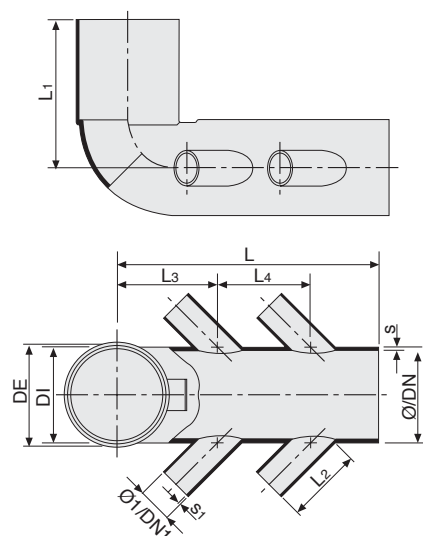
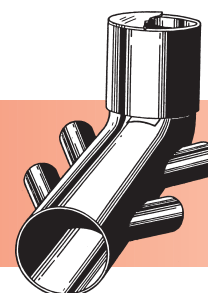
EXTENDED PAN CONNECTOR, 2 BRANCHES

Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	K	Kg	Quantity
90/40	80/32	381001	3.5	3	110	116	270	160	87	115	80	0.545	5
90/50	80/40	381003	3.5	3	110	116	270	160	87	115	80	0.555	5
110/40	100/32	381005	4.3	3	110	116	300	170	100	115	120	0.755	5
110/50	100/40	381007	4.3	3	110	116	300	170	87	120	120	0.735	5
110/50	100/40	381125	4.3	3	125	131	300	190	87	115	120	0.745	5

*

* Without cap

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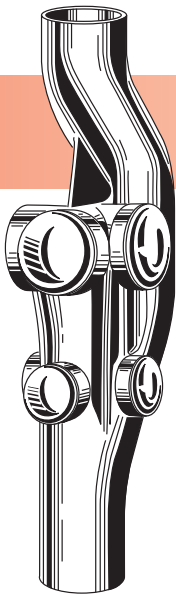
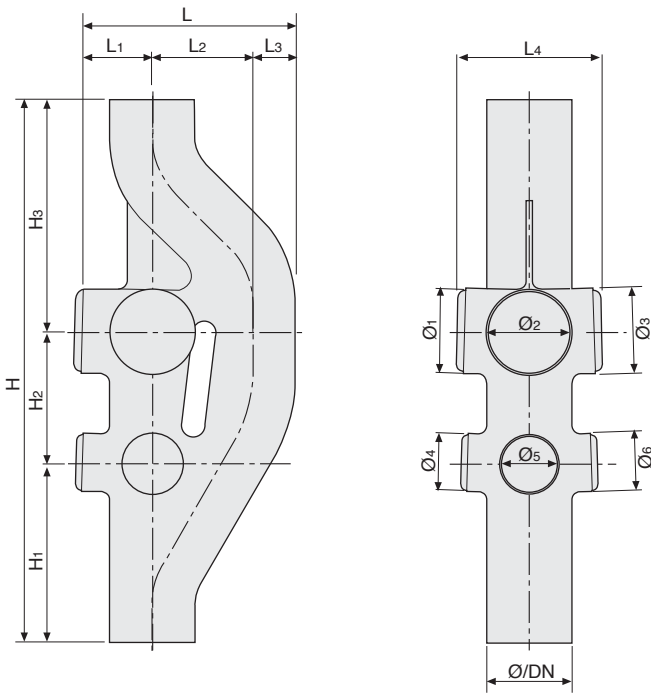
EXTENDED PAN CONNECTOR, 4 BRANCHES

Ø/Ø ₁	DN/DN ₁	CODE	S	S ₁	DI	DE	L	L ₁	L ₂	L ₃	L ₄	Kg	Quantity
110/40	100/32	379001	4.3	3	110	117	300	170	87	115	107	0.745	5
110/50	100/40	379003	4.3	3	110	117	300	170	87	120	107	0.790	5
110/50	100/40	379125	4.3	3	125	130	300	190	87	115	107	0.790	5

*

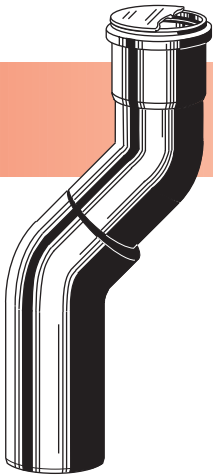
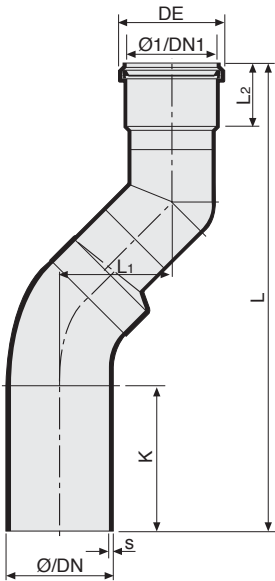
* Without cap

VENTILATION BRANCH



Ø	DN	CODE	Ø ₁ /Ø ₂ /Ø ₃	Ø ₄ /Ø ₅ /Ø ₆	L	L ₁	L ₂	L ₃	L ₄	H	H ₁	H ₂	H ₃	Kg	Quantity
110	100	316175	110 max	75 max	275	90	130	55	188	700	230	170	300	2.570	1

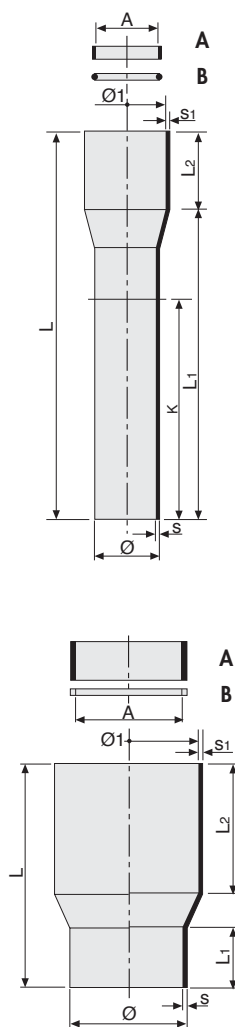
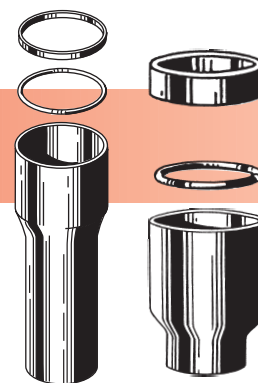
SHIFTED PIPE



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Ø/Ø ₁	DN/DN ₁	CODE	S	DE	L	L ₁	L ₂	K	Kg	Quantity
90/90	80/80	323090	3.5	108	470	100	70	135	0.590	5
110/90	110/80	323109	4.3	108	480	110	65	170	0.750	5

ADAPTOR (CAST IRON, STEEL, ASBESTOS CEMENT PIPES)



MOD. 1

Ø	Ø ₁	CODE	S	S ₁	L	L ₁	L ₂	K	A	B	Kg	Quantity
50	60	383001	3	3	300	240	60	170	53-54	48-49	0.165	15
50	73	383003	3	3	275	220	55	170	60-67	53-60	0.145	15
50	80	383005	3	3	285	230	55	170	67-74	60-67	0.170	15
50	90	383007	3	3	305	235	70	170	80-84	73-77	0.205	15
50	100	383009	3	3	310	240	70	170	90-94	83-87	0.215	15
56	60	383011	3	3	265	205	65	140	53-54	-	0.130	15
56	73	383013	3	3	245	190	55	140	60-67	-	0.130	15
56	80	383015	3	3	245	190	55	140	67-74	53-60	0.150	15
56	90	383017	3	3	265	195	70	140	80-84	60-67	0.180	15
56	100	383019	3	3	270	200	70	140	90-94	-	0.200	15
63	73	383021	3	3	265	205	65	140	60-67	-	0.180	15
63	80	383023	3	3	245	195	55	140	67-74	-	0.165	15
63	90	383025	3	3	265	195	70	140	80-84	-	0.175	15
63	100	383027	3	3	265	205	70	140	90-94	-	0.170	15
75	80	383029	3	3	250	190	65	-	67-74	-	0.190	15
75	90	383031	3	3	245	175	70	120	80-84	73-77	0.215	15
75	100	383033	3	3	150	80	70	120	90-94	83-87	0.215	15
90	110	382001	3.5	3.5	160	60	100	-	84-98	-	0.190	15

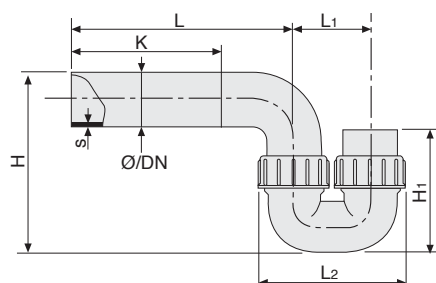
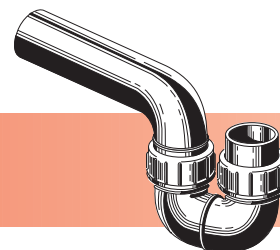
MOD. 2

110	125	382003	4.3	4.3	165	43,5	100	-	102-111	100-109	0.250	10
110	140	382005	4.3	4.3	180	80	100	-	102-126	100-124	0.310	10
125	150	382007	4.9	4.9	180	80	100	-	116-136	115-134	0.425	10

A = Flat seal

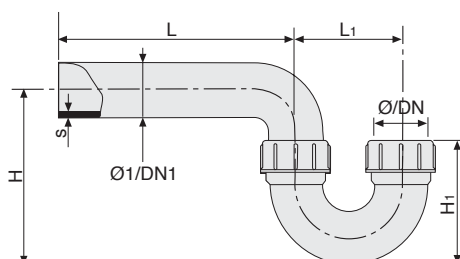
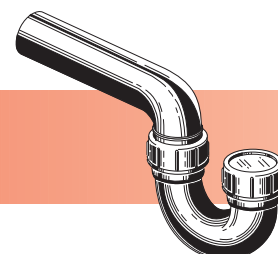
B = O-Ring

UNIVERSAL TRAP, VERTICAL INLET AND HORIZONTAL OUTLET



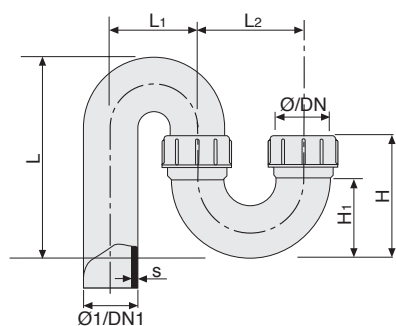
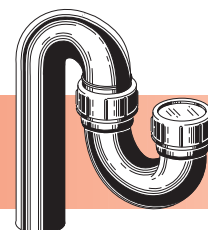
Ø	DN	CODE	S	L	L ₁	L ₂	H	H ₁	K	Kg	Quantity
63	50	700833	3	210	95	185	235	160	160	0.520	1
75	70	700835	3	210	135	245	335	245	140	0.920	1
90	80	700839	3.5	240	140	270	320	225	200	1.190	1
110	100	700840	4.3	270	160	310	370	260	220	1.920	1

TRAP, VERTICAL INLET AND HORIZONTAL OUTLET



Ø/Ø ₁	DN/DN ₁	CODE	S	L	L ₁	H	H ₁	Kg	Quantity
40/40	32/32	700814	3	150	80	140	110	0.220	10
40/50	32/40	700817	3	180	80	160	110	0.310	10
40/56	32/50	700811	3	210	80	155	110	0.310	10
50/50	40/40	700815	3	180	100	170	110	0.310	10
50/56	40/50	700813	3	210	100	165	110	0.310	10

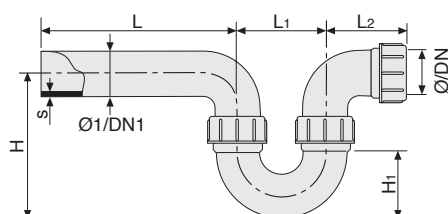
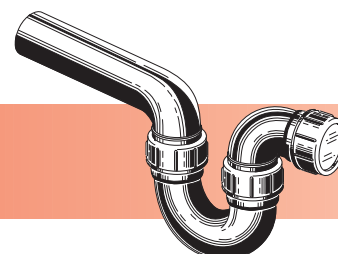
TRAP, VERTICAL INLET AND OUTLET



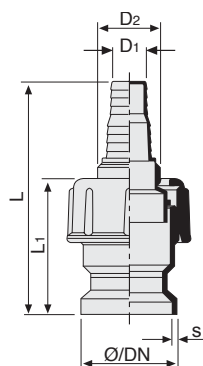
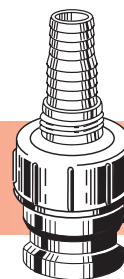
Ø/Ø ₁	DN/DN ₁	CODE	S	L	L ₁	L ₂	H	H ₁	Kg	Quantity
40/40	32/32	700809	3	160	60	80	110	60	0.235	10
40/50	32/40	700807	3	180	80	80	110	65	0.340	10
40/56	32/50	700801	3	238	80	80	110	65	0.340	10
50/50	40/40	700805	3	180	80	100	110	70	0.340	10
50/56	40/50	700803	3	190	80	100	120	70	0.370	10

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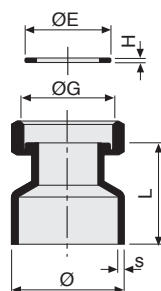
TRAP, HORIZONTAL INLET AND OUTLET



Ø/Ø ₁	DN/DN ₁	CODE	S	L	L ₁	L ₂	H	H ₁	Kg	Quantity
40/40	32/32	700819	3	150	80	90	140	40	0.310	10
40/50	32/40	700821	3	180	80	90	160	65	0.370	10
40/56	32/50	700825	3	210	80	90	160	40	0.400	10
50/50	40/40	700823	3	180	100	90	170	70	0.420	10
50/56	40/50	700827	3	210	100	90	165	80	0.440	10

WASHING MACHINE CONNECTOR

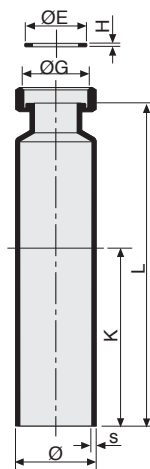
Ø	DN	CODE	S	D ₁	D ₂	L	L ₁	Kg	Quantity
50	40	700853	3	15/20	1"G	120	65	0.065	20

FITTING WITH NUT

Ø	Ø G	CODE	S	L	ØE	H	NUT	Kg	Quantity
32	1"1/4	700038	3	45	40	2	BRASS	0.075	40
40	1"1/4	700043	3	45	40	2	BRASS	0.080	40
40	1"1/2	700045	3	45	45	2	BRASS	0.090	40
48	1"1/4	700044	3	45	40	2	BRASS	0.080	40
48	1"1/2	700046	3	45	45	2	BRASS	0.090	40
50	1"1/4	700062	3	45	40	2	BRASS	0.080	40
50	1"1/2	700063	3	45	45	2	BRASS	0.090	40

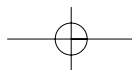
32	1"1/4	700238	3	45	40	2	PLASTIC	0.025	40
40	1"1/4	700243	3	45	40	2	PLASTIC	0.030	40
40	1"1/2	700245	3	45	45	2	PLASTIC	0.030	40
48	1"1/4	700244	3	45	40	2	PLASTIC	0.030	40
48	1"1/2	700246	3	45	45	2	PLASTIC	0.030	40
50	1"1/4	700262	3	45	40	2	PLASTIC	0.030	40
50	1"1/2	700263	3	45	45	2	PLASTIC	0.030	40

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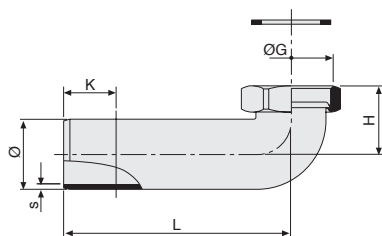
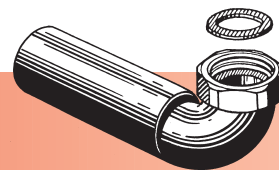
EXTENDED FITTING WITH NUT

Ø	Ø G	CODE	S	L	ØE	H	K	NUT	Kg	Quantity
40	1"1/4	700051	3	195	40	2	110	BRASS	0.130	20
40	1"1/2	700053	3	195	45	2	110	BRASS	0.145	20
48	1"1/4	700054	3	195	40	2	110	BRASS	0.145	20
48	1"1/2	700056	3	195	45	2	110	BRASS	0.155	20
50	1"1/4	700058	3	195	40	2	110	BRASS	0.150	20
50	1"1/2	700060	3	195	45	2	110	BRASS	0.155	20

40	1"1/4	700251	3	195	40	2	110	PLASTIC	0.080	20
40	1"1/2	700253	3	195	45	2	110	PLASTIC	0.085	20
48	1"1/4	700254	3	195	40	2	110	PLASTIC	0.095	20
48	1"1/2	700256	3	195	45	2	110	PLASTIC	0.095	20
50	1"1/4	700258	3	195	40	2	110	PLASTIC	0.100	20
50	1"1/2	700260	3	195	45	2	110	PLASTIC	0.095	20

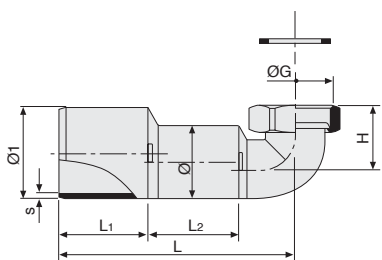
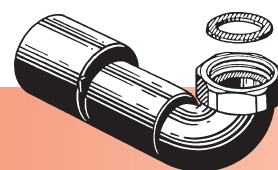


BEND WITH NUT



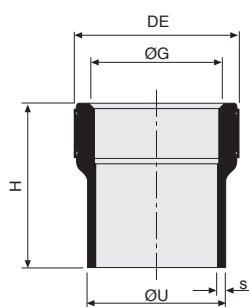
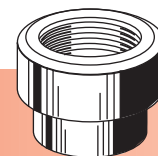
Ø	Ø G	CODE	S	L	H	K	NUT	Kg	Quantity
40	1"1/4	700180	3	130	25	100	BRASS	0.100	20
40	1"1/2	700190	3	130	30	100	BRASS	0.105	20
40	1"1/4	700280	3	130	25	100	PLASTIC	0.035	20
40	1"1/2	700290	3	130	30	100	PLASTIC	0.040	20

BEND WITH NUT

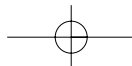


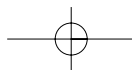
Ø/Ø1	Ø G	CODE	S	L	L1	L2	H	NUT	Kg	Quantity
40/50	1"1/4	700059	3	130	50	54	25	BRASS	0.110	20
40/50	1"1/2	700061	3	120	50	N.C.	30	BRASS	0.120	20
40/50	1"1/4	700259	3	130	50	54	25	PLASTIC	0.060	20
40/50	1"1/2	700261	3	120	50	N.C.	30	PLASTIC	0.055	20

END WITH INTERNAL THREADING, REINFORCED WITH STEEL RING

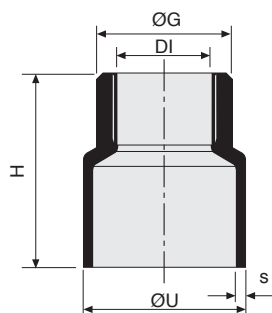
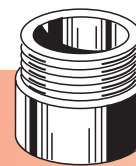


Ø U	Ø G	CODE	S	DE	H	Kg	Quantity
40	1/2"	384001	3	40.5	55	0.065	10
40	3/4"	384003	3	40.5	55	0.060	10
40	1"	384005	3	40.5	55	0.060	10
50	1/2"	384007	3	50	60	0.075	10
50	3/4"	384009	3	50	60	0.075	10
50	1"	384011	3	50	60	0.075	10
50	1"1/4	384013	3	50	60	0.070	10
50	1"1/2	384015	3	58.5	60	0.070	10
56	2"	384017	3	70	65	0.100	10
63	2"	384019	3	70	65	0.105	10
75	2"1/2	384021	3	89	70	0.135	10



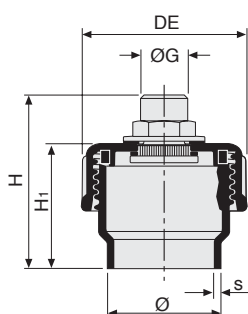
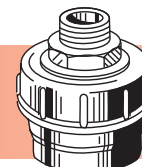


END WITH EXTERNAL THREADING, REINFORCED WITH STEEL RING



Ø U	Ø G	CODE	S	DI	H	Kg	Quantity
50	1"1/4"	385013	3	29	60	0.055	10
50	1"1/2"	385015	3	29	60	0.065	10
56	2"	385017	3	47	65	0.090	10
63	2"	385019	3	47	65	0.095	10
75	2"1/2"	385021	3	57	70	0.125	10

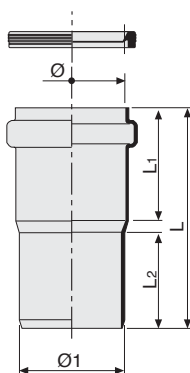
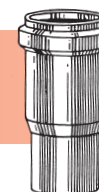
THREADED FITTING WITH BRASS NIPPLE



Ø	Ø G	CODE	S	DE	H	H ₁	Kg	Quantity
40	1/2" x 15 mm	387001	3	60	81	74	0.180	10
40	3/4" x 18 mm	387003	3	60	84	74	0.240	10
50	1/2" x 15 mm	387007	3	71	92	76	0.150	10
50	3/4" x 18 mm	387009	3	71	95	76	0.185	10
50	1" x 22 mm	387011	3	71	95	76	0.245	10



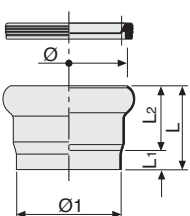
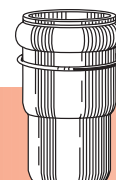
PVC ADAPTOR (SOLVENT WELD)



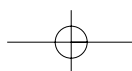
Ø/Ø ₁	CODE	L	L ₁	L ₂	Kg	Quantity
40/40	564121	105	50	55	0.045	20
50/50	564123	105	50	55	0.055	20
50/100	564150	130	91	40	0.140	10
75/75	564075	144	87	58	0.190	10
75/80	564131	154	78	75	0.145	10
75/82	564182	159	78	80	0.130	10
75/100	564175	156	77	77	0.185	10
90/100	564190	143	76	65	0.250	10
110/125	564251	145	83	60	0.255	10

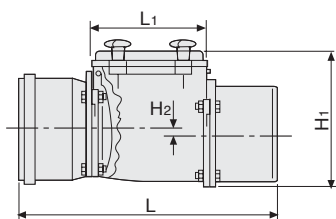
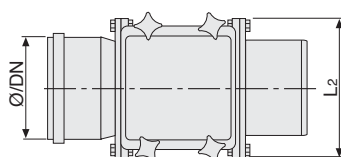
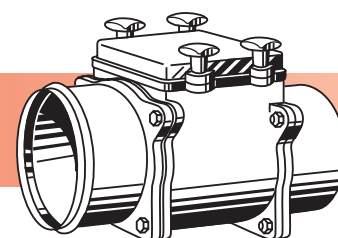
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METAL ADAPTOR (BRASS)

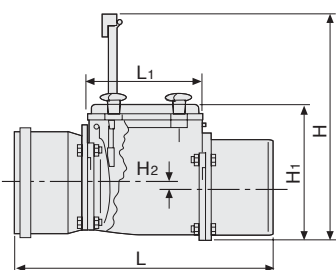
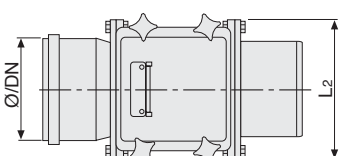
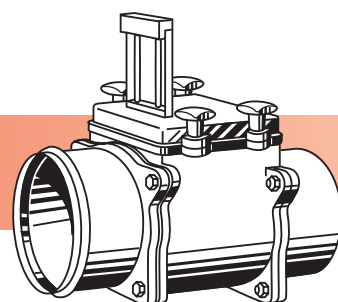


Ø	Ø ₁	CODE	L	L ₁	L ₂	Kg	Quantity
32	32	570001	61	26	33	0.065	20
40	32	570002	59	28	25	0.040	20
40	40	570003	55	25	25	0.040	20
50	50	570005	40	10	26	0.065	20

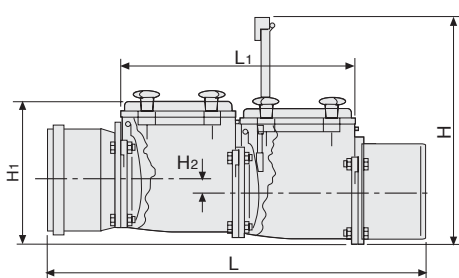
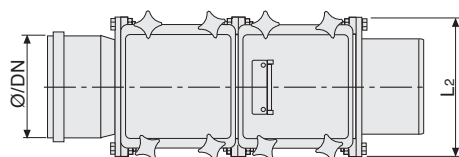
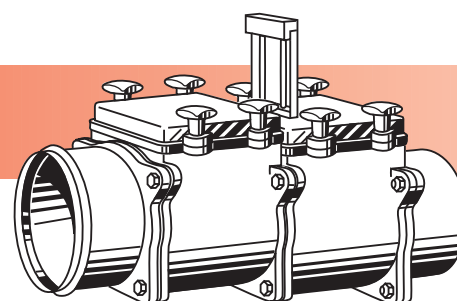


NONRETURN VALVE

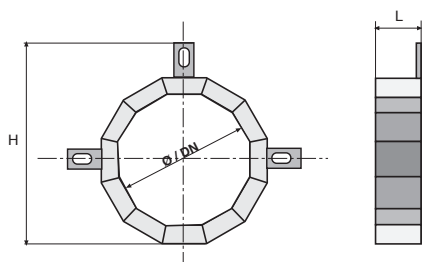
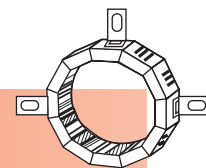
Ø	DN	CODE	L	L ₁	L ₂	H ₁	H ₂	Kg	Quantity
110	100	200111	288	135	180	179	10	1.390	1
125	125	200113	303	135	180	179	15	1.480	1
160	150	200115	380	165	244	246	25	2.705	1
200	200	200117	445	165	244	246	25	3.050	1

NONRETURN VALVE WITH CLOSURE

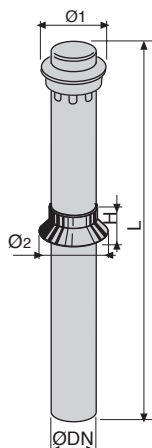
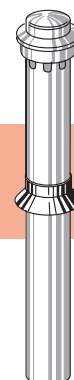
Ø	DN	CODE	L	L ₁	L ₂	H	H ₁	H ₂	Kg	Quantity
110	100	200201	28	135	180	215-270	179	10	1.400	1
125	125	200203	30	135	180	215-270	179	15	1.550	1
160	150	200225	38	165	244	248-348	246	25	2.970	1
200	200	200217	44	165	244	248-348	246	25	3.350	1

NONRETURN VALVE WITH DOUBLE THROTTLE CLOSURE

Ø	DN	CODE	L	L ₁	L ₂	H	H ₁	H ₂	Kg	Quantity
110	100	200301	428	275	180	215-270	192	10	2.520	1
125	125	200303	443	275	180	215-270	192	15	2.620	1
160	150	200305	550	335	244	248-348	244	25	4.780	1
200	200	200307	615	335	244	248-348	244	25	5.010	1

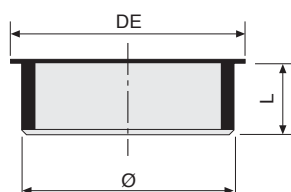
FIRE STOP

Ø	DN	CODE	L	H	Quantity
40	32	410001	22,4	69	1
50	40	410003	22,4	69	1
56	50	410005	32,4	85	1
63	50	410007	32,4	85	1
75	70	410009	42,4	121	1
90	80	410011	47,4	151	1
110	100	410013	47,4	151	1
125	125	410015	92,5	162	1
160	150	410017	112,5	209	1
200	200	410019	175	255	1
250	250	410021	230	315	1
315	300	410023	330	395	1

GREY PP VENT TERMINAL

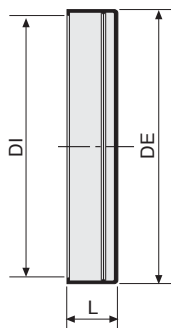
Ø	CODE	Ø ₁	Ø ₂	L	H	Kg	Quantity
50	394001	140	91	790	45	0.410	10
75	394003	200	121	720	52	0.575	5
110	394005	200	166	720	55	0.930	5

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PROTECTIVE CAP FOR SOCKETS, EXPANSION JOINTS AND SPIGOT BENDS

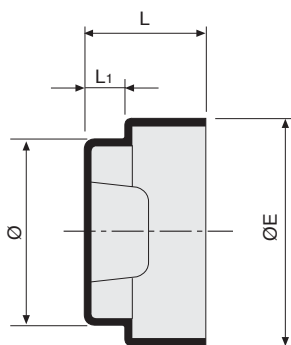
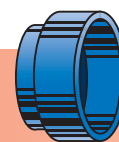
Ø	CODE	DE	L	Kg	Quantity
32	503000	36	16	0.005	50
40	503001	46	38	0.005	40
50	503003	56	38	0.010	40
56	503002	62	25	0.010	40
58	503004	65	21	0.010	20
63	503006	71	38	0.015	30
75	503005	85	38	0.020	30
90	503008	102	38	0.030	30
110	503007	123	39	0.040	30
125	503009	135	38	0.055	20
160	503011	167	36	0.055	10
200	503013	220	50	0.130	1

PROTECTIVE CAP FOR BENDS, WC SLEEVES AND BENDS FOR WALL-HUNG PANS



Ø	CODE	DI	DE	L	Kg	Quantity
90	503090	107	113	25	0.030	20
110	503110	127	134	30	0.040	20

PROTECTIVE CAP FOR SPIGOT BENDS DIAM.46

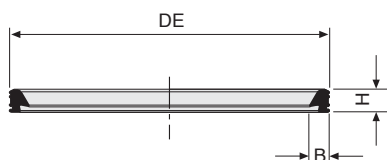


Ø	CODE	DE	L	L ₁	Kg	Quantity
46	503222	56	30	5	0.010	40

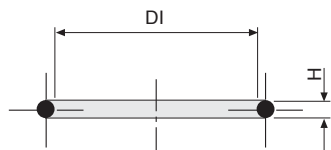
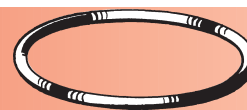
1 LIP SEAL FOR SOCKETS



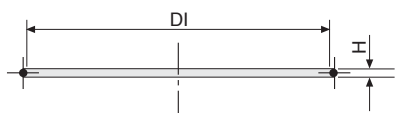
87



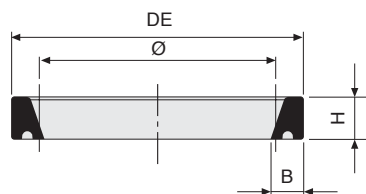
Ø	DN	CODE	DE	H	B	Kg	Quantity
32	25	391001	40.5	6	4.95	0.002	50
40	32	391003	51.4	7.8	6.5	0.005	50
50	40	391005	61.4	7.8	6.5	0.005	50
56	50	391007	67.5	7.8	6.5	0.010	50
63	50	391009	74	7.8	6	0.010	50
75	70	391011	86.6	7.8	6.5	0.010	50
100	100	391222	114	9.3	8.20	0.020	20
90	80	391013	103	8.9	7.5	0.015	20
110	100	391015	123.9	8.9	7.9	0.020	20
125	125	391017	142.2	10.2	8.9	0.025	20
160	150	391019	179.8	11.5	10.2	0.045	20
200	200	391021	223.7	12.8	11.2	0.045	20
250	250	391023	282	19.5	1.6	0.500	1
315	300	391025	350	20.5	17.15	0.055	1

O-RING FOR SOCKETS

Ø	DN	CODE	DI	H	Kg	Quantity
32	25	392000	31 ^{+0,5}	5	0.005	20
40	32	392001	39 ⁺¹	6	0.005	20
50	40	392003	49 ⁺¹	6	0.005	20
56	50	392004	54 ⁺¹	6	0.005	20
63	50	392005	62 ⁺¹	6	0.010	20
75	70	392007	79 ⁺¹	6	0.010	20
90	80	392009	89 ⁺¹	6	0.010	20
110	100	392011	109 ^{+1.5}	7	0.015	20
125	125	392013	124 ^{+1.5}	8	0.025	20
160	150	392015	159 ^{+1.5}	9	0.035	20

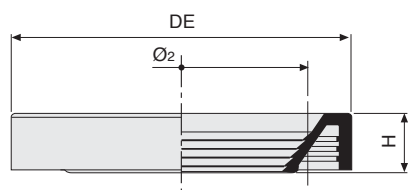
O-RING FOR ADAPTORS (PVC)

Ø	DI	CODE	H	FOR CODES	Kg	Quantity
100	95	392222	2.62	353-354	0.002	20

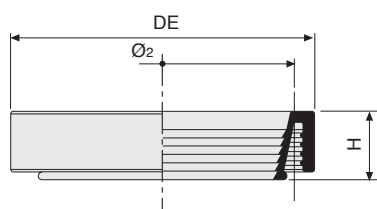
SEAL FOR EXPANSION SOCKETS

Ø	DN	CODE	H	B	DE	Kg	Quantity
32	25	391001	6	4.95	40.5	0.015	50
40	32	390001	16	12	60	0.025	20
50	40	390003	16	12	70	0.035	20
56	50	390004	16	12	76	0.040	20
63	50	390005	16	12.5	83	0.045	20
75	70	390007	16	12.5	95.5	0.050	20
90	80	390009	16	12.5	111	0.055	20
110	100	390011	16	12.5	130.5	0.070	20
125	125	390013	16	12	143.5	0.070	20
160	150	390015	16	12.5	180.5	0.115	20
200	200	390017	21.8	11.2	223.7	0.045	1
250	250	390019	19.5	16	282	0.050	1
315	300	390021	20.5	17.15	350	0.055	1

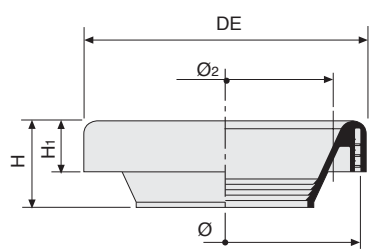
88

SEAL FOR SLEEVES, TRAPS AND WC BENDS

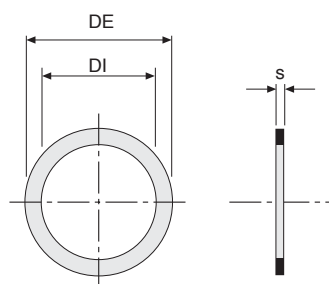
Ø	DN	CODE	Ø2	DE	H	COLOUR	FOR CODES	Kg	Quantity
125	125	386001	102±5	134	23.5	BLACK	352-354-362125 356-366 367-375-378 380-353	0.125	20
125	125	386003	102±5	134	23.5	WHITE	365	0.100	20

SEAL FOR WC SLEEVES AND EXTENDED BENDS

Ø	CODE	Ø2	DE	H	FOR CODES	Kg	Quantity
115	388001	102±5	120	23.5	353-362-363	0.082	20

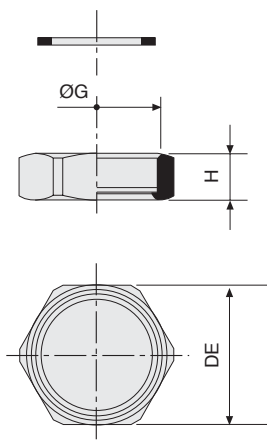
SEAL FOR CONNECTING SLEEVE (PVC)

Ø	DN	CODE	DE	Ø2	H	H ₁	FOR COD.	Kg	Quantity
125	125	386005	130	100±7	40	23	353007	0.110	20

RUBBER FLAT SLEEVE

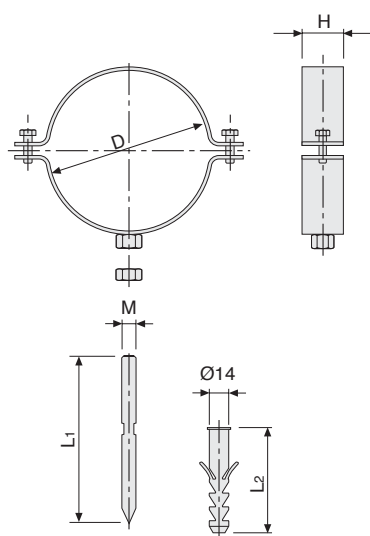
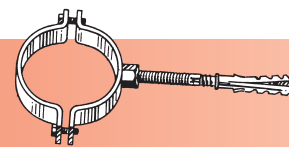
Ø	CODE	S	DE	DI	Kg	Quantity
40 x 1"1/4	703024	2.4	38	30	0.015	10
40 x 1"1/2	703021	2.4	45	36	0.020	10

89

BRASS NUT

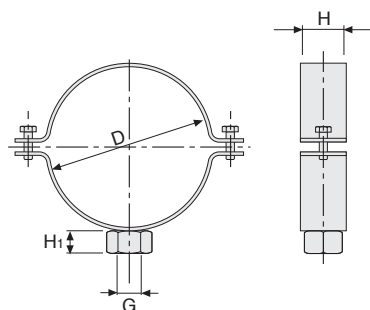
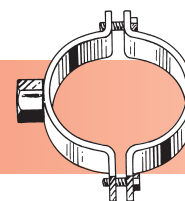
Ø G	CODE	DE	H	Kg	Quantity
40/1"1/4	703114	KEY 45	15	0.055	10
40/1"1/2	703121	KEY 45	15	0.070	10

GALVANISED IRON PIPE CLIP WITH ANCHOR FOR ATTACHMENT TO WALLS M10



Ø ext. pipe	CODE	D	H	L ₁	L ₂	Kg	Quantity
40	395001	43	30	120	75	0.230	50
50	395003	53	30	120	75	0.240	50
56	395004	59	30	120	75	0.255	50
63	395005	66	30	120	75	0.270	50
75	395007	78	30	120	75	0.280	25
90	395009	93	30	120	75	0.330	25
110	395011	113	30	120	75	0.345	25
125	395013	128	30	120	75	0.320	25
160	395015	163	30	120	75	0.435	25

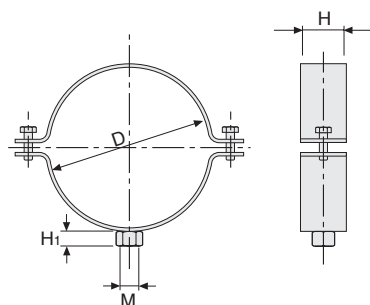
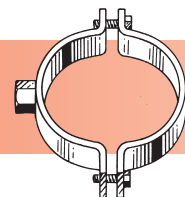
GALVANISED STEEL PIPE CLIP FOR RIGID SUPPORT G 1/2"



Ø ext. pipe	CODE	D	H	H ₁	Kg	Quantity
40	396001	43	30	15	0.200	50
50	396003	53	30	15	0.195	50
56	396004	59	30	15	0.210	50
63	396005	66	30	15	0.225	50
75	396007	78	30	15	0.340	25
90	396009	93	30	15	0.310	25
110	396011	113	30	15	0.350	25
125	396013	128	30	15	0.350	25
160	396015	163	30	15	0.400	25

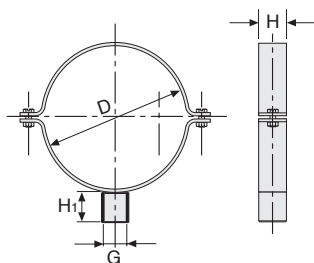
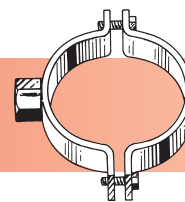
90

GALVANISED STEEL PIPE CLIP FOR RIGID SUPPORT M 10



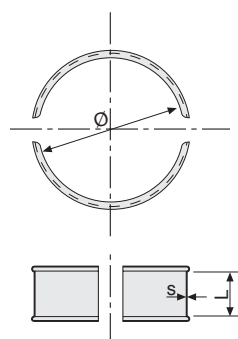
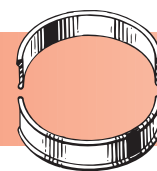
Ø ext. pipe	CODE	D	H	H ₁	Kg	Quantity
40	396021	43	30	9	0.160	50
50	396023	53	30	9	0.165	50
56	396024	59	30	9	0.190	50
63	396025	66	30	9	0.190	50
75	396027	78	30	9	0.250	25
90	396029	93	30	9	0.295	25
110	396031	113	30	9	0.280	25
125	396033	128	30	9	0.305	25
160	396035	163	30	9	0.365	25

GALVANISED STEEL PIPE CLIP FOR RIGID SUPPORT G 1/2''



Ø ext. pipe	CODE	D	H	H ₁	Kg	Quantity
200	396050	203	40	43	1.050	10
250	396052	253	40	43	1.250	10
315	396054	318	40	43	1.550	10

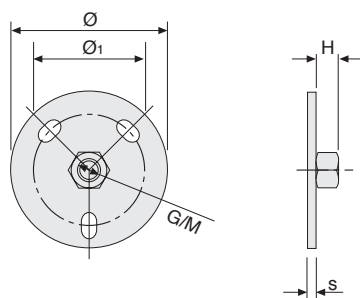
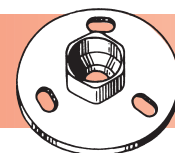
STAINLESS STEEL PIPE CLIP FOR RIGID SUPPORT



Ø	CODE	L	S	Kg	Quantity
40	397001	30	1	0.035	50
50	397003	30	1	0.045	50
56	397004	30	1	0.050	50
63	397005	30	1	0.055	50
75	397007	30	1	0.065	25
90	397009	30	1	0.075	25
110	397011	30	1	0.095	25
125	397013	30	1	0.105	25
160	397015	30	1	0.130	25

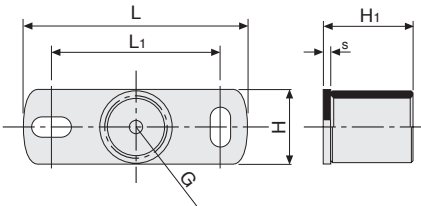
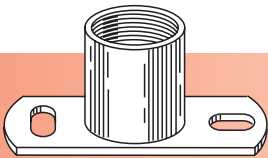
91

GALVANISED STEEL FLANGE



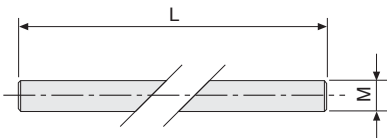
Ø	CODE	G/M	Ø ₁	H	S	Kg	Quantity
70	398001	G 1/2''	50	15	4	0.120	100
70	398003	M10	50	9	4	0.150	100

GALVANISED STEEL FLANGE 1"



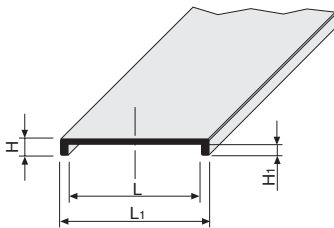
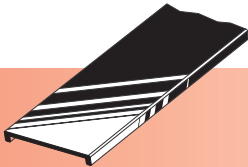
CODE	L	G	L ₁	H	H ₁	S	Kg	Quantity
398005	120	1"	90	40	48	4	0.250	25

THREADED ROD M10



CODE	M	L	Kg	Quantity
408001	M10	1000	0.480	1

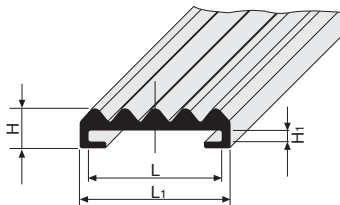
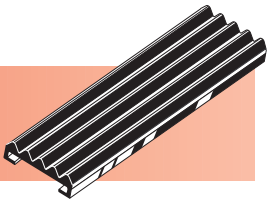
RUBBER INSERT FOR CLIPS



CODE	L	L ₁	H	H ₁	Kg	Pack
399001	30	34	4	2	5.015	1 x 50 m
399003	40	45	6	4	1.580	1 x 10 m

92

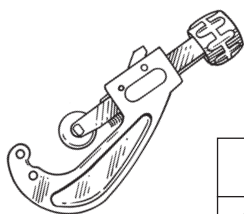
ANTI-VIBRATION RUBBER INSERT FOR CLIPS



CODE	L	L ₁	H	H ₁	Kg	Pack
399222	30	36	9	3	6.110	1 x 30 m

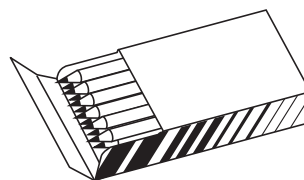
10 ACCESSORIES

PIPE CUTTER



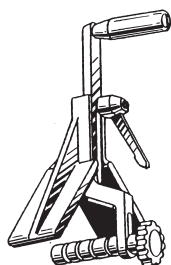
Ø	Mod.	CODE	Quantity
6 ÷ 63	T1	458001	1
50 ÷ 140	T2	458003	1
100 ÷ 168	T3	458005	1

PENCILS



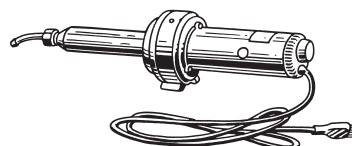
CODE	Quantity
474001	1 x (12 Pz.)

BEVELLING MACHINE



Ø	CODE	Quantity
32 ÷ 160	460001	1
40 ÷ 250	460003	1

HOT AIR BLOWER FOR WELDING



Watt	CODE	Quantity
700	476001	1

93

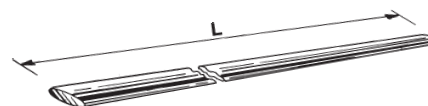
LUBRICANT



Plastic tube

gr.	CODE	Quantity
150	900001	50
250	900003	50

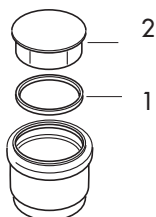
FOR WELDING WITH HOT AIR



L (cm.)	mm	CODE	Quantity
100	5.5 x 3	477001	1x (Kg 2)

11 SPARE PARTS

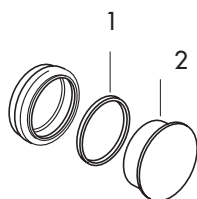
RING SEAL ADAPTOR



ARTICLE CODE	324000	324001	324003	324004	324005	324006	324007
DIAMETER	Ø 32	Ø 40	Ø 50	Ø 56	Ø 63	Ø 56/63	Ø 75
1 ONE-LIP SEAL CODE	391001	391003	391005	391007	391009	391007	391011
2 PROTECTIVE CAP CODE	503000	503001	503003	503002	503006	503002	503005

ARTICLE CODE	324009	324011	324013	324015	324017	324019	324021
DIAMETER	Ø 90	Ø 110	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315
1 ONE-LIP SEAL CODE	391013	391015	391017	391019	391021	391023	391025
2 PROTECTIVE CAP CODE	503008	503007	503009	503011	503013	-	-

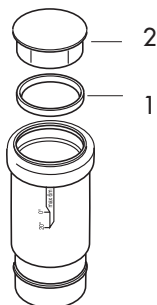
SHORT RING SEAL ADAPTOR



ARTICLE CODE	326001	326003	326111
DIAMETER	Ø 90	Ø 110	Ø 90/110
1 ONE-LIP SEAL CODE	391013	391015	391009
2 PROTECTIVE CAP CODE	503008	503007	503008

94

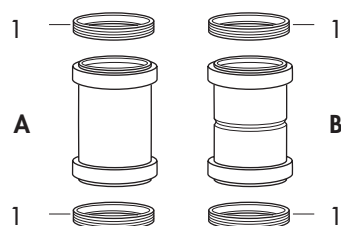
EXPANSION JOINT



ARTICLE CODE	328000	328001	328003	328004	328005	328007	328009
DIAMETER	Ø 32	Ø 40	Ø 50	Ø 56	Ø 63	Ø 75	Ø 90
1 ONE-LIP SEAL CODE	390000	390001	390003	390335	390007	390009	390011
2 PROTECTIVE CAP CODE	503000	503001	503003	503002	503006	503005	503008

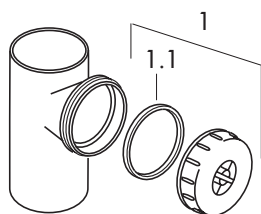
ARTICLE CODE	328011	328013	328015	328017	328019	328021
DIAMETER	Ø 110	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315
1 ONE-LIP SEAL CODE	390013	390015	390017	391021	391023	391025
2 PROTECTIVE CAP CODE	503007	503009	503011	503013	-	-

SLIDING CONNECTOR AND RING SEAL SOCKET



VERSION	A				B			
ARTICLE CODE	355017	355019	355021	355023	357017	357019	357021	357023
DIAMETER	Ø 160	Ø 200	Ø 250	Ø 315	Ø 160	Ø 200	Ø 250	Ø 315
1 ONE-LIP SEAL CODE	391019	391021	391023	391025	391019	391021	391023	391025

90° ACCESS PIPE WITH SCREW CAP

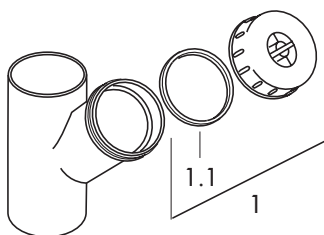


ARTICLE CODE	348001	348003	348004	348005	348007	348009	348011
DIAMETER	Ø 40	Ø 50	Ø 56	Ø 63	Ø 75	Ø 90	Ø 110
1 CAP + SEAL CODE	340840	340850	340856	340863	340875	340890	340210
1.1 SEAL CODE	338040	338050	338056	338063	338075	338090	338121

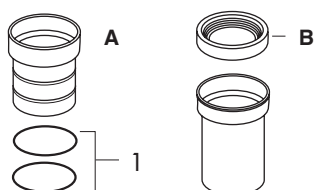
ARTICLE CODE	348013	348015	348017	348019	348021
DIAMETER	Ø 125	Ø 160	Ø 200	Ø 250	Ø 315
1 CAP + SEAL CODE	340210	340210	340210	340210	340210
1.1 SEAL CODE	338121	338121	338121	338121	338121

95

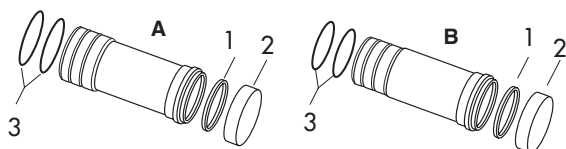
45° ACCESS PIPE WITH SCREW CAP



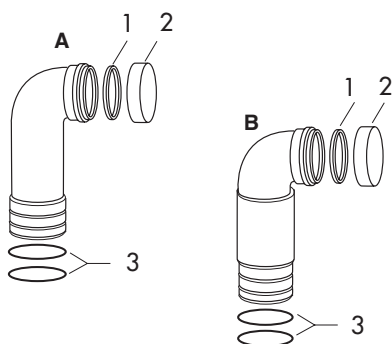
ARTICLE CODE	348110	348125	348160
DIAMETER	Ø 110/110	Ø 125/110	Ø 160/110
1 CAP + SEAL CODE	340120	340120	340120
1.1 SEAL CODE	338121	338121	338121

PVC ADAPTOR

VERSION	A		B	
ARTICLE CODE	353001	353003	353005	353007
CONNECTED DIAMETERS	Ø 90/100	Ø 110/100	Ø 100/90	Ø 100/110
1 O-RING CODE	392222	392222	-	-
2 SEAL CODE	-	-	386005	386005

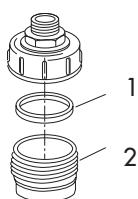
STRAIGHT WC PAN CONNECTOR WITH SEAL AND CAP, CONNECTION TO PVC

VERSION	A	B
ARTICLE CODE	366090	366110
CONNECTED DIAMETERS	Ø 90/100	Ø 110/100
1 ONE-LIP SEAL CODE	391013	391015
2 PROTECTIVE CAP CODE	503090	503110
3 O-RING CODE	592222	392222

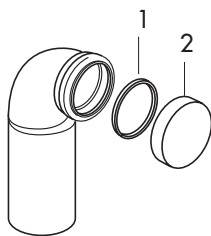
WC BEND FOR HANGING PAN WITH SEAL AND CAP

VERSION	A	B
ARTICLE CODE	364090	364100
CONNECTED DIAMETERS	Ø 90/100	Ø 110/100
1 ONE-LIP SEAL CODE	391013	391015
2 PROTECTIVE CAP CODE	503090	503110
3 O-RING CODE	392222	392222

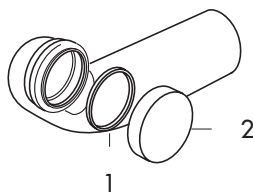
96

SCREW FITTING WITH BRASS NIPPLE

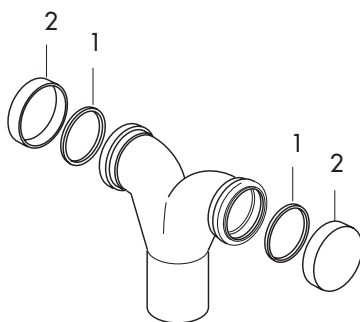
ARTICLE CODE	387001	387003	387007	387009	387011
CONNECTED DIAMETERS	Ø 40 x 1/2	Ø 40 x 3/4	Ø 50 x 1/2	Ø 50 x 3/4	Ø 50 x 1"
1 SEAL CODE	338040	338040	338050	338050	338050
2 THREADED UNION CODE	340340	340340	340350	340350	340350

WC BEND FOR HANGING PAN WITH SEAL AND CAP

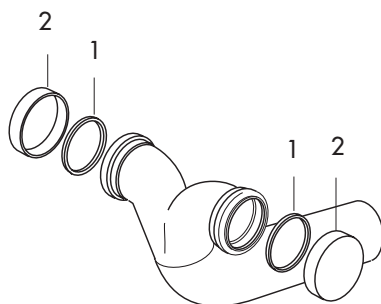
ARTICLE CODE	364001	364003	364111	364090	364100
CONNECTED DIAMETERS	Ø 90	Ø 110/110	Ø 90/110	Ø 90/100	Ø 110/100
1 ONE-LIP SEAL CODE	391013	391015	391013	391013	391015
2 PROTECTIVE CAP CODE	503090	503110	503090	503090	503110

WC BEND FOR HANGING PAN WITH 1-LIP SEAL AND CAP, LEFT/RIGHT

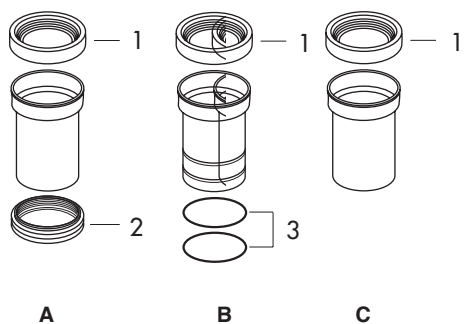
ARTICLE CODE	370002	370003	370001	372002	372003	372001
CONNECTED DIAMETERS	Ø 90	Ø 90/110	Ø 110	Ø 90	Ø 90/110	Ø 110
1 ONE-LIP SEAL CODE	391013	391013	391015	391013	391013	391015
2 PROTECTIVE CAP CODE	503090	503090	503110	503090	503090	503110

DOUBLE WC PAN CONNECTOR WITH 1-LIP SEALS AND CAPS

ARTICLE CODE	368003	368001
CONNECTED DIAMETERS	Ø 90/110	Ø 110/110
1 ONE-LIP SEAL CODE	391013	391015
2 PROTECTIVE CAP CODE	503090	503110

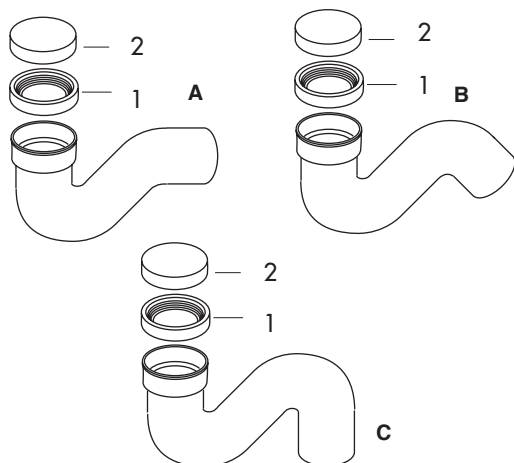
97**WC DOUBLE BEND FOR HANGING PAN WITH 1-LIP SEALS AND CAPS**

ARTICLE CODE	374003	374001
CONNECTED DIAMETERS	Ø 90/110	Ø 110/110
1 ONE-LIP SEAL CODE	391013	391015
2 PROTECTIVE CAP CODE		503110

WC CONNECTOR

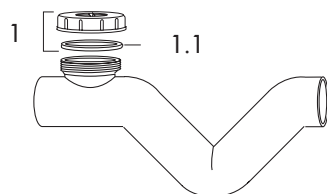
VERSION	A	B	C	
ARTICLE CODE	361001	354001	365001	365003
CONNECTED DIAMETERS	Ø 110	Ø 110	Ø 90	Ø 110
1 WC SEAL CODE	386001	386001	386003	386003
2 FINNED SEAL CODE	389125	-	-	-
3 O-RING CODE	-	392222	-	-

VERSION	C					
ARTICLE CODE	366001	366003	367001	367003	366125	366130
CONNECTED DIAMETERS	Ø 90	Ø 110	Ø 90	Ø 110	Ø 90	Ø 90
1 WC SEAL CODE	386001	386001	386001	386001	386001	386001

TRAP WITH SEAL AND CAP

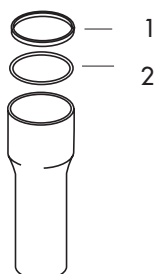
VERSION	A	B	C
ARTICLE CODE	375001	375003	375005
Ø /ANGLE OF OUTLET	Ø 110/0°	Ø 110/45°	Ø 110/90°
1 WC SEAL CODE	386001	386001	386001
2 PROTECTIVE CAP CODE	503110	503110	503110

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TRAP WITH ACCESS

ARTICLE CODE	375110	375125	375160
Ø I/OUTLET - Ø CAP	Ø 110	Ø 125/110	Ø 160/110
1 CAP+ SEAL CODE	340120	340120	340120
1.1 SEAL CODE	338121	338121	338121

ADAPTOR (CAST IRON, STEEL, ASBESTOS CEMENT PIPES)



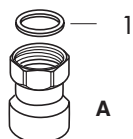
ARTICLE CODE	382001	382003	382005	382007
CONNECTED DIAMETERS	Ø 90/110	Ø 110/125	Ø 110/140	Ø 125/150
1 FLAT SEAL CODE	392190	392110	392110	392120
2 RING SEAL CODE	-	392096	392096	392096

ARTICLE CODE	383001	383003	383005	383007	383009	383011	383013
CONNECTED DIAMETERS	Ø 50/60	Ø 50/73	Ø 50/80	Ø 50/90	Ø 50/100	Ø 56/60	Ø 56/73
1 FLAT SEAL CODE	392158	392163	392170	392180	392185	392158	392163
2 RING SEAL CODE	392045	392049	392055	392070	392075	392045	392049

ARTICLE CODE	383015	383017	383019	383021	383023	383025	383027
CONNECTED DIAMETERS	Ø 50/80	Ø 56/90	Ø 56/100	Ø 63/73	Ø 63/80	Ø 63/90	Ø 63/100
1 FLAT SEAL CODE	392170	392180	392185	392163	392170	392180	392185
2 RING SEAL CODE	392055	392070	392075	392049	392055	392070	392075

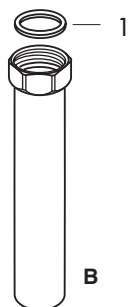
ARTICLE CODE	383029	383031	383033
CONNECTED DIAMETERS	Ø 75/80	Ø 75/90	Ø 75/100
1 FLAT SEAL CODE	392170	392180	392185
2 RING SEAL CODE	392055	392070	392075

FITTING WITH NUT



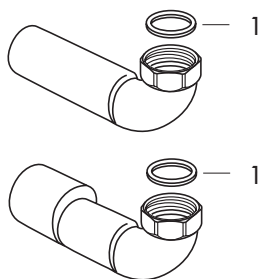
VERSION A	PLASTIC NUT						
ARTICLE CODE	700238	700243	700245	700244	700246	700262	700263
CONNECTED DIAMETERS	Ø 32 1"1/4	Ø 40 1"1/4	Ø 40 1"1/2	Ø 48 1"1/4	Ø 48 1"1/2	Ø 50 1"1/4	Ø 50 1"1/2
1 FLAT SEAL CODE	703024	703024	703021	703024	703021	703024	703021

VERSION A	BRASS NUT						
ARTICLE CODE	700038	700043	700045	700044	700046	700062	700063
CONNECTED DIAMETERS	Ø 32 1"1/4	Ø 40 1"1/4	Ø 40 1"1/2	Ø 48 1"1/4	Ø 48 1"1/2	Ø 50 1"1/4	Ø 50 1"1/2
1 FLAT SEAL CODE	703024	703024	703021	703024	703021	703024	703021

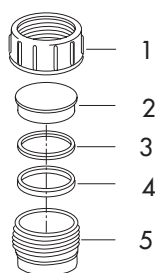


EXTENDED VERSION B	PLASTIC NUT						
ARTICLE CODE	700251	700253	700254	700256	700258	700260	
CONNECTED DIAMETERS	Ø 40 1"1/4	Ø 40 1"1/2	Ø 48 1"1/4	Ø 48 1"1/2	Ø 50 1"1/4	Ø 50 1"1/2	
1 FLAT SEAL CODE	703024	703021	703024	703021	703024	703021	

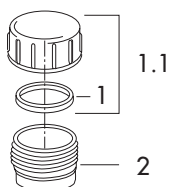
EXTENDED VERSION B	BRASS NUT						
ARTICLE CODE	700051	700053	700054	700056	700058	700060	
CONNECTED DIAMETERS	Ø 40 1"1/4	Ø 40 1"1/4	Ø 48 1"1/4	Ø 48 1"1/2	Ø 50 1"1/4	Ø 50 1"1/2	
1 FLAT SEAL CODE	703024	703021	703024	703021	703024	703021	

BEND WITH NUT

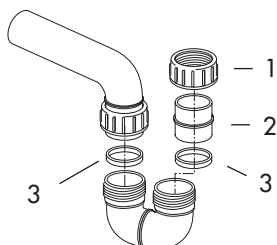
VERSION (BRASS NUT)	A		B	
ARTICLE CODE	700180	700190	700059	700061
CONNECTED DIAMETERS	Ø 40 x 1"1/4	Ø 40 x 1"1/2	Ø 40/50 x 1"1/4	Ø 40/50 x 1"1/2
1 SEAL CODE	703024	703021	703024	703021

THREADED COUPLING

ARTICLE CODE	338001	338003	338004	338005	338006	338007	338009	338011
CONNECTED DIAMETERS	Ø 40	Ø 50	Ø 56	Ø 63	Ø 56/63	Ø 75	Ø 90	Ø 110
1 NUT CODE	338840	338850	338856	338863	338856	338875	338890	338811
2 CA CODE	503001	503003	503002	503006	503002	503006	503008	503007
3 RING CODE	338041	338051	338058	338065	338058	338076	338081	338111
4 SEAL CODE	338040	338050	338056	338063	338056	338075	338090	338110
5 THREADED UNION CODE	340340	340350	340356	340363	340353	340365	340375	340310

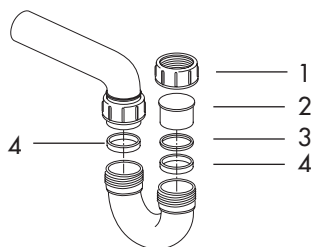
COMPLETE CAP

ARTICLE CODE	340001	340003	340004	340005	340007	340009	340011
CONNECTED DIAMETERS	Ø 40	Ø 50	Ø 56	Ø 63	Ø 75	Ø 90	Ø 110
1 SEAL CODE	340840	340850	340856	340863	340875	340890	340811
1.1 CAP WITH SEAL CODE	338040	338050	338056	338063	338075	338090	338110
2 THREADED UNION CODE	340340	340350	340356	340363	340365	340375	340310

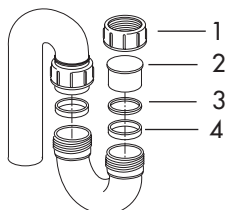
UNIVERSAL TRAP, VERTICAL INLET AND HORIZONTAL OUTLET

ARTICLE CODE	700833	700835	700839	700840
CONNECTED DIAMETERS	Ø 63	Ø 75	Ø 90	Ø 110
1 NUT CODE	338863	338875	338890	338811
2 CONNECTING UNION CODE	344005	344007	344009	344011
3 SEAL CODE	338063	338075	338090	338110

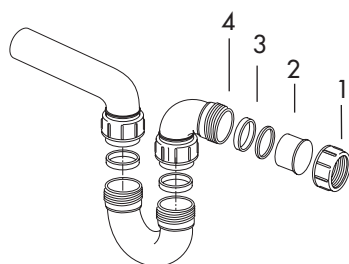
HOPE TRAPS



ARTICLE CODE	700814	700817	700811	700815	700813
CONNECTED DIAMETERS	Ø 40/40	Ø 40/50	Ø 40/56	Ø 50/50	Ø 50/56
1 NUT	CODE	338840	338840	338840	338850
		-	338850	338856	-
2 CAP	CODE	503001	503001	503001	503003
3 RING	CODE	338041	338041	3380413	338051
4 SEAL	CODE	338040	338040	338040	338050



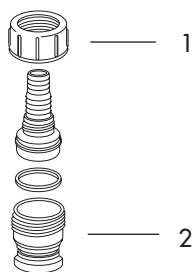
ARTICLE CODE	700809	700807	700801	700805	700803
CONNECTED DIAMETERS	Ø 40/40	Ø 40/50	Ø 40/56	Ø 50/50	Ø 50/56
1 NUT	CODE	338840	338840	338840	338850
		-	338850	338856	-
2 CAP	CODE	503001	503001	503001	503003
3 RING	CODE	338041	338041	338041	338051
4 SEAL	CODE	338040	338040	338040	338050



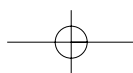
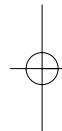
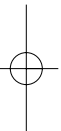
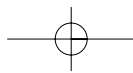
ARTICLE CODE	700819	700821	700825	700823	700827
CONNECTED DIAMETERS	Ø 40/40	Ø 40/50	Ø 40/56	Ø 50/50	Ø 50/56
1 NUT	CODE	338840	338840	338840	338850
		-	338850	338856	-
2 CAP	CODE	503001	503001	503001	503003
3 RING	CODE	338041	338041	338041	338051
4 SEAL	CODE	338040	338040	338040	338050

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WASHING MACHINE CONNECTOR



ARTICLE CODE	700853
CONNECTED DIAMETERS	Ø 50
1 NUT	CODE
	338840
2 SEAL	CODE
	338040



Valsir hopes that this technical manual is of use to all those operating in the plumbing sector. Naturally it is not possible to deal with all the problems or installation examples in this manual. Our technical staff is, however, available to give guidance on design and the correct use of all VALSIR products. While every effort has been made to ensure the accuracy of the information contained in this manual, no responsibility is accepted for errors or omissions.