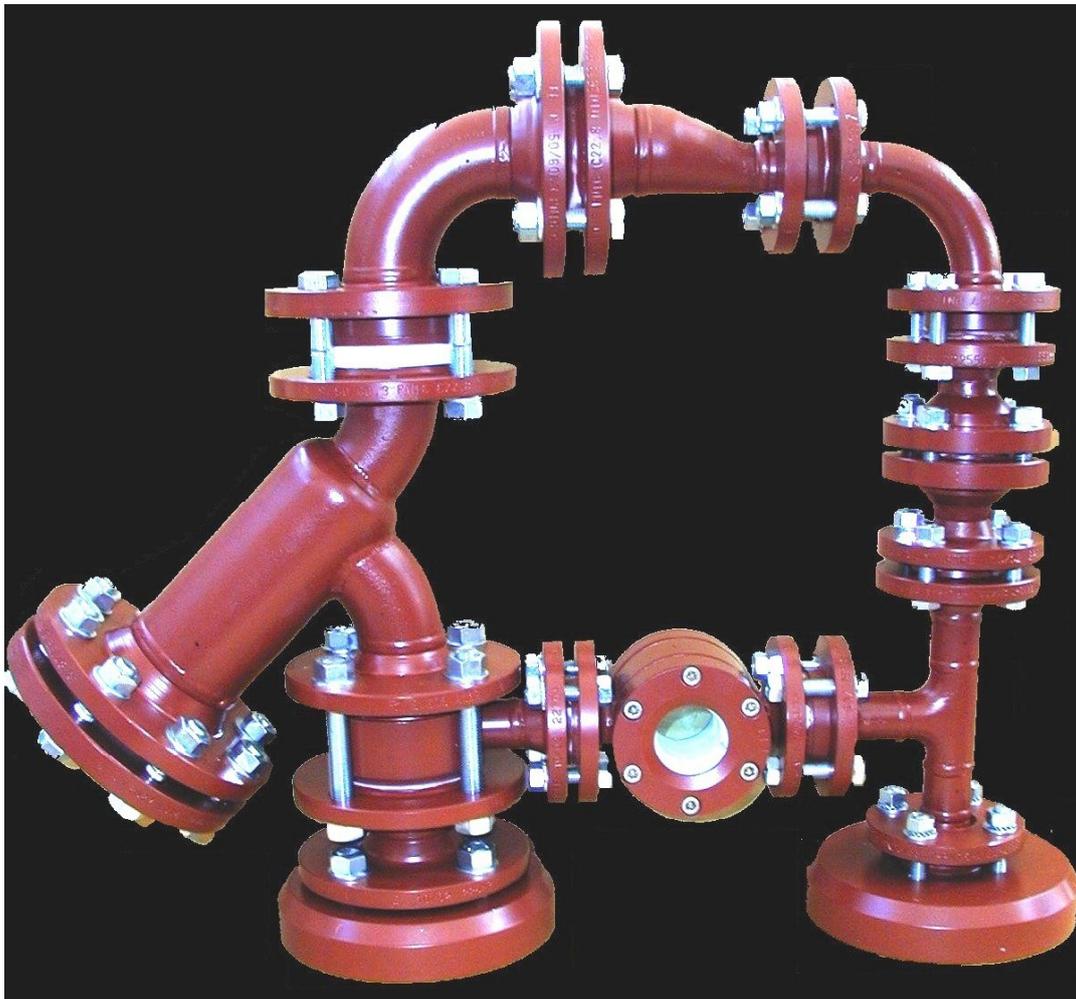




FLUORCARBON s.r.l.



The specialists in ptfе piping !

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PTFE lined tube systems.

PTFE exceptional resistance to chemical aggressions at temperatures between -200°C and +260°C accounts for its high corrosion strength, which makes it possible to use these piping systems in a wide range of applications.

The processing techniques that we have expressly developed mainly consist of isostatic moulding and paste extrusion. The resulting end product has exclusive features as:

- High density and crystallinity which, coupled with a considerable wall thickness, make PTFE extremely vacuum-resistant, and at the same time protect it from gas and steam permeation.
- The homogeneous composition of the lining in critical spots, too, prevents weakening of the structure and thinning of the wall.
- A minimal initial subsidence, which then remains constant, minimizes deformation during the sintering process.
- The accurate processing keeps influence able properties such as resistance to strokes and bending, tensile strength and crystallinity at a constantly high standard.
- The strength of PTFE pipes, no matter the way they are processed, is the same radially and longitudinally, which makes the pipes particularly strong against vacuum and alternate pressures.

Summary table referred to DIN (ANSI) material.

Nominal sizes DN 15 (½") ÷ DN 300 (12") (different sizes on request).

Nominal pressure PN 10 – PN 16

Higher pressures are available on request.

Pipes + shaped parts in compliance with DIN 2848 (ANSI B16.5).

Delivery terms in compliance with DIN 2874.

Types of Flanges:

DIN version:

Welding neck flanges for DN 15 up to DN 150

in compliance with DIN 2633 (PN 16); for DN 200 up to DN 300 in compliance with DIN 2632 (PN 10).

Lap joint flanges for DN 15 up to DN 150

in compliance with DIN 2577 (PN 16); for DN 200 up to DN 300 in compliance with DIN 2576 (PN 10).

ANSI version:

Flanges in compliance with ANSI 150 lbs..

Special flanges available on request

Types of shaped parts:

a) 45° and 90° bends

For DN 15 up to DN 40: in compliance with DIN 2605 (5d)
 For DN 50 up to DN 300: in compliance with DIN 2605 (3d)

b) 45° and 90° bends

For ½" up to 2": Long Radius
 For 2½" up to 12": Short Radius

c) T-shaped parts in compliance with DIN 2615 (ANSI: schedule 40)

d) Reducers in compliance with DIN 2616 (ANSI: schedule 40)

e) Sight glasses in compliance with DIN 28121

Steel material:

a) Shaped parts and tubes St 35 (1.0308) in Compliance with DIN 1629 Part 3. (ANSI: ASTM A 106 gr. B for pipes and ASTM A 234 gr. WPB for fittings)

b) Flanges: R-St 37-2 (1.10112) in compliance with DIN 17100 (ANSI: ASTM A105).

c) the above mentioned classes of steel could vary depending on availability on the market.

d) special steel with particular high-quality features is available on request.

Lining:

White "virgin" PTFE in compliance with DIN 28055 part 1 and 2 (ASTM D 4894 and 4895)

Other types:

Compound PTFE: (conductive versions – special versions)

Processing:

a) Pipes: DN 15 paste extrusion

DN 20 ÷ 300 isostatic moulding

b) Shaped parts: isostatic moulding

Features of pure PTFE

(mean values)

1. Thermal properties

Feature	Value	Unit	Checking method
Thermal application field	-200 ... + 260	°C	
Melting field	320 – 340	°C	DTA
Coefficient of linear expansion between			
20°C and 100°C	$16 \cdot 10^{-5}$	K ⁻¹	DIN 52328 (dilatometer)
20°C and 200°C	$19,5 \cdot 10^{-5}$	K ⁻¹	
20°C and 300°C	$25 \cdot 10^{-5}$	K ⁻¹	
Specific heat			
At 0°C	0,96	kJ/Kg K	adiabatic calorimeter
At 50°C	1,03	kJ/Kg K	
Heat conductivity	0,25 – 0,50	W/m · K	DIN 56612

2. Further physical properties

Feature	Value	Unit	Checking method
Water absorption	None	%	DIN 53472
UV resistance and weatherability	Very good		ASTM E 42-57 T
Flammability	None		DIN 53459
Coefficient of permeability	$2-8 \cdot 10^{-7}$	$\frac{\text{cm}^3 \cdot \text{cm}}{\text{cm} \cdot \text{sec} \cdot \text{bar}}$	Checked with Helium At +23°C – 50°C
Radiation resistance			
No damage	< 30	J/Kg	
Destruction limit	About 500	J/Kg	
Brittleness	10^4	J/Kg	

3. Mechanical properties

Feature	Value	Unit	Checking method
Density	2,15 – 2,20	g/cm ³	DIN 53479
Tensile strength	20 – 40	N/mm ²	DIN 53455
Elongation at break	250...500	%	DIN 53455
10% Expansion tension	11...12	N/mm ²	DIN 53455
Number of transverse contraction	About 0,4		
Modulus of E traction	750	N/mm ²	DIN 53457
Thrust modulus	750	N/mm ²	DIN 53445
Resistance to pressure			
Yielding limit 1%	10	N/mm ²	DIN 53454
Yielding limit 10%	18	N/mm ²	
Resistivity to bending	No breaking	N/mm ²	DIN 53452
Torsion rigidity	160	N/mm ²	DIN 53447
Resistivity to strokes	No breaking	KJ/m ²	DIN 53453
Resilience	16	KJ/m ²	DIN 53453
Number of alternated bending	>10 ⁶	Load change	DIN 53374
Shore hardness	55...59	Shore D	DIN 53505
	85...87	Shore C	
Hardness according to Rockwell	80...95		
Abrasion	470	mm ³	DIN 53516

4. Electrical properties

Feature	Value	Unit	Checking method
Relative dielectric Constant from 50-10 ⁷ Hz	2,1	—	DIN 53483
Dielectric dissipation Factor from 50-10 ⁷ Hz	0,3 – 0,7 · 10 ⁻⁴	—	DIN 53483
Resist. to disruptive discharge (plate 0,2 mm)	50-80	KV/mm	VDE 0303/Part 2
Specific resistivity to through way	10 ¹⁸	w□ cm	DIN 53482
Surface resistivity	10 ¹⁷	w□	DIN 53482
Resistivity to crawling current	KC>600	Grade	VDE 0303/Part 1/9.64
Resistivity to arching	L4	Grade	VDE 0303/Part 5

5. Resistance to chemicals

PTFE is resistant against all chemical agents with the few following exceptions:

- alkaline metals such as sodium, potassium and calcium give a brownish hue when melted or fused.
- Fluorine hydrocarbons (Frigene) cause swelling (reversible), possibly at room temperature.
- Elementary fluorine and chlortrifluoride do not cause any alterations at room temperature, but at higher temperatures and pressures shrinking can come about.
- Benzyl chloride, Dymethyl Formamide and fuming nitric acids can alter PTFE structure at high temperatures.

6. Marking

The shaped parts and the pipes bear the manufacturer's mark on the flat side of the flange. On the flange rim are also marked nominal size, nominal pressure, lining material (PTFE) and manufacture date (month/year).

7. Tolerances

The sizes of the various piping elements are in compliance with DIN 2848 and DIN 2848 Part 10, 11 and 12.

Tolerances in the size of lined steel elements are such as to meet precision grade B in compliance with DIN 8570.

The thickness of the lining walls is matched to the different nominal sizes and ranges from 3,0 to 7,0 mm (DN 15 - DN 300).

In compliance with GKV guidelines a 10% deviation is allowed for wall thickness and a 5% deviation for diameters.

8. Surface constitution

The surface of the PTFE lining is smooth and free from anomalies and alien bodies.

9. Quality inspections

All the raw materials used, as well as semi-finished products and end products are routinely checked in order to ensure a constant quality.

Raw material

PTFE granulate is constantly checked for density, tear resistance, humidity, average particle size contamination and sintering behaviour.

Semi-finished products

In compliance with VDI 2539 pores, fissures and weak spots of the lining are repeatedly checked under high-tension. The direct current used ranges from 15 to 25 KV according to the different wall thickness (i.e., it is correlated to nominal sizes).

Finally, before storing, PTFE parts undergo a further visual inspection and their size is checked once again.

End Products

All end products are checked at a pressure corresponding to 1,5 times the nominal pressure, in water and at room temperature.

Material inspection and certificates

Certificates with inspection results are available, in compliance with EN 10204 - 2.2 and EN 10204 - 3.1 against overprice, and in case they should be required when placing the order.

10. Packing, transport, storing

Straight pipes have a protection cap on the seal surface of the flange which should be removed immediately before use.

Shaped parts are transported in boxes or similar containers; since the seal surface of their flanges is not protected it is advisable to take them out of the boxes with caution, in order to avoid mechanical damaging of the PTFE surfaces.

11: Design Conditions

Hereunder we are showing the Design conditions for our material with "Standard Duty" ptfe lining:

"Standard Duty"														
Size	15 ½"	20 ¾"	25 1"	32 1¼"	40 1½"	50 2"	65 2½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"
Thickness of ptfe (mm)	3,0	3,0	3,0	3,0	3,0	3,0	3,5	4,0	4,5	4,5	5,0	6,0	7,0	7,0
Max design pressure (bar)	16	16	16	16	16	16	16	16	16	16	16	10	10	10
Min design temperature (°C)	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
Max design temperature (°C)	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Max desing vacuum at 200°C (mbar)	10	10	10	10	10	10	10	10	200	300	500	600	800	800

In case of more critical vacuum conditions, we developed a specific line of products called "Heavy Duty" with an increased thickness of ptfe lining and hereunder we are reporting its Design conditions:

(values for sizes from DN 15 (½") up to DN 80 (3") included remain the same)

"Heavy Duty"														
Size	15 ½"	20 ¾"	25 1"	32 1¼"	40 1½"	50 2"	65 2½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"
Thickness of ptfe (mm)	3,0	3,0	3,0	3,0	3,0	3,0	3,5	4,0	7,0	7,0	8,0	9,5	11,0	11,0
Max design pressure (bar)	16	16	16	16	16	16	16	16	16	16	16	10	10	10
Min design temperature (°C)	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
Max design temperature (°C)	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Max desing vacuum at 200°C (mbar)	10	10	10	10	10	10	10	10	10	20	30	50	80	100

In the following table we are reporting the max vacuum resistance for "Standard Duty" and "Heavy Duty" items according to different temperatures:

"Standard Duty"						"Heavy Duty"								
Size	15 ½"	20 ¾"	25 1"	32 1¼"	40 1½"	50 2"	65 2½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"
Max desing vacuum at 20°C (mbar) – S.D.	1	1	1	1	1	1	1	1	20	30	50	60	80	80
Max desing vacuum at 20°C (mbar) – H.D.	1	1	1	1	1	1	1	1	1	2	3	5	8	10
Max desing vacuum at 50°C (mbar) – S.D.	3	3	3	3	3	3	3	3	50	75	130	150	200	200
Max desing vacuum at 50°C (mbar) – H.D.	3	3	3	3	3	3	3	3	3	5	10	15	20	30
Max desing vacuum at 100°C (mbar) – S.D.	5	5	5	5	5	5	5	5	100	150	250	300	400	400
Max desing vacuum at 100°C (mbar) – H.D.	5	5	5	5	5	5	5	5	5	10	15	30	40	50
Max desing vacuum at 150°C (mbar) – S.D.	8	8	8	8	8	8	8	8	150	225	380	450	600	600
Max desing vacuum at 150°C (mbar) – H.D.	8	8	8	8	8	8	8	8	8	15	25	40	60	80
Max desing vacuum at 200°C (mbar) – S.D.	10	10	10	10	10	10	10	10	200	300	500	600	800	800
Max desing vacuum at 200°C (mbar) – H.D.	10	10	10	10	10	10	10	10	10	20	30	50	80	100

12. Assembly instructions for lined tubes and shaped parts

The seal surface of the flanges is provided with a protection cap during transport and storing; the cap should be removed immediately before use. Do not remove the wooden protection caps until assembling and do not leave the pieces without protection caps under the sun.

The lined parts of the tubes should not be welded or brazed in order to avoid damaging the lining.

Following twisting moments can be used as general criteria for assembly:

Specifications in Nm

DIN (ANSI) SIZE	PN 10 (for DN 200 and above)/PN 16 for others (ANSI 150 lbs.)		Twisting moments (for DIN and ANSI)	PN 25 (for DN 200 and above)/PN 40 for others. (ANSI 300 lbs.)		Twisting moments (for DIN and ANSI)
	Number of screws and threads			Number of screws and threads		
15 (1/2")	4 x M12	(4 x 1/2")	15	4 x M12	(4 x 1/2")	17
20 (3/4")	4 x M12	(4 x 1/2")	22	4 x M12	(4 x 5/8")	25
25 (1")	4 x M12	(4 x 1/2")	22	4 x M12	(4 x 5/8")	25
32 (1 1/4")	4 x M16	(4 x 1/2")	25	4 x M16	(4 x 5/8")	30
40 (1 1/2")	4 x M16	(4 x 1/2")	25	4 x M16	(4 x 3/4")	30
50 (2")	4 x M16	(4 x 5/8")	35	4 x M16	(8 x 5/8")	40
65 (2 1/2")	8 x M16	(4 x 5/8")	45	8 x M16	(8 x 3/4")	50
80 (3")	8 x M16	(4 x 5/8")	45	8 x M16	(8 x 3/4")	50
100 (4")	8 x M16	(8 x 5/8")	50	8 x M20	(8 x 3/4")	55
125 (5")	8 x M16	(8 x 3/4")	60	8 x M24	(8 x 3/4")	80
150 (6")	8 x M20	(8 x 3/4")	70	8 x M24	(12 x 3/4")	95
200 (8")	8 x M20	(8 x 3/4")	100	12 x M24	(12 x 7/8")	120
250 (10")	12 x M20	(12 x 7/8")	100	12 x M27	(16 x 1")	120
300 (12")	12 x M20	(12 x 7/8")	120	16 x M27	(16 x 1 1/8")	140

These specifications are referred to maximal temperature and screws with lubricated threads easy to insert.

About 24 hours after the screwing is operative, once the final temperature has been reached, the screwing should be checked in relation to the twisting moments. At room temperature the values concerning the twisting moments can be exceeded up to 50%.

The whole piping is provided with holes: it is important not to obstruct them when insulation or anti-corrosion means are

taken. When the temperature exceeds 50°C the piping should not be dismantled in order to avoid damaging the seal surfaces.

In case of leakages at the points where the flanges meet, the screws should not be tightened: on the contrary the connection should be loosened in order to allow inspection for alien bodies or unevenness.

13. Safety.

The Producer (L.M.P. Fluorcarbon s.r.l.) is not supplying safety valves or alternative systems to avoid any excessive pressure inside the delivered materials, which could cause serious damages to people and/or plants and/or part of the same: the operation for

Assembly of the single elements does not require further sealing, but a PTFE-lined sealing should be used when connecting the flange with materials such as glass or enamel in a not parallel way.

Do not use sharp edges to mount the items: a cut on the ptfе flare does not permit to use the item any more.

Tighten always the bolting into a cross-section: an excessive traction during flange screwing may cause deformation on the seal surface.

granting a safety conditions of the items will be on User's account.

Moreover, the items supplied by the Producer (L.M.P. Fluorcarbon s.r.l.) are studied to be used with presence of high temperature (up to 200°C), even if they are not protected outside because of the very particular nature of the material and of the protective barriers available on the market, which are suitable to be used with pipes and fittings in steel with inside ptfе lining.

Finally, the steel frames with ptfе lining inside are studied for the passage of dangerous, corrosive and toxic fluid, in any case, substances that in case they come out from the piping line, could cause serious damages to people, animals, things and environment: the final User must utilize all the available and possible means in order to avoid any accident, paying particular attention to the protection, maintenance and right use of the delivered items.

The Producer (L.M.P. Fluorcarbon S.r.l.) cannot be considered responsible for any damages to people, animals, things and environment, caused by the User with an improper use, or without the respect of the working conditions communicated, or even for lack of application of the Law Disposals and of any applicable regulation.

14. Lining Performance of PTFE

The processing technique that we expressly developed mainly consists of isostatic mould, system which gives high features.

The above mentioned process can be divided into 2 different systems:

- on one side there is the lining system of pipes,
- on the other side there is the one of fittings.

The isostatic moulding system applied to pipes is made outside of the original steel frames to be lined and, thanks to some rubber shapes exclusively built up for this reason, the ptfе compounds are compressed inside of special steel moulds designed by L.M.P. Fluorcarbon at high pressure rates.

The obtained result is a ptfе pipe 3 meters long ¹, length which is only made by few Companies in the world with such a technology.

Once the ptfе pipe has been moulded, it must undergo to a sintering process in order to obtain the typical properties of a ptfе liner.

Starting from the 3 meters long pipes, we can line all the desired lengths within that dimension. In order to line the specific steel pipes, the ptfе bar is cut at the proper length and then it is flared on both sides.

The isostatic moulding process applied to fittings is completely different: the lining of the steel parts is made directly into the steel frame to be lined.

This means that a part of the mould is the steel frame itself and another important part of the mould is a rubber form, which is designed by L.M.P. Fluorcarbon to follow the different shapes of the pieces to be coated; this system also gives the possibility to test the generosity of the welding seams of the steel frames that, in some cases, are exposed up to a pressure of 300 bars.

Once that the ptfе compound has been compacted in the above described way, even the fittings must undergo to a sintering cycle, which gives as result the final needed item with all the rich properties typical of the isostatic moulding process.

The best advantages out of this system are:

- a complete homogeneous composition of the coating with all the mechanical properties the same in all the points of the ptfе part (preventing weakening of the structure and thinning of the wall);
- all the pieces obtained by this technology are lined in only one single ptfе part, avoiding the risk of leakages in the connecting points;
- the mechanical properties must be considered constant along the whole surface of the liner and they are kept at a high standard quality;
- the type of used moulding system cannot accept compromises in terms of quality: in fact, once a piece has a defect of fabrication, instantaneously the full liner cracks and it is rejected during the production;
- an improved stability of the ptfе part inside of the steel frame, result which guarantees less significant increasements and/or deformations than with all the other processing systems;
- a minimal initial subsidence, which then remains constant, minimizes deformation during the sintering process;
- resistance to strokes and bending, tensile strength and crystallinity are kept at a constantly high standard;
- in case of pipes, the strength is the same radially and longitudinally, as well, due to the transforming process: this characteristic makes the pipes particularly strong against alternating pressures;
- in case of fittings, the moulded ptfе parts must be not stretched, curved or flared: this means that the mechanical properties of ptfе are not decreased and they remain stable.

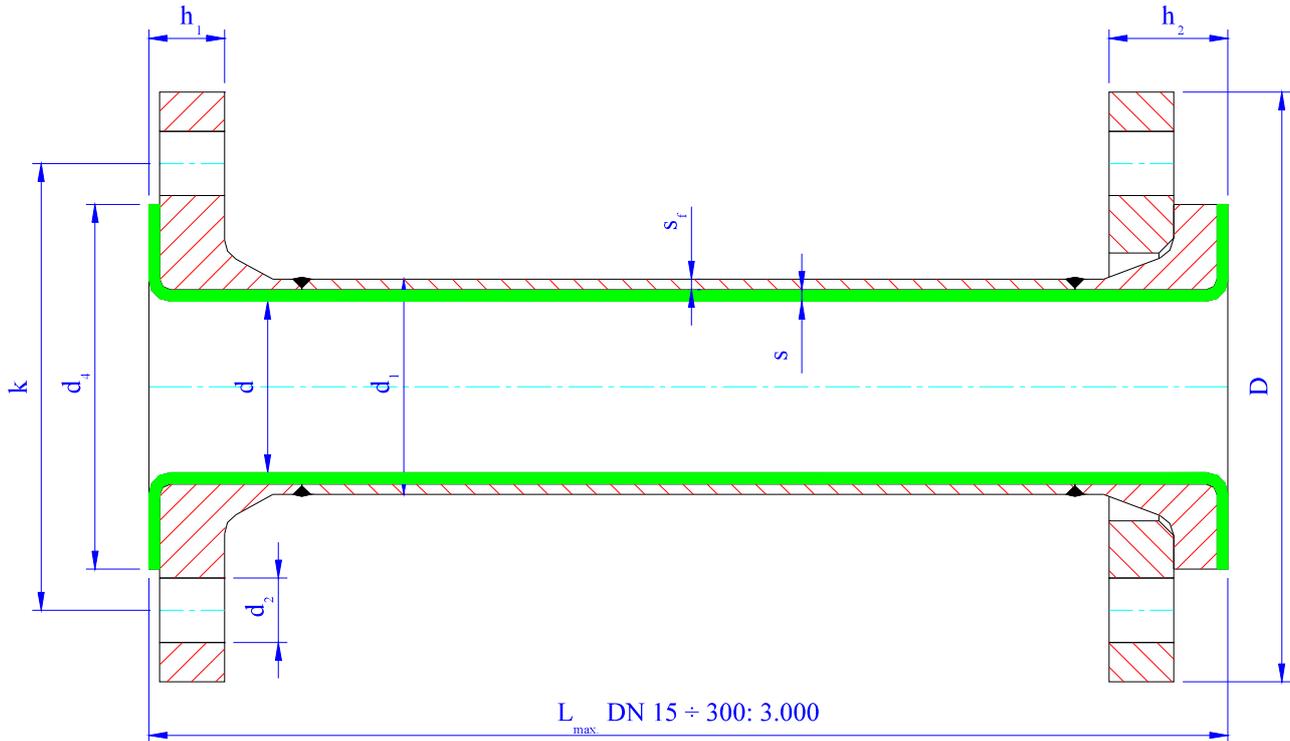
L.M.P. Fluorcarbon pays particular attention to the quality of the produced items, checking and testing several times during the processes the entire quantities: this event gives final products which are considered ones of the most qualified pieces in the world of ptfе lining process.

¹The maximum length for pipes bigger than DN 300 is 1 meter.

FLANGED PIPES (DIN 2848 part 12).

Material specification: Tube: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery terms: in compliance with DIN 2874

Dimensions expressed in mm.



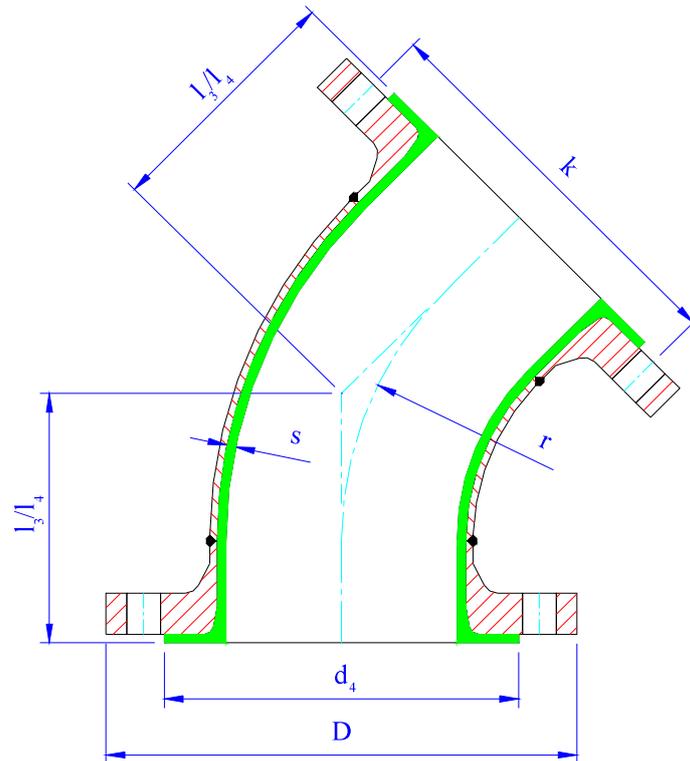
DN	d ₁	s _r	d	s	n x d ₂	d ₄	k	D	h ₁	h ₂
15	24,0	3,0	12	3	4 x 14	45	65	95	16,5	26,5
20	33,7	2,9	22	3	4 x 14	58	75	105	19	29
25	33,7	2,9	22	3	4 x 14	68	85	115	19	31
32	42,4	2,6	31	3	4 x 18	78	100	140	19	31
40	48,3	2,9	37	3	4 x 18	88	110	150	19	31
50	60,3	2,9	48	3	4 x 18	102	125	165	21	33
65	76,1	2,9	63	3,5	8 x 18	122	145	185	21,5	33,5
80	88,9	3,2	75	4	8 x 18	138	160	200	23,5	37,5
100	114,3	3,6	99	4,5	8 x 18	158	180	220	24	38
125	139,7	4,0	122	4,5	8 x 18	188	210	250	26,5	40,5
150	168,3	4,5	149	5	8 x 22*	212	240	285	27	41
200	219,1	6,3	194	6	8 x 22*	268	295	340	30	46
250	273,0	6,3	248	7	12 x 22*	320	350	395	32	50
300	323,9	7,1	297	7	12 x 22*	370	400	445	32	54

* for flanges according to DIN 2673 it is 8 x 23 or 12 x 23.
 On request it is available "Heavy Duty" material suitable for vacuum.
 Vent Holes according to Producer's option.

FLANGED 45° BENDS according to DIN 2848

Material specification: Steel frame: St. 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.10112)
 Lining: Pure Ptfе in compliance with ASTM-D 1457-78 Type IV - V
 Delivery time: in compliance with DIN 2874

Sizes are expressed in mm.



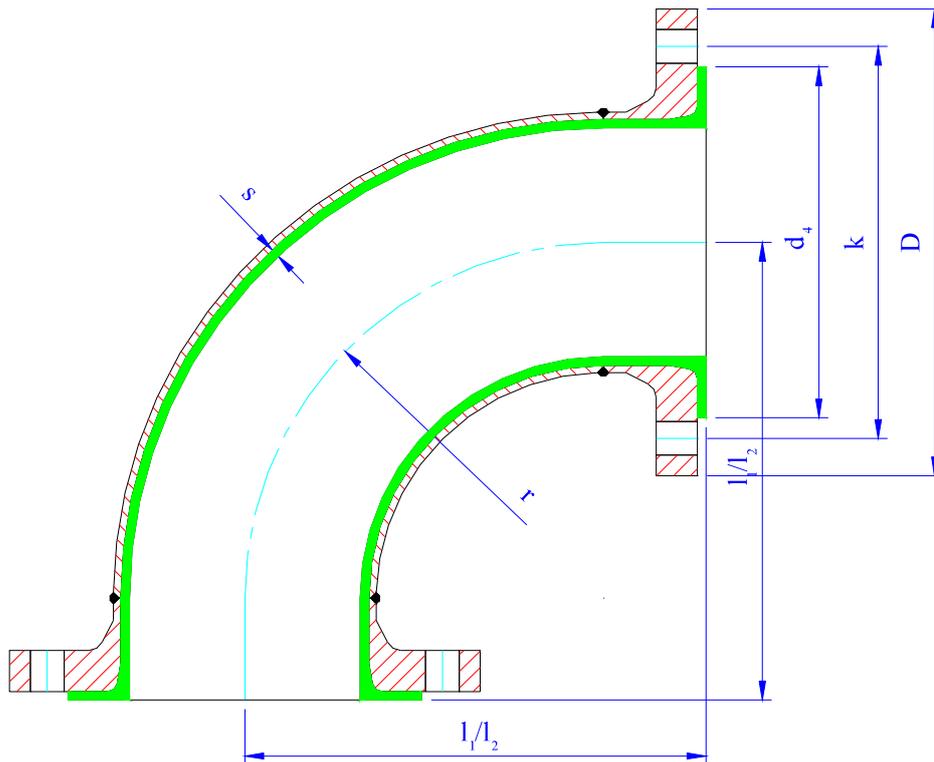
DN	s	Type of bend	r	l ₃	l ₄	d ₄	k	D	Weight kg.
15	3	5d	42,5		45	45	65	95	1,9
20	3	5d	72,5		65	58	75	105	2,2
25	3	5d	72,5		70	68	85	115	2,6
32	3	5d	92,5		80	78	100	140	3,8
40	3	5d	107,5		90	88	110	150	4,2
50	3	3d	76	80		102	125	165	5,5
65	3,5	3d	95	85		122	145	185	7,2
80	4	3d	114,5	100		138	160	200	10,0
100	4,5	3d	152,5	115		158	180	220	12,0
125	4,5	3d	190,5	135		188	210	250	17,1
150	5	3d	228,5	150		212	240	285	22,3
200	6	3d	305	190		268	295	340	33,0
250	7	3d	381	225		320	350	395	54,0
300	7	3d	457	260		370	400	445	76,0

On request it is available "Heavy Duty" material suitable for vacuum.
 On request we can supply bends with different angles
 Vent Holes according to producer's discretion.

FLANGED 90° BENDS (DIN 2848)

Material specification: Steel Frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery terms: in compliance with DIN 2874

Sizes are expressed in mm.



DN	s	Type of bend	r	l_1	l_2	d_4	k	D	Weight kg.
15	3	5d	42,5		80	45	65	95	2,0
20	3	5d	72,5		95	58	75	105	2,3
25	3	5d	72,5		110	68	85	115	2,9
32	3	5d	92,5		130	78	100	140	4,0
40	3	5d	107,5		150	88	110	150	4,5
50	3	3d	76	120		102	125	165	6,0
65	3,5	3d	95	140		122	145	185	7,9
80	4	3d	114,5	165		138	160	200	10,4
100	4,5	3d	152,5	205		158	180	220	12,6
125	4,5	3d	190,5	245		188	210	250	19,0
150	5	3d	228,5	285		212	240	285	26,0
200	6	3d	305	365		268	295	340	48,1
250	7	3d	381	450		320	350	395	76,2
300	7	3d	457	525		370	400	445	110,0

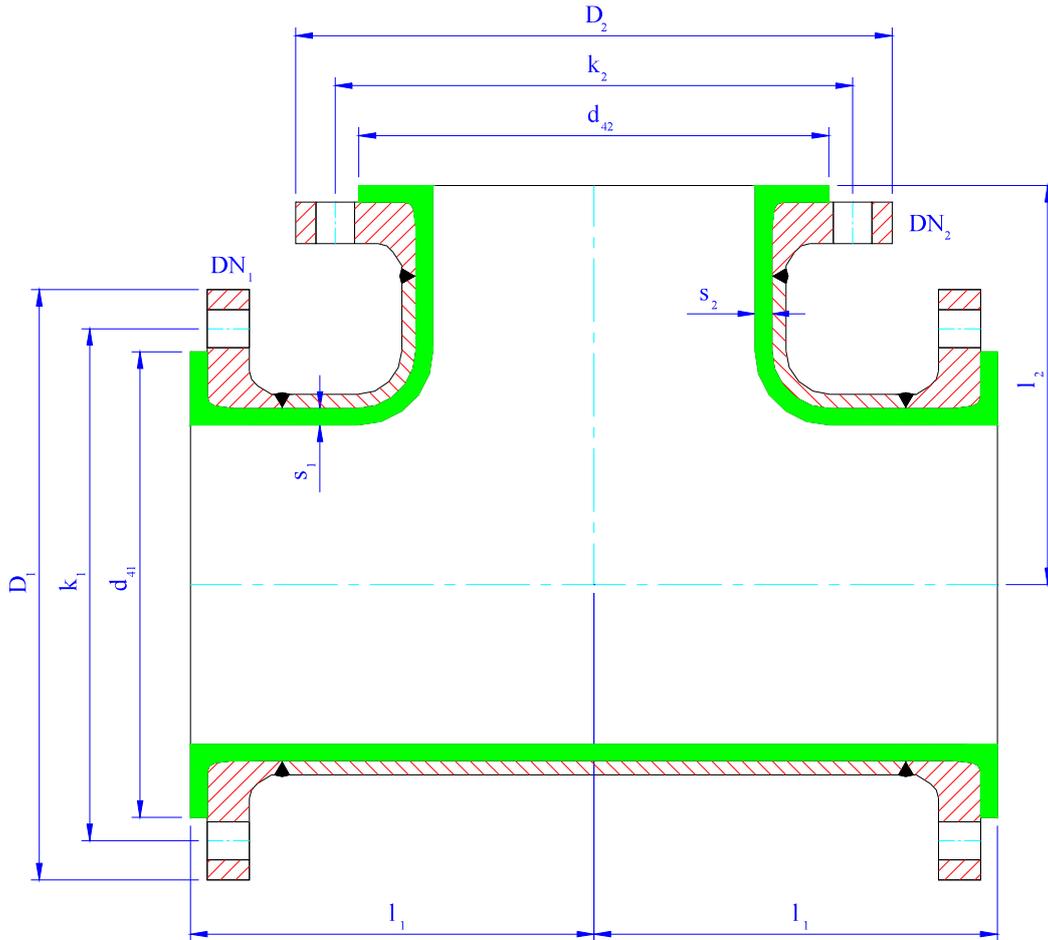
On request, "Heavy Duty" pieces are available for vacuum conditions.
 Steel frames are according to schedule 40.
 On request, bends with different angles are available.
 Vent holes at Manufacturer's discretion.

EQUAL AND REDUCING TEES (DIN 2848)

WITH EQUAL OR REDUCED BRANCH

Material specification: Steel Frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery terms: in compliance with DIN 2874

Dimensions expressed in mm.



DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Kg.
15	3	80	45	65	95	15						2,4
20	3	95	58	75	105	20						3,3
20	3	95	58	75	105	15	3	80	45	65	95	2,7
25	3	110	68	85	115	25						4,4
25	3	110	68	85	115	20	3	95	58	75	105	4,0
25	3	110	68	85	115	15	3	80	45	65	95	3,6
32	3	130	78	100	140	32						6,4
32	3	130	78	100	140	25	3	110	68	85	115	6,1
32	3	130	78	100	140	20	3	95	58	75	105	5,8
32	3	130	78	100	140	15	3	80	45	65	95	5,5
40	3	150	88	110	150	40						7,8
40	3	150	88	110	150	32	3	130	78	100	140	7,5
40	3	150	88	110	150	25	3	110	68	85	115	7,1
40	3	150	88	110	150	20	3	95	58	75	105	6,8
40	3	150	88	110	150	15	3	80	45	65	95	6,5

EQUAL AND REDUCING TEES (DIN 2848)

WITH EQUAL OR REDUCED BRANCH

Material specification: Steel Frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery terms: in compliance with DIN 2874

Dimensions expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Kg.
50	3	120	102	125	165	50						9,6
50	3	120	102	125	165	40	3	150	88	110	150	8,4
50	3	120	102	125	165	32	3	130	78	100	140	7,9
50	3	120	102	125	165	25	3	110	68	85	115	7,6
50	3	120	102	125	165	20	3	95	58	75	105	7,3
50	3	120	102	125	165	15	3	80	45	65	95	7,0
65	3,5	140	122	145	185	65						11,7
65	3,5	140	122	145	185	50	3	120	102	125	165	11,0
65	3,5	140	122	145	185	40	3	150	88	110	150	10,2
65	3,5	140	122	145	185	32	3	130	78	100	140	9,6
65	3,5	140	122	145	185	25	3	110	68	85	115	9,0
65	3,5	140	122	145	185	20	3	95	58	75	105	8,5
65	3,5	140	122	145	185	15	3	80	45	65	95	8,3
80	4	165	138	160	200	80						16,9
80	4	165	138	160	200	65	3,5	140	122	145	185	15,0
80	4	165	138	160	200	50	3	120	102	125	165	13,8
80	4	165	138	160	200	40	3	150	88	110	150	13,0
80	4	165	138	160	200	32	3	130	78	100	140	12,5
80	4	165	138	160	200	25	3	110	68	85	115	12,1
80	4	165	138	160	200	20	3	95	58	75	105	11,6
80	4	165	138	160	200	15	3	95	45	65	95	11,0
100	4,5	205	158	180	220	100						20,7
100	4,5	205	158	180	220	80	4	165	138	160	200	19,2
100	4,5	205	158	180	220	65	3,5	140	122	145	185	18,1
100	4,5	205	158	180	220	50	3	120	102	125	165	17,1
100	4,5	205	158	180	220	40	3	150	88	110	150	16,3
100	4,5	205	158	180	220	32	3	130	78	100	140	15,4
100	4,5	205	158	180	220	25	3	110	68	85	115	15,0
100	4,5	205	158	180	220	20	3	110	58	75	105	14,4
100	4,5	205	158	180	220	15	3	110	45	65	95	14,0
125	4,5	245	188	210	250	125						31,3
125	4,5	245	188	210	250	100	4,5	205	158	180	220	30,0
125	4,5	245	188	210	250	80	4	165	138	160	200	28,9
125	4,5	245	188	210	250	65	3,5	140	122	145	185	28,0
125	4,5	245	188	210	250	50	3	120	102	125	165	27,2
125	4,5	245	188	210	250	40	3	150	88	110	150	26,4
125	4,5	245	188	210	250	32	3	130	78	100	140	25,7
125	4,5	245	188	210	250	25	3	120	68	85	115	25,0

EQUAL AND REDUCING TEES (DIN 2848)

WITH EQUAL OR REDUCED BRANCH

Material specification: Steel Frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery terms: in compliance with DIN 2874

Dimensions expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Kg.
150	5	285	212	240	285	150						41,8
150	5	285	212	240	285	125	4,5	245	188	210	250	40,7
150	5	285	212	240	285	100	4,5	205	158	180	220	36,2
150	5	285	212	240	285	80	4	165	138	160	200	34,8
150	5	285	212	240	285	65	3,5	140	122	145	185	33,4
150	5	285	212	240	285	50	3	140	102	125	165	32,1
150	5	285	212	240	285	40	3	150	88	110	150	30,9
150	5	285	212	240	285	32	3	140	78	100	140	29,8
150	5	285	212	240	285	25	3	140	68	85	115	28,8
200	6	365	268	295	340	200						68,0
200	6	365	268	295	340	150	5	285	212	240	285	61,0
200	6	365	268	295	340	125	4,5	245	188	210	250	60,0
200	6	365	268	295	340	100	4,5	205	158	180	220	56,0
200	6	365	268	295	340	80	4	165	138	160	200	52,0
200	6	365	268	295	340	65	3,5	165	122	145	185	48,0
200	6	365	268	295	340	50	3	165	102	125	165	44,0
250	7	450	320	350	395	250						104,0
250	7	450	320	350	395	200	6	365	268	295	340	94,0
250	7	450	320	350	395	150	5	285	212	240	285	89,0
250	7	450	320	350	395	125	4,5	245	188	210	250	85,0
250	7	450	320	350	395	100	4,5	205	158	180	220	81,0
250	7	450	320	350	395	80	4	205	138	160	200	76,0
250	7	450	320	350	395	65	3,5	205	122	145	185	71,0
250	7	450	320	350	395	50	3	205	102	125	165	66,0
300	7	525	370	400	445	300						148,0
300	7	525	370	400	445	250	7	450	320	350	395	134,0
300	7	525	370	400	445	200	6	365	268	295	340	126,0
300	7	525	370	400	445	150	5	285	212	240	285	121,0
300	7	525	370	400	445	125	4,5	245	188	210	250	116,0
300	7	525	370	400	445	100	4,5	245	158	180	220	112,0
300	7	525	370	400	445	80	4	245	138	160	200	108,0
300	7	525	370	400	445	65	3,5	245	122	145	185	105,0
300	7	525	370	400	445	50	3	245	102	125	165	101,0

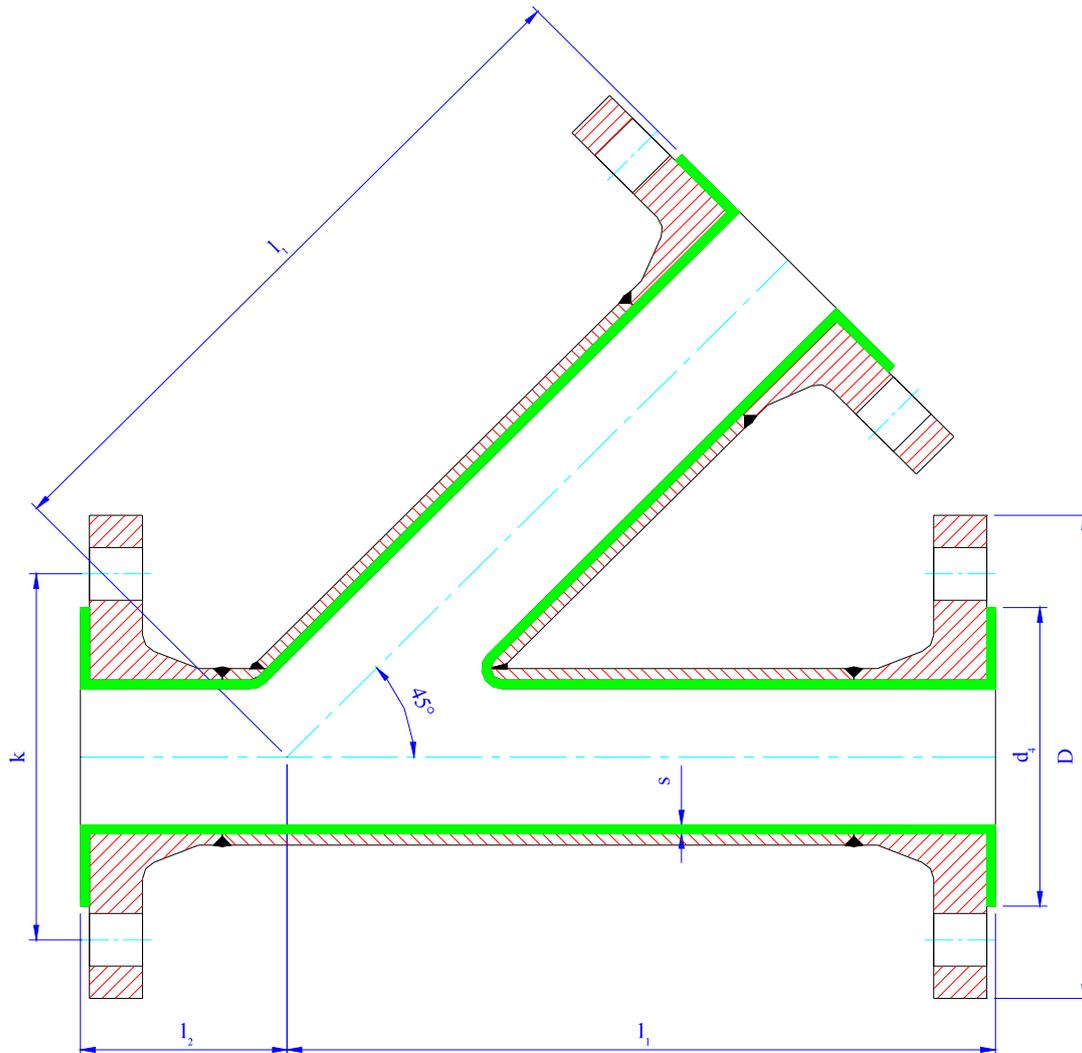
On request, "Heavy Duty" pieces are available for vacuum conditions.
 Steel frames are according to schedule 40.
 Vent holes at Manufacturer's discretion.

LATERAL TEES, with 45° branch

Material specification: Steel frames: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV - V
 in compliance with DIN 2874

Delivery terms:

Sizes are expressed in mm.



DN	s	l ₁	l ₂	d ₄	k	D	Weight kg.
25	3	180	40	68	85	115	4,2
32	3	210	45	78	100	140	6,1
40	3	220	50	88	110	150	7,5
50	3	240	55	102	125	165	9,3
65	3,5	260	60	122	145	185	11,2
80	4	290	70	138	160	200	16,3
100	4,5	320	80	158	180	220	19,9
125	4,5	350	90	188	210	250	30,1
150	5	380	100	212	240	285	41,0
200	6	455	120	268	295	340	68,0

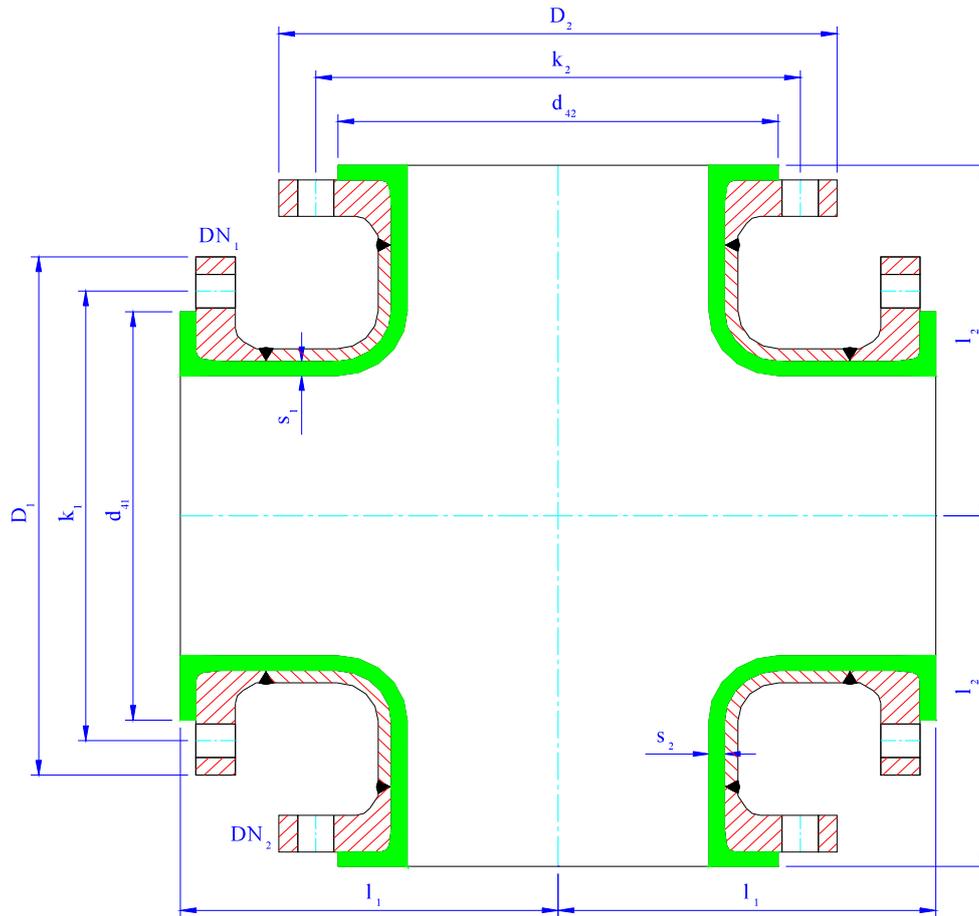
Steel frames are according to schedule 40.
 On request, "Heavy Duty" pieces are available for vacuum condition.
 Reduced lateral tees and/or lateral tees with different angles can be taken into account.
 Vent holes at Manufacturer's discretion.

EQUAL AND REDUCING CROSSES according to DIN 2848.

Material specification: Steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 Type IV e V

Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN_1	s_1	l_1	d_{41}	k_1	D_1	DN_2	s_2	l_2	d_{42}	k_2	D_2	Weight kg.
15	3	80	45	65	95	15	3	80	45	65	95	3,0
20	3	95	58	75	105	20	3	95	58	75	105	4,1
20	3	95	58	75	105	15	3	80	45	65	95	3,2
25	3	110	68	85	115	25	3	110	68	85	115	4,8
25	3	110	68	85	115	20	3	95	58	75	105	4,5
25	3	110	68	85	115	15	3	80	45	65	95	4,2
32	3	130	78	100	140	32	3	130	78	100	140	6,1
32	3	130	78	100	140	25	3	110	68	85	115	5,3
32	3	130	78	100	140	20	3	95	58	75	105	4,5
32	3	130	78	100	140	15	3	80	45	65	95	3,7
40	3	150	88	110	150	40	3	150	88	110	150	8,2
40	3	150	88	110	150	32	3	130	78	100	140	8,0
40	3	150	88	110	150	25	3	110	68	85	115	7,8
40	3	150	88	110	150	20	3	95	58	75	105	7,5
40	3	150	88	110	150	15	3	80	45	65	95	7,1

EQUAL AND REDUCING CROSSES according to DIN 2848.

Material specification: Steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 Type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight kg.
50	3	120	102	125	165	50	3	120	102	125	165	10,7
50	3	120	102	125	165	40	3	150	88	110	150	9,9
50	3	120	102	125	165	32	3	130	78	100	140	9,3
50	3	120	102	125	165	25	3	110	68	85	115	8,9
50	3	120	102	125	165	20	3	95	58	75	105	8,5
50	3	120	102	125	165	15	3	80	45	65	95	8,1
65	3,5	140	122	145	185	65	3,5	140	122	145	185	14,4
65	3,5	140	122	145	185	50	3	120	102	125	165	12,9
65	3,5	140	122	145	185	40	3	150	88	110	150	12,0
65	3,5	140	122	145	185	32	3	130	78	100	140	11,1
65	3,5	140	122	145	185	25	3	110	68	85	115	10,2
65	3,5	140	122	145	185	20	3	95	58	75	105	9,3
65	3,5	140	122	145	185	15	3	80	45	65	95	8,5
80	4	165	138	160	200	80	4	165	138	160	200	26,8
80	4	165	138	160	200	65	3,5	140	122	145	185	25,5
80	4	165	138	160	200	50	3	120	102	125	165	23,2
80	4	165	138	160	200	40	3	150	88	110	150	22,0
80	4	165	138	160	200	32	3	130	78	100	140	20,9
80	4	165	138	160	200	25	3	110	68	85	115	20,0
80	4	165	138	160	200	20	3	95	58	75	105	19,2
80	4	165	138	160	200	15	3	95	45	65	95	18,4
100	4,5	205	158	180	220	100	4,5	205	158	180	220	40,2
100	4,5	205	158	180	220	80	4	165	138	160	200	36,5
100	4,5	205	158	180	220	65	3,5	140	122	145	185	32,5
100	4,5	205	158	180	220	50	3	120	102	125	165	28,7
100	4,5	205	158	180	220	40	3	150	88	110	150	25,8
100	4,5	205	158	180	220	32	3	130	78	100	140	23,9
100	4,5	205	158	180	220	25	3	110	68	85	115	20,0
100	4,5	205	158	180	220	20	3	110	58	75	105	18,6
100	4,5	205	158	180	220	15	3	110	45	65	95	17,1
125	4,5	245	188	210	250	125	4,5	245	188	210	250	52,0
125	4,5	245	188	210	250	100	4,5	205	158	180	220	47,5
125	4,5	245	188	210	250	80	4	165	138	160	200	43,7
125	4,5	245	188	210	250	65	3,5	140	122	145	185	40,5
125	4,5	245	188	210	250	50	3	120	102	125	165	37,5
125	4,5	245	188	210	250	40	3	150	88	110	150	34,3
125	4,5	245	188	210	250	32	3	130	78	100	140	31,8
125	4,5	245	188	210	250	25	3	120	68	85	115	28,7

EQUAL AND REDUCING CROSSES according to DIN 2848.

Material specification: Steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 Type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight kg.
150	5	285	212	240	285	150	5	285	212	240	285	64,5
150	5	285	212	240	285	125	4,5	245	188	210	250	58,7
150	5	285	212	240	285	100	4,5	205	158	180	220	52,5
150	5	285	212	240	285	80	4	165	138	160	200	47,8
150	5	285	212	240	285	65	3,5	140	122	145	185	43,2
150	5	285	212	240	285	50	3	140	102	125	165	39,7
150	5	285	212	240	285	40	3	150	88	110	150	36,1
150	5	285	212	240	285	32	3	140	78	100	140	35,9
150	5	285	212	240	285	25	3	140	68	85	115	31,5
200	6	365	268	295	340	200	6	365	268	295	340	118,0
200	6	365	268	295	340	150	5	285	212	240	285	86,5
200	6	365	268	295	340	125	4,5	245	188	210	250	79,5
200	6	365	268	295	340	100	4,5	205	158	180	220	72,0
200	6	365	268	295	340	80	4	165	138	160	200	65,0
200	6	365	268	295	340	65	3,5	165	122	145	185	58,5
200	6	365	268	295	340	50	3	165	102	125	165	52,5
250	7	450	320	350	395	250	7	450	320	350	395	168,0
250	7	450	320	350	395	200	6	365	268	295	340	131,0
250	7	450	320	350	395	150	5	285	212	240	285	113,0
250	7	450	320	350	395	125	4,5	245	188	210	250	106,5
250	7	450	320	350	395	100	4,5	205	158	180	220	100,5
250	7	450	320	350	395	80	4	205	138	160	200	95,0
250	7	450	320	350	395	65	3,5	205	122	145	185	90,5
250	7	450	320	350	395	50	3	205	102	125	165	84,5
300	7	525	370	400	445	300	7	525	370	400	445	225,0
300	7	525	370	400	445	250	7	450	320	350	395	184,0
300	7	525	370	400	445	200	6	365	268	295	340	169,0
300	7	525	370	400	445	150	5	285	212	240	285	152,0
300	7	525	370	400	445	125	4,5	245	188	210	250	137,0
300	7	525	370	400	445	100	4,5	245	158	180	220	123,0
300	7	525	370	400	445	80	4	245	138	160	200	110,0
300	7	525	370	400	445	65	3,5	245	122	145	185	97,5
300	7	525	370	400	445	50	3	245	102	125	165	85,5

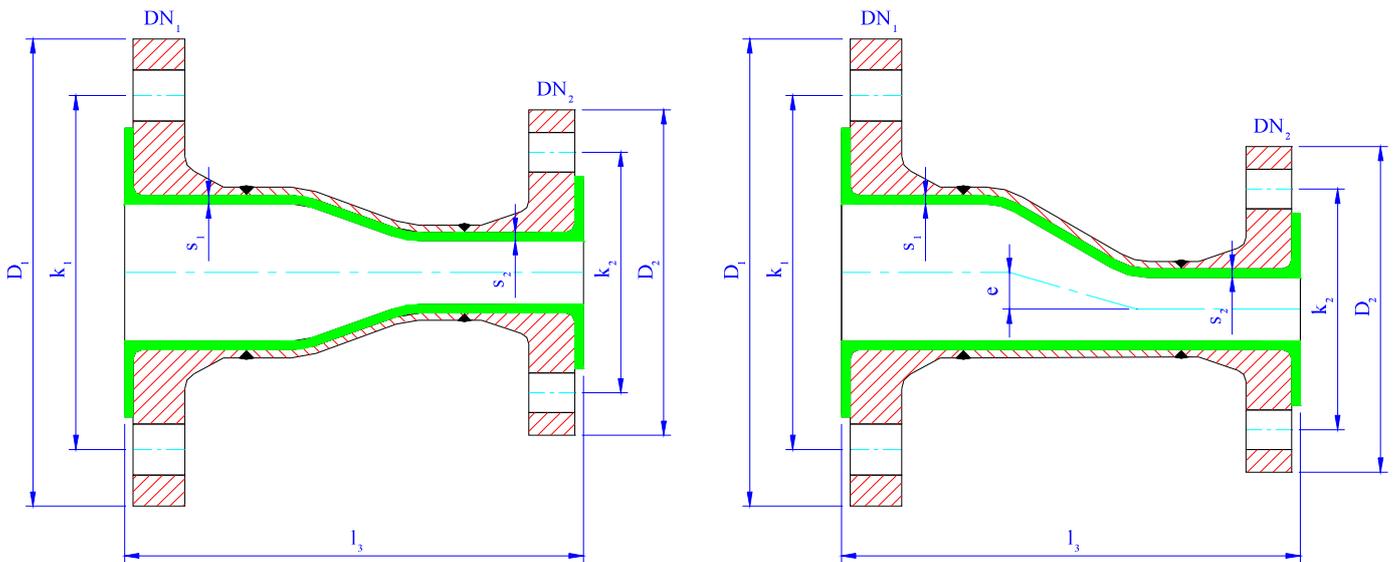
On request, "Heavy Duty" pieces are available for vacuum condition.
 Steel frames are according to schedule 40.
 Vent holes at Manufacturer's discretion.

FLANGED REDUCERS (DIN 2848)

CONCENTRIC / ECCENTRIC

Material specification: Steel frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery conditions: in compliance with DIN 2874

Dimensions expressed in mm.



DN ₁	s ₁	DN ₂	s ₂	e	l ₃	k ₁	D ₁	k ₂	D ₂	Weight kg.
20	3	15	3	3	125	75	105	65	95	2,1
25	3	20	3	3	125	85	115	75	105	2,3
25	3	15	3	3	125	85	115	65	95	2,2
32	3	25	3	4	130	100	140	85	115	3,1
32	3	20	3	4	130	100	140	75	105	2,9
32	3	15	3	4	130	100	140	65	95	2,5
40	3	32	3	3	150	110	150	100	140	4,3
40	3	25	3	7	145	110	150	85	115	3,4
40	3	20	3	7	145	110	150	75	105	2,5
40	3	15	3	7	145	110	150	65	95	1,8
50	3	40	3	6	165	125	165	110	150	5,3
50	3	32	3	9	165	125	165	100	140	4,8
50	3	25	3	13	160	125	165	85	115	4,3
50	3	20	3	13	160	125	165	75	105	3,8
50	3	15	3	13	160	125	165	65	95	3,0

FLANGED REDUCERS (DIN 2848)

CONCENTRIC / ECCENTRIC

Material specification: Steel frame: St 35 in compliance with DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 in compliance with DIN 17100 (1.0112)
 Lining: Pure PTFE in compliance with ASTM D 1457-78 type IV e V
 Delivery conditions: in compliance with DIN 2874

Dimensions expressed in mm.

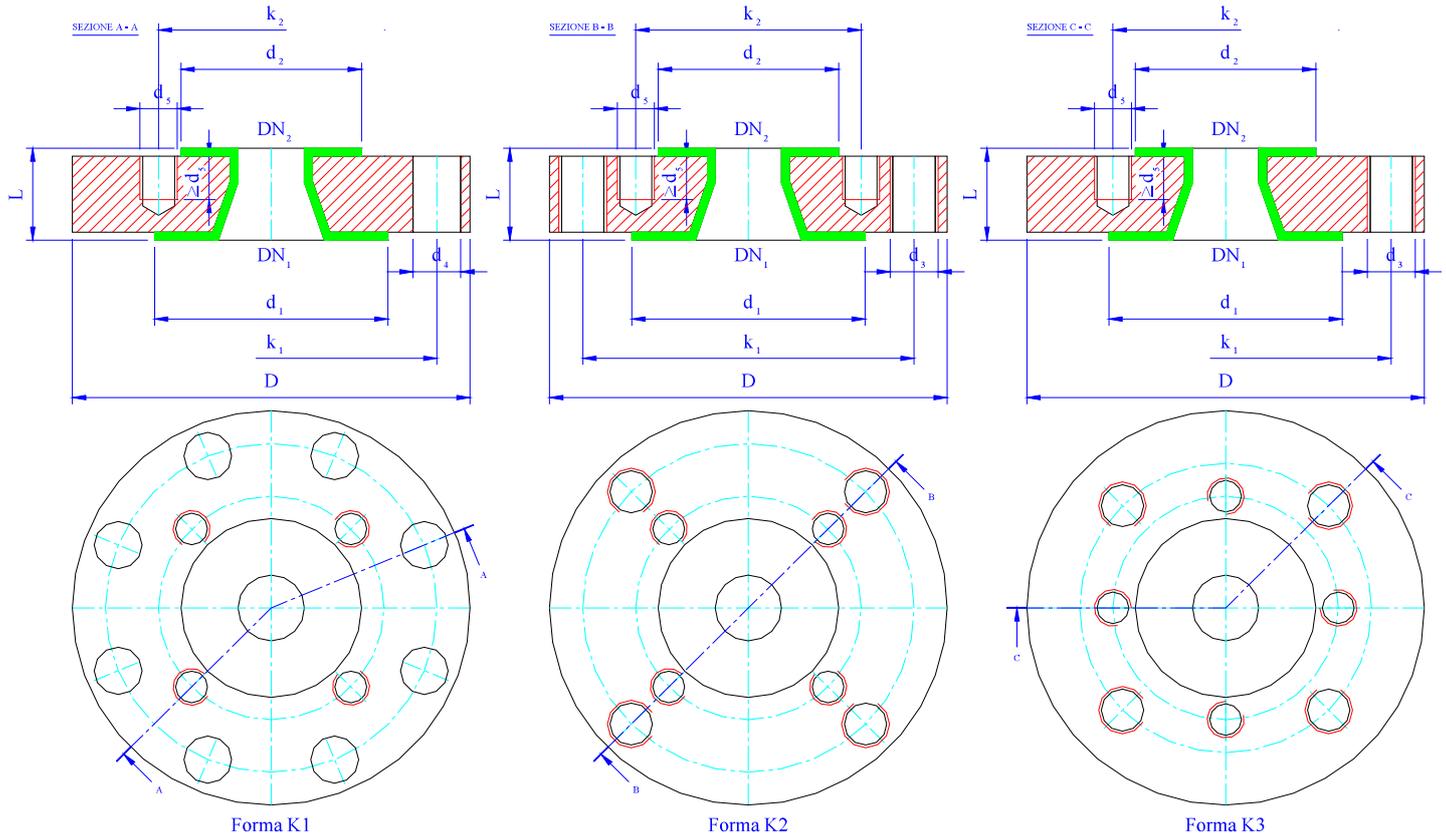
DN ₁	s ₁	DN ₂	s ₂	e	l ₃	k ₁	D ₁	k ₂	D ₂	Weight kg.
65	3,5	50	3	8	185	145	185	125	165	6,5
65	3,5	40	3	14	180	145	185	110	150	5,9
65	3,5	32	3	17	180	145	185	100	140	5,7
65	3,5	25	3	21	180	145	185	85	115	5,5
65	3,5	20	3	21	180	145	185	75	105	5,2
65	3,5	15	3	21	180	145	185	65	95	4,9
80	4	65	3,5	6	190	160	200	145	185	8,8
80	4	50	3	14	190	160	200	125	165	8,2
80	4	40	3	20	185	160	200	110	150	7,1
80	4	32	3	23	185	160	200	100	140	6,0
80	4	25	3	28	185	160	200	85	115	5,8
80	4	20	3	28	185	160	200	75	105	5
80	4	15	3	28	185	160	200	65	95	4,1
100	4,5	80	4	13	205	180	220	160	200	10,3
100	4,5	65	3,5	19	200	180	220	145	185	9,8
100	4,5	50	3	27	200	180	220	125	165	9,3
100	4,5	40	3	33	200	180	220	110	150	8,8
100	4,5	32	3	36	200	180	220	100	140	8,3
100	4,5	25	3	40	200	180	220	85	115	8,0
100	4,5	20	3	40	200	180	220	75	105	7,6
100	4,5	15	3	40	200	180	220	65	95	7,1
125	4,5	100	4,5	13	235	210	250	180	220	13,9
125	4,5	80	4	25	235	210	250	160	200	12,8
125	4,5	65	3,5	32	230	210	250	145	185	12,4
125	4,5	50	3	40	230	210	250	125	165	12,0
150	5	125	4,5	14	250	240	285	210	250	18,1
150	5	100	4,5	27	250	240	285	180	220	16,5
150	5	80	4	40	250	240	285	160	200	15,9
150	5	65	3,5	46	250	240	285	145	185	15,0
150	5	50	3	54	250	240	285	125	165	14,2
200	6	150	5	25	270	295	340	240	285	26,3
200	6	125	4,5	40	270	295	340	210	250	25,8
200	6	100	4,5	52	270	295	340	180	220	23,6
250	7	200	6	27	310	350	395	295	340	38,2
250	7	150	5	52	305	350	395	240	285	34,6
250	7	125	4,5	67	305	350	395	210	250	34,1
250	7	100	4,5	79	305	350	395	180	220	33,7
300	7	250	7	25	340	400	445	350	395	48,8
300	7	200	6	52	335	400	445	295	340	45,3
300	7	150	5	78	330	400	445	240	285	41,8

On request, "Heavy Duty" pieces are available for vacuum conditions.
 Steel frames are according to schedule 40. Vent holes at Manufacturer's discretion.

REDUCING FLANGES according to DIN 2848 Part 10)

Material specification: steel frame: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN ₁	DN ₂	Tipo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight kg.
20	15	K3	105	58	75	4 X M12		45	65	4 X M12	35	1,7
25	20	K3	115	68	85	4 X M12		58	75	4 X M12	35	1,8
25	15	K3	115	68	85	4 X M12		45	65	4 X M12	35	2,1
32	25	K3	140	78	100	4 X M16		68	85	4 X M12	35	2,9
32	20	K3	140	78	100	4 X M16		58	75	4 X M12	35	3,0
32	15	K3	140	78	100	4 X M16		45	65	4 X M12	35	3,2
40	32	K3	150	88	110	4 X M16		78	100	4 X M16	35	3,5
40	25	K3	150	88	110	4 X M16		68	85	4 X M12	35	3,6
40	20	K2	150	88	110	4 X M16		58	75	4 X M12	35	3,6
40	15	K2	150	88	110	4 X M16		45	65	4 X M12	35	3,7
50	40	K3	165	102	125	4 X M16		88	110	4 X M16	35	4,2
50	32	K3	165	102	125	4 X M16		78	100	4 X M16	35	4,3
50	25	K2	165	102	125	4 X M16		68	85	4 X M12	35	4,4
50	20	K2	165	102	125	4 X M16		58	75	4 X M12	35	4,4
50	15	K2	165	102	125	4 X M16		45	65	4 X M12	35	4,5

REDUCING FLANGES according to DIN 2848 Part 10)

Material specification: steel frame: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	DN ₂	Tipo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight kg.
65	50	K3	185	122	145	8 X M16		102	125	4 X M16	35	5,3
65	40	K3	185	122	145	8 X M16		88	110	4 X M16	35	5,3
65	32	K2	185	122	145	8 X M16		78	100	4 X M16	35	5,4
65	25	K2	185	122	145	8 X M16		68	85	4 X M12	35	5,6
65	20	K2	185	122	145	8 X M16		58	75	4 X M12	35	5,6
65	15	K2	185	122	145	8 X M16		45	65	4 X M12	35	5,7
80	65	K2	200	138	160	8 X M16		122	145	8 X M16	35	5,8
80	50	K3	200	138	160	8 X M16		102	125	4 X M16	35	6,1
80	40	K2	200	138	160	8 X M16		88	110	4 X M16	35	6,4
80	32	K2	200	138	160	8 X M16		78	100	4 X M16	35	6,5
80	25	K1	200	138	160		8 X 18	68	85	4 X M12	35	6,5
80	20	K1	200	138	160		8 X 18	58	75	4 X M12	35	6,6
80	15	K1	200	138	160		8 X 18	45	65	4 X M12	35	6,7
100	80	K3	220	158	180	8 X M16		138	160	8 X M16	45	9,4
100	65	K3	220	158	180	8 X M16		122	145	8 X M16	45	9,6
100	50	K2	220	158	180	8 X M16		102	125	4 X M16	45	9,7
100	40	K1	220	158	180		8 X 18	88	110	4 X M16	45	9,8
100	32	K1	220	158	180		8 X 18	78	100	4 X M16	45	10,1
100	25	K1	220	158	180		8 X 18	68	85	4 X M12	45	10,3
100	20	K1	220	158	180		8 X 18	58	75	4 X M12	45	10,3
100	15	K1	220	158	180		8 X 18	45	65	4 X M12	45	10,4
125	100	K3	250	188	210	8 X M16		158	180	8 X M16	45	11,3
125	80	K2	250	188	210	8 X M16		138	160	8 X M16	45	12,0
125	65	K2	250	188	210	8 X M16		122	145	8 X M16	45	12,1
125	50	K1	250	188	210		8 X 18	102	125	4 X M16	45	12,3
125	40	K1	250	188	210		8 X 18	88	110	4 X M16	45	12,5
125	32	K1	250	188	210		8 X 18	78	100	4 X M16	45	12,7
125	25	K1	250	188	210		8 X 18	68	85	4 X M12	45	12,8
125	20	K1	250	188	210		8 X 18	58	75	4 X M12	45	12,8
125	15	K1	250	188	210		8 X 18	45	65	4 X M12	45	12,8
150	125	K3	285	212	240	8 X M20		188	210	8 X M16	45	13,8
150	100	K2	285	212	240	8 X M20		158	180	8 X M16	45	14,7
150	80	K1	285	212	240		8 X 22	138	160	8 X M16	45	15,7
150	65	K1	285	212	240		8 X 22	122	145	8 X M16	45	15,8
150	50	K1	285	212	240		8 X 22	102	125	4 X M16	45	16,0
150	40	K1	285	212	240		8 X 22	88	110	4 X M16	45	16,6
150	32	K1	285	212	240		8 X 22	78	100	4 X M16	45	17,3
150	25	K1	285	212	240		8 X 22	68	85	4 X M12	45	17,3
150	20	K1	285	212	240		8 X 22	58	75	4 X M12	45	17,5
150	15	K1	285	212	240		8 X 22	45	65	4 X M12	45	17,5

REDUCING FLANGES according to DIN 2848 Part 10)

Material specification: steel frame: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

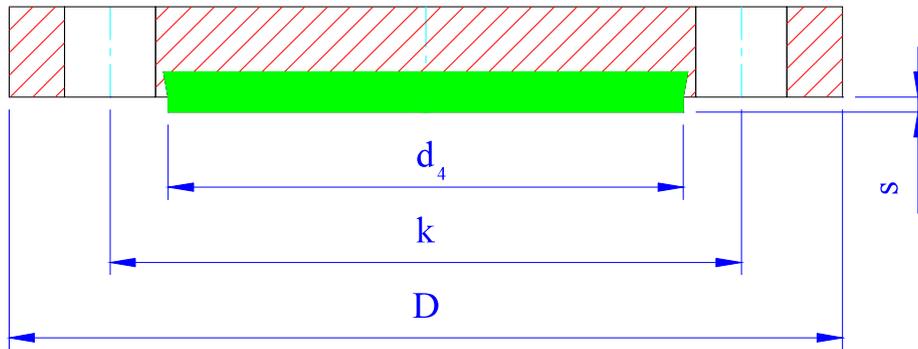
DN ₁	DN ₂	Tipo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight Kg.
200	150	K2	340	268	295	8 X M20		212	240	8 X M20	45	19,5
200	125	K1	340	268	295		8 X 22	188	210	8 X M16	45	20,5
200	100	K1	340	268	295		8 X 22	158	180	8 X M16	45	21,2
200	80	K1	340	268	295		8 X 22	138	160	8 X M16	45	21,8
200	65	K1	340	268	295		8 X 22	122	145	8 X M16	45	22,4
200	50	K1	340	268	295		8 X 22	102	125	4 X M16	45	22,9
200	40	K1	340	268	295		8 X 22	88	110	4 X M16	45	23,3
200	32	K1	340	268	295		8 X 22	78	100	4 X M16	45	23,4
200	25	K1	340	268	295		8 X 22	68	85	4 X M12	45	23,4
200	20	K1	340	268	295		8 X 22	58	75	4 X M12	45	23,5
200	15	K1	340	268	295		8 X 22	45	65	4 X M12	45	23,5
250	200	K2	395	320	350	12 X M20		268	295	8 X M20	45	24,7
250	150	K1	395	320	350		12 X 22	212	240	8 X M20	45	26,8
250	125	K1	395	320	350		12 X 22	188	210	8 X M16	45	27,6
250	100	K1	395	320	350		12 X 22	158	180	8 X M16	45	28,4
250	80	K1	395	320	350		12 X 22	138	160	8 X M16	45	29,5
250	65	K1	395	320	350		12 X 22	122	145	8 X M16	45	31,0
250	50	K1	395	320	350		12 X 22	102	125	4 X M16	45	32,0
250	40	K1	395	320	350		12 X 22	88	110	4 X M16	45	32,3
250	32	K1	395	320	350		12 X 22	78	100	4 X M16	45	32,3
250	25	K1	395	320	350		12 X 22	68	85	4 X M12	45	33,0
250	20	K1	395	320	350		12 X 22	58	75	4 X M12	45	33,0
250	15	K1	395	320	350		12 X 22	45	65	4 X M12	45	33,3
300	250	K2	445	370	400	12 X M20		320	350	12 X M20	50	28,5
300	200	K1	445	370	400		12 X 22	268	295	8 X M20	50	31,0
300	150	K1	445	370	400		12 X 22	212	240	8 X M20	50	34,0
300	125	K1	445	370	400		12 X 22	188	210	8 X M16	50	36,5
300	100	K1	445	370	400		12 X 22	158	180	8 X M16	50	38,0
300	80	K1	445	370	400		12 X 22	138	160	8 X M16	50	39,5
300	65	K1	445	370	400		12 X 22	122	145	8 X M16	50	40,5
300	50	K1	445	370	400		12 X 22	102	125	4 X M16	50	42,0
300	40	K1	445	370	400		12 X 22	88	110	4 X M16	50	42,0
300	32	K1	445	370	400		12 X 22	78	100	4 X M16	50	42,5
300	25	K1	445	370	400		12 X 22	68	85	4 X M12	50	43,0
300	20	K1	445	370	400		12 X 22	58	75	4 X M12	50	43,0
300	15	K1	445	370	400		12 X 22	45	65	4 X M12	50	43,5

On request, eccentric reducing flanges are available.

BLANK FLANGES lined in PTFE according to DIN.

Material specification: Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

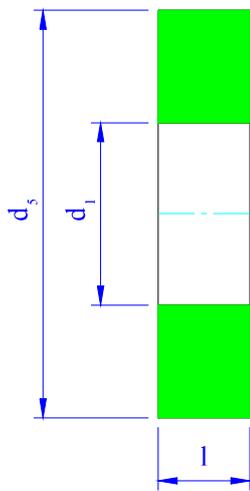


DN	s	d ₄	k	D	Weight kg.
15	3	45	65	95	0,9
20	3	58	75	105	1,1
25	3	68	85	115	1,3
32	3	78	100	140	1,9
40	3	88	110	150	2,4
50	3	102	125	165	3,0
65	3,5	122	145	185	3,9
80	4	138	160	200	4,9
100	4,5	158	180	220	6,0
125	4,5	188	210	250	8,7
150	5	212	240	285	10,7
200	6	268	295	340	17,0
250	7	320	350	395	24,5
300	7	370	400	445	31,8

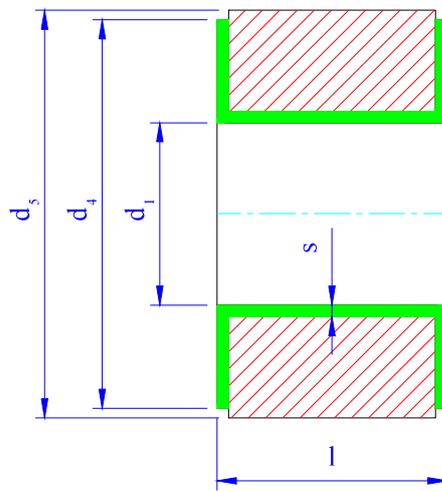
SPACERS according to DIN 2848 Part 11.

Material specification: Form "F": Pure PTFE according to ASTM D 1457-78 type IV e V
 Form "G" + "H": St 35 (1.0112) with lining in pure PTFE.
 Delivery terms: according to DIN 2874

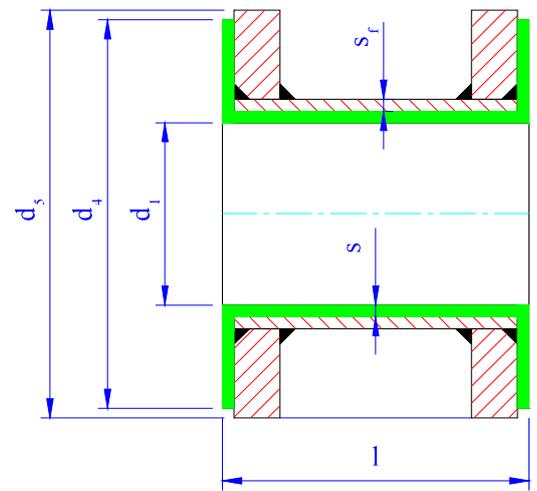
Sizes are expressed in mm.



Forma F



Forma G



Forma H

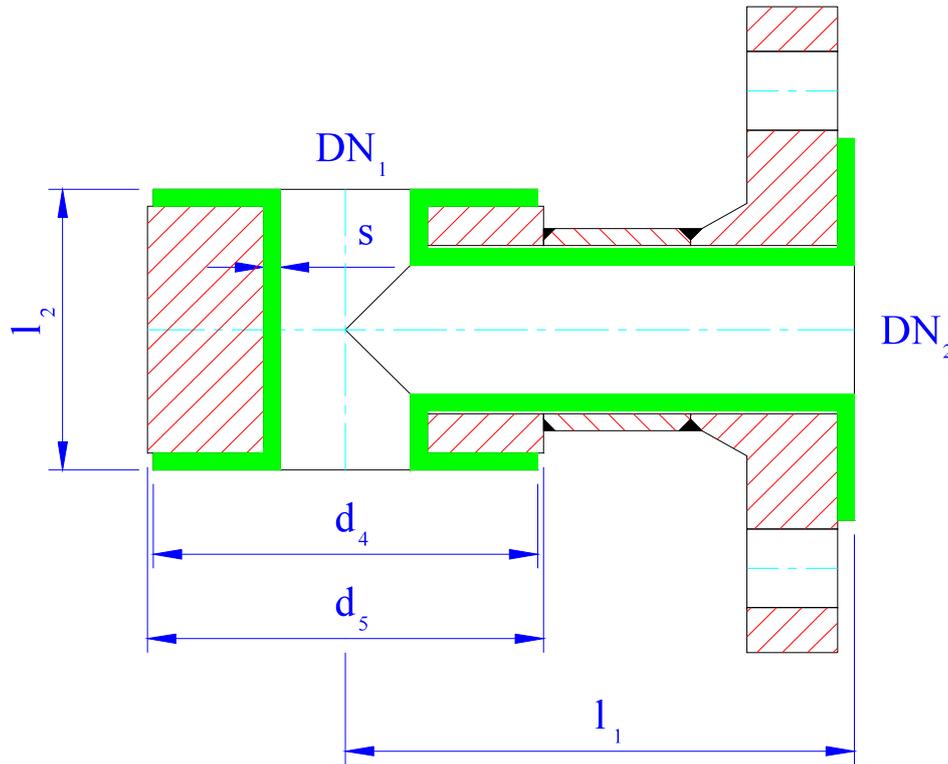
DN	d ₁	s	s _f	d ₄	d ₅	l (form F)	l (form G)	l (form H)
15	13	3	3,0	45	48			
20	16	3	2,6	58	60			
25	22	3	2,6	68	70			
32	31	3	3,0	78	82			
40	37	3	2,6	88	92			
50	48	3	2,9	102	107			
65	64	3,5	2,9	122	127	5 - 20	10 - 70	60 - 100
80	76	4	3,2	138	142			
100	101	4,5	3,6	158	162			
125	125	4,5	4,0	188	192			
150	153	5	4,5	212	218			
200	201	6	6,3	268	273			
250	254	7	6,3	320	328			
300	303	7	7,1	370	378			

INSTRUMENT TAPPINGS according to DIN 2848

Material specification: steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V

Delivery conditions: according to DIN 2874

Sizes are expressed in mm.



Main passage					Branch DN ₂					
DN ₁	s	d ₄	d ₅	l ₁	DN 25 l ₂	DN 25 Weight Kg.	DN 40 l ₂	DN 40 Weight kg.	DN 50 l ₂	DN 50 Weight kg.
25	3	68	70	90	50	3,0	=	=	=	=
32	3	78	82	100	50	3,5	=	=	=	=
40	3	88	92	110	50	3,8	75	4,6	=	=
50	3	102	107	115	50	5,2	75	6,4	90	8,8
65	3,5	122	127	125	50	6,3	75	7,4	90	9,8
80	4	138	142	135	50	6,8	75	8,5	90	11,1
100	4,5	158	162	150	50	7,4	75	9,5	90	12,8
125	4,5	188	192	160	50	8,9	75	11,5	90	14,8
150	5	212	218	180	50	9,9	75	12,7	90	16,0
200	6	268	273	210	50	12,5	75	14,5	90	18,0
250	7	320	328	240	50	15,0	75	17,5	90	20,5
300	7	370	378	340	90	18,5	110	21,0	120	24,5

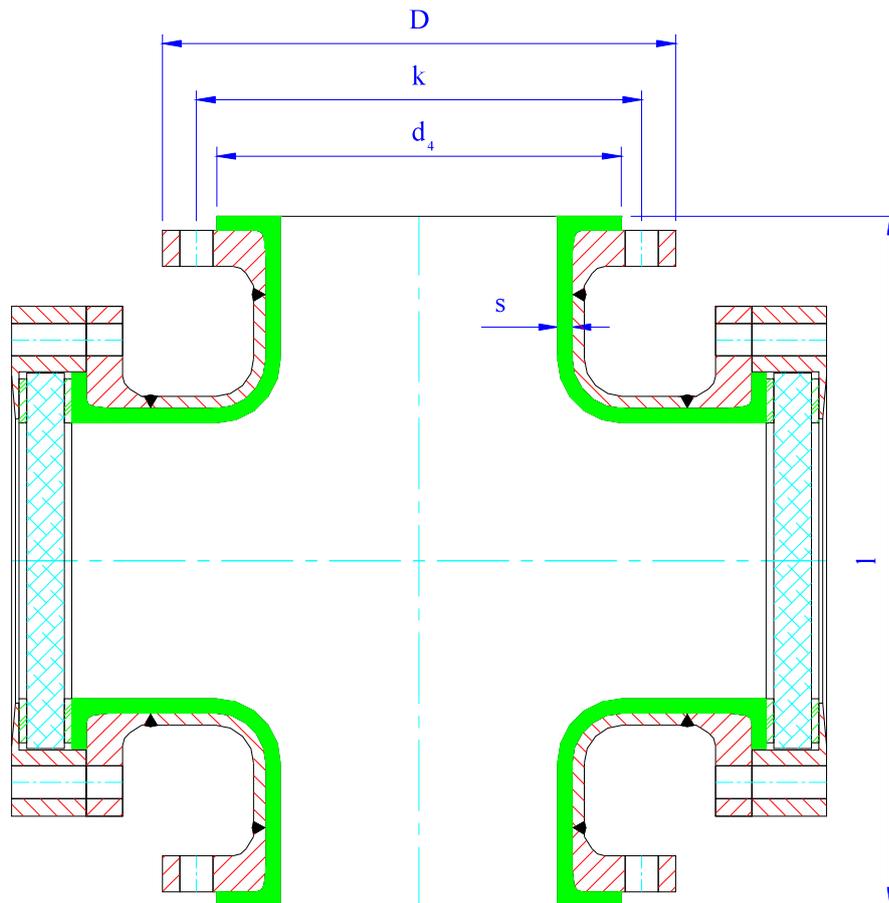
On request, other sizes are available.
 On request, instrument tappings with double branches are available.
 Vent holes at Manufacturer's discretion.

SIGHT GLASSES according to DIN 28121

ASSEMBLY LENGTH ACCORDING TO DIN 3202 Column F1

Material specification: Steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	s	d ₄	K	D	l	Weight kg.
15	3	45	65	95	130	5,2
20	3	58	75	105	150	5,6
25	3	68	85	115	160	5,9
32	3	78	100	140	180	7,6
40	3	88	110	150	200	8,8
50	3	102	125	165	230	12,6
65	3,5	122	145	185	290	21,9
80	4	138	160	200	310	25,1
100	4,5	158	180	220	350	38,0
125	4,5	188	210	250	400	57,0
150	5	212	240	285	480	68,0
200	6	268	295	340	600	105,0

On request, "Heavy Duty" pieces are available for vacuum condition.
 On request, glasses in borosilicate are available.
 On request, other dimensions are available.
 Vent holes at Manufacturer's discretion.

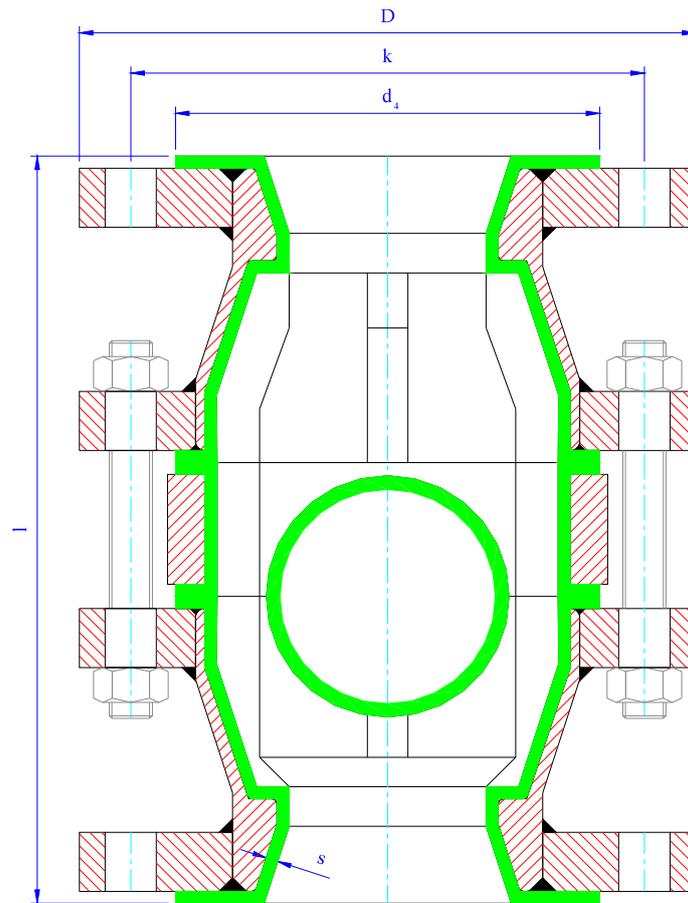
BALL CHECK VALVES with PTFE lining. For horizontal and vertical assembly.

ASSEMBLY LENGTH IN COMPLIANCE WITH DIN 3202 Column F1.

Material specification: steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 flanges: R-St 37-2 according to DIN 17100 (1.0112)
 lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 according to DIN 2874

Delivery terms:

Sizes are expressed in mm.



DN	s	d ₄	k	D	l	Weight kg.
15	3	45	65	95	130	5,1
20	3	58	75	105	150	5,5
25	3	68	85	115	160	5,7
32	3	78	100	140	180	11,7
40	3	88	110	150	200	12,8
50	3	102	125	165	230	14,9
65	3,5	122	145	185	290	20,5
80	4	138	160	200	310	24,8
100	4,5	158	180	220	350	36,0
150	5	212	240	285	480	69,0
200	6	268	295	340	600	81,0

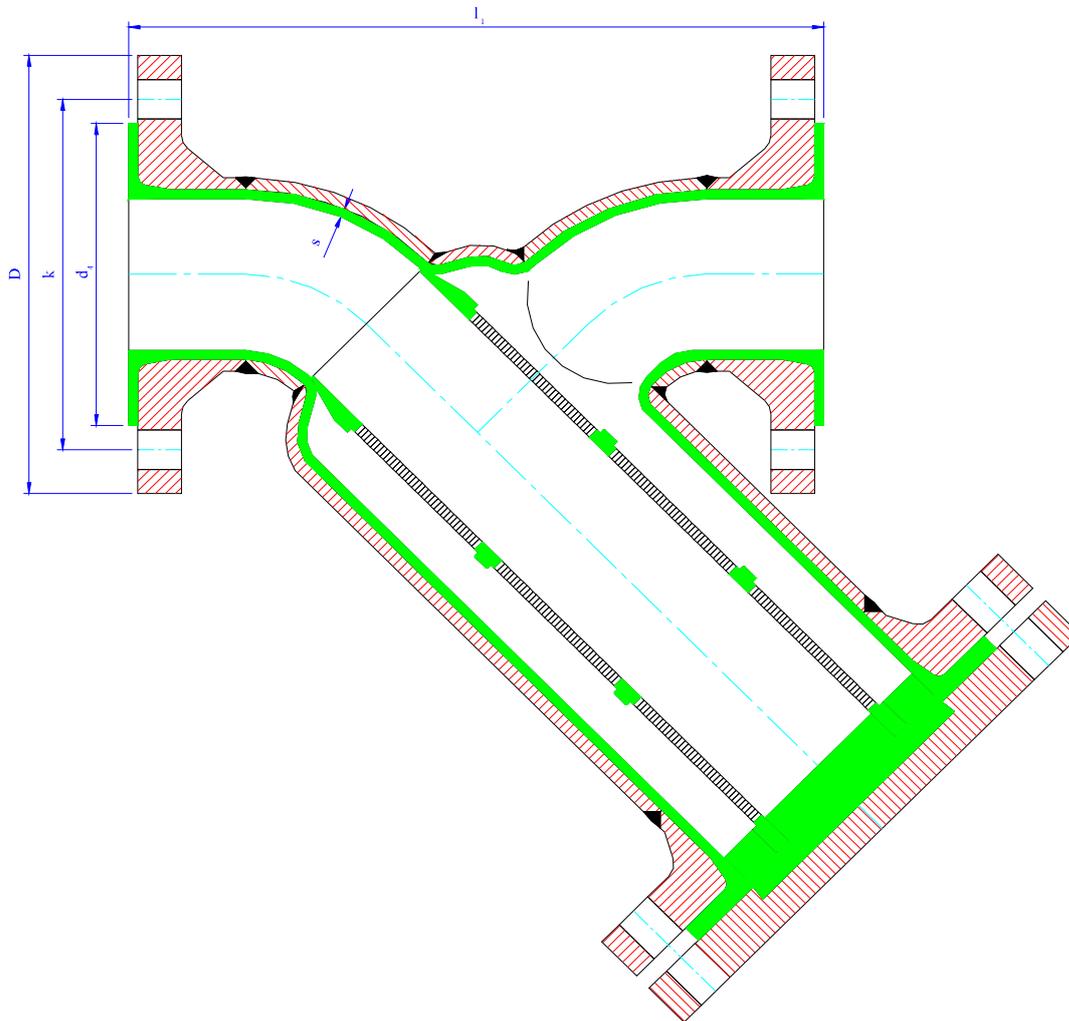
On request, combined ball check valves – sight glasses are available in sizes from DN 25 to DN 100.
 Ball check valves are regularly delivered with full ptfе sphere: on request, different spheres can be supplied.
 Vent holes at Manufacturer's discretion.

Y STRAINERS with ptfе lining.

ASSEMBLING LENGTH ACCORDING TO DIN 3202 Column F1

Material specification:	Steel Frame:	St 35 acc.to DIN 1629 Part 3 (1.0308)
	Flanges:	R-St 37-2 acc.to DIN 17100 (1.0112)
	Lining:	Pure PTFE acc.to ASTM D 1457-78 type IV e V
	Filtering Basket:	PTFE/glass or PTFE
	Filtering net:	PTFE
mesh:	standard 210 micron, different sizes on request.	
Delivery terms:	acc.to DIN 2874	

Sizes are expressed in mm.



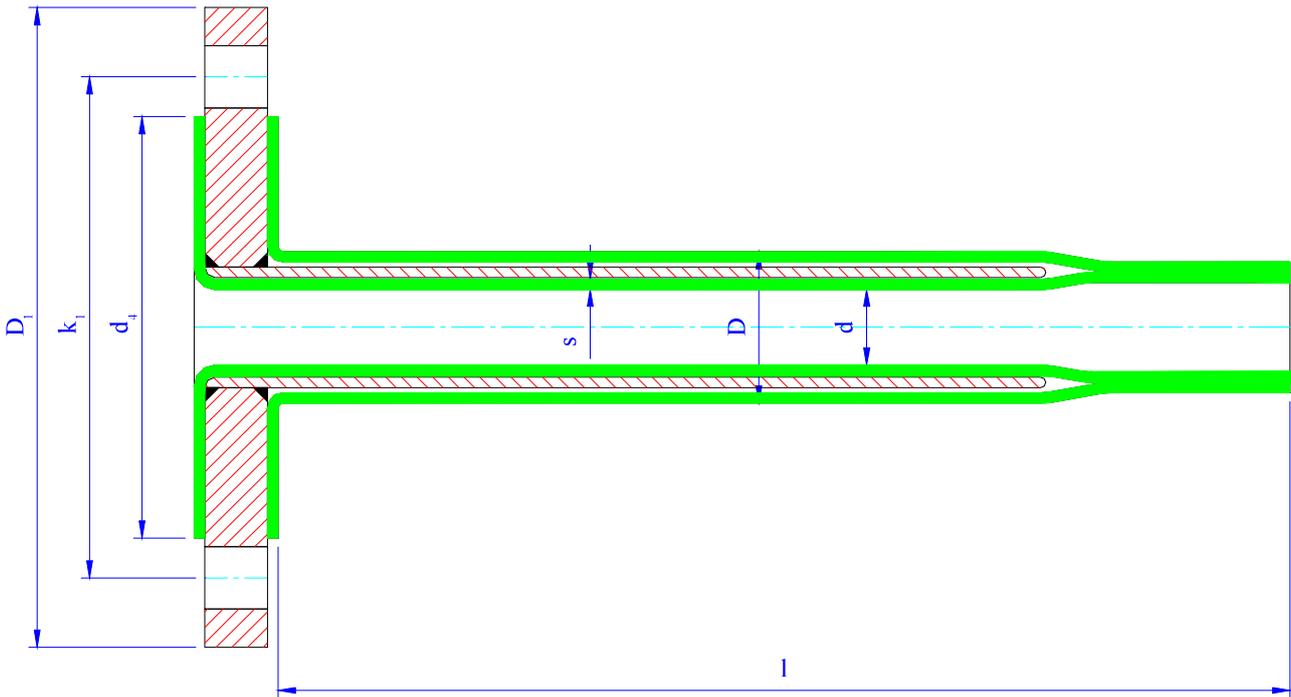
DN	s	l ₁	d ₁	k	D	Weight kg.
25	3	160	68	85	115	5,2
40	3	200	88	110	150	11,8
50	3	230	102	125	165	14,9
80	4	310	138	160	200	22,8
100	4,5	350	158	180	220	30,5
150	5	480	212	240	285	56,0
200	6	600	268	295	340	88,0

Vent Holes at Manufacturer's discretion.

INJECTION PIPES lined in PTFE according to DIN 2848

Material specification: Pipe: St 35 according to DIN 1629 Part 3 (1.0308)
 Flange: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



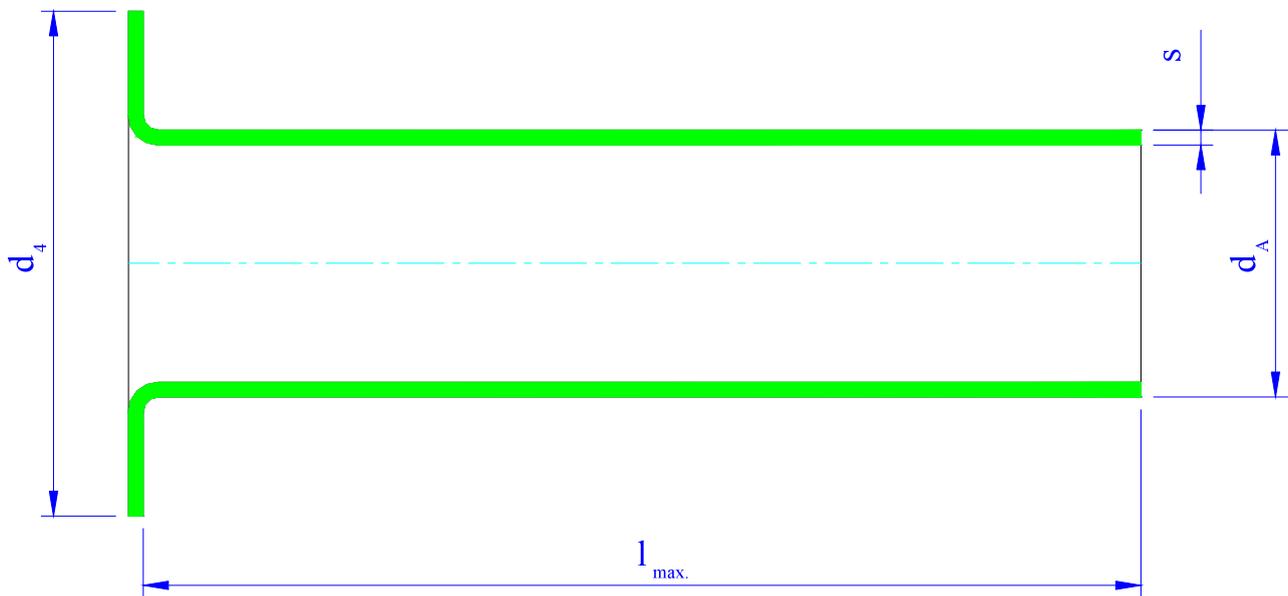
DN	d ₁	k ₁	D ₁	D	d	l _{max}
15	45	65	95	38 (29)	20 (13)	3000
20	58	75	105	38	20	3000
25	68	85	115	44	22	3000
32	78	100	140	54	31	3000
40	88	110	150	54	37	3000
50	102	125	165	70	48	3000
65	122	145	185	82	63	3000
80	138	160	200	107	75	3000
100	158	180	220	131	99	3000
125	188	210	250	159	122	3000
150	212	240	285	206	149	3000
200	268	295	340	238	194	3000
250	320	350	395	309	248	3000

On request, different sizes are available.
 On request, different shapes and different final ends are available.
 Vent holes at Manufacturer's discretion.

PTFE INJECTION NOZZLE (without steel insert)

Material specification: Lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2848

Sizes are expressed in mm.

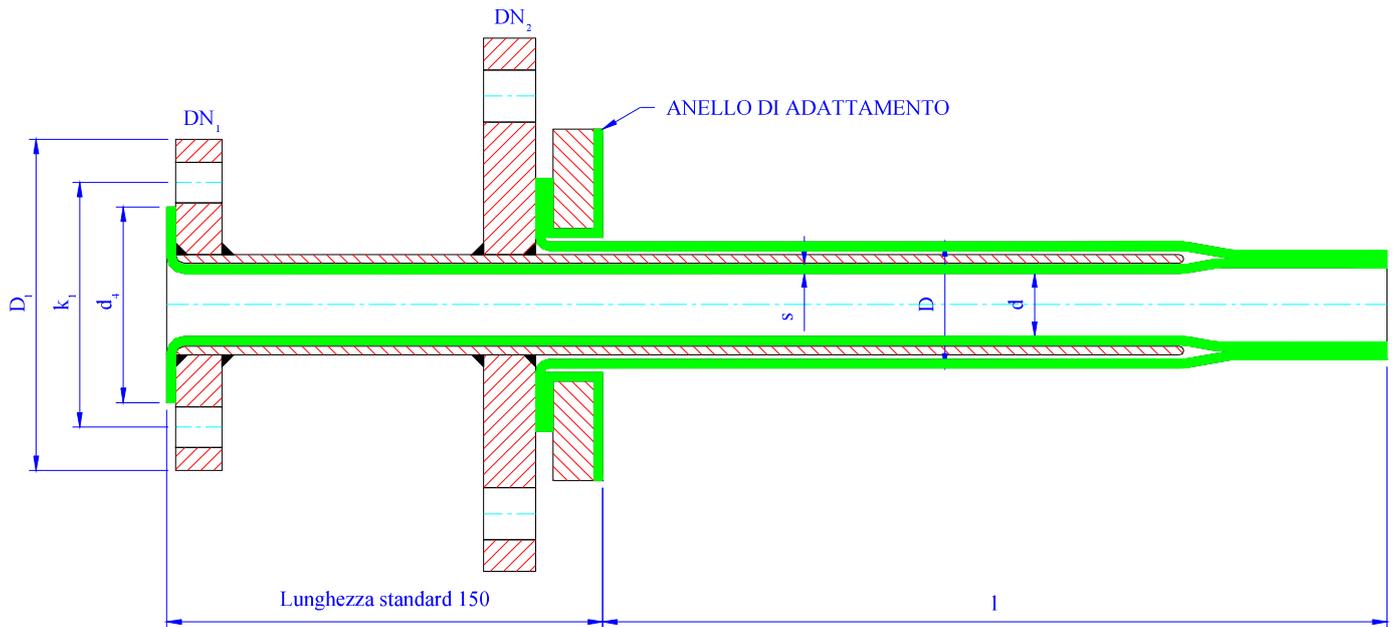


DN	s	d _A	d ₄	l _{max}
15	3	18	45	3.000
20	3	22	58	3.000
25	3	28	68	3.000
32	3	37	78	3.000
40	3	43	88	3.000
50	3	54	102	3.000
65	3,5	70	122	3.000
80	4	82	138	3.000
100	4,5	107	158	3.000
125	4,5	131	188	3.000
150	5	159	212	3.000
200	6	206	268	3.000
250	7	260	320	3.000
300	7	309	370	3.000

DIP PIPES with ptfе lining.

Material Specification: Steel tube: St 35 according to DIN 1629 part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV and V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



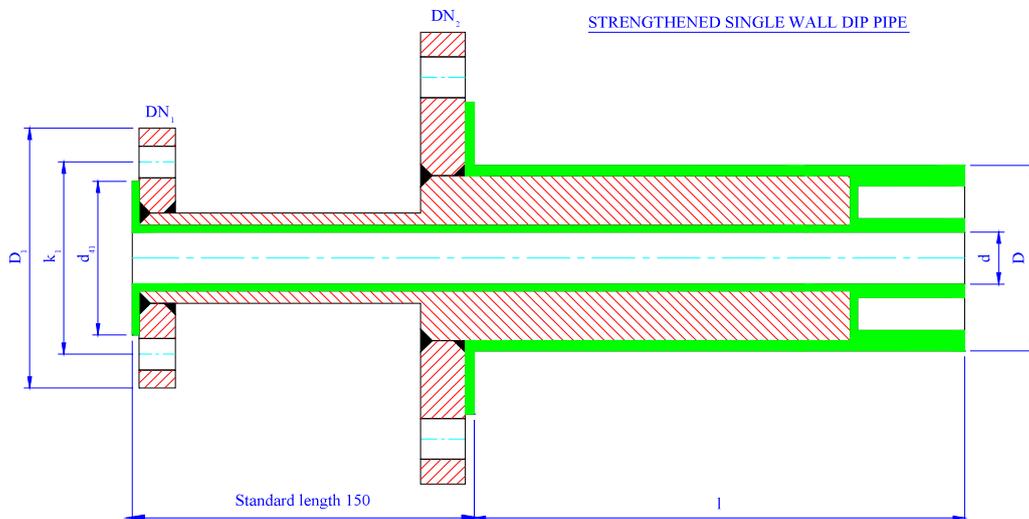
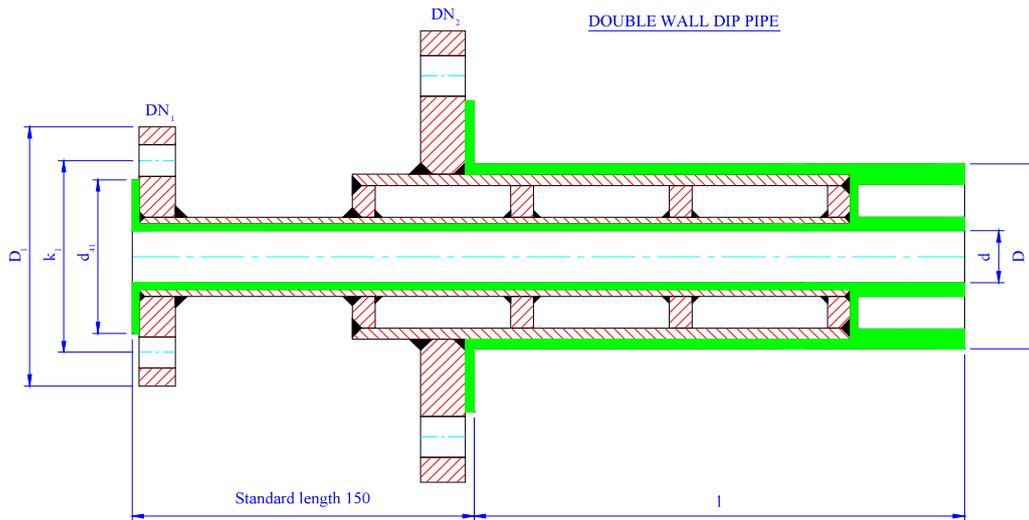
DN	s	d ₄	k ₁	D ₁	D	d	DN ₂	l _{max}
15	3	45	65	95	38 (29)	20 (13)	ADAPTED TO THE FLANGE OF THE REACTION VESSEL	3.000
20	3	58	75	105	38	20		3.000
25	3	68	85	115	44	22		3.000
32	3	78	100	140	54	31		3.000
40	3	88	110	150	54/70	37		3.000
50	3	102	125	165	70	48		3.000
65	3,5	122	145	185	82	63		3.000
80	4	138	160	200	107	75		3.000
100	4,5	158	180	220	131	99		3.000
125	4,5	188	210	250	159	122		3.000
150	5	212	240	285	206	149		3.000
200	6	268	295	340	238	194		3.000
250	7	320	350	395	309	248		3.000

On request, different sizes are available.
 on request, special dip pipes (curved, with spraying nozzles,...) are available.
 The Manufacturer will decide whether to mount an adapting ring and/or reinforcing tails.

DOUBLE WALL DIP PIPES with ptfе lining. (double wall dip pipe – or strengthened wall)

Material specification: Steel tube: St 35 according to DIN 1629 Part 3 (1.0308)
 Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: Pure PTFE according to ASTM D 1457-78 type IV - V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



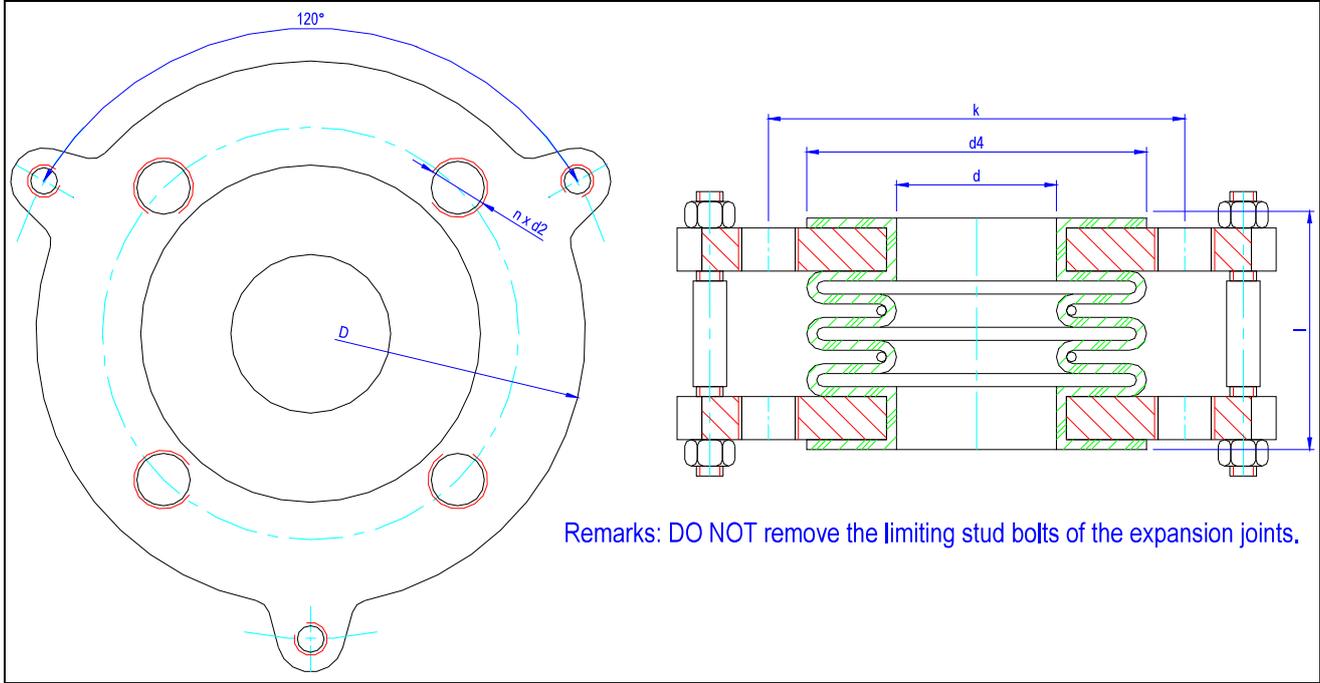
DN	s	d ₄₁	k ₁	D ₁	D	d	DN ₂	l _{max}
20	3	58	75	105	70	20	Flange of the reaction vessel	3.000
25	3	68	85	115	70	22		3.000
40	3	88	110	150	82	37		3.000
50	3	102	125	165	107	48		3.000
65	3,5	122	145	185	107	63		3.000
80	4	138	160	200	131	75		3.000
100	4,5	158	180	220	159	99		3.000

On request, different sizes are available.
 On request, special dip pipes (curved, with spraying nozzles,...) are available.
 The Manufacturer will decide whether to mount an adapting ring and/or reinforcing tails.
 On request, double wall dip pipes can be supplied with a heating jacket, with flanged connections or threaded connections.

EXPANSION JOINTS

Material specification: Flanges: R-St 37-2 according to DIN 17100 (1.0112)
 Lining: "TFM"[®] (produced by Dyneon)
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



Remarks: DO NOT remove the limiting stud bolts of the expansion joints.

DN	d	d ₄	k	n x d ₂	D	l for 2 conv.	l for 3 conv.	l for 4 conv.	l for 5 conv.	l for 6 conv.	l for 7 conv.	l for 8 conv.
15	22	45	65	4 x M12	95	38	50	62	74	86	98	110
20	22	58	75	4 x M12	105	38	50	62	74	86	98	110
25	22	68	85	4 x M12	115	41	55	69	83	97	111	125
32	31	78	100	4 x M16	140	41	55	69	83	97	111	125
40	37	88	110	4 x M16	150	51	65	79	93	107	121	135
50	48	102	125	4 x M16	165	56	70	84	98	112	126	140
65	63	122	145	8 x M16	185	54	70	86	102	118	134	150
80	75	138	160	8 x M16	200	54	70	86	102	118	134	150
100	99	158	180	8 x M16	220	82	100	118	136	154	172	190
125	122	188	210	8 x M16	250	82	100	118	136	154	172	190
150	149	212	240	8 x M20	285	87	105	123	141	159	177	195
200	194	268	295	8 x M20	340	86	105	124	143	162	181	200
250	248	320	350	12 x M20	395	78	105	132	159	186	N.A.	N.A.
300	297	370	400	12 x M20	445	78	105	132	159	186	N.A.	N.A.
350	325	430	460	16 x M20	505	78	105	132	159	186	N.A.	N.A.
400	376	482	515	16 x M22	565	93	120	147	174	201	N.A.	N.A.
450	420	532	565	20 x M22	615	93	120	147	174	201	N.A.	N.A.
500	471	585	620	20 x M22	670	93	120	155	174	201	N.A.	N.A.
600	595	685	725	20 x M27	780	81	100	N.A.	N.A.	N.A.	N.A.	N.A.

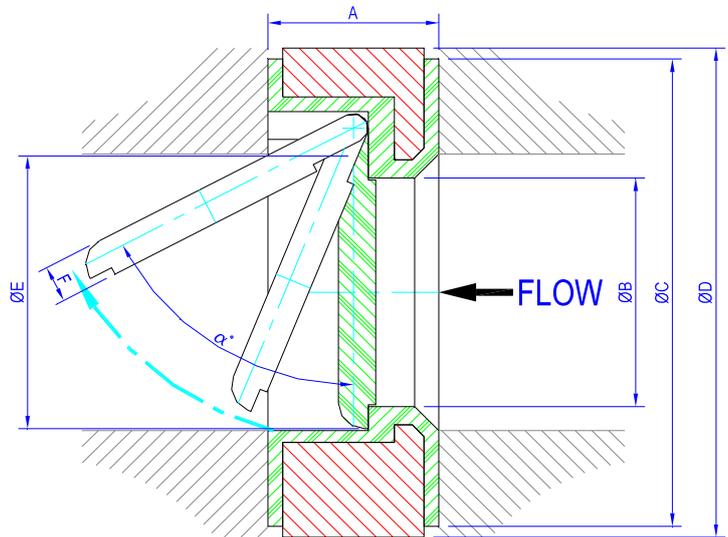
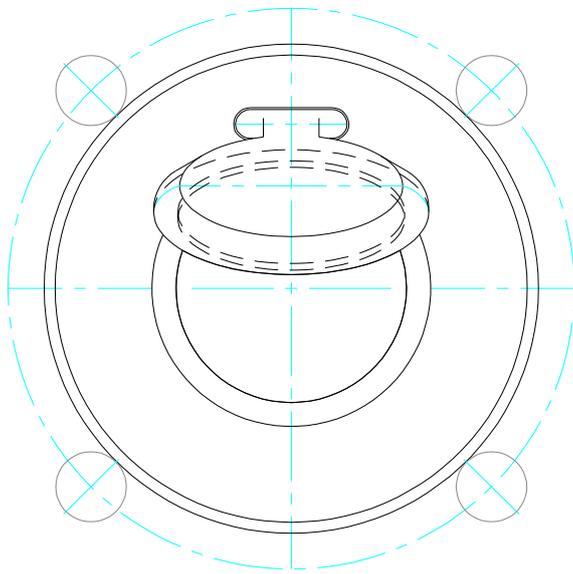
N.A. = not available.

Flanges are according to DIN PN 16 from DN 15 to DN 150 (included) and DIN PN 10 from DN 200 onwards.
 All sizes are provided with threaded holes (passing through).
 All the expansion joints are moulded in "TFM"[®] (made by Dyneon), with mechanical properties absolutely superior than the traditional PTFE.
 The expansion joints are supplied with 3 stud bolts for the limit stop at 120° on diameter: DO NOT REMOVE THE LIMITING STUD BOLTS.
 Each convolutions is provided with a stainless steel reinforcing ring, for better performances.
 The movement of each convolution is +12 mm (expansion) / -8 mm (compression), longitudinally.
 On request, it is possible to supply expansion joints with stainless steel flanges.
 Special sizes shall be required to the Manufacturer.

SWING CHECK VALVE with PTFE lining.

Material specification: steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Disk: Pure PTFE
 lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	A	B	C	D	E	α°	F	Weight kg.
40	33	28	88	90	32			
50	43	38	102	107	46			
80	46	62	138	152	74	63°	10	2,7
100	52	82	158	162	94	70°	12	4,3
150	56	132	212	218	144	69°	15	7,8

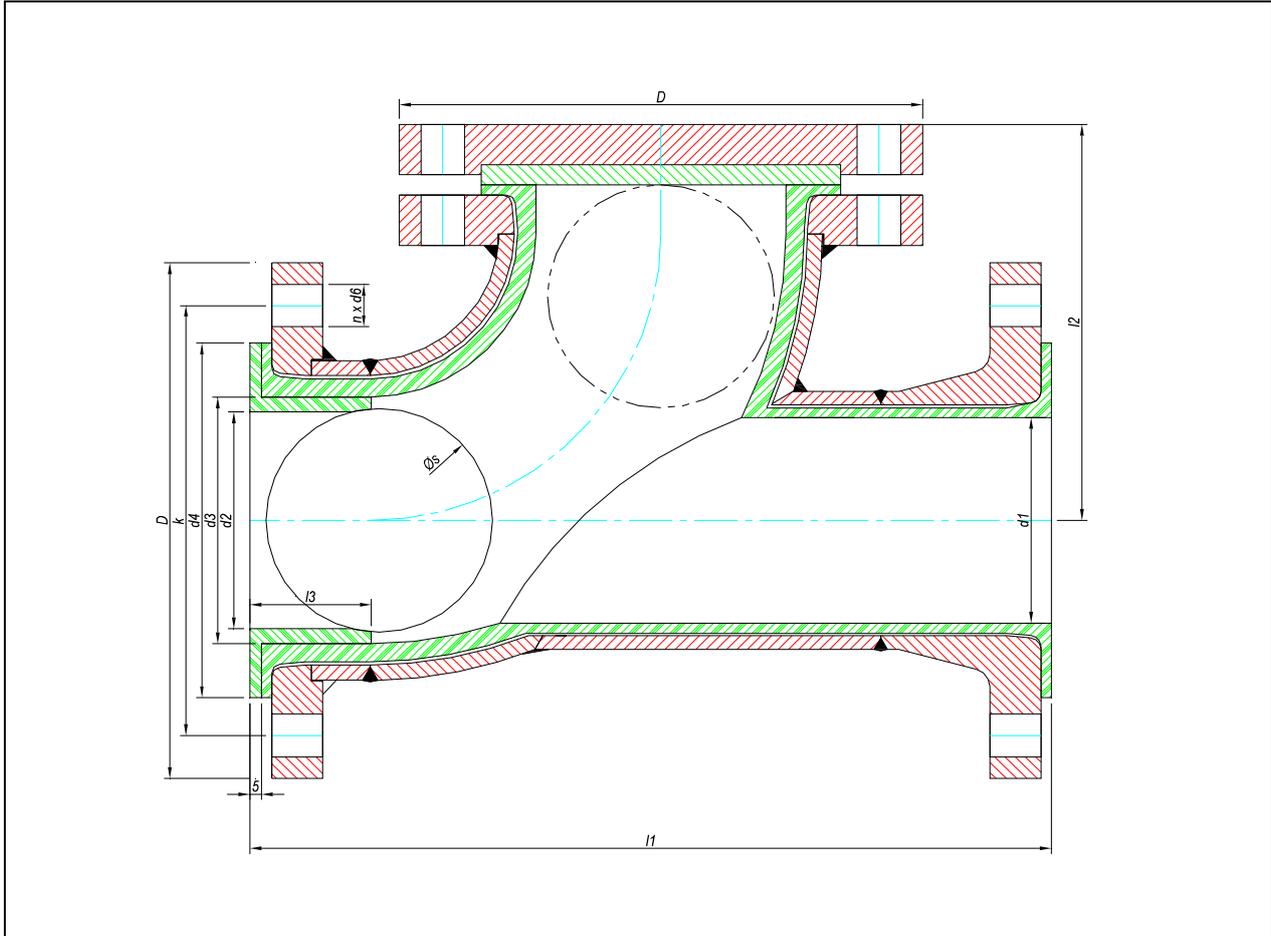
Vent holes at Manufacturer's discretion.

As an option, it is available a version of the swing check valve with a special O-ring in the cage of the body, in contact with the disk: the function is to improve the sealing (however it must be taken into account that a swing check valve cannot be bubble tight).

BALL CHECK VALVE Y TYPE with ptfе lining. Suitable for horizontal and vertical use –

Material specification: Steel frame: St 35.0 according to DIN 1629
 Flanges: R-St-37-2 acc. to DIN 17100
 Lining: Pure and virgin PTFE acc. to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



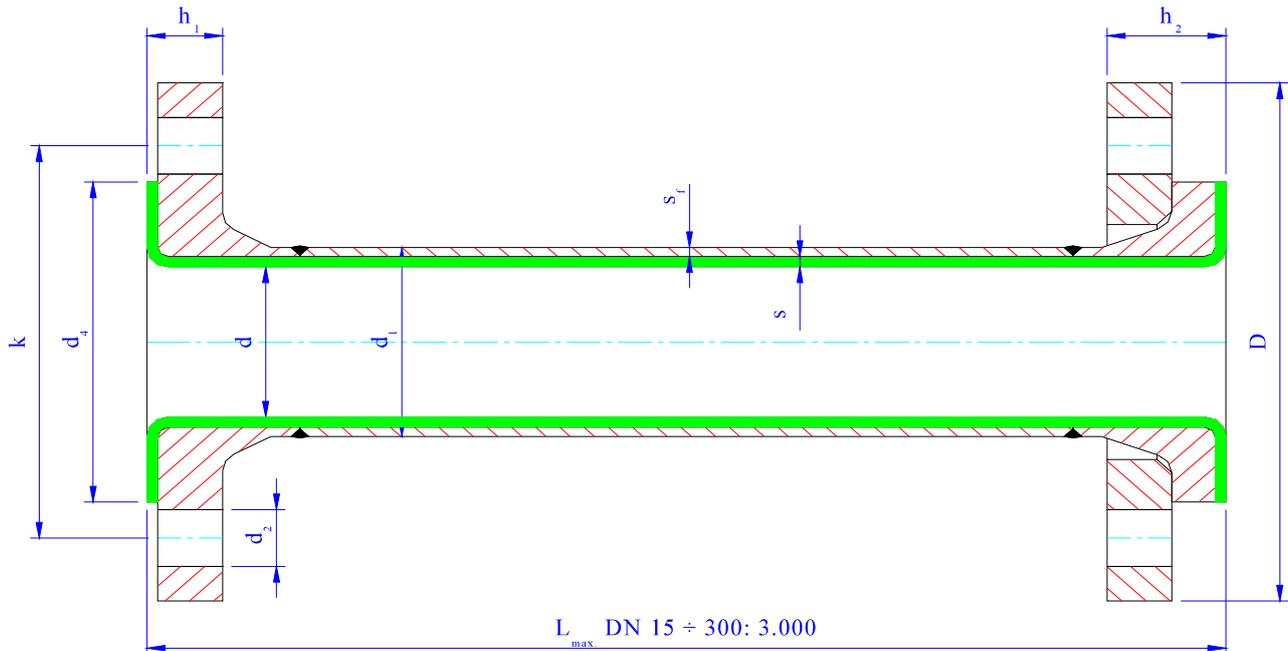
DN	Body							Ball and sealing			
	d ₁	d ₄	k	n x d ₆	D	l ₁	l ₂	Øs	d ₂	d ₃	l ₃
25	22	68	85	4 x 14	140	160	/	/	/	/	/
40	37	88	110	4 x 18	150	200	/	/	/	/	/
50	48	102	125	4 x 18	165	230	/	/	/	/	/
80	75	138	160	8 x 18	200	310	/	/	/	/	/
100	99	158	180	8 x 18	220	350	/	/	/	/	/

The Y type ball check valve are regularly delivery with full ptfе ball: on demand we can supply them with different type of ball.
 Vent holes are according to Manufacturer's discretion.
 The stated dimensions could slightly vary owing to tecnal reasons, without leaving any responsibility for the Manufacturer.

FLANGED PIPES according to ANSI B16.5 class 150.

Material specification: Tubes: ASTM A106 gr.B according to ANSI B36.10
 API 5L gr.B according to ANSI B36.10
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE according to ASTM-D 4894 - 4895
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	d ₁	s _f	d	s	n x d ₂	d ₄	k	D	h ₁	h ₂
½"	24	3,00	12	3	4 x 15,9	35	60,3	88,9	13,6	23,1
¾"	33,7	2,90	12	3	4 x 15,9	43	69,8	98,4	15,2	26,3
1"	33,7	2,90	19	3	4 x 15,9	51	79,4	107,9	17,3	28,4
1¼"	42,4	2,60	28	3	4 x 15,9	64	88,9	117,5	18,9	30,0
1½"	48,3	3,68	32	3	4 x 15,9	73	98,4	127,0	20,5	31,6
2"	60,3	3,91	44	3	4 x 19,0	92	120,6	152,4	22,1	36,2
2½"	76,1	2,90	61	3,5	4 x 19,0	105	139,7	177,8	25,2	39,4
3"	88,9	5,49	69	4	4 x 19,0	127	152,4	190,5	26,8	42,6
4"	114,3	6,02	94	4,5	8 x 19,0	157	190,5	228,6	26,8	42,6
5"	139,7	4,50	121	4,5	8 x 22,2	185	215,9	254,0	26,8	44,2
6"	168,3	7,11	144	5	8 x 22,2	216	241,3	279,4	30,4	46,3
8"	219,1	6,35	194	6	8 x 22,2	270	298,4	342,9	33,1	53,7
10"	273,0	6,35	246	7	12 x 25,4	324	361,9	406,4	35,2	57,4
12"	323,9	7,11	297	7	12 x 25,4	381	431,8	482,6	36,8	58,9

Steel tube schedule 40 up to 6" (included), schedule 20 from 8" and above.
 On request, "Heavy Duty" pieces are available for vacuum condition. Vent holes at Manufacturer's discretion.

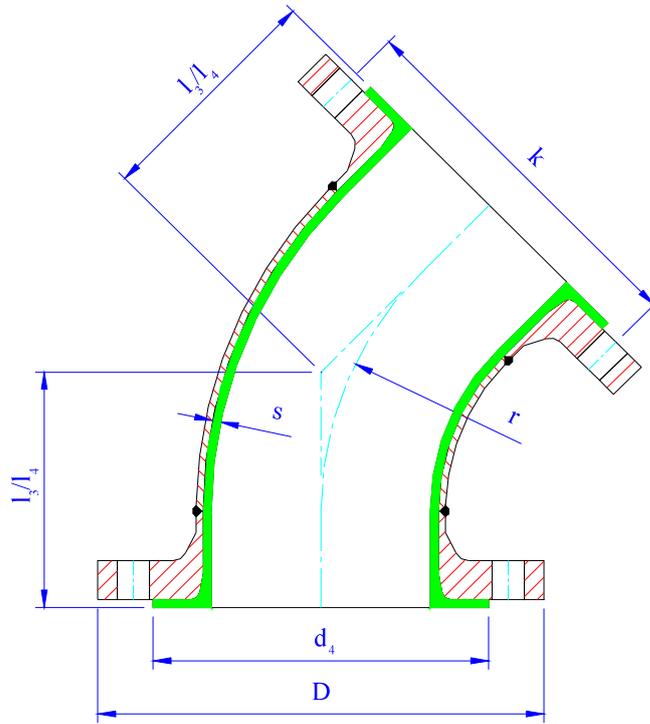
Weights in Kgs.

Size	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
1 meter pipe	1,6	2,1	2,8	3,7	4,2	5,8	7,8	9,9	14,5	20,7	23,4	39,1	51,7	67,7
loose+fixed flange	1,7	2,3	3,0	4,2	4,8	6,7	9,0	11,4	11,7	15,6	20,3	34,0	44,3	68,4

FLANGED 45° BENDS according to ANSI B16.5 class 150.

Material specification: Steel frames: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



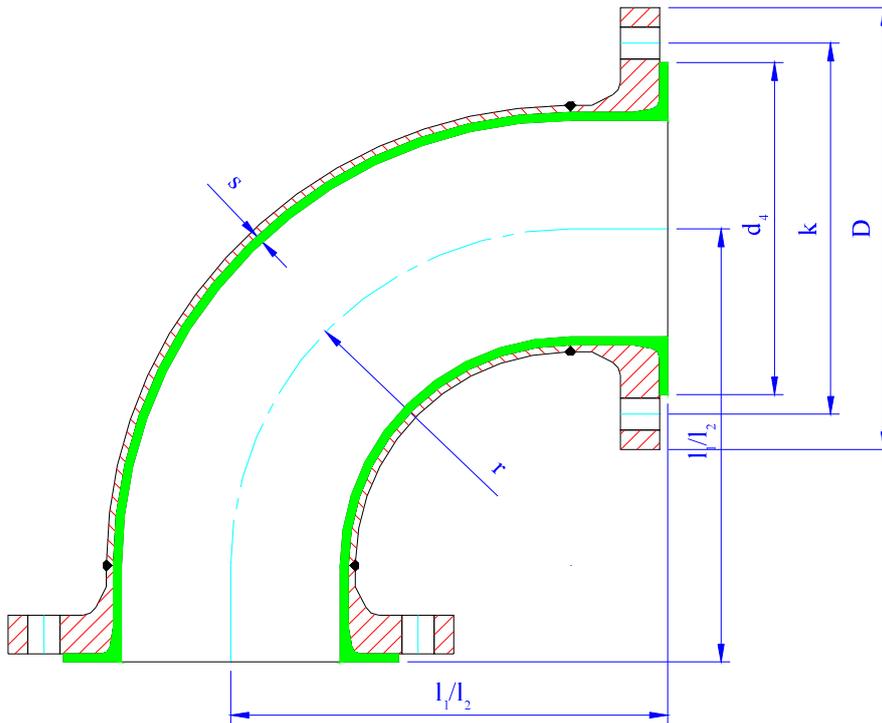
DN	s	Type of elbow	r	l ₃	l ₄	d ₄	k	D	Weight kg.
1/2"	3	5d	42,5		45	35	60,3	88,9	2,2
3/4"	3	5d	72,5		45	43	69,8	98,4	2,5
1"	3	L. R.	38,1		45	51	79,4	107,9	3,0
1 1/4"	3	L. R.	47,6		51	64	88,9	117,5	4,4
1 1/2"	3	L. R.	57,2		57	73	98,4	127,0	4,8
2"	3	L. R.	76,2	64		92	120,6	152,4	6,3
2 1/2"	3,5	S.R.	63,5	76		105	139,7	177,8	8,3
3"	4	S.R.	76,2	76		127	152,4	190,5	11,5
4"	4,5	S.R.	101,6	102		157	190,5	228,6	13,8
5"	4,5	S.R.	127,0	114		185	215,9	254,0	19,6
6"	5	S.R.	152,4	127		216	241,3	279,4	28,3
8"	6	S.R.	203,2	140		270	298,4	342,9	47,6
10"	7	S.R.	254,0	165		324	361,9	406,4	72,4
12"	7	S.R.	304,8	190		381	431,8	482,6	106,4

On request, "Heavy Duty" pieces are available for vacuum condition .
 Steel frames are according to schedule 40.
 On request, bends with different angles are available.
 Vent holes at Manufacturer's discretion.

FLANGED 90° BENDS according to ANSI B16.5 class 150.

Material specification: Steel frames: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



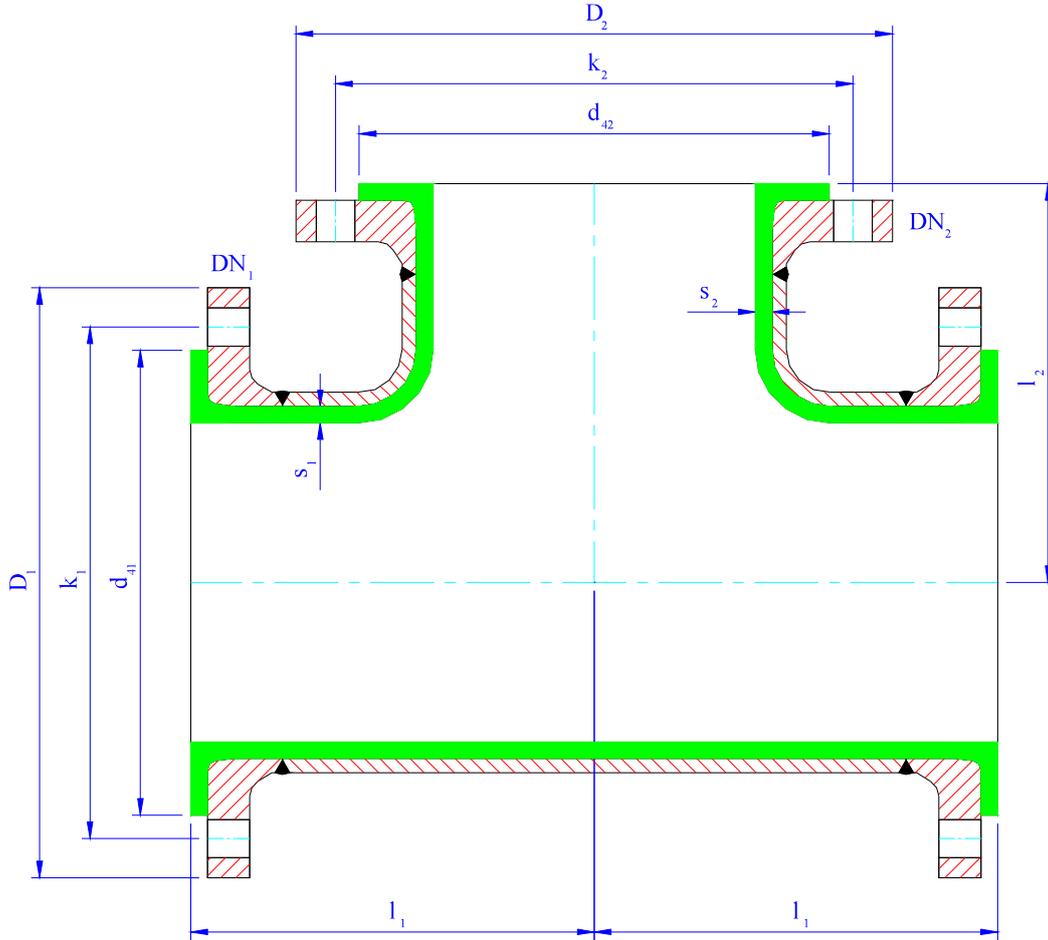
DN	s	Type of elbow	r	l ₁	l ₂	d ₄	k	D	Weight kg.
½"	3	5d	42,5		65	35	60,3	88,9	2,3
¾"	3	5d	72,5		75	43	69,8	98,4	2,6
1"	3	L. R.	38,1		89	51	79,4	107,9	3,3
1¼"	3	L. R.	47,6		95	64	88,9	117,5	4,6
1½"	3	L. R.	57,2		102	73	98,4	127,0	5,2
2"	3	L. R.	76,2	114		92	120,6	152,4	6,9
2½"	3,5	S.R.	63,5	127		105	139,7	177,8	9,1
3"	4	S.R.	76,2	140		127	152,4	190,5	11,9
4"	4,5	S.R.	101,6	165		157	190,5	228,6	14,5
5"	4,5	S.R.	127,0	190		185	215,9	254,0	21,8
6"	5	S.R.	152,4	203		216	241,3	279,4	32,0
8"	6	S.R.	203,2	229		270	298,4	342,9	62,7
10"	7	S.R.	254,0	279		324	361,9	406,4	94,6
12"	7	S.R.	304,8	305		381	431,8	482,6	140,4

On request, "Heavy Duty" pieces are available for vacuum condition.
 Steel frames are according to schedule 40.
 On request, bends with different angles are available.
 Vent holes at Manufacturer's discretion.

EQUAL AND REDUCING TEE PIECES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight Kg.
1/2"	3	65	35	60,3	88,9	1/2"						2,7
3/4"	3	75	43	69,8	98,4	3/4"						3,8
3/4"	3	75	43	69,8	98,4	1/2"	3	75	35	60,3	88,9	3,1
1"	3	89	51	79,4	107,9	1"						5,0
1"	3	89	51	79,4	107,9	3/4"	3	89	43	69,8	98,4	4,6
1"	3	89	51	79,4	107,9	1/2"	3	89	35	60,3	88,9	4,1
1 1/4"	3	95	64	88,9	117,5	1 1/4"						7,4
1 1/4"	3	95	64	88,9	117,5	1"	3	95	51	79,4	107,9	7,0
1 1/4"	3	95	64	88,9	117,5	3/4"	3	95	43	69,8	98,4	6,7
1 1/4"	3	95	64	88,9	117,5	1/2"	3	95	35	60,3	88,9	6,3
1 1/2"	3	102	73	98,4	127,0	1 1/2"						8,9
1 1/2"	3	102	73	98,4	127,0	1 1/4"	3	102	64	88,9	117,5	8,6
1 1/2"	3	102	73	98,4	127,0	1"	3	102	51	79,4	107,9	8,1
1 1/2"	3	102	73	98,4	127,0	3/4"	3	102	43	69,8	98,4	7,8
1 1/2"	3	102	73	98,4	127,0	1/2"	3	102	35	60,3	88,9	7,5

EQUAL AND REDUCING TEE PIECES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight Kg.
2"	3	114	92	120,6	152,4	2"						11,0
2"	3	114	92	120,6	152,4	1½"	3	114	73	98,4	127,0	9,7
2"	3	114	92	120,6	152,4	1¼"	3	114	64	88,9	117,5	9,1
2"	3	114	92	120,6	152,4	1"	3	114	51	79,4	107,9	8,7
2"	3	114	92	120,6	152,4	¾"	3	114	43	69,8	98,4	8,4
2"	3	114	92	120,6	152,4	½"	3	114	35	60,3	88,9	8,0
2½"	3,5	127	105	139,7	177,8	2½"						13,5
2½"	3,5	127	105	139,7	177,8	2"	3	127	92	120,6	152,4	12,6
2½"	3,5	127	105	139,7	177,8	1½"	3	127	73	98,4	127,0	11,7
2½"	3,5	127	105	139,7	177,8	1¼"	3	127	64	88,9	117,5	11,0
2½"	3,5	127	105	139,7	177,8	1"	3	127	51	79,4	107,9	10,3
2½"	3,5	127	105	139,7	177,8	¾"	3	127	43	69,8	98,4	9,8
2½"	3,5	127	105	139,7	177,8	½"	3	127	35	60,3	88,9	9,5
3"	4	140	127	152,4	190,5	3"						19,4
3"	4	140	127	152,4	190,5	2½"	3,5	140	105	139,7	177,8	17,2
3"	4	140	127	152,4	190,5	2"	3	140	92	120,6	152,4	15,9
3"	4	140	127	152,4	190,5	1½"	3	140	73	98,4	127,0	15,0
3"	4	140	127	152,4	190,5	1¼"	3	140	64	88,9	117,5	14,4
3"	4	140	127	152,4	190,5	1"	3	140	51	79,4	107,9	14,0
3"	4	140	127	152,4	190,5	¾"	3	140	43	69,8	98,4	13,3
3"	4	140	127	152,4	190,5	½"	3	140	35	60,3	88,9	12,6
4"	4,5	165	157	190,5	228,6	4"						23,8
4"	4,5	165	157	190,5	228,6	3"	4	165	127	152,4	190,5	22,0
4"	4,5	165	157	190,5	228,6	2½"	3,5	165	105	139,7	177,8	20,8
4"	4,5	165	157	190,5	228,6	2"	3	165	92	120,6	152,4	19,6
4"	4,5	165	157	190,5	228,6	1½"	3	165	73	98,4	127,0	18,7
4"	4,5	165	157	190,5	228,6	1¼"	3	165	64	88,9	117,5	17,7
4"	4,5	165	157	190,5	228,6	1"	3	165	51	79,4	107,9	17,2
4"	4,5	165	157	190,5	228,6	¾"	3	165	43	69,8	98,4	16,5
4"	4,5	165	157	190,5	228,6	½"	3	165	35	60,3	88,9	16,1
5"	4,5	190	185	215,9	254,0	5"						36,0
5"	4,5	190	185	215,9	254,0	4"	4,5	190	157	190,5	228,6	34,5
5"	4,5	190	185	215,9	254,0	3"	4	190	127	152,4	190,5	33,2
5"	4,5	190	185	215,9	254,0	2½"	3,5	190	105	139,7	177,8	32,2
5"	4,5	190	185	215,9	254,0	2"	3	190	92	120,6	152,4	31,3
5"	4,5	190	185	215,9	254,0	1½"	3	190	73	98,4	127,0	30,4
5"	4,5	190	185	215,9	254,0	1¼"	3	190	64	88,9	117,5	29,5
5"	4,5	190	185	215,9	254,0	1"	3	190	51	79,4	107,9	28,7

EQUAL AND REDUCING TEE PIECES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

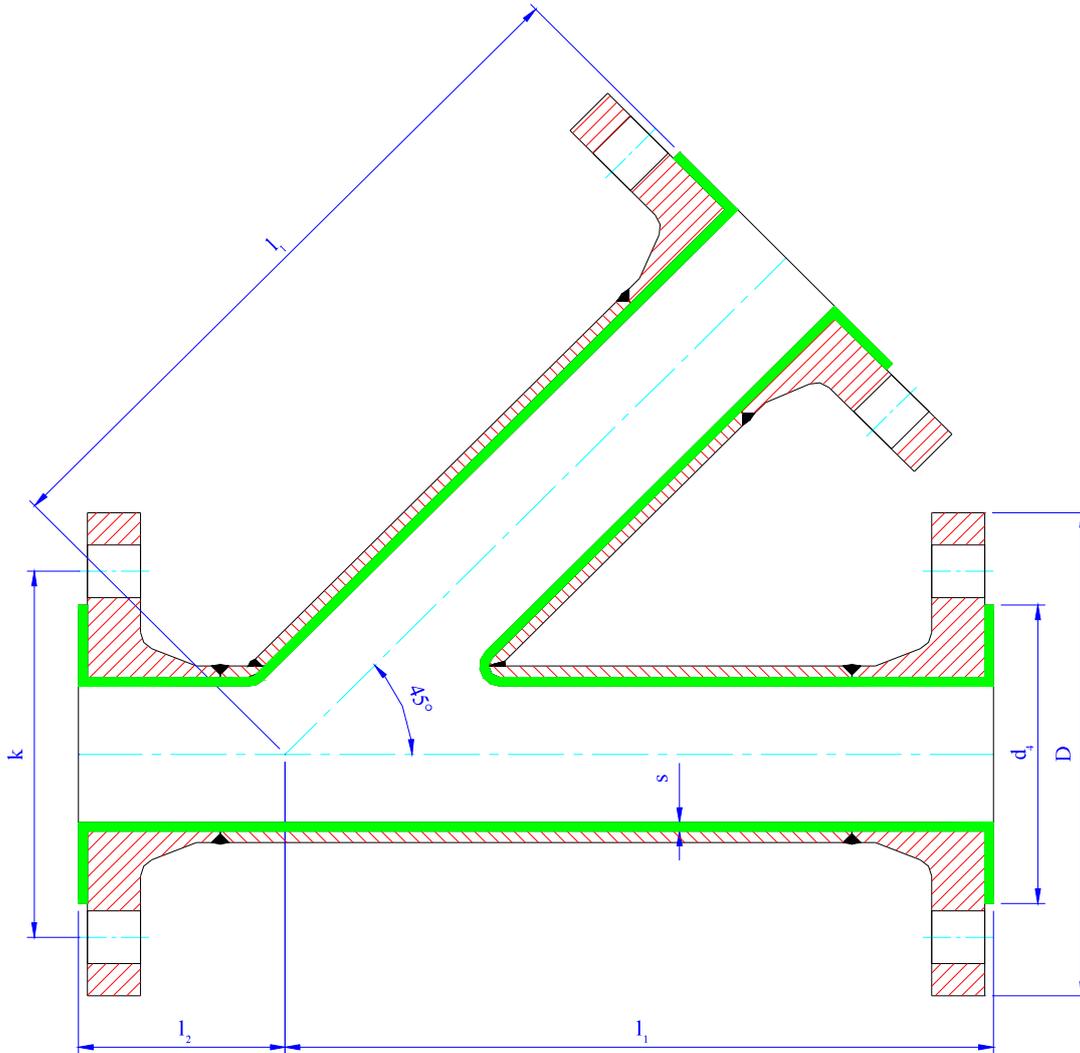
DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight Kg.
6"	5	203	216	241,3	279,4	6"						50,8
6"	5	203	216	241,3	279,4	5"	4,5	203	185	215,9	254,0	46,7
6"	5	203	216	241,3	279,4	4"	4,5	203	157	190,5	228,6	42,2
6"	5	203	216	241,3	279,4	3"	4	203	127	152,4	190,5	40,8
6"	5	203	216	241,3	279,4	2½"	3,5	203	105	139,7	177,8	39,4
6"	5	203	216	241,3	279,4	2"	3	203	92	120,6	152,4	38,1
6"	5	203	216	241,3	279,4	1½"	3	203	73	98,4	127,0	36,9
6"	5	203	216	241,3	279,4	1¼"	3	203	64	88,9	117,5	35,8
6"	5	203	216	241,3	279,4	1"	3	203	51	79,4	107,9	34,8
8"	6	229	270	298,4	342,9	8"						89,9
8"	6	229	270	298,4	342,9	6"	5	229	216	241,3	279,4	75,6
8"	6	229	270	298,4	342,9	5"	4,5	229	185	215,9	254,0	74,6
8"	6	229	270	298,4	342,9	4"	4,5	229	157	190,5	228,6	70,6
8"	6	229	270	298,4	342,9	3"	4	229	127	152,4	190,5	66,6
8"	6	229	270	298,4	342,9	2½"	3,5	229	105	139,7	177,8	62,6
8"	6	229	270	298,4	342,9	2"	3	229	92	120,6	152,4	58,6
10"	7	279	324	361,9	406,4	10"						131,6
10"	7	279	324	361,9	406,4	8"	6	279	270	298,4	342,9	112,4
10"	7	279	324	361,9	406,4	6"	5	279	216	241,3	279,4	107,4
10"	7	279	324	361,9	406,4	5"	4,5	279	185	215,9	254,0	103,4
10"	7	279	324	361,9	406,4	4"	4,5	279	157	190,5	228,6	99,4
10"	7	279	324	361,9	406,4	3"	4	279	127	152,4	190,5	94,4
10"	7	279	324	361,9	406,4	2½"	3,5	279	105	139,7	177,8	89,4
10"	7	279	324	361,9	406,4	2"	3	279	92	120,6	152,4	84,4
12"	7	305	381	431,8	482,6	12"						193,6
12"	7	305	381	431,8	482,6	10"	7	305	324	361,9	406,4	164,4
12"	7	305	381	431,8	482,6	8"	6	305	270	298,4	342,9	156,4
12"	7	305	381	431,8	482,6	6"	5	305	216	241,3	279,4	151,4
12"	7	305	381	431,8	482,6	5"	4,5	305	185	215,9	254,0	146,4
12"	7	305	381	431,8	482,6	4"	4,5	305	157	190,5	228,6	142,4
12"	7	305	381	431,8	482,6	3"	4	305	127	152,4	190,5	138,4
12"	7	305	381	431,8	482,6	2½"	3,5	305	105	139,7	177,8	135,4
12"	7	305	381	431,8	482,6	2"	3	305	92	120,6	152,4	131,4

On request, "Heavy Duty" pieces are available for vacuum condition .
 Steel frames are according to schedule 40.
 Vent holes at Manufacturer's discretion.

45° LATERAL TEES according to ANSI B16.5 class 150.

Material specification: Steel frame: A106 gr.B, API 5L gr.B, according to ANSI B36.10
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



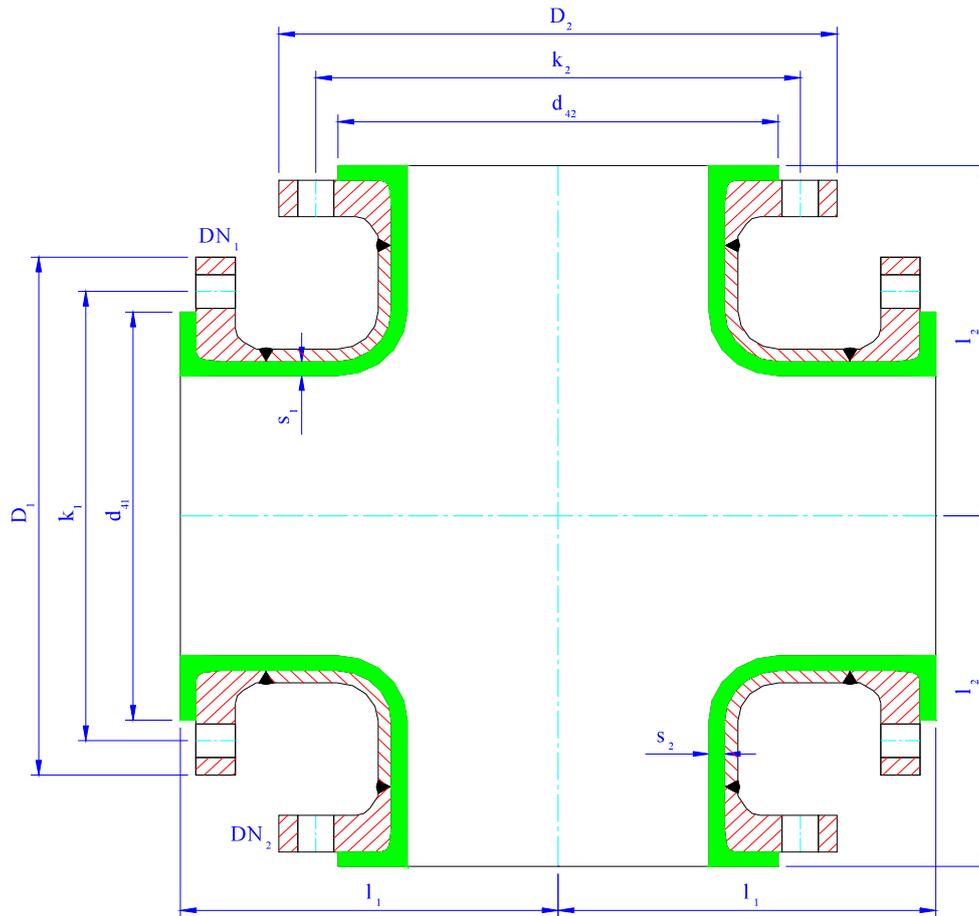
DN	s	l ₁	l ₂	d ₄	k	D	Weight kg.
1"	3	180	40	51	79,4	107,9	4,8
1¼"	3	210	45	64	88,9	117,5	7,0
1½"	3	220	50	73	98,4	127,0	8,6
2"	3	240	55	92	120,6	152,4	10,7
2½"	3,5	260	60	105	139,7	177,8	12,9
3"	4	290	70	127	152,4	190,5	18,7
4"	4,5	320	80	157	190,5	228,6	22,8
5"	4,5	350	90	185	215,9	254,0	34,6
6"	5	380	100	216	241,3	279,4	50,0
8"	6	455	120	270	298,4	342,9	89,9

Steel frames are according to schedule 40.
 On request, "Heavy Duty" pieces are available for vacuum condition.
 Reduced lateral tees and/or lateral tees with different angles can be taken into account.
 Vent holes at Manufacturer's discretion.

EQUAL AND REDUCING CROSSES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight kg.
½"	3	65	35	60,3	88,9	½"	3	65	35	60,3	88,9	3,5
¾"	3	75	43	69,8	98,4	¾"	3	75	43	69,8	98,4	4,7
¾"	3	75	43	69,8	98,4	½"	3	75	35	60,3	88,9	3,7
1"	3	89	51	79,4	107,9	1"	3	89	51	79,4	107,9	5,5
1"	3	89	51	79,4	107,9	¾"	3	89	43	69,8	98,4	5,1
1"	3	89	51	79,4	107,9	½"	3	89	35	60,3	88,9	4,8
1¼"	3	95	64	88,9	117,5	1¼"	3	95	64	88,9	117,5	7,0
1¼"	3	95	64	88,9	117,5	1"	3	95	51	79,4	107,9	6,1
1¼"	3	95	64	88,9	117,5	¾"	3	95	43	69,8	98,4	5,2
1¼"	3	95	64	88,9	117,5	½"	3	95	35	60,3	88,9	4,2
1½"	3	102	73	98,4	127,0	1½"	3	102	73	98,4	127,0	9,4
1½"	3	102	73	98,4	127,0	1¼"	3	102	64	88,9	117,5	9,2
1½"	3	102	73	98,4	127,0	1"	3	102	51	79,4	107,9	8,9
1½"	3	102	73	98,4	127,0	¾"	3	102	43	69,8	98,4	8,6
1½"	3	102	73	98,4	127,0	½"	3	102	35	60,3	88,9	8,2

EQUAL AND REDUCING CROSSES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight kg.
2"	3	114	92	120,6	152,4	2"	3	114	92	120,6	152,4	12,3
2"	3	114	92	120,6	152,4	1½"	3	114	73	98,4	127,0	11,4
2"	3	114	92	120,6	152,4	1¼"	3	114	64	88,9	117,5	10,7
2"	3	114	92	120,6	152,4	1"	3	114	51	79,4	107,9	10,2
2"	3	114	92	120,6	152,4	¾"	3	114	43	69,8	98,4	9,7
2"	3	114	92	120,6	152,4	½"	3	114	35	60,3	88,9	9,3
2½"	3,5	127	105	139,7	177,8	2½"	3,5	127	105	139,7	177,8	16,5
2½"	3,5	127	105	139,7	177,8	2"	3	127	92	120,6	152,4	14,8
2½"	3,5	127	105	139,7	177,8	1½"	3	127	73	98,4	127,0	13,8
2½"	3,5	127	105	139,7	177,8	1¼"	3	127	64	88,9	117,5	12,7
2½"	3,5	127	105	139,7	177,8	1"	3	127	51	79,4	107,9	11,7
2½"	3,5	127	105	139,7	177,8	¾"	3	127	43	69,8	98,4	10,7
2½"	3,5	127	105	139,7	177,8	½"	3	127	35	60,3	88,9	9,8
3"	4	140	127	152,4	190,5	3"	4	140	127	152,4	190,5	30,8
3"	4	140	127	152,4	190,5	2½"	3,5	140	105	139,7	177,8	29,3
3"	4	140	127	152,4	190,5	2"	3	140	92	120,6	152,4	26,7
3"	4	140	127	152,4	190,5	1½"	3	140	73	98,4	127,0	25,3
3"	4	140	127	152,4	190,5	1¼"	3	140	64	88,9	117,5	24,0
3"	4	140	127	152,4	190,5	1"	3	140	51	79,4	107,9	23,0
3"	4	140	127	152,4	190,5	¾"	3	140	43	69,8	98,4	22,1
3"	4	140	127	152,4	190,5	½"	3	140	35	60,3	88,9	21,1
4"	4,5	165	157	190,5	228,6	4"	4,5	165	157	190,5	228,6	46,2
4"	4,5	165	157	190,5	228,6	3"	4	165	127	152,4	190,5	41,1
4"	4,5	165	157	190,5	228,6	2½"	3,5	165	105	139,7	177,8	37,3
4"	4,5	165	157	190,5	228,6	2"	3	165	92	120,6	152,4	33,0
4"	4,5	165	157	190,5	228,6	1½"	3	165	73	98,4	127,0	29,6
4"	4,5	165	157	190,5	228,6	1¼"	3	165	64	88,9	117,5	27,5
4"	4,5	165	157	190,5	228,6	1"	3	165	51	79,4	107,9	23,0
4"	4,5	165	157	190,5	228,6	¾"	3	165	43	69,8	98,4	21,4
4"	4,5	165	157	190,5	228,6	½"	3	165	35	60,3	88,9	19,6
5"	4,5	190	185	215,9	254,0	5"	4,5	190	185	215,9	254,0	59,8
5"	4,5	190	185	215,9	254,0	4"	4,5	190	157	190,5	228,6	54,6
5"	4,5	190	185	215,9	254,0	3"	4	190	127	152,4	190,5	50,2
5"	4,5	190	185	215,9	254,0	2½"	3,5	190	105	139,7	177,8	46,6
5"	4,5	190	185	215,9	254,0	2"	3	190	92	120,6	152,4	43,1
5"	4,5	190	185	215,9	254,0	1½"	3	190	73	98,4	127,0	39,4
5"	4,5	190	185	215,9	254,0	1¼"	3	190	64	88,9	117,5	36,6
5"	4,5	190	185	215,9	254,0	1"	3	190	51	79,4	107,9	33,0

EQUAL AND REDUCING CROSSES according to ANSI B16.5 class 150.

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	s ₁	l ₁	d ₄₁	k ₁	D ₁	DN ₂	s ₂	l ₂	d ₄₂	k ₂	D ₂	Weight kg.
6"	5	203	216	241,3	279,4	6"	5	203	216	241,3	279,4	76,5
6"	5	203	216	241,3	279,4	5"	4,5	203	185	215,9	254,0	64,7
6"	5	203	216	241,3	279,4	4"	4,5	203	157	190,5	228,6	58,5
6"	5	203	216	241,3	279,4	3"	4	203	127	152,4	190,5	53,8
6"	5	203	216	241,3	279,4	2½"	3,5	203	105	139,7	177,8	49,2
6"	5	203	216	241,3	279,4	2"	3	203	92	120,6	152,4	45,7
6"	5	203	216	241,3	279,4	1½"	3	203	73	98,4	127,0	42,1
6"	5	203	216	241,3	279,4	1¼"	3	203	64	88,9	117,5	41,9
6"	5	203	216	241,3	279,4	1"	3	203	51	79,4	107,9	37,5
8"	6	229	270	298,4	342,9	8"	6	229	270	298,4	342,9	147,2
8"	6	229	270	298,4	342,9	6"	5	229	216	241,3	279,4	101,1
8"	6	229	270	298,4	342,9	5"	4,5	229	185	215,9	254,0	94,1
8"	6	229	270	298,4	342,9	4"	4,5	229	157	190,5	228,6	86,6
8"	6	229	270	298,4	342,9	3"	4	229	127	152,4	190,5	79,6
8"	6	229	270	298,4	342,9	2½"	3,5	229	105	139,7	177,8	73,1
8"	6	229	270	298,4	342,9	2"	3	229	92	120,6	152,4	67,1
10"	7	279	324	361,9	406,4	10"	7	279	324	361,9	406,4	204,8
10"	7	279	324	361,9	406,4	8"	6	279	270	298,4	342,9	149,4
10"	7	279	324	361,9	406,4	6"	5	279	216	241,3	279,4	131,4
10"	7	279	324	361,9	406,4	5"	4,5	279	185	215,9	254,0	124,9
10"	7	279	324	361,9	406,4	4"	4,5	279	157	190,5	228,6	118,9
10"	7	279	324	361,9	406,4	3"	4	279	127	152,4	190,5	113,4
10"	7	279	324	361,9	406,4	2½"	3,5	279	105	139,7	177,8	108,9
10"	7	279	324	361,9	406,4	2"	3	279	92	120,6	152,4	102,9
12"	7	305	381	431,8	482,6	12"	7	305	381	431,8	482,6	285,3
12"	7	305	381	431,8	482,6	10"	7	305	324	361,9	406,4	214,4
12"	7	305	381	431,8	482,6	8"	6	305	270	298,4	342,9	199,4
12"	7	305	381	431,8	482,6	6"	5	305	216	241,3	279,4	182,4
12"	7	305	381	431,8	482,6	5"	4,5	305	185	215,9	254,0	167,4
12"	7	305	381	431,8	482,6	4"	4,5	305	157	190,5	228,6	153,4
12"	7	305	381	431,8	482,6	3"	4	305	127	152,4	190,5	140,4
12"	7	305	381	431,8	482,6	2½"	3,5	305	105	139,7	177,8	127,9
12"	7	305	381	431,8	482,6	2"	3	305	92	120,6	152,4	115,9

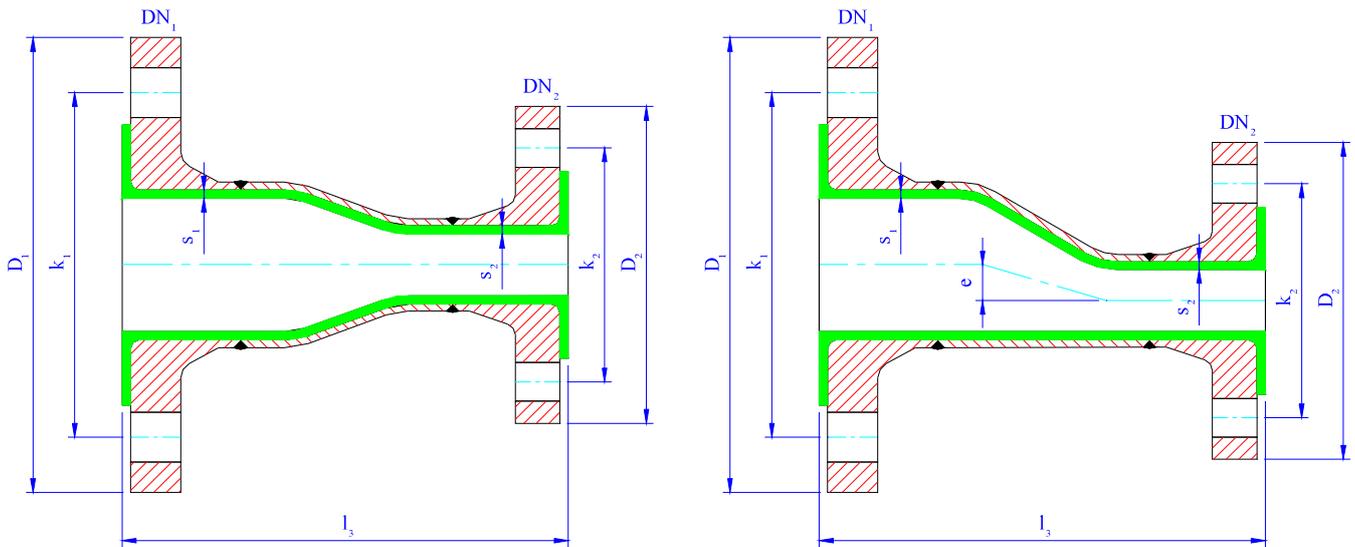
On request, "Heavy Duty" pieces are available for vacuum condition.
 Steel frames are according to schedule 40.
 Vent holes at Manufacturer's discretion.

FLANGED REDUCERS according to ANSI B16.5 class 150.

CONCENTRIC / ECCENTRIC

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN ₁	s ₁	DN ₂	s ₂	e	l ₃	K ₁	D ₁	k ₂	D ₂	Weight kg.
¾"	3	½"	3	3	114	69,8	98,4	60,3	88,9	2,4
1"	3	¾"	3	3	114	79,4	107,9	69,8	98,4	2,6
1"	3	½"	3	3	114	79,4	107,9	60,3	88,9	2,5
1¼"	3	1"	3	4	114	88,9	117,5	79,4	107,9	3,5
1¼"	3	¾"	3	4	114	88,9	117,5	69,8	98,4	3,3
1¼"	3	½"	3	4	114	88,9	117,5	60,3	88,9	2,8
1½"	3	1¼"	3	3	114	98,4	127,0	88,9	117,5	4,9
1½"	3	¾"	3	7	114	98,4	127,0	69,8	98,4	3,9
1½"	3	1"	3	7	114	98,4	127,0	79,4	107,9	2,8
1½"	3	½"	3	7	114	98,4	127,0	60,3	88,9	2,0
2"	3	1½"	3	6	127	120,6	152,4	98,4	127,0	6,1
2"	3	1¼"	3	9	127	120,6	152,4	88,9	117,5	5,5
2"	3	1"	3	13	127	120,6	152,4	79,4	107,9	4,9
2"	3	¾"	3	13	127	120,6	152,4	69,8	98,4	4,3
2"	3	½"	3	13	127	120,6	152,4	60,3	88,9	3,4

FLANGED REDUCERS according to ANSI B16.5 class 150.

CONCENTRIC / ECCENTRIC

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 Flanges: ASTM A105, according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

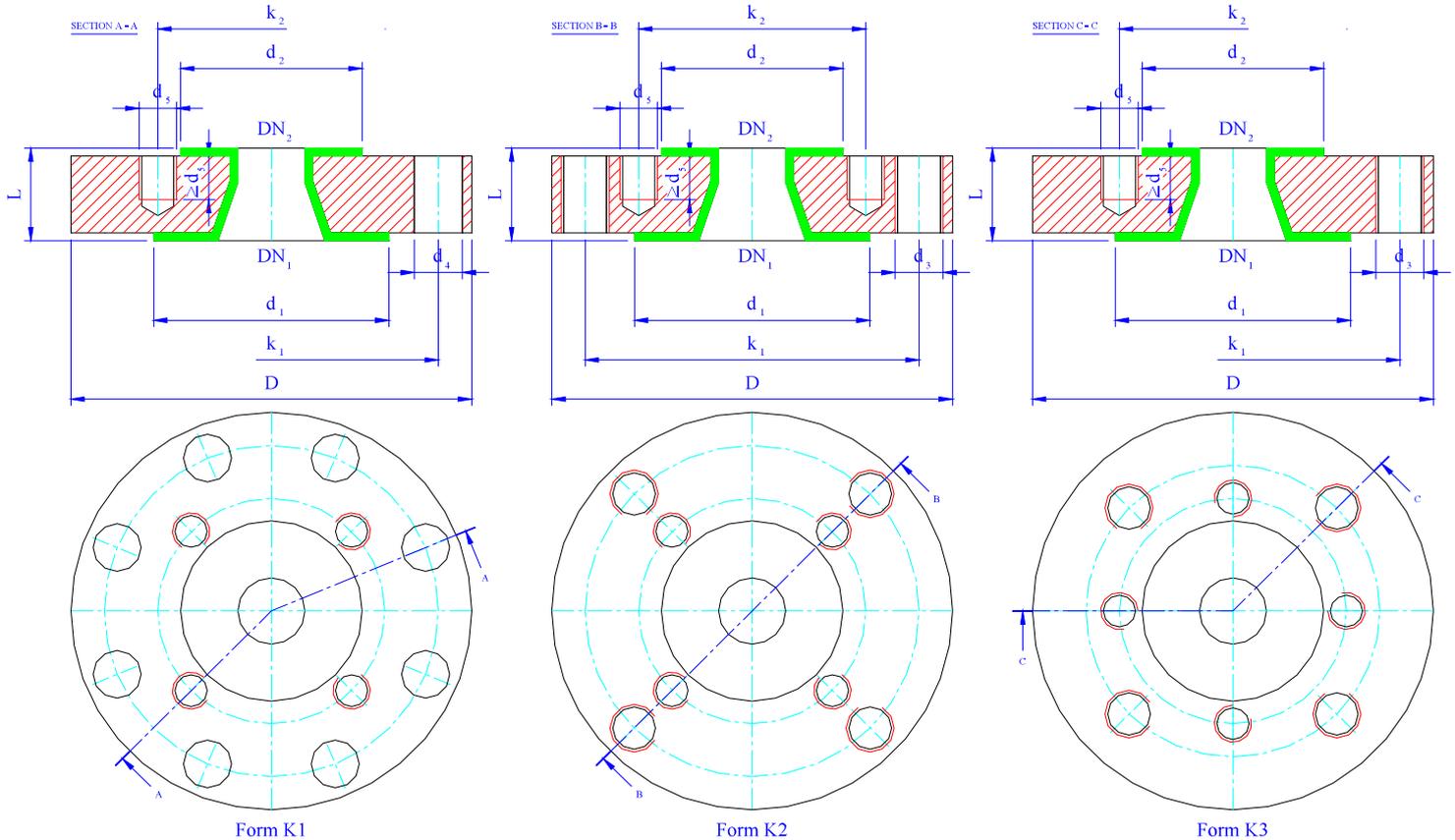
DN ₁	s ₁	DN ₂	s ₂	e	l ₃	K ₁	D ₁	k ₂	D ₂	Weight kg.
2½"	3,5	2"	3	8	140	139,7	177,8	120,6	152,4	7,5
2½"	3,5	1½"	3	14	140	139,7	177,8	98,4	127,0	6,8
2½"	3,5	1¼"	3	17	140	139,7	177,8	88,9	117,5	6,5
2½"	3,5	1"	3	21	140	139,7	177,8	79,4	107,9	6,3
2½"	3,5	¾"	3	21	140	139,7	177,8	69,8	98,4	5,9
2½"	3,5	½"	3	21	140	139,7	177,8	60,3	88,9	5,6
3"	4	2½"	3,5	6	152	152,4	190,5	139,7	177,8	10,1
3"	4	2"	3	14	152	152,4	190,5	120,6	152,4	9,4
3"	4	1½"	3	20	152	152,4	190,5	98,4	127,0	8,1
3"	4	1¼"	3	23	152	152,4	190,5	88,9	117,5	6,9
3"	4	1"	3	28	152	152,4	190,5	79,4	107,9	6,7
3"	4	¾"	3	28	152	152,4	190,5	69,8	98,4	5,7
3"	4	½"	3	28	152	152,4	190,5	60,3	88,9	4,7
4"	4,5	3"	4	13	178	190,5	228,6	152,4	190,5	11,8
4"	4,5	2½"	3,5	19	178	190,5	228,6	139,7	177,8	11,3
4"	4,5	2"	3	27	178	190,5	228,6	120,6	152,4	10,7
4"	4,5	1½"	3	33	178	190,5	228,6	98,4	127,0	10,1
4"	4,5	1¼"	3	36	178	190,5	228,6	88,9	117,5	9,5
4"	4,5	1"	3	40	178	190,5	228,6	79,4	107,9	9,2
4"	4,5	¾"	3	40	178	190,5	228,6	69,8	98,4	8,7
4"	4,5	½"	3	40	178	190,5	228,6	60,3	88,9	8,1
5"	4,5	4"	4,5	13	203	215,9	254,0	190,5	228,6	16,0
5"	4,5	3"	4	25	203	215,9	254,0	152,4	190,5	14,7
5"	4,5	2½"	3,5	32	203	215,9	254,0	139,7	177,8	14,2
5"	4,5	2"	3	40	203	215,9	254,0	120,6	152,4	13,8
6"	5	5"	4,5	14	229	241,3	279,4	215,9	254,0	21,1
6"	5	4"	4,5	27	229	241,3	279,4	190,5	228,6	19,5
6"	5	3"	4	40	229	241,3	279,4	152,4	190,5	18,9
6"	5	2½"	3,5	46	229	241,3	279,4	139,7	177,8	18,0
6"	5	2"	3	54	229	241,3	279,4	120,6	152,4	17,2
8"	6	6"	5	25	279	298,4	342,9	241,3	279,4	33,6
8"	6	5"	4,5	40	279	298,4	342,9	215,9	254,0	33,1
8"	6	4"	4,5	52	279	298,4	342,9	190,5	228,6	30,9
10"	7	8"	6	27	305	361,9	406,4	298,4	342,9	47,4
10"	7	6"	5	52	305	361,9	406,4	241,3	279,4	43,8
10"	7	5"	4,5	67	305	361,9	406,4	215,9	254,0	43,3
10"	7	4"	4,5	79	305	361,9	406,4	190,5	228,6	42,9
12"	7	10"	7	25	356	431,8	482,6	361,9	406,4	64,0
12"	7	8"	6	52	356	431,8	482,6	298,4	342,9	60,5
12"	7	6"	5	78	356	431,8	482,6	241,3	279,4	57,0

On request, "Heavy Duty" pieces are available for vacuum condition.
 Steel frames are according to schedule 40.
 Vent holes at Manufacturer's discretion.

REDUCING FLANGES according to ANSI B16.5 class 150.

Material specification: Steel frame: St 44.2 according to DIN 17100
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN ₁	DN ₂	Tipo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight kg.
3/4"	1/2"	K3	98,4	43	69,7	4 X 1/2"		35	60,3	4 X 1/2"	38,1	1,8
1"	3/4"	K3	107,9	51	79,4	4 X 1/2"		43	69,8	4 X 1/2"	38,1	1,9
1"	1/2"	K3	107,9	51	79,4	4 X 1/2"		35	60,3	4 X 1/2"	38,1	2,3
1 1/4"	1"	K3	117,5	64	88,9	4 X 1/2"		51	79,4	4 X 1/2"	38,1	3,1
1 1/4"	3/4"	K3	117,5	64	88,9	4 X 1/2"		43	69,8	4 X 1/2"	38,1	3,2
1 1/4"	1/2"	K3	117,5	64	88,9	4 X 1/2"		35	60,3	4 X 1/2"	38,1	3,4
1 1/2"	1 1/4"	K3	127,0	73	98,4	4 X 1/2"		64	88,9	4 X 1/2"	38,1	3,8
1 1/2"	1"	K3	127,0	73	98,4	4 X 1/2"		51	79,4	4 X 1/2"	38,1	3,9
1 1/2"	3/4"	K2	127,0	73	98,4	4 X 1/2"		43	69,8	4 X 1/2"	38,1	3,9
1 1/2"	1/2"	K2	127,0	73	98,4	4 X 1/2"		35	60,3	4 X 1/2"	38,1	4,0
2"	1 1/2"	K3	152,4	92	120,6	4 X 5/8"		73	98,4	1 X 1/2"	38,1	4,5
2"	1 1/4"	K3	152,4	92	120,6	4 X 5/8"		64	88,9	4 X 1/2"	38,1	4,6
2"	1"	K2	152,4	92	120,6	4 X 5/8"		51	79,4	4 X 1/2"	38,1	4,7
2"	3/4"	K2	152,4	92	120,6	4 X 5/8"		43	69,8	4 X 1/2"	38,1	4,7
2"	1/2"	K2	152,4	92	120,6	4 X 5/8"		35	60,3	4 X 1/2"	38,1	4,8

REDUCING FLANGES according to ANSI B16.5 class 150.

Material specification: Steel frame: St 44.2 according to DIN 17100
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

DN ₁	DN ₂	Typo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight kg.
2½"	2"	K3	177,8	105	139,7	4 X 5/8"		92	120,6	4 X 5/8"	38,1	5,7
2½"	1½"	K3	177,8	105	139,7	4 X 5/8"		73	98,4	1 X ½"	38,1	5,7
2½"	1¼"	K2	177,8	105	139,7	4 X 5/8"		64	88,9	4 X ½"	38,1	5,8
2½"	1"	K2	177,8	105	139,7	4 X 5/8"		51	79,4	4 X ½"	38,1	6,0
2½"	¾"	K2	177,8	105	139,7	4 X 5/8"		43	69,8	4 X ½"	38,1	6,0
2½"	½"	K2	177,8	105	139,7	4 X 5/8"		35	60,3	4 X ½"	38,1	6,0
3"	2½"	K2	190,5	127	152,4	4 X 5/8"		105	139,7	4 X 5/8"	38,1	6,3
3"	2"	K2	190,5	127	152,4	4 X 5/8"		92	120,6	4 X 5/8"	38,1	6,6
3"	1½"	K2	190,5	127	152,4	4 X 5/8"		73	98,4	1 X ½"	38,1	6,9
3"	1¼"	K2	190,5	127	152,4	4 X 5/8"		64	88,9	4 X ½"	38,1	7,0
3"	1"	K1	190,5	127	152,4		4 X 19	51	79,4	4 X ½"	38,1	7,0
3"	¾"	K1	190,5	127	152,4		4 X 19	43	69,8	4 X ½"	38,1	7,1
3"	½"	K1	190,5	127	152,4		4 X 19	35	60,3	4 X ½"	38,1	7,2
4"	3"	K3	228,6	157	190,5	8 X 5/8"		127	152,4	4 X 5/8"	38,1	7,9
4"	2½"	K2	228,6	157	190,5	8 X 5/8"		105	139,7	4 X 5/8"	38,1	8,1
4"	2"	K2	228,6	157	190,5	8 X 5/8"		92	120,6	4 X 5/8"	38,1	8,2
4"	1½"	K1	228,6	157	190,5		8 X 19	73	98,4	1 X ½"	50,8	11,1
4"	1¼"	K1	228,6	157	190,5		8 X 19	64	88,9	4 X ½"	50,8	11,4
4"	1"	K1	228,6	157	190,5		8 X 19	51	79,4	4 X ½"	50,8	11,6
4"	¾"	K1	228,6	157	190,5		8 X 19	43	69,8	4 X ½"	50,8	11,6
4"	½"	K1	228,6	157	190,5		8 X 19	35	60,3	4 X ½"	50,8	11,7
5"	4"	K3	254,0	185	215,9	8 X ¾"		157	190,5	8 X 5/8"	38,1	9,5
5"	3"	K2	254,0	185	215,9	8 X ¾"		127	152,4	4 X 5/8"	38,1	10,1
5"	2½"	K2	254,0	185	215,9	8 X ¾"		105	139,7	4 X 5/8"	50,8	13,7
5"	2"	K1	254,0	185	215,9		8 X 22	92	120,6	4 X 5/8"	50,8	13,9
5"	1½"	K1	254,0	185	215,9		8 X 22	73	98,4	1 X ½"	50,8	14,1
5"	1¼"	K1	254,0	185	215,9		8 X 22	64	88,9	4 X ½"	50,8	14,4
5"	1"	K1	254,0	185	215,9		8 X 22	51	79,4	4 X ½"	50,8	14,5
5"	¾"	K1	254,0	185	215,9		8 X 22	43	69,8	4 X ½"	50,8	14,5
5"	½"	K1	254,0	185	215,9		8 X 22	35	60,3	4 X ½"	50,8	14,5
6"	5"	K3	279,4	216	241,3	8 X ¾"		185	215,9	8 X ¾"	38,1	11,1
6"	4"	K2	279,4	216	241,3	8 X ¾"		157	190,5	8 X 5/8"	38,1	12,4
6"	3"	K1	279,4	216	241,3		8 X 22	127	152,4	4 X 5/8"	50,8	17,8
6"	2½"	K1	279,4	216	241,3		8 X 22	105	139,7	4 X 5/8"	50,8	17,9
6"	2"	K1	279,4	216	241,3		8 X 22	92	120,6	4 X 5/8"	50,8	18,1
6"	1½"	K1	279,4	216	241,3		8 X 22	73	98,4	1 X ½"	50,8	18,8
6"	1¼"	K1	279,4	216	241,3		8 X 22	64	88,9	4 X ½"	50,8	19,6
6"	1"	K1	279,4	216	241,3		8 X 22	51	79,4	4 X ½"	50,8	19,6
6"	¾"	K1	279,4	216	241,3		8 X 22	43	69,8	4 X ½"	50,8	19,8
6"	½"	K1	279,4	216	241,3		8 X 22	35	60,3	4 X ½"	50,8	19,8

REDUCING FLANGES according to ANSI B16.5 class 150.

Material specification: Steel frame: St 44.2 according to DIN 17100
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

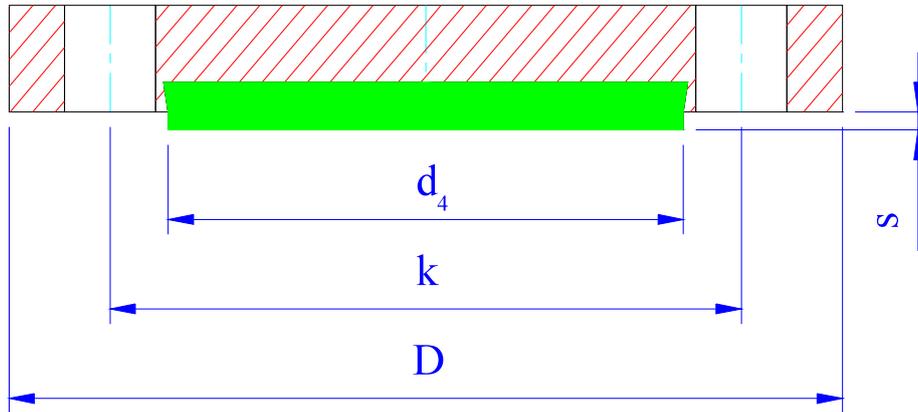
DN ₁	DN ₂	Tipo	D	d ₁	k ₁	n x d ₃	n x d ₄	d ₂	k ₂	n x d ₅	l	Weight Kg.
8"	6"	K2	342,9	270	298,4	8 X 3/4"		216	241,3	8 X 3/4"	38,1	16,4
8"	5"	K1	342,9	270	298,4		8 X 22	185	215,9	8 X 3/4"	38,1	17,3
8"	4"	K1	342,9	270	298,4		8 X 22	157	190,5	8 X 5/8"	50,8	24,0
8"	3"	K1	342,9	270	298,4		8 X 22	127	152,4	4 X 5/8"	50,8	24,7
8"	2 1/2"	K1	342,9	270	298,4		8 X 22	105	139,7	4 X 5/8"	50,8	25,4
8"	2"	K1	342,9	270	298,4		8 X 22	92	120,6	4 X 5/8"	50,8	26,0
8"	1 1/2"	K1	342,9	270	298,4		8 X 22	73	98,4	1 X 1/2"	50,8	26,4
8"	1 1/4"	K1	342,9	270	298,4		8 X 22	64	88,9	4 X 1/2"	50,8	26,5
8"	1"	K1	342,9	270	298,4		8 X 22	51	79,4	4 X 1/2"	50,8	26,5
8"	3/4"	K1	342,9	270	298,4		8 X 22	43	69,8	4 X 1/2"	50,8	26,6
8"	1/2"	K1	342,9	270	298,4		8 X 22	35	60,3	4 X 1/2"	50,8	26,6
10"	8"	K2	406,4	324	361,9	12 X 7/8"		270	298,4	8 X 3/4"	38,1	20,9
10"	6"	K1	406,4	324	361,9		12 X 25	216	241,3	8 X 3/4"	50,8	30,4
10"	5"	K1	406,4	324	361,9		12 X 25	185	215,9	8 X 3/4"	50,8	31,3
10"	4"	K1	406,4	324	361,9		12 X 25	157	190,5	8 X 5/8"	50,8	32,2
10"	3"	K1	406,4	324	361,9		12 X 25	127	152,4	4 X 5/8"	50,8	33,4
10"	2 1/2"	K1	406,4	324	361,9		12 X 25	105	139,7	4 X 5/8"	50,8	35,1
10"	2"	K1	406,4	324	361,9		12 X 25	92	120,6	4 X 5/8"	50,8	36,3
10"	1 1/2"	K1	406,4	324	361,9		12 X 25	73	98,4	1 X 1/2"	50,8	36,6
10"	1 1/4"	K1	406,4	324	361,9		12 X 25	64	88,9	4 X 1/2"	50,8	36,6
10"	1"	K1	406,4	324	361,9		12 X 25	51	79,4	4 X 1/2"	50,8	37,4
10"	3/4"	K1	406,4	324	361,9		12 X 25	43	69,8	4 X 1/2"	50,8	37,4
10"	1/2"	K1	406,4	324	361,9		12 X 25	35	60,3	4 X 1/2"	50,8	37,7
12"	10"	K2	482,6	381	431,8	12 X 7/8"		324	361,9	4 X 5/8"	38,1	21,7
12"	8"	K1	482,6	381	431,8		12 X 25	270	298,4	8 X 3/4"	50,8	31,6
12"	6"	K1	482,6	381	431,8		12 X 25	216	241,3	8 X 3/4"	50,8	34,7
12"	5"	K1	482,6	381	431,8		12 X 25	185	215,9	8 X 3/4"	50,8	37,2
12"	4"	K1	482,6	381	431,8		12 X 25	157	190,5	8 X 5/8"	50,8	38,8
12"	3"	K1	482,6	381	431,8		12 X 25	127	152,4	4 X 5/8"	50,8	40,3
12"	2 1/2"	K1	482,6	381	431,8		12 X 25	105	139,7	4 X 5/8"	50,8	41,3
12"	2"	K1	482,6	381	431,8		12 X 25	92	120,6	4 X 5/8"	50,8	42,8
12"	1 1/2"	K1	482,6	381	431,8		12 X 25	73	98,4	1 X 1/2"	50,8	42,8
12"	1 1/4"	K1	482,6	381	431,8		12 X 25	64	88,9	4 X 1/2"	50,8	43,4
12"	1"	K1	482,6	381	431,8		12 X 25	51	79,4	4 X 1/2"	50,8	43,8
12"	3/4"	K1	482,6	381	431,8		12 X 25	43	69,8	4 X 1/2"	50,8	43,8
12"	1/2"	K1	482,6	381	431,8		12 X 25	35	60,3	4 X 1/2"	50,8	44,4

On request, eccentric reducing flanges are available.

BLANK FLANGES lined in PTFE according to ANSI B16.5, class 150

Material specification: Flange: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

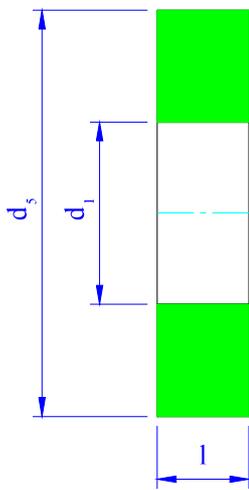


DN	s	d ₄	k	D	Weight kg.
½"	3	35	60,3	88,9	1,0
¾"	3	43	69,8	98,4	1,6
1"	3	51	79,4	107,9	1,5
1¼"	3	64	88,9	117,5	2,1
1½"	3	73	98,4	127,0	2,7
2"	3	92	120,6	152,4	3,4
2½"	3,5	105	139,7	177,8	4,5
3"	4	127	152,4	190,5	5,6
4"	4,5	157	190,5	228,6	6,9
5"	4,5	185	215,9	254,0	10,0
6"	5	216	241,3	279,4	12,3
8"	6	270	298,4	342,9	19,5
10"	7	324	361,9	406,4	28,1
12"	7	381	431,8	482,6	36,6

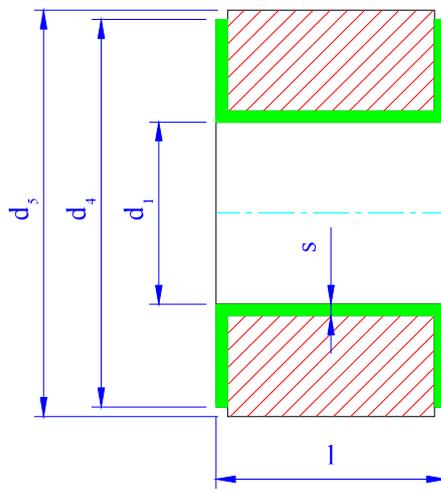
SPACERS according to ANSI B16.5, class 150

Material specification: Form "F": Pure PTFE, according to ASTM-D 4894
 Form "G" + "H": ASTM A106 gr. B according to ANSI B36.10
 API 5L gr. B according to ANSI B36.10
 ASTM A105 according to ANSI B36.10
 St 52.0 according to DIN 1629
 according to DIN 2874

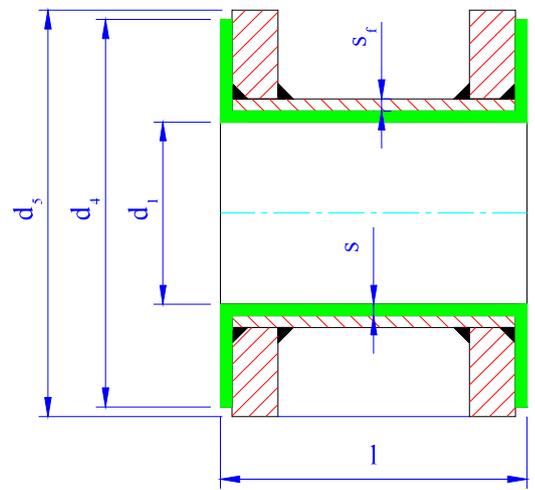
Sizes are expressed in mm.



Form F



Form G



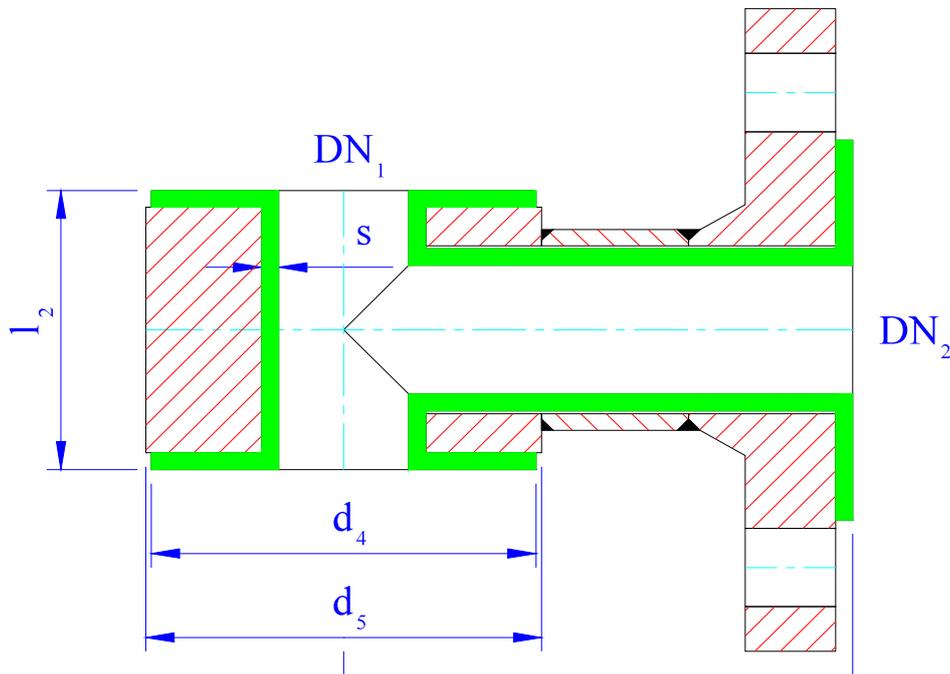
Form H

DN	d ₁	s _f	s	d ₄	d ₅	l (form F)	l (form G)	l (form H)
1/2"	9	3,0	3	35	44			
3/4"	15	3,0	3	43	53			
1"	19	3,38	3	51	63			
1 1/4"	28	3,56	3	64	72			
1 1/2"	32	3,68	3	73	82			
2"	44	3,91	3	92	101			
2 1/2"	61	5,16	3,5	105	119	5 - 20	10 - 70	60 - 100
3"	69	5,49	4	127	132			
4"	94	6,02	4,5	157	171			
5"	121	6,55	4,5	186	192			
6"	144	7,11	5	216	218			
8"	194	6,35	6	270	275			
10"	246	6,35	7	324	337			
12"	297	6,35	7	381	406			

INSTRUMENT TAPPINGS according to ANSI B16.5, class 150

Material specification: Steel frame: ASTM A106 gr. B, according to ANSI B36.10
 API 5L gr.B according to ANSI B36.10
 St 52.0 according to DIN 1629
 Flanges: A105 gr. B according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



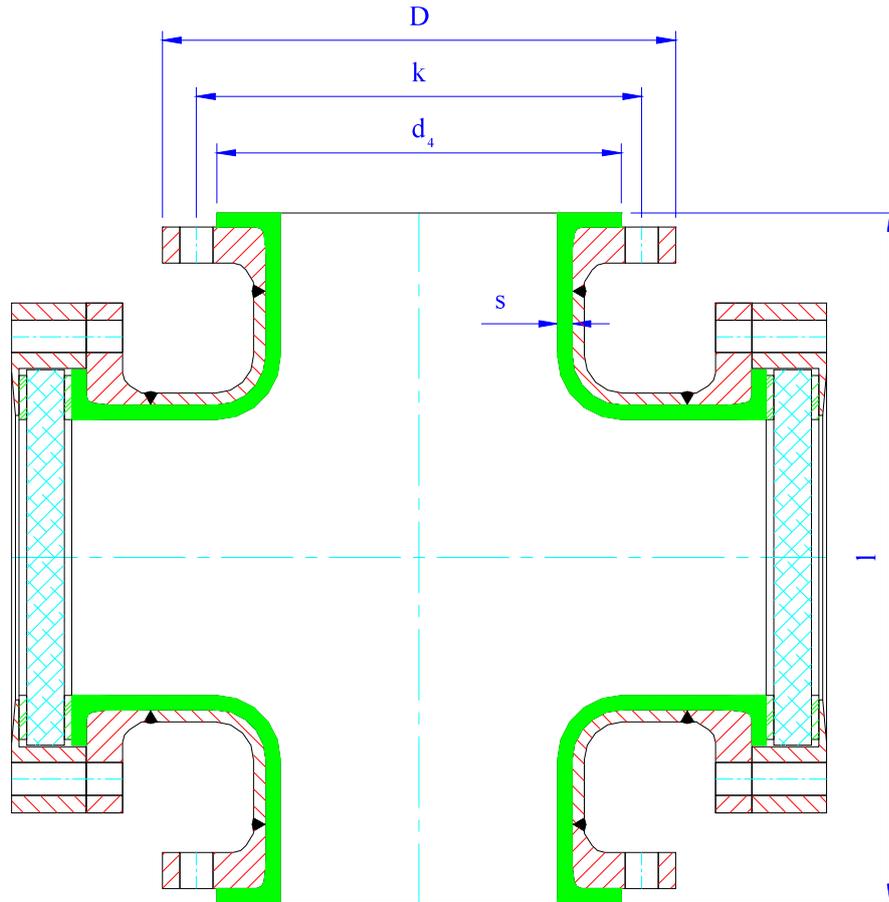
Main Passage DN ₁					Branch DN ₂					
DN ₁	s	d ₄	d ₅	l ₁	1" l ₂	1" Weight kg.	1½" l ₂	1½" Weight kg.	2" l ₂	2" Weight kg.
1"	3	51	63	89	51	3,5	=	=	=	=
1¼"	3	64	72	95	51	4,0	=	=	=	=
1½"	3	73	82	102	51	4,4	75	5,3	=	=
2"	3	92	101	114	51	5,6	75	7,3	90	9,2
2½"	3,5	105	119	127	51	7,2	75	8,5	90	11,3
3"	4	127	132	140	51	7,8	75	9,7	90	12,7
4"	4,5	157	171	165	51	8,5	75	10,9	90	14,7
5"	4,5	186	192	190	51	10,2	75	13,2	90	17,0
6"	5	216	218	203	51	11,4	75	14,6	90	18,4
8"	6	270	275	229	51	14,3	75	16,6	90	20,7
10"	7	324	337	279	51	17,2	75	20,1	90	23,5
12"	7	381	406	305	51	21,2	75	24,1	90	28,1

On request, other sizes are available.
 On request, instrument tappings with double branches are available.
 Vent holes at Manufacturer's discretion.

SIGHT GLASSES according to ANSI B16.5, class 150

Material specification: Steel frame: ASTM A234 gr. WPB, according to ANSI B16.28
 St. 52.0 according to DIN 1629
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	s	d ₄	k	D	l	Weight kg.
½"	3	35	60,3	88,9	108,0	6,0
¾"	3	43	69,8	98,4	117,5	6,4
1"	3	51	79,4	107,9	127,0	6,7
1¼"	3	64	88,9	117,5	140,0	8,7
1½"	3	73	98,4	127,0	165,0	10,1
2"	3	92	120,6	152,4	178,0	14,5
2½"	3,5	105	139,7	177,8	190,5	25,2
3"	4	127	152,4	190,5	203,0	28,8
4"	4,5	157	190,5	228,6	229,0	43,7
5"	4,5	186	215,9	254,0	254,0	65,5
6"	5	216	241,3	279,4	267,0	78,2
8"	6	270	298,4	342,9	292,0	120,7

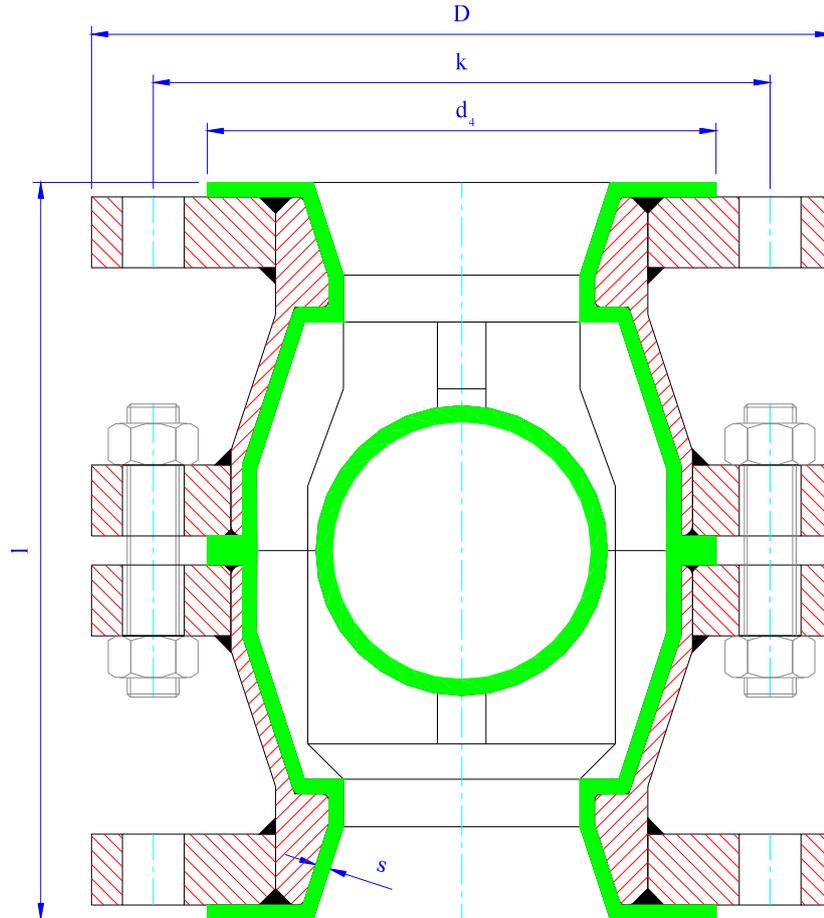
On request, "Heavy Duty" pieces are available for vacuum condition.
 On request, glasses in borosilicate are available.
 On request, other dimensions are available.
 Vent holes at Manufacturer's discretion.

BALL CHECK VALVES lined in PTFE

For horizontal and vertical assembly according to ANSI B16.5, class 150

Material specification: Steel frame: ASTM A105 according to ANSI B16.5
 St 52.0 according to DIN 1629
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



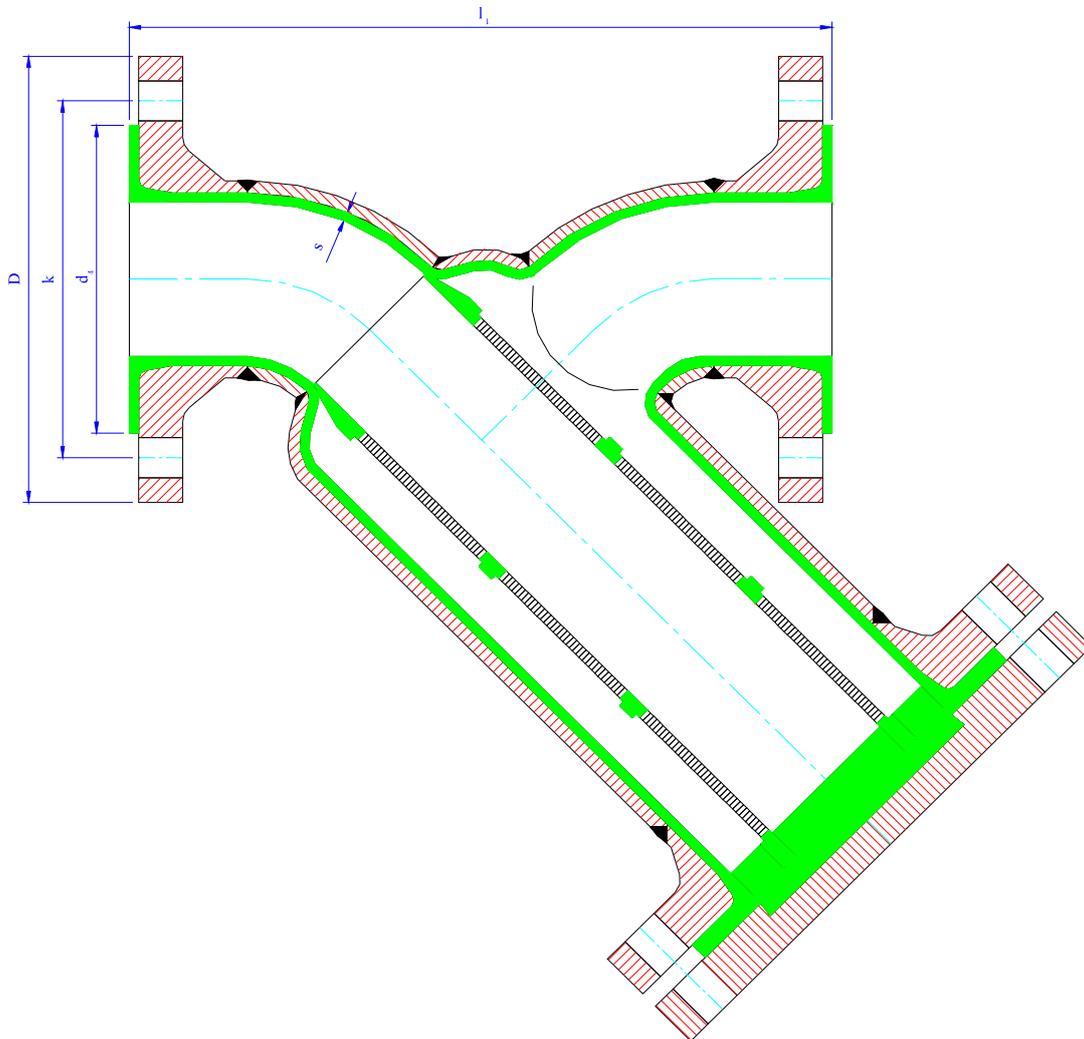
DN	s	d ₄	k	D	l	Weight kg.
½"	3	35	60,3	88,9	108,0	5,8
¾"	3	43	69,8	98,4	117,5	6,3
1"	3	51	79,4	107,9	127,0	6,5
1¼"	3	64	88,9	117,5	140,0	13,4
1½"	3	73	98,4	127,0	165,0	14,7
2"	3	92	120,6	152,4	178,0	17,1
2½"	3,5	105	139,7	177,8	190,5	23,5
3"	4	127	152,4	190,5	203,0	28,5
4"	4,5	157	190,5	228,6	229,0	41,4
6"	5	216	241,3	279,4	267,0	79,3
8"	6	270	298,4	342,9	292,0	93,1

On request, combined ball check valves – sight glasses are available in sizes from 1" to 4".
 Ball check valves are regularly delivered with full ptfе sphere: on request, different spheres can be supplied.
 Vent holes at Manufacturer's discretion.

Y STRAINERS according to ANSI B16.5 class 150.

Material specification:	Steel frame:	ASTM A106 gr. B according to ANSI B36.10 API 5L gr. B according to ANSI B36.10 ASTM A234 gr. WPB according to ANSI B16.28
	Flanges:	ASTM A105 according to ANSI B16.5
	Lining:	Pure PTFE, according to ASTM-D 4894
	Filtering basket:	Pure PTFE or glass filled PTFE
	Filtering net:	PTFE
	Mesh:	standard 210 micron, different sizes on request.
Delivery terms:		according to DIN 2874

Sizes are expressed in mm.



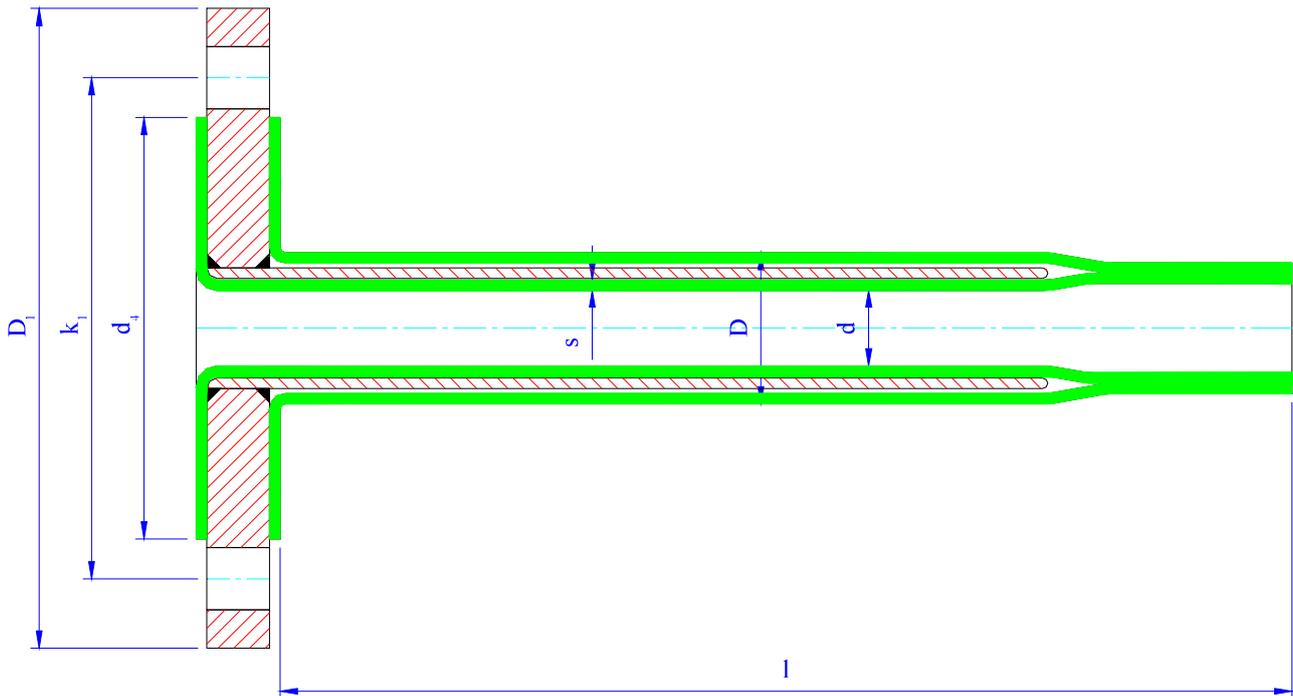
DN	s	l ₁	d ₁	k	D	Weight kg.
1"	3	160	51	79,4	107,9	5,9
1½"	3	200	73	98,4	127,0	13,5
2"	3	230	92	120,6	152,4	17,1
3"	4	310	127	152,4	190,5	26,2
4"	4,5	350	157	190,5	228,6	35,0
6"	5	480	216	241,3	279,4	64,4
8"	6	600	270	298,4	342,9	101,0

Strainers are only available with DIN face-to-face dimensions and flanges according to ANSI B16.5.
 Vent holes at Manufacturer's discretion.

INJECTION PIPES lined in PTFE according to ANSI B16.5, class 150.

Material specification: Steel tubes: ASTM A106 gr.B according to ANSI B36.10
 API 5L gr. B, according to ANSI B36.10
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



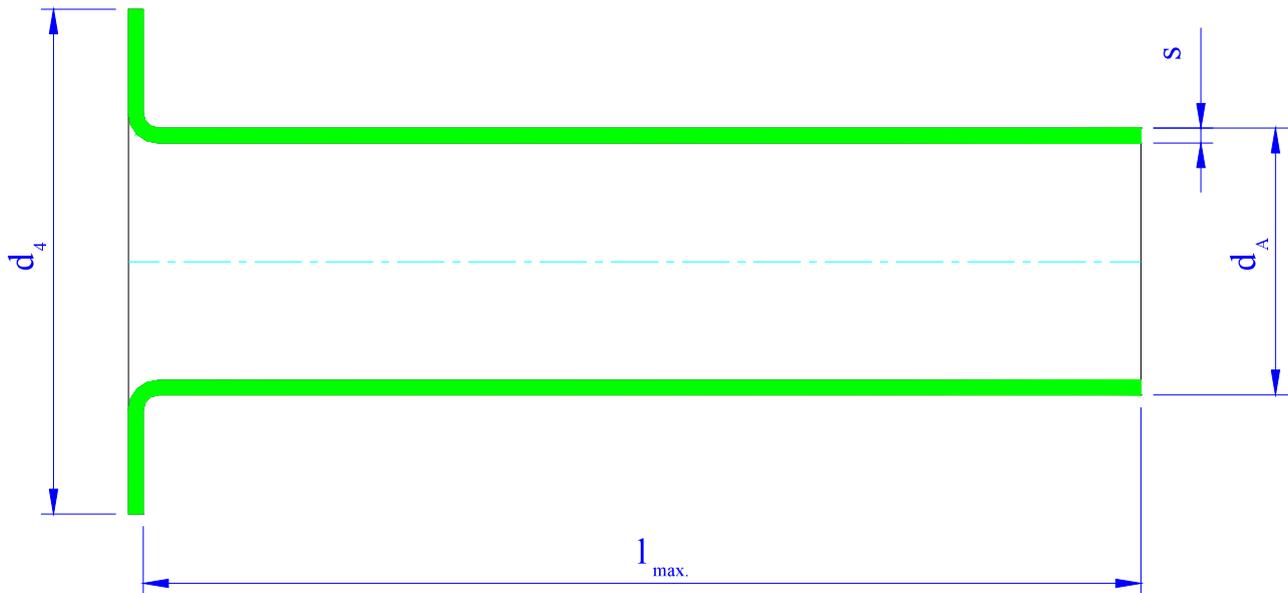
DN	d_4	k_1	D_1	D	d	l_{max}
1/2"	35	60,3	88,9	38 (29)	20 (13)	3000
3/4"	43	69,8	98,4	38	20	3000
1"	51	79,4	107,9	44	22	3000
1 1/4"	64	88,9	117,5	54	31	3000
1 1/2"	73	98,4	127,0	54	37	3000
2"	92	120,6	152,4	70	48	3000
2 1/2"	105	139,7	177,8	82	63	3000
3"	127	152,4	190,5	107	75	3000
4"	157	190,5	228,6	131	99	3000
5"	185	215,9	254,0	159	122	3000
6"	216	241,3	279,4	206	149	3000
8"	270	298,4	342,9	238	194	3000
10"	324	361,9	406,4	309	248	3000

On request, different sizes are available.
 On request, different shapes and different final ends are available.
 Vent holes at Manufacturer's discretion.

PTFE INJECTION NOZZLE (without steel insert).

Material specification: Lining: Pure PTFE, according to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.

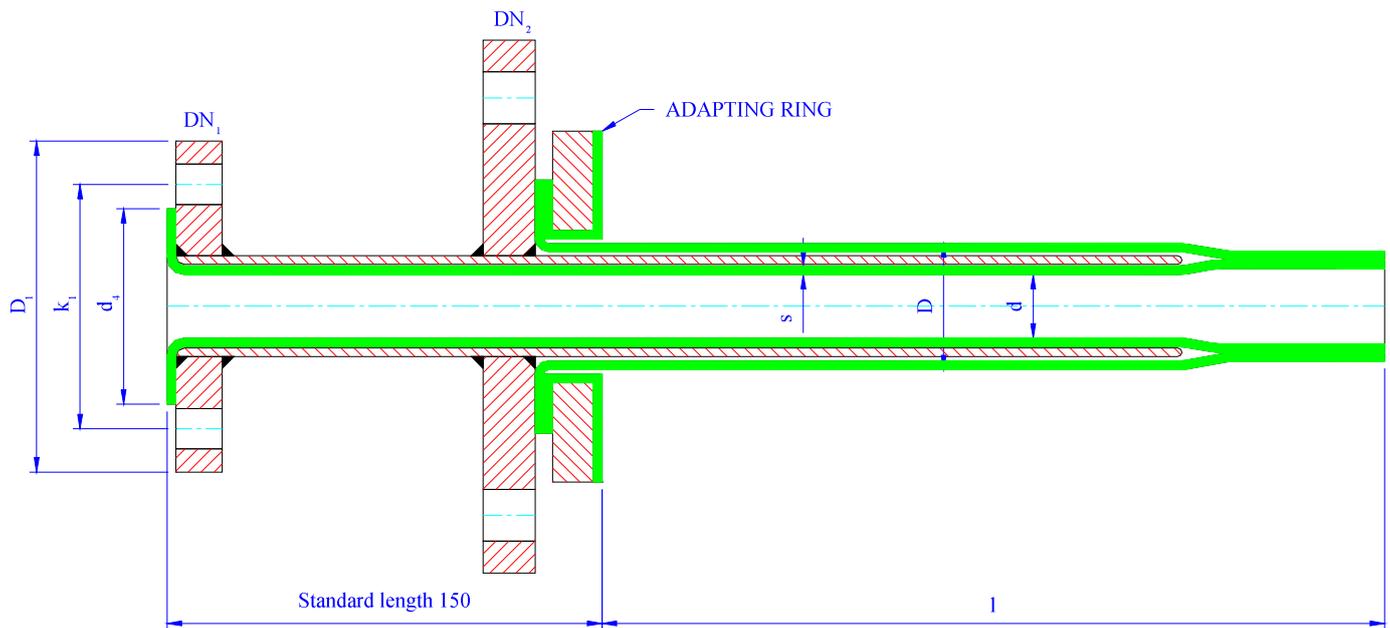


DN	s	d _A	d ₄	l _{max}
1/2"	3	16	35	3.000
3/4"	3	21	43	3.000
1"	3	26	51	3.000
1 1/4"	3	34	64	3.000
1 1/2"	3	39	73	3.000
2"	3	51	92	3.000
2 1/2"	3,5	69	105	3.000
3"	4	78	127	3.000
4"	4,5	103	157	3.000
5"	4,5	131	185	3.000
6"	5	154	216	3.000
8"	6	206	270	3.000
10"	7	260	324	3.000
12"	7	311	381	3.000

DIP PIPES according to ANSI B16.5 class 150.

Material Specification: Steel tube: ASTM A106 gr. B according to ANSI B36.10
 API 5L gr. B according to ANSI B36.10
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE according to ASTM D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



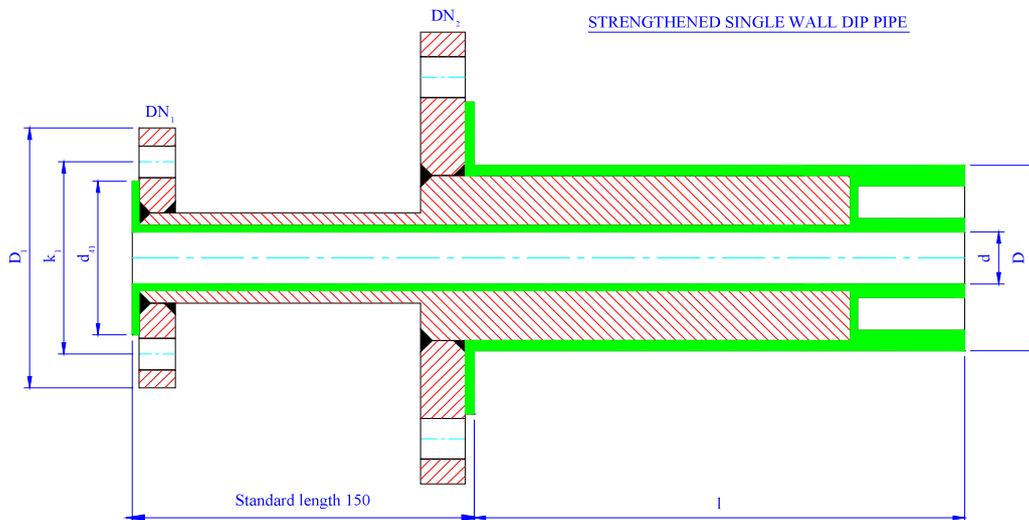
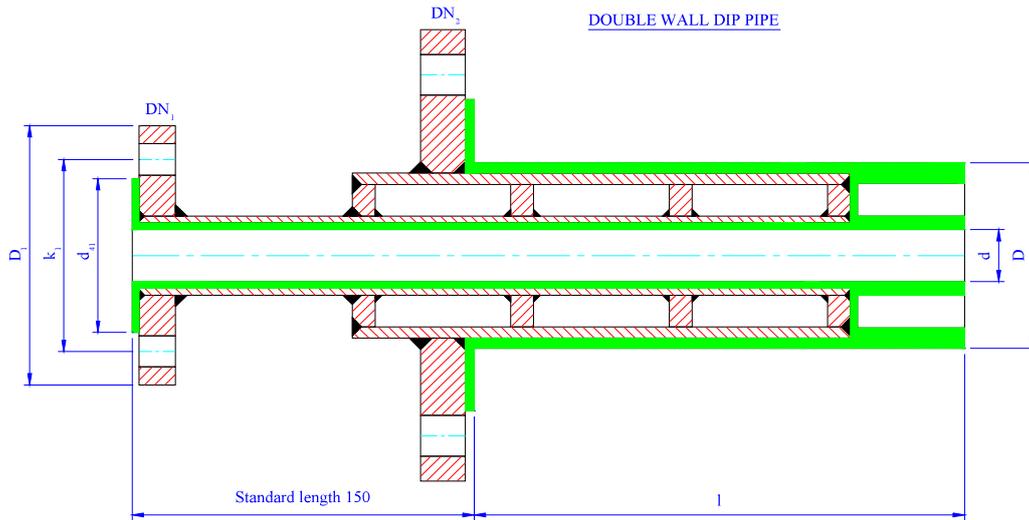
DN	s	d ₁	k ₁	D ₁	D	d	DN ₂	l _{max}
1/2"	3	35	60,3	88,9	38 (29)	20 (13)	ADAPTED TO THE FLANGE OF THE REACTION VESSEL	3.000
3/4"	3	43	69,8	98,4	38	20		3.000
1"	3	51	79,4	107,9	44	22		3.000
1 1/4"	3	64	88,9	117,5	54	31		3.000
1 1/2"	3	73	98,4	127,0	54/70	37		3.000
2"	3	92	120,6	152,4	70	48		3.000
2 1/2"	3,5	105	139,7	177,8	82	63		3.000
3"	4	127	152,4	190,5	107	75		3.000
4"	4,5	157	190,5	228,6	131	99		3.000
5"	4,5	185	215,9	254,0	159	122		3.000
6"	5	216	241,3	279,4	206	149		3.000
8"	6	270	298,4	342,9	238	194		3.000
10"	7	324	361,9	406,4	309	248	3.000	

On request, different sizes are available.
 on request, special dip pipes (curved, with spraying nozzles,....) are available.
 The Manufacturer will decide whether to mount an adapting ring and/or reinforcing tails.

DOUBLE WALL DIP PIPES according to ANSI B16.5, class 150.

Material specification: Steel tube: ASTM A106 gr. B according to ANSI B36.10
 API 5L gr. B according to ANSI B36.10
 Flanges: ASTM A105 according to ANSI B16.5
 Lining: Pure PTFE according to ASTM D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



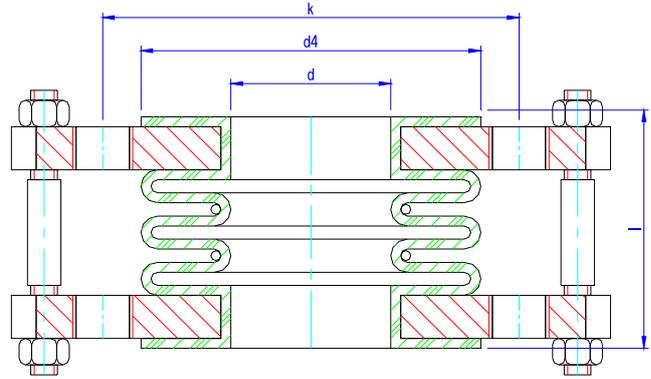
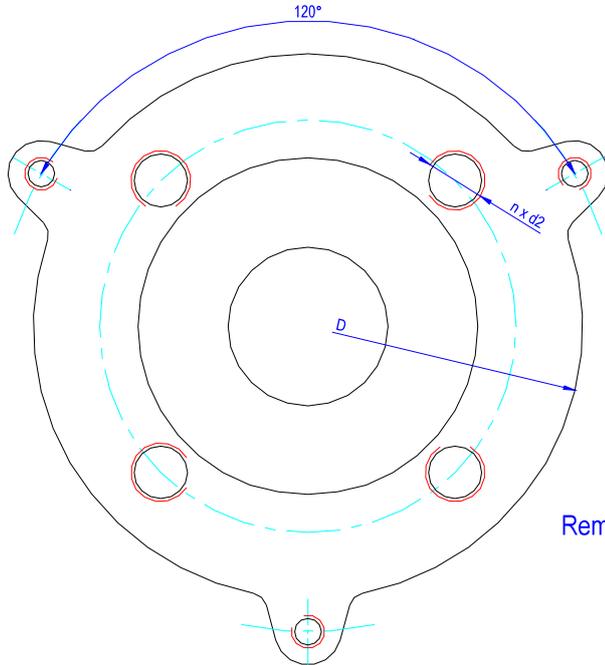
DN	s	d ₄₁	k ₁	D ₁	D	d	DN ₂	l _{max}
¾"	3	43	69,8	98,4	70	20	Flange of the reaction vessel	3.000
1"	3	51	79,4	107,9	70	22		3.000
1½"	3	73	98,4	127,0	82	37		3.000
2"	3	92	120,6	152,4	107	48		3.000
2½"	3,5	105	139,7	177,8	107	63		3.000
3"	4	127	152,4	190,5	131	75		3.000
4"	4,5	157	190,5	228,6	159	99		3.000

On request, different sizes are available.
 On request, special dip pipes (curved, with spraying nozzles,...) are available.
 The Manufacturer will decide whether to mount an adapting ring and/or reinforcing tails.
 On request, double wall dip pipes can be supplied with a heating jacket, with flanged connections or threaded connections.

EXPANSION JOINTS according to ANSI B16.5 class 150

Material specifications: Flanges: ASTM A105 according to ANSI B16.5
 Expansion joints: "TFM"® (product by Dyneon)

Delivery terms: according to DIN 2874
 Sizes are expressed in mm.



Remarks: DO NOT remove the limiting stud bolts of the expansion joints.

DN	d	d ₄	k	n x d ₂	D	l for 2 conv.	l for 3 conv.	l for 4 conv.	l for 5 conv.	l for 6 conv.	l for 7 conv.	l for 8 conv.
1/2"	22	35	60	4 x 1/2"	89	38	50	62	74	86	98	110
3/4"	22	43	70	4 x 1/2"	98	38	50	62	74	86	98	110
1"	22	51	79	4 x 1/2"	108	41	55	69	83	97	111	125
1 1/4"	28	64	89	4 x 1/2"	117	41	55	69	83	97	111	125
1 1/2"	33	73	98	4 x 1/2"	127	51	65	79	93	107	121	135
2"	44	92	121	4 x 5/8"	152	56	70	84	98	112	126	140
2 1/2"	62	105	140	4 x 5/8"	178	54	70	86	102	118	134	150
3"	70	127	152	4 x 5/8"	190	54	70	86	102	118	134	150
4"	94	157	190	8 x 5/8"	229	82	100	118	136	154	172	190
5"	122	185	216	8 x 3/4"	254	82	100	118	136	154	172	190
6"	144	216	241	8 x 3/4"	279	87	105	123	141	159	177	195
8"	194	270	298	8 x 3/4"	343	86	105	124	143	162	181	200
10"	246	324	362	12 x 7/8"	406	78	105	132	159	186	n.a.	n.a.
12"	297	381	432	12 x 7/8"	483	78	105	132	159	186	n.a.	n.a.
14"	325	413	476	12 x 1"	533	78	105	132	159	186	n.a.	n.a.
16"	376	470	540	16 x 1"	597	93	120	147	174	201	n.a.	n.a.
18"	420	533	578	16 x 1 1/8"	635	93	120	147	174	201	n.a.	n.a.
20"	471	584	635	20 x 1 1/8"	698	93	120	155	174	201	n.a.	n.a.
24"	595	692	749	20 x 1 1/4"	813	81	100	n.a.	n.a.	n.a.	n.a.	n.a.

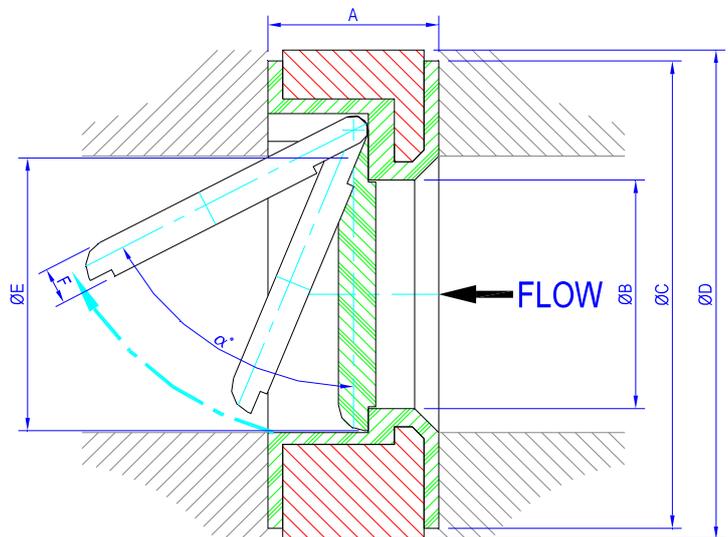
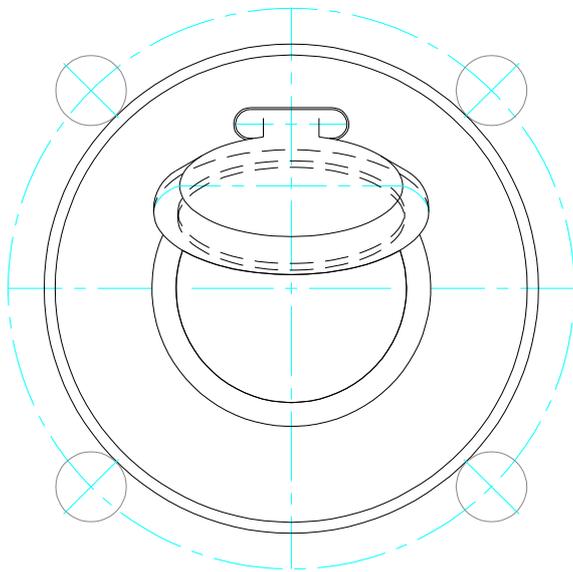
n.a. = not available.

Flanges are according to ANSI 150 lbs.
 All the sizes are provided with threaded holes (passing through).
 All the expansion joints are moulded in "TFM"® (made by Dyneon), with mechanical properties absolutely superior than the traditional PTFE.
 The expansion joints are supplied with 3 stud bolts for the limit stop at 120° on diameter: DO NOT REMOVE THE LIMITING STUD BOLTS.
 Each convolution is provided with a stainless steel reinforcing ring, for better performances.
 The movement of each convolution is + 12 mm (expansion) / - 8 mm (compression), longitudinally.
 On request, it is possible to supply expansion joints with stainless steel flanges.
 Special sizes shall be required to the Manufacturer.

SWING CHECK VALVE with PTFE lining.

Material specification: steel frames: St 35 according to DIN 1629 Part 3 (1.0308)
 Disk: Pure PTFE
 lining: Pure PTFE according to ASTM D 1457-78 type IV e V
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	A	B	C	D	E	α°	F	Weight kg.
1½"	33	28	73	75	32			
2"	43	38	92	95	46			
3"	46	62	127	130	74	63°	10	2,7
4"	52	82	157	160	94	70°	12	4,3
6"	56	132	216	218	144	69°	15	7,8

Vent holes at Manufacturer's discretion.

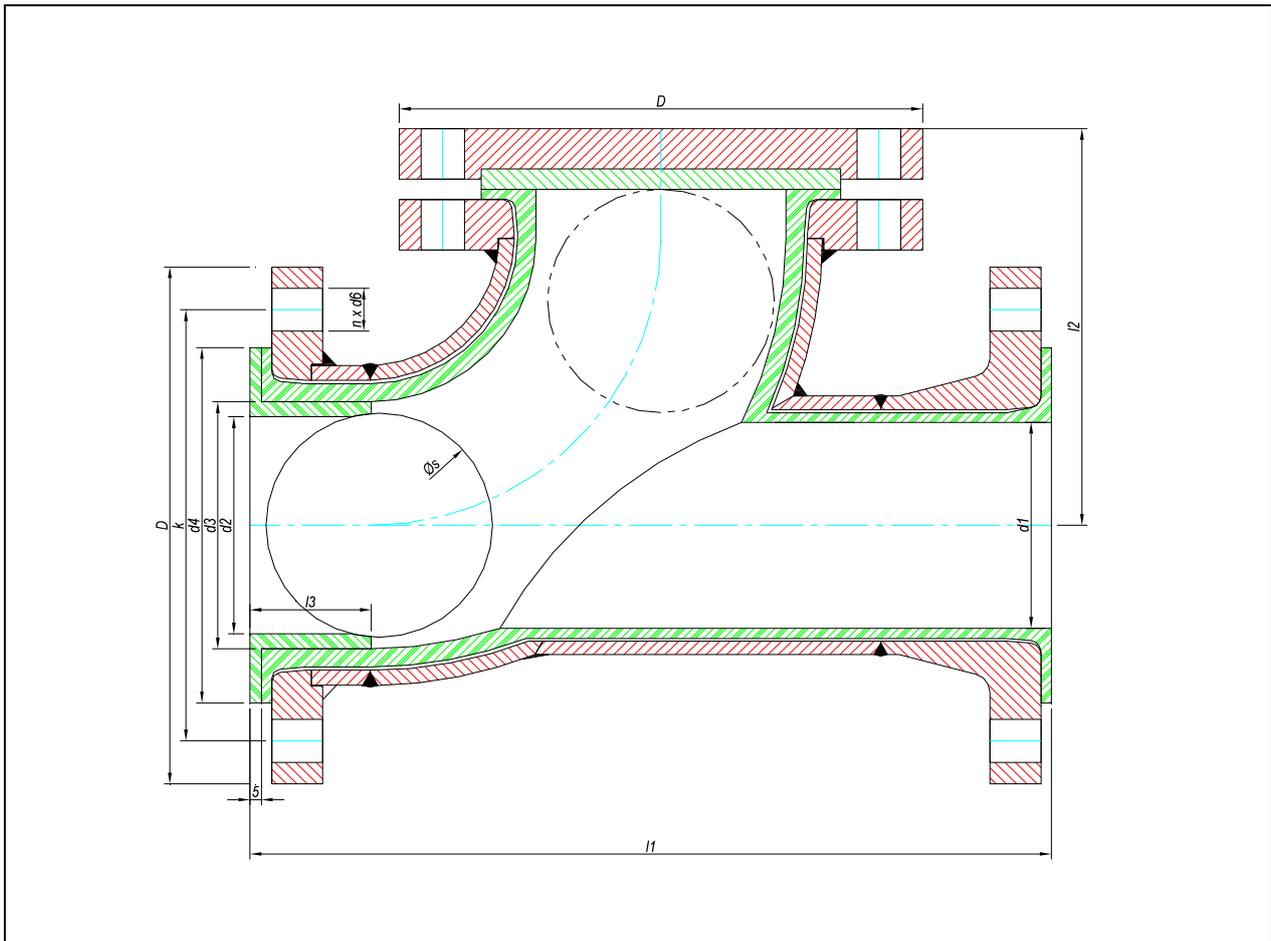
As an option, it is available a version of the swing check valve with a special O-ring in the cage of the body, in contact with the disk: the function is to improve the sealing (however it must be taken into account that a swing check valve cannot be bubble tight).

BALL CHECK VALVE Y TYPE with ptfе lining.

Suitable for horizontal and vertical use – face to face dimensions acc. to DIN – flanges acc. to ANSI lbs. 150

Material specification: Steel frame: St 35.0 according to DIN 1629
 Flanges: R-St-37-2 acc. to DIN 17100
 Lining: Pure and virgin PTFE acc. to ASTM-D 4894
 Delivery terms: according to DIN 2874

Sizes are expressed in mm.



DN	Body							Ball and sealing			
	d ₁	d ₄	k	n x d ₆	D	l ₁	l ₂	Øs	d ₂	d ₃	l ₃
1"	22	51	79.4	4 x 15.9	107,9	160	/	/	/	/	/
1½"	37	73	98,4	4 x 15.9	127	200	/	/	/	/	/
2"	46	92	120,6	4 x 19	152,4	230	/	/	/	/	/
3"	75	127	152,4	8 x 19	190,5	310	/	/	/	/	/
4"	99	157	190,5	8 x 19	228,6	350	/	/	/	/	/

The Y type ball check valve are regularly delivery with full ptfе ball: on demand we can supply them with different type of ball.
 Vent holes are according to Manufacturer's discretion.
 The stated dimensions could slightly vary owing to tecnical reasons, without leaving any responsibility for the Manufacturer.

Diagram pressure - temperature for expansion joints with 2 convolutions

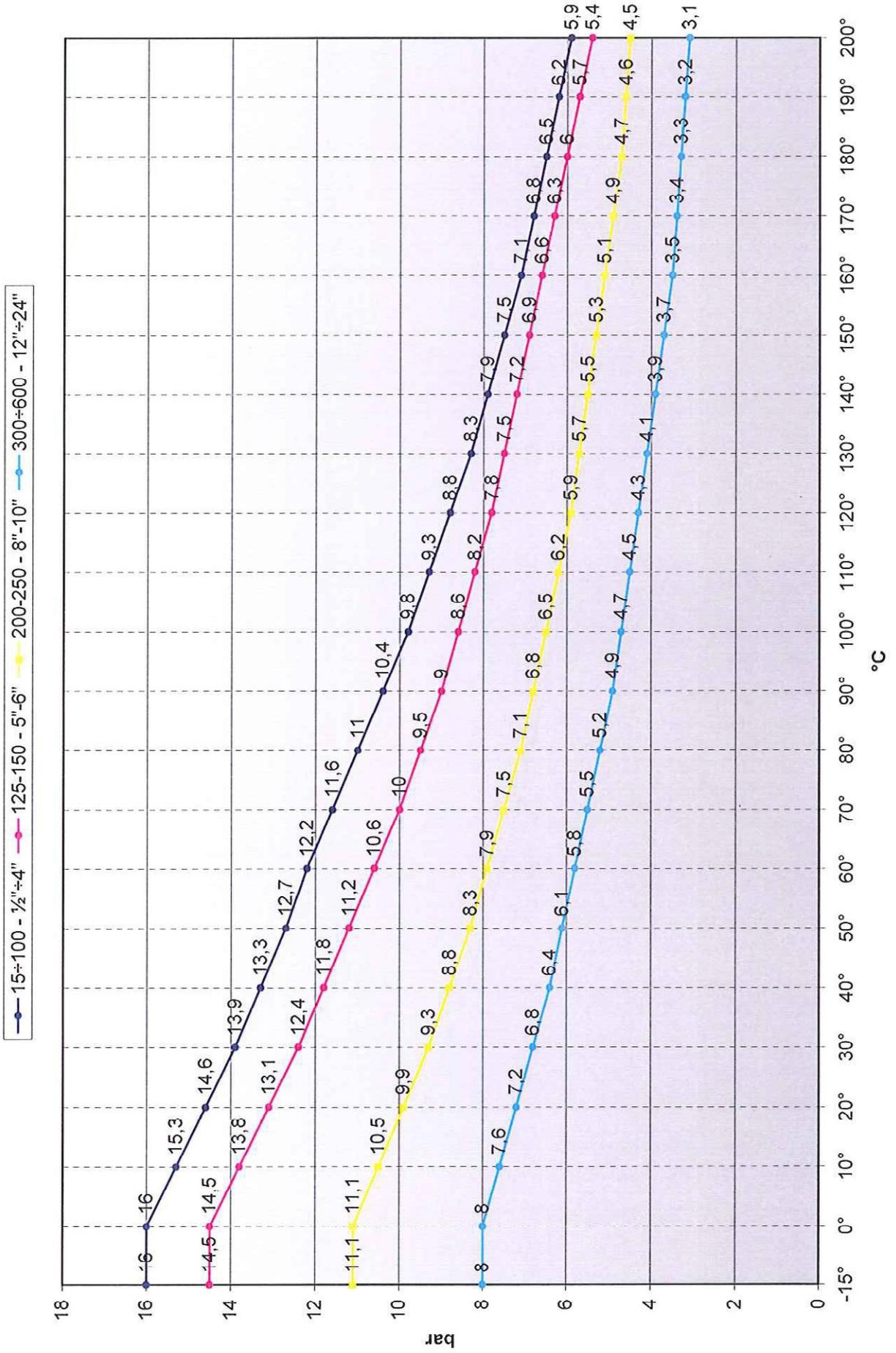


Diagram pressure - temperature for expansion joints with 3 convolutions

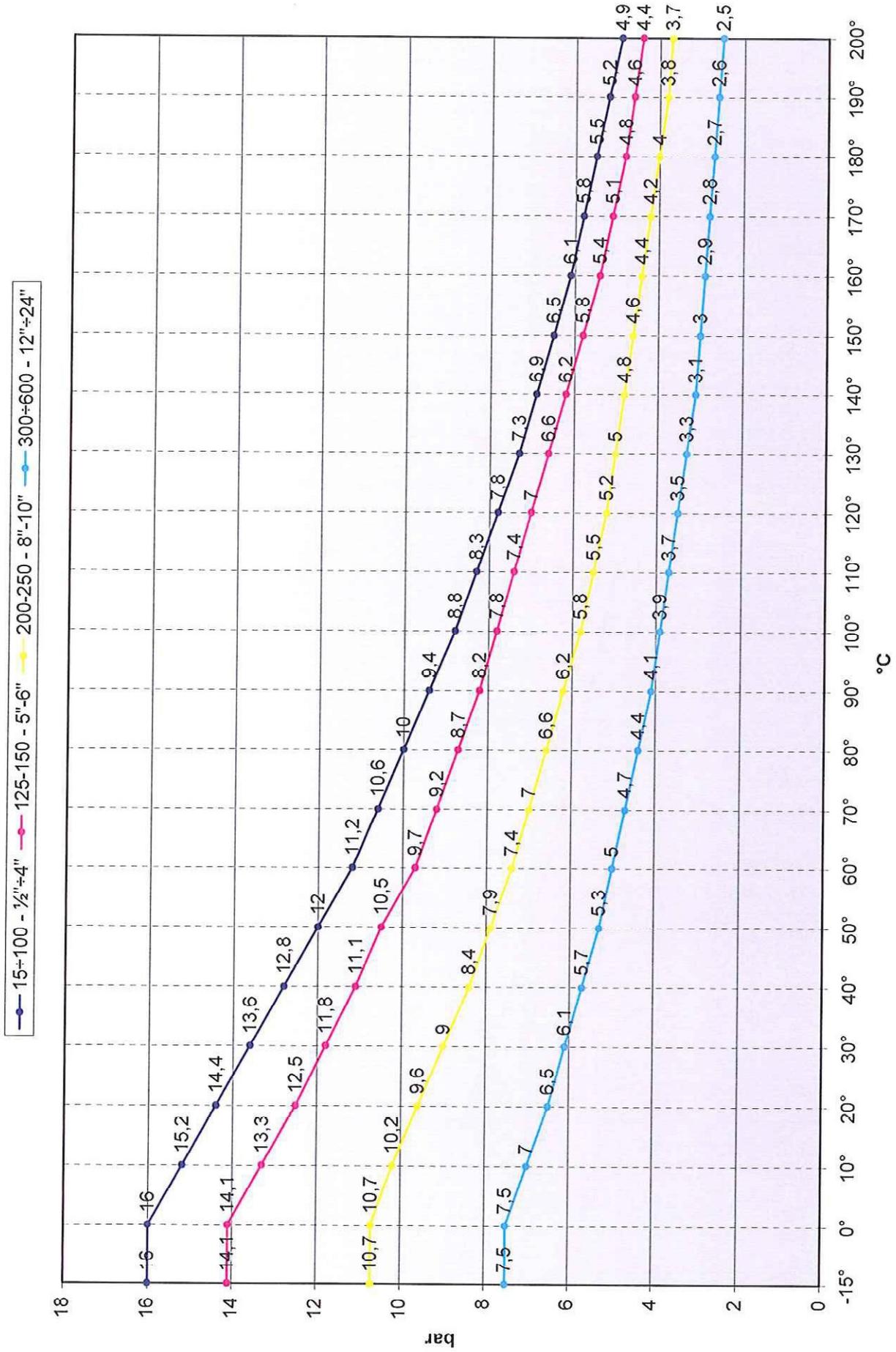


Diagram pressure - temperature for expansion joints with 4 convolutions

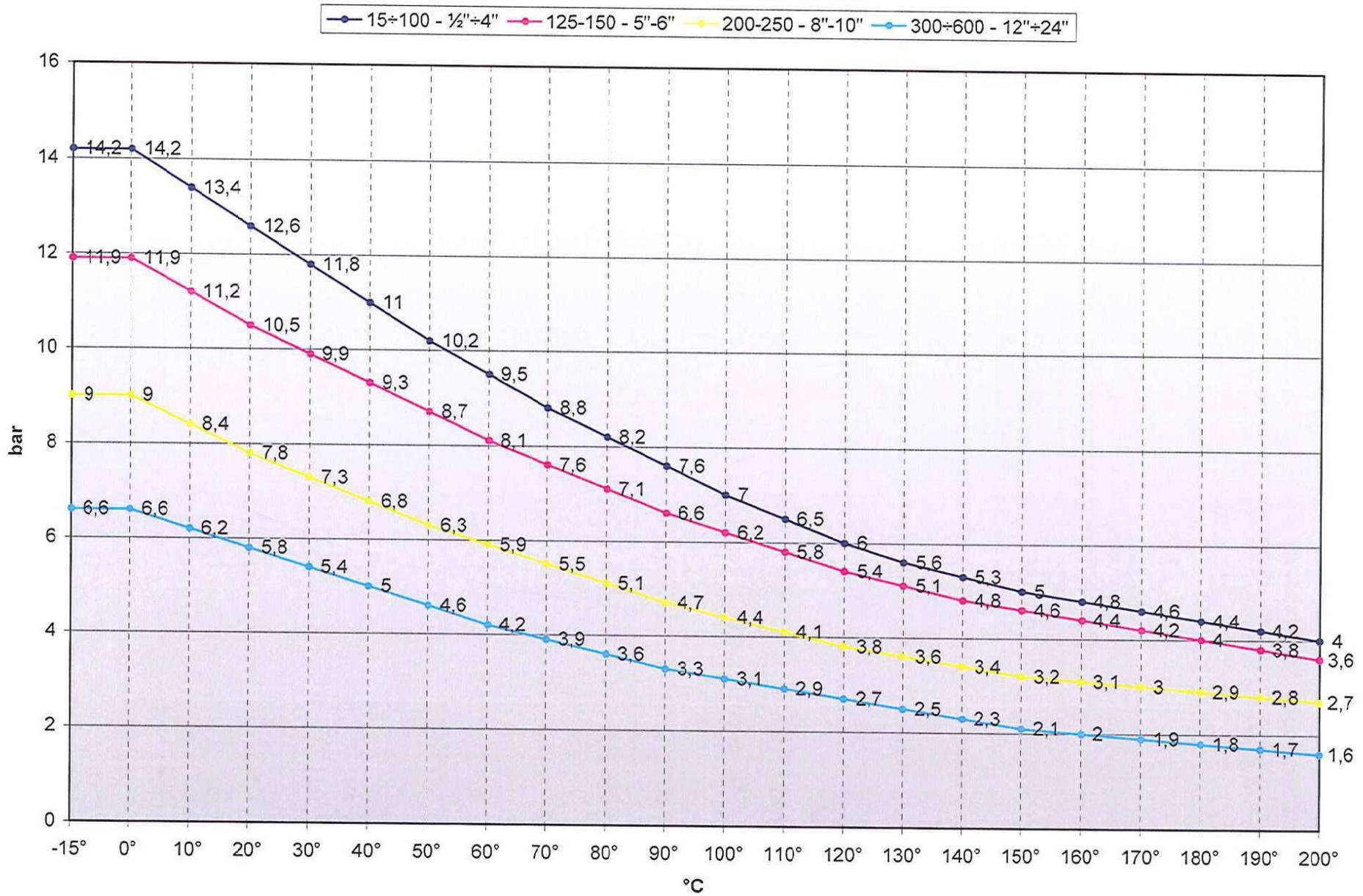


Diagram pressure - temperature for expansion joints with 5 convolutions

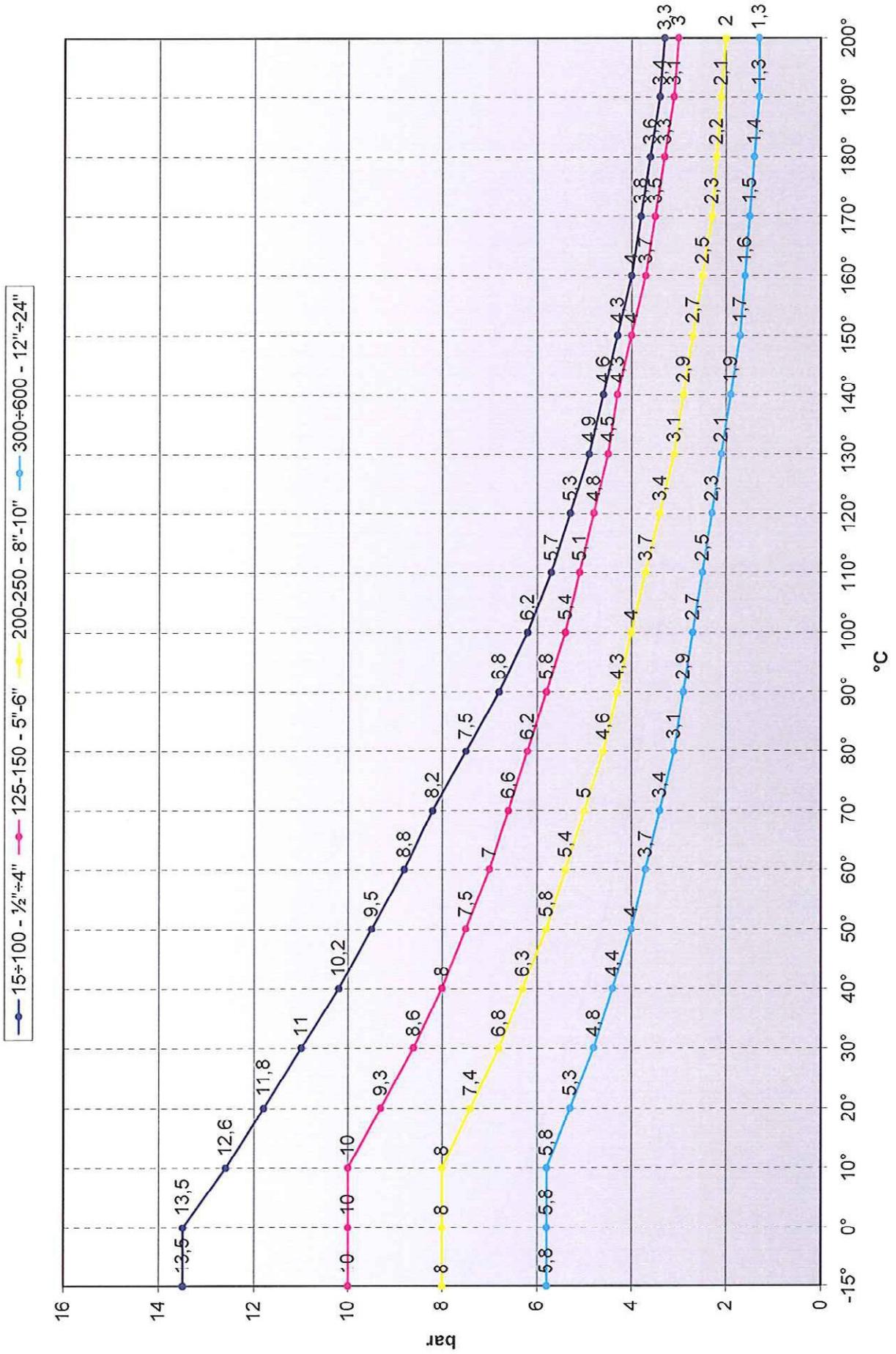


Diagram pressure - temperature for expansion joints with 6 convolutions

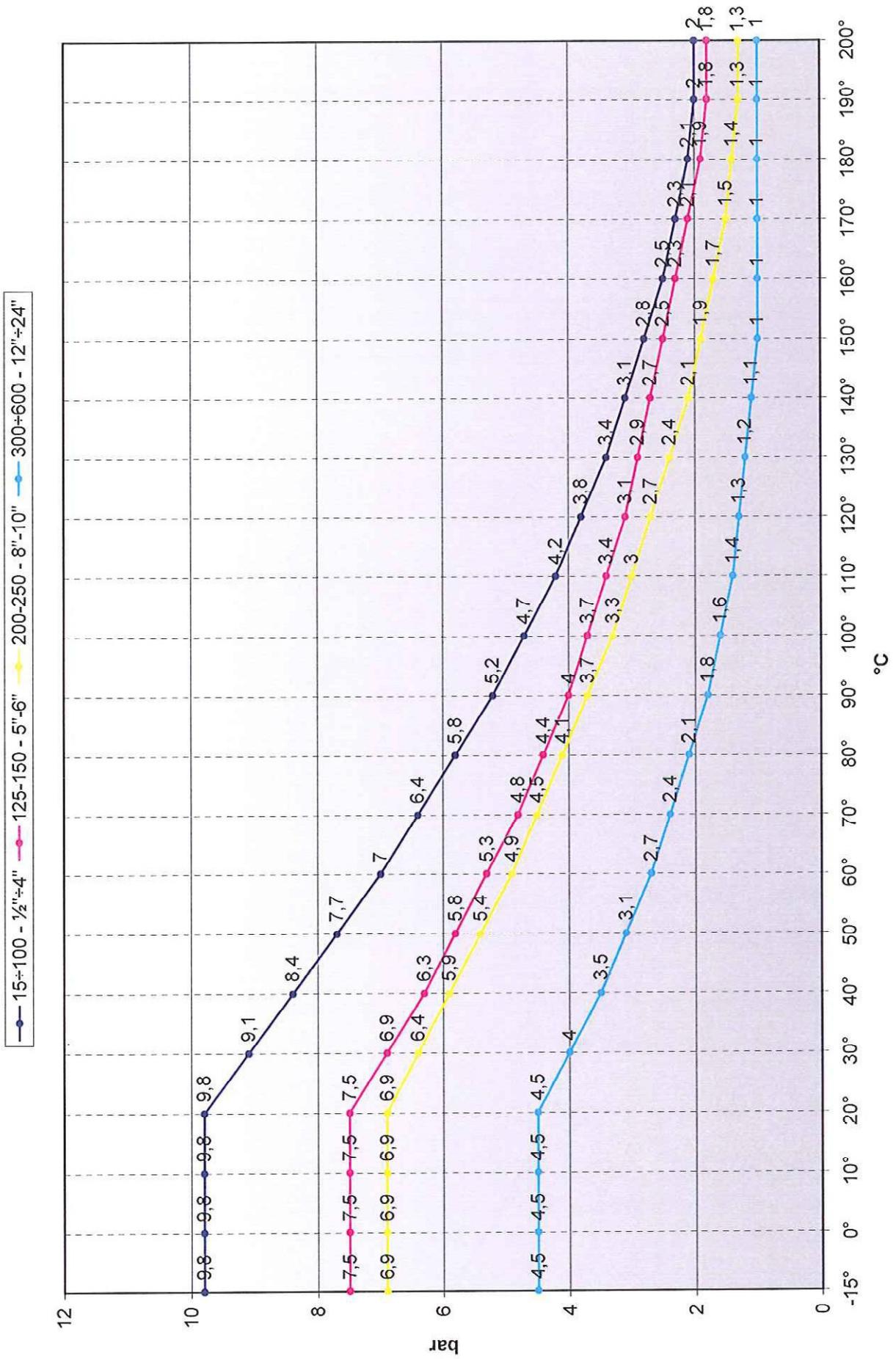


Diagram pressure - temperature for expansion joints with 7 convolutions

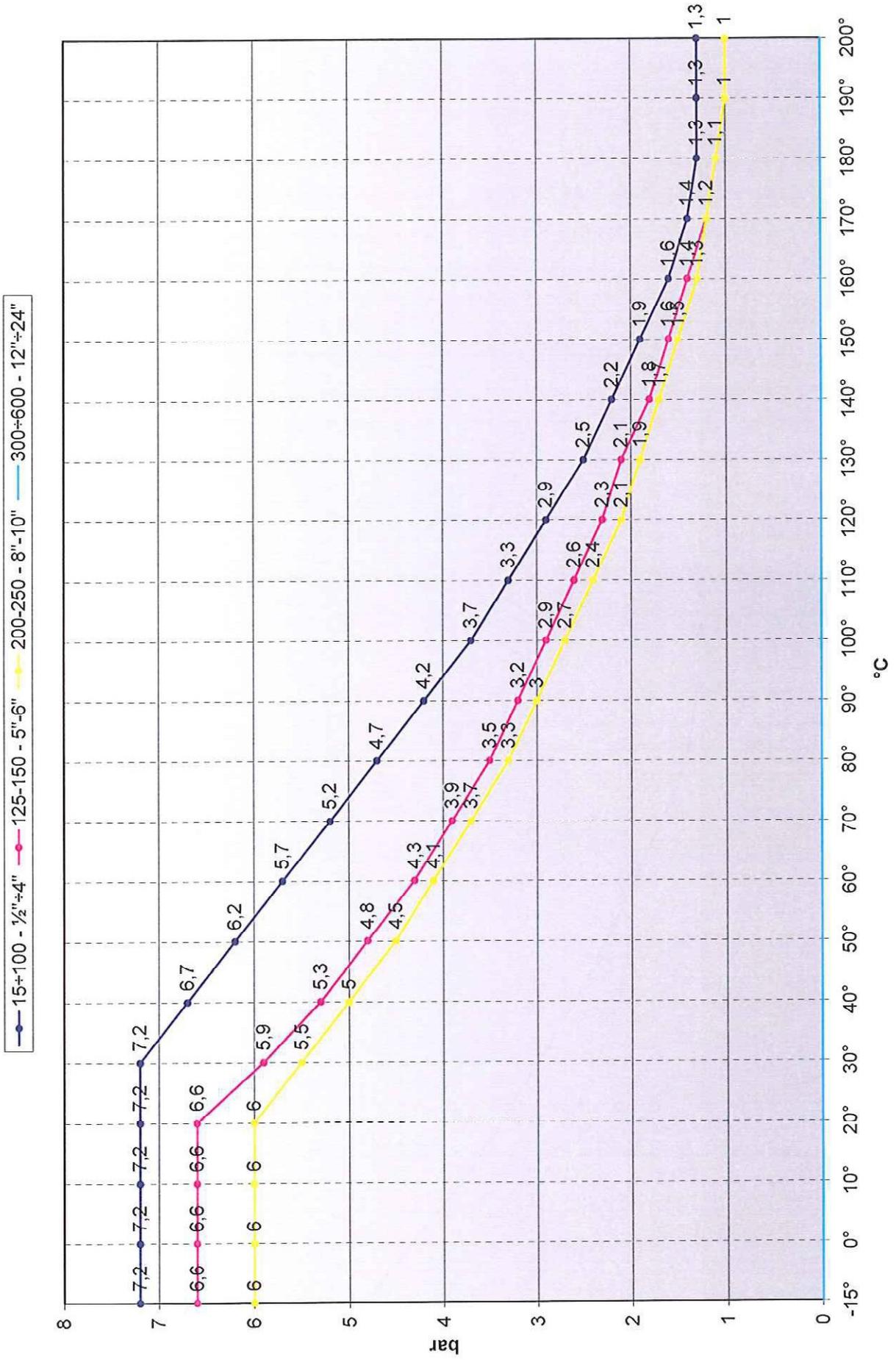
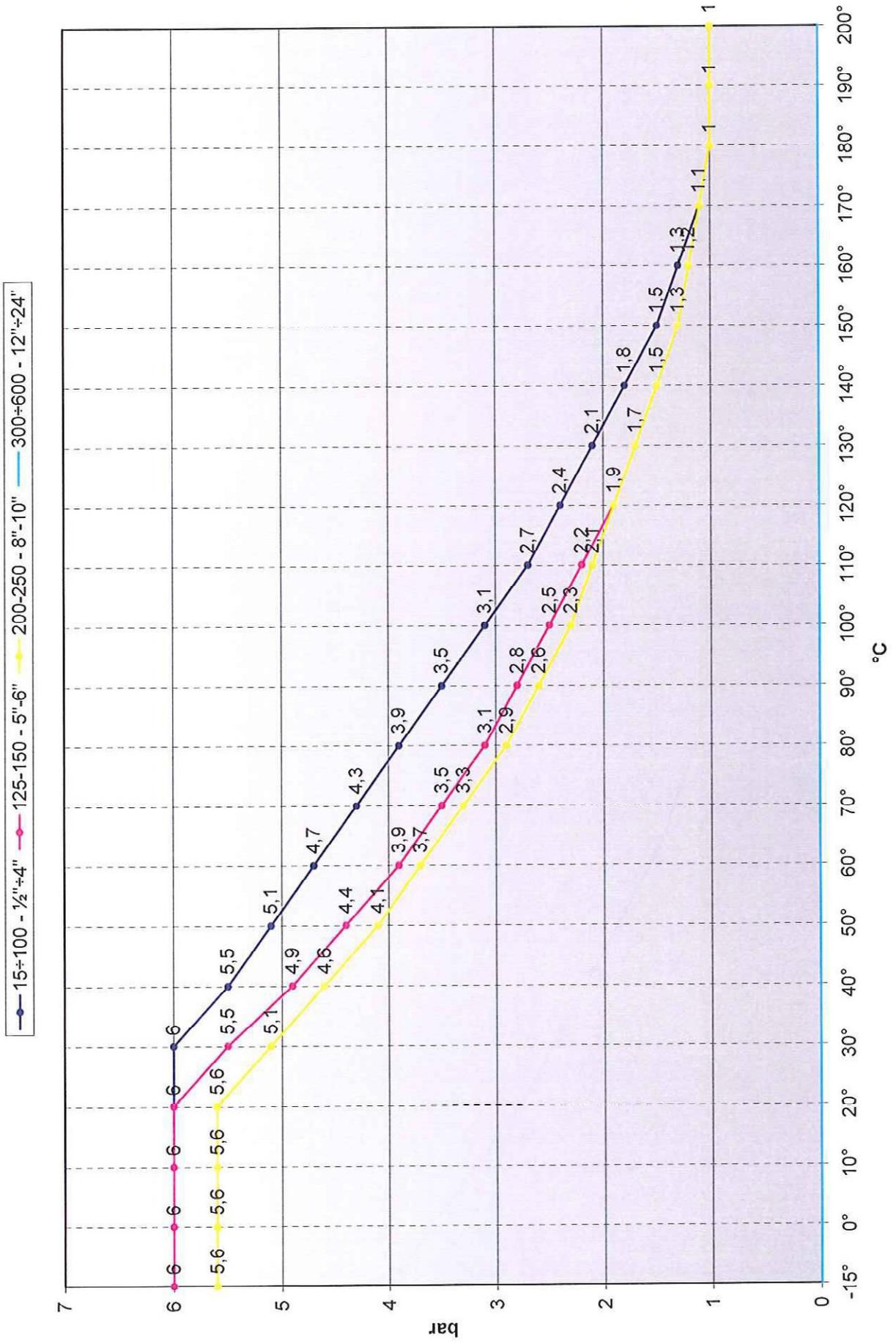


Diagram pressure - temperature for expansion joints with 8 convolutions



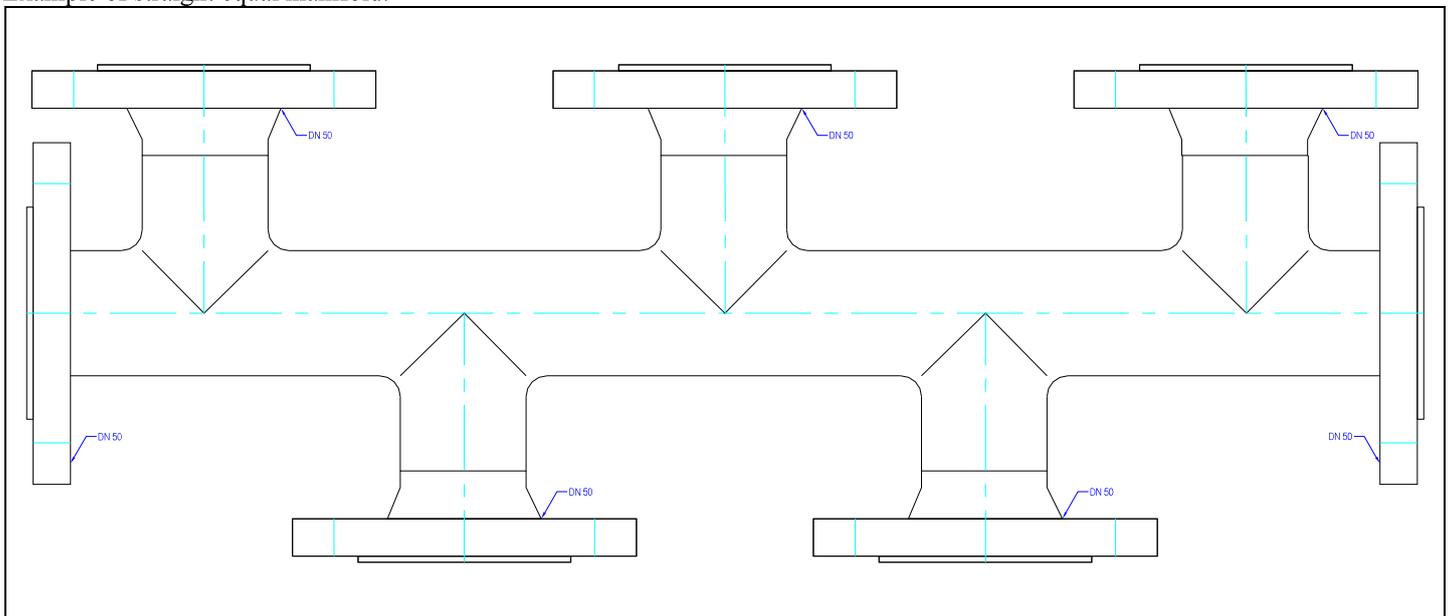
MANIFOLDS.

In some cases it is quite difficult to have space enough for a series of lateral branches, or, for safety, it is recommended to have many branches but the lowest number of intermediate flanged couplings.

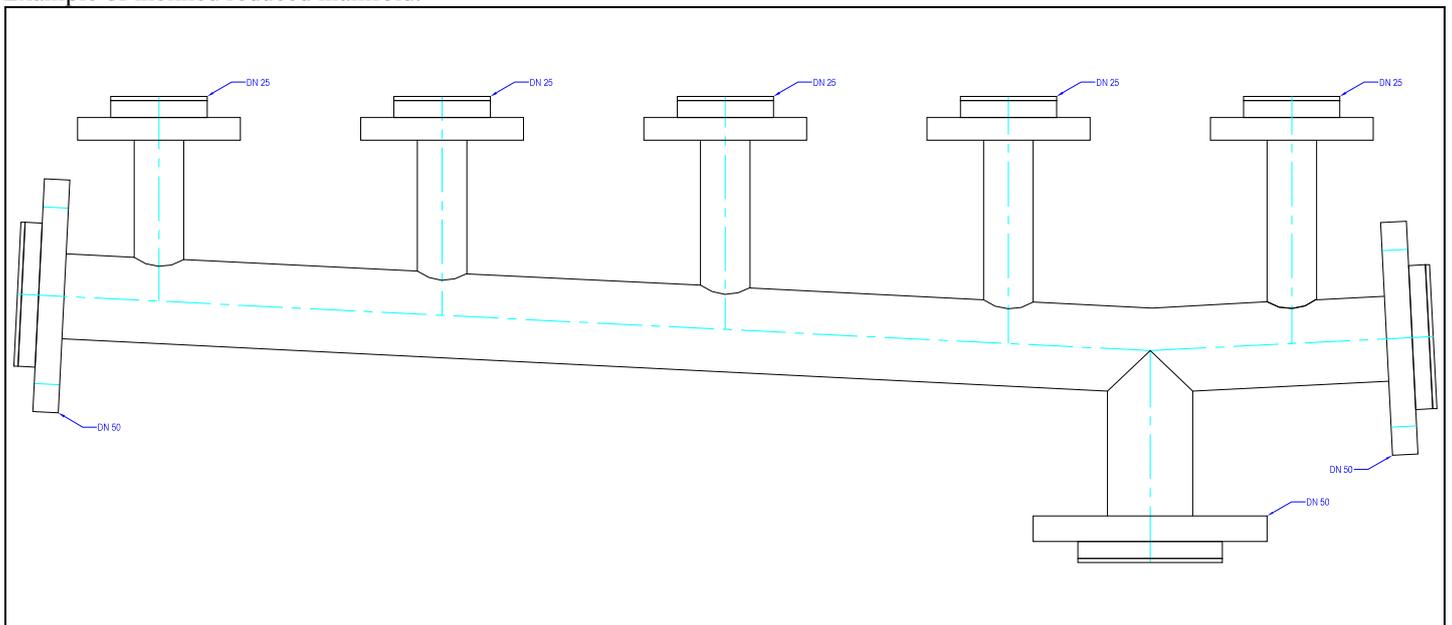
L.M.P. Fluorcarbon s.r.l. has developed a new product for those cases, that is the manifold: considered the real “State of the Art”, it is tailor made for the real needs of the Users, reducing as much as possible the number of flanges and moulding it in a unique, single piece.

Please, contact the manufacturer for further details.

Example of straight equal manifold.



Example of inclined reduced manifold.



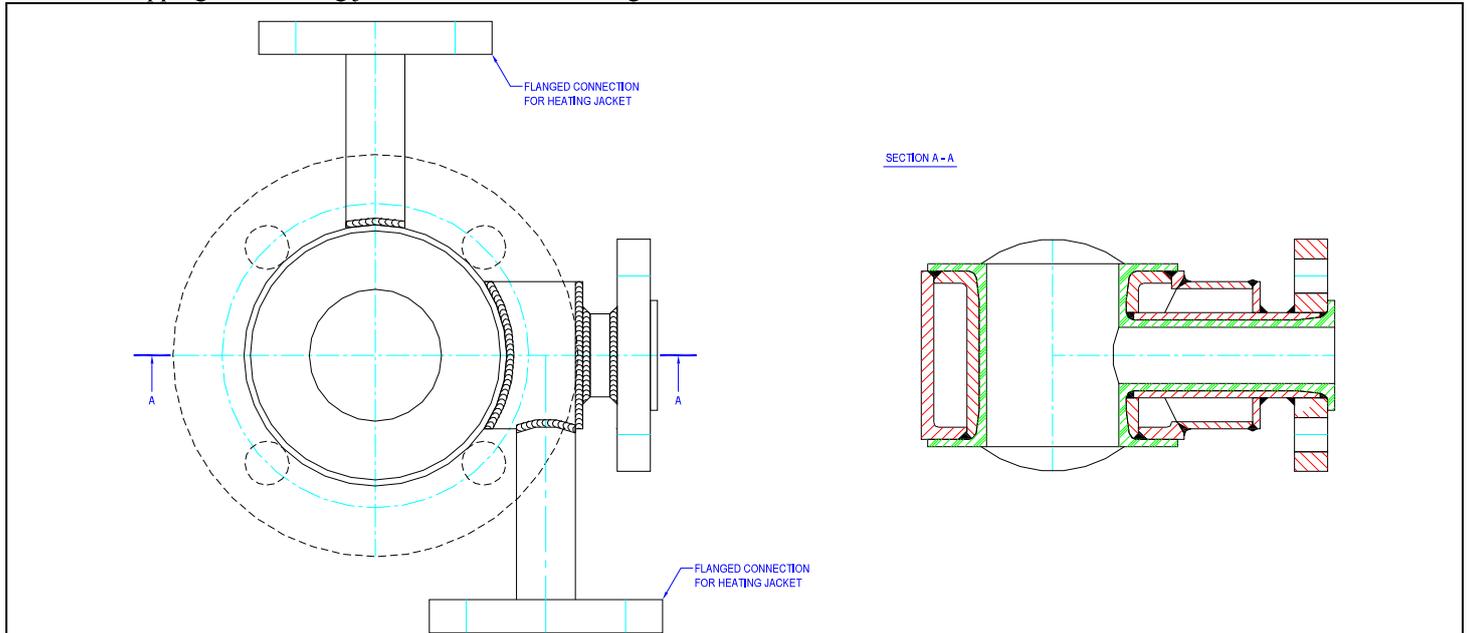
JACKETED PIPES AND FITTINGS.

L.M.P. Fluorcarbon s.r.l. can propose pipes and fittings with heating jackets: both the alternatives ANSI and DIN are available with heating unit.

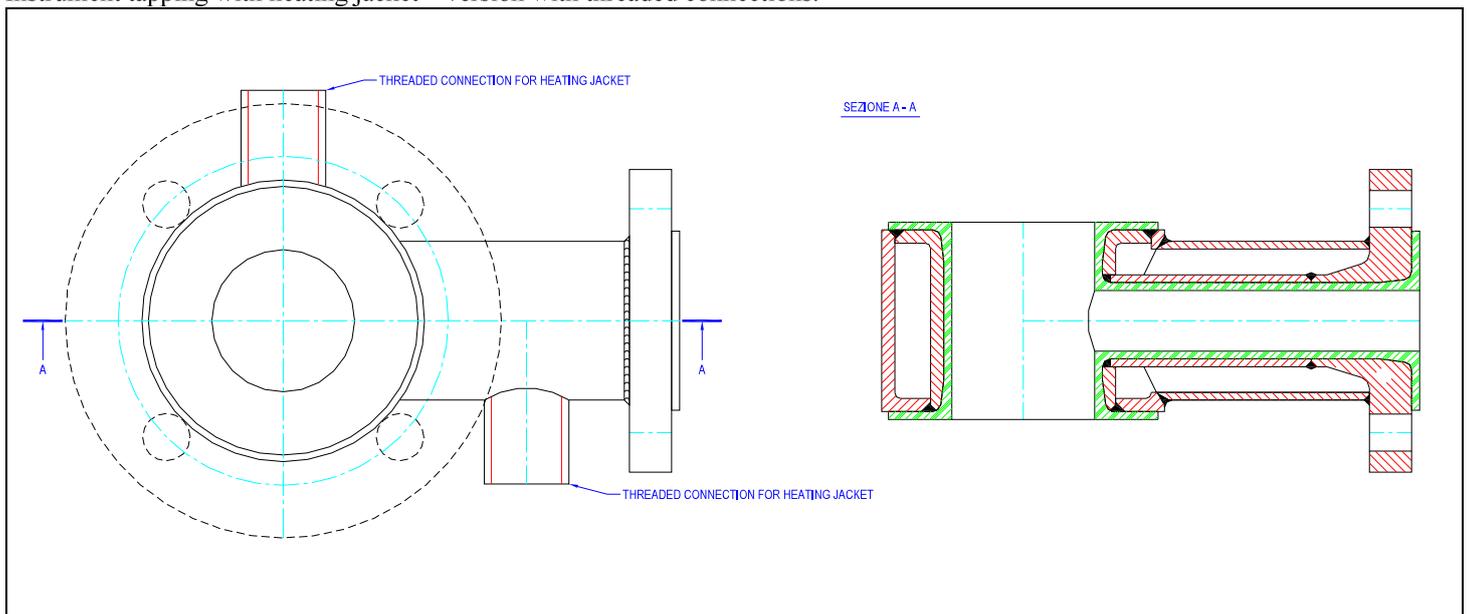
Two choices can be offered, the flanged connections or the threaded ones.

Please, contact the manufacturer for further details.

Instrument tapping with heating jacket – version with flanged connections.



Instrument tapping with heating jacket – version with threaded connections.



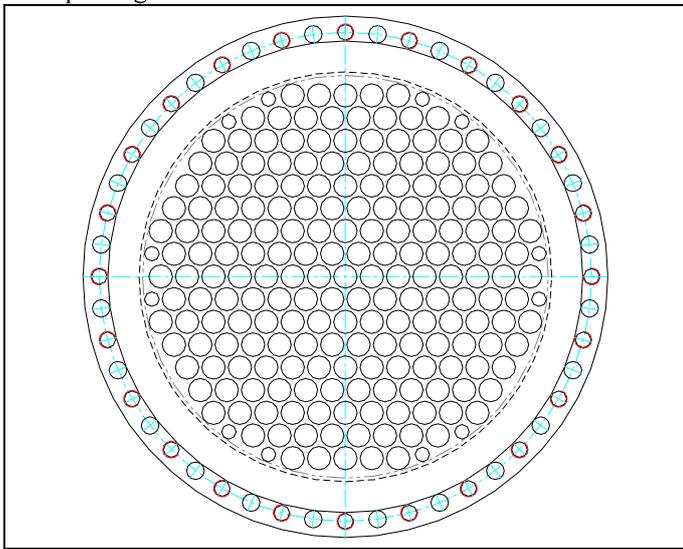
COLUMNS AND VESSELS - OPTIONS.

The inside sections of columns and vessels can usually contain other components, in order to obtain the desired result from the passage of the media.

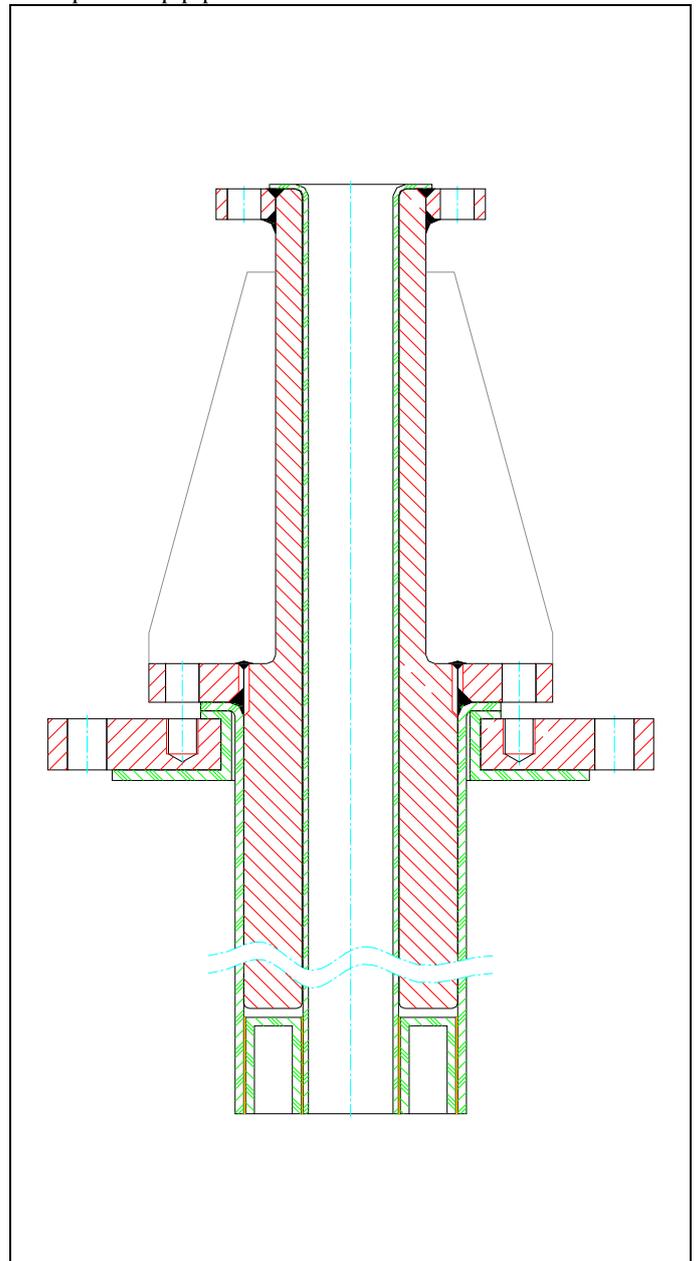
L.M.P. Fluorcarbon s.r.l. has developed a wide range of complementary components for apparatus, including among the others grids, conveyers, spray balls, dip pipes...

Please, contact the manufacturer for further details.

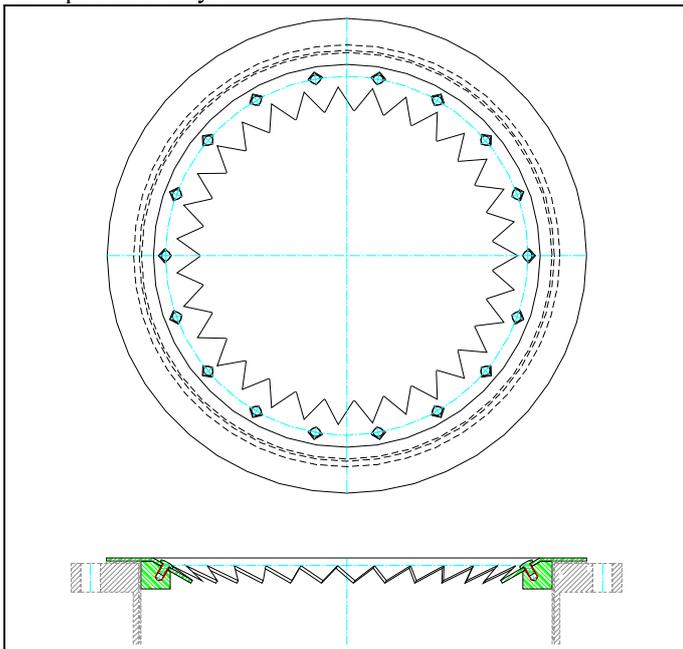
Example of grid.



Example of dip pipe.



Example of conveyer.



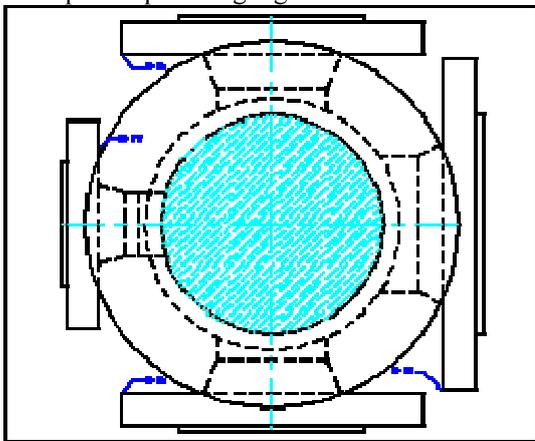
SPECIAL PIECES.

Chemical plants are very often critical due to the missed space to permit modifications, or processes are asking difficult plants to obtain the desired final results: L.M.P. Fluorcarbon s.r.l. has a chance to study special components, out of any standardisation, to satisfy the Customers' needs.

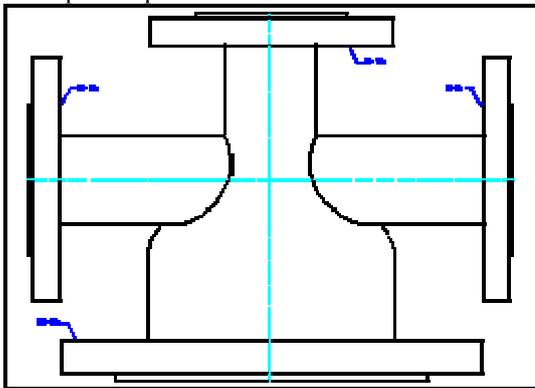
Thanks to our technology of the isostatic moulding process, we have a good flexibility to create "tailor made" pieces, trying to solve the space troubles and the technical matters faced in a plant.

Please, contact the manufacturer for further details.

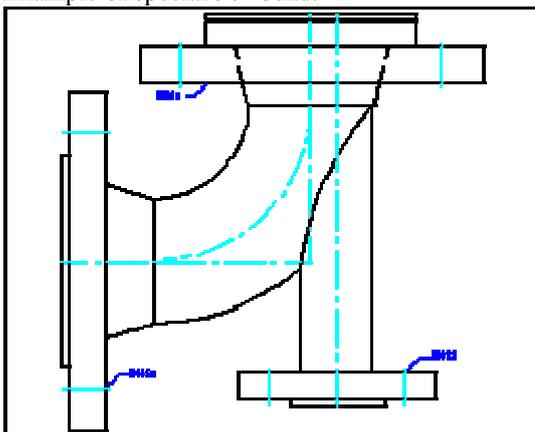
Example of special sight glass.



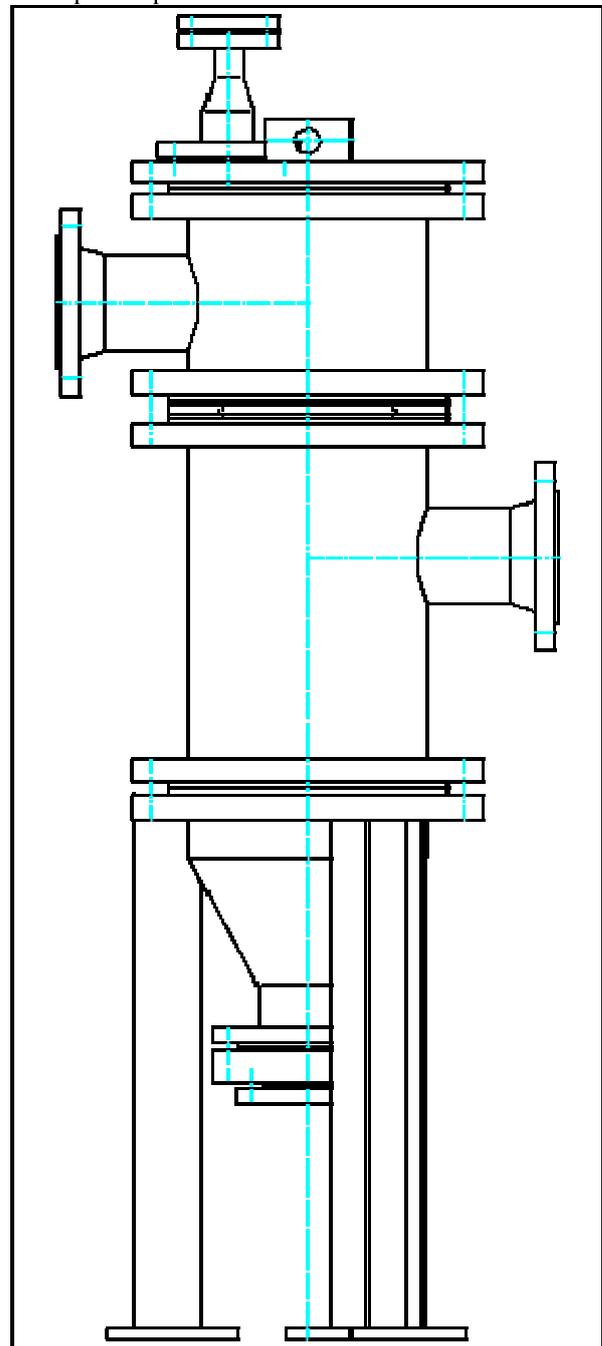
Example of special concentric reducer.



Example of special 90° bend.



Example of special strainer.





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