FLEXIBLE HOSES

FLEXIBLE HOSES FACTORY

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Metal flexible corrugated hoses

CONTRUCTION

Metal flexible corrugated leak proof hoses have been producing by special hydraulic forming from thin-walled butt welded tubes. The corrugation of these hoses can be helical or annular. Our hoses Maflex N and Maflex S have corrugations perpendicular to the axis of the hose.

Owing to their corrugated form, metal flexible hoses have high resistance to pressure acting to radial direction and less one to hose axis. To increase pressure resistance, these hoses are single or multiple wire braided. Number of braids, braiding material and hose characteristic, depending on number of braids, are indicated for each type of hoses on the next pages. Metal flexible corrugated hoses can be fitted by flanges, threaded connectors, tube weld ends etc. The assembling connectors with the hoses is carried out by protective gas welding, brazing, silver soldering and mechanical jointing.

MATERIALS

As flexible conduits they often have to operate elastically under extreme conditions and, because of the thin walls as compared with rigid piping, they must be especially corrosion resistant.

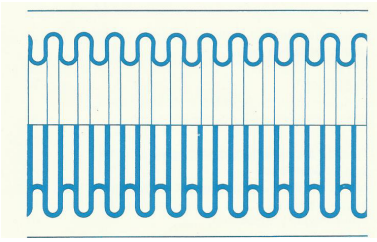
Moreover, these hoses have to meet the following requirements:

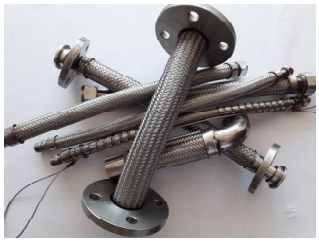
- good cold forming properties,
- good strenght properties,
- optimal thermal stability,
- good corrosion resistance,
- high reliability in operation.

In principle, there is no material which will ideally meet all these domands. The materials, used for our range, cover a larqe variety of needs occuring in practice. Our standard materials are indicated for each type of hoses. It is possible to make hoses of the other materials but it is conditionned by quantity.

DESCRIPTION

- absorption of movements (movements of one or both end fittings with large amplitude and low movement frequency),
- absorption of vibration (movement with low amplitude and high frequency),
- absorption of thermal expansion of hose assembly,
- compensation of parallel offset in pipelines,
- absorption of angular movements.





DEFINITIONS AND EXPLANATIONS OF HOSE CHARACTERISTICS

Nominal size (DN)

according to ISO 6708 is represented by numerical indication of size which is common for all components in piping system. Nominal diameter is a convenient rounded off number reference applications and it hasn't to be equal to the actual inside diameter of hose.

Inside diameter (d 1)

is an effective section of hose and mostly equal to its nominal size.

Outside diameter

Diameter of cylinder enveloping the straightened out tube.

Braiding

With the aim of improving the pressure resistance and mechanical protecting, hoses can be covered by single or double braiding. The hoses for vacuum applications are not normally braided.

Working pressure (Pr)

is the maximum pressure which a hose can withstand during the operation at room temperature (20ºC) and at fluid without pressure fluctuations and vibrations. The working pressure is established as a quarter of the bursting pressure:

$$Pr = \frac{\text{bursting pressure}}{4}$$

If the hoses are exposed to thermal stresses that, is to temperature higher than room one, the working pressure will be decrease. It is established by the following formula:

$$Pdop = Pr \times Kt$$

Minimal bending radius

is a minimal of axis turn of hose permissible in operation . It is determined on the base of measurement and calculating and given in the tables as static for one bending only and dynamic for repeated bending in operation.

The bending radius un active position shall be larger than or equal to the minimal bending radius given in the tables.

The bending radius essentially influences on lifetime of hose. Its increasing will augment lifetime of hose.

Hose mass

given in the tables, is determined by calculation and measurement. The permissible deviation must be kept in limits ± 10%.

Maximal permissible working temperature

is lowest maximal permissible working temperature of any constituent component:

- hose material,
- attachment method of connecting elements and hoses,
- connecting element material,
- connection method etc.

The working temperatures of hoses without connecting elements are given in the description of the individual hose type.



QUALITY CONTROL AND CERTIFICATES

The quality control is a matter of exceptional importance in consideration of specific quality of flexible hoses as in view of their production so with regard to their exploitation.

Material control

The high quality material is one of the most important factors in high quality flexible corrugated hoses manufacturing. Therefore, we have been purchasing materials from reputable European manufacturers. All materials have to be followed by corresponding certificate such as the one according to DIN 50049-3.1.B. Besides, all purchased materials are submitted to the testing of chemical, mechanical characteristics , resistance on inter crystalline corrosion etc.

Manufacturing process control

The particular care must be taken of the dimension accuracy control and careful material working out. The basic material of hose is exposed to considerable strains during the hydraulic process and it is simultaneously very reliable way of material testing.

Leakproofness of hoses

To check up the leakprofness of hoses, pneumatic or vacuum tests can be done. The pneumatic test is carried out by air or nitrogen under water. The nitrogen testing is more expensive and it has to be carried out in those hoses which are mainly used in conveying the gaseous or very liquid media During this test hoses are exposed to a pressure equal 10 % of working one or 2 bar minimum.

The vacuum test is applied only in special cases it is considerabley expensive and therefore,it must be apart agreed.

Testing by hydraulic pressure

This testing is carried out in the aim of checking up the hose solidity by hydraulic or pneumatic testing pressure.

A straight sample of hose at room temperature shall be subjected to a testing pressure which shall be 1,5 times the maximal permissible working pressure.

Unless otherwise stated, the test medium shall be water. The test pressure shall be applied and maintained for a sufficient length of time to permit a visual examination of all surface joints.

The testing by pneumatic test pressure is carried out under same conditions as hydraulic testing but the medium is gas. Pneumatic testing is potentially a much more dangerous operation than hydraulic testing in that , irrespective of size, any failure during test is likely to be of a highly explosive nature.

Therefore, this testing is applied only exceptional cases by particular agreement.

Certificates

Depending on client's request we or specialized agencies carry out the reception control. Therefore, on the basis of carried out testing according to the reception control the corresponding certificates have to be issued. These certificates are issued in accordance with relevant standards ISO 404 or DIN 50049. If the client doesn't denote, we usually issue the certificate in accordance with DIN 50049-3.1 B .

Installation

Our hoses are very specific products. They are reliable in operation but they can only function satisfactorily under the condition they are chosen and installed correctly.

Correct handling

Since the hoses are manufactured of relatively thin-wall material, it is necessary to treat them carefully so that they would not be damaged before installing. The hoses must be stored straightened out or coiled with a bending radius larger than minimum permissible one. At transport they should not be dragged along the floor or across sharp edges.

Correct choice of a tube length

The correct choice of hose length is very important . Excessive shortness of hose doesn't give the needed flexibility , in that case it is too rigid. In addition, the hose can be damaged relatively quickly close to the end fittings. Excessive long hose is not only too expensive but it is also quickly damaged in operation. In determining the hose length you should use recommendations, and if you are not sure, consult us.

Permissible bending radius must be observed

Non-observance gives rise to damage of hoses. The instructions , relating to pressures, temperatures etc. must be also followed.

No torsion stress

Our flexible hoses can be only subjected to bandings. Torsion stresses must, therefore , be avoided. This can, in most cases, be realized by suitable installing of the hose. In the case of movements in operation, the hose must be installed in that way that the hoses axis and the direction of movement are in the same plane.

TYPE: M A F L E X - N

CONSTRUCTION:

All metal single-walled flexible hose hydraulically formed from a butt welded tube.

PROFILE:

Normal parallel corrugations.

MATERIALS:

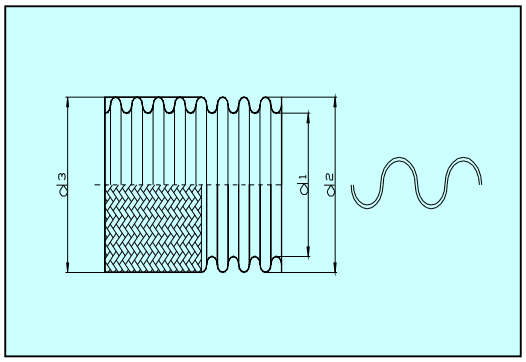
Austenitic stainless steel according to material no.
- W.Nr. 1.4571 (AiSi 316 Ti),
- W. Nr. 1.4401 (AiSi 316),
- W. Nr. 1.4404 (AiSi 316L),
- W. Nr. 1.4541 (AiSi 321).

BRAIDS:

Stainless steel wire according to material no. **W.Nr. 1.4301** (**AiSi 304**).

END FITTINGS:

Flanges, thread connectors, weld ends.



DIMENSIONS:

DN 10 to DN 150.

PRESSURE RANGE:

105 bar max. Depending on nominal diameter, number of braids, temperature range etc.

TEMPERATURE RANGE:

- 196 º C to 600 º C

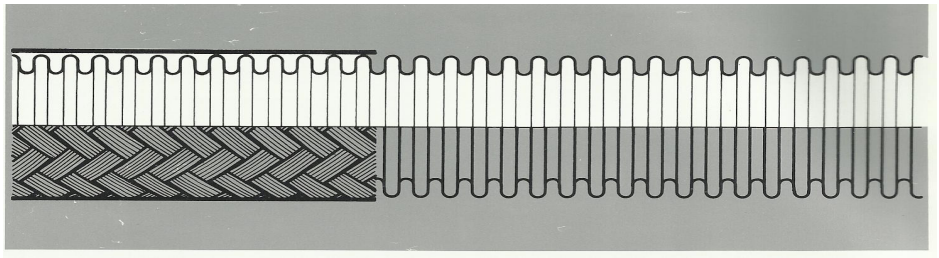
APPLICATION:

The conveyance of fluids and gas under pressure and vacuum. Owing to its all stainless steel construction, it is used in the most applications of corrosive fluids and atmosphere, as compensating elements for absorption, displacement of rigid thermal dilatations, compensation of misalignment of rigid tubes and the like.

Working pressure (Pr), given in the table, is the maximal permissible working pressure at room temperature.

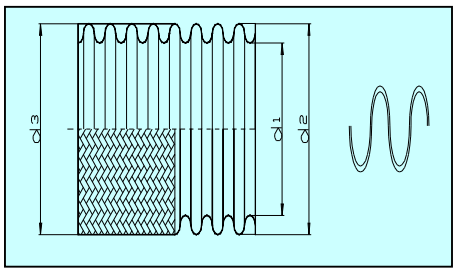
Maximal permissible working pressure at temperatures higher then room one can be calculated as follows: $P_{rt}=P_r$ x kt (bar)

Working temperature t(C)	**20**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
Reduction coefficient kt(-)	**1**	**0,95**	**0,88**	**0,83**	**0,79**	**0,75**	**0,72**	**0,68**	**0,64**	**0,61**	**0,59**	**0,57**



DN	Inside diameter		Outside diameter		Min. bending radius		Working pressure	Mass
	d1	tol. ±	d2, d3	tol. ±				(kg/m)
	mm	mm	mm	mm	static	dynamic	NP (bar)	tol. ±10%
10	9,2	0,3	14,8	0,3	32	150	16	0,090
			16,0	0,4	32	160	75	0,220
			17,2	0,5	32	170	105	0,350
12	12,4	0,3	19,8	0,3	45	200	12	0,120
			21,4	0,5	45	210	45	0,310
			23,0	0,6	45	220	105	0,500
15	15,5	0,3	22,9	0,3	50	210	7	0,155
			24,2	0,5	50	230	65	0,350
			25,5	0,6	50	250	90	0,545
20	18,8	0,3	27,2	0,3	50	220	5	0,230
			28,5	0,5	50	240	47	0,470
			29,8	0,6	50	260	70	0,710
25	25,1	0,3	35,5	0,3	60	230	4	0,320
			36,8	0,5	60	250	38	0,620
			38,1	0,6	60	270	55	0,920
32	31,5	0,3	43,5	0,3	80	250	3	0,420
			44,7	0,6	80	265	34	0,870
			45,9	0,8	80	280	48	1,320
40	37,8	0,3	50,6	0,3	110	290	2	0,490
			53,1	0,6	110	310	30	1,190
			55,6	0,8	110	330	41	1,890
50	49,9	0,4	65,6	0,4	140	330	1,5	0.76
			67,7	0,8	140	355	25	1,720
			70,0	1,0	140	380	36	2,660
65	63,2	0,4	80,6	0,4	180	380	1	1,290
			82,8	0,8	180	415	21	2,490
			85,0	1,0	180	450	30	3,690
80	75,7	0,4	95,5	0,4	200	440	0,7	1,530
			97,8	0,8	200	475	19	2,930
			100,8	1,0	200	510	27	4,330
100	101,8	0,5	124,8	0,5	225	530	0,5	2,120
			127,0	1,0	225	585	14	4,020
			129,0	1,2	225	630	20	5,920
125	126,4	0,6	151,3	0,6	425	810	0,3	3,300
			153,7	1,2	425	850	10	6,100
			156,2	1,4	425	890	14	8,900
150	149,2	0,7	173,0	0,7	525	1200	0,2	4,800
			175,5	1,2	525	1250	8	7,800
			178,0	1,4	525	1300	12	10,800

TYPE: M A F L E X - S

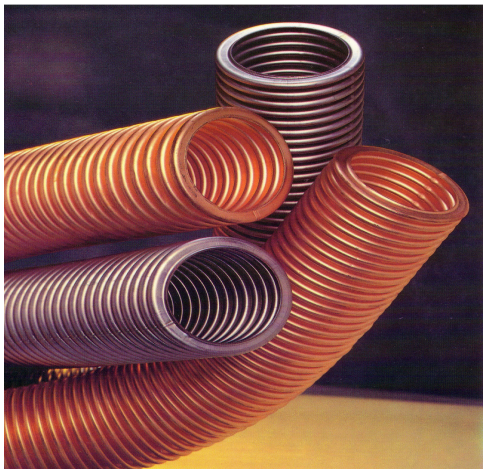


CONSTRUCTION:

All metal single-walled flexible hose hydraulically formed from a butt welded tube.

PROFILE:

Close pitch parallel corrugations (omega profile).



MATERIALS:

Austenitic stainless steel according to material no.

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BRAIDS:

Stainless steel wire according to material no. **W.Nr. 1.4301** (**AiSi 304**).

END FITTINGS:

Flanges, thread connectors, weld ends.

DIMENSIONS:

DN 10 to DN 150.

PRESSURE RANGE:

105 bar max.
Depending on nominal diameter, number of braids, temperature range etc.

TEMPERATURE RANGE:

- 196 º C to 600 º C

APPLICATION:

The conveyance of fluids and gas under pressure and vacuum. Owing to its all stainless steel construction, it is used in the most applications of corrosive fluids and atmosphere, as compensating elements for absorption, deplacement of rigid thermal dilatations, compensation of misalignment of rigid tubes and the like.

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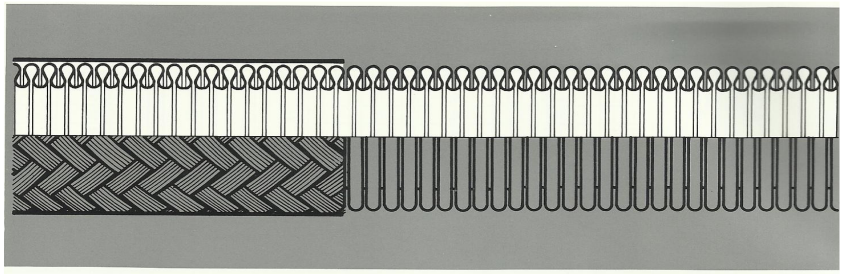
Reduction coefficient kt(-)	**1**	**0,95**	**0,88**	**0,83**	**0,79**	**0,75**	**0,72**	**0,68**	**0,64**	**0,61**	**0,59**	**0,57**



DN	Inside diameter		Outside diameter		Min. bending radius		Working pressure	Mass
	d1	tol ±	d2, d3	tol ±				(kg / m)
	mm	mm	mm	mm	static	dynamic	NP (bar)	tol. ± 10%
10	8,8	0,3	14,8	0,3	32	100	10	0,125
			16,0	0,4	32	125	75	0,255
			17,2	0,5	32	140	105	0,380
12	12,0	0,3	19,8	0,3	45	130	8	0,210
			21,4	0,5	45	145	75	0,400
			23,0	0,6	45	160	105	0,590
15	15,1	0,3	23,0	0,3	50	155	4	0,260
			24,3	0,5	50	170	65	0,455
			25,6	0,6	50	190	90	0,600
20	18,0	0,3	27,3	0,3	60	165	3,2	0,320
			28,6	0,5	60	180	47	0,560
			29,9	0,6	60	195	70	0,800
25	24,0	0,3	35,8	0,3	70	175	2	0,440
			37,1	0,5	70	190	38	0,740
			38,4	0,6	70	210	55	1,040
32	30,7	0,3	43,8	0.3	90	185	1,6	0,590
			45,0	0,6	90	200	34	1,040
			46,2	0,8	90	220	48	1,490
40	37,0	0,3	50.8	0,3	120	220	1	0,690
			53,3	0,6	120	240	30	1,320
			55,8	0,8	120	270	41	2,090
50	49,6	0,4	65,8	0,4	150	270	0,63	1,050
			67,9	0,8	150	290	25	1,990
			70,2	1,0	150	340	36	2,930
65	61,8	0,4	80,8	0,4	190	310	0,63	1,950
			83,0	0,8	190	340	21	3,150
			85,2	1,0	190	400	30	4,350
80	74,5	0,4	95,8	0,4	205	360	0,5	2,400
			98,1	0,8	205	395	19	3,630
			101,1	1,0	205	440	27	4,310
100	101,0	0,5	125,4	0,5	225	440	0,3	3,150
			127,4	1,0	225	485	14	5,050
			129,4	1,2	225	550	20	6,950
125	125,5	0,6	151,9	0,6	400	600	0,2	4,800
			154,3	1,2	400	650	10	7,600
			156,8	1,4	400	720	14	10,400
150	148,1	0,7	173,7	0,7	550	750	0,16	7,000
			176,2	1,2	550	815	8	10,000
			178,7	1,4	550	900	12	13,000

INSTALLATION INSTRUCTIONS

Handling and assembly.

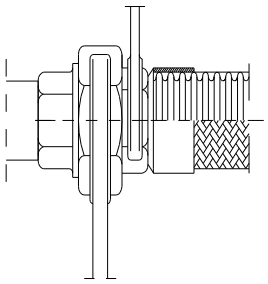
The type and form of installation of metal hoses are determined primarily by the direction, size and frequency of displacement. For this reason, we have provided here specific characteristic examples of assembly. When installing, it is especially important to ensure that the hose is installed without torsional stresses, and that the axis of the connection and displacement lie in the same plane.

Make sure to pay attention to:

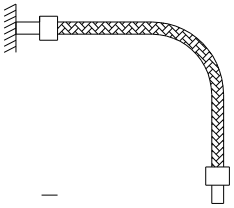
- stress-free assembly (Example No.1)
- no torsional requirements (Example No.2)

Example No.1, 2.

Tighten the hose without turning. For rotary threaded connections, be sure to use a different counter key. If there is no suitable surface for the key, then use hose clamps (Rohrzange).



Example No.1



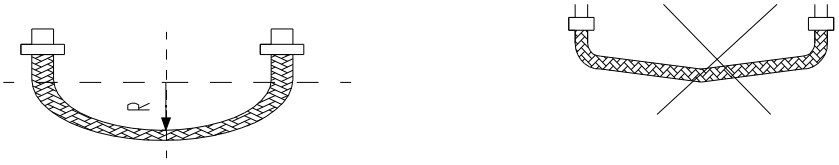
Example No.2

Example No.3.

Onion 180 degrees long enough neutral length. Determine the distance between the hose ends according to the bending radius. When selecting the length of the hose, no shifting connections may occur. If necessary to secure the connectors, we can attach a protective coil to the terminals.

With the colander, it is mandatory to use a counter key. When defining connections, make sure that a swivel connection is installed on one side of the hose. The permitted bending radius should not be exceeded.

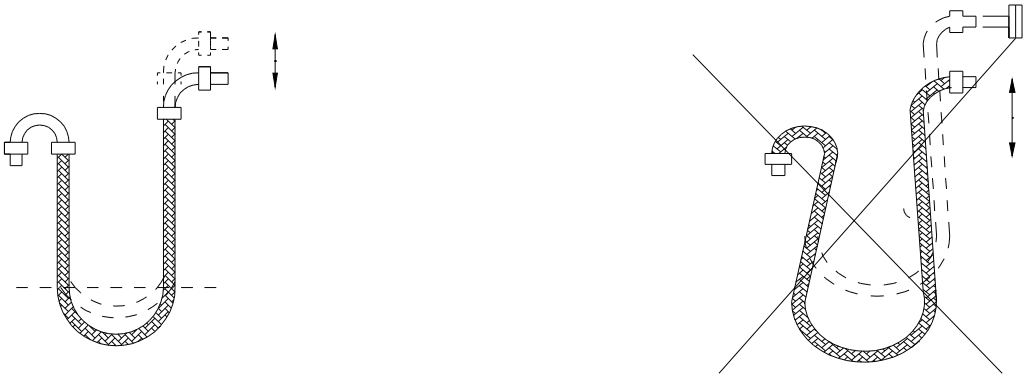
The minimum bending radius depends on the temperature pressure and the desired number of cycles. These values are given for all types of flexible hoses.



Example No.3

Example No.4.

By applying a solid hose onion, it is prevented from bending directly behind the fittings.



Example No.4

Example No.5.

The displacement direction and the hose onion lie in the same plane. Harmful torsional stresses are thus prevented.

Example No.5

Example No.6.

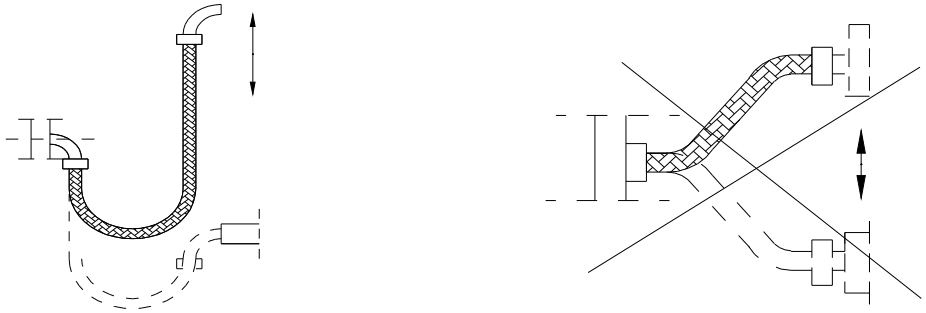
No bending is allowed directly behind the fittings, which is prevented by the use of a rigid pipe fitting.

Example No.6

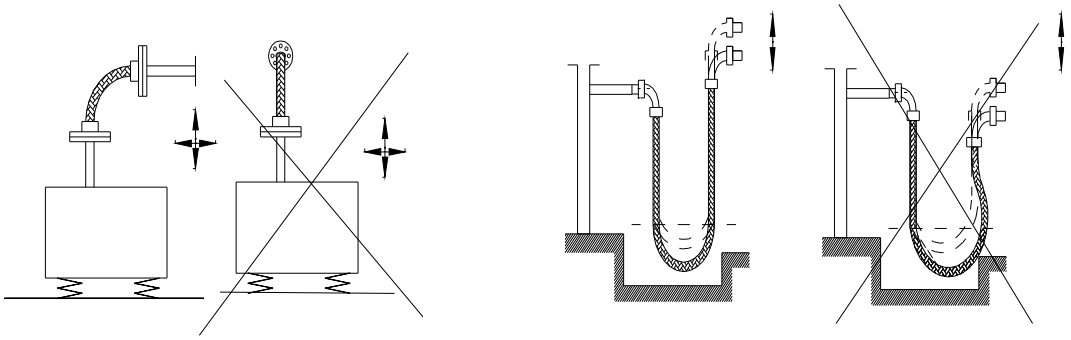
Place the hose in a free hanging arch so that it does not come into contact with the floor or other objects.

Example No.7, 8.

Install the pipes free from turning. The main direction of vibration and the arc of the tube must lie in the same plane. This prevents harmful torsion effects.



Example No.7

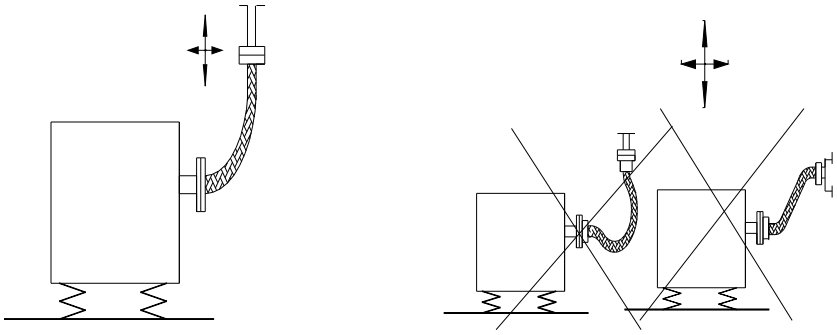


It is very important for the vibration to properly mount the hose

Example No.8

Example No.9.

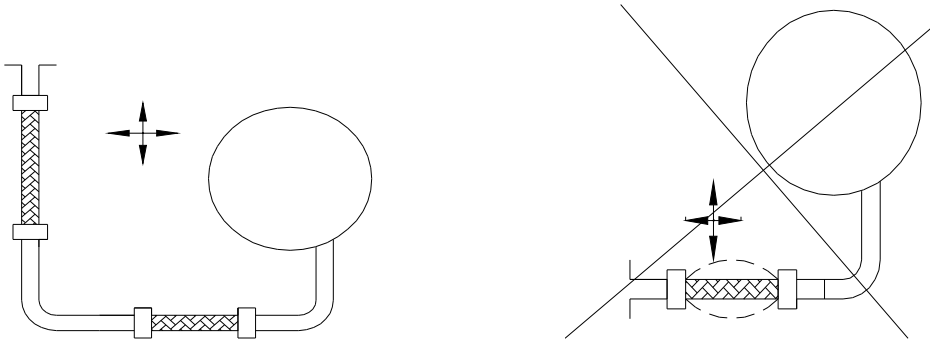
Make an onion of 90 ° with a permissible bending radius and a sufficiently neutral hose length. Folding and stretching the hose onion is not allowed



Example No.9

Example No.10.

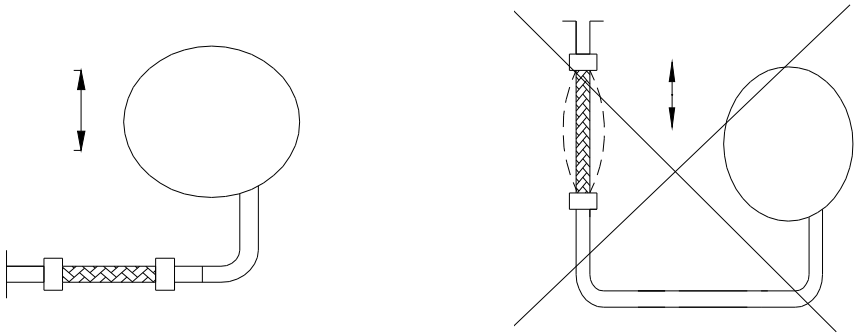
In order to absorb two- or three-dimensional vibrations, the hose must be installed in this way.



Example No.10

Example No.11.

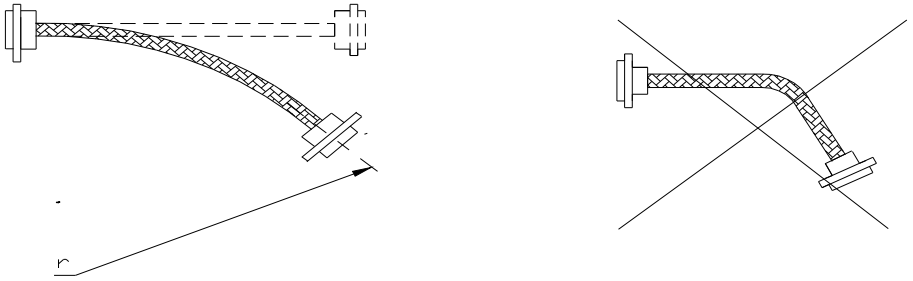
Install the hoses normally in the direction of vibration



Example No.11

Example No.12.

To assume angular displacements, install a hose with sufficient neutral length. Note the bending radius.



Example No.12

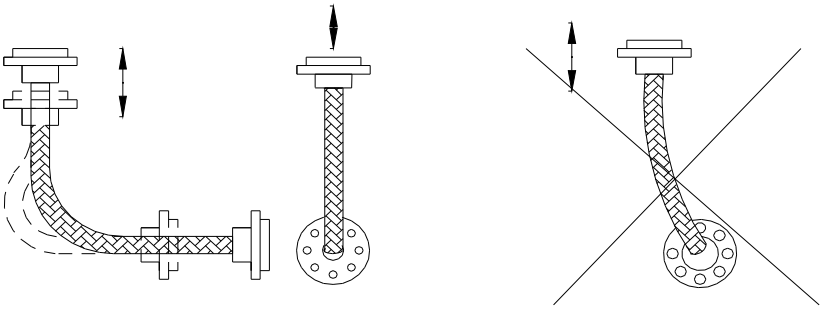
Example No.13.

The angular displacement and the arc of the pipe must lie in the same plane. This prevents harmful torsional stresses

Example No.13

Example No.14.

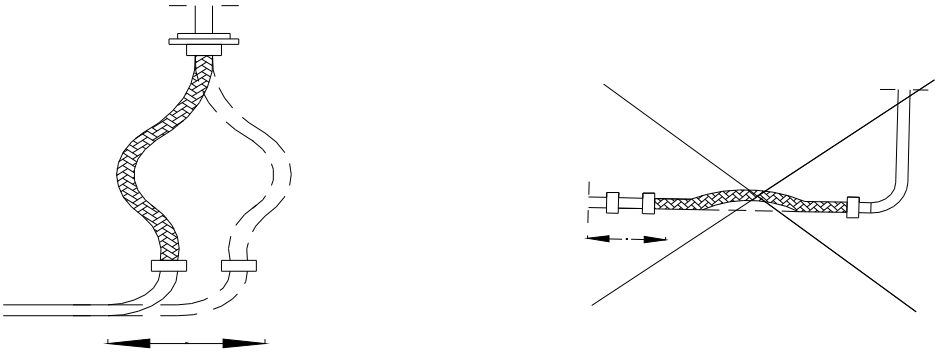
To assume thermal displacements, provide an onion of 90 ° with sufficient straight arm length. The hose onion and direction must be in the same plane.



Example No.14

Example No.15.

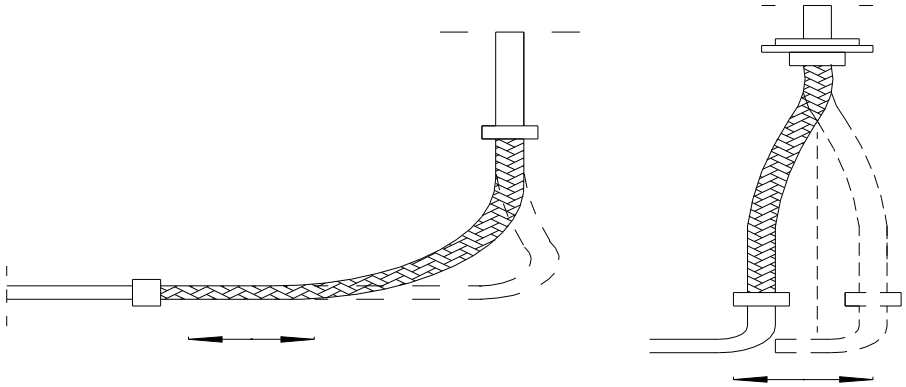
Lateral assembly is allowed to take only minor displacements. Hose stretching or shrinkage is not permitted.



Example No.15

Example No.16

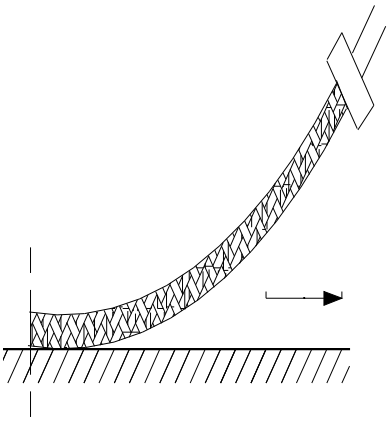
For larger displacements, install the hose as a 90 degree arc. Lateral assembly is no longer permitted.



Example No.16

Example No.17.

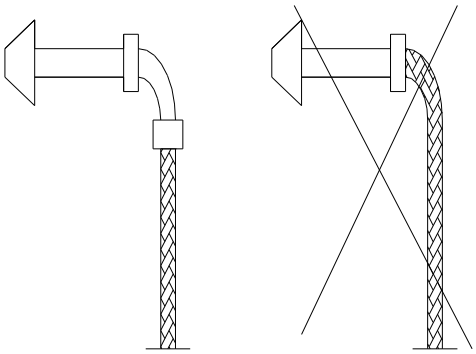
If it is impossible to prevent mechanical conditions (traction on the floor), the pipe can be protected with wire protection or with a protective pipe over the existing one.



Example No.17

Example No.18.

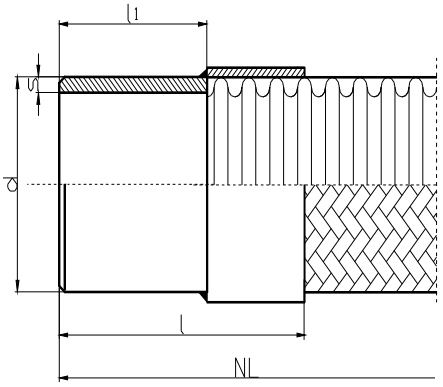
For manual use, protect the tubes against bending by using a solid pipe arch.



Example No.18

FITINGS

1. WELD ENDS:

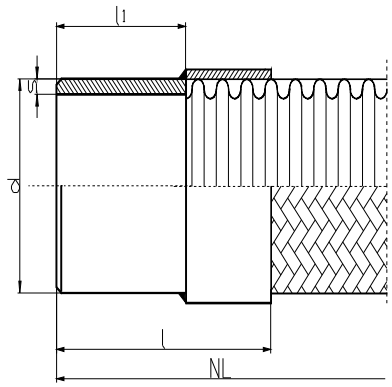


1.1. WELD END type NC

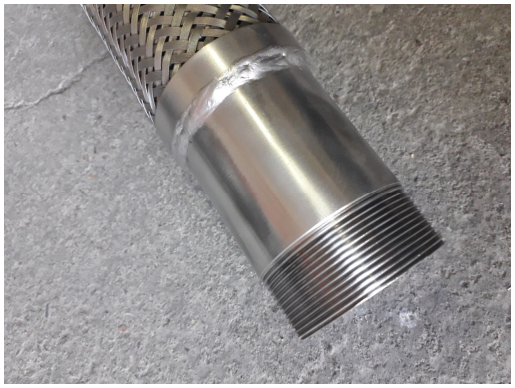
For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded

Type fittings	Connection material	Maximal permissible operating temperature
NC 12 M	Steel	400° C
NC 22 M	Stainless steel	600° C

NP (bar)	160			100		40							
DN	10	12	15	20	25	32	40	50	65	80	100	125	150
d	17,2	21,3	21,3	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3	139,7	168,3
l 1	55	60	60	60	65	65	70	70	75	80	85	90	95
l	75	80	80	80	85	85	90	90	95	120	125	130	135
s	1,8	2	2	2,3	2,6	2,6	2,6	2,9	2,9	3,2	3,6	4	4,5



TIP-CP



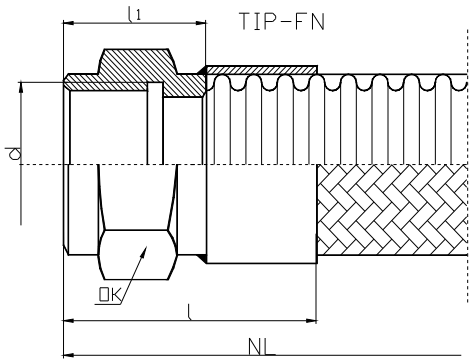
1.2. WELD END with male BSP thread type NCN

For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded

Type fittings	Connection material	Maximal permissible operating temperature
NCN 12 N	Steel	400° C
NCN 22 N	Stainless steel	600° C

DN	10	12	15	20	25	32	40	50	65	80	100
D	17,2	21,3	21,3	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
d	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 1"	G 1 1/4"	G 1 1/2"	G 2"	G 2 1/2"	G 3"	G 4"
l1	30	40	40	40	50	55	60	65	75	75	95
l	40	52	54	55	70	75	85	95	105	105	125

2. FIXED CONNECTION:



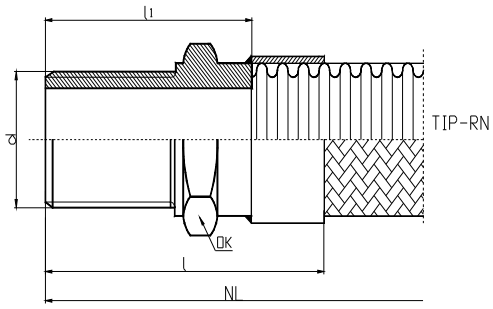
2.1. Nut with pipe thread type PČS

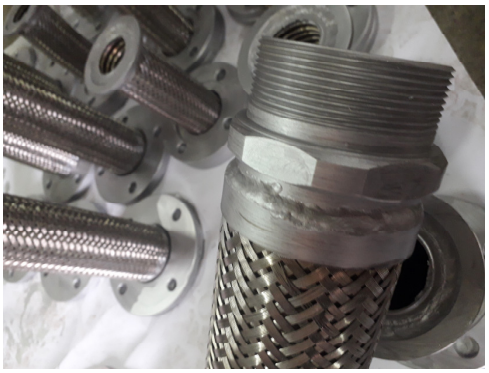
For connecting the flexible hose type: Maflex-N and Maflex-S.

Assembling method –TIG.

Type fittings	Connection material	Maximal permissible operating temperature
PČU 12 S	Steel	400° C
PČU 22 S	Stainless steel	600° C
PČU 43 M	Brass	250° C
PČU 53 T	TeL	300 °C

NP (bar)	1 0 0					6 3		
DN	10	12	15	20	25	32	40	50
d	Rp 3/8"	Rp 1/2"	Rp 5/8"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"
OK	22	27	27	32	41	46	55	65
l 1	20	23	23	27	32	35	37	39
l	40	43	43	47	52	55	57	59





2.2. **Nipple with pipe thread type PČS**

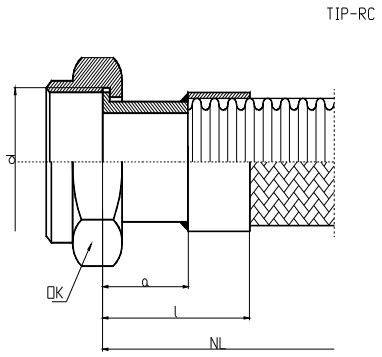
For connecting the flexible hose type: Maflex-N and Maflex-S.

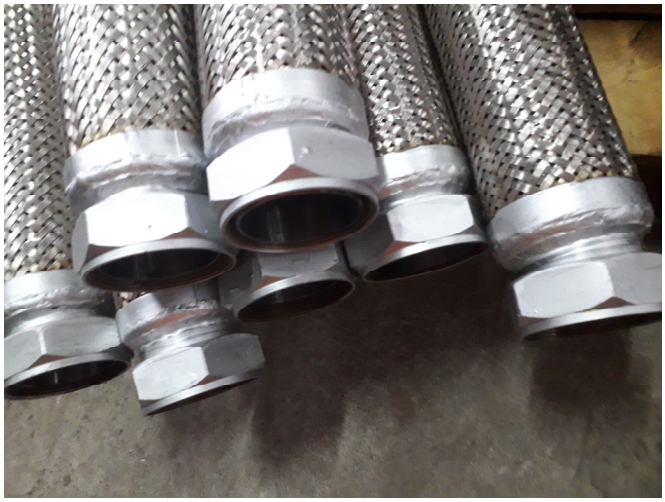
Assembling method and Steel – Welded and for Tel, malleable cost – Hard soldered.

Type fittings	Connection material	Maximal permissible operating temperature
PČS 12 S	Steel	400° C
PČS 22 S	Stainless steel	600° C
PČS 43 M	Brass	250° C
PČS 53 T	TeL	300° C

DN	10	12	15	20	25	32	40	50	65	80
d	Rp 3/8"	Rp ½"	Rp 1/2"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"	Rp 2 1/2"	Rp 3"
OK	22	27	27	32	41	50	55	70	85	100
l 1	23	28	28	33	40	43	47	50	55	65
l	43	48	48	53	60	63	67	70	75	105

3. Nut with pipe thread:





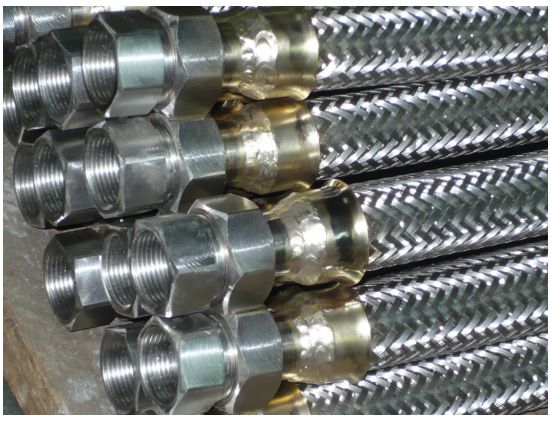
3.1. **Nut with pipe thread - tightening by flat seat type PORU**

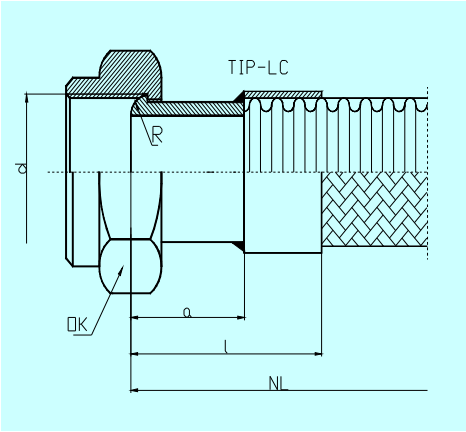
For connecting the flexible hose type: Maflex-N and Maflex-S.

Assembling method– Welded.

Type fittings	Connection material	Maximal permissible operating temperature
PORU 12 S	Steel	400° C
PORU 22 S	Stainless steel	600° C
PORU 43 M	Brass	250° C

NP (bar)		100				63		40		20
DN	10	12	15	20	25	32	40	50	65	80
d	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 1"	G 1 1/4"	G 1 1/2"	G 2"	G 2 1/2"	G 3"
OK	22	27	30	32	41	46	55	65	80	95
a	38	40	40	44	47	50	50	52	55	55
l	58	60	60	64	67	70	70	72	75	95





3.2. **Nut with pipe thread - tightening by ball-like seat type POKU**

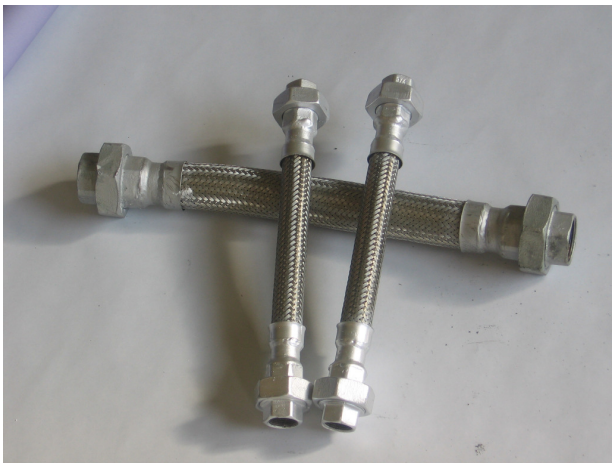
For connecting the flexible hose type: Maflex-N and Maflex-S.

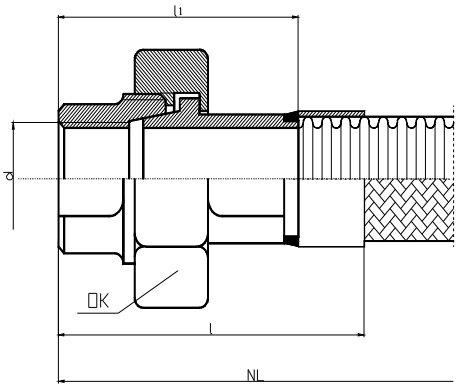
Assembling method– Welded

Type fittings	Connection material	Maximal permissible operating temperature
POKU 12 S	Steel	400° C
POKU 22 S	Stainless steel	600 °C
POKU 43 M	Brass	250° C

DN	10	12	15	20	25	32	40	50	65	80
d	G 3/8"	G 1/2"	G 1/2"	G 3/4"	G 1"	G 1 1/4"	G 1 1/2"	G 2"	G 2 1/2"	G 3"
OK	22	27	30	32	41	46	55	65	80	95
a	33	40	40	44	47	50	50	52	55	55
l	58	60	60	64	67	70	70	72	75	95

4. THREADED CONNECTIONS, ROTABLE





4.1. Unions with female BSP thread type POKU 2

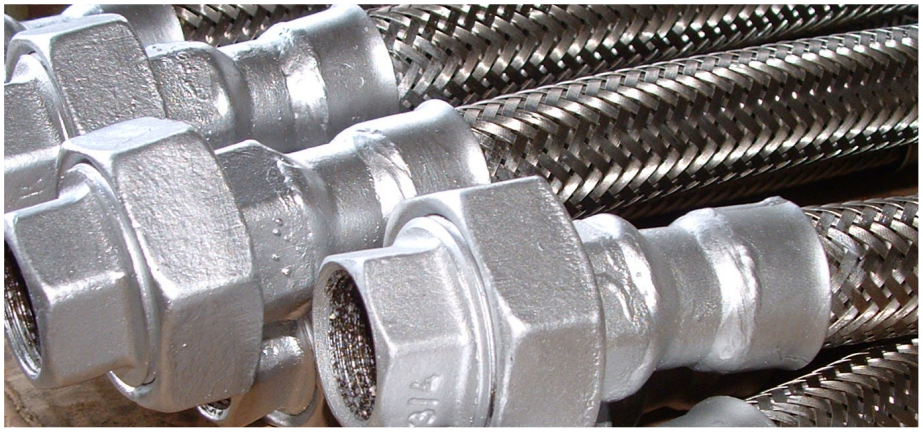
Tightening by metal to metal taper seat.

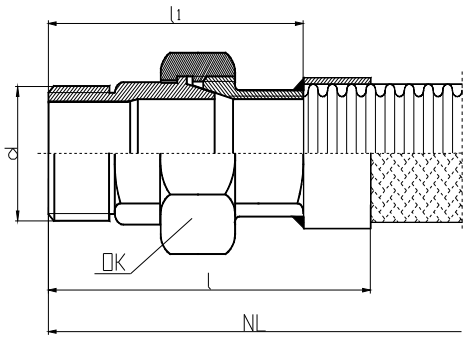
For connecting the flexible hose type: Maflex-N and Maflex-S.

Assembling method and Steel – Welded and for Tel, malleable cost – Hard soldered

Type fittings	Connection material	Maximal permissible operating temperature
POKU2 12 S	Steel	400° C
POKU2 22 S	Stainless steel	600° C
POKU2 43 M	Brass	250° C
POKU2 53 T	TeL	300° C

DN	10	12	15	20	25	32	40	50
d	Rp 3/8"	Rp 1/2"	Rp 1/2"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"
OK	32	46	46	50	55	70	75	90
l 1	45	48	48	52	58	65	70	78
l	65	68	68	72	78	85	90	98





4.2. Unions with male BSP thread type POKS

Tightening by metal to metal taper seat.

For connecting the flexible hose type: Maflex-N and Maflex-S.

Assembling method and Steel – Welded and for Tel, malleable cost – Hard soldered

Type fittings	Connection material	Maximal permissible operating temperature
POKS 12 S	Steel	400° C
POKS 22 S	Stainless steel	600° C
POKS 43 M	Brass	250° C
POKS 53 T	TeL	300° C

DN	10	12	15	20	25	32	40	50
d	Rp 3/8"	Rp 1/2"	Rp 1/2"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"
OK	32	46	46	50	55	70	75	90
l 1	58	66	66	72	80	90	95	106
l	78	86	86	92	100	110	115	126

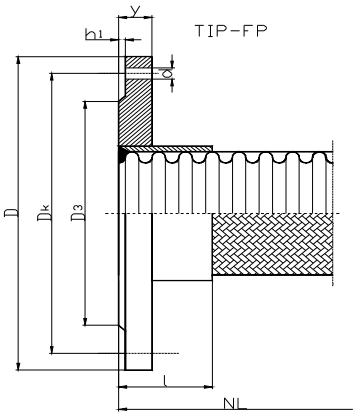
5. FLANGE

5.1. FIXED FLANGE ACCORDING DIN type FPD

For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded.

Type fittings						Connection	Maximal permissible
NP 2,5	NP 6	NP 10	NP 16	NP 25	NP 40	material	operating temperature
FPD 12 A	FPD 12 B	FPD 12 C	FPD 12 D	FPD 12 E	FPD 12 F	Steel	400 ° C
FPD 22 A	FPD 22 B	FPD 22 C	FPD 22 D	FPD 22 E	FPD 22 F	Stainless steel	600 ° C

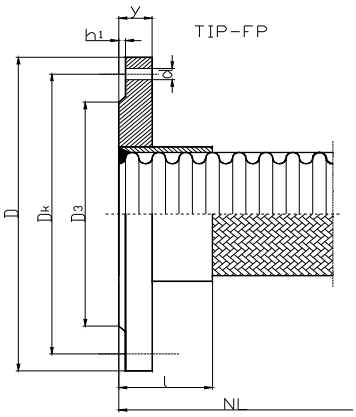
DN	NP	D	D3	Dk	Num. hols	d	h1	y	l
20	2, 5, 6	90	50	70	4	11,5	2	14	32
	10, 16	105	58	80	4	14	2	18	32
	25, 40	105	58	80	4	14	2	20	32
25	2, 5, 6	100	60	80	4	11,5	2	14	35
	10, 16	115	68	90	4	14	2	18	35
	25, 40	115	68	90	4	14	2	20	35
32	2, 5, 6	120	70	90	4	14	2	14	35
	10, 16	140	78	105	4	18	2	18	35
	25, 40	140	78	105	4	18	2	20	35
40	2, 5, 6	130	80	100	4	14	3	14	38
	10, 16	150	88	115	4	18	3	18	38
	25, 40	150	88	115	4	18	3	20	38
50	2, 5, 6	140	90	110	4	14	3	14	38
	10, 16	165	102	125	4	18	3	18	38
	25, 40	165	102	125	4	18	3	20	38
65	2, 5, 6	160	110	130	4	14	3	14	38
	10, 16	185	122	145	4	18	3	18	38
	25, 40	185	122	145	8	18	3	22	38
80	2, 5, 6	190	128	150	4	18	3	16	42
	10	200	138	160	4	18	3	20	42
	16	200	138	160	8	18	3	20	42
	25, 40	200	138	160	8	18	3	24	42
100	2, 5, 6	210	148	170	4	18	3	16	45
	10, 16	220	158	180	8	18	3	20	45
	25, 40	235	162	190	8	23	3	24	45
125	2, 5, 6	240	178	200	8	18	3	18	54
	10, 16	250	188	210	8	18	3	22	54
150	2, 5, 6	265	202	225	8	18	3	18	54
	10, 16	285	212	240	8	23	3	22	54



5.2. FIXED FLANGE ACCORDING DIN type FPA

For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded.

Type fittings		Connection	Maximal permissible
ASA 150 Lb	ASA 300 Lb	material	operating temperature
FPA 12 A	FPA 12 B	Steel	400 ° C
FPA 22 A	FPA 22 B	Stainless steel	600 ° C



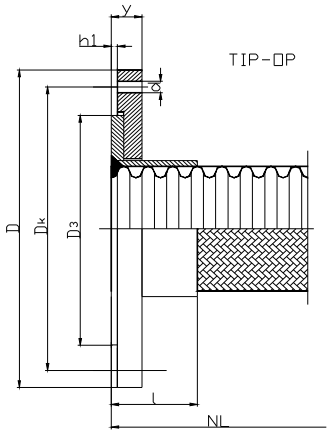
DN	Tip	D	D3	Num. hols	d	h1	y	l
20	150 Lb	108	51	4	16	6,4	20,5	49
	300 Lb	124	51	4	19	6,4	22,5	49
25	150 Lb	117,5	63,5	4	16	6,4	22,5	51
	300 Lb	124	63,5	4	19	6,4	24	51
32	150 Lb	127	73	4	16	6,4	24	53
	300 Lb	133,5	73	4	19	6,4	25,5	53
40	150 Lb	152,5	92	4	16	6,4	25,5	57
	300 Lb	155,5	92	4	22	6,4	27	57
50	150 Lb	178	105	4	19	6,4	28,5	62
	300 Lb	165	105	8	22	6,4	28,5	62
65	150 Lb	190,5	127	4	19	6,4	30	67
	300 Lb	190,5	127	8	22	6,4	32	67
80	150 Lb	228,5	157	8	19	6,4	30	75
	300 Lb	228,5	157	8	22	6,4	35	75
100	150 Lb	254	185,5	8	19	6,4	30	80
	300 Lb	254	185,5	8	22	6,4	38	80
	150 Lb	279,5	216	8	22	6,6	35	131
125	300 Lb	279,5	216	8	22	6,6	35	131
	150 Lb	343	270	8	22	7,1	36,5	149
150	300 Lb	343	270	8	22	7,1	36,5	149

5.3. FLOATING FLANGE ACCORDING DIN type OPD

For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded.

Type fittings						Connection material		Maximal working temperature
NP 2,5	NP 6	NP 10	NP 16	NP 25	NP 40	Fix the part by hose	Floating part (flange)	
OPD 12 G	OPD 12 H	OPD 12 I	OPD 12 J	OPD 12 K	OPD 12 L	Steel	Steel	400 °C
OPD 33 G	OPD 33 H	OPD 33 I	OPD 33 J	OPD 33 K	OPD 33 L	Stainless steel	Steel	400° C
OPD 22 G	OPD 22 H	OPD 22 I	OPD 22 J	OPD 22 K	OPD 22 L	Stainless steel	Stainless steel	600 °C

DN	NP	D	D3	Dk	Num. hols	d	h1	y	l
20	2, 5, 6	90	50	70	4	11,5	2	10	32
	10, 16	105	58	80	4	14	2	14	32
	25, 40	105	58	80	4	14	2	16	32
25	2, 5, 6	100	60	80	4	11,5	2	12	35
	10, 16	115	68	90	4	14	2	16	35
	25, 40	115	68	90	4	14	2	16	35
32	2, 5, 6	120	70	90	4	14	2	12	35
	10, 16	140	78	105	4	18	2	16	35
	25, 40	140	78	105	4	18	2	16	35
40	2, 5, 6	130	80	100	4	14	3	12	38
	10, 16	150	88	115	4	18	3	16	38
	25, 40	150	88	115	4	18	3	16	38
50	2, 5, 6	140	90	110	4	14	3	12	20
	10, 16	165	102	125	4	18	3	16	20
	25, 40	165	102	125	4	18	3	16	20
65	2, 5, 6	160	110	130	4	14	3	12	20
	10, 16	185	122	145	4	18	3	16	20
	25, 40	185	122	145	8	18	3	18	20
80	2, 5, 6	190	128	150	4	18	3	14	40
	10	200	138	160	4	18	3	16	40
	16	200	138	160	8	18	3	16	40
	25, 40	200	138	160	8	18	3	18	40
100	2, 5, 6	210	148	170	4	18	3	14	40
	10, 16	220	158	180	8	18	3	16	40
	25, 40	235	162	190	8	22	3	20	40
125	2, 5, 6	240	178	200	8	18	3	14	40
	10, 16	250	188	210	8	18	3	18	40
150	2, 5, 6	265	202	225	8	18	3	14	40
	10, 16	285	212	240	8	22	3	18	40

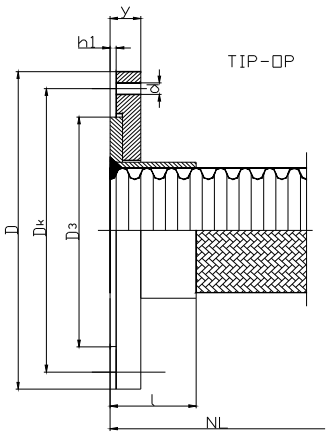


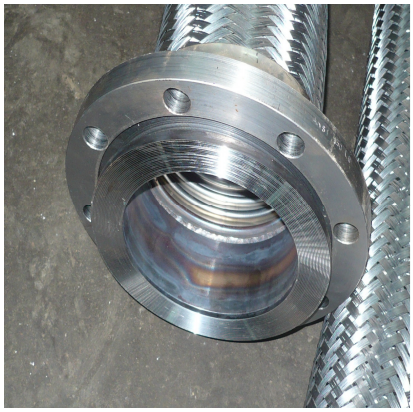
5.4. FLOATING FLANGE ACCORDING ASA type OPA

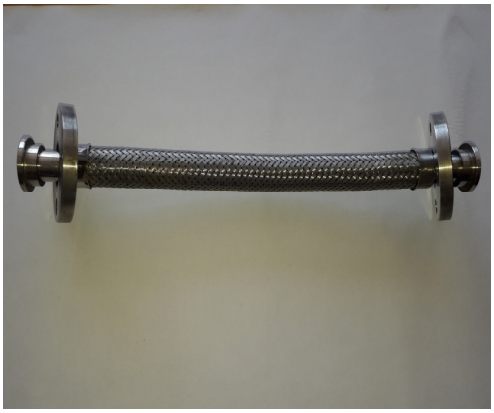
For connecting the flexible hose type: Maflex-N and Maflex-S.
Assembling method – Welded.

Type fittings		Connection	Maximal permissible
ASA 150 Lb	ASA 300 Lb	material	operating temperature
OPA 12 A	OPA 12 B	Steel	400 ° C
OPA 22 A	OPA 22 B	Stainless steel	600 ° C

DN	Tip	D	D3	Br. rupa	d	h1	y	l
20	150 Lb	108	51	4	16	1,6	12,5	52
	300 Lb	124	51	4	19	1,6	16	52
25	150 Lb	117,5	63,5	4	16	1,6	14,5	56
	300 Lb	124	63,5	4	19	1,6	17,5	56
32	150 Lb	127	73	4	16	1,6	16	57
	300 Lb	133,5	73	4	19	1,6	19	57
40	150 Lb	152,5	92	4	16	1,6	17,5	62
	300 Lb	155,5	92	4	22	1,6	20,5	62
50	150 Lb	178	105	4	19	1,6	19	64
	300 Lb	165	105	8	22	1,6	22	64
65	150 Lb	190,5	127	4	19	1,6	22	70
	300 Lb	190,5	127	8	22	1,6	25,5	70
80	150 Lb	228,5	157	8	19	1,6	24	70
	300 Lb	228,5	157	8	22	1,6	28,5	70
100	150 Lb	254	185,5	8	19	1,6	24	76
	300 Lb	254	185,5	8	22	1,6	31,5	76
125	150 Lb	279,5	216	8	22	1,6	24	76
	300 Lb	279,5	216	8	22	1,6	35	76
150	150 Lb	343	270	8	22	1,6	25,5	79
	300 Lb	343	270	8	22	1,6	36,5	79







6. KAMLOCK CLUTCH:

6.1. Male adapter type A female BSP thread

Type fittings	Connection material	Maximal permissible operating temperature
MAUN	Stainless steel AISI 316L	600° C

NP (bar)	16							14	7
DN	12	20	25	32	38	50	65	80	100
d	G 1/2"	G 3/4"	G 1"	G 1 1/4"	G 1 1/2"	G 2"	G 2 1/2"	G 3"	G 4"

6.2. Female adapter type B male BSP thread

Type fittings	Connection material	Maximal permissible operating temperature
ZSSNB	Stainless steel AISI 316L	600° C

NP (bar)	16							14	7
DN	12	20	25	32	38	50	65	80	100
d	Rp 1/2"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"	Rp 2 1/2"	Rp 3"	Rp 4"

6.3. Female adapter with ends type C

Type fittings	Connection material	Maximal permissible operating temperature
ZSNC	Stainless steel AISI 316L	600° C

NP (bar)	16							14	7
DN	12	20	25	32	38	50	65	80	100

6.4. Female adapter type D with female thread BSP

Type fittings	Connection material	Maximal permissible operating temperature
ZSUND	Stainless steel AISI 316L	600° C

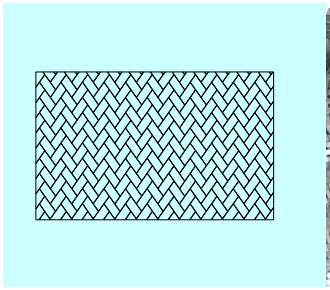
NP (bar)	16							14	7
DN	12	20	25	32	38	50	65	80	100
d	G 1/2"	G 3/4"	G 1"	G 1 1/4"	G 1 1/2"	G 2"	G 2 1/2"	G 3"	G 4"

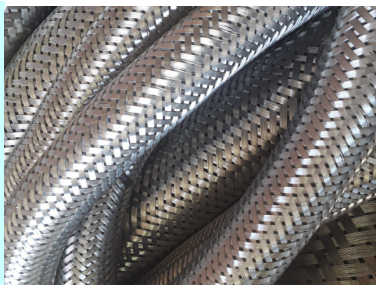
6.5. Male adapter type F with male thread BSP

Type fittings	Connection material	Maximal permissible operating temperature
MASNF	Stainless steel AISI 316L	600° C

NP (bar)	16							14	7
DN	12	20	25	32	38	50	65	80	100
d	Rp 1/2"	Rp 3/4"	Rp 1"	Rp 1 1/4"	Rp 1 1/2"	Rp 2"	Rp 2 1/2"	Rp 3"	Rp 4"

BRAIDS:





Construction:

Round section braiding can be done with sharp obtuse angle

Material :

Stainless steel wire x 5 Cr Ni 189 according to DIN 17440,material no.1.4301 (AISI 304).
Bright bronze wire
Galvanized steel wire
Other materials such as copper etc.

Size :

Inside diameter of braid from 4 to 174 mm

Application:

Braiding the metal rubber and plastic flexible hoses because of mechanical protection and increasing the resistance on inside pressure.
Wire braiding hoses for interference suppression and shielding of cables.
Braids without core for special purposes etc.

Type	Material	Working
11		temperature
12	Galvanized steel wire	250°C
33	Stainless steel wire	400 °C