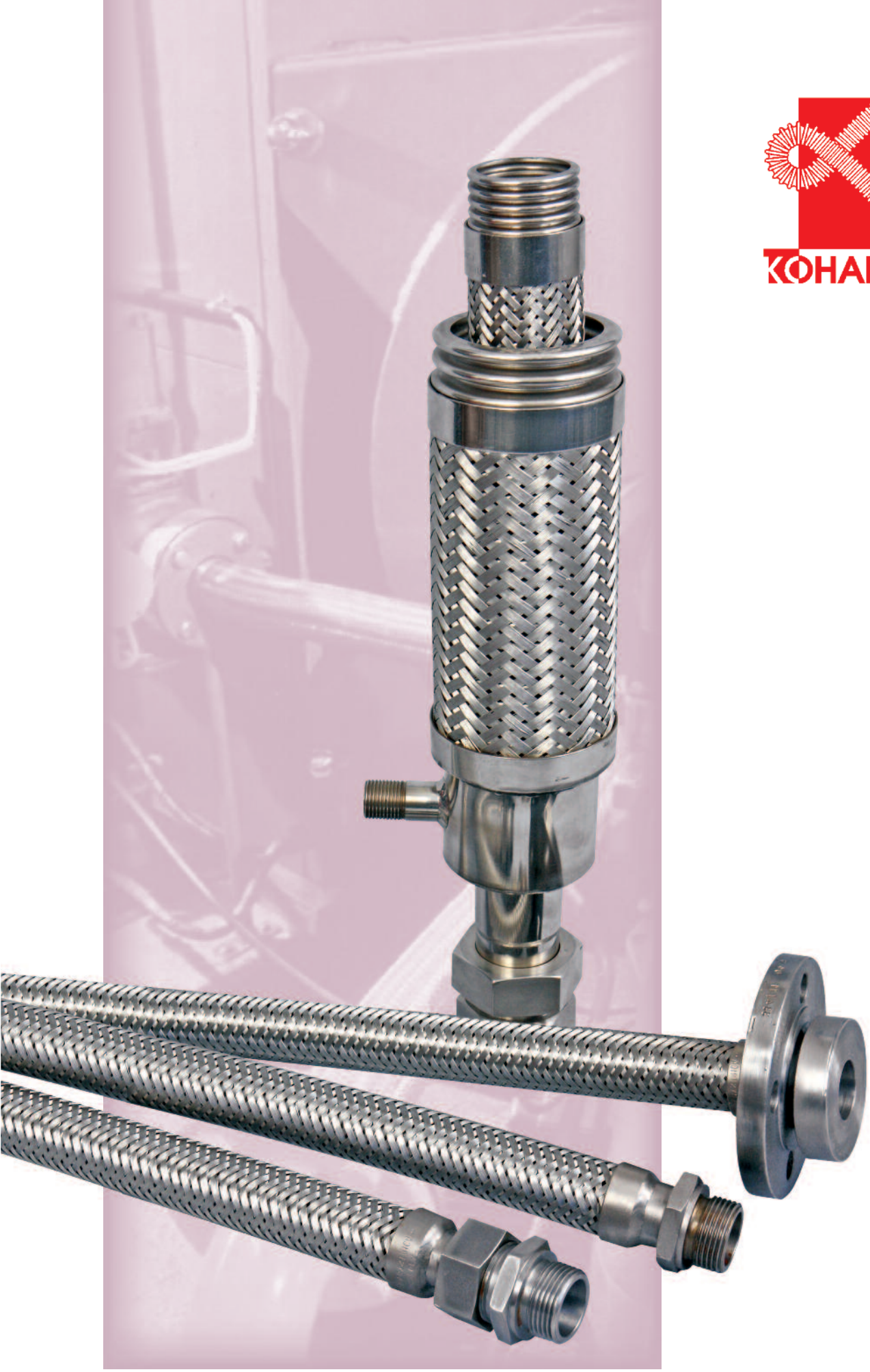
KOHAFLEX®



Flexible metal hoses

General information

Metal hoses are flexible corrugated metal „pipes“ manufacture by forming of thin sheets from stainless steel. To increase pressure resistance and mechanical protection are metal hose braided with the wire from stainless steel. On both sides of hose could be welded threaded, flange or welding ends, special fittings defined by drawing or standards. Hose length and combination of fittings are always individual, according to customer requirement.

Use of hoses

Metal pressure hoses are used for flexible lines for liquid and gaseous media on technological equipments, where is required resistance against high temperature of medium and outside environment, resistance against chemically aggressive medium and chemically aggressive environment and also on equipment where is required high level of safety, reliability and life processes.

Material of hoses

In standard version are metal hoses manufactured from stainless steel AISI316L and AISI321.

Material of braiding

To increase pressure resistance and mechanical protection are metal hoses braided with wire from stainless steel grade AISI304.

Bending radius

Bending radius mentioned in the table are given from middle of bending to middle of (axis) hose. Standard ISO EN 10380 distinguishes static and dynamic bending radius. Static bending radius specifies one-bend, example. At positioning (assembly) of hose. Dynamic bending radius refers to repeated bending.

Thermal resistance

Metal hoses are in standard stainless steel version resistant to range of temperature -190 °C up to 600 °C.

Pressure resistance

Pressure resistance depends on type of hose, diameter of hose, type of braiding and working temperature of medium. In case of higher working temperature in thermal range 100 °C up to 600 °C is maximal working pressure p_{max} mentioned in table of individual types of hoses reduced by corresponding coefficient k_t, which takes into account working temperature of transported medium or outside temperature and kind of hose material. Allowed working pressure $p_{dov}=p_{max}.k_t$

Protection of hoses

In case of higher risk of thermal load from outside environment, in case of need to protect environment before burning and all over where can occur damage caused by abrasion we recommend to protect hose with following protection:

Pyrotex – sleeve from glass yarns coated with silicone rubber. Has possibility to resist splashes of cast metal without leaving slags. Working temperature: up to 260 °C non-stop, up to 1090 °C for 20 minutes, up to 1640 °C till 30 seconds.

BB51 and BB52 – sleeve from ceramic yarns, which are reinforced by glass (BB51) or inconel (BB52), what increase thermal and mechanical properties. Working temperature: BB51 – up to 700 °C non-stop.

CB30 – sleeve from glass yarns. Working temperature: up to 550 °C non-stop.

NOTE. More information are mentioned in our catalogue THERMAL INSULATING MATERIALS.

Metal spiral – circular cross section **(type SK)** or flat cross section **(type SP)** manufactured from high-quality spring wire protecting against mechanical damage. Spiral must be deployed before assembly of fittings.

Table for coefficient k_t

Temperature °C	Material of hose	
	AISI 321	AISI316L
-200 do +20	1	1
50	0,94	0,93
100	0,86	0,83
150	0,76	0,72
200	0,73	0,66
250	0,70	0,62
300	0,67	0,59
350	0,65	0,56
400	0,63	0,55
450	0,61	0,53
500	0,60	0,51
550	0,59	0,50
600	0,57	0,50

Assembly of hoses

Company **KOHAFLEX** provides assembly of hoses in own production plant. Assembly is executed by welding method TIG on special dedicated technology, using both primary and secondary protection of the weld. Hose with fittings is manufactured according to customer requirement, which specifies length of hose and required type of connection. Production quality is certified according to standard ISO 9001:2008.

Manufacture test

Company **KOHAFLEX** provides:
- 100% pneumatic test for tightness by air or nitrogen at pressure 0,6 MPa
- Hydraulic test of pressure resistance 1,5-multiple of maximal working pressure.

PARALLEL – K10

Metal hose PARALLEL – K10 is made by curving of metal strip, which is welded by microplasma to shape of longitudinally welded pipe. This tube is made by procedure of hydraulic rolling by cold forming and it has parallel (corrugated) wave, which gives hose flexibility and resistance against small axial movements (vibrations).

Hose without braiding PARALLEL – K10

DN	6	8	10	12	16	20	25	32	40	50	65	80	100
Inside diameter (mm)	6,1	8,2	10,05	12,25	16,2	20,3	25,4	34,3	40,0	50,2	65,3	80,2	100
Outside diameter (mm)	9,6	12,1	14,3	16,8	21,5	26,6	32,3	41,1	49,5	60,5	78,0	94,8	116,2
Tolerance of diameter (mm)	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,4	0,4	0,5	0,5
Weight (g/m)	71	81	94	100	182	268	354	478	678	888	1090	1700	1950
Bending radius - static (mm)	15	16	18	20	28	32	40	50	60	70	115	130	160
Max. working pressure at 20˚C SF3 (bar)	18	13	9	7	5	3	2,5	2	2	1	0,5	0,5	0,5
Nom. pressure PN acc. to EN ISO 10380, SF4 (bar)	20	16	10	10	6	4	2,5	2,5	2,5	0,5	0,5	0,5	0,5

Hose PARALLEL – K10 with braid from stainless steel wire – type A

DN	6	8	10	12	16	20	25	32	40	50	65	80	100
Inside dimaeter (mm)	6,1	8,2	10,05	12,25	16,2	20,3	25,4	34,3	40,0	50,2	65,3	80,2	100
Outside diameter (mm)	10,7	13,6	15,6	18,3	23,8	28,6	34,3	43	52	62,4	81,2	94,8	119,4
Tolerance of diameter (mm)	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,4	0,4	0,5	0,5
Weight (g/m)	147	197	217	224	400	491	747	892	1382	1652	2480	3520	3940
Bending radius-static (mm)	25	32	38	45	58	70	85	105	130	160	200	240	290
Bending radius-dynamic(mm)	60	124	130	140	160	170	190	260	300	320	460	660	750
Max. working pressure 20˚C SF3 (bar)	200	176	133	93	85	57	65	47	51	35	33	21	13
Nom. pressure PN acc. to EN ISO10380, SF4(bar)	150	100	100	65	65	40	40	25	40	25	25	16	10

PARALLEL – K20

Metal hose PARALLEL – K20, heavy duty, is made by curving of metal strip, which is welded by microplasma to shape of longitudinally welded pipe. This tube is made by procedure of hydraulic rolling by cold forming and it has parallel (corrugated) wave, which gives hose flexibility and resistance against small axial movements (vibrations). Its heavy construction predetermines for use at extreme high pressure.

Hose without braiding PARALLEL – K20

DN	6	8	10	12	16	20	25	32	40	50
Inside diameter (mm)	5,8	7,5	10,3	12	16,2	20,3	25,4	34,3	40	50,2
Outside diameter (mm)	9,5	12,2	14,6	17,1	21,5	26,6	32,3	41,1	49,5	60,5
Tolerance of diameter (mm)	0,2	0,2	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,4
Bending radius - static (mm)	15	20	25	30	40	45	50	60	75	90
Bending radius - dynamic (mm)	140	180	220	250	195	285	325	380	430	490
Max. working pressure at 20˚ C SF3 (bar)	67	67	33	33	33	8	8	5	3	3
Nominal pressure PN acc. to EN ISO 10380, SF4 (bar)	50	50	25	25	25	6	6	4	2,5	2,5

Hose PARALLEL – K20 with braiding from stainless steel wire - type A

DN	6	8	10	12	16	20	25	32	40	50
Inside diameter (mm)	5,8	7,5	10,3	12	16,2	20,3	25,4	34,3	40	50,2
Outside diameter (mm)	11,6	14,1	15,8	18,6	23,8	28,6	34,3	43,0	52,0	62,4
Tolerance of diameter (mm)	0,2	0,2	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,4
Bending radius - static (mm)	25	32	38	45	58	70	85	105	130	160
Bending radius - dynamic (mm)	140	180	220	250	195	285	325	380	430	490
Max. working pressure at 20 ˚C SF3 (bar)	333	200	200	133	200	87	67	60	53	67
Nominal pressure PN acc. to EN ISO 10380, SF4 (bar)	250	150	150	100	150	65	50	45	40	50

Hose PARALLEL – K20 with braiding from stainless steel wire - type B

DN	6	8	10	12	16	20	25	32	40	50
Inside diameter (mm)	5,8	7,5	10,3	12	16,2	20,3	25,4	34,3	40	50,2
Outside diameter (mm)	13,5	15,8	16,9	20,4	25,8	30,6	36,3	45,0	54,0	64,4
Tolerance of diameter (mm)	0,2	0,2	0,3	0,3	0,3	0,3	0,3	0,3	0,4	0,4
Bending radius - static (mm)	40	50	60	70	90	70	85	105	130	160
Bending radius - dynamic (mm)	140	180	220	250	195	285	325	380	430	490
Max. working pressure at 20 ˚C SF3 (bar)	333	333	267	267	267	133	133	87	87	87
Nominal pressure PN acc. to EN ISO 10380, SF4 (bar)	250	250	150	150	150	100	100	65	65	65

DUO

Metal hose DUO is made by electrical resistance welding from profiled strip. By specific forming and folding of profiled steel strip is created at forming of hose double wall on both vertical walls and recesses of hose waves. At the top (perimeter) is wall of hose triple, what gives this hose good mechanical properties. Its use is specially suitable for highest pressure. Manufacture of hose is protected by patent. Hose has good resistance against vibrations. Hose is according to standard EN ISO 10380.

Hose without braiding DUO

Nominal diameter DN (mm)	5	6	8	10	12	16	20	25	32	40	50	65	80	100	125	150	175	200	250	300
Inside diameter (mm)	5,2	6,3	8,1	10,2	12,2	16,2	20,2	25,2	32,3	40,3	50,3	65,3	80,4	100,4	126	151	176	201	252	302
Outside diameter (mm)	8,4	9,5	12,1	14,1	17	21	26,4	31,4	40,7	48,7	61	76	93	113	140	165,5	191	216	269	319
Tolerance of diameter +/- (mm)	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3	0,3	0,4	0,4	0,7	0,7	0,8	0,8	1	1
Weight (g/m)	95	110	185	210	275	335	580	650	1030	1200	2050	2450	3200	3900	5500	6560	7560	8600	11400	13600
Bending radius - static (mm)	20	25	32	38	45	58	70	85	105	130	160	200	240	290	370	470	570	700	860	1120
Bending radius - dynamic (mm)	75	80	100	115	125	145	170	195	300	340	390	460	520	600	720	880	1040	1200	1520	1870
Max. working pressure at 20 °C (bar)	8	7,5	6,5	5,5	5	3,2	2,5	2	1,6	1,6	1,5	1,5	1,5	1,5	1,5	1,4	1,4	1,4	1,3	1,3

Hose DUO with braiding from stainless steel wire - type A

Nominal diameter DN (mm)	5	6	8	10	12	16	20	25	32	40	50	65	80	100	125	150	175	200	250	300
Outside diameter (mm)	9,9	11	13,6	15,6	18,5	22,5	27,9	33,4	42,7	50,7	63	78	95,5	115,5	143	168,5	197	223	275	325
Weight (g/m)	175	195	320	355	440	540	730	1030	1570	1830	2820	3300	5000	5750	7600	9100	11000	12700	16100	19100
Bending radius - static (mm)	20	25	32	38	45	58	70	85	105	130	160	200	240	290	370	470	570	700	860	1120
Bending radius - dynamic (mm)	75	80	100	115	125	145	170	195	300	340	390	460	520	600	820	1050	1400	1800	2280	2800
Max. working pressure at 20 °C (bar)	200	180	150	130	110	90	80	65	55	45	35	30	25	20	15	10	8	6	6	4

Hose DUO with braiding from stainless steel wire - type B

Nominal diameter DN (mm)	5	6	8	10	12	16	20	25	32	40	50	65	80	100	125	150	175	200	250	300
Outside diameter (mm)	11,4	12,5	15,1	17,1	20	24	29,4	35,4	44,7	52,7	63,5	78,5	96	116	146	171,5	198	222	281	331
Weight (g/m)	260	280	460	500	610	750	960	1480	2080	2400	3550	4100	6400	7300	9800	11500	14300	16500	20800	24700
Bending radius - static (mm)	20	25	32	38	45	58	70	85	105	130	160	200	240	290	440	550	670	770	1000	1320
Bending radius - dynamic (mm)	120	140	165	190	210	250	285	325	380	430	490	580	660	750	960	1320	1580	2000	2500	3250
Max. working pressure at 20 °C (bar)	270	250	200	175	160	130	110	95	80	65	55	40	35	30	22	20	18	15	14	12

Hose DUO with braiding from stainless steel wire - type C

Nominal diameter DN (mm)	5	6	8	10	12	16	20	25	32	40	50	65	80	100	125	150	175	200	250	300
Outside diameter (mm)								37,4	46,7	54,7	66	81	99	119	147	172,5				
Weight (g/m)								1950	2600	3000	4300	5000	7900	9600	12000	14000				
Bending radius - static (mm)								130	160	180	260	300	470	570	720	840				
Bending radius - dynamic (mm)								325	380	430	490	580	660	750	1050	1560				
Max. working pressure at 20 °C (bar)								135	115	95	80	60	50	40	35	30				

PARALLEL

Metal hose PARALLEL is made by forming of metal strip, which is welded by microplasma to shape of longitudinally welded pipe. This tube is made by procedure of hydraulic rolling by cold forming and it has parallel (corrugated) wave, which gives hose flexibility and resistance against small axial movements (vibrations). Is possible to use it as compensation element. Hose is according to standard EN ISO 10380.

Hose without braiding PARALLEL

Nominal diameter DN (mm)	10	12	16	20	25	32	40	50	65	80	100	125	150	200	250	300
Inside diameter (mm)	10,6	12,9	15,7	19,8	25,8	33,0	40,0	51,6	66,6	76,6	103,0	127,5	151,5	200,0	250,0	300,0
Outside diameter (mm)	16,1	19,3	23,7	28,8	34,5	43,7	52,0	65,5	85,4	97,5	125,0	151,5	177,0	227,0	282,0	335,0
Tolerance of diameter +/- (mm)	0,3	0,3	0,4	0,4	0,4	0,4	0,5	0,5	0,6	0,6	1,0	1,0	1,0	1,6	1,6	2,0
Weight (g/m)	150	160	250	250	380	420	700	880	1250	1750	2100	3250	4000	7300	9200	12700
Bending radius - static (mm)	35	35	45	55	70	80	100	130	175	200	250	325	375	260	340	420
Bending radius - dynamic (mm)	125	140	190	215	250	270	320	360	450	500	600	750	850	950	1200	1600
Max. working pressure at 20 °C (bar)	5	5	4	3	3	3	2	1	1	1	1	1	0,8	0,8	0,6	0,5

Hose PARALLEL with braiding from stainless steel wire - type A

Nominal diameter DN (mm)	10	12	16	20	25	32	40	50	65	80	100	125	150	200	250	300
Outside diameter (mm)	17,5	20,8	25,2	30,3	36,0	45,7	54,0	67,5	87,9	100,0	128,0	154,5	180,0	232,0	287,0	340,0
Weight (g/m)	300	320	500	530	750	950	1350	1600	2600	3200	4400	5750	6900	11000	13500	17600
Bending radius - static (mm)	35	35	45	55	70	80	100	130	175	200	250	325	375	260	340	420
Bending radius - dynamic (mm)	190	210	285	310	375	405	480	550	675	750	920	1160	1320	1400	1650	1750
Max. working pressure at 20 °C (bar)	75	70	65	50	40	35	30	25	20	18	14	12,5	10	6	3,5	2

Hose PARALLEL with braiding from stainless steel wire - type B

Nominal diameter DN (mm)	10	12	16	20	25	32	40	50	65	80	100	125	150	200	250	300
Outside diameter (mm)	19,0	22,3	26,7	31,8	37,4	47,7	56,0	69,5	90,4	102,5	130	157,5	183,0	237,0	292,0	345,0
Weight (g/m)	450	480	750	800	1150	1500	2000	2350	4000	4700	6700	8300	9800	15000	17800	23000
Bending radius - static (mm)	35	35	45	55	70	80	100	130	175	200	250	325	375	260	340	420
Bending radius - dynamic (mm)	205	225	305	330	382	415	490	570	685	770	960	1200	1400	1600	1750	2300
Max. working pressure at 20 °C (bar)	105	100	90	75	60	50	40	32	25	22	20	18	15	9	5	3

Standard range of fittings

The advantage of complete metal hoses is, that by welding or soldering of fittings could be produced reliable, tight and pressure resistant, clean metal connection without organic sealings. To reduce bending stress of hose in the wake of connection place (weld) is necessary to use metal protection ferrules. In these sleeves are welded ends of hose with protection braiding and fittings.

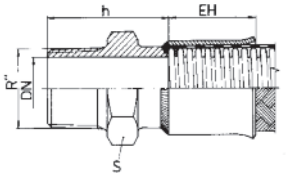
Lengths of ferrules

DN	5	6	8	10	12	16	20	25	32	40	50	65	80	100	125	150	175	200	250	300
EH	8	8	10	10	12	12	14	14	17	17	20	20	25	25	30	30	40	40	50	50

Tolerance of total lengths of hose

Tolerance of total length of hose is in range of tolerance class -1% up to +3%.

Fixed hexagonal nipple Tappered male

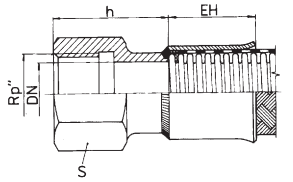


Pipe conical thread according to STN EN 10226

Type of fitting	Material	Allowed working temperature	Type of hose connection - fitting
AA 1	Carbon steel	300 °C	Welding in protection atmosphere Ar
AA 3	Stainless steel	550 °C	Welding in protection atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread R"	1/4	1/4	3/8	1/2	1/2	3/4	1	$1^{1/4}$	$1^{1/2}$	2
s (mm)	14	14	17	22	22	27	36	46	50	65
h (mm)	28	30	31	34	34	36	40	42	44	52
PN (bar) to 120 °C	100							63		

Fixed hexagonal nipple, straight female

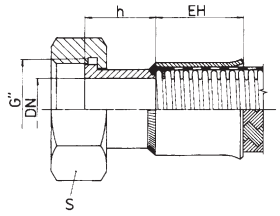


Pipe cylindrical thread according to STN EN 10226

Type of fitting	Material	Allowed working temperature	Type of hose connection - fitting
BA 1	Carbon steel	300 °C	Welding in protection atmosphere Ar
BA 3	Stainless steel	550 °C	Welding in protection atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread Rp"	1/4	1/4	3/8	1/2	1/2	3/4	1	$1^{1/4}$	$1^{1/2}$	2
s (mm)	17	17	22	27	27	32	41	50	55	65
h (mm)	25	25	25	29	29	32	36	38	40	44
PN (bar) to 120 °C	100							63		

Female swivel with flat seal

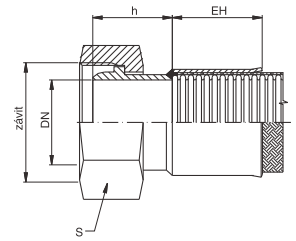


Hexagonal nut, pipe internal thread according to STN 01 4033

Type of fittings	Material	Allowed working temperature	Type of hose connection - fitting
CA 1	Carbon steel	300 °C	Welding in protective atmosphere Ar
CA 3	Stainless steel	550 °C	Welding in protective atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread G"	1/4	3/8	1/2	5/8	3/4	1	$1^{1/4}$	$1^{1/2}$	$1^{3/4}$	$2^{1/4}$
s (mm)	17	22	27	27	32	41	50	55	60	70
h (mm)	18	18	18	22	22	22	24	24	26	26
PN (bar) to 120 °C	100							63		40

Female swivel with spherical seal



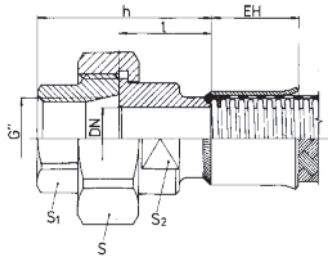
CB – hexagonal nut, inside pipe thread acc. to ISO 228/1
CC – hexagonal nut, inside metrical thread acc. to DIN 3870 - type LL

Type of fitting		Material	Allowed working tempareture	Type of connection - fitting
CB 1	**CC 1**	Carbon steel	300°C	Welding in protect. atmosphere Ar
CB 3	**CC 3**	Stainless steel	550°C	Welding in protect. atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread G" at CB	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2 1/4
Thread M at CC	M14x1,5	M16x1,5	M18x1,5	M22x1,5	M26x1,5	M30x1,5	M38x1,5	M45x1,5	M52x1,5	M65x1,5
s (mm)	17	22	27	27	32	41	50	55	60	70
h (mm)	23	23	23	25	25	28	30	30	33	36
PN (bar) at 120 °C	100							63		

In case of requirement is possible to use fitting with O-ring and 24° cone mentioned in catalogue of hydraulic hoses type M10 (DKOL), M20 (DKOS).

Hexagonal union, straight female with front sealing face

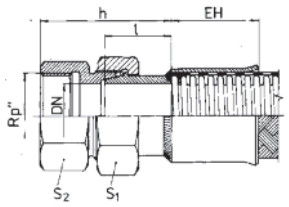


Hexagonal threaded connection with flat sealing, inside pipe thread acc. to STN EN 10226

Type of fitting	Material		Allowed working temperature	Type of hose connection - fitting
DA1	Fitting malleable cast iron	Union nut	300 °C	Welding in protective atmosphere Ar
		Tappered nipple		
	Carbon steel	Supporting end		
DA3	Stainless steel		550 °C	Welding in protective atmosphere Ar

DN (mm)	8	10	16	20	25	32	40	50	65	80
Thread G"	1/4	3/8	1/2	3/4	1	$1^{1/4}$	$1^{1/2}$	2	$2^{1/2}$	3
h (mm)	47	51	56	60	66	71	77	81	99	108
l (mm)	26	28	31	33	36	38	41	46	56	57
s (mm)	32	36	46	50	55	70	75	90	110	130
s_1(mm)	19	22	27	32	38	47	56	66	83	96
S_2(mm)	17	19	24	30	36	46	50	60	80	90
PN (bar) to 120°C	25	25	25	25	16	16	16	16	16	16
PN (bar) to 300°C	20	20	20	20	13	13	13	13	13	13

Hexagonal union, straight female with conical sealing face

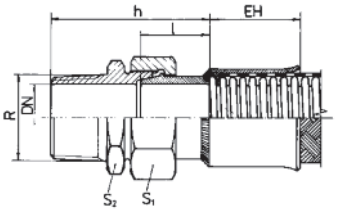


Hexagonal threaded union with conical sealing face 24°, pipe cylindrical thread acc. To STN EN 10226

Type of fitting	Material	Allowed working temperature	Type of hose connection - fitting
EA 1	Carbon steel	300 °C	Welding in protective atmosphere Ar
EA 3	Stainless steel	550 °C	Welding in protective atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread Rp"	1/4	1/4	3/8	1/2	1/2	3/4	1	1 1/4	1 1/2	2
h (mm)	42	43	45	51	51	57	62	68	71	79
l (mm)	23	23	24	25	25	28	30	34	36	39
s (mm)	17	19	22	27	32	36	41	50	60	70
s (mm)	17	17	22	24	27	32	41	46	55	65
PN (bar) to 120 °C	100							63		

Hexagonal union, straight male, with conical sealing face

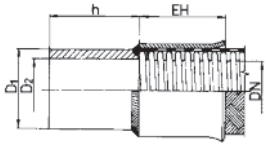


Hexagonal threaded connection with conical sealing face 24°, pipe cylindrical thread acc. to STN EN 10226

Type of fitting	Material	Allowed working temperature	Type of hose connection - fitting
GA 1	Carbon steel	300 °C	Welding in protective atmosphere Ar
GA 3	Stainless steel	550 °C	Welding in protective atmosphere Ar

DN (mm)	6	8	10	12	16	20	25	32	40	50
Thread R"	1/4	1/4	3/8	1/2	1/2	3/4	1	1 1/4	1 1/2	2
h (mm)	41	43	45	52	52	59	65	72	73	84
l (mm)	23	23	24	25	25	28	30	34	36	39
s_1 (mm)	17	19	22	27	32	36	41	50	60	70
s_2 (mm)	17	17	19	24	27	32	41	46	55	65
PN (bar) to 120 °C	100							63		

Welding end



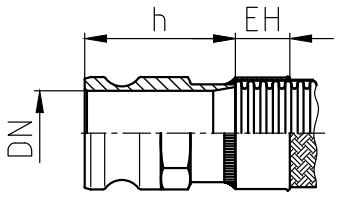
Type of fitting	Material	Allowed working temperature	Type of hose connection - fitting
FA 1	Carbon steel	300 °C	Welding in protective atmosphere Ar
FA 3	Stainless steel	550 °C	Welding in protective atmosphere Ar

DN (mm)	10	16	20	25	32	40	50	65	80	
D_1 (mm)	14	20	25	30	38	45	57	76	89	
D_2 (mm)	10	16	20	25	33	40	50	67	80	
h (mm)	50	50	54	54	56	56	60	60	70	
PN (bar)	100				63			40		

Couplings KAMLOK

Asymmetric couplings are used for connecting of hoses, pipes and fixed tanks installation sites. They are produced according to A-A59326A (formerly Mil-C-27487). Pressure resistance is standardly 16 bar, for special applications can be supplied with resistance up to 60 bar.

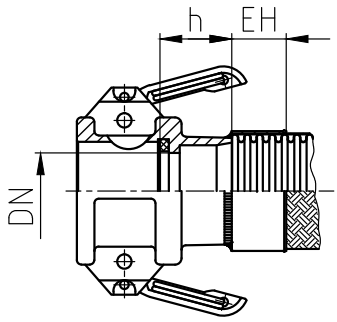
Fitting KAMLOK – nipple type HA 3



Type of fitting	Material	Allowed working temerature	Type of connection - fitting
HA 3	Stainless steel 1.4401	200˚C	Welding in protect. Atmosph. Ar

DN (mm)	12	16	20	25	32	40	50	65	80	100
h (mm)	48	56	56	72	80	84	88	100	106	114

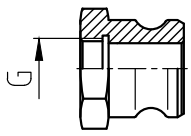
Fitting KAMLOK – coupling type HD 3



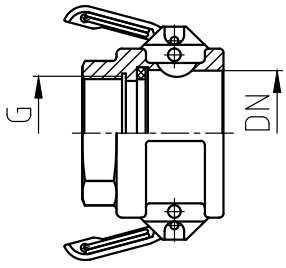
Type of fitting	Material	Allowed working temerature	Type of connection - fitting
HD 3	Stainless steel 1.4401 Sealing NBR	120 ˚C	Welding in protect. Atmosph. Ar
	Stainless steel 1.4401 Sealing VITON (on request)	200 ˚C	

DN (mm)	12	16	20	25	32	40	50	65	80	100
h (mm)	30	30	32	32	32	34	36	36	40	50

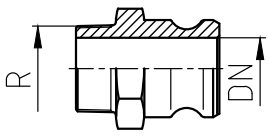
Above mentioned couplings is possible to combine with following couplings KAMLOK:



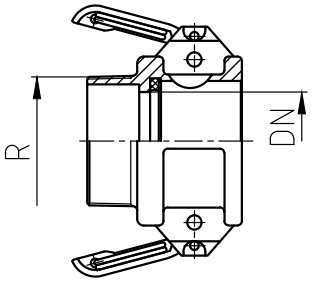
KAMLOK Type A



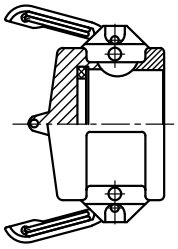
KAMLOK Type D



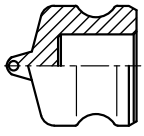
KAMLOK Type F



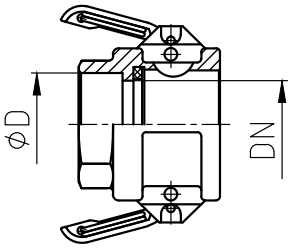
KAMLOK Type B



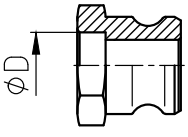
KAMLOK Type DC



KAMLOK Type DP



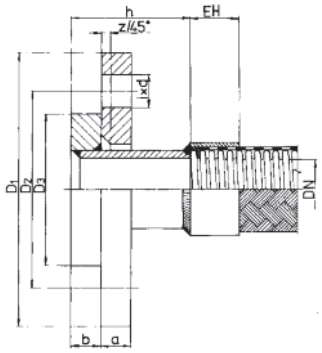
KAMLOK Type SW-D



KAMLOK Type SW-A

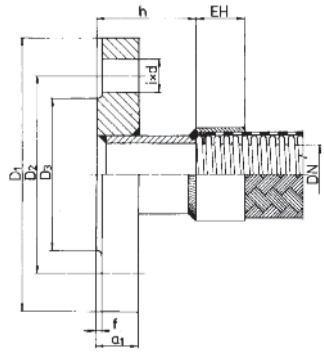
Flange fittings

	Type of connection	Material		Allowed working temperature	Type of hose connection - fitting
Fixed flange	**PP 1**	Carbon steel		450 °C	Welding in protective atmosphere Ar
	PP 3	Stainless steel		550 °C	
Swivel flange with welding end	**VP 1**	Swivel flange	Carbon steel	450 °C	
		Welding end	Carbon steel		
	VP 3	Swivel flange	Stainless steel	550 °C	
		Welding end			



Connection dimension of flange acc. to STN EN 1092-1 – range of pressure PN 2,5 to PN 100 Type PP + VP, common dimensions for pressure PN 2,5 to PN 100

DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
f (mm)	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4
z (mm)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
h (mm)	52	52	57	57	59	59	65	65	75	75	75	85	85	100	120



Type PP + VP, dimensions for pressure PN 2,5 and PN 6 for all DN 10 to 300

DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
D_1 (mm)	75	80	90	100	120	130	140	160	190	210	240	265	320	375	440
D_2 (mm)	50	55	65	75	90	100	110	130	150	170	200	225	280	335	395
D_3 (mm)	35	40	50	60	70	80	90	110	128	148	178	202	258	312	365
a (mm)	10	10	10	12	12	12	12	12	14	14	14	14	16	20	24
a_1(mm)	12	12	14	14	14	16	16	16	18	18	20	20	22	22	24
b (mm)	10	10	10	10	10	10	12	12	14	14	14	14	16	18	18
i	4	4	4	4	4	4	4	4	4	4	8	8	8	12	12
d (mm)	11	11	11	11	14	14	14	14	18	18	18	18	18	18	22

Type PP + VP
pressure PN 10 for DN 10 to 250
pressure PN 16 for DN 10 to 150

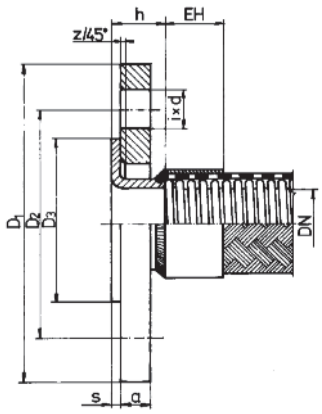
DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
D_1 (mm)	90	95	105	115	140	150	165	185	200	220	250	285	340	395	
D_2 (mm)	60	65	75	85	100	110	125	145	160	180	210	240	295	350	
D_3 (mm)	42	47	58	68	78	88	102	122	133	158	184	212	268	320	
a (mm)	14	14	14	16	16	16	16	16	18	18	18	18	20	24	
a_1 (mm)	14	14	16	16	16	18	20	20	22	24	26	26	26	26	
b (mm)	10	10	12	12	12	12	14	14	16	16	18	18	20	20	
i	4	4	4	4	4	4	4	4	8	8	8	8	8	12	
d (mm)	14	14	14	14	18	18	18	18	18	18	18	22	22	22	

Type PP + VP
pressure PN 25 for DN 10 to 100
pressure PN 40 for DN 10 to 80

DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
D_1 (mm)	90	95	105	115	140	150	165	185	200	235					
D_2 (mm)	60	65	75	85	100	110	125	145	160	190					
D_3 (mm)	42	47	58	68	78	88	102	122	133	158					
a (mm)	16	16	16	18	18	18	20	22	24	24					
a_1(mm)	16	16	18	18	18	18	20	22	24	24					
b (mm)	12	12	14	14	14	14	16	16	18	18					
i	4	4	4	4	4	4	4	8	8	8					
d (mm)	14	14	14	14	18	18	18	18	18	22					

Type PP + VP
pressure PN 63 for DN 10 to 50
pressure PN 100 for DN 10 to 25

DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
D_1 (mm)	100	105		140		170	180								
D_2 (mm)	70	75		100		125	135								
D_3 (mm)	42	47		68		88	102								
a (mm)	20	20		22		22	24								
a_1(mm)	22	22		24		24	26								
b (mm)	14	14		16		16	18								
i	4	4		4		4	4								
d (mm)	14	14		18		22	22								



	Type of fitting	Material		Allowed working temperature	Type of hose connection - fitting
Swivel flange with collar ring	**LP 1**	Collar ring	Stainless steel	550 °C	Welding in protective atmosphere Ar
		Swivel flange	Carbon steel	450 °C	
	LP 2	Collar ring	Stainless steel	550 °C	
		Swivel flange	Galvanized steel	450 °C	
	LP 3	Collar ring	Stainless steel	550 °C	
		Swivel flange			

Type LP, common dimension for pressure PN 2,5 to PN 16

DN (mm)	10	16	20	25	32	40	50	65	80	100	125	150	200	250	300
h (mm)			10	12	14	17	18	20	23	26	28	28	28	31	37
s (mm)			1,5	1,5	1.5	2	2	2	2	2	2	2	3	3	3

Other dimensions are same as dimensions of flange fittings VP

For pressure PN 2,5 to PN 100 are valid mentioned dimensions of flanges in version:

- Raised face - STN EN 1092-1 type B1 and B2
- Flat face - STN EN 1092-1 type A

For pressure PN 10 to PN 100 is possible on customer request to modify sealing face of flanges in version:

-spigot	- STN EN 1092-1 type E
-recess	- STN EN 1092-1 type F
-tongue	- STN EN 1092-1 type C
-groove	- STN EN 1092-1 type D

Connection dimensions acc. to STN 13 1160 are same with standard DIN 2501 for pressure:

PN 2,5; PN 6	in complete range of dimensions DN 10 to 300
PN 10; PN 16	to dimension DN 65
PN 25; PN 40	to dimension DN 65
PN 63	to dimension DN 25
PN 100	only dimension DN 25

Non-standard fittings

After agreement with manufacturer is possible to manufacture special fittings accordig to customer requirements.

Specification of inquiry

In order have to be mentioned this informations:

- nominal diameter DN
- total length with fittings
- quantity
- type of fittings (connection dimension)
- type of transported medium
- maximal working pressure
- maximal working temperature
- type and size of movement

Example of order:

We order 6 pcs. of hoses DN25, fittings CA1/PP1, connection diameter of fiting PP1 according PN40, total length of hose 1.500 mm, max. working pressure 3MPa, max. working temperature 150°C, transported medium - water steam, type of movements - vibrations.

Installation instructions for metal flexible hoses

Lifetime of metal hoses very much depends on their correct assembly. In most cases, where metal hoses did not work properly and were are cause of failure, the reason of this failure was incorrect assembly and their application.

By effective change of installation (example – use of fixed bends) is possible to achieve better results for flexible hoses.

Metal hoses is not possible to stress over their limit of elasticity. Torsional stress is not allowed. In most cases is possible to eliminate this by correct assembly. Great importance is the choice of the correct length of hose.

Further more are harmful alternating movements and bending stress near the fittings. Hose should not be bend right behind the connection. Important is that metal hose should be assembled freely without pre-stress. Due that should hose be at least on one end connected by swivel nut or swivel flange.

From a functional point of view and working of flexible hose implies that this hose is often much more stressed than any other part of the machine.

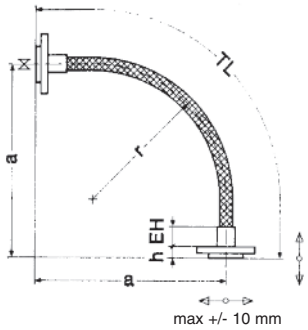
Because the requirements for metal hoses are always different, we encourage you to notify us using the sketch or picture of the location and use of hose. Based on this information, we can design optimal location and type of hose according to your requirements.

The following drawings illustrate some, in practice, often occurring wrong way of applying hoses and examples of their correct application with correction of deficiences.

In determining the bend radius must be taken into account rules and regulations acc. to EN ISO 10380 for the flexible corrugated hose. When sizing assembly available thus apply these provisions to EN ISO 10380, and in particular:

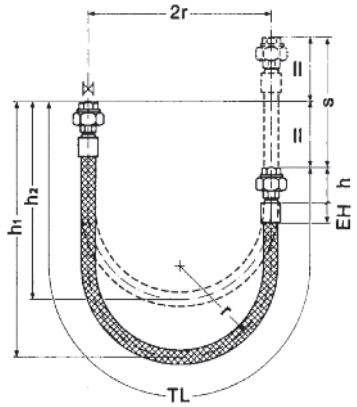
- regulation for type test
- defining of lifetime
- resistance against pressure load at increased temperature

Rules for calculation of total length of hose



90° - angle at simple bend and for small movements

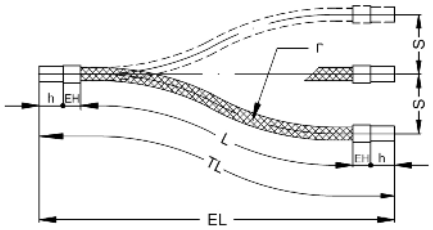
Total length TL	= 2r + 2(h + 2 EH)
Length of side a	= 1,215r + h + 2 EH
r	= bending radius at simple bend
h	= length of fitting (see “Standard range of fittings”)
EH	= length of ferrule (see “Standard range of fittings”)
a	= length of side
TL	= total length of hose



180° - angle for vertical movement

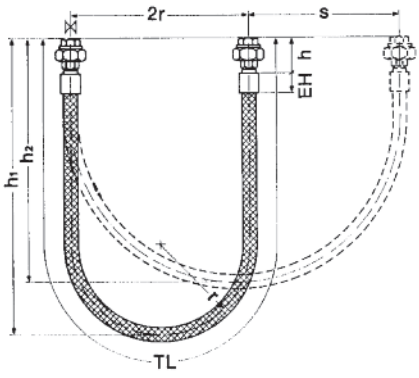
Total length TL	= 4r + 0,5s + 2(h + 3EH)
h_1	= 1,43r + 0,5s + h+ 3EH
h_2	= 1,43r + h + 3EH
r	= dynamic bending radius (tab. of individual types of hoses)
h	= length of fitting
EH	= length of ferrule
S	= movement of hose
h_1	= max. high for 180° angle
h_2	= min. high for 180° angle
TL	= total length of hose

At absorbing of side expansion



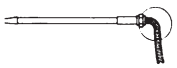
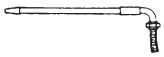
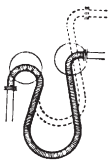
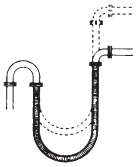
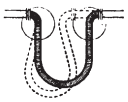
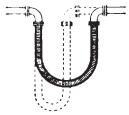
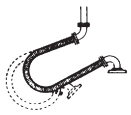
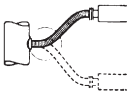
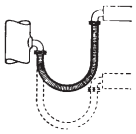
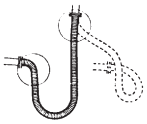
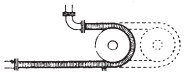
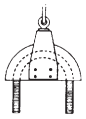
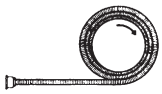
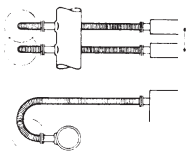
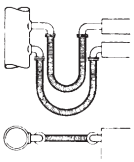
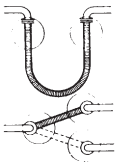
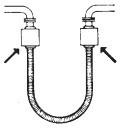
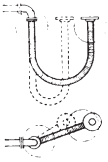
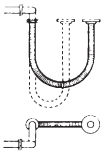
L	= $\sqrt{20rS}$
TL	= L + 2(h+EH)
EL	= $\sqrt{L^2 - S^2}$ + 2(h+EH)
L	= effective length of hose
TL	= total length of hose
EL	= building length of hose
r	= dynamic bending radius
S	= side movement from the middle of axis (max. only 25% from dynamic bedning radius)
h	= length of fitting (see “Standard range of fittings”)
EH	= length of ferrule (see “Standard range of fittings”)

180° - angle at lateral movement

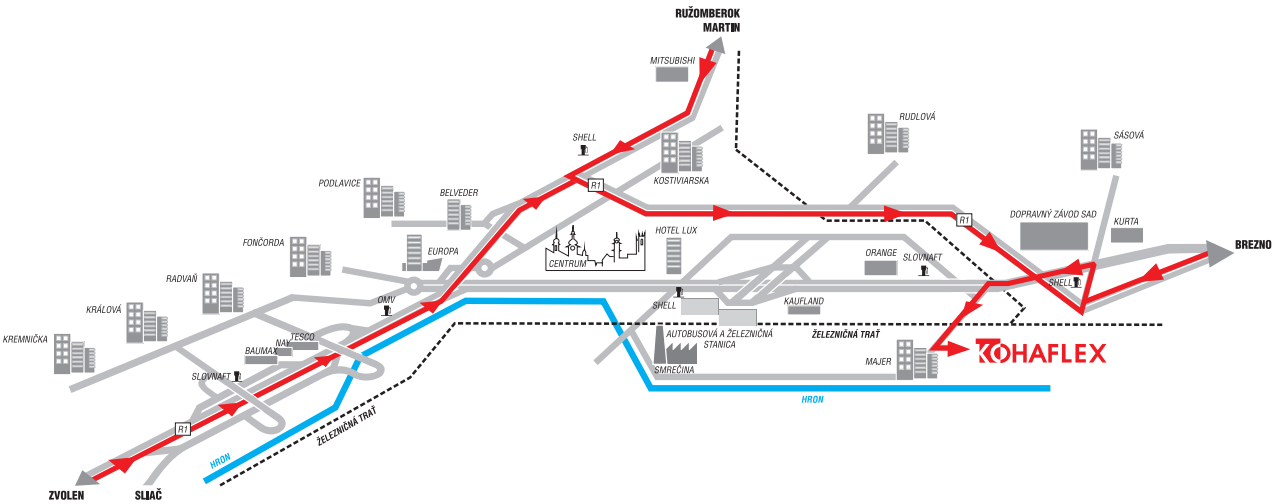


Total length TL	= 4r + 1,57s + 2(h + 3EH)
h_1	= 1,43r + 0,785s + h + 3EH
h_2	= 1,43r + 0,5s + h + 3EH
r	= dynamic bending radius (tab. of individual types of hoses)
h	= length of fitting
EH	= length of ferrule
S	= movement of hose
h_1	= max. high for 180° angle
h_2	= min. high of 180° angle
TL	= total length of hose

In case of requirement for other hose application, please contact technical department of Kohaflex and require design of optimal hose construction.

Incorrect		Correct		
Too strong bending stress right behind connection		When using fixed pipeline is heading right down		Pict. 1
Too strong bending stress right behind place of bending		The bending stress is transferred only to the middle part of the hose when using solid arches before connecting tube		Pict. 2
As in case pict. 2		As in case pict. 2		Pict. 3
Alternating bending stress and too strong bending on connections		No variable bending and little stress right behind connection if used fixed arches		Pict. 4
Alternating bending stress and too intensive bending of hose fittings		Alternating movement and bending stress fall off when using fixed arches		Pict. 5
Adverse torsional movements and torsional stress		Use at the same time moving roller carrier removes alternating movements and stress		Pict. 6
Too strong stress in bend		Reduced bending stress at acceptable level		Pict. 7
Coiled hose in any way should not by straighten by pulling one end		Straightening of hose by un-twisting from wound position		Pict. 8
Torsional stress and too strong bend right behind left connection		Remove torsion and favorable stress bending when using the fixed arches		Pict. 9
Torsional stress		In those cases, if not eliminate torque loads should be used swivel joints, that capture the torsional stress, so the hose will be stressed only in bending		Pict. 10
Torsional stress, as both connection are not in one axis		Remove stress by using fixed double arch		Pict. 11

Company KOHAFLEX holds Quality management certificate ISO 9001



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