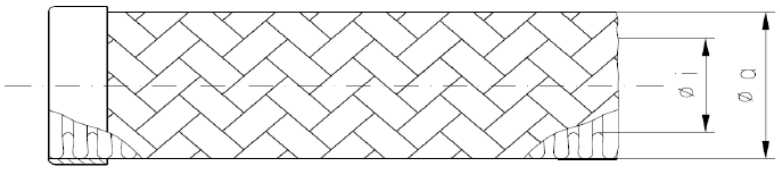
Stainless Steel Hoses
Type SE with DVGW-Approval

Stainless Steel Hose, annular corrugated



SE-0 without braiding
SE-1 one braiding

Approved in accordance to ISO 10380 / DVGW
Suitable temperature range: -270°C…+600°C
Braiding: not braided
single braided

DN6 - DN100

Typ	Nennweite	Betriebsdruck	Innen-durchmesser	Außen-durchmesser	Toleranzen	Biegeradius statisch	Biegeradius Dynamisch	Gewicht
type	*nominal diameter*	*working pressure*	*inner diameter*	*outer diameter*	*tolerances*	*bending radius*		*weight*
-	DN	bei 20°C	-	-	-	-		-
-	[mm]	[bar]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/m]
SE-0	6	18	6,1	9,6	± 0,2	15	60	
SE-1		150		10,7		25		
SE-0	8	13	8,4	12,2	± 0,2	16	124	
SE-1		132		13,6		32		
SE-0	10	9	10	14,2	± 0,2	18	130	
SE-1		100		15,6		38		
SE-0	12	7	12,5	16,9	± 0,2	20	140	
SE-1		70		18,3		45		
SE-0	16	5	16,3	21,8	± 0,2	28	160	
SE-1		64		23,8		58		
SE-0	20	3	20,3	26,6	± 0,3	32	170	
SE-1		43		28,6		70		
SE-0	25	2,5	25,4	32,3	± 0,3	40	190	
SE-1		49		34,3		85		
SE-0	32	2	34,3	41,1	± 0,3	50	260	
SE-1		35		43		105		
SE-0	40	2	40	49,6	± 0,3	60	300	
SE-1		38		52		130		
SE-0	50	1	50,5	60,5	± 0,4	70	320	
SE-1		26		62,4		160		
SE-0	65	1	65,4	80,6	± 0,4	115	460	
SE-1		25		83,5		200		
SE-0	80	1	80,2	97,8	± 0,5	130	660	
SE-1		16		100,2		240		
SE-0	100	1	100,2	119,8	± 0,5	160	750	
SE-1		10		122,5		290		

Influence of the service conditions on the metal hose design:

In view of the variety of the different applications the working pressures and bending radius stated in the technical tables can only be used as a guideline. They are valid for predominantly statical stress and room temperature (20 °C).

Bursting pressure of the hoses is a factor 4 comparing to the working pressure mentioned in the tables. Max. allowable testing pressure is 1.5 x the working pressure. The existing service conditions (i.e. pulsating and discontinuous demand, type and frequency of motion, higher working temperature etc.) exert additional demands on the hose material. These influences can be taken into account in favour of the working safety and working life of the hose assemblies. Below mentioned tables and diagrammes should be used by designing.

Single motion:

Minimum bending radius for single motion tested according to ISO 10380 7.4.2

Repeated motion:

For repeated motion without major dynamic demand.

Dynamic motion:

For dynamic motion the radius Rb is to be re-calculated according to the table with the help of the corrective factors f_t and $f_{dyn.}$

The allowed working pressure is calculated as follows:

$$P_{toel.} = P_{max.} \times f_t \times f_{dyn.}$$

$P_{toel.}$ = Allowed working pressure (bar)

P_{max} = Max. working pressure acc. to table (bar)

f_t = Reduction factor for increased temperature (without dimensions)

$f_{dyn.}$ = Reduction factor for dynamic demand (without dimensions)

The allowed bending radius is calculated as follows:

$$R_{dyn.} = \frac{R_b}{2,98}\left(1,09 + f_t \times f_{dyn.} + \frac{1}{f_t} + \frac{1}{f_{dyn.}}\right)$$

$R_{dyn.}$ = Bending radius for dynamic demand (mm)

R_b = Bending radius for repeated motion acc. to table (mm)

f_t = Reduction factor for increased temperature (without dimensions)

$f_{dyn.}$ = Reduction factor for dynamic demand (without dimensions)

Low temperature applications:

Because of icing at low temperature applications the risk of hose burst occurs.

Reduction factor for increased temperatures:

Working Temperature °C	Material X 6 CrNiTi 18 10 AISI 321 (1.4541)	Material X 2 CrNiMo 17 13 2 AISI 316L / AISI 316Ti (1.4404) / (1.4571)
-200…+50	1,00	1,00
51…100	0,96	0,94
150	0,92	0,90
200	0,88	0,86
250	0,84	0,82
300	0,80	0,78
350	0,76	0,74
400	0,72	0,70
450	0,66	---
500	0,60	---
550	0,54	---
600	0,44	---

Corrective factors for dynamic demand:

Motion / Flow*	Without vibration, low and slow motion	Low vibration, frequent uniform motion	Strong vibration, rhythmical ongoing motion
Stationary or slow uniform flow	1,00	0,80	0,40
Pulsating and swelling flow	0,80	0,64	0,32
Rhythmical and discontinous flow	0,40	0,32	0,16

* An internal liner should be used when the flow velocity of the medium is exceeding the following values:
- Hose without braiding: gas 30m/s, liquid 15m/s
- Hose with braiding: gas 45m/s, liquid 22,5m/s

Flow Velocity

High velocities should be avoided as they can lead to premature fatigue failure.

An interlock hose should be used as a liner if the velocity exeeds followings values:

- without braiding:
  30 m/s for gases
  15 m/s for liquids
- without braiding:
  45 m/s for gases
  22,5 m/s for liquids

If the hose is installed in a bend condition the above mentioned values of the flow velocity should be reduced as follows:

- at 90° beding by 50%
- at 45° by 25%
- further proportionally to the above mentioned values

Pressure Loss

As to achieve the same pressure loss as in steel pipes, the diameter of the stainless steel hose should be increase by approx. 15%.

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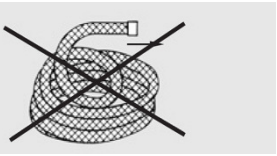
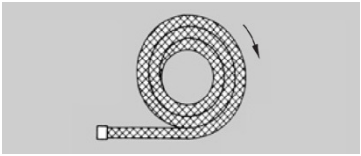
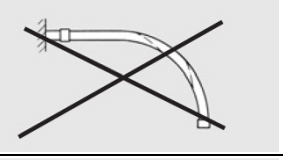
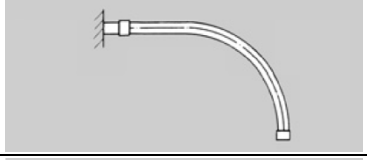
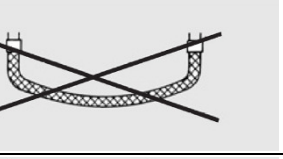
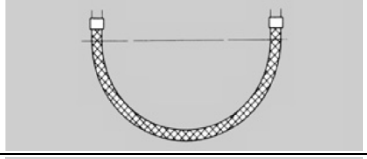
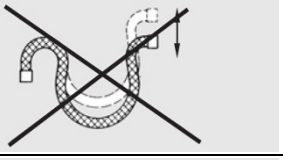
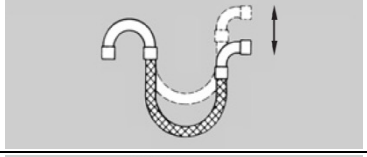
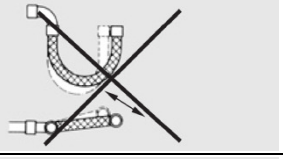
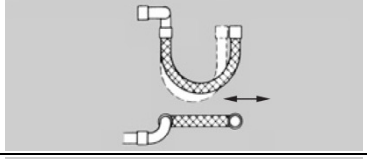
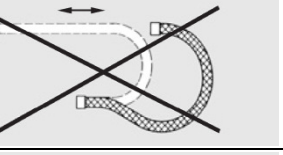
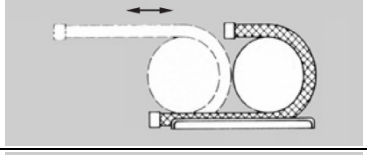
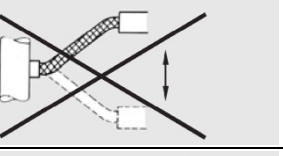
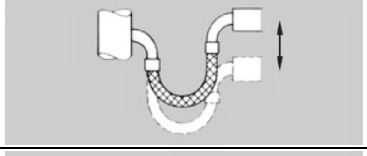
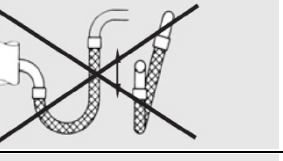
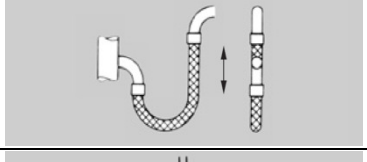
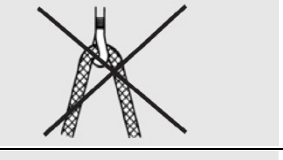
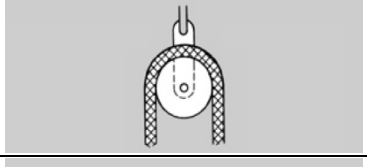
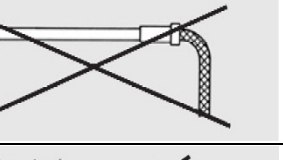
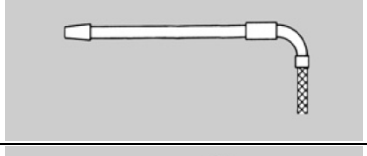
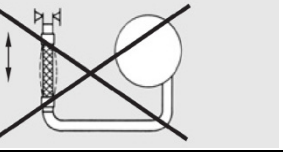
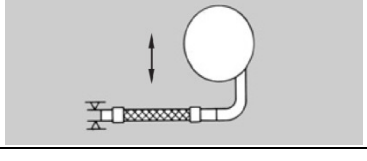
Installation instructions stainless steel hoses

WRONG INSTALLATION		CORRECT INSTALLATION
	Don’t pull the hose off – uncoil it	
	Don’t twist the hose – install it torsion-free	
	Dimension the hose adequately – take care that the flexible length is not too short	
	Avoid excessive bending of the hose – use pipe bends	
	Don’t move the hose obliquely to the installation plane – move it in hose axis only	
	Avoid sagging of the hose – use a support	
	If larger axial movement has to be absorbed: Don’t install the hose in a straight line – install it in a U-shaped bend	
	Avoid torsional twist when fittings are not in line – install in one plane only	
	Avoid over bending when suspending the hose – use a support roll	
	Avoid excessive bending of the hoses at their ends – use pipe bends	
	Don’t absorb vibrations in the axial direction – install the hoses vertically to the direction of movement	

Installation instructions stainless steel hoses

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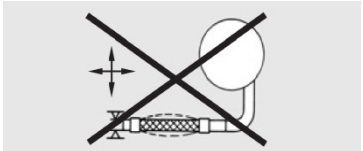
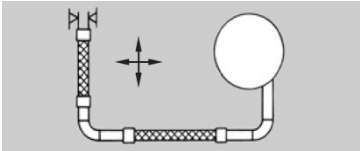
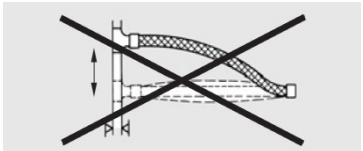
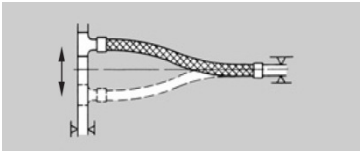
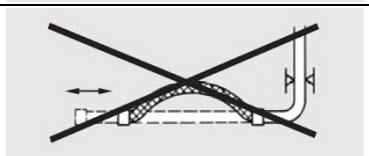
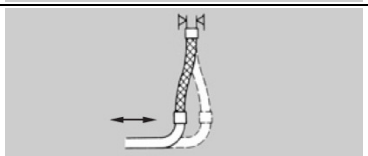
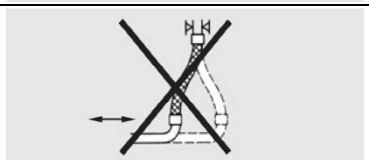
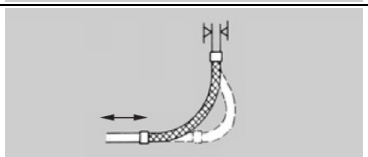
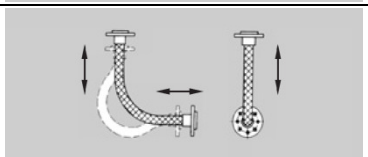
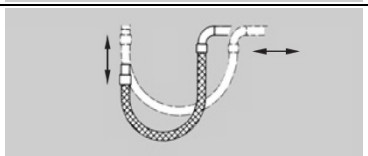
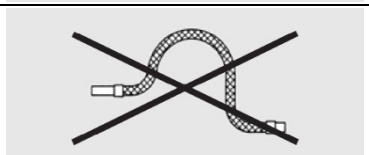
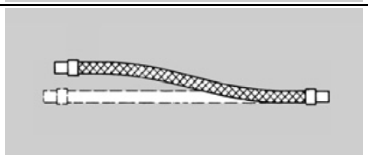
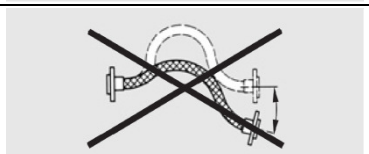
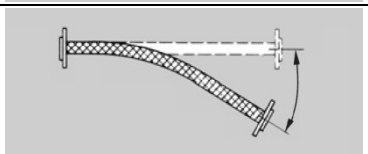
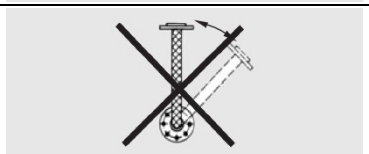
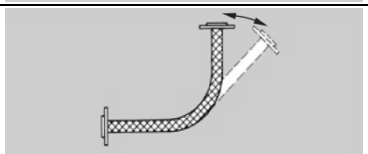
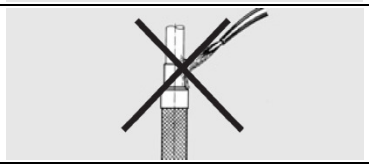
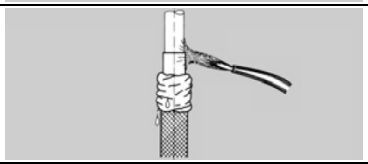
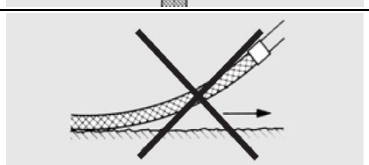
	Don't absorb vibrations from several directions by one single hose – install several hoses in a 90°C angle line	
	Don't allow the hose to move in one direction only – centre it to permit absorption of half of the movement in both directions	
	Don't permit axial movements – install the hose vertically to the direction of movement	
	Avoid large lateral movement – install the hose in a 90°C	
	Avoid torsion – the hose bend and the direction of movements must be in the same plane	
	Avoid excessive bending of the hoses at their ends – use pipe bends	
	Don't use any length – dimension the exact length	
	Take care that the flexible length is not too long – dimension the exact length	
	Avoid torsion due to angular movements – all movements in hose axis only	
	Keep the welding torch away from the hose – cool the connecting seam between the hose and the fittings – don't overheat it	
	Don't drag the hose on the floor without any protection – avoid damage by using an outer protection cover