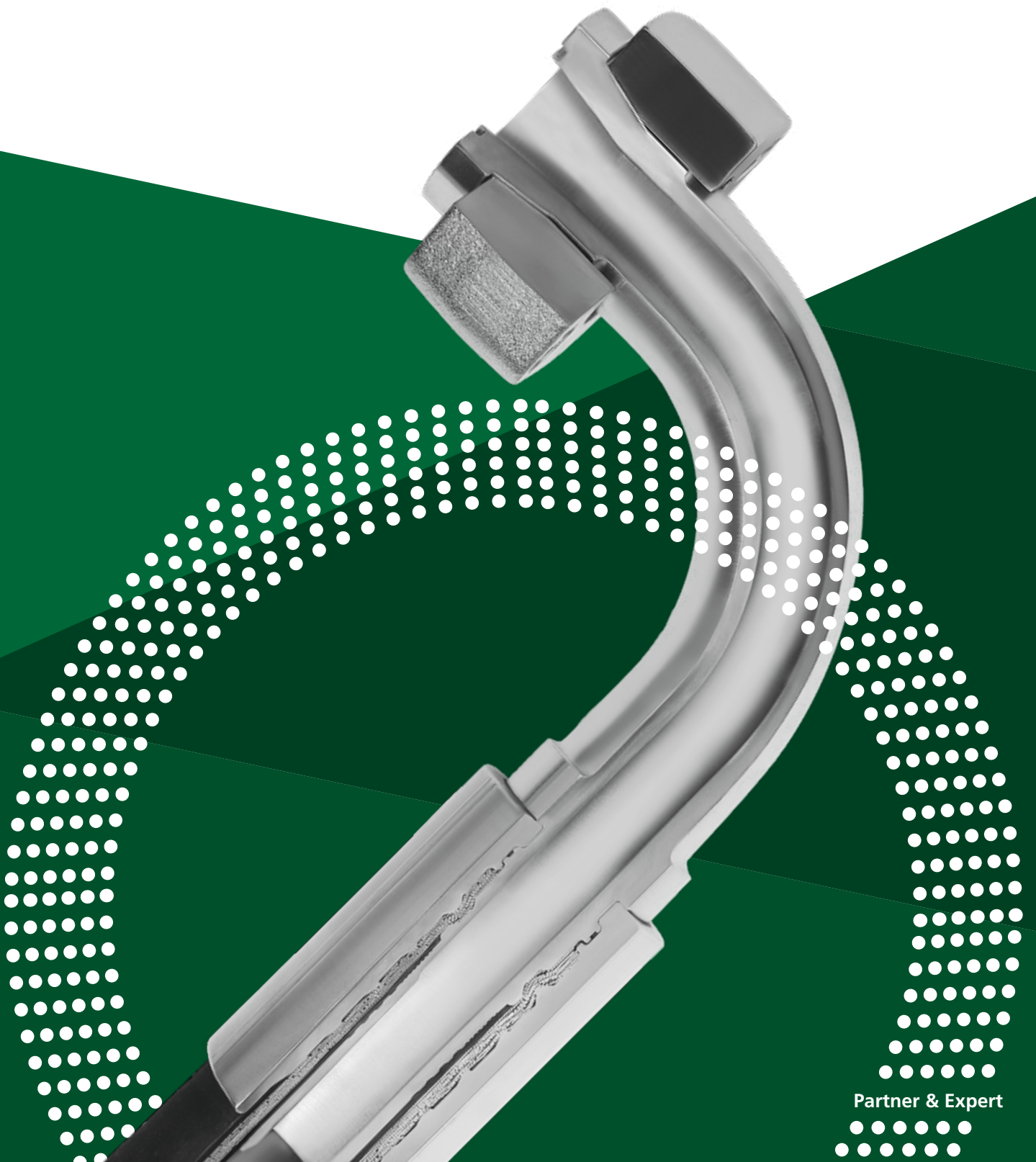


# HDS

## SPIRAL HOSE ASSEMBLIES

with Safety Couplings for Extra-High Pressures



Partner & Expert

With more than 60 years of experience, HDS is the leading manufacturer of spiral hose assemblies with safety couplings for extra high pressures. The long-term reputation of the company is found in the brand name HDS – Hydraulik, which when translated from German is “high pressure hose assemblies”. Since its humble beginnings in a garage, HDS has become a success story based around technological advancement. Many of the company’s state of the art inventions have become common place in the global hose and fitting industry.

With continued technological advancement HDS is always looking to set new standards and limits as well as boundaries. New innovations are established within the customer base which are replacing previous standards with new and important advantages.

HDS remains the driving force in the market place, always focused on advanced technology, and providing an important contribution to keep their customers competitive.

### Hose and couplings

Our hose material is produced by well-known and reputable partners according to our own specifications and privately branded with the HDS logo.

According to the HDS work standard, all tolerances are more stringent, and the technical as well as hydrostatical properties are designed for much higher requirements. The connection of our couplings and ferrules shows a technological unity where visibly all components are matched with each other. It is required not only to fulfill normative regulations, but also to provide sufficient safety reserves under extreme environmental impacts, pressure peaks or even the ongoing aging process.

Together with our experts, we are in a position to fulfill individual inquiries and develop customized solutions for the hose material. It is necessary that we continue to further develop the performance of the inner tube compound and whole hose structure in order to cope with the increasing expectations of the market in the future.

### OEM-focus

HDS operates in a unique position of a close partnership with the manufacturer through their customer protection agreement. This cooperation results in a mutual trust knowing that our products are not automatically available for the aftermarket or the end user business.

Our customers rely on the fact that HDS spiral hose assemblies can’t be sourced by local dealers or relevant sales channels. Under these circumstances HDS can define a mutual strategy with original components in each country. The support abroad is generated by our daughter companies, or workshops at our customers subsidiaries which reduce delivery times and reliance on import activities.

On request we are planning hose workshops for our customers starting from the layout, required equipment, installation and training of selected employees.



### HDS spiral hose assemblies

In all sizes and versions HDS offers spiral hose assemblies for up to 420 bar working pressure or 6000 PSI. Hose material suitable for 560 bar, combined with a special outer cover material, is also available on demand. In addition to our standard connections, there are also special couplings or multiple bended elbow couplings available. The definition and description of the assemblies are provided by HDS.

### HDS braided hose assemblies

In addition to our high pressure portfolio we offer braided hose assemblies based on the specifications DIN/EN 857 and DIN/EN 853. Within the design of the couplings and ferrules we have incorporated important features from our spiral hose technology in order to achieve higher performances, greater impulse results and also longer life cycles on the machines. The braided hose varieties are displayed in a separate catalogue.

### HDS innovations

In addition to innovations based around hose assemblies, HDS offers a large variety of new components that offer solutions for higher working pressure conditions, and new dimensions in order to reduce pressure losses. These inventions reduce installation space, sealing points, weight, and normally the assembly time. The innovations are summarized in our folder "ideas and inspirations for designers" where separate brochures are available on demand.

### HDS engineering

The growth in expertise and the increase in network of specialists, consultants and laboratories has enabled HDS to become a competent partner for engineering related solutions. For many of our customers we are assisting in engineering projects in areas such as prototypes, machine manufacturing, ERP interfaces and other customer related projects.

### HDS machines and equipment

Almost all production machines are designed by HDS and are dedicated towards the advanced performance levels in a series production environment. The focus of these machines is to exceed alternatives in the marketplace in regards durability, accuracy, speed and overall quality. In order to produce HDS hose assemblies we recommend our equipment and devices in order to control all quality areas.



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### HDS-North

Administration | Production | Spiral hose assemblies



### HDS-South

Administration | Production | Braided hose assemblies

### HDS-North

#### **HDS Hydraulik GmbH & Co. KG**

Werner-von-Siemens-Straße 14  
51647 Gummersbach  
Germany

Fon +49 2261 8198-0

info@HDS-Hydraulik.com

### HDS-South

#### **HDS Hydraulik GmbH & Co. KG**

Hückeswagener Straße 10  
51647 Gummersbach  
Germany

Fon +49 2261 8198-0

info@HDS-Hydraulik.com





### HDS Hydraulik GmbH & Co. KG

Fon +49 2261 8198-0  
info@HDS-Hydraulik.com  
www.hds-hydraulik.com



**HDS**  
Germany

### HDS Österreich GmbH

Fon +43 732 371332  
info.at@HDS-Hydraulik.com  
www.hds-hydraulik.com



**HDS**  
Austria

### HDS Hoses Dalian Co. Ltd.

Fon +86 411 8757 3535  
Wenhai.Zhou@hds-hoses.com  
www.hds-hydraulik.com

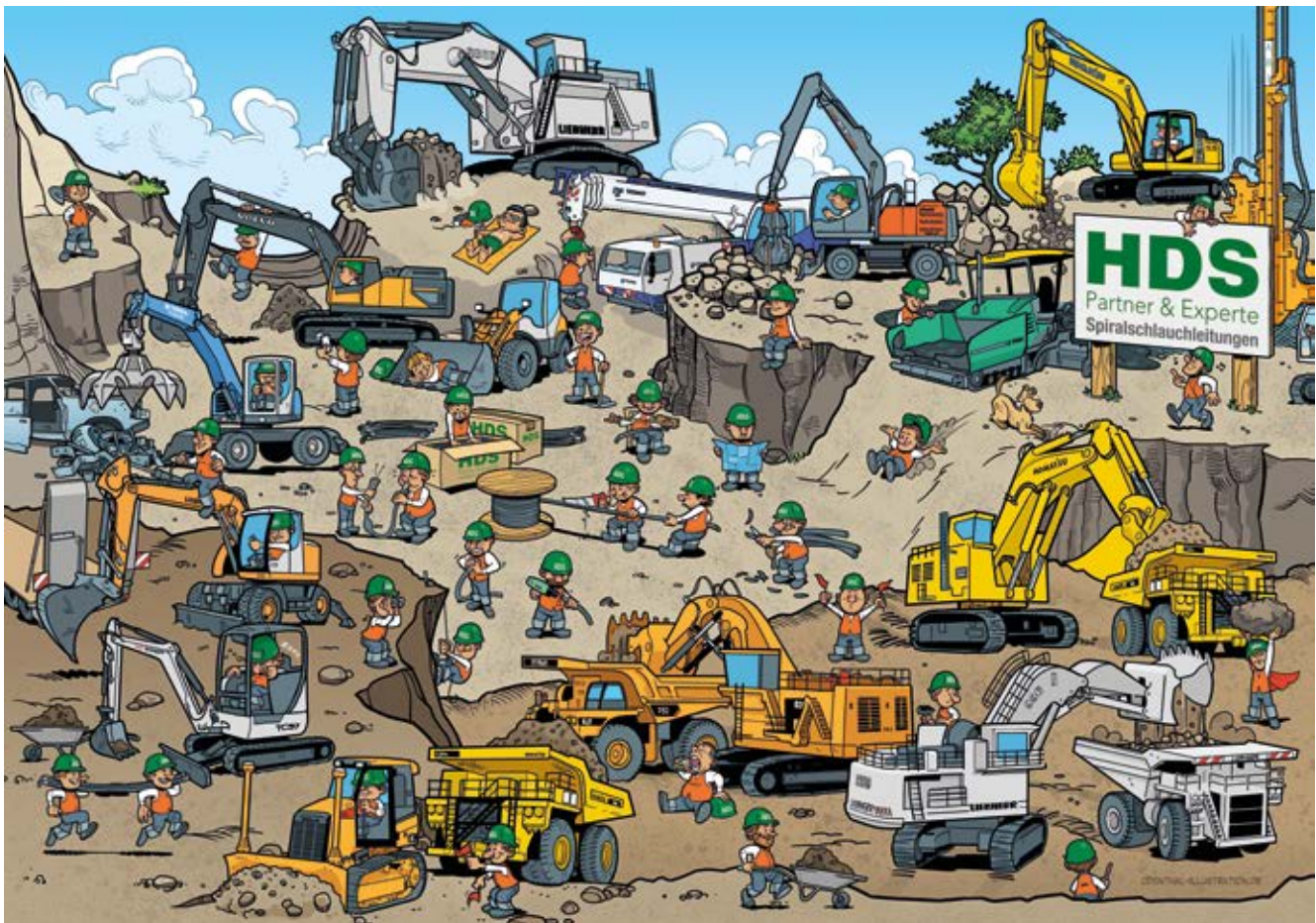
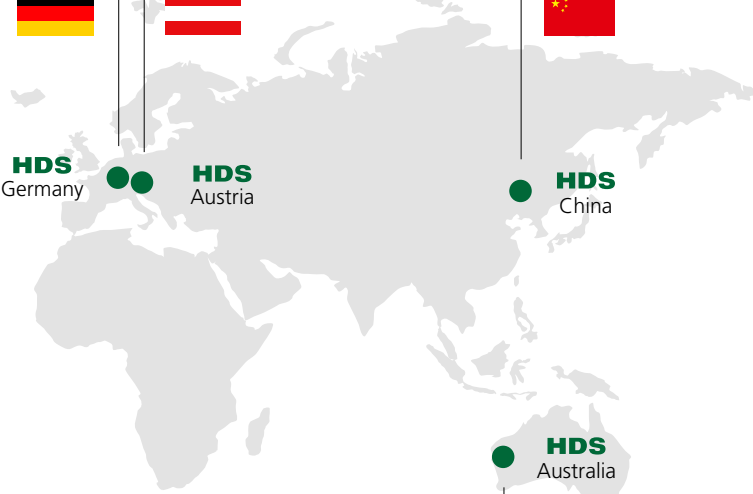


**HDS**  
China

**HDS**  
Australia

### HDS Hoses Australia Pty. Ltd.

Fon +61 892 740020  
info-Aus@HDS-Hoses.com  
www.hds-hydraulik.com



- 1965** DKO couplings with o-ring seal
- 1970** Swaged couplings with an interlock design
- 1971** Anti-kink sleeves
- 1971** One-piece elbow couplings
- 1975** First swaging press from Rawlings
- 1976** First test benches for proof pressures up to 800 bar
- 1986** Double nipple couplings
- 1990** First brazing oven
- 1991** New HDS factory in Gummersbach Windhagen
- 1996** Factory extension
- 1998** Patented SK6 couplings with reinforced full flanges
- 2002** Modernisation of the production and relevant processes
- 2005** Patented bending tools, V+K angle setting device, test bench and test adapters
- 2005** Installation of the second brazing oven
- 2006** Patented hose cutting machine
- 2006** Opening of the HDS subsidiary in Australia
- 2007** Patented double connector DA6
- 2009** Installation of the impulse testing machine, patented SKM6 coupling
- 2009** Certification acc. to DIN EN ISO 9001:2008
- 2010** Opening of the HDS subsidiary in China
- 2011** Patented SV6 connection concept, patented FA6 testing ports on flanges and MA6 port distribution
- 2012** Registration of the brand name „HDS“ and „HDS-Hydraulik“
- 2012** Introduction of the HDS work standard
- 2012** Move into the branch „HDS-South“ in Gummersbach
- 2013** Patented new dimensions in 6-ply wire DN36, DN45 and DN57
- 2014** Compatibility matrix for various oil mediums
- 2015** Optimization of material flow in production and warehouse
- 2016** Introduction of a new ERP-System
- 2017** Opening of the HDS subsidiary in Linz (Austria)
- 2018** Increase of the production capacities
- 2019** Installation and expansion of several workshops in Russia, Indonesia and Ukraine
- 2020** New HDS website
- 2020** Introduction of innovative and automated manufacturing processes
- 2021** New HDS catalogue

Due to the availability of many different fitting variations HDS spiral hose assemblies can be adjusted perfectly to almost all individual installations. In order to achieve a precise definition of the assembly please refer to the breakdown example below.

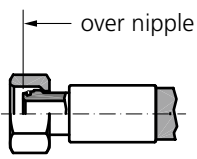
Very complicated assemblies should be defined in drawings.

	<i>Hose dimension</i>	<i>Hose type</i>	<i>Lengths</i>	<i>Connection size</i>	<i>Elbow of the first coupling</i>	<i>First head size connection</i>	<i>Elbow lengths first coupling</i>	<i>Full flange 6000 PSI</i>	<i>K angle setting see page 10</i>	<i>Connection size</i>	<i>Elbow of the second coupling</i>	<i>Second head size connection</i>	<i>Elbow lengths second coupling</i>	<i>Full flange 6000 PSI</i>	<i>V angle setting elbow coupling</i>	<i>Wire guard</i>	<i>Coupling series</i>
<b>Example 1:</b> S46 elbow coupling, one size step size	NW32 / L46 x 1000	1.½"	90° SF6	H120	K270° / 1.¼"	90° SF6	H120	V180° + SS	S46								
<b>Example 2:</b> Standard elbow coupling	NW32 / L46 x 1000	1.¼"	90° SF6	H120	/ 1.¼"	90° SF6	H120	V270°	S46								
<b>Example 3:</b> Standard coupling, straight	NW32 / L46 x 1000	1.¼"	SF6	+ VF6	/ 1.¼"	SF6	+ VF6	S46									

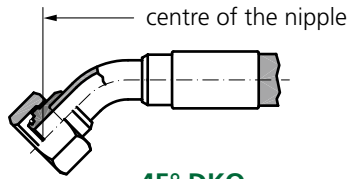
### Explanations

1. The connection size must be defined for each coupling.
2. The angle settings of couplings must be defined before the head size connection for example 90°SF6.
3. The elbow length H must be placed behind the defined elbow coupling for example 1.1/2"90°SF6 H120.
4. Both coupling codes must be separated by a slash for example 1.1/4"SF6 / 1" SF6.
5. The description of loose connections is based on the above example followed by the hose dimension and the coupling series for example 1.1/2"90°SF6 H120 NW 32 S46.
6. The K angle setting defines the position of elbow couplings in regards to the natural curvature of the hose material see page 10.
7. In cases where the SAE flange coupling requires also a full flange the relevant code of the flange must be added afterwards for example SF6 + VF6.

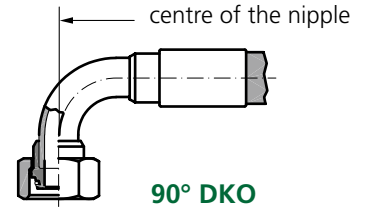




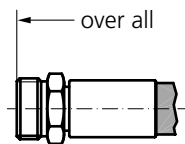
**DKO straight**



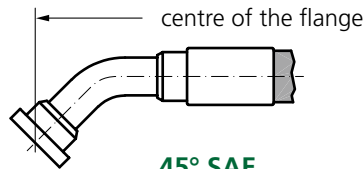
**45° DKO**



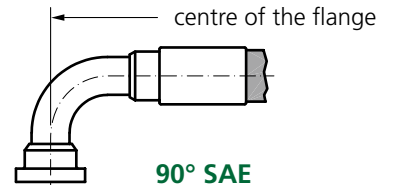
**90° DKO**



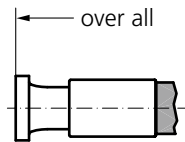
**CES straight**



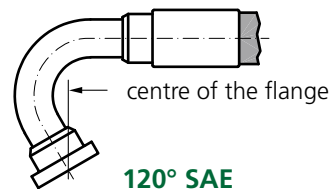
**45° SAE**



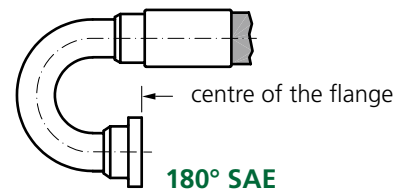
**90° SAE**



**SAE straight**



**120° SAE**



**180° SAE**

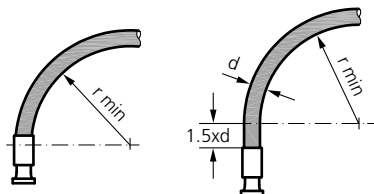
### HDS-Length tolerances acc. to DIN EN 856 but in reduced definition

Hose length [mm]	Internal target: +1% / -0,5% of the overall length								
	<300	<500	<700	<900	<1.100	<1.250	1.250 - 2.500	2.500 - 6.000	>6.000
up to NW 25	+3 mm	+5 mm	+7 mm	+9 mm	+11 mm	+12,5 mm	+20 mm / -6 mm	+25 mm	+40 mm
NW32 - NW 50	-1 mm	-2 mm	-3 mm	-4 mm	-5 mm	-6 mm	+25 mm / -6 mm	-6 mm	-6 mm

Permitted tolerances for K- and V-angle settings  $\pm 3^\circ$

## Installation instructions

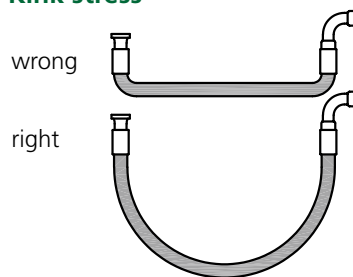
### Kink stress



wrong

right

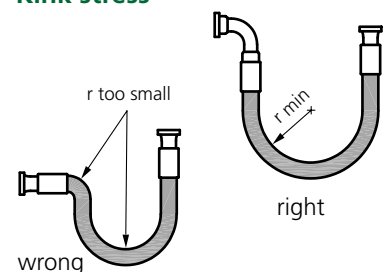
### Kink stress



wrong

right

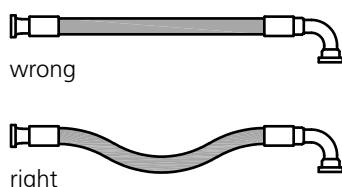
### Kink stress



wrong

right

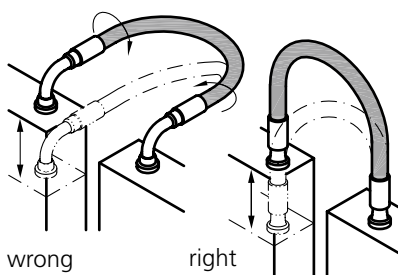
### Tensile stress, assembly too short



wrong

right

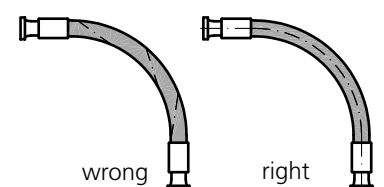
### Torsion stress



wrong

right

### Torsion stress



wrong

right

### Definition of angle settings between elbow couplings on both sides with the V angle – V –

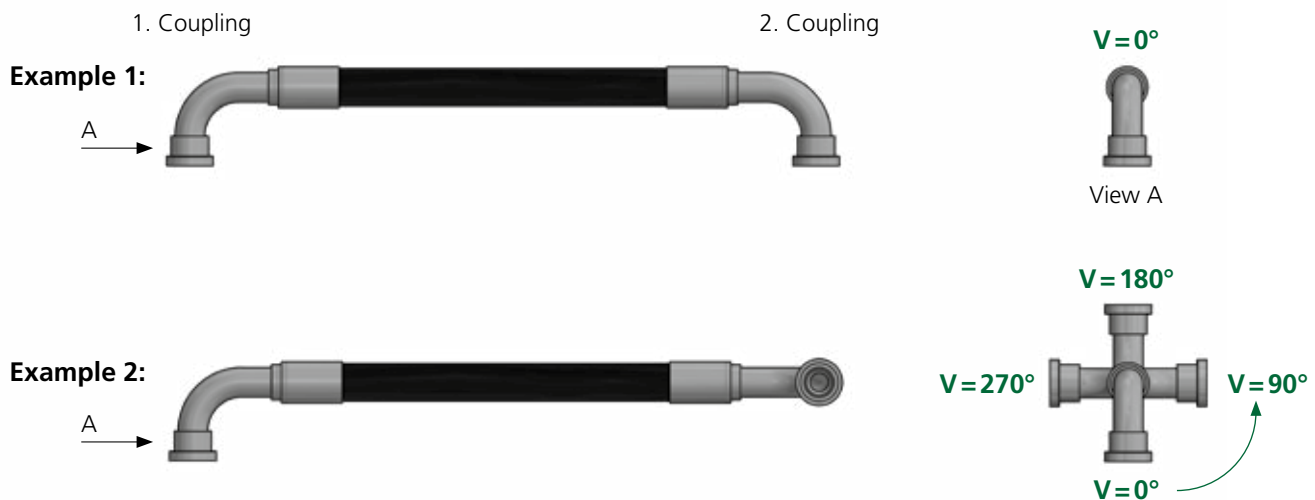
Without indication of a V angle both elbow couplings of the assembly are following the natural curvature of the hose material in neutral position  $V=0^\circ$ .

**Example 1:** NW32/L46 x 1000 1.1/4" 90°SF6 H100 / 1.1/4" 90°SF6 H120 ( $V=0^\circ$ ) S46

The individual V angle between both elbow couplings must be defined with the following description:

The first elbow coupling follows under consideration of the K angle towards the front downwards. The second elbow coupling must be adjusted by  $X^\circ$  anticlockwise as shown in the below examples. The required V angle must be added to the hose definition as follows:

**Example 2:** NW32/L46 x 1000 1.1/4" 90°SF6 H100 / 1.1/4" 90° SF6 H120  $V=90^\circ$  S46



### Definition of the V angle combined with the special angle – K –

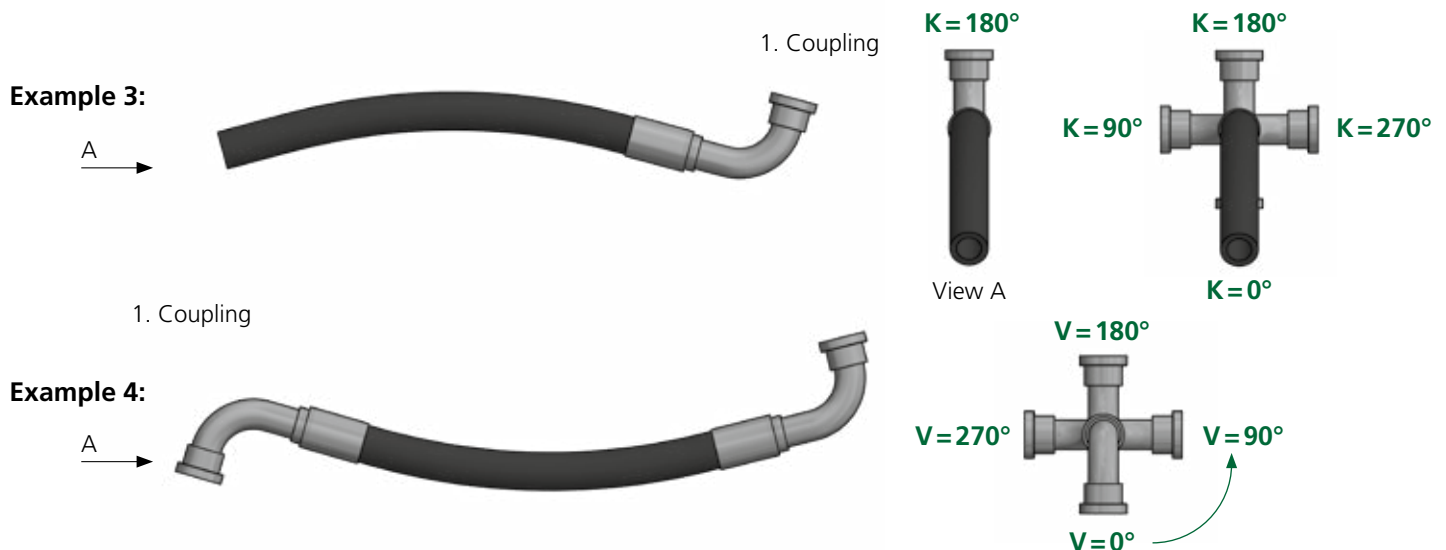
In cases where the elbow coupling of an assembly should not follow the natural curvature of the hose material ( $K=0^\circ$ ) it must be defined with the special angle K. It considers the angle setting of the elbow coupling regarding the natural curvature as shown in the below drawings.

**Example 3:** NW32/L46 x 1000 1.1/4" 90°SF6 H120  $K=180^\circ$  / ...

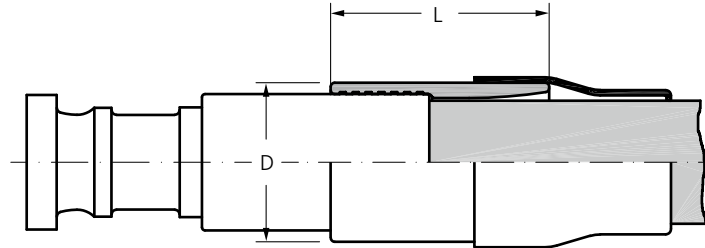
On assemblies with elbow couplings on both sides the first already swaged elbow coupling shows to the front downwards, the opposite connection must be adjusted towards the V angle by  $X^\circ$  anticlockwise and after that to be swaged.

**Example 4:** NW32/L46 x 1000 1.1/4" 90°SF6 H120  $K=180^\circ$  / 1.1/4" 90°SF6 H120  $V:180^\circ$  S46

On assemblies with an elbow and a straight coupling the required K angle will be considered in relation to the elbow coupling. The required K angle must be stated in relation to the elbow coupling and swaged as described before.



The anti-kink-sleeves in one-piece version – **KSE** – ensure that the hose material runs straight out of the coupling. It avoids the premature damage of the hose material working under extreme flexing conditions.



Ozone-resistant rubber caps avoid the penetration of dirt and rainwater.

Item	NW	Series	KSE (Anti-kink-sleeves)				Rubber caps			
			Art. no.	L [mm]	D [mm] <small>(swaging diameter)</small>	Weight [g]	Art. no.	L [mm]	D [mm]	Weight [g]
1	<b>12</b>	<b>S4</b>	2440	52	32	115	-	-	-	-
2	<b>16</b>	<b>S4</b>	2828	58	35,8	150	-	-	-	-
3	<b>20</b>	<b>S46</b>	3220	65	40,5	210	-	-	-	-
4	<b>25</b>	<b>S46</b>	5300	70	48,3	290	-	-	-	-
5	<b>32</b>	<b>S46/S46E</b>	8012	85	60,3	530	9883	75	63,5	37
6		<b>S6E</b>	8380	90	66	710	9885	75	69	43
7	<b>40</b>	<b>S6E</b>	8424	110	76,7	1260	9887	95	80,2	64
8	<b>50</b>	<b>S6E</b>	8470	120	91,4	1640	9889	111	95	95
9	<b>65</b>	<b>S6E</b>	30007	135	106,4	2380	30009	112	110	110

## Protective sleeves

HDS spiral hose assemblies can be covered by protective sleeves in order to prevent damages of the outer cover. The right product must be chosen under consideration of the routing, environmental impacts and the individual conditions on site. Detailed informations are summarized in our folder „Protective sleeves“.

Heat protection hose **HS**



Textile cover **BB**



Plastic spiral guard **KSS**



Steel wire spring guard **SS**



### HDS – spiral hose material

Our standard hose types L4, L46 or L6 with 4 or 6 ply steel wires in combination with the coupling series S4, S46, S46E and S6E represent a successfully proven portfolio that operates under the highest requirements in the market place. In all dimensions and specifications relevant pressure rates and quality features such as DIN/EN 856, types 4SP, 4SH, R13 or acc. SAE 100 R15 are exceeded.

In addition to the standard hose types L4, L46 and L6 produced with an inner tube compound of NBR, further compounds are also available on demand.

**A-version** with much greater abrasion resistant cover material:

- 20 times better in comparison to the HDS standard hose material
- 100 times better in reference to the norm EN856:2015

**Hose descriptions L4 A, L46 A, L6 A**

**C-versions** with cold resistant cover material suitable for arctic conditions down to -55°C.

**Hose descriptions L4 C, L46 C, L6 C**

**CR-versions** with inner tube compound on CR-basis suitable for installations with emulsions or oil mediums based on water-glycol mixtures.

**Hose descriptions L4 CR, L46 CR, L6 CR**

**X-versions** with more flexible hose material suitable for limited installation spaces and small bending radii.

**Hose descriptions L4 X, L46 X, L6 X**





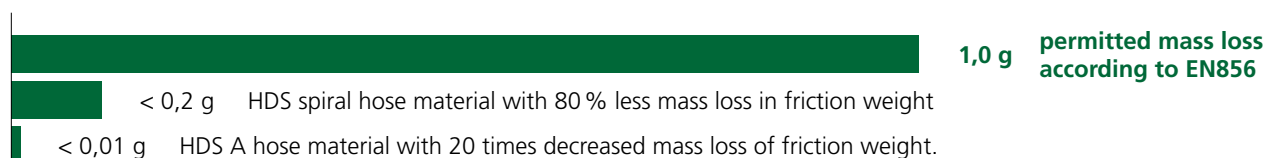
The following quality features distinguish HDS spiral hose material from many other suppliers in the market place.

- Ozone resistant outside cover compound over 300 hours -50 pphm according to ISO 10960 under dynamic conditions. Alternatively under same parameters but according to EN ISO 7326 under static conditions.
- Outside and inside rubber compound suitable for a temperature range from -45°C up to 120°C (recommended permanent temperature up to 100°C)
- The outside rubber compound in the cold resistant C hose specification is suitable for temperatures down to -55°C.
- Increased working pressure and burst pressure rates including hydrostatic performances in all dimensions.
- The ratio between working pressure and burst pressure is 1:4.
- Impulse test resistance up to 2 Mio. cycles according to ISO 6802 under rotating conditions.
- Reduced tolerances of the hose material compared to ISO 4671 and under consideration of the concentricity (max. deviation of the wall thickness).
- Increased compatibility based on the HDS assessment matrix replicating long term aging with various oil mediums.

This examination is based on the ISO 1817 up to 2000 hours and following parameters:

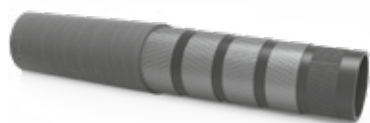
- Shore hardness
- Volume change
- Tensile strength
- Elongation at break

- Deviations in total length under working pressure including twisting much lower according to EN ISO 1402.
- Adhesion between the layers and between lining and reinforcement as well as between cover and reinforcement much stronger compared to EN ISO 8033.
- Abrasion resistance of the outer cover compared to EN 856 according to the following illustration:



For the standard hose material as well as for the cold resistant C hose material the mass loss in friction weight with 5 kg vertical force and 2000 strokes should not exceed 0,2 g according to EN 856. The A hose material provides a mass loss of lower than 0,01 g under the same testing conditions.

- Embossed private branding with unique features, traceability and exact production date.

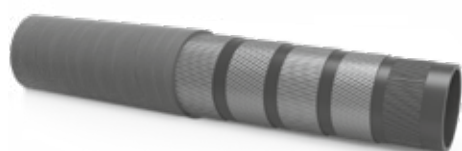


**Spiral hose type: L4**  
with 4-ply steel wire  
also valid for the versions: **A, C and CR**

Item 1-4: > EN 856/4 SP

Item	NW [mm]	Hose type	Outside-Ø ± 0.5 [mm]	Working pressure dynamic [bar]	Burst pressure (bar)	Bending radius [mm]	Weight [kg/m]	Coupling range
1	6	L4	17,8	600	2.400	150	0,6	S4
2	10	L4	20,5	500	2.000	180	0,7	S4
3	12	L4	24,0	450	1.800	230	0,8	S4
4	16	L4	27,0	420	1.680	250	1,0	S4

Hose material in NW8 is not available. The dimension NW 10 is available in connection NW 8.  
Hose specifications: see [page 12/13](#)

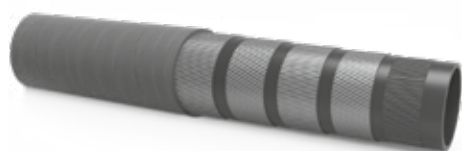


**Spiral hose type: L46**  
with 4-ply reinforced steel wire  
also valid for the versions: **A, C and CR**

Item 5-6: > EN 856/4 SH

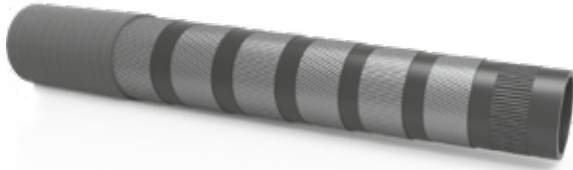
Item	NW [mm]	Hose type	Outside-Ø ± 0.5 [mm]	Working pressure dynamic [bar]	Burst pressure (bar)	Bending radius [mm]	Weight [kg/m]	Coupling range
5	20	L46	32,0	450	1.800	280	1,5	S46
6	25	L46	38,2	450	1.800	340	2,1	S46
7	32	L46	49,2	425	1.700	420	3,4	S46 S46E
8	40	L46	57,0	350	1.400	500	4,0	S46E
9	50	L46	70,6	280	1.120	630	5,3	S46E

Hose specifications: see [page 12/13](#)



**Spiral hose type: L4 X, L46 X and L6 X**  
for increased flexibility  
and reduced bending radii

Item	NW [mm]	Hose type	Outside-Ø [mm]	Working pressure dynamic [bar]	Burst pressure (bar)	Bending radius [mm]	Weight [kg/m]	Coupling range
10	10	L4 X	20,2	420	1.680	65	0,7	S4
11	12	L4 X	22,9	420	1.680	90	0,8	S4
12	16	L4 X	24,2	420	1.680	100	1,1	S4
13	20	L46 X	30,7	420	1.680	120	1,5	S46
14	25	L46 X	37,3	420	1.680	150	1,9	S46
15	32	L6 X	49,6	420	1.680	250	3,2	LB31
16	40	L6 X	56,4	420	1.680	300	4,5	LB38

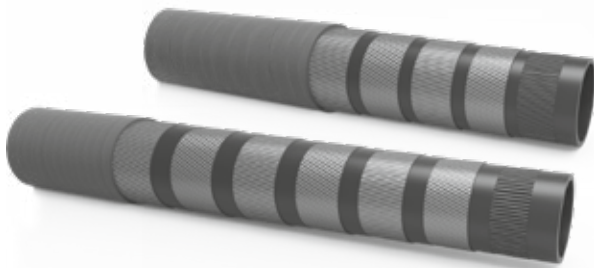


**Spiral hose type: L6**  
with 6-ply reinforced steel wire  
also valid for the versions: **A, C and CR**

Item	NW [mm]	Hose type	Outside-Ø [mm]	Working pressure dynamic [bar]	Burst pressure (bar)	Bending radius [mm]	Weight [kg/m]	Coupling range
17	32	L6	52,0 ± 0.6	525	2.100	430	4,3	S6E
18	36	L6	55,7 ± 0.6	475	1.900	460	4,8	S6E
19	40	L6	59,0 ± 0.6	475	1.900	500	5,3	S6E
20	45	L6	66,3 ± 0.6	450	1.800	580	6,0	S6E
21	50	L6	72,6 ± 0.7	420	1.680	630	6,8	S6E
22	57	L6	80,0 ± 0.7	400	1.600	730	7,7	S6E
23	65	L6	87,0 ± 0.7	350	1.400	800	9,3	S6E

Hose specifications: see [page 12/13](#)

Spiral hose types with 8 or 10-ply steel wires are available on demand.



**Spiral hose type: L49 and L69**  
with 4 or 6-ply reinforced steel wire

Item	NW [mm]	Hose type	Outside-Ø [mm]	Working pressure dynamic [bar]	Burst pressure (bar)	Bending radius [mm]	Weight [kg/m]	Coupling range
24	20	L49	33,5 ± 0.6	560	2.240	280	1,7	S49E
25	25	L69	41,2 ± 0.6	560	2.240	350	2,9	S69E



### Reliable interlock design

Coupling series: **S4**  
Swaging couplings with anti-blow-out safety device.  
Hose type: **L4** NW 6 - 16



Coupling series: **S46**  
Swaging couplings with anti-blow-out safety device.  
Hose type: **L46** NW 20 - 32



Coupling series: **S46E**  
Swaging couplings with anti-blow-out safety device.  
Hose type: **L46** NW 32 - 50



Coupling series: **S6E**  
Swaging couplings with anti-blow-out safety device.  
Hose type: **L6** NW 32 - 65



In all dimensions and versions our couplings within the series S4, S46, S46E and S6E provide a very reliable interlock zone. After removing the inner and outer rubber material over a certain length the steel wires are permanently connected with the coupling after the swaging process.

The conical nipple combined with the micro and macro grooves provide a progressive sealing performance and tolerance compensation within the swaging section.



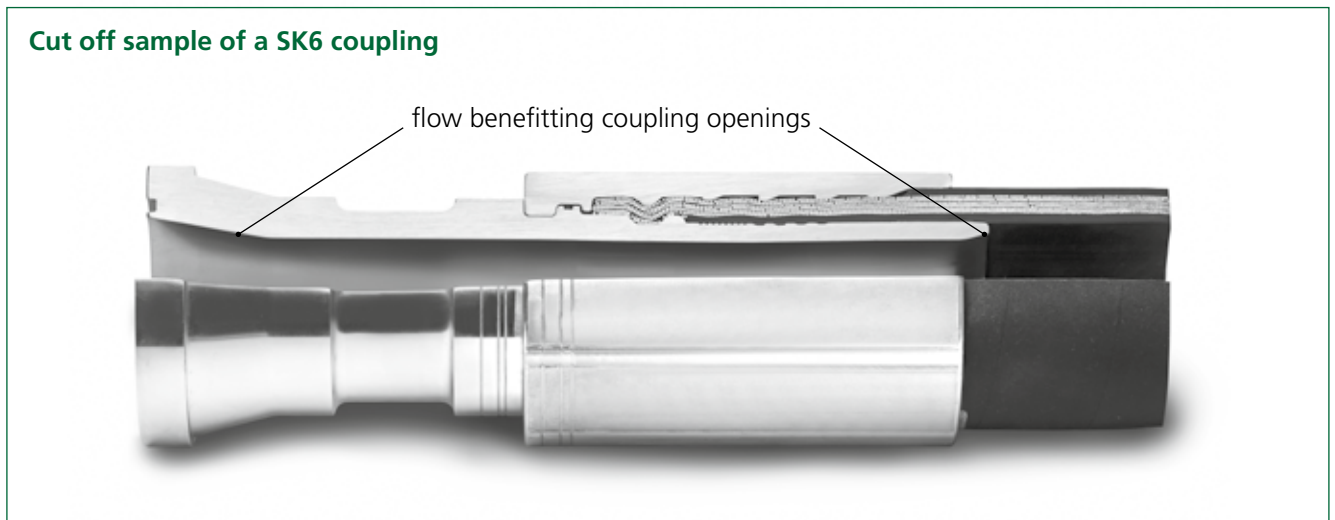


### Flow benefitting couplings

The inside diameter and especially the design of the slants on both coupling ends have an essential impact on the flow performance in the field.

Without weakening the stability of the couplings we have optimized the nipple openings and tested significant advantages in laboratories.

These improvements are evidenced in diameters starting from DN32 and larger where the volume flow passes stronger coupling material. With our patented SK6 couplings we can optimize the volume flow as shown in the below illustration.

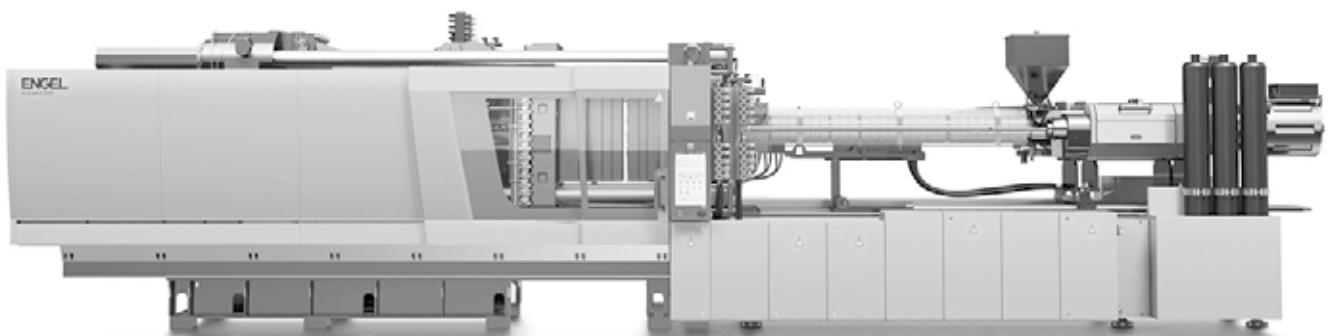


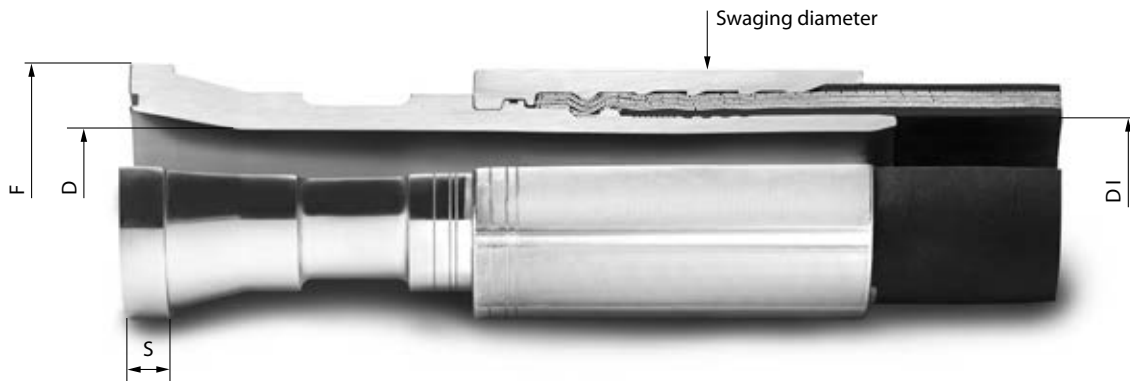
### SK6 couplings with reduced step size heads

On our patented SK6 couplings the inside diameter even in reduced step size heads remains the same as in the relevant standard hose dimension. In order to avoid negative flow restrictions this coupling series can provide significant advantages. Further information and measurement data is displayed in the pages 45 and following.

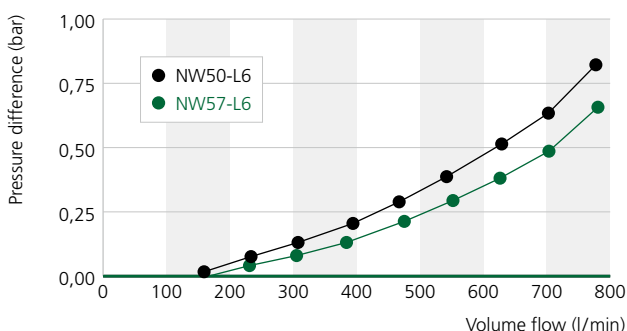
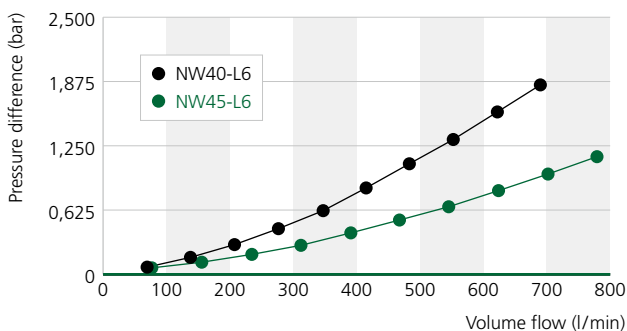
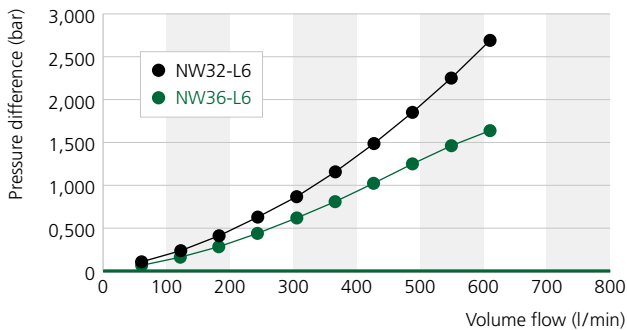
### Intermediate dimensions (Further information is summarized on the following page)

Based on our SK6 couplings we have introduced our intermediate dimensions for improved flow rates in NW36, NW45 and NW57. In comparison to our standard versions these spiral hose types provide a very good balance between stiffness and flexibility. Furthermore they provide almost the same hydrostatical performances as the next smaller standard dimensions NW32, NW40 and NW50. Further informations are summarized on the next page.





Item	NW	Head connection	Working pressure [bar]	Flange			Δ Diameter comparison	DI	Swaging-Ø [mm]	Hose
				F	S	D				L6 Coupling S6E
1	32	1¼"	475	57,5	11,0	24,0	100%	32,1	56,5	x
2	36	1¼"				28,0	136%	36,0	61,3	x
3	40	1½"	450	68,5	13,0	29,0	100%	38,4	66,0	x
4	45					35,0	145%	45,0	75,0	x
5	50	2"	400	83,5	14,0	40,0	100%	51,1	81,5	x
6	57					46,0	132%	57,0	88,0	x



Under obtaining the same size of the SAE connections and the same values of the hole pattern we offer three new spiral hose types with 6 reinforced wire layers for up to 450 bar working pressure in the dimensions NW36, NW45 and NW57.

In combination with our SK6 coupling design they can be assembled towards the next smaller standard connection 1.1/4", 1.1/2" and 2", as shown in the above chart.

They are fully interchangeable with the standard hose couplings. With these new intermediate dimensions negative flow restrictions can be reduced and the efficiency as well as the speed can be improved. Compared to the standard dimensions they offer almost the same pressure values and kinematic characteristics.

This innovation compensates disadvantages of flow parameters and supports the reduction of fuel and energy consumption. The diagrams on the left indicate the reduced pressure difference (bar) under the same volume flow (l/min) towards of the intermediate dimensions.

### HDS work standard

In connection with the HDS work standard and various quality requirements the technical performance parameters are in line with the management system DIN EN ISO 9001.

### Hose material

- Work standard for spiral hose material
- Own expertise in Caoutchouc and rubber compound development, design and audits of production processes
- Uniform designed hose construction
- Cold resistant outer cover material
- Abrasion resistant outer cover material
- Special qualities of the inner tube compound
- Compatibility against mediums according to ISO 1817
- Burst pressure resistance
- Adhesion between layers
- Dimensions, concentricity, tolerances and neutral helix
- Temperature range and resistance 100 °C (120°C)
- Cold bending tests according to ISO 10619-2 down to -40°C (-55°C)
- Ozone tests carried out according to EN ISO 7326 and ISO 10960
- Daily production dates and traceability
- Dispatch and packaging instructions

### Couplings

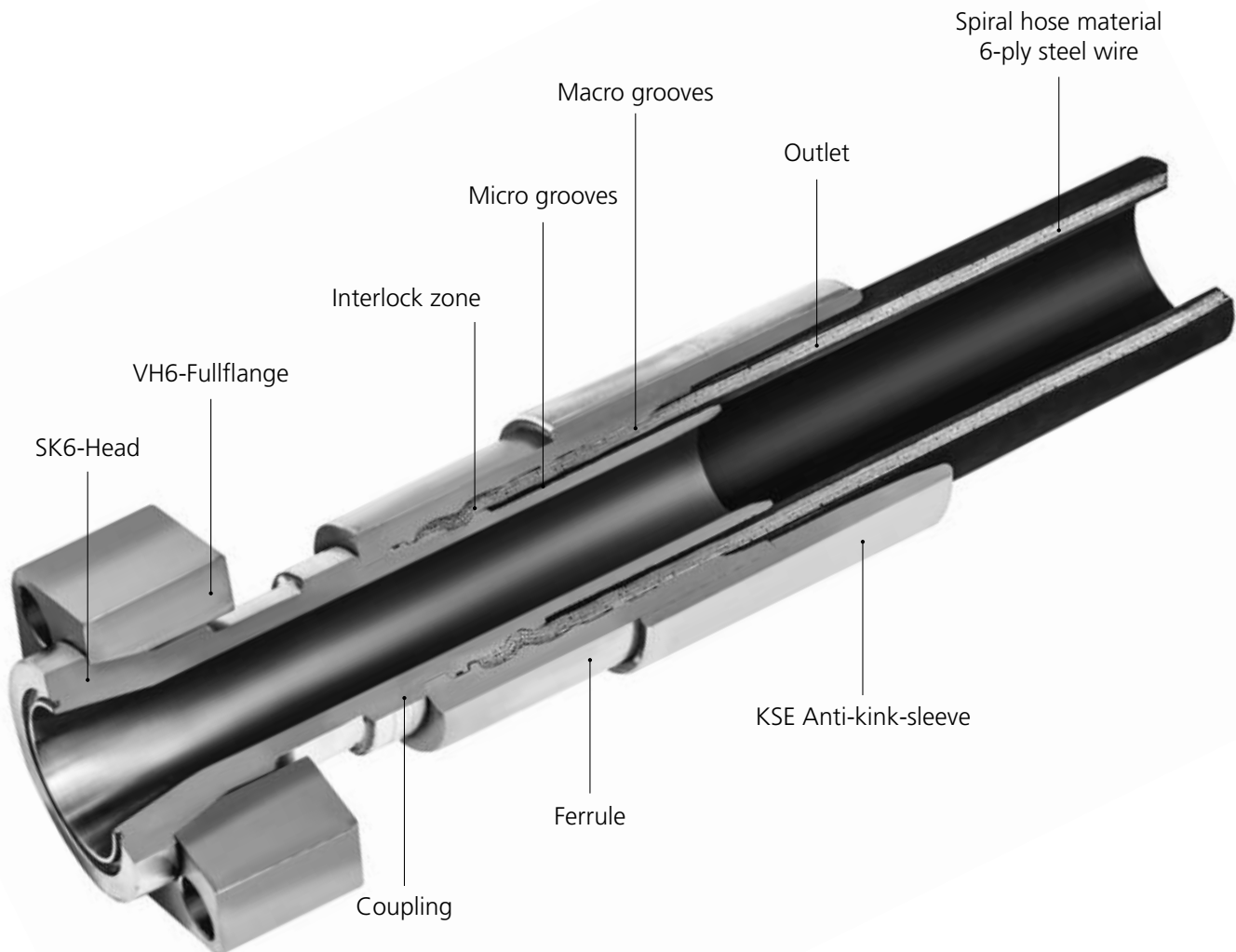
- Work standard for couplings and ferrules
- Uniform defined coupling principles and designs with reliable interlock zone
- Material requirements according to the acceptance certificate 3.1
- Surface roughness
- Heat treatment instructions
- Examination of the brazing stability
- Galvanizing / coating instruction
- Salt spray test according to DIN EN ISO 9227
- Dispatch and packaging instructions

### Complete hose assemblies

- Hydrostatical requirements / pressure resistance
- Impulse tests according to ISO 6802 and ISO 6803
- Impulse tests according to KES standards
- Compliance of total length deviations under working pressure
- Tensile force resistance of the interlock zone
- Traceability of batches
- 100 % pressure testing and cleaning
- High level of process reliability and accuracy due to patented equipment
- Dispatch instructions, storage regulations
- Recommended storage periods and periods of usage

### Functional principles of HDS spiral hose couplings

The design and functional principles of HDS couplings and ferrules have proven their superior performance for decades in the field. Even if a permanent product evolution is required the basic principles and structure in all dimensions and versions remains the same.



The inner and outer rubber material must be removed over a certain length and then pushed to its end position into the coupling in order to be reliably connected. This area is called the anti-blow-out device or interlock zone. The micro grooves, an invention by HDS replicate the last barrier for the required sealing performance at high temperatures and pressures or long operating periods.

In the center area of the swaging section the macro grooves provide a statical stabilization of the hose material with a progressive compression and compensation of relevant tolerances. The nipple ends always have a very smooth surface being longer than the ferrules in order to reduce bulging phenomena or damage of the inner tube material.

The design of the ferrules supports a very straight outlet of the hose material, while at the same time avoiding the penetration of moisture and condensation water. The popular SK6 head is part of the HDS patent range providing much higher safety reserves in cases of severe hydrostatic or mechanical forces.



### DKO couplings with over tightening limitation

DKO couplings in straight and elbow versions with forged nuts without trust wire are designed in order to avoid an over tightening during installation and the expansion of the opposite connection.

#### Available couplings

DKOS: straight female couplings with metric union nut and o-ring, heavy version, DIN ISO 12151-2:2004-01, chart 1

DKOL: straight female couplings with metric union nut and o-ring, light version, DIN ISO 12151-2:2004-01, chart 2

CES: metric male couplings with 24° cone, heavy version, DIN ISO 12151-2:2004-01, chart 4

CEL: metric male couplings with 24° cone, light version, DIN ISO 12151-2:2004-01, chart 4

### One-piece SF3 and SF6 couplings

For increased pressure loads we offer our one-piece couplings in straight or elbow versions with reinforced SAE flanges and full flanges as follows:

SF3 (3000 PSI), NW40-50, series S46E

SF6 (6000 PSI), NW20-50, series S46E and S6E

#### Available couplings

SF3: SAE flange couplings, 3000 PSI starting from 1" up to 2" with reinforced flange plates and full flanges, optional also reinforced DIN ISO 12151-3:2012-08

SF6: SAE flange couplings, 6000 PSI, partly with reinforced flange plates and full flanges, DIN ISO 12151-3:2012-08

### One-piece SK6 couplings, NW20 - NW65

Our one-piece SK6 couplings within the series S46E and S6E in straight and elbow versions represent the highest technology of spiral hose assemblies. The design, especially in larger dimensions, replaces standard SAE flange couplings due to its many advantages in high pressure and vibration stress installations. The SK6 flange head provides higher stability especially in the connection area. The conical contact between the SK6 head and the special full flanges, including a tightening torque limitation, provides a central and gap free assembly situation. The result is an absolute parallel position to the counter surface and improved sealing function.

#### Available couplings

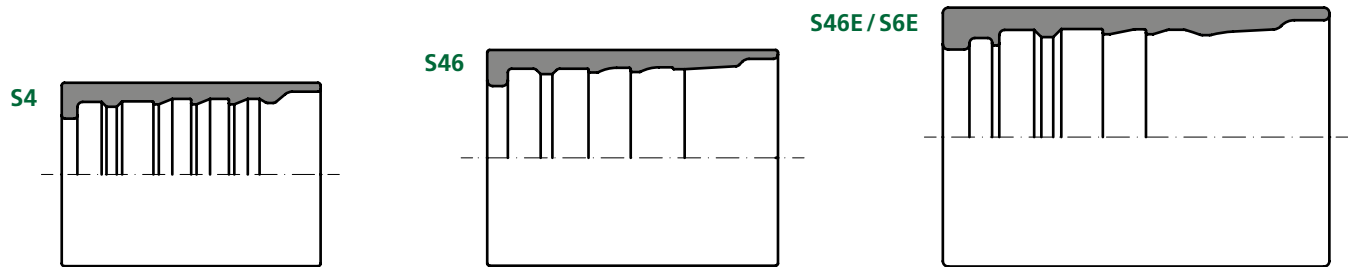
Details and options are summarized in the pages 45-47. SK3 connections for hole pattern 3000 PSI available on demand.

#### All couplings include:

- A safe and reliable interlock zone
- High quality surface on couplings and inner bores
- Uniform functional principles in all dimensions
- Increased burst pressure values of the hose material.  
The coupling survives the burst pressure tests without damages.

#### Pressure test and cleaning

On our own developed testing equipment all hose assemblies are pressure tested and cleaned before dispatch. The pressure test is carried out with a water oil emulsion and without any air in the hose assembly over just a few seconds. With the same medium the hose assembly is cleaned according to ISO 4406 achieving a cleanliness class of 18-16-13. This result is based on a one metre hose length in any diameter.

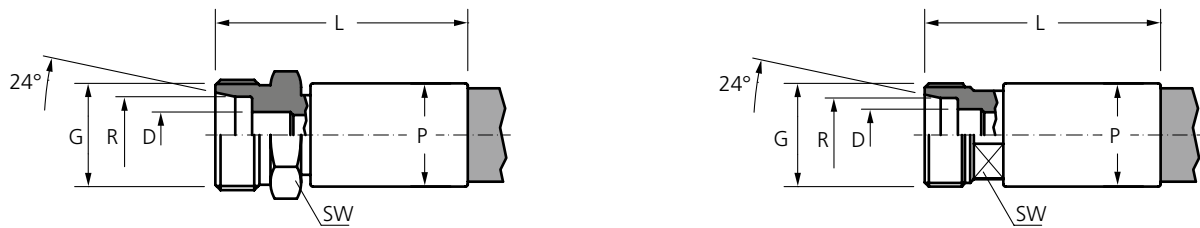


Ferrules made with coated steel

Item	Art. no.	NW	Non-swaged		Swaging-Ø [mm]	Hose				Weight [g]
						Outside-Ø	Length	L4	L46	
			S4	S46				S46E	S6E	
1	1800	<b>6</b>	23	36	<b>19,2</b>	x				50
2	2250	<b>10</b>	26,5	38	<b>23,0</b>	x				70
3	2600	<b>12</b>	29,5	41	<b>26,2</b>	x				85
4	3007	<b>16</b>	34	48	<b>30,0</b>	x				120
5	3370	<b>20</b>	38	58	<b>34,2</b>		x			170
6	5312	<b>25</b>	46	62	<b>42,0</b>		x			250
7	5323		54	85	<b>48,0</b>				x	600
8	5689	<b>32</b>	58	79	<b>52,8</b>		x			480
9	8016		58	91	<b>52,8</b>			x		550
10	8382		62	91	<b>56,5</b>				x	620
11	4320	<b>36</b>	67	98	<b>61,3</b>				x	800
12	8079	<b>40</b>	70	97	<b>63,5</b>			x		920
13	8426		72	107,5	<b>66,0</b>				x	1100
14	6320	<b>45</b>	82	115	<b>75,0</b>				x	1550
15	8119	<b>50</b>	83	103	<b>77,0</b>			x		1300
16	8469		89	120,5	<b>81,5</b>				x	1835
17	30005	<b>65</b>	103	133	<b>94,0</b>				x	2465

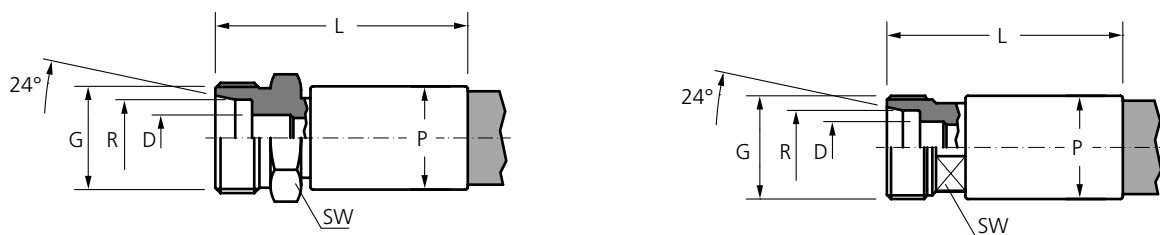
Ferrules made with stainless steel

Item	Art. no.	NW	Non-swaged		Swaging-Ø [mm]	Hose				Weight [g]
						Outside-Ø	Length	L4	L46	
			S4	S46				S46E	S6E	
17	29810	<b>32</b>	58	91	<b>52,8</b>			x		660
18	29760	<b>40</b>	72	107,5	<b>66,0</b>				x	1085
19	29791	<b>50</b>	89	120,5	<b>81,5</b>				x	1780
20	30050	<b>65</b>	103	133	<b>94,0</b>				x	2530



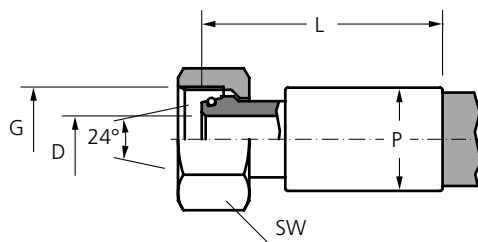
Item	Part no.	NW	Connection G	SW	R	D	Swaging-Ø [mm]	Hose		L	Weight [g]
								L4 Coupling S4	L46 S46		
1	3013	<b>10</b>	M18 x 1,5	19 x 8	12 L	6,0	<b>23,0</b>	x		76	120
2	3015	<b>16</b>	M26 x 1,5	27 x 10	18 L	12,0	<b>30,0</b>	x		78	241
3	3386	<b>20</b>	M30 x 2	32 x 15	22 L	14,0	<b>34,2</b>		x	96	393
4	5707	<b>32</b>	M45 x 2	46 x 18	35 L	24,0	<b>52,8</b>		x	125	1080

The maximum working pressures for the above connections must be observed. See DIN 2353.



Item	Part no.	NW	Connection G	SW	R	D	Swaging-Ø [mm]	Hose		L	Weight [g]
								L4 Coupling S4	L46 S46		
1	1810	<b>6</b>	M16 x 1,5	17 x 7	8 S	3,5	<b>19,2</b>	x		61	89
2	1812	<b>6</b>	M18 x 1,5	19 x 7	10 S	3,5	<b>19,2</b>	x		61	94
3	2262	<b>10</b>	M20 x 1,5	22 x 9,5	12 S	7,0	<b>23,0</b>	x		65	135
4	2604	<b>12</b>	M24 x 1,5	24 x 8,5	16 S	9,0	<b>26,2</b>	x		70	175
5	3019	<b>16</b>	M30 x 2	30 x 9	20 S	13,0	<b>30,0</b>	x		79	268
6	3382	<b>20</b>	M36 x 2	36 x 10	25 S	15,0	<b>34,2</b>		x	94	412
7	5325	<b>25</b>	M42 x 2	30 x 12	30 S	20,0	<b>42,0</b>		x	96	543
8	5327	<b>25</b>	M52 x 2	30 x 14	38 S	26,0	<b>42,0</b>		x	100	600
9	5708	<b>32</b>	M52 x 2	41 x 16	38 S	26,0	<b>52,8</b>		x	119	1070

The maximum working pressures for the above connections must be observed. See DIN 2353.

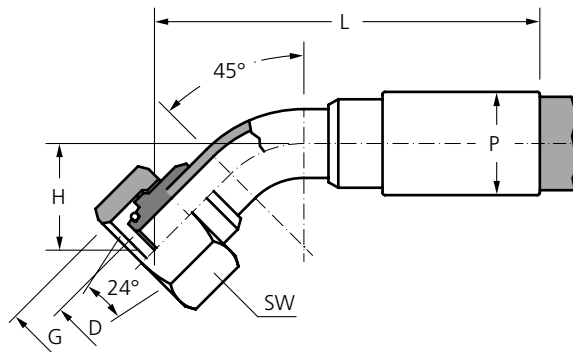


Item	Part no.	NW	Connection G	SW	D	Swag-ing-Ø [mm]	Hose Coupling		L	Total weight [g]
							L4 S4	L46 S46		
1	1803	<b>6</b>	M14 x 1,5	17	3,5	<b>19,2</b>	x		58	86
2	2257	<b>10</b>	M16 x 1,5	19	4,0/6,0	<b>23,0</b>	x		88	135
3	2192		M18 x 1,5	22	6,0		x		59	160
4	2612	<b>12</b>	M22 x 1,5	27	9,0	<b>26,2</b>	x		65	181
5	22062	<b>16</b>	M22 x 1,5	27	9,0/11,5	<b>30,0</b>	x		94	290
6	3023		M26 x 1,5	32	11,5		x		74	271
7	22068	<b>20</b>	M30 x 2	36	14,0	<b>34,2</b>		x	107	430
8	26068	<b>25</b>	M36 x 2	41	19,5	<b>42,0</b>		x	121	780
9	29176	<b>32</b>	M36 x 2	41	19,5	<b>52,8</b>		x	139	1170
10	29170		M45 x 2	50	26,0/25,0			x	152	1370
11	29185	<b>40</b>	M45 x 2	50	26,0/25,0	<b>63,5</b>		x	172	2200
12	29713		M52 x 2	60	32,0/28,0			x	192	2450

The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.

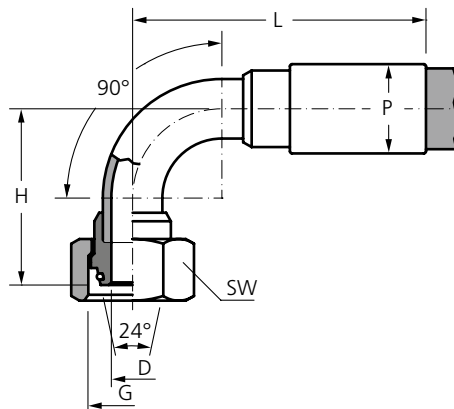






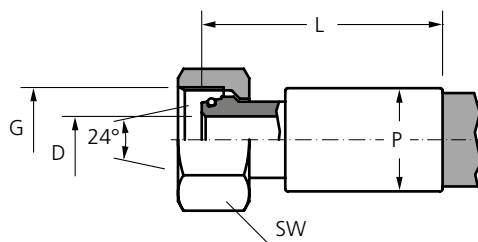
Item	Part no.	NW	Connection G	SW	D	H	brazed with pipe E355 (St 52.4)	Swag-ing-Ø [mm]	Hose		L	Total weight [g]
									L4 Coupling S4	L46 S46		
1	2309	<b>10</b>	M16 x 1,5	19	4	23	8 x 2	<b>23,0</b>	x		89	140
2	2326		M18 x 1,5	22	4/6	35	10 x 2		x		91	155
3	13070	<b>12</b>	M22 x 1,5	27	9	30	14 x 2,5	<b>26,2</b>	x		110	230
4	15700		M26 x 1,5	32	11,5	28	18 x 3		x		120	350
5	22070	<b>20</b>	M30 x 2	36	14/15	40	22 x 3,5	<b>34,2</b>		x	150	540
6	26070		M36 x 2	41	19,5	35	28 x 4			x	139	760
7	29172	<b>32</b>	M45 x 2	50	26/25	48	35 x 5	<b>52,8</b>		x	190	1460
8	29714		M52 x 2	60	32/28	50	40 x 6			x	230	2760

The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.



Item	Part no.	NW	Connection G	SW	D	H	one-piece/brazed with pipe E355 (St 52.4)	Swag-ing-Ø [mm]	Hose		L	Total weight [g]
									L4 Coupling S4	L46 S46		
1	2307	<b>10</b>	M16 x 1,5	19	4	42	8 x 2	<b>23,0</b>	x		68	170
2	2193		M18 x 1,5	22	4/6	42	10 x 2		x		77	175
3	13072	<b>12</b>	M22 x 1,5	27	9	60	14 x 2,5	<b>26,2</b>	x		100	290
4	15710		M26 x 1,5	32	11,5	55	18 x 3		x		101	390
5	22072	<b>20</b>	M30 x 2	36	14	60	22 x 3,5	<b>34,2</b>		x	117	595
6	26072		M36 x 2	41	19,5	70	28 x 4			x	135	910
7	29174	<b>32</b>	M45 x 2	50	26/25	86	35 x 5	<b>52,8</b>		x	165	1600
8	29715		M52 x 2	60	32/32	100	40 x 6			x	225	3030

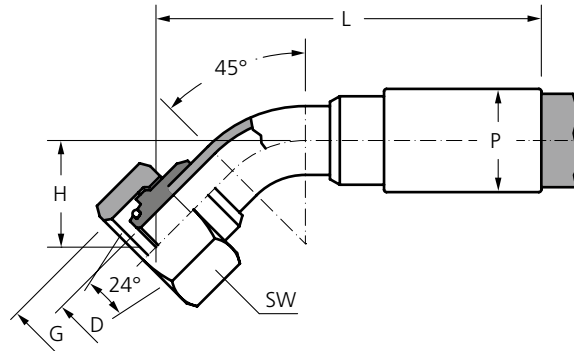
The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.



Item	Part no.	NW	Connection G	SW	D	Swaging-Ø [mm]	Hose		L	Total weight [g]
							L4 Coupling S4	L46 S46		
1	1799	<b>6</b>	M14 x 1,5	17	2/3,5	<b>19,2</b>	x		60	80
2	1802		M16 x 1,5	19	4/3,5		x		60	90
3	1804		M18 x 1,5	22	4/3,5		x		58	100
4	2255	<b>10</b>	M18 x 1,5	22	4/6	<b>23,0</b>	x		60	130
5	2260		M20 x 1,5	24	6		x		62	140
6	2300		M22 x 1,5	27	6		x		61	150
7	11002		M24 x 1,5	30	6		X		62	160
8	2608	<b>12</b>	M24 x 1,5	30	9	<b>26,2</b>	x		70	210
9	3024	<b>16</b>	M24 x 1,5	30	10/11,5	<b>30,0</b>	x		77	280
10	3028		M30 x 2	36	12/11,5		x		75	300
11	3439	<b>20</b>	M30 x 2	36	13/14	<b>34,2</b>		x	88	380
12	3441		M36 x 2	41	18/14,5			x	90	450
13	3444		M42 x 2	50	20/14			x	97	580
14	5385	<b>25</b>	M36 x 2	41	15/19	<b>42,0</b>		x	90	570
15	5387		M42 x 2	50	19			x	99	710
16	5390		M52 x 2	60	19			x	100	910
17	5771		<b>32</b>	M52 x 2	60		26/24	<b>52,8</b>		x

The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.

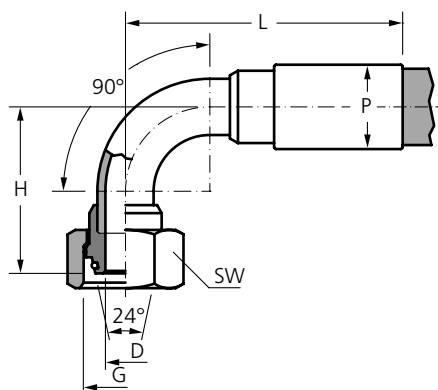




Item	Part no.	NW	Connection G	SW	D	H	one-piece / brazed with pipe E355 (St 52.4)	Swag-ing-Ø [mm]	Hose Coupling		L	Total weight [g]	
									L4 S4	L46 S46			
1	1770	<b>6</b>	M16 x 1,5	19	4/3,5	20	one-piece	<b>19,2</b>	x		83	101	
2	1772		M18 x 1,5	22		23	one-piece		x	80,5	107		
3	1997	<b>10</b>	M20 x 1,5	24	6	28	one-piece	<b>23,0</b>	x		102	162	
4	2325		M22 x 1,5	27	6	27	one-piece		x	103	173		
5	2513	<b>12</b>	M24 x 1,5	30	9	32	one-piece	<b>26,2</b>	x		98	238	
6	2894	<b>16</b>	M24 x 1,5	30	9	32	14 x 2,5	<b>30,0</b>	x		116	330	
7	2903		M30 x 2	36	12	35	one-piece		x	111	362		
8	2907		M30 x 2	36	12	78	18 x 3		x		175	400	
9	3446	<b>20</b>	M30 x 2	36	12	35	one-piece			x	135	500	
10	3463		M36 x 2	41	18/14	45	one-piece	<b>34,2</b>		x	141	574	
11	3448		M42 x 2	50	20	55	28 x 4			x	186	930	
12	5411	<b>25</b>	M42 x 2	50	19	55	one-piece	<b>42,0</b>			x	160	940
13	5413		M52 x 2	60	26/25	63	35 x 5				x	210	1530
14	5788	<b>32</b>	M42 x 2	50	19	44	28 x 4	<b>52,8</b>			x	195	930
15	5790		M52 x 2	60	26/25	48	35 x 5				x	195	1270
16	5789		M52 x 2	60	26/24	63	one-piece				x	191	1880

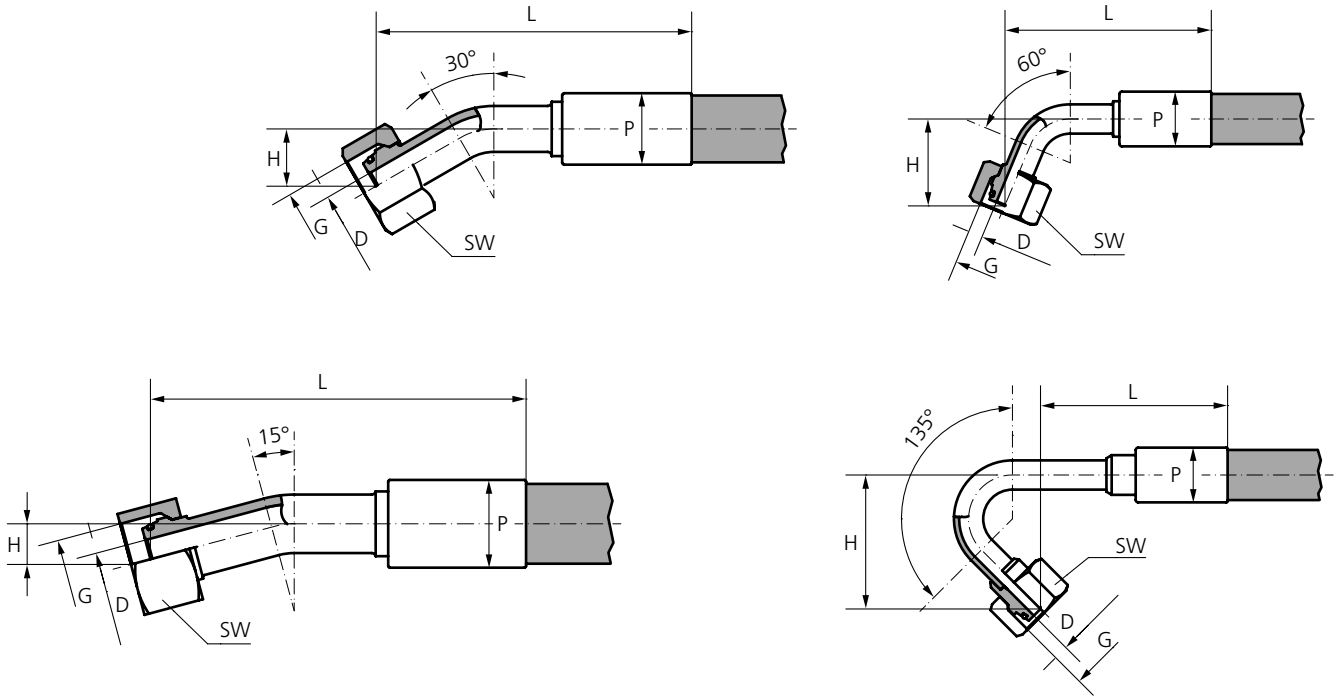
The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.





Item	Part no.	NW	Connection G	SW	D	H	one-piece / brazed with pipe E355 (St 52.4)	Swag- ing-Ø [mm]	Hose		L	Total weight [g]
									L4 Coupling S4	L46 S46		
1	1764	6	M16 x 1,5	19	4/3,5	37	one-piece	19,2	x		69	105
2	1761		M18 x 1,5	22	4/3,5	39	one-piece		x		67	116
3	2303	10	M18 x 1,5	22	4/6	42	one-piece	23,0	x		74	150
4	1989		M20 x 1,5	24	6	45	one-piece		x		74	161
5	2305		M22 x 1,5	27	6	45	one-piece		x		74	173
6	2505	12	M22 x 1,5	27	6	45	Ø10 x 2	26,2	x		77	230
7	2506		M24 x 1,5	30	9	52	one-piece		x		81	250
8	2508		M24 x 1,5	30	9	85	Ø14 x 2,5		x		117	320
9	2509		M24 x 1,5	30	9	120	Ø14 x 2,5		x		152	380
10	2502		M30 x 2	36	12	60	Ø18 x 3		x		97	350
11	2896	16	M24 x 1,5	30	9	52	Ø14 x 2,5	30,0	x		90	330
12	2897		M30 x 2	36	12	60	one-piece		x		93	380
13	2898		M30 x 2	36	12	85	Ø18 x 3		x		124	470
14	2900		M30 x 2	36	12	120	Ø18 x 3		x		124	520
15	2899		M30 x 2	36	12	150	Ø18 x 3		x		148	580
16	2889		M36 x 2	41	15	60	Ø22 x 3,5		x		106	600
17	3447	20	M30 x 2	36	12	60	one-piece	34,2		x	112	510
18	3451		M36 x 2	41	18/14	65	one-piece			x	115	585
19	3453		M36 x 2	41	15	85	Ø22 x 3,5			x	138	700
20	3455		M36 x 2	41	15	105	Ø22 x 3,5			x	157	760
21	3476		M36 x 2	41	18/14	120	one-piece			x	115	700
22	3456		M36 x 2	41	15	125	Ø22 x 3,5			x	157	790
23	3458		M36 x 2	41	15	155	Ø22 x 3,5			x	157	830
24	3449		M42 x 2	50	20	80	Ø28 x 4			x	141	950
25	5394	25	M36 x 2	41	15	65	one-piece	42,0		x	120	880
26	5391		M36 x 2	41	15	135	Ø22 x 3,5			x	161	1060
27	5398		M42 x 2	50	19	86	one-piece			x	129	980
28	5405		M42 x 2	50	20	110	Ø28 x 4			x	165	1200
29	5402		M42 x 2	50	20	156	Ø28 x 4			x	180	1420
30	5403		M42 x 2	50	20	205	Ø28 x 4			x	180	1500
31	5404		M52 x 2	60	26	92	Ø35 x 5			x	146	1470
32	5780	32	M52 x 2	60	26/24	90	one-piece	52,8		x	164	1720
33	5782		M52 x 2	60	26/25	125	Ø35 x 5			x	196	2100
34	5783		M52 x 2	60	26/25	156	Ø35 x 5			x	228	2250

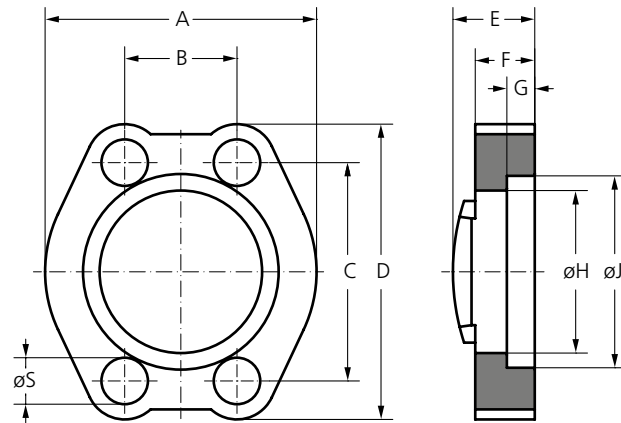
The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.



Item	Part no.	NW	α	Conne- tion G	SW	D	H	one-piece / brazed with pipe E355 (St 52.4)	Swag- ing-Ø [mm]	Hose		L	Total weight [g]
										L4 Coupling S4	L46 S46		
1	1985	10	67,5°	M20 x 1,5	24	6	36	one-piece	23,0	x		88	160
2	2306		100°	M20 x 1,5	24	6	41	one-piece		x		69	170
3	2304		115°	M20 x 1,5	24	6	43	one-piece		x		60	170
4	2518	12	20°	M24 x 1,5	30	9	14	one-piece	26,2	x		108	240
5	2515		30°	M24 x 1,5	30	9	21	one-piece		x		107	240
6	2519		67,5°	M24 x 1,5	30	9	42	one-piece		x		99	250
7	2511		135°	M24 x 1,5	30	9	60	14 x 2,5		x		90	320
8	2906	16	30°	M30 x 2	36	12	23	one-piece	30,0	x		122	360
9	2908		60°	M30 x 2	36	12	42	one-piece		x		121	380
10	2918		60°	M30 x 2	36	12	70	18 x 3		x		215	540
11	3445	20	15°	M30 x 2	36	12	18	18 x 3	34,2		x	186	550
12	3461		15°	M36 x 2	41	18/14	14	one-piece			x	156	570
13	3460		22,5°	M36 x 2	41	18/14	23	one-piece			x	154	570
14	3466		30°	M36 x 2	41	18/14	27	one-piece			x	151	570
15	3464		60°	M36 x 2	41	15	57	22 x 3,5			x	152	670
16	3477		100°	M36 x 2	41	18/14	70	one-piece			x	108	585
17	5410	25	15°	M42 x 2	50	19	17	one-piece	42,0		x	179	940
18	5412		22,5°	M42 x 2	50	19	26	one-piece			x	177	940
19	5409		30°	M42 x 2	50	19	36	one-piece			x	173	950
20	5406		65°	M42 x 2	50	20	79	28 x 4			x	174	1100
21	5774	32	5°	M52 x 2	60		4	35 x 5	52,8		x	197	1700
22	5779		15°	M52 x 2	60		20	35 x 5			x	228	1810
23	5781		30°	M52 x 2	60	26/25	40	35 x 5			x	224	1830
24	5787		60°	M52 x 2	60		120	35 x 5			x	282	2240
25	5794		75°	M52 x 2	60		90	35 x 5			x	187	1850

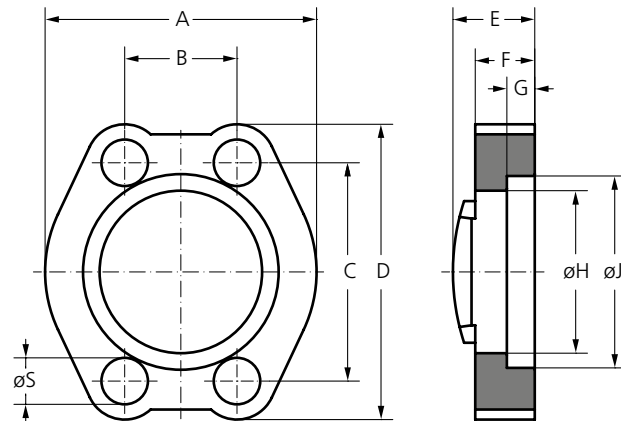
The maximum pressure rates acc. to ISO 8434-1:2018 and DIN ISO 12151-2:2004-01 must be observed.





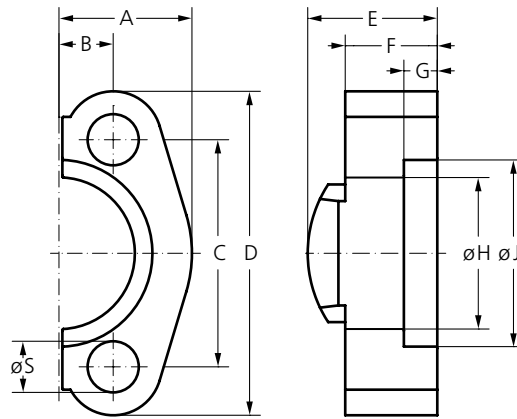
Material: S355J0/C45  
(1.0553)/(1.0503)

Item	Part no.	SAE size	A	B	C	D	E	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
1	9685	1/2"	46	17,5	38,1	54,0	19,0	13,0	6,2	24,3	31,0	8,7	M8 x 25	130
2	9706	3/4"	52	22,2	47,6	65,0	22,0	14,0	6,2	32,2	38,9	10,5	M10 x 30	180
3	9728	1"	59	26,2	52,4	70,0	24,0	16,0	7,5	38,5	45,3	10,5	M10 x 30	210
4	9748	1 1/4"	73,0	30,2	58,7	79,0	22,0	14,0	7,5	43,7	51,6	12,0	M10 x 30	280
5	9758		73,0	30,2	58,7	79,0	24,0	16,0	7,5	43,7	51,6	12,5	M12 x 35	350
6	9771	1 1/2"	83,0	35,7	69,9	94,0	25,0	19,0	7,5	50,8	61,1	13,5	M12 x 40	560
7	9804	2"	97,0	42,9	77,8	102,0	26,0	19,0	9,0	62,8	72,3	13,5	M12 x 40	653



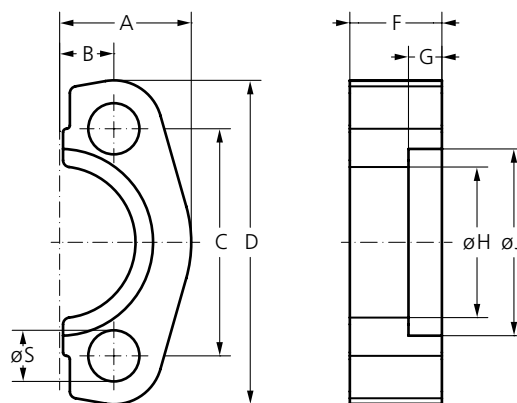
Material: S355J0/C45  
(1.0553)/(1.0503)

Item	Part no.	SAE size	A	B	C	D	E	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
8	9731	1"	58,0	26,0	52,4	70,0	26,0	26,0	7,5	38,5	45,2	10,5	M10 x 45	360
9	9750	1 1/4"	73,0	30,2	58,7	79,0	33,0	24,0	7,5	43,7	51,6	12,5	M12 x 45	510
10	9768	1 1/2"	83,0	35,7	69,9	94,0	37,0	27,0	7,5	50,8	61,1	13,5	M12 x 50	780
11	9788	2"	97,0	42,9	77,8	102,0	43,0	30,0	9,0	62,8	72,3	13,5	M12 x 50	1070



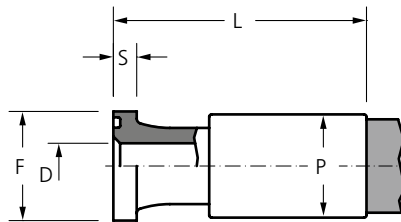
Material: S355J0/C45  
(1.0553)/(1.0503)

Item	Part no.	SAE size	A	B	C	D	E	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
1	9702	3/4"	26,0	11,2	47,6	65,0	22	14	6,2	32,2	38,9	10,8	M10 x 30	90
2	9720	1"	29,0	13,1	52,4	70,0	24	16	7,5	38,5	45,3	10,8	M10 x 30	110
3	9736	1 1/4"	37,0	15,1	58,7	79,0	22/24	16	7,5	43,7	51,6	12,0	M10 x 30	150
4	9738		37,0	15,1	58,7	79,0	22/24	16	7,5	43,7	51,6	10,7	M10 x 30	150
5	9742		37,0	15,1	58,7	79,0	22/24	14	7,5	43,7	51,6	12,8	M12 x 35	150
6	9764	1 1/2"	41,0	17,9	69,9	94,0	25	16	7,5	50,8	61,1	13,5	M12 x 35	230
7	9785	2"	49,0	21,5	77,8	102,0	26	16	9,0	62,8	72,3	13,5	M12 x 35	250
8	9786		49,0	21,5	77,8	102,0	26	19	9,0	62,8	72,3	13,5	M12 x 40	310
<b>HF36 SAE Half flange in reinforced version hole pattern: 3000 PSI, mechanical resistance for 6000 PSI</b>														
9	9784	2" HF36	49,0	21,5	77,8	102,0	42	30	9,0	62,8	72,3	13,5	M12 x 50	510



Material: C60 (1.0601)

Item	Part no.	SAE size	A	B	C	D	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
10	9682	1 1/2"	23,0	8,8	38,1	54,0	13,0	6,2	24,3	31,0	9,0	M8 x 25	60
11	9722	1"	29,0	13,1	52,4	70,0	16,0	7,5	38,5	45,3	11,0	M10 x 30	100

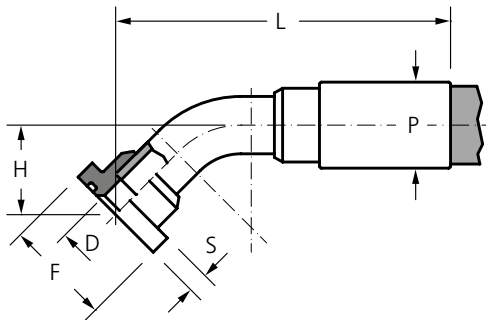


Item	Part no.	NW	Connection size	Flange			Swag- ing-Ø [mm]	Hose Coupling				L	Total weight [g]
				F	S	D		L4 S4	L46 S46	L6 S46E	L6 S6E		
1	2525	<b>12</b>	½"	30,2	7	12	<b>26,2</b>	x				67	170
2	3088	<b>16</b>	¾"	38,1	7	16	<b>30,0</b>	x				73	250
3	3480	<b>20</b>	¾"	38,1	7	16	<b>34,2</b>		x			97	380
4	3488		1"	44,4	8	21			x			88	410
5	5434	<b>25</b>	1"	44,4	8	19	<b>42,0</b>		x			103	560
6	5441		1¼"	50,8	10	19			x			110	745
7	5807	<b>32</b>	1¼"	50,8	9,8	25	<b>52,8</b>		x			159	1210
8	8088	<b>40</b>	1½"	60,3	10,5	29	<b>63,5</b>			x		197	2250
9	8423		1½"	60,3	10,5	29		<b>66,0</b>			x	208	2490
10	8126	<b>50</b>	2"	71,4	12	40	<b>77,0</b>			x		175	2880

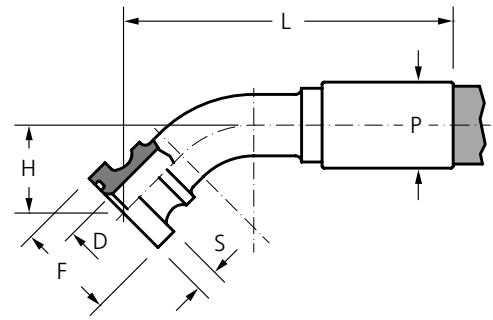
The maximum pressure rates acc. to ISO 6162-1:2012 must be observed.



**A** brazed



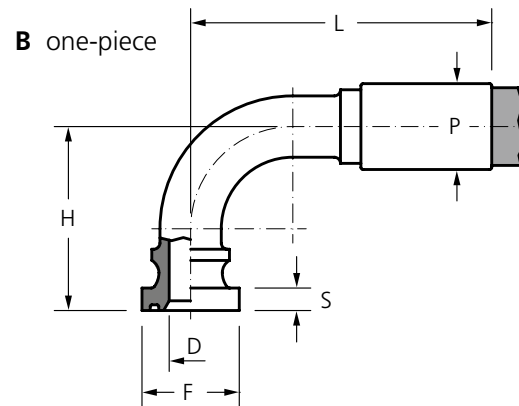
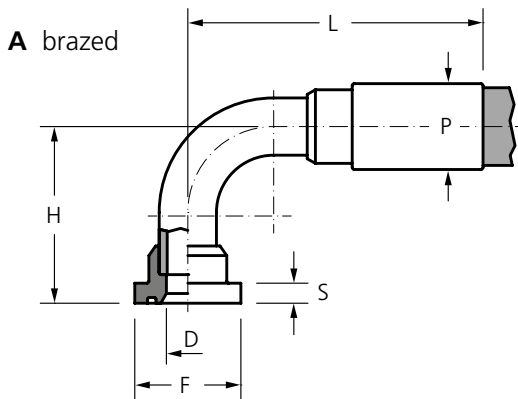
**B** one-piece



Item	Part no.	NW	Conne- ction size	Flange			H	Version	Swag- ing-Ø [mm]	Hose Coupling				L	Total weight [g]
				F	S	D				L4 S4	L46 S46	L6 S46E	L6 S6E		
1	2545	<b>12</b>	½"	30,2	7	12	28	A	<b>26,2</b>	x				116	260
2	2534		¾"	38,1	7	12	32	A		x				112	290
3	2959	<b>16</b>	¾"	38,1	7	16	40	A	<b>30,0</b>	x				141	450
4	2952		1"	44,4	8	16	40	A		x				128	490
5	3564	<b>20</b>	¾"	38,1	7	16	40	A	<b>34,2</b>		x			153	550
6	7932		¾"	38,1	8	14	40	B			x			152	570
7	3571		1"	44,4	8	16	40	A			x			153	590
8	5629	<b>25</b>	¾"	38,1	7	16	40	A	<b>42,0</b>		x			153	700
9	5564		1"	44,4	9,5	21	50	A			x			180	890
10	5573		1¼"	50,8	10	21	50	A			x			182	920
11	5928	<b>32</b>	1¼"	50,8	10	25	60	A	<b>52,8</b>		x			221	1570
12	5936		1½"	60,3	10,5	25	60	A			x			223	1700
13	8104	<b>40</b>	1½"	60,3	10,5	29	80	B	<b>63,5</b>			x		252	2780
14	8141	<b>50</b>	2"	71,4	12	40	80	B	<b>77,0</b>			x		282	4430
15	8507		2"	71,4	12	40	90	B		<b>81,5</b>				x	310

The maximum pressure rates acc. to ISO 6162-1:2012 must be observed.

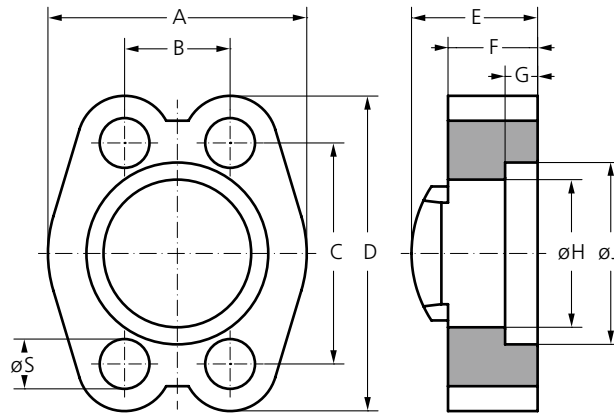




Item	Part no.	NW	Conne- ction size	Flange			H	Version	Swag- ing-Ø [mm]	Hose				L	Total weight [g]
				F	S	D				L4	L46		L6		
										S4	S46	S46E	S6E		
1	2531	12	½"	30,2	7	12	52	A	26,2	x				94	270
2	2536		¾"	38,1	7	12	55	A		x				92	300
3	2538		¾"	38,1	7	12	68	A		x				103	325
4	2934	16	¾"	38,1	7	12	55	A	30,0	x				99	380
5	2979		¾"	38,1	7	16	80	A		x				125	510
6	2941		¾"	38,1	7	16	120	A		x				125	580
7	2943		1"	44,4	8	16	60	A		x				106	490
8	3502	20	¾"	38,1	7	16	60	A	34,2		x			118	540
9	3508		¾"	38,1	7	16	80	A			x			138	610
10	3532		1"	44,4	8	16	60	A			x			118	580
11	3538		1"	44,4	8	16	80	A			x			138	640
12	3555		1¼"	50,8	10	21	80	A			x			137	790
13	3566		1¼"	50,8	10	21	100	A			x			155	880
14	5459	25	¾"	38,1	7	16	60	A	42,0		x			122	700
15	5457		¾"	38,1	7	16	100	A			x			159	810
16	26626		1"	44,4	8	19	70	B			x			150	850
17	7966		1"	44,4	9,6	19	83	B			x			157	1020
18	5490		1"	44,4	9,5	21	100	A			x			159	990
19	5483		1"	44,4	9,5	21	220	A			x			176	1310
20	5532		1¼"	50,8	10	21	80	A			x			139	930
21	5535		1¼"	50,8	10	21	100	A			x			159	1030
22	26636		1¼"	50,8	10	19	150	B			x			148	1520
23	26631		1¼"	50,8	10	19	200	B			x			152	1750
24	5553	1½"	60,3	10,5	21	90	A		x			148	1290		
25	5850	32	1¼"	50,8	10	25	90	A	52,8		x			164	1500
26	5862		1¼"	50,8	10	25	120	A			x			196	1750
27	5869		1¼"	50,8	10	25	200	A			x			196	2050
28	5870		1¼"	50,8	10	25	250	A			x			196	2220
29	5898		1½"	60,3	10,5	25	92	A			x			170	1620
30	5901		1½"	60,3	10,5	25	125	A			x			196	1870
31	8425	40	1½"	60,3	10,5	30	110	A	S46E = 63,5			x		235	2840
32	8097		1½"	60,3	10,5	29	140	B				x		235	3190
33	8109		1½"	60,3	10,5	30	180	A				x		240	3280
34	8412		1½"	60,3	15,0	29	140	B		S6E = 66,0			x	245	3500
35	8135	50	2"	71,4	12	40	170	B	77,0			x		260	5130
36	8508		2"	71,4	12	40	180	B		81,5				x	295

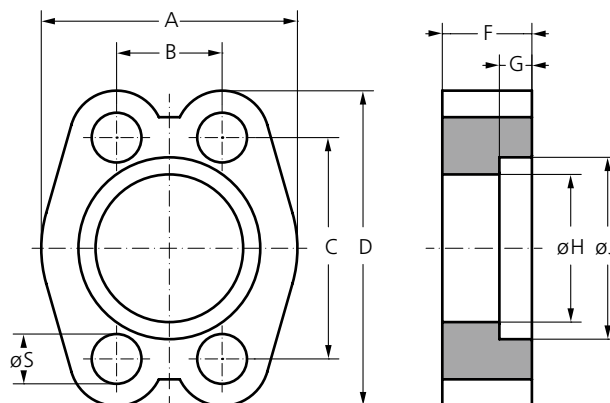
The maximum pressure rates acc. to ISO 6162-1:2012 must be observed.





Material: S355J0/C45  
(1.0553)/(1.0503)

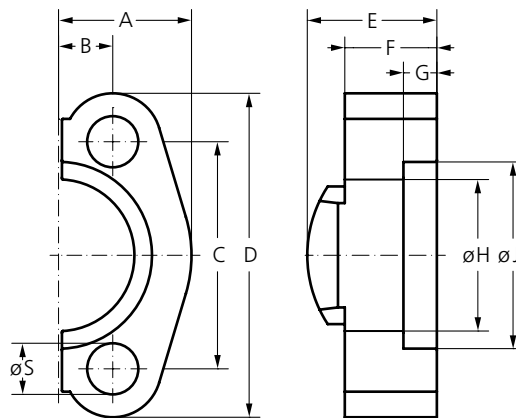
Item	Part no.	SAE size	A	B	C	D	E	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
1	9689	1/2"	48	18,2	40,5	56,0	22,0	16,0	7,2	24,6	32,5	8,7	M8 x 30	160
2	9715	3/4"	60,0	23,8	50,8	71,0	28,0	19,0	8,2	32,5	42,0	M10		340
3	9707		60,0	23,8	50,8	71,0	28,0	19,0	8,2	32,5	42,0	10,5	M10 x 35	350
4	9726	1"	70,0	27,8	57,2	81,0	33,0	24,0	9,0	38,8	48,4	M12		530
5	9727		70,0	27,8	57,2	81,0	33,0	24,0	9,0	38,8	48,4	13,5	M12 x 45	530
6	9737	1 1/4"	78,0	31,8	66,6	95,0	38,0	27,0	9,8	44,5	54,8	M12		820
7	9745		78,0	31,8	66,6	95,0	38,0	27,0	9,8	44,5	54,8	M14		800
8	9746		78,0	31,8	66,6	95,0	38,0	27,0	9,8	44,5	54,8	13,5	M12 x 45	800
9	9747		78,0	31,8	66,6	95,0	38,0	27,0	9,8	44,5	54,8	14,7	M14 x 50	800
10	9769	1 1/2"	95,0	36,5	79,3	113,0	43,0	30,0	12,0	51,6	64,3	17	M16 x 55	1350
11	9789	2"	114	44,5	96,8	133,0	52,0	37,0	12,0	67,6	80,2	21	M20 x 70	2100



Material: C60 (1.0601)

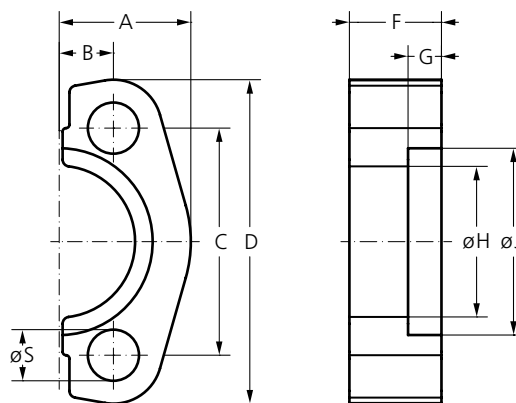
Item	Part no.	SAE size	A	B	C	D	F	G	H Ø	J Ø	S Ø	Screws	Total weight [g]
12	9709	3/4"	60,0	23,8	50,8	71,0	20,0	8,2	32,5	42,0	10,75	M10 x 35	300
13	9708		60,0	23,8	50,8	71,0	20,0	8,2	34,6	42,0	10,75	M10 x 35	275
14	9729	1"	70,0	27,8	57,2	81,0	25,0	9,0	38,8	48,4	13,0	M12 x 45	510
15	9749	1 1/4"	80,0	31,8	66,6	95,0	27,0	9,8	44,5	54,8	14,75	M14 x 50	670

The above flat flanges are also available as split flanges providing a nearly gap-free assembly situation and resulting in a strongly deduced tendency to tilt.



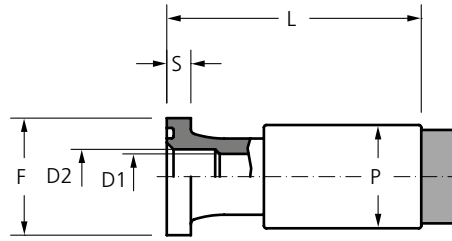
Material: S355J0/C45  
(1.0553)/(1.0503)

Item	Part no.	SAE size	A	B	C	D	E	F	G	H Ø	J Ø	S Ø	Screws	Weight [g]
1	9741	1 1/4"	39,0	15,9	66,6	95,0	38	27	9,8	44,5	54,8	M14	M12 x 45	400
2	9744		39,0	15,9	66,6	95,0	38	27	9,8	44,5	54,8	13,5		400
3	9739		39,0	15,9	66,6	95,0	38	27	9,8	44,5	54,8	14,75		400
4	9765	1 1/2"	48,0	18,25	79,3	113,0	43	30	12,0	51,6	64,3	17	M16 x 55	680
5	9783	2"	57,0	22,25	96,8	133,0	52	37	12,0	67,6	80,2	21	M20 x 70	1050

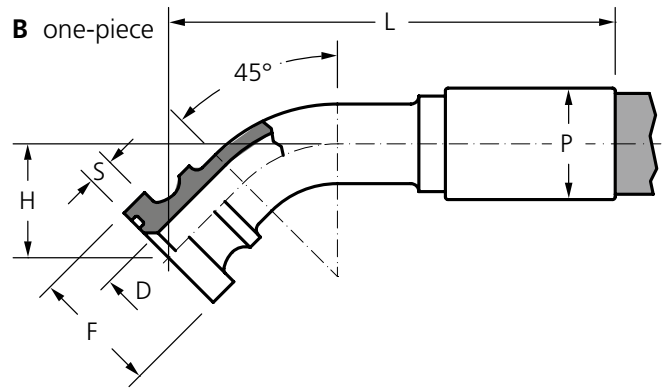
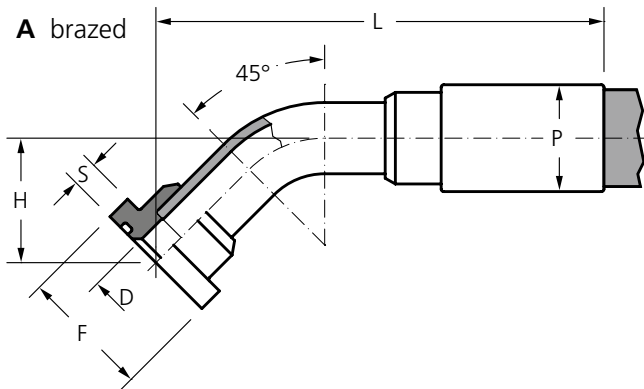


Material: C60 (1.0601)

Item	Part no.	SAE size	A	B	C	D	F	G	H Ø	J Ø	S Ø	Screws	Weight [g]
6	9683	1/2"	23,5	9,1	40,5	56,0	16	7,2	24,4	32,5	9,0	M8 x 30	80
7	9703	3/4"	29,0	11,9	50,8	69,0	20	8,2	32,5	42,0	11,0	M10 x 35	160
8	9723	1"	35,5	13,9	57,2	78,0	25	9,0	38,9	48,4	13,0	M12 x 45	250
9	9743	1 1/4"	38,7	15,9	66,6	92,0	27	9,8	44,5	54,8	15,0	M14 x 50	340
10	9763	1 1/2"	47,7	18,25	79,3	107,0	30	12,0	51,5	64,3	17,0	M16 x 55	550



Item	Part no.	NW	Connection size	Flange				Swag- ing-Ø [mm]	Hose				L	Total weight [g]
				F	S	D2	D1		L4	L46		L6		
									S4	S46	S46E	S6E		
1	2618	<b>12</b>	½"	31,7	8	12	9	<b>26,2</b>	x				67	170
2	2619		¾"	41,3	9	16	9		x				60	220
3	3080	<b>16</b>	½"	31,7	8	12	11,5	<b>30,0</b>	x				87	240
4	3090		¾"	41,3	9	16	12		x				72	280
5	2920		1"	47,6	9,8	16	11,5		x				112	350
6	3479	<b>20</b>	½"	31,7	8	14	14	<b>34,2</b>		x			98	330
7	3483		¾"	41,3	9	14	14			x			102	390
8	3489		1"	47,6	9,6	21	14			x			88	390
9	7943		1"	47,6	9,6	19	14			x			103	530
10	3492		1¼"	54,0	10,5	21	13			x			98	540
11	5433	<b>25</b>	¾"	41,3	9	19	19	<b>42,0</b>		x			120	620
12	5437		1"	47,6	9,6	19	19			x			105	670
13	7970		1"	47,6	9,6	19	19			x			119	740
14	5438		1"	47,6	9,6	19	19			x			120	670
15	26870		1"	47,6	9,6	19	19			x			159	870
16	5439		1¼"	54,0	10,5	19	19			x			90	630
17	7973		1¼"	54,0	12	24	19			x			105	740
18	5808	<b>32</b>	1"	47,6	9,8	24	24	S46(E) = <b>52,8</b>		x			148	1110
19	5812		1¼"	54,0	10,5	25	24			x			128	1080
20	5813		1¼"	54,0	10,5	25	24			x			158	1240
21	8035		1¼"	54,0	12	24	24				x	x	171	1450/1570
22	8033		1¼"	54,0	12	24	24					x	203	1620/1740
23	5817		1½"	63,5	12,8	30	24				x		133	1240
24	28385		1½"	63,5	12,7	24	24					x	186	1930/2050
25	8039		1½"	63,5	15	29	24					x	156	1550/1670
26	28432	<b>40</b>	1½"	63,5	12,7	29	29	S46E = <b>63,5</b>			x		192	2400
27	8089		1½"	63,5	15	29	29				x		197	2300
28	28457		1½"	63,5	12,7	29	29					x	203	2650
29	8438		1½"	63,5	15	29	29						210	2560
30	28435		2"	79,4	12,7	29	29					x	208	3170
31	8440		2"	79,4	15	33	29						193	2985
32	8128	<b>50</b>	2"	79,4	12,8	40	40	<b>77,0</b>			x		175	2880
33	28482		2"	79,4	12,7	40	40				x		215	3910
34	8477		2"	79,4	15	40	40					x	236	4420



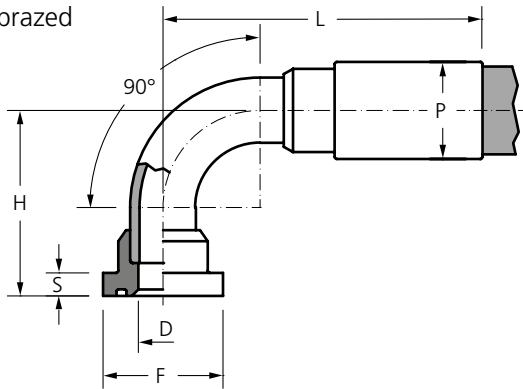
Item	Part no.	NW	Connection size	Flange			H	Version	Swag- ing-Ø [mm]	Hose Coupling				L	Total weight [g]
				F	S	D				L4 S4	L46 S46	L6 S46E	S6E		
1	2543	<b>12</b>	½"	31,7	8	12	32	A	<b>26,2</b>	x				115	250
2	2547		¾"	41,3	9	12	32	A		x				111	310
3	2950	<b>16</b>	½"	31,7	8	12	32	A	<b>30,0</b>	x				118	330
4	2954		¾"	41,3	9	12	32	A		x				122	370
5	2955		¾"	41,3	9	16	32	A		x				135	460
6	2957		¾"	41,3	9	16	40	A		x				140	490
7	2956		¾"	41,3	9	16	52	A		x				170	530
8	2958		1"	47,6	9,8	16	52	A		x				170	570
9	3563	<b>20</b>	¾"	41,3	9	16	31	A	<b>34,2</b>		x			147	540
10	3565		¾"	41,3	9	16	40	A			x			152	570
11	7933		¾"	41,3	9	14	40	B			x			150	580
12	3568		¾"	41,3	9	16	52	A			x			181	630
13	3574		1"	47,6	9,8	21	35	A			x			141	670
14	3573		1"	47,6	9,8	16	40	A			x			152	600
15	3580		1"	47,6	9,8	21	42	A			x			154	790
16	7942		1"	47,6	9,6	14	45	B			x			156	710
17	3577		1"	47,6	9,8	16	52	A			x			182	650
18	3610		1"	47,6	9,8	21	52	A			x			179	870
19	21531		1"	47,6	9,8	14	82	B			x			225	990
20	21530	1"	47,6	9,6	14	100	B		x			219	990		
21	7945	1¼"	54,0	12,0	19	50	B		x			166	990		
22	28356	<b>25</b>	¾"	41,3	9	19	31	B	<b>42,0</b>		x			141	690
23	5555		¾"	41,3	9	16	40	A			x			155	700
24	5556		¾"	41,3	9	16	52	A			x			186	760
25	26977		¾"	41,3	10	19	39	B			x			160	740
26	5562		1"	47,6	9,8	21	35	A			x			143	810
27	7990		1"	47,6	9,6	19	43	B			x			170	952
28	5565		1"	47,6	9,8	21	50	A			x			177	900
29	5569		1"	47,6	9,8	21	74	A			x			206	970
30	5568		1¼"	54,0	10,5	21	35	A			x			146	850
31	5574		1¼"	54,0	10,5	21	50	A			x			177	950
32	7994		1¼"	54,0	12	19	50	B			x			165	1070

Item	Part no.	NW	Connection size	Flange			H	Version	Swag-ing-Ø [mm]	Hose				L	Total weight [g]		
				F	S	D				L4	L46		L6				
										Coupling							
S4	S46	S46E	S6E														
33	5970	32	1"	47,6	9,8	21	50	A	S46(E) = <b>52,8</b>		x			185	1290		
34	29641		1"	47,6	11	24	60	B					x	x	250	1680/1800	
35	5931		1¼"	54,0	12	24	30	B				x			216	1410	
36	5930		1¼"	54,0	10,5	25	48	A				x			195	1480	
37	5929		1¼"	54,0	10,5	25	60	A				x			220	1610	
38	28383		1¼"	54,0	10,4	24	41	B					x	x	195	1500/1620	
39	8055		1¼"	54,0	12,0	24	60	B			S6E		x	x	234	1900/2020	
40	29135		1¼"	54,0	12,0	24	100	B			=		x	x	260	2140/2260	
41	29136		1¼"	54,0	12,0	24	115	B			<b>56,5</b>		x	x	303	2380/2500	
42	5938		1½"	63,5	12,8	25	60	A				x			223	1730	
43	8050		1½"	63,5	15,0	24	60	B					x	x	244	2230/2350	
44	28433		40	1½"	63,5	12,7	29	48		B	S46E			x		230	2580
45	8105			1½"	63,5	12,8	30	80		A	= <b>63,5</b>			x		295	3000
46	8408	1½"		63,5	15,0	29	60	B	S6E				x	283	3150		
47	8454	1½"		63,5	15,0	29	80	B	= <b>66,0</b>				x	263	3150		
48	28483	50	2"	79,4	12,7	40	59	B	<b>77,0</b>			x		280	4160		
49	8490		2"	79,4	15,0	40	90	B	<b>81,5</b>				x	302	5470		

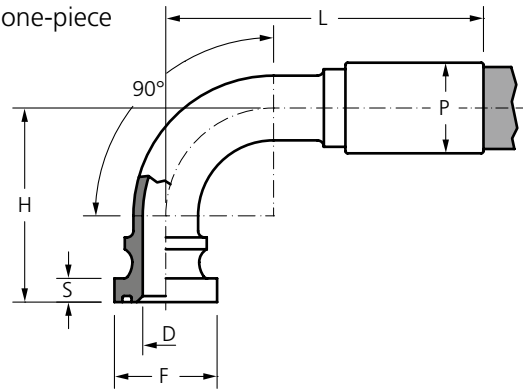




**A** brazed



**B** one-piece

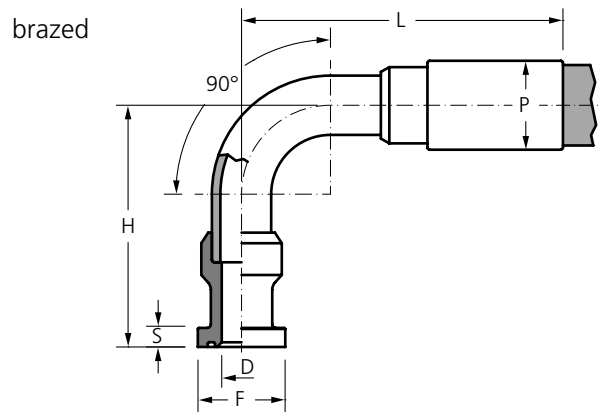


Item	Part no.	NW	Connection size	Flange			H	Version	Swag-ing-Ø [mm]	Hose				L	Total weight [g]		
				F	S	D				L4	L46		L6				
										S4	S46	S46E	S6E				
1	2335	<b>10</b>	½"	31,7	8	10	45	A	<b>23,0</b>	x				80	200		
2	2533	<b>12</b>	½"	31,7	8	12	51	A	<b>26,2</b>	x				92	280		
3	2537		¾"	41,3	9	12	52	A		x				92	320		
4	2925	<b>16</b>	½"	31,7	8	12	51	A	<b>30,0</b>	x				102	340		
5	2928		½"	31,7	8	12	80	A		x				126	390		
6	2931		½"	31,7	8	12	120	A		x				125	430		
7	2935		¾"	41,3	9	16	60	A		x				106	470		
8	2967		¾"	41,3	9	16	74	A		x				120	520		
9	2938		¾"	41,3	9	16	80	A		x				126	530		
10	2969		¾"	41,3	9	16	85	A		x				131	560		
11	2939		¾"	41,3	9	16	100	A		x				148	590		
12	2944		1"	47,6	9,8	16	80	A		x				128	570		
13	2915		1¼"	54,0	10,5	21	100	A		x				160	880		
14	3503		<b>20</b>	¾"	41,3	9	16	60		A	<b>34,2</b>		x			118	560
15	3504			¾"	41,3	9	16	68		A			x			127	580
16	7925			¾"	41,3	9	14	75		B			x			132	650
17	3509	¾"		41,3	9	16	80	A		x				138	620		
18	3511	¾"		41,3	9	16	86	A		x				145	640		
19	3516	¾"		41,3	9	16	100	A		x				158	690		
20	3519	¾"		41,3	9	16	120	A		x				158	710		
21	3533	1"		47,6	9,8	16	60	A		x				118	600		
22	3535	1"		47,6	9,8	16	75	A		x				130	630		
23	7941*	1"		47,6	9,6	14	80	B		x				132	770		
24	3545	1"		47,6	9,8	16	100	A		x				158	710		
25	3551	1"		47,6	9,8	16	120	A		x				158	750		
26	21510*	1"		47,6	9,6	14	140	B		x				134	990		
27	21512	1"		47,6	9,6	14	180	B						139	1050		
28	22028	1¼"	54,0	12	19	100	B			x		168	1260				
29	5462	<b>25</b>	¾"	41,3	9	16	80	A	<b>42,0</b>		x			139	760		
30	26979		¾"	41,3	9	19	80	B			x			150	840		
31	5461		¾"	41,3	9	16	90	A			x			146	790		
32	26037		¾"	41,3	9	16	100	A			x			158	830		
33	26052		¾"	41,3	9	16	120	A			x			163	850		
34	26976		¾"	41,3	9	19	130	B			x			150	960		
35	26039		1"	47,6	9,8	16	60	A			x			122	730		
36	7955		1"	47,6	9,8	19	70	B			x			150	850		
37	5481		1"	47,6	9,8	21	75	A				x		136	880		

\* These couplings are available in brazed version and almost same dimensions.

Item	Part no.	NW	Connection size	Flange			H	Version	Swag- ing-Ø [mm]	Hose				L	Total weight [g]	
				F	S	D				L4	L46		L6			
										Coupling						
				S4	S46	S46E	S6E									
38	7957	25	1"	47,6	9,6	19	80	B	42,0		x			157	1050	
39	5522		1"	47,6	9,8	21	86	A			x				145	940
40	7981		1"	47,6	9,6	19	90	B			x				147	1050
41	26625*		1"	47,6	9,6	19	100	B			x				160	1120
42	7975*		1"	47,6	9,6	19	120	B			x				160	1180
43	7969		1"	47,6	9,6	19	130	B			x				147	1180
44	5505		1"	47,6	9,8	21	140	A			x				180	1150
45	26615*		1"	47,6	9,6	19	150	B			x				170	1400
46	26617		1"	47,6	9,6	19	170	B			x				150	1400
47	26610		1"	47,6	9,6	19	210	B			x				147	1640
48	28347*		1¼"	54,0	10,4	19	80	B			x				145	1020
49	7988		1¼"	54,0	12	19	82	B			x				166	1180
50	7984*		1¼"	54,0	12	19	100	B			x				147	1200
51	5542		1¼"	54,0	10,5	21	120	A			x				180	1130
52	7986		1¼"	54,0	12	19	130	B			x				149	1300
53	26635	1¼"	54,0	12	19	150	B		x				149	1530		
54	26632	1¼"	54,0	12	19	200	B		x				151	1900		
55	26644	1½"	63,5	15	19	130	B		x				185	2260		
56	5829	32	1"	47,6	9,8	21	80	A	S46(E) = 52,8  S6E = 56,5		x			160	1300	
57	5854		1"	47,6	11,0	24	90	B			x				165	1420
58	29642		1"	47,6	11,0	24	92	B				x	x		210	1690/1810
59	5828		1"	47,6	9,8	21	100	A			x				180	1400
60	5847		1¼"	54,0	12	24	71	B			x				170	1410
61	5851		1¼"	54,0	10,5	25	88	A			x				164	1550
62	28384		1¼"	54,0	10,4	24	88	B				x	x		181	1660/1780
63	29080		1¼"	54,0	12	24	95	B				x	x		190	1900/2020
64	8045		1¼"	54,0	12	24	120	B				x	x		207	2150/2270
65	29635		1¼"	54,0	12	24	150	B				x	x		228	2390/2510
66	29630		1¼"	54,0	12	24	180	B				x	x		194	2430/2550
67	29072		1¼"	54,0	12	24	290	B				x	x		238	3190/3310
68	29075		1¼"	54,0	12	24	375	B				x	x		239	3670/3790
69	28387		1½"	63,5	12,7	24	88	B				x	x		185	1730/1850
70	8048		1½"	63,5	15	24	120	B				x	x		207	2420/2540
71	5903	1½"	63,5	12,8	25	150	A			x			229	2130		
72	8049	1½"	63,5	15	24	160	B				x	x	247	2870/3000		
73	29009	1½"	63,5	15	24	180	B				x	x	232	2870/3000		
74	28434	40	1½"	63,5	12,7	29	105	B	S46E = 63,5  S6E = 66,0			x		225	2910	
75	28461		1½"	63,5	12,7	29	105	B					x		235	3180
76	8098		1½"	63,5	15	29	140	B					x		262	3440
77	8447		1½"	63,5	15	29	140	B						x	243	3500
78	8095		1½"	63,5	12,7	29	150	B					x		281	3550
79	28447		1½"	63,5	12,7	29	200	B					x		231	3550
80	28458		1½"	63,5	12,7	29	200	B						x	235	3820
81	8418		1½"	63,5	15	29	220	B						x	272	4780
82	8429		1½"	63,5	15	29	250	B						x	263	4780
83	28437		2"	79,4	12,7	29	105	B					x		229	3130
84	8450	2"	79,4	15	29	160	B					x	243	4320		
85	28481	50	1½"	63,5	12,7	29	105	B	77,0			x		241	3800	
86	28484		2"	79,4	12,7	40	135	B	77,0			x		255	4900	
87	28662		2"	79,4	12,7	40	135	B	81,5				x	270	5590	
88	8509		2"	79,4	15	40	180	B	81,5				x	283	6220	

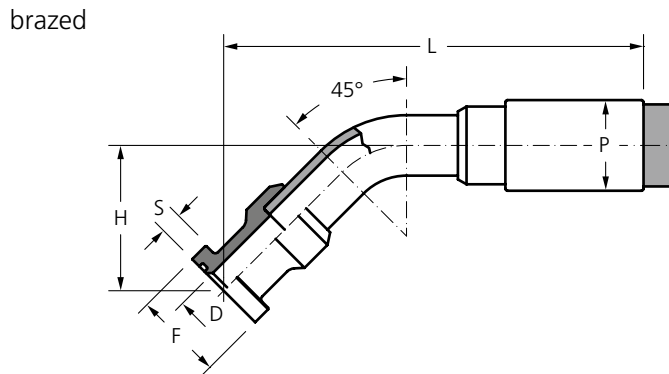
\* These couplings are available in brazed version and almost same dimensions.



Item	Part no.	NW	Connection size	Flange			H	Pipe E355 (St 52.4)	Hose L46		L	Total weight [g]
				F	S	D			Coupling S46 / S46E			
									Swaging-Ø			
1	3496	<b>20</b>	1/2"	31,7	8	13	80	22 x 3,5	<b>34,2</b>	x	118	570
2	3497		1/2"	31,7	8	13	100	22 x 3,5		x	138	630
3	3499		1/2"	31,7	8	13	120	22 x 3,5		x	157	700
4	3515		3/4"	41,3	9	18	108	28 x 4		x	137	850
5	3517		3/4"	41,3	9	18	130	28 x 4		x	165	965
6	3514		3/4"	41,3	9	18	200	28 x 4		x	176	1170
7	5465	<b>25</b>	3/4"	41,3	9	18	108	28 x 4	<b>42,0</b>	x	140	990
8	5468		3/4"	41,3	9	18	128	28 x 4		x	160	1084
9	5471		3/4"	41,3	9	18	135	28 x 4		x	168	1120
10	5469		3/4"	41,3	9	18	158	28 x 4		x	177	1190
11	5526		3/4"	41,3	9	18	230	28 x 4		x	185	1360
12	5511		1"	47,6	9,8	24	130	35 x 5		x	157	1410
13	5510	1"	47,6	9,8	24	181	35 x 5	x	184	1650		
14	5842	<b>32</b>	1"	47,6	9,8	24	120	35 x 5	<b>52,8</b>	x	171	1670
15	5844		1"	47,6	9,8	24	150	35 x 5		x	198	1900
16	8114	<b>40</b>	1 1/4"	54	10,5	28	155	40 x 6	<b>63,5</b>	x	214	3050
17	8112		1 1/4"	54	10,5	28	175	40 x 6		x	240	3260
18	8092		1 1/4"	54	10,5	28	230	40 x 6		x	240	3600
19	29740		1 1/4"	54	10,5	28	330	40 x 6		x	248	4090
20	8099		1 1/2"	63,5	15	24	195	40 x 6		x	235	3810
21	8130	<b>50</b>	1 1/2"	63,5	15	24	376	40 x 6	<b>77,0</b>	x	255	5200
22	8131		1 1/2"	63,5	15	24	330	40 x 6		x	255	5300

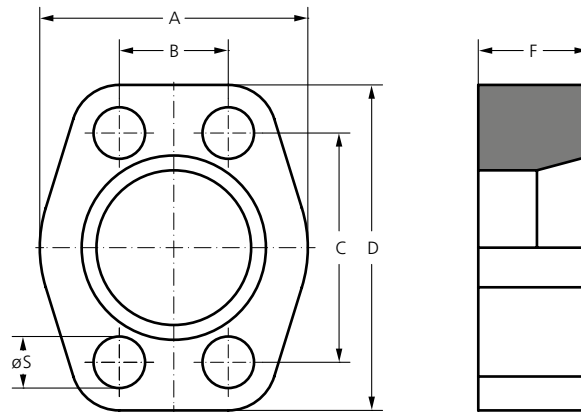
The inside diameters of the above special couplings with SAE flange connections in reduced step size remain basically maintained in comparison to the corresponding standard version. Due to the design of the flange head a greater elbow length H must be considered.





Item	Part no.	NW	Connection size	Flange			$\angle$	H	Pipe E355 (St 52.4)	Hose L46		L	Total weight [g]
				F	S	D				Coupling S46 / S46E			
										Swaging-Ø			
1	2992	<b>16</b>	1/2"	31,8	8	13	180°	88	22 x 3,5	<b>30,0</b>	x	108	760
2	3581	<b>20</b>	1/2"	31,8	8	13	45°	52	22 x 3,5	<b>34,2</b>	x	167	580
3	3569		3/4"	41,3	9	18	45°	55	28 x 4		x	158	750
4	3590		3/4"	41,3	9	18	170°	194	28 x 4		x	46	1440
5	3611		3/4"	41,3	9	18	180°	150	28 x 4		x	-65	1620
6	5586		3/4"	41,3	9	18	30°	42	28 x 4		x	196	940
7	5593	<b>25</b>	3/4"	41,3	9	18	35°	52	28 x 4	<b>42,0</b>	x	193	950
8	5595		3/4"	41,3	9	18	35°	135	28 x 4		x	333	1340
9	5563		3/4"	41,3	9	18	45°	70	28 x 4		x	195	980
10	5561		3/4"	41,3	9	18	65°	95	28 x 4		x	183	1020
11	5500		3/4"	41,3	9	18	70°	180	28 x 4		x	200	1210
12	5444		3/4"	41,3	9	18	80°	108	28 x 4		x	165	1020
13	5445		3/4"	41,3	9	18	80°	158	28 x 4		x	201	1220
14	5463		3/4"	41,3	9	18	105°	110	28 x 4		x	135	1040
15	5466		3/4"	41,3	9	18	120°	120	28 x 4		x	156	1180
16	5611		3/4"	41,3	9	18	180°	180	28 x 4		x	35	1670
17	5560		1"	47,6	9,8	24	45°	69	35 x 5		x	195	1250
18	5575		1"	47,6	9,8	24	45°	120	35 x 5		x	284	1470
19	5618		1"	47,6	9,8	24	75°	105	35 x 5		x	175	1340
20	5464		1"	47,6	9,8	24	146°	138	35 x 5		x	121	1790
21	5920		<b>32</b>	1"	47,6	9,8	24	30°	60		35 x 5	<b>52,8</b>	x
22	5923	1"		47,6	9,8	24	45°	83	35 x 5	x	239		1740
23	5924	1"		47,6	9,8	24	65°	120	35 x 5	x	229		1820
24	8108	<b>40</b>	1 1/4"	54	10,5	28	45°	100	40 x 6	<b>63,5</b>	x	315	3130
25	8113		1 1/4"	54	10,5	28	105°	180	40 x 6		x	220	3440
26	8462		1 1/2"	63,5	15	24	175°	140	40 x 6		x	170	4800

The inside diameters of the above special couplings with SAE flange connections in reduced step size remain basically maintained in comparison to the corresponding standard version. Due to the design of the flange head a greater elbow length H must be considered.



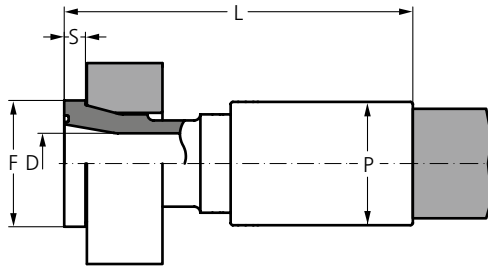
Material: S355J0/C45  
(1.0553)/(1.0503)

Item	Part no.	SAE size	NW	A	B	C	D	H	S Ø	Screws	Total weight [g]
1	9712	¾"	20 + 25	60	23,9	50,8	71	25	11	M10 x 50	390
2	9732	1"	25	70	27,8	57,2	81	27	13	M12 x 55	590
3	9754	1"	32	70	27,8	57,2	81	27	13	M12 x 60	570
4	9755	1¼"	25 + 32	78	31,7	66,7	95	32	13	M12 x70	950
5	9751		25 + 32	78	31,7	66,7	95	32	M14		940
6	9752		25/32/36	78	31,7	66,7	95	32	15	M14 x 70	940
7	9770		40	78	31,7	66,7	95	32	15	M14 x 75	900
8	9772	1½"	32 + 40	95	36,5	79,4	113,4	39	17	M16 x 80	1760
9	9777		45	95	36,5	79,4	113,4	39	17	M16 x 80	1650
10	9790		50	95	36,5	79,4	113,4	39	17	M16 x 80	1570
11	9792	2"	40/50/57	114	44,5	96,8	133	50	21	M20 x 100	2940
12	9795	2½"	50 + 65	152	58,8	123,8	180	55	26	M24 x 120	5640
13	9797	3"	75	198	71,6	152,4	215	60	31	M30 x 130	9420

Material: X6CrNiMoTi-17-12-2 (1.4571)

Item	Part no.	SAE size	NW	A	B	C	D	H	S Ø	Screws	Total weight [g]
14	29812	1¼"	32	78	31,7	66,7	95	32	15	M14 x 70	960
15	29761	1½"	40	95	36,5	79,4	113	39	17	M16 x 80	1790
16	29792	2"	50	114	44,5	96,8	133	50	21	M20 x 100	2990
17	30051	2½"	65	150	58,8	123,8	180	55	26	M24 x 120	5740





Material: galvanized steel

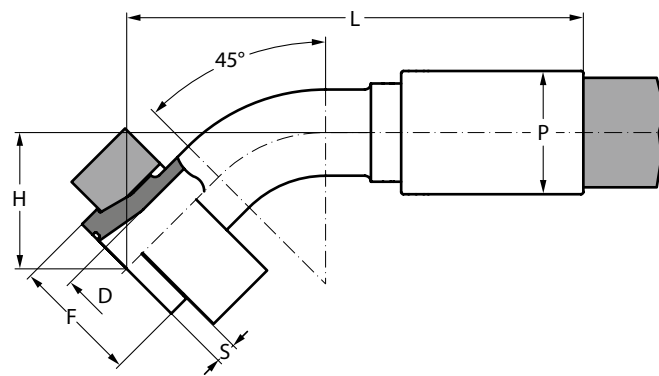
Item	Part no.	NW	Connection size	Flange			Swaging-Ø [mm]	Hose			L	Total weight [g]
				F	S	D		L46	L6			
								Coupling				
S46	S46E	S6E										
1	7920	<b>20</b>	¾"	43,5	8	14	<b>34,2</b>	x			113	910
2	7971	<b>25</b>	1"	49,5	9	19	<b>42,0</b>	x			120	1400
3	7974		1¼"	57,5	11	19		x			109	1830
4	8042	<b>32</b>	1"	49,5	9	24	S46(E) = <b>52,8</b>		x	x	171	2160
5	8037		1¼"	57,5	11	24		x			171	2510
6	8036		1¼"	57,5	11	24		S6E	x	x	200	2800
7	8041		1½"	68,5	13	29/24		= <b>56,5</b>	x	x	156	2720/2840
8	4301	<b>36</b>	1¼"	57,5	11	28	<b>61,3</b>			x	210	2910
9	8441	<b>40</b>	1¼"	57,5	11	29	<b>66,0</b>			x	226	3620
10	8439		1½"	68,5	13	29				x	210	4520
11	8460		1½"	68,5	13	29				x	344	5030
12	8446		2"	83,5	14	29				x	190	5070
13	6300	<b>45</b>	1½"	68,5	13	35	<b>75,0</b>			x	225	5100
14	8481	<b>50</b>	1½"	68,5	13	40	<b>81,5</b>			x	262	5970
15	28654		2"	83,5	14	40				x	205	7320
16	8478		2"	83,5	14	40				x	235	7600
17	8515		2½"	109,0	17	40				x	260	12800
18	30015	<b>65</b>	2½"	109,0	17	50	<b>94,0</b>			x	280	15000

On SK6 couplings with reduced step size heads as per items: 4, 8, 9, 13 and 14 the inside diameters are the same as in the corresponding standard version. Consequently the next larger hose dimension can be used in order to avoid negative flow restrictions.

Material: stainless steel

Item	Part no.	NW	Connection size	Flange			Swaging-Ø [mm]	Hose			L	Total weight [g]
				F	S	D		L46	L6			
								Coupling				
S46	S46E	S6E										
19	29820	<b>32</b>	1¼"	57,5	11	24	<b>52,8</b>		x	x	171	2560
20	29761	<b>40</b>	1½"	68,5	13	29	<b>66,0</b>			x	205	4610
21	29793	<b>50</b>	2"	83,5	14	40	<b>81,5</b>			x	235	7750
22	30052	<b>65</b>	2½"	109,0	17	50	<b>94,0</b>			x	280	15290





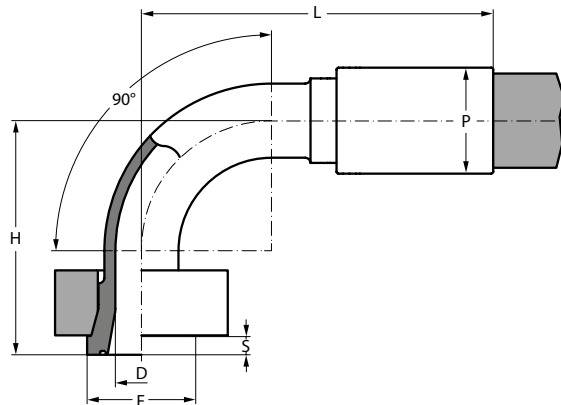
Material: galvanized steel

Item	Part no.	NW	Conne- ction size	Flange			H	Swag- ing-Ø [mm]	Hose			L	Total weight [g]
				F	S	D			L46		L6		
									Coupling				
								S46	S46E	S6E			
1	7934	<b>20</b>	¾"	43,5	8	14	40	<b>34,2</b>	x			156	1030
2	7989		¾"	43,5	8	19	40		x			168	1290
3	7991	<b>25</b>	1"	49,5	9	19	43	<b>42,0</b>	x			180	1620
4	8005		1¼"	57,5	11	19	50		x			215	2200
5	8044		1"	49,5	9	24	60	S46(E) = <b>52,8</b>		x	x	227	2430/2550
6	8057	<b>32</b>	1¼"	57,5	11	24	60	S6E = <b>56,5</b>		x	x	235	2960/3080
7	8052		1½"	68,5	13	24	60			x	x	243	4180/4300
8	4335	<b>36</b>	1¼"	57,5	11	28	51	<b>61,3</b>			x	230	3230
9	8457		1¼"	57,5	11	29	70				x	265	3930
10	28629		1½"	68,5	13	29	68				x	263	5030
11	8456	<b>40</b>	1½"	68,5	13	29	80	<b>66,0</b>			x	272	5130
12	8421		2"	83,5	14	29	90				x	288	7190
13	6345	<b>45</b>	1½"	68,5	13	35	72	<b>75,0</b>			x	279	5860
14	8483		1½"	68,5	13	40	82				x	305	6500
15	8516		1½"	68,5	13	40	135				x	364	7130
16	28655		2"	83,5	14	40	69				x	290	8280
17	8491	<b>50</b>	2"	83,5	14	40	90	<b>81,5</b>			x	311	8600
18	8492		2"	83,5	14	40	135				x	365	9310
19	8511		2"	83,5	14	40	155				x	452	10400
20	8520		2½"	109,0	17	50	105				x	351	13370
21	30035	<b>65</b>	2½"	109,0	17	50	110	<b>94,0</b>			x	371	15800

On SK6 couplings with reduced step size heads as per items: 4, 8, 9, 13 and 14 the inside diameters are the same as in the corresponding standard version. Consequently the next larger hose dimension can be used in order to avoid negative flow restrictions.

Material: stainless steel

Item	Part no.	NW	Conne- ction size	Flange			H	Swag- ing-Ø [mm]	Hose			L	Total weight [g]
				F	S	D			L46		L6		
									Coupling				
								S46	S46E	S6E			
22	29822	<b>32</b>	1¼"	57,5	11	24	60	<b>52,8</b>		x	x	230	3010
23	29772	<b>40</b>	1½"	68,5	13	29	80	<b>66,0</b>			x	272	5230
24	29799	<b>50</b>	2"	83,5	14	40	90	<b>81,5</b>			x	311	8760
25	30054	<b>65</b>	2½"	109,0	17	50	110	<b>94,0</b>			x	371	15900



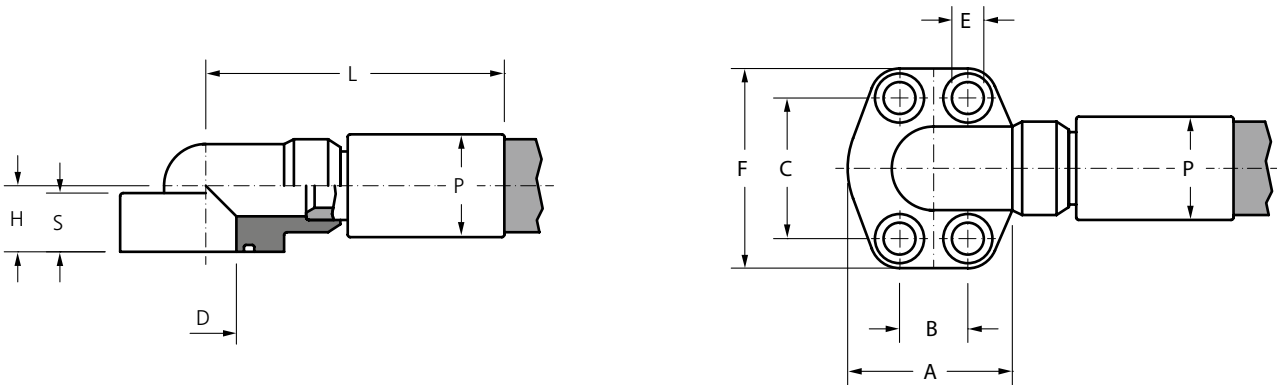
Material: galvanized steel

Item	Part no.	NW	Conne- ction size	Flange			H	Swag- ing-Ø [mm]	Hose			L	Total weight [g]
				F	S	D			L46	L6			
									Coupling				
								S46	S46E	S6E			
1	7926	<b>20</b>	¾"	43,5	8	14	75	<b>34,2</b>	x			138	1090
2	7979	<b>25</b>	¾"	43,5	8	19	88	<b>42,0</b>	x			150	1390
3	7953		¾"	43,5	8	19	120		x			162	1600
4	7954		¾"	43,5	8	19	150		x			232	1900
5	7982		1"	49,5	9	19	90		x			160	1680
6	7985		1¼"	57,5	11	19	100		x			157	2250
7	8043		<b>32</b>	1"	49,5	9	24		116	S46(E) = <b>52,8</b>		x	x
8	29115	1"		49,5	9	24	150	x	x		263	3250/3370	
9	29110	1"		49,5	9	24	176	x	x		242	3250/3370	
10	8047	1¼"		57,5	11	24	120	S6E = <b>56,5</b>	x		x	212	3200/3320
11	8051	1¼"		57,5	11	24	160		x		x	210	3420/3540
12	8053	1½"		68,5	13	24	120		x		x	220	4320/4440
13	4330	<b>36</b>	1¼"	57,5	11	28	110	<b>61,3</b>			x	230	3600
14	4331		1¼"	57,5	11	28	170		x		225	3960	
15	4346		1¼"	57,5	11	28	150		x		245	3960	
16	8459	<b>40</b>	1¼"	57,5	11	29	130	<b>66,0</b>			x	244	4240
17	28630		1½"	68,5	13	29	120		x		242	5280	
18	8448		1½"	68,5	13	29	140		x		245	5460	
19	8449		2"	83,5	14	29	160		x		245	7500	
20	6330	<b>45</b>	1½"	68,5	13	35	155	<b>75,0</b>			x	275	6530
21	8482	<b>50</b>	1½"	68,5	13	40	175	<b>81,5</b>			x	283	7210
22	28656		2"	83,5	14	40	150		x		281	8800	
23	8485		2"	83,5	14	40	180		x		277	9420	
24	8489		2"	83,5	14	40	280		x		280	10400	
25	8525		2½"	109,0	17	40	225		x		301	14300	
26	30030		<b>65</b>	2½"	109,0	17	50		225	<b>94,0</b>			x

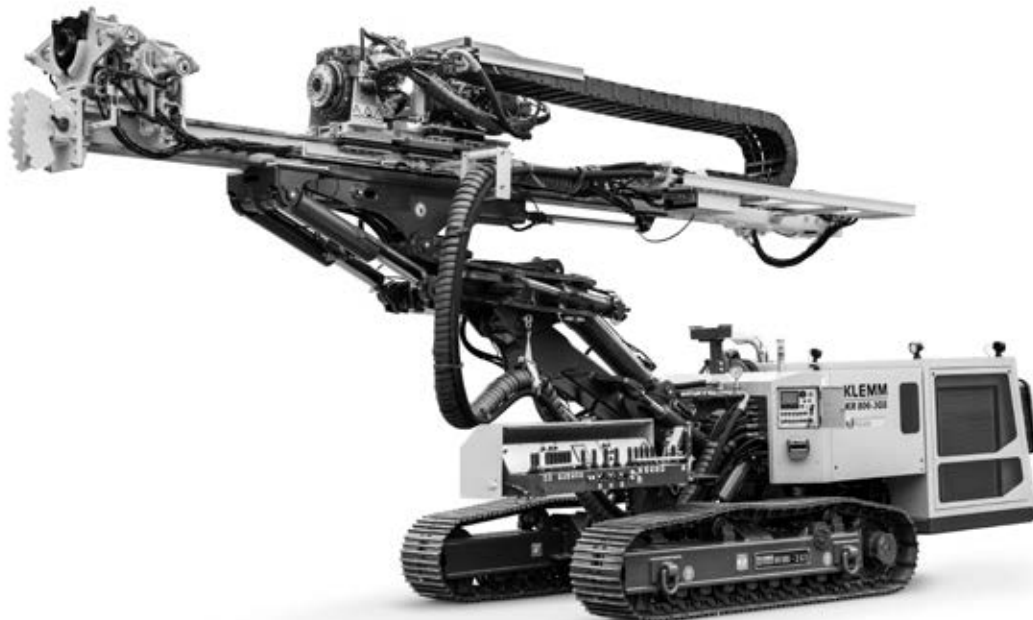
On SK6 couplings with reduced step size heads as per items: 4, 8, 9, 13 and 14 the inside diameters are the same as in the corresponding standard version. Consequently the next larger hose dimension can be used in order to avoid negative flow restrictions.

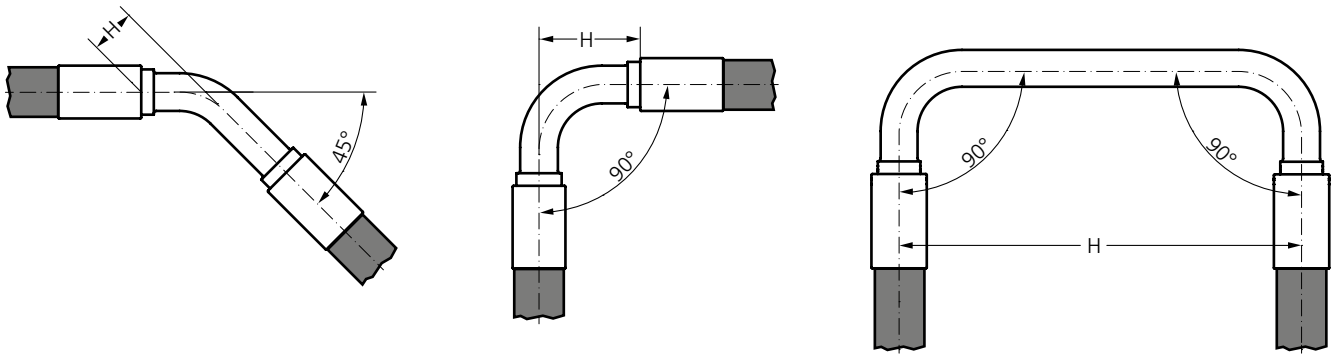
Material: stainless steel

Item	Part no.	NW	Conne- ction size	Flange			H	Swag- ing-Ø [mm]	Hose			L	Total weight [g]
				F	S	D			L46	L6			
									Coupling				
								S46	S46E	S6E			
27	29826	<b>32</b>	1¼"	57,5	11	24	120	<b>52,8</b>		x	x	210	3260
28	29775	<b>40</b>	1½"	68,5	13	29	140	<b>66,0</b>			x	245	5560
29	29796	<b>50</b>	2"	83,5	14	40	180	<b>81,5</b>			x	277	9600
30	30056	<b>65</b>	2½"	109,0	17	50	225	<b>94</b>			x	335	17300



Item	Part no.	NW	Con- nec- tion size	H	D	S	A	B	C	F	E	Screws	Swag- ing-Ø [mm]	Hose			L	Total weight [g]
														L4 S4	L46 S46	L6 S6E		
1	2330	<b>10</b>	½"	20	13	16	41	18,2	40,5	54	9	M8x30	<b>23,0</b>	x			90	460
2	2520	<b>12</b>	½"	20	13	16	41	18,2	40,5	54	9	M8x30	<b>26,2</b>	x			92	480
3	2524		¾"	22	19	19	60	23,8	50,8	71	11	M10x35		x			97	730
3	2932	<b>16</b>	½"	20	13	16	41	18,2	40,5	54	9	M8x30	<b>30,0</b>	x			95	520
4	2940		¾"	22	19	19	60	23,8	50,8	71	11	M10x35		x			103	750
5	2942		1"	27	25	24	67	27,8	57,2	81	13	M12x45		x			116	1050
6	3536	<b>20</b>	½"	20	13	16	41	18,2	40,5	54	9	M8x30	<b>34,2</b>		x		110	610
7	3501		¾"	22	19	19	60	23,8	50,8	71	11	M10x35			x		118	830
8	3531		1"	27	25	24	67	27,8	57,2	81	13	M12x45			x		124	1170
9	3507		1¼"	32	30	27	72	31,8	66,7	95	15	M14x50			x		123	1570
10	5473	<b>25</b>	¾"	22	19	19	60	23,8	50,8	71	11	M10x35	<b>42,0</b>		x		136	1100
11	5480		1"	27	25	24	67	27,8	57,2	81	13	M12x45			x		127	1310
12	5494		1¼"	32	30	27	72	31,8	66,7	95	15	M14x50			x		136	1825
13	5709	<b>32</b>	1"	27	25	24	67	27,8	57,2	81	13	M12x45	<b>52,8</b>		x		169	1780
14	5710		1¼"	32	30	27	72	31,8	66,7	95	15	M14x50			x		152	2170
15	8444	<b>40</b>	1½"	40	38	30	85,5	36,5	79,4	113	17	M16x50	<b>66,0</b>			x	199	3910



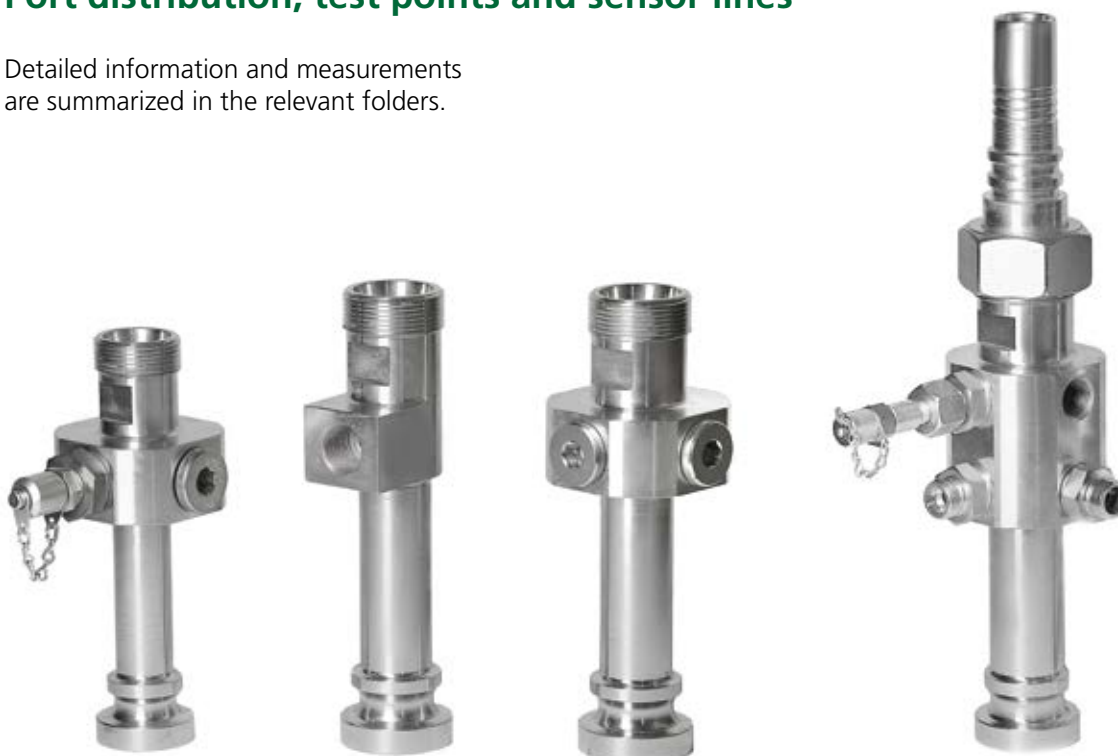


Item	Part no.	NW	∠	1. ∠	D	H	one-piece / brazed with pipe E355 (St 52.4)	Swag- ing-Ø [mm]	Hose			L	Total weight [g]	
									L46	-	-			
									Coupling					
									S46	S46E	S6E			
1	21027	<b>20</b>	30°		13	25	22 x 3,5	<b>34,2</b>	x			90	740	
2	21026		45°		13	37	22 x 3,5		x			87	750	
3	3657		90°		13	56	22 x 3,5		x			55	740	
4	3658		90°		14	65	one-piece		x			66	800	
5	21021		90°		13	160	28 x 4		x			160	1350	
6	5659	<b>25</b>	0°		19	-	35 x 5	<b>42,0</b>	x			155	1570	
7	26105		45°		19	45	28 x 4		x			105	1220	
8	7962		45°		19	64	one-piece		x			120	1360	
9	26110		80°		19	94	28 x 4		x			95	1320	
10	26104		90°		19	80	28 x 4		x			80	1240	
11	7958		90°		19	80	one-piece		x			80	1360	
12	5657		90°		19	100	28 x 4		x			100	1340	
13	26106		90°		19	145	28 x 4		x			125	1590	
14	5666		180°		19	180	28 x 4		x			140	1900	
15	29050	<b>32</b>	0°		24	-	one-piece	S46(E) = <b>52,8</b>  S6E = <b>56,5</b>		x	x	20	1960	
16	8038		45°		24	45	one-piece			x	x	155	2770/3020	
17	8026		45°	45°	24	168	one-piece			x	x	50	3560/3810	
18	29664		55°		24	60	one-piece			x	x	150	2770/3020	
19	8027		55°		24	65	one-piece			x	x	270	3560/3810	
20	29666		75°		24	80	one-piece			x	x	130	2770/3020	
21	29016		90°		24	100	one-piece			x	x	95	2770/3020	
22	5804		90°		24	115	35 x 5		x			115	2450	
23	29052		90°	90°	24	400	one-piece				x	x	100	4770
24	29021		95°		24	95	one-piece				x	x	100	2770/3020
25	8420	<b>40</b>	90°		29	125	one-piece	<b>66,0</b>			x	125	4900	
26	8498	<b>50</b>	90°		40	150	one-piece	<b>81,5</b>			x	150	8400	

One-piece versions should be preferred. Further special elbow options available on demand.

### Port distribution, test points and sensor lines

Detailed information and measurements are summarized in the relevant folders.



#### MA6

The number of ports can be defined individually and unique design opportunities can be realized.



#### FA6

The FA6 is an invention where in use assemblies or testing ports can be connected directly on the full flange. Single or twin solutions in the size NW20-NW50 can be selected.

### Port distributions in brazed version

A wide range of distributions can be realized with SAE and DKO connections. If requested the hose can be crimped directly on the coupling.



### Y-Distributor

With the Y-distributor an optimized flow can be achieved. All ends have a CES connection in the dimensions 20, 25 and 32.



### Y-Block distributor

This Y block distributor is designed in order to be connected with SAE flange couplings.



### Double connector



### DA6

The double connector can substitute previous block solutions. The assembly is very simple and self-centring as it is made for the existing SAE bolt pattern.



### DA6 closed

With the DA6 in closed version very small elbow heights can be realized. For the assembly standard full flanges can be used.



### DA6 coupling

The DA6 couplings are available in straight or any required elbow configuration.



### DA6L

On the principle of the patented DA6 connector a wide range of ports can be realized. The exact positioning follows the standard SAE bolt configuration.



### Port distribution in one-piece version

In heavy duty applications these ports can be used in the dimensions NW20 up to NW50 offering unique opportunities.

### Couplings with special bending

Couplings in various special bending configurations are available in one-piece and also brazed version.





### Converter SAE to CES

In order to simplify the aftersales demand this converter can be used in order to assemble DKO connections.



### Compact couplings

In very narrow installations these compact couplings can offer individual solutions and exact angle options in the dimensions NW20 up to NW32.



### CES-CES connector

Wherever long and complicated assemblies must be divided into segments, this CES-CES connector can be used.



### SKM6

This coupling is based on the patented SK6 innovation where instead of the full flanges, special swivel nuts can be used. Available from NW20 up to NW50.

### Hose routing

In various installations hose assemblies must be defined for individual and confined circumstances where a correct hose routing is required.



#### Half shells

Half shells are made from steel or plastic and can be assembled afterwards.



#### Slot sleeves

Slot sleeves are made from steel or plastic can be positioned free on the hose assembly.



#### Swage sleeves

Swage sleeves out of steel are suitable for standard clamps.



### Tube sleeves

Tube sleeves can be swaged on the hose material at a defined position. They are suitable for all standard clamping systems.



### Plastic twisting clamp

With this invention multiple hose assemblies can be held in an exact position. Available for hose dimensions NW16, NW20 and NW25.

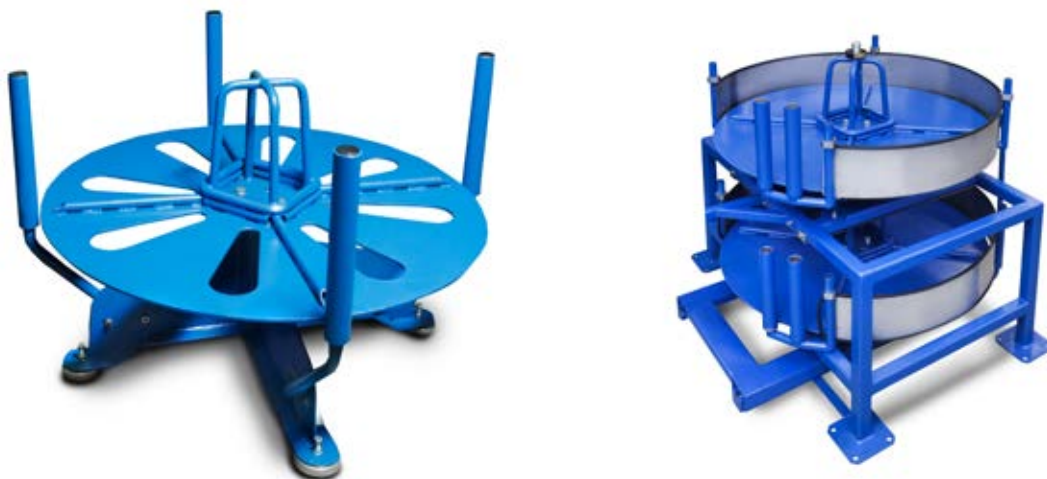


### Straps

The robust straps are made from FRAS material and can bundle multiple hoses or hold them in position.

HDS offers a variety of self developed machines and equipment for an optimal, precise and safe production of hose assemblies. Below some examples from our current range.

**Twisting plates** – available in various dimensions and options



**Cutting machines** – manual or semi automatic



**Automatic cutting line**





## Skiving machines – manual and semi automatic



## V- and K angle setting devices



## Nipple pusher



**Testbenches** – for cleaning and pressure testing



**Hose trolleys**



Further detailed Informations are summarized in our machine catalogue.



**Editor:**

HDS Hydraulik GmbH & Co. KG  
Werner-von-Siemens-Straße 14  
51647 Gummersbach  
Germany

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[www.HDS-Hydraulik.com](http://www.HDS-Hydraulik.com)



**HDS Hydraulik GmbH & Co. KG**

Werner-von-Siemens Straße 14  
51647 Gummersbach  
Germany

Fon +49 2261 8198-0  
Fax +49 2261 8198-98

[info@HDS-Hydraulik.com](mailto:info@HDS-Hydraulik.com)  
[www.HDS-Hydraulik.com](http://www.HDS-Hydraulik.com)