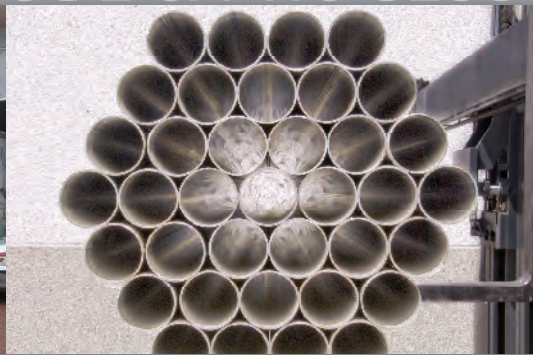
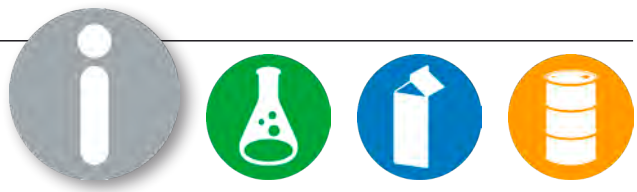


HYGIENIC TUBE & PROCESS COMPONENTS



INSTALLATION MATERIALS







Stainless steel Installation materials

S.K.S. keeps the right installation materials, pumps or equipment in stock no matter what the application, version or dimensions are. Our experience of the complete market of the light process industry is the base of our package. Despite the many differences in the finishing of the materials and the diversity of the materials and dimensions, SKS is able to deliver many products directly from stock. SKS is specialised in hygienic tube- and process components.

The total offer of all product groups is to divide into 3 groups. These groups are based on the application (the kind of process industry). We also have these subdivisions in our range. Within this groups the different components do match according to the sizes and dimensions and the more specific requirements like the cleanability and finishing of the internal surface. The product groups are:



Pharma

All parts are adapted for this application which occurs especially within the pharmaceutical / aseptic industry. All the installation materials are according to the standards, which are a stringent requirement within this industry. The other brand-related materials are produced especially for this application and classified by S.K.S. The pharma range is divided into 2 standards; ASME BPE (American) and DIN 11866 (European). These 2 groups are also divided into different dimensions, sizes and versions with varying surface roughness and materials. You can find more information about the different product properties in our documentation.



Food

The materials divided in this product group are manufactured especially for this application. The trend in this market is the standardized versions, but S.K.S. also preserved the traditional sizes and delivery options.

Besides the complete range of installation materials, SKS is also the official distributor of the most leading brands regarding to valves, equipment and pumps. The complete range tube and process components for the food applications is shown in 3 different documentation brochures. This dividing is based on the 3 standards; DIN 11850, BS 4825, and ISO 2037. The DIN 11850 standard is the base of each modern process component, that's why the dimensions and sizes are the main differences between the products. Because the cleanability depends on the connections of the materials, a proper classification is an important tool. That is the reason why we have chosen this setting.



Industrial

The section of our package which we call 'industrial', consists of products whereby the cleanability is less, or not important. This package consists of components for utility- or waterworks, but also of construction materials. The industrial tube components are divided in two groups. The DIN/ISO series and the ANSI/ASTM series. Sometimes the diameter sizes are close together, that is the reason why this groups are often used together.

Within this product group cleanability of the products is not important, the materials are more robust.



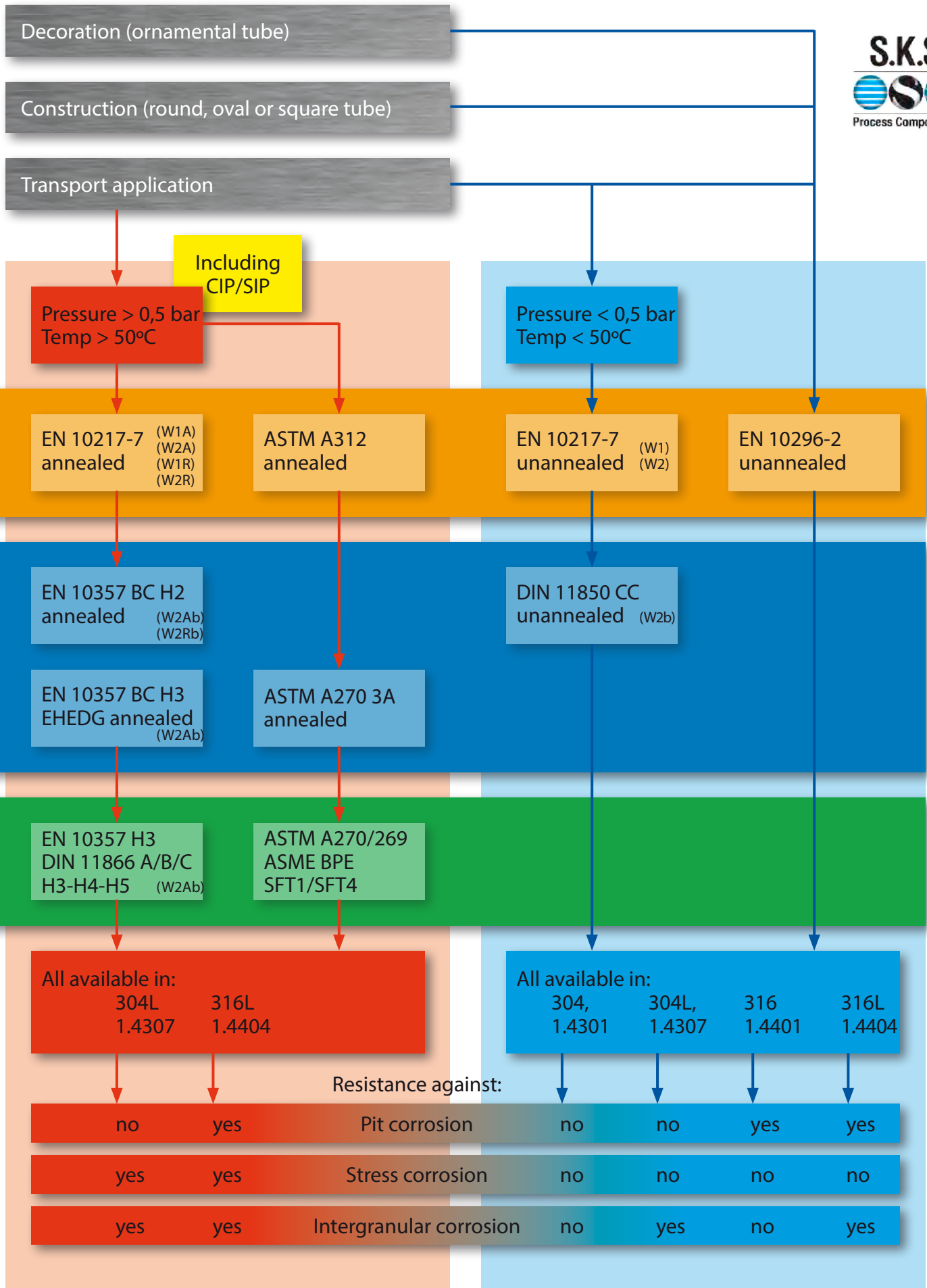
Productgroup	Pharma	Food	Industrial
Tube	•	•	•
Bend	•	•	•
Tee	•	•	•
Reducers	•	•	•
Connections	•	•	•
Construction material	-	-	•
Diverse	•	•	•

deliverable
 n.a.

deliverable
 n.a.

deliverable
 n.a.

Application tubes





Besides the hygienic requirement, there is also a twofold requirement according the right choice of materials. This is the combination of pressure and temperature of the product. The choice depends on the official guidelines and off course the corrosion resistance. In the flow diagram on page 4 you can find a review according the choice for the right norm or material.

Further in this documentation you will find ther reviews. These reviews on page 10 and 11 could be your guidance to compile an integral tube system. If you step aside towards an other product range, it means that you directly change to other dimensions, tolerances, pressure reach, or even the internal surface finishing. In some cases, especially when there is a transition to other systems, you can't prevent this. In this case you have to keep in mind that the differences between the product ranges can be enormous.

The product groups can be divided into norm ranges below.

Product groups

Tubes

This product group is the biggest part of our stock and product flow of SKS. It also requires the most attention. We consider the tubes as the aorta of the process, that's why there are often stringent requirement.

As the central point in our chain we take the responsibility of our product range and the availability of it. Per application the range is divided in:

Pharma: All tubes are according the norms: ASME BPE (American) and DIN 11866 (European).

Food: The leading norm is the EN 10357 (European). This norm is the most current one and the most complete one. Other dimension ranges like the ISO 2037 (SMS), BS 4825, A-270, the Dutch inch and the old DIN range are produced according the EN 10357 range.

Industrial: The tubes within this group are used for the other applications, like water-, drain-, steam tubes etc. But also as decoration or construction tubes. The 2 biggest groups are the DIN/ISO (European) and ASTM/ANSI (American).

Bends

For all dimension range there are welding bends available, but there are different kind of bends:

Pharma:

- Material: Only 316L (1.4404 / 1.4435) polished
- Connection: weld- or couplings. (see connections)
- Kind of bend: Short BS or long BL, 45°, 90° and 180°
- Radius/ mounting dimensions: By radius according the product norms.

Food:

- Material: 304L matt, or polished, 316L matt or polished
- Connection: weld- or couplings. (see connections)
- Kind of bend: Short BS or long BL, 45°, 90° and 180°
- Radius/ mounting dimensions: bends according norms, fixed radius according the norm Bends that haven't a norm often the radius varies per producer.

Industrial:

- Material: 304(L) and 316(L), both only matt
- Connection: weld- or thread connection (BSP)
- Kind of bend: Short BS meanly 90°
- Radius/ mounting dimensions: Various radius (ASTM of DIN/ISO)

Tees

For all dimensions there are tees available, but we distinguish some different versions.

Pharma:

- Material: Only 316L (1.4404 / 1.4435) polished
- Connection: weld- or couplings. (see connections)
- Kind of Tee: long TS, U piece or Instrument piece

Food:

- Material : 304L matt or polished, 316L matt or polished
- Connection: weld- or couplings. (see connections)
- Kind of Tee: short TK or long TS; standard, reducing, Teebend, Y-piece or cross piece

Industrial:

- Material : 304(L) and 316(L), both only matt
- Connection: weld- or thread connection (BSP)
- Kind of Tee: short TK or long TS; equal or reducing

Reducers

For all dimensions there are reducers available, but we distinguish some different versions.

Pharma:

- Material: Only 316L (1.4404 / 1.4435) polished
- Connection: weld- or couplings (see connections)
- Kind of reducer: Long (orbital weldable) Conical RK and Eccentric RE

Food:

- Material: 304L matt or polished, 316L matt or polished
- Connection: weld- or couplings (see connections)
- Kind of reducer: Short Conical RK and eccentric RE

Industrial:

- Material: 304(L) and 316(L), both only matt
- Connection: weld - or thread (BSP)
- Kind of reducer: Short Conical en Eccentric

Connections

Every application needs another connection, there are a lot of different connections available, but we distinguish some different versions.

Pharma:

- Material: Only 316L (1.4404 / 1.4435) polished
- Connection: weld (orbital weldable) or connection piece
- Kind of connection: Screw-, flange- (DIN 11864) or clamp connection (ASME BPE or DIN 11864)

Food:

- Material: 304L or 316L
- Connection: Weld- or connectable (threaded male parts)
- Kind of connection: Screw-, flange- or clamp connection (all existing connections)

Industrial:

- Material: 304(L) and 316(L), both only matt
- Connection: weld- of connection piece (BSP thread, etc.)
- Kind of connection: Screw- or flange connections

Construction material

SKS provides a range of this kind of products to also fulfil the demand for it. The biggest part of this range is deliverable from stock.

- Square tubes and rectangular tubes
- Warm rolled and slit materials (flat, round, equal angle, hexagonal of square)
- Plates (finish 2b coated, perforated or diamond plate)
- Mounting materials

Various

This group is not a residual within the SKS package. Besides the other weld fittings, this group also contains articles that are complementary

to the process components. The group consist of:




- Convex bottoms
- Mounting materials
- Hoses and hose equipment
- Tools
- Complementary products
- Pipette wall boot systems
- Pre-insulated tube systems


Besides the normed components there are a lot of materials available which aren't connected with a norm. A good example of this are the process components with the "Dutch inch" sizes. These materials are still applied and can be combined with the BS 4825 or ISO 2037 norm. Besides that combinations of food and pharma components or food and industrial components occurs. Below you can find a review which provides you information about which combinations can be made (vertical line).


Pharma				
Range	DIN (Europa)	ASTM (USA)		
Tubes	DIN 11866	ASME BPE		
Weld fittings	DIN 11865	ASME BPE		
Couplings	DIN 11864-A-1	ASME BPE Clamp		
	DIN 11864-A-2			
	DIN 11864-A-3			
	DIN 11864-B-1			
Also applicable	DIN 32676 Clamp (Range A)	DIN 11864-A (Range C)		
	ASME BPE Clamp (Range C)	BS 4825-3 (Clamp)		
	BS 4825-3 (Range C)	SKS koppeling (EHEDG)		
	DIN 11853 (Range A)			

Food				
Range	DIN (Europa) NW size	BS (British) Inches	ISO (International)	3A (USA) Inches
Tubes	EN 10357-A	EN 10357-D	EN 10357-D	ASTM A-270
Weld fittings	DIN 11852	BS 4825-2	ISO 2851	ASME BPE
Couplings	DIN 11851	BS 4825-3 Clamp	ISO 2852 clamp	ASME BPE clamp
	DIN 11853	BS 4825-4 IDF	ISO 2853 IDF	
	DIN 32676 Clamp	BS 4825-5 RJT		
Applicable couplings	SKS Coupling (EHEDG)	SKS Coupling (EHEDG)	SMS 1145	DIN 11864-A Range C
	DIN 11864-A Range A	DIN 11851 Inch	SMS (French)	DIN 11851 Inch
	DIN 11864-B Range A	DIN 11864-A Range C		

Industrial				
Range	EN (DIN)	ISO	Metric (Trubore)	ANSI / ASTM
Tubes	EN 10217-7	EN ISO 1127	SSG 1361	ANSIB36.19/ASTMA-312/312M
	EN 10296-2			
Weld fittings	EN 10253-3	EN ISO 5251	Bend SSG 1362	ANSI B16.9 / ASTM A-403
	EN 10253-4	Thread fittings EN 10241	Tee SSG 1363	BSP Thread fittings
	Thread fittings EN 10241		reducer SSG 1364	
Couplings			Collar SSG 1366	
	EN 1092-1 Flanges	EN 1092-1 Flanges	End cap SSG 1369	
	Bite ring couplings	Couplings EN 10241	EN 1092-1 Flanges	ANSIB16.5/ASTMA-182Flanges
Applicable couplings	Various	DIN 11851 ISO	BSP couplings	BSP couplings
		DIN 11864 Range B	Various	Various
		Various		

Part	Sort	Pharma 	Food 	Industrial 	
Tubes	Welded tubes	ASME BPE SFT1	EN 10357-A CC	EN 10296-2	
		ASME BPE SFT4	EN 10357-A BC H2	EN 10217-7 W1	
		DIN 11866 H3	EN 10357 BC H3 (EHEDG)	EN 10217-7 W2b	
		DIN 11866 H4	EN 10357-D SMS	ASTM A312	
		DIN 11866 H5	EN 10357-D BS 4825-1		
			ASTM A-270 3A		
			EN 10357-D Dutch inch		
			Old standard DIN 11850		
Seamless tubes		EN 10216-5	-	EN 10216-5	
		ASME BPE		ASTM A-312/A-530	
		Only the smaller sizes			
Machine tube		-	-	EN 10216-5	
				ASTM A-451	
Bends	Welding bends 90°	ASME BPE SFF1	DIN 11852 BS (kort)	EN 10253-3 (DIN 2605)	
		ASME BPE SFF4	DIN 11852 BL (lang)	EN 10253-4 (DIN 2605)	
		DIN 11865 H3	ISO 2851 (lang)	ASTM A-403	
		DIN 11865 H4	BS 4825-2 (lang)	Segmented bends	
		DIN 11865 H5	ASTM A-270 3A		
			Dutch inch		
			Old standard DIN 11850		
Welding bends 45°		ASME BPE SFF1	DIN 11852 BS (kort)	EN 10253-3 (DIN 2605)	
		ASME BPE SFF4	DIN 11852 BL (lang)	EN 10253-4 (DIN 2605)	
		DIN 11865 H3	ISO 2851 (lang)	ASTM A-403	
		DIN 11865 H4	BS 4825-2 (lang)		
		DIN 11865 H5	ASTM A-270 3A		
Welding bends 180°		ASME BPE SFF1	DIN 11852 BS (Short)	-	
		ASME BPE SFF4	Dutch inch		
			Old standard DIN 11850		
Long radius bends		-	DIN 11852 5D Bends	ASTM A-403 LR	
			Dutch inch 3D		
			DIN 11867 (Pigging)		
Tees	Tee (symmetric)	ASME BPE SFF1	DIN 11852 TS	EN 10253-3 (DIN 2615)	
		ASME BPE SFF4	ISO 2851	EN10253-4(DIN2615)	
		DIN 11865 H3	BS 4825-2	ASTM A-403	
		DIN 11865 H4	ASTM A-270 3A		
		DIN 11865 H5	Dutch inch		
			Old standard DIN 11850		
	Tee short		-	DIN 11852 TK	EN10253-3(DIN2615)
				ISO 2851	EN10253-4(DIN2615)
				BS 4825-2	ASTM A-403
				ASTM A-270 3A	
			Dutch inch		
		Old standard DIN 11850			
Reduced welding Tee		ASME BPE SFF1	DIN 11852 TS and TK	EN 10253-3 (DIN 2615)	
		ASME BPE SFF4	Dutch inch	EN 10253-4 (DIN 2615)	
		DIN 11865 H3	Old standard DIN 11850	ASTM A-403	
		DIN 11865 H4	of drawing		
		DIN 11865 H5			
Welding Tee bend		-	DIN 11852 R2	-	
			Dutch inch		
			Old standard DIN 11850		
Welding Y-piece		-	DIN 11852 R2	-	
			Dutch inch		
			Old standard DIN 11850		
Cross pieces		ASME BPE SFF1	DIN 11852 R2	-	
		ASME BPE SFF4	Dutch inch		
			Old standard DIN 11850		

 Deliverable  n.a. -

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Part	Sort	Pharma	Food	Industrial	Material	
Reducers	Concentric	ASME BPE SFF1		DIN 11852 RK	EN 10253-3 (DIN 2616)	
		ASME BPE SFF4		ISO 2851	EN10253-4(DIN2616)	
		DIN 11865 H3 RK		BS 4825-2	ASTM A-403	
		DIN 11865 H4 RK		ASTM A-270 3A		
		DIN 11865 H5 RK		Old standard DIN 11850		
	Eccentric	ASME BPE SFF1		DIN 11852 RK	EN 10253-3 (DIN 2616)	
		ASME BPE SFF4		ISO 2851	EN10253-4(DIN2616)	
		DIN 11865 H3 RK		BS 4825-2	ASTM A-403	
		DIN 11865 H4 RK		ASTM A-270 3A		
		DIN 11865 H5 RK		Old standard DIN 11850		
Screw coupling	Weld coupling	DIN 11864-A-1 H3		DIN 11851	BSP Flat sealin	
		DIN 11864-A-1 H4		DIN 11853	BSPConicalsealin	
		DIN 11864-B-1 H3		DIN 11851 SKS		
		DIN 11864-B-1 H4		SMS (1145)		
				ISO 2853 IDF		
				BS 4825-4 IDF		
				BS 4825-5 RJT		
				DS		
				DIN 11851		
				SMS (1145)		
			DIN 11851	BSP vlakdichten		
			SMS (1145)	BSP conisch dichtend		
		Blind parts	DIN 11864-A	DIN 11851	-	
				DIN 11853		
				SMS (1145)		
				ISO 2853 IDF		
		Hose connection	-	DIN 11851	BSP	
				SMS (1145)		
				ISO 2853 IDF		
		Rotating coupling	-	Diverse	-	
		Seal	Diverse	Various	PTFE	
		Tools	Haaksleutel	Spanner	Open-end spanner	
				Open-end spanner		
	Clamp connection	Weld ferrules	ASME BPE SFF1		ASME A-270	-
			ASME BPE SFF4		DIN 32676	
DIN 11864-A-1 H3				ISO 2852		
DIN 11864-A-1 H4				BS 4825-3		
Diverse				Diverse	-	
		Clamp (bracket)				
		In-/on screw coupling	ASME BPE	Diverse	-	
		Blind parts	ASME BPE	ASME A-270	-	
			DIN 11864-A	DIN 32676		
				ISO 2852		
		Hose connection	Diverse	Various	-	
		Clamp seal	Diverse	Various	-	
Flange connection		Weld neck flange	DIN 11864-A-1 H3		64-A-2 H3	DIN Version
			DIN 11864-A-1 H4		Varivent	EN1092-1 type 1
					FGN Flanges	ASTM A-182
				DIN Version	EN 1092-1 type 01	
				Dutch Inch Version	ASTM A-182 Slip on	
		Plate flange	-			
		Slip on flange	-	EN 1092-1 type 02 A	EN 1092-1 type 02 A	
		Blind flange	DIN 11864-A-2 H3	EN 1092-1 type 05	EN 1092-1 type 05	
			DIN 11864-A-1 H4		ASTM A-182	
		Collars	-	EN 1092-1 type 33	EN 1092-1 type 33	
		Thread flange	-	-	EN 1092-1 type 1	
		Flange gasket	Diverse	Various	Diverse	
	Thread fittings	Various	Diverse mogelijkheden	Various possibilities	BSP	
					NPTBite ring	
					ASTM A-403	
End caps	divers	ASME BPE SFF1		DIN 11850 R2	ASTM A-403	
		ASME BPE SFF4		Dutch inch (DIN 11850)	DIN / ISO	
		Old standard DIN 11850				

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Part	Sort	Pharma	Food	Industrial	Material
Couple pieces	Bends	Various possibilities	Various possibilities	Various possibilities	Various possibilities
	Tees	Various possibilities	Various possibilities	Various possibilities	Various possibilities
	Reducers	Various possibilities	Various possibilities	Various possibilities	Various possibilities
Tube	Square	-	-		EN 10219-1 EN 10219-2
	Rectangular	-	-		EN 10219-1 EN 10219-2
Mill products	Flat bars	-	-		EN 10051 Slitted Warmrolled
	Round bars	-	-		EN 10051 Descaled ToI. H9 polished
	Square	-	-		EN 10051
Hexagonal	-	-		EN 10051	
Plate	Coated	-	-		Cold rolled Warm rolled
	Perferated	-	-		Round Slot Sqaure
Support	Diamonds plate	-	-		Diamonds
	Pipe support	Heavy version	Heavy version	Heavy version	Heavy version
		Light version	Light version	Light version	Light version
		Version with shaft	Version with shaft	Version with shaft	Version with shaft
		Version with thread	Version with thread	Version with thread	Version with thread
		Version with sock	Version with sock	Version with sock	Version with sock
	U-bolt pipe clamp	U-bolt pipe clamp	U-bolt pipe clamp		
	U-pipe support	U-pipe support	U-pipe support		
Complementary	Isolation	PTS program	PTS program	PTS program	
	Pipetite	Wall boot systems	Wall boot systems	Wallbootsystem	
	Pipe sawing tools	All dimensions	All dimensions	Limiteddimension	
	Wall sheet		beperkt programma	beperkt programma	
	Complementary products	Pickle paste	Pickle paste	Pickle paste	Pickle paste
		Scotch Brite	Scotch Brite	Scotch Brite	Scotch Brite
		Polish material	Polish material	Polish material	Polish material
		Form plug	Form plug	Form plug	Form plug
	Mounting materials	Mounting materials	Mounting materials		
	Plastic plugs	Plastic plugs	Plastic plugs		

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Guidance for uniform tube system

		Pharma						
Sort	Version	Bio-pharm				Pharma (High clean)		
		BPE SFT4	DIN 11866-A H4	DIN 11866-B H4	DIN 11866-C H4	BPE SFT1	DIN 11866-A H3	DIN 11866-B H3
		< 0,375 µm	< 0,4 µm	< 0,4 µm	< 0,4 µm	< 0,5 µm	< 0,8 µm	< 0,8 µm
		Stock	Stock	Stock	Stock	Stock	Stock	Stock
Tubes								
Welding bends BS	BS	-	-	-	-	-	-	-
Welding bends BL	BL	SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Tee TK	TK	-	-	-	-	-	-	-
Tee TS	TS	SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Tee reducing		SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Reducer conical	RK	SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Reducer eccentric	RE	SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Cross piece		SFF4	-	-	SFF4	SFF1	-	-
Teebend		-	-	-	-	-	-	-
Y-piece		-	-	-	-	-	-	-
Thread fittings	BSP	-	-	-	-	-	-	-
Bite ring couplings		-	-	-	-	-	-	-
Couple pieces		SFF4	DIN 11865	DIN 11865	DIN 11865 / SFF4	SFF1	DIN 11865	DIN 11865
Screw coupling	DIN 11851	-	-	-	-	-	DIN 11851	DIN 11851
	DIN 11853	-	-	-	-	-	DIN 11853	DIN 11853
	DIN 11864-A	DIN 11864-A-1	DIN 11864-A-1	DIN 11864-A-1	DIN 11864-A-1	DIN 11864-A-1	DIN 11864-A-1	DIN 11864-A-1
	DIN 11864-B	DIN 11864-B-1	DIN 11864-B-1	DIN 11864-B-1	DIN 11864-B-1	DIN 11864-B-1	DIN 11864-B-1	DIN 11864-B-1
	SMS	-	-	-	-	-	-	-
	IDF	-	-	-	-	-	-	-
	RJT	-	-	-	-	-	-	-
	BSP	-	-	-	-	-	-	-
Clamp coupling	SKS seal	-	-	-	-	-	DIN 11851	DIN 11851
	ISO 2853	-	-	-	-	-	-	-
	BS4825	-	-	-	-	-	-	-
	ASME BPE	SFF4	-	-	SFF4	SFF1	-	-
	DIN 11864-A	DIN11864-A-3	DIN 11864-A-3	DIN 11864-A-3	DIN 11864-A-3	DIN11864-A-3	DIN 11864-A-3	DIN 11864-A-3
	DIN 32767	-	-	-	-	-	DIN 32676	-
Flange connection	DIN 11850	-	-	-	-	-	-	-
	DIN 11864-A	DIN11864-A-2	DIN 11864-A-2	DIN 11864-A-2	DIN 11864-A-2	DIN11864-A-2	DIN 11864-A-2	DIN 11864-A-2
	DIN 11864-B	DIN11864-B-2	DIN 11864-B-2	DIN 11864-B-2	DIN 11864-B-2	DIN11864-B-2	DIN 11864-B-2	DIN 11864-B-2
	DIN 11853	-	-	-	-	-	DIN 11853	DIN 11853
	EN-1092	-	-	-	-	-	-	-
	ANSI	-	-	-	-	-	-	-



		Food						Industrial	
		Standard food							
DIN 11866-C H3	H3 EHEDG	EN 10357-A H3	EN 10357-D H2	EN 10357-C	EN 10357-D BS 4825(Dutch Inch EN 10357-D	Old DIN 11850 No norm	EN 10217	ASTM/ANSI A-312
< 0,8 µm	< 0,8 µm	< 0,8 µm	< 0,8/1,6 µm	< 1,6 µm	< 1,6 µm	< 0,8/1,6 µm	< 0,8/1,6 µm	Stock	Stock
Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	A-403
-	-	DIN11852	-	-	-	No norm	No norm	EN 10253	A-403
DIN 11865 / SFF	DIN 11865	DIN11852	ISO 2851	BS 4825	BS and ISO	No norm	-	-	-
-	-	DIN11852	No norm	BS 4825	BS and ISO	No norm	EN 10253	A-403	A-403
DIN 11865 / SFF	DIN 11865	DIN11852	ISO 2851	BS 4825	BS and ISO	No norm	EN 10253	A-403	A-403
DIN 11865 / SFF	DIN 11865	No norm	No norm	No norm	BS and ISO	No norm	EN 10253	A-403	A-403
DIN 11865 / SFF	DIN 11865	DIN 11852	No norm	No norm	BS and ISO	No norm	EN 10253	A-403	A-403
DIN 11865 / SFF	DIN 11865	DIN 11852	No norm	No norm	BS and ISO	No norm	EN 10253	A-403	A-403
SFF1	-	No norm	No norm	No norm	BS and ISO	No norm	-	-	-
-	-	No norm	No norm	No norm	BS and ISO	No norm	-	-	-
-	-	No norm	No norm	No norm	BS and ISO	No norm	-	-	-
-	-	-	-	-	-	-	BSP	BSP	BSP
-	-	-	-	-	-	-	•	•	•
DIN 11865 / SFF	DIN 11865	No norm	No norm	No norm	maatwerk	maatwerk	-	-	-
DIN 11851	DIN 1185 1	DIN 11851	-	DIN 11851	DIN 11851	DIN 11851	DIN 11851	DIN 11851	DIN 11851
DIN 11853	DIN 11853	DIN 11853	-	DIN 11853	-	-	-	-	-
DIN 11864-A-1	DIN 11864-A	DIN 11864-A-1	-	DIN 11864-A-1	-	-	-	-	-
DIN 11864-B-1	DIN 11864-B	DIN 11864-B-1	-	DIN 11864-B-1	-	-	-	-	-
-	-	-	ISO 3005	-	ISO3005	-	-	-	-
-	-	-	ISO 2852	BS 4825	BS en ISO	-	-	-	-
-	-	-	-	BS 4825	BS 4825	-	-	-	-
-	-	-	-	-	-	-	BSP	BSP	BSP
DIN 11851	DIN 11851	DIN 11851	-	DIN 11851	DIN 11851	-	-	-	-
-	-	-	ISO 2853	-	ISO 2853	-	-	-	-
-	-	-	-	BS 4825	BS 4825	-	-	-	-
SFT1	-	-	-	SFT1	SFT1	-	-	-	-
DIN 11864-A-3	DIN 11864-A-3	DIN 11864-A-3	-	DIN 11864-A-3	-	-	-	-	-
-	DIN 32676	DIN 32676	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
DIN 11864-A-2	DIN 11864-A-2	DIN 11864-A-2	-	DIN 11864-A-2	-	-	-	-	-
DIN 11864-B-2	DIN 11864-B-2	DIN 11864-B-2	-	DIN 11864-B-2	-	-	-	-	-
DIN 11853	DIN 11853-2	DIN 11853-2	-	DIN 11853-2	-	-	-	-	-
-	-	Plate flange	-	Plate flange	Customised	Plate flange	EN-1092	EN-1092	EN-1092
-	-	-	-	-	-	-	ANSI	ANSI	ANSI

 Deliverable •
 n.a. -

 Deliverable •
 n.a. -

 Deliverable •
 n.a. -


Package options

Because the wishes or requirements, according the packaging of tubes, can be different from each other, S.K.S. provides 5 different possibilities. These possibilities distinguish themselves in price but also in the protection of the tube. In the review below you can find the differences between the packaging



Code A: Bundle

The way of packaging is a bundle. SKS packs together a quantity of tubes with a stainless steel or plastic tie to prevent corrosion. The ends are covered to be protected against the polluting of the tubes.



Code C: Supported bundle

This kind of packaging provides more protection because the bundle (A) is supported with a wooden frame. The bundle can be moved in an other way than with only a strop. This to avoid the damaging of the tubes when moving them. The dimensions are variable and depend on the size of the bundle.



Code F: Closed wooden case ISPM-15

The optimal protection for your tubes is a closed wooden case. SKS has a standard closed case that is seaworthy, internal covered with plastic and provided with the ISPM mark. There are different sizes regarding to the height and width of the cases. Depending on the quantity, the right case will be selected.



Code D: Open wooden case

An open wooden case provides enough protection against damaging the tubes during the transport. Thanks to the closed ends the tubes are good protected. The case will be strengthened with stainless steel ties and is stackable. There are different sizes regarding to the height and width of the cases. Depending on the quantity, the right case will be selected. The cases with the D-code are used with export orders.



SIZE RANGES

Nominal Diameter DN	Industrial							Food					Pharma				
	ANSI B 36.19		EN ISO 1127		SSG 1361	Hydraul	DIN 11850	ISO 2037	BS 4825	Dutch	A-270	DIN 11866	Range B	Range C	ASME BPE		
	inch	mm	Serie 1	2	3	Metric mm	Seaml, mm	OD mm	OD mm	OD mm	Inch				OD Inch	mm	mm
4				6		6	6										
6				8		8	8					8		6,35	1/4"	6,35	
8	1/8"	10,3	10,2	10		10	10						10,2				
				12		12	12							9,53	3/8"	9,53	
											1/2"	12,7		12,7	1/2"	12,7	
10	1/4"	13,7	13,5										13,5				
				14		15	12										
				16		16	13									5/8"	15,88
15	3/8"	17,1	17,2										17,2				
				18		18	18										
				19			19		19,05		3/4"	19,05	19		19,05	3/4"	19,05
				20		20	20										
20	1/2"	21,3	21,3										21,3				
				22		22	22										
						23	23						23				
				25		25	25	25									
				25,4					25,4	25,4	1"	25,4		25,4	1"	25,4	
25	3/4"	26,7	26,9										26,9				
				30		28	28	28									
				31,8		30	29	29					29				
																1 1/4"	31,8
32	1"	33,4	33,7	32				32					33,7				
				35		35	34										
							35										
				38		38	38	38	38,1	38,1	1 1/2"	38,1		38,1	1 1/2"	38,1	
40	1 1/4"	42,2	42,4	40									42,4				
						43	40										
				44,5		44	41						41		1 3/4"	44,5	
50	1 1/2"	48,3	48,3										48,3				
				51		50	52	51	50,8	50,8	2"	50,8		50,8	2"	50,8	
						53	53						53				
				54		54											
				57													
65	2"	60,3	60,3										60,3				
				63,5		68	60		63,5	63,5	63,5	2 1/2"	63,5		63,5	2 1/2"	63,5
				70		69	65	70					70				
	2 1/2"	73,0															
				76,1					76,1	76,2	76,1	3"	76,2	76,1	76,2	3"	76,2
80				82,5	83/84		85						85				
	3"	88,9	88,9										88,9		3 1/2"	88,9	
100	3 1/2"	101,6		101,6					101,6	101,6	101,6	4"	101,6		101,6	4"	101,6
						103/104	104						104				
	4"	114,3	114,3										114,3		4 1/2"	114,3	
125						128/129	129						129			5"	127,0
	5"	141,3	139,7										139,7		5 1/2"	139,7	
150						154	154					6"	152,4	154	152,4	6"	152,4
	6"	168,3	168,3										168,3				
200						204	204										
	8"	219,1	219,1														
250						254											
	10"	273,0	273,0														
300						305											
	12"	323,9	323,9														

Bigger sizes only available in industrial version.



FLOW

NW	10	15	20	25	32	40	50	65	80	100	125	150
Dimensions mm	13x1,5	19x1,5	23x1,5	29x1,5	35x1,5	41x1,5	53x1,5	70x2	85x2	104x2	129x2	154x2
d = int. diameter mm	10	16	20	25	32	38	50	66	81	100	125	150
Volume l/m C=d ² x0,0007854	0,08	0,20	0,31	0,49	0,80	1,13	1,96	3,42	5,15	7,85	12,27	17,67
Empty weight kg/m	0,432	0,657	0,808	1,033	1,258	1,484	1,934	3,405	4,157	5,108	6,360	7,612
Weightwithwaterkg/m	0,51	0,86	1,12	1,52	2,06	2,62	3,90	6,83	9,31	12,96	18,63	25,28
Speed m/s	Flow m ³ /h											
0,5	0,14	0,36	0,57	0,88	1,36	1,94	3,39	6,16	9,28	14,14	22,09	31,81
0,6	0,17	0,43	0,68	1,06	1,63	2,32	4,07	7,39	11,13	16,96	26,51	38,17
0,7	0,20	0,51	0,79	1,24	1,90	2,71	4,75	8,62	12,99	19,79	30,93	44,53
0,8	0,23	0,58	0,90	1,41	2,17	3,10	5,43	9,85	14,84	22,62	35,34	50,89
0,9	0,25	0,65	1,02	1,59	2,45	3,48	6,11	11,08	16,70	25,45	39,76	57,26
1	0,28	0,72	1,13	1,77	2,72	3,87	6,79	12,32	18,55	28,27	44,18	63,62
1,1	0,31	0,80	1,24	1,94	2,99	4,26	7,47	13,55	20,41	31,10	48,60	69,98
1,2	0,34	0,87	1,36	2,12	3,26	4,64	8,15	14,78	22,26	33,93	53,01	76,34
1,3	0,37	0,94	1,47	2,30	3,53	5,03	8,83	16,01	24,12	36,76	57,43	82,70
1,4	0,40	1,01	1,58	2,47	3,80	5,42	9,50	17,24	25,97	39,58	61,85	89,06
1,5	0,42	1,09	1,70	2,65	4,08	5,81	10,18	18,47	27,83	42,41	66,27	95,43
1,6	0,45	1,16	1,81	2,83	4,35	6,19	10,86	19,71	29,68	45,24	70,69	101,79
1,7	0,48	1,23	1,92	3,00	4,62	6,58	11,54	20,94	31,54	48,07	75,10	108,15
1,8	0,51	1,30	2,04	3,18	4,89	6,97	12,22	22,17	33,39	50,89	79,52	114,51
1,9	0,54	1,38	2,15	3,36	5,16	7,35	12,90	23,40	35,25	53,72	83,94	120,87
2	0,57	1,45	2,26	3,53	5,43	7,74	13,58	24,63	37,10	56,55	88,36	127,23
2,1	0,59	1,52	2,36	3,71	5,71	8,13	14,26	25,86	38,96	59,38	92,78	133,60
2,2	0,62	1,59	2,49	3,89	5,98	8,52	14,94	27,10	40,81	62,20	97,19	139,96
2,3	0,65	1,66	2,60	4,06	6,25	8,90	15,61	28,33	42,67	65,03	101,61	146,32
2,4	0,68	1,74	2,71	4,24	6,52	9,29	16,29	29,56	44,52	67,86	106,03	152,68
2,5	0,71	1,81	2,83	4,42	6,79	9,68	16,97	30,79	46,38	70,69	110,45	159,04
2,6	0,74	1,88	2,94	4,59	7,06	10,06	17,65	32,02	48,23	73,51	114,86	165,40
2,7	0,76	1,95	3,05	4,77	7,34	10,45	18,33	33,25	50,09	76,34	119,28	171,77
2,8	0,79	2,03	3,17	4,95	7,61	10,84	19,01	34,49	51,94	79,17	123,70	178,13
2,9	0,82	2,10	3,28	5,12	7,88	11,23	19,69	35,72	53,80	82,00	128,12	184,49
3	0,85	2,17	3,39	5,30	8,15	11,61	20,37	36,95	55,65	84,82	132,54	190,85
3,1	0,88	2,24	3,51	5,48	8,42	12,00	21,04	38,18	57,51	87,65	136,95	197,21
3,2	0,90	2,32	3,62	5,65	8,69	12,39	21,72	39,41	59,36	90,48	141,37	203,58
3,3	0,93	2,39	3,73	5,83	8,97	12,77	22,40	40,64	61,22	93,31	145,79	209,94
3,4	0,96	2,46	3,85	6,01	9,24	13,16	23,08	41,88	63,07	96,13	150,21	216,30
3,5	0,99	2,53	3,96	6,19	9,51	13,55	23,76	43,11	64,93	98,96	154,63	222,66
3,6	1,02	2,61	4,07	6,36	9,78	13,93	24,44	44,34	66,78	101,79	159,04	229,02
3,7	1,05	2,68	4,18	6,54	10,05	14,32	25,12	45,57	68,64	104,62	163,46	235,38
3,8	1,07	2,75	4,30	6,72	10,33	14,71	25,80	46,80	70,49	107,44	167,88	241,75
3,9	1,10	2,82	4,41	6,89	10,60	15,10	26,48	48,03	72,35	110,27	172,30	248,11
4	1,13	2,90	4,52	7,07	10,87	15,48	27,15	49,27	74,20	113,10	176,71	254,47



	NBR	HNBR	EPDM	MVQ	FPM / FKM
Market name	Perbunan / Buna-N / Nitrilrubber	HNBR	EPDM	Silicone	Viton
Official name	Acrylnitril-Butaieen rubber	Hydrated NBR	Ethyleen-Propyleen-Dieen Monomeer	Dimethiy siliconen rubber	Fluor Carbon rubber
Color	Blue / White	Wellow	Black	Red/Transparentwhite	Green / black
FDA approval	FDA/BgVV XXI	FDA/BgVV XV	FDA/BgVV XXI	FDA/BgVV XXI	FDA/BgVV XXI
Operating temp. Ca.	-20° C - 100°C	-25° C - 100°C	-40° C - 130°C	-30° C - 120°C	-25° C - 220°C
	Short 130°C	Short 140°C	Short 140°C	Short 120°C	
Resistance					
Vapor	X	++	++	X	X
Steam	-	+	++	X	X
Hot air	X	+	+	++	++
Fats	++	++	-	+	++
Oils	++	++	X	+	++
Acids	X	*	++	X	++
Bases	-	*	-	X	++

X = None resistance - = Bad resistance + = Good resistance ++ = Excellent resistance *= resistant against specific acids and bases available on demand

FYSICAL PROPERTIES STAINLESS STEEL 20°C

		Density	Specific heat capacity	Heat conduction capacity	Electric resistance capacity	Elasticity modulus	Linear expansion coeff.	Magnetic permeability
AISI	DIN	kg/dm ³	J / g-K	W / K-m	Ω - mm ² / m	10 ³ N/mm ²	20° - 100°C / x10 ⁶ /°C	
304	1.4301	7,90	0,50	15	0,73	200	17,0	1,010
304L	1.4306	7,90	0,50	15	0,73	200	17,0	1,010
304L	1.4307	7,90	0,50	15	0,73	200	17,0	1,010
321	1.4541	7,90	0,50	15	0,73	200	17,0	1,050
316	1.4401	7,95	0,50	15	0,75	200	16,5	1,010
316L	1.4404	7,95	0,50	15	0,75	200	16,5	1,010
316TI	1.4571	7,95	0,50	15	0,75	200	16,5	1,050
316SL	1.4435	7,95	0,50	15	0,75	200	16,5	1,010
31803	1.4462	7,70	0,50	15	0,79	206	13,0	ferro magnetic

MECHANIC PROPERTIES STAINLESS STEEL 20°C

		Hardness	0,2- stretch limit	1% stretch limit	Pull strength	L°=5D° Break limit	DVM value	constriction
AISI	DIN	HB max.	min. N/mm ²	min. N/mm ²	N/mm ² min.	min. %	min. J	min. %
304	1.4301	202	205	225	515	40	85	60
304L	1.4306	183	170	215	485	40	85	60
304L	1.4307	183	170	215	485	40	85	60
321	1.4541	217	205	245	515	40	85	50
316	1.4401	217	205	235	515	40	85	60
316L	1.4404	217	170	235	485	40	85	60
316TI	1.4571	217	205	265	515	40	85	50
316SL	1.4435	217	170	235	485	40	85	60
31803	1.4462	max. 235	450	530	680	30	30	-

Material certificates

Purpose of the certificates

- Government institutions can require certificates. (TÜV, PED, etc.)
- Warranty for insurance companies regarding objects, which should be covered. (Link between delivered materials and production norm, traceability)
- Logical consequence on a handled norm or specification (warranty according the demanded norm or specification)
- Ease the process of accept or reject materials. (inspection report)
- Source of information in case of failure / claims / 0-inspection / etc. (composition, finishing, tolerances etc. according the delivered products)
- Stimulus for the producers to maintain a constant quality level.
- Content / layout according EN 10168
- Confirmation by responsible person(s): Name, function and signature.
- The trader may only deliver certificates or a copy of it, if it is unchanged with a identification between certificate and product. Traceability and identification have to be guaranteed.

There are different levels of certificates. The more the information on a certificate have to be directly derived from the product, the more independent the one has to be who confirms the certificate, the higher the quality level of the certificate.

A certificate, no matter how well it is drawn or who signed it, is worthless if there can not be made an unequivocal connection between the certificate and the delivery. Like for example a heat number. We distinguish 2 kind of certificates which are divided into:



The processor of the material is seen as a producer only if he changes the metallurgical state of the product.

Production declaration

Certificate based on not-specific tests;

A written declaration by the producer, that the delivered product is produced according the order you placed. Any test results don't have to be about the delivered products. Validation of declaration is done by the producer themselves.

2.1 declaration without test results

2.2 declaration inclusive non-specific test results

Test certificate

Certificate based on specific tests;

Published by the producer with the confirmation that the delivered products meet the requirements according in the order.

With list of the test results. The test has to be carried out according the official guidelines. Data of the pre-material may be copied if the traceability and origin of the certificate is guaranteed.

The test result has to be about the delivered products.

3.1 certificate Validation by an official of the producer who is completely independent of the production.

3.2 certificate Validation by an official or a neutral official functionary who is authorised by the producer and the purchasing company.



STAINLESS STEEL SPECIFICATION REGARDING TO CORROSION RESISTANCE

> 11% Chromium

Protection against moisture and oxidation at a high temperature.

> 8% Nickel

Protection against acid vapour

Max. 0,02-0,08% Carbon

Limited against the heating of the chromium. Carbon influences the hardness of SS

L is for low Carbon (<0,03% carbon). Chromium and carbon by the input of heat (welding) create Chromium carbides (weakening) Low C content is against intergranular corrosion

Molybdenum offers more protection against Pit corrosion (affecting of the passivation layer by for example Chlorine- Iodine- or Fluorine ions)

AISI 304 (1.4301)
17-19,5% Chromium
8-10,5% Nickel
0,08% Carbon

AISI 304L (1.4307)
17-19,5% Chromium
8-10% Nickel
0,03% Carbon

AISI 316 (1.4401)
16,5-18,5% Chromium
10-13% Nickel
0,07% Carbon
2-2,5% Molybdenum

AISI 316L (1.4404)
16,5-18,5% Chromium
10-13% Nickel
0,03% Carbon
2-2,5% Molybdenum

AISI 316L (1.4435)
16-18% Chromium
10-14% Nickel
0,03% Carbon
2-3% Molybdenum

Un annealed CC or CD

Bright annealed BC or BD (not pickled)

Annealed (pickled) BC of BD

Increasing corrosion resistance

The right annealing process gives protection against stress corrosion In combination with tension above 50°C.

pickle/passivate cleans the surface and accelerates the formation of a new passivation layer (increases the corrosion resistance)

Polishing (CD and BD) Damages the passivation layer. This increases The chance of corrosion and removes identification and also the specification.

YOUR STAINLESS STEEL CHOICE



CHEMICAL COMPOSITION ACCORDING EN 10088-2

AISI	DIN	Steel number acc. EN 10088-2	Chemical composition									
			C %	Ni %	Cr %	Mo %	Mn %	Si %	P %	S %	N %	Ti %
304	1.4301	X5 CrNi 18-10	≤ 0,07	08,00- 10,50	17,00 - 19,50	-	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
304L	1.4306	X2 CrNi 19-11	≤ 0,03	10,00 - 12,00	18,00 - 20,00	-	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
304L	1.4307	X2 CrNi 18-9	≤ 0,03	08,00 - 10,00	17,50 - 19,50	-	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
321	1.4541	X6 CrNiTi 18-10	≤ 0,08	09,00 - 12,00	17,00 - 19,00	-	≤ 2	≤ 1	≤ 0,045	≤ 0,015	-	5xCmin - 0,70
316	1.4401	X5 CrNiMo 17-12-2	≤ 0,07	10,00 - 13,00	16,50 - 18,50	2,00 - 2,50	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
316L	1.4404	X2 CrNiMo 17-12-2	≤ 0,03	10,00 - 13,00	16,50 - 18,50	2,00 - 2,50	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
316Ti	1.4571	X6CrNiMoTi17-12-2	≤ 0,08	10,50 - 13,50	16,50 - 18,50	2,00 - 2,50	≤ 2	≤ 1	≤ 0,045	≤ 0,015	-	5xCmin - 0,70
316SL	1.4435	X2 CrNiMo 18-14-3	≤ 0,03	12,50 - 15,00	17,00 - 19,00	2,50 - 3,00	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
316L	1.4432	X2 CrNiMo 17-12-3	≤ 0,03	10,50 - 13,00	16,50 - 18,50	2,50 - 3,00	≤ 2	≤ 1	≤ 0,045	≤ 0,015	≤ 0,11	-
310S	1.4845	X8 CrNi 25-21	≤ 0,10	19,00 - 22,00	24,00 - 26,00	-	≤ 2	≤ 1,5	≤ 0,045	≤ 0,030	≤ 0,11	-
31803	1.4462	X2 CrNiMoN 22-5-3	≤ 0,03	04,50 - 06,50	21,00 - 23,00	2,50 - 3,50	≤ 2	≤ 1	≤ 0,035	≤ 0,015	≥ 0,10 - 0,22	-
309	1.4828	X15 CrNiSi 20-12	≤ 0,20	11,00 - 13,00	19,00 - 21,00	-	≤ 2	1,5 - 2,5	≤ 0,045	≤ 0,030	≤ 0,11	-

CHEMICAL COMPOSITION ACCORDING A269 - 07A

AISI	Steel number acc. ASTM A269	Chemical composition									
		C %	Ni %	Cr %	Mo %	Mn %	Si %	P %	S %	N %	Ti %
304	TP S30400	≤ 0,08	08,00 - 11,00	18,00 - 20,00	-	≤ 2	≤ 1	≤ 0,045	≤ 0,030	≤ 0,11	-
304L	TP S30403	≤ 0,035	08,00 - 12,00	18,00 - 20,00	-	≤ 2	≤ 1	≤ 0,045	≤ 0,030	≤ 0,11	-
316	TP S31600	≤ 0,08	10,00 - 14,00	16,00 - 18,00	2,00 - 3,00	≤ 2	≤ 1	≤ 0,045	≤ 0,030	≤ 0,11	-
316L	TP S31603	≤ 0,035	10,00 - 15,00	16,00 - 18,00	2,00 - 3,00	≤ 2	≤ 1	≤ 0,045	≤ 0,030	≤ 0,11	-

