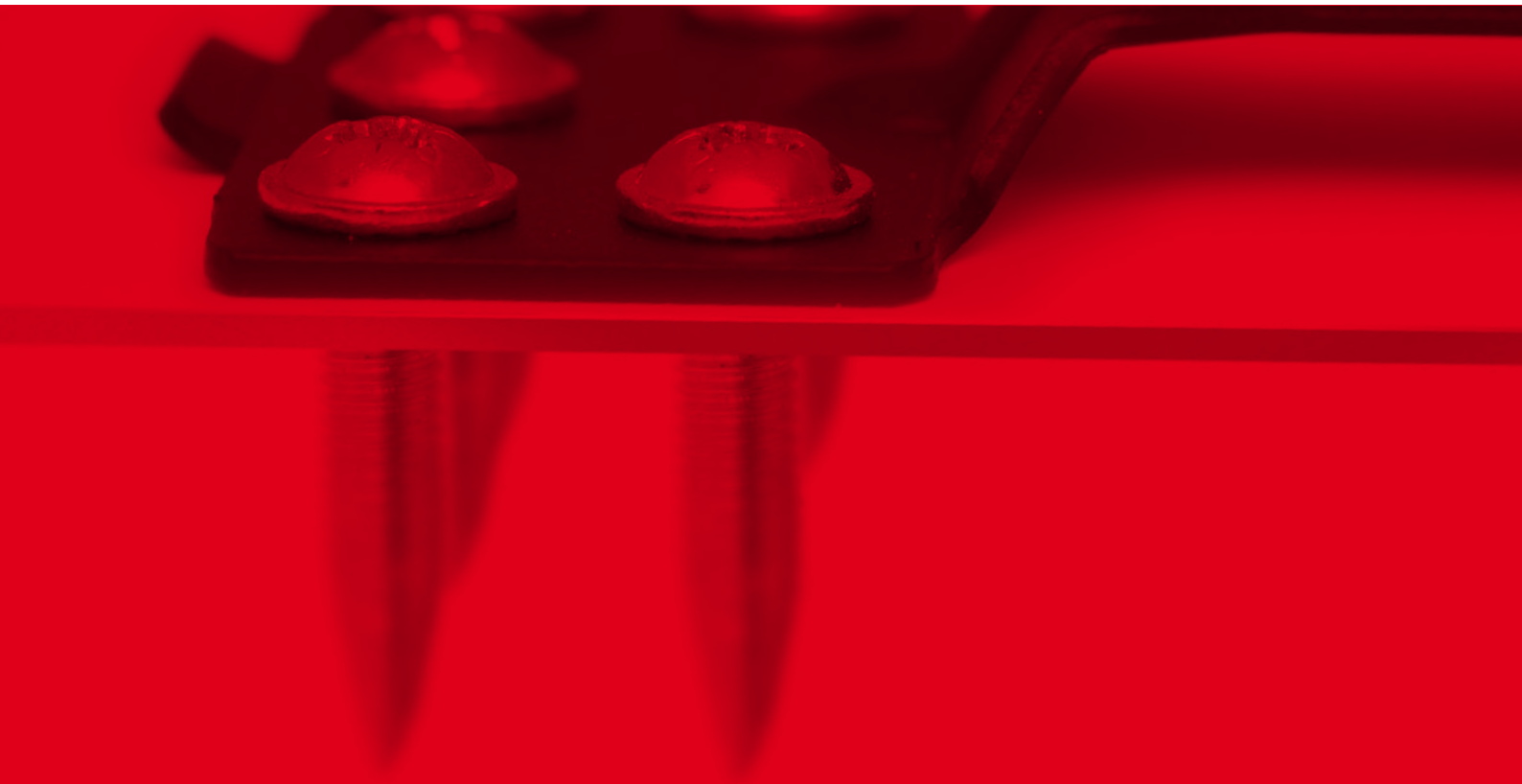
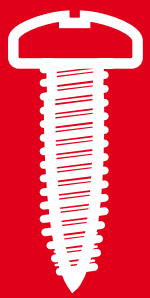
SCHRIEVER®

verbindet.



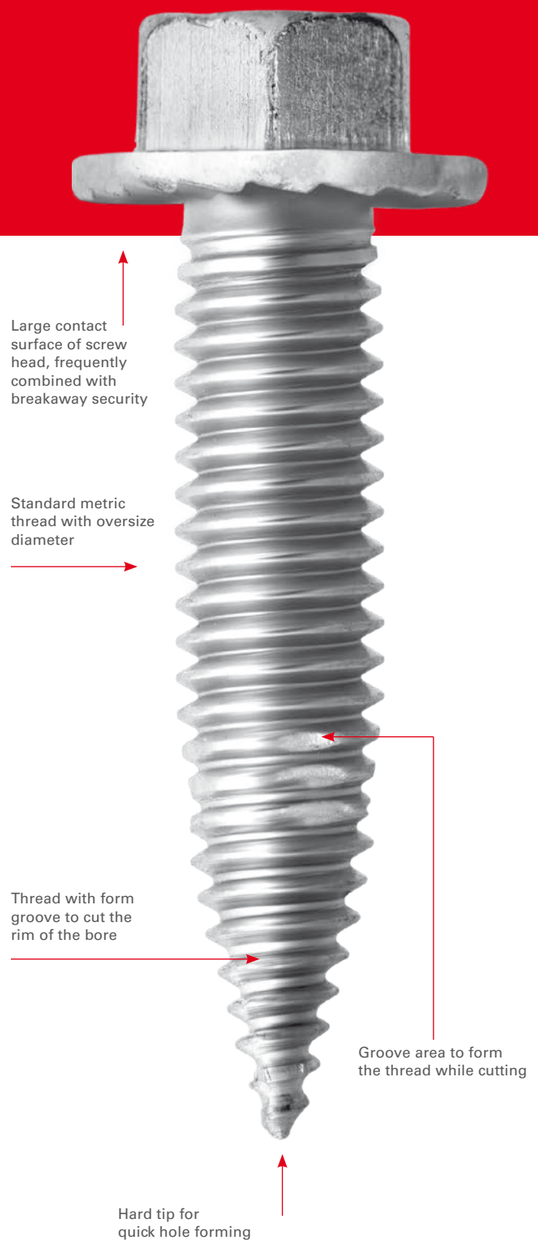


SBS®

The ideal connection for thin sheet metal

SCHRIEVER SBS®

Increasing trends towards lightweight steel sheet constructions lead to changing requirements for fasteners used.



Advantages for the user

1. Cost-effective connections in thin sheet metal, providing an extremely high level of durability and stability!
2. High destruction torque and vibration resistance
3. Cost savings in process fees due to omission of the punching process (drilling, stamping etc.)
4. No hole mismatch due to thread forming the bore during manufacturing
5. No chip formation

Conventional Self-Tapping screws are not suitable for use in lightweight steel sheet constructions. These screws have a limited power transmission and lack loosening security. A connection with inseparable components i.e. rivets is often either not possible or not wanted.

In order to meet the particular requirements regarding profitability, durability of the connection and potential dismantling, Schriever has developed and patented the self-tapping Schriever SBS® especially for use in thin sheet metal. Depending on the screw dimensions, they are available up to approx. 1.5 mm thickness. Due to its special thread geometry, this screw is able to shape a thread rim hole of the displaced material and screw into the thin sheet metal without chip formation.

Previously needed supports i.e. clips or nuts to secure the connection become superfluous. Other advantages exist in applications which do not allow a complex screwwing technology for reasons of costs, weight or space or in order to prevent thermal load of the thin sheet metal (i.e. insulating foam walls).

Our service

Our technical experts will assist you to ensure an optimal usage of the Schriever SBS® in your specific application. Your joining applications will be technically optimised in our laboratory and design recommendations provided. You will receive a inspection report free of charge.

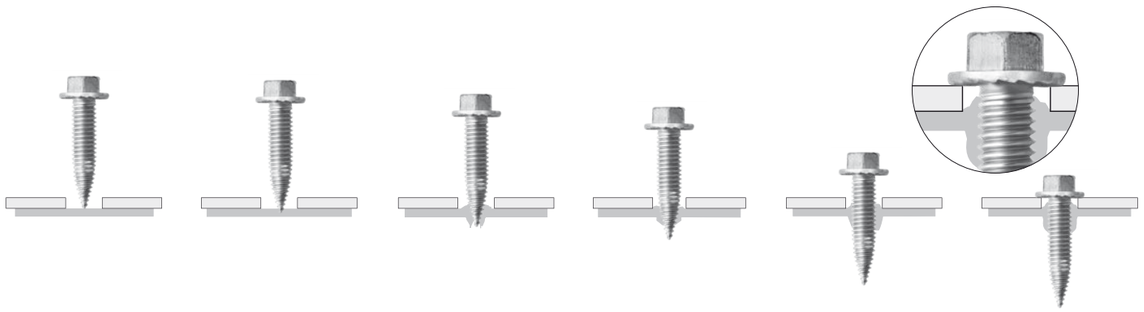
Material

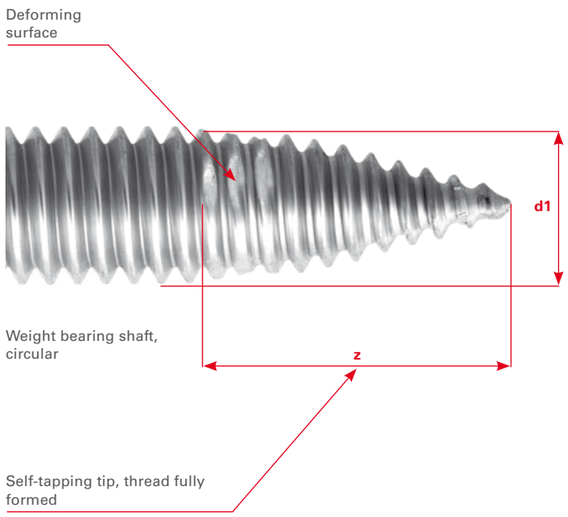
Schriever SBS®-screws are of high tensile hardened and tempered steel by default according to WN 7500. According to customers needs we also supply hardened and tempered steel property according to class 10.9 or 8.8. On request inductive hardened thread tips are also available.

Screw Assembly

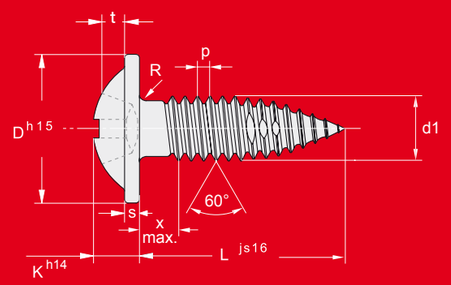
During assembly the thin sheet metal is reshaped without harmful thermal loading of the components and the connection. The thread which is entirely formed up to the tip is drawn in to the sheet independently with the first turn of the thread. The very slim tip expands the already formed hole which results in a thread rim hole multiple of the original sheet thickness.

After the thread rim hole has been formed, the thread forming part of the screw produces a metric thread. Simultaneously, a strain-hardening takes place on the sheet, which significantly increases the load-bearing capacity of the connection. A clear difference in strength and hardness between screw and sheet is absolutely essential for this purpose. As a result, Schriever SBS®-screws are made of steel that can be case-hardened or quenched and tempered.



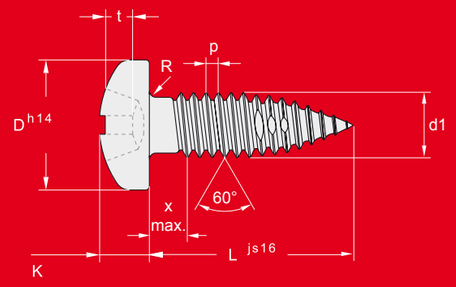


The special shaft geometry allows for a power transmission in the rim of two to three completely formed threads. The form locking in the self formed nut causes an increased security against automatic loosening of the connection.. A repeated release and tightening of the connection is possible. The thread which was produced with oversize allows simultaneously the later usage of a screw with a standard metric thread instead of the Schriever SBS®-screw. The application of the Schriever SBS®-screw also allows for cost effective repair and maintenance work where mounted components have to be loosened.



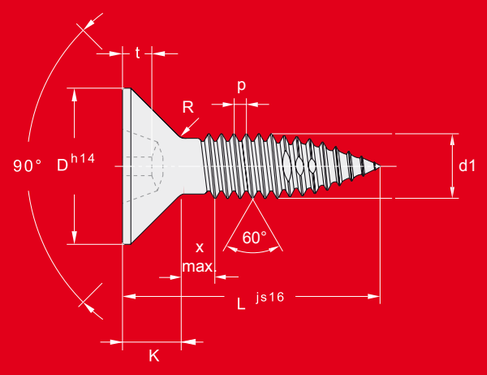
KN 9031 / KN 9131

Type		KN 9031	KN 9131	KN 9031	KN 9131	KN 9031	KN 9131	KN 9031	KN 9131	KN 9031	KN 9131	KN 9031	KN 9131	KN 9031	KN 9131
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		7,5	7,5	8,5	9	10	10	12	11,5	14	14,5
Head height + flange	**K**					2,4	2,35	2,5	2,6	3,2	3,05	4	3,55	4,6	4,55
Flange thickness	**s**					0,8	0,8	0,9	0,9	1,1	1,1	1,30	1,35	1,5	1,8
Radius	**R**						0,1		0,1		0,2		0,2		0,25
H-cross recess	**t min.**					1,07	1,35	1,33	1,4	1,98	1,8	2,24	2,26	2,84	3
Penetration depth	**t max.**					1,7	1,8	1,96	2,03	2,61	2,46	2,9	2,87	3,5	3,66
Z-cross recess	**t min.**					1,08	1,58	1,4	1,47	2,01	1,88	2,27	2,28	2,91	3,02
Penetration depth	**t max.**					1,54	1,83	1,86	1,93	2,47	2,34	2,73	2,74	3,37	3,48
Cross-size H/Z						1	1	2	2	2	2	3	2	3	3



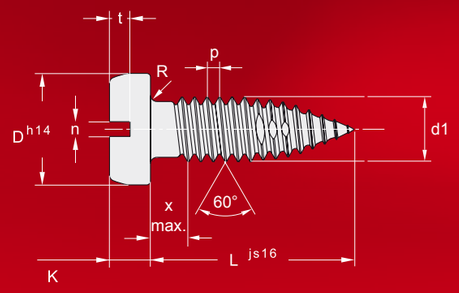
KN 9032 / KN 9132

Type		KN 9032	KN 9132	KN 9032	KN 9132	KN 9032	KN 9132	KN 9032	KN 9132	KN 9032	KN 9132	KN 9032	KN 9132	KN 9032	KN 9132
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		6	5,6	7	7	8	8	10	9,5	12	12
Head height	**K**					2,4	2,4	2,7	2,6	3,1	3,1	3,8	3,7	4,6	4,6
Tolerance head height						+/-0,12	-0,14	+/-0,12	-0,14	+/-0,15	-0,18	+/-0,15	-0,18	+/-0,15	-0,3
Radius	**R**						0,1		0,1		0,2		0,2		0,25
H-cross recess	**t min.**					1,7	1,4	1,74	1,4	2,04	1,9	2,77	2,4	3,03	3,1
Penetration depth	**t max.**					2	1,8	2,24	1,9	2,54	2,4	3,27	2,9	3,53	3,6
Z-cross recess	**t min.**					1,68	1,5	1,65	1,48	1,9	1,89	2,64	2,29	3,02	3,03
Penetration depth	**t max.**					1,93	1,75	2,11	1,93	2,36	2,34	3,1	2,74	3,48	3,46
Cross-size H/Z						1	1	2	2	2	2	2	2	3	3



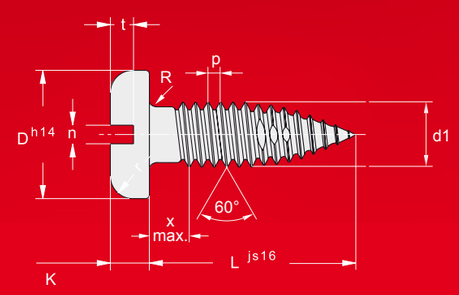
KN 9033 / KN 9133

Type		KN 9033	KN 9133	KN 9033	KN 9133	KN 9033	KN 9133	KN 9033	KN 9133	KN 9033	KN 9133	KN 9033	KN 9133	KN 9033	KN 9133
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		5,6	5,5	6,5	7,3	7,5	8,4	9,2	9,3	11	11,3
Head height	**K max.**						1,65		2,35		2,7		2,7		3,3
Radius	**R**					0,8	0,8	0,95	0,9	1	1	1,3	1,3	1,6	1,5
H-cross recess	**t min.**					1,5	1,7	1,4	1,9	1,9	2,1	2,1	2,7	2,8	3
Penetration depth	**t max.**					1,8	2,1	1,9	2,4	2,4	2,6	2,6	3,2	3,3	3,5
Z-cross recess	**t min.**					1,48	1,76	1,34	1,75	1,6	2,06	2,05	2,6	2,46	3
Penetration depth	**t max.**					1,73	2,01	1,8	2,2	2,06	2,51	2,51	3,05	2,92	3,45
Cross-size H/Z						1	1	2	2	2	2	2	2	3	3



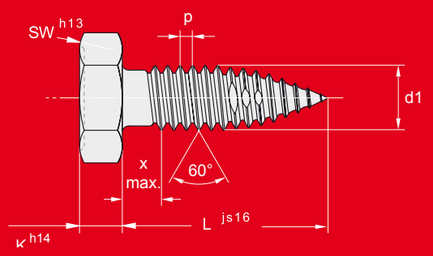
KN 9034 / KN 9134

Type		KN 9034	KN 9134	KN 9034	KN 9134	KN 9034	KN 9134	KN 9034	KN 9134	KN 9034	KN 9134	KN 9034	KN 9134	KN 9034	KN 9134
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
Head-Ø	**D**	on request		on request			5,5		6		7		8,5		10
Head height	**K**						2		2,4		2,6		3,3		3,9
Tolerance head height							-0,14		-0,14		-0,14		-0,18		-0,3
Radius	**R**						0,1		0,1		0,2		0,2		0,25
Slot width	**n min.**						0,86		1,06		1,26		1,26		1,66
	n max.						1		1,2		1,51		1,51		1,91
Slot depth	**t min.**						0,85		1		1,1		1,3		1,6



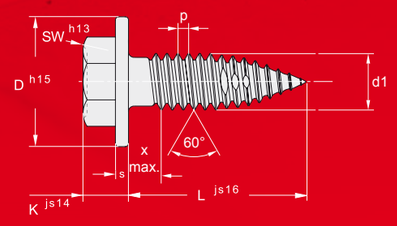
KN 9035 / KN 9135

Type		KN 9035	KN 9135	KN 9035	KN 9135	KN 9035	KN 9135	KN 9035	KN 9135	KN 9035	KN 9135	KN 9035	KN 9135	KN 9035	KN 9135
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request			5,6		7		8		9,5		12
Head height	**K**						1,8		2,1		2,4		3		3,6
Tolerance head height							-0,14		-0,14		-0,14		-0,14		-0,3
Radius	**R**						0,1		0,1		0,2		0,2		0,25
Slot width	**n min.**						0,86		1,06		1,26		1,26		1,66
	n max.						1		1,2		1,51		1,51		1,91
Slot depth	**t min.**						0,7		0,8		1		1,2		1,4



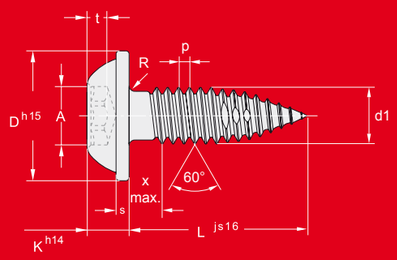
KN 9036 / KN 9136

Type		KN 9036	KN 9136	KN 9036	KN 9136	KN 9036	KN 9136	KN 9036	KN 9136	KN 9036	KN 9136	KN 9036	KN 9136	KN 9036	KN 9136
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Width across flats (AF size)	**SW**	on request		on request			5,5		6		7		8		10
Head height	**K**						2		2,4		2,8		3,5		4



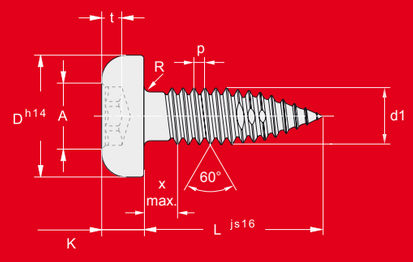
KN 9037 / KN 9137

Type		KN 9037	KN 9137	KN 9037	KN 9137	KN 9037	KN 9137	KN 9037	KN 9137	KN 9037	KN 9137	KN 9037	KN 9137	KN 9037	KN 9137
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		7,5		8,3		9		11	11,8	13	14,2
Width across flats (AF size)	**SW**					5		5,5		5,5		7	8	8	10
Head height	**K max.**					3		3,4		3,8		4,3	5,4	5	6,6
Flange thickness	**s**					0,6		0,8		0,8		1	1	1,2	1,1



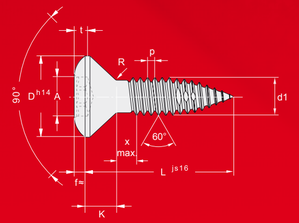
KN 9038 / KN 9138

Type		KN 9038	KN 9138	KN 9038	KN 9138	KN 9038	KN 9138	KN 9038	KN 9138	KN 9038	KN 9138	KN 9038	KN 9138	KN 9038	KN 9138
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		7,5	7,5	8,5	9	10	10	12	11,5	14	14,5
Head height + flange	**K**					2,4	2,35	2,6	2,5	3,3	3,05	3,6	3,5	4,2	4,55
Flange thickness	**s**					0,70	0,8	0,8	0,9	1,0	1,1	1,20	1,35	1,4	1,8
Radius	**R**						0,1		0,1		0,2		0,2		0,25
Hexalobular drive						T 10	T 10	T 15	T 15	T 20	T 20	T 25	T 25	T 30	T 30
A						2,8	2,8	3,35	3,35	3,95	3,95	4,5	4,5	5,6	5,6
Penetration depth	**t min.**					1		1,2		1,4		1,6		2	
	t max.					1,3		1,5		1,8		2		2,4	



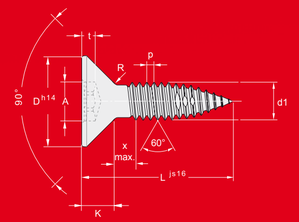
KN 9039 / KN 9139

Type		KN 9039	KN 9139	KN 9039	KN 9139	KN 9039	KN 9139	KN 9039	KN 9139	KN 9039	KN 9139	KN 9039	KN 9139	KN 9039	KN 9139
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		6	5,6	7	7	8	8	10	9,5	12	12
Head height	**K**					2,4	2,4	2,7	2,6	3,1	3,1	3,8	3,7	4,6	4,6
Tolerance head height						+/-0,12	-0,14	+/-0,12	-0,14	+/-0,15	-0,18	+/-0,15	-0,18	+/-0,15	-0,3
Radius	**R**						0,1		0,1		0,2		0,2		0,25
Hexalobular drive						T10	T 10	T 15	T 15	T 20	T 20	T 25	T 25	T 30	T 30
A						2,8	2,8	3,35	3,35	3,95	3,95	4,5	4,5	5,6	5,6
Penetration depth	**t min.**					1	1,01	1,2	1,07	1,4	1,27	1,6	1,52	2	2,02
	t max.					1,3	1,27	1,5	1,33	1,8	1,66	2	1,91	2,4	2,42



KN 9040 / KN 9140

Type		KN 9040	KN 9140	KN 9040	KN 9140	KN 9040	KN 9140	KN 9040	KN 9140	KN 9040	KN 9140	KN 9040	KN 9140	KN 9040	KN 9140
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request		5,6	5,5	6,5	7,3	7,5	8,4	9,2	9,3	11	11,3
Head height	**K max.**						1,65		2,35		2,7		2,7		3,3
	f≈					0,75	0,7	0,9	0,8	1	1	1,25	1,2	1	1,4
Radius	**R**						0,8		0,9		1		1,3		1,5
Hexalobular drive						T 10	T 10	T 15	T 15	T 20	T 20	T 25	T 25	T 30	T 30
A						2,8	2,8	3,35	3,35	3,95	3,95	4,5	4,5	5,6	5,6
Penetration depth	**t min.**					1	0,88	1,2	1,27	1,4	1,42	1,6	1,65	2	2,02
	t max.					1,3	1,15	1,5	1,53	1,8	1,8	2	2,03	2,4	2,42



KN 9041 / KN 9141

Type		KN 9041	KN 9141	KN 9041	KN 9141	KN 9041	KN 9141	KN 9041	KN 9141	KN 9041	KN 9141	KN 9041	KN 9141	KN 9041	KN 9141
Dimensions		SBS AM2		SBS AM2,5		SBS AM3		SBS AM3,5		SBS AM4		SBS AM5		SBS AM6	
Thread outside-Ø	**d1**	2	2	2,5	2,5	3	3	3,5	3,5	4	4	5	5	6	6
P		0,4	0,4	0,45	0,45	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,8	1,0	1,0
Head-Ø	**D**	on request		on request			5,5		7,3		8,4		9,3		11,3
Head height	**K max.**						1,65		2,35		2,7		2,7		3,3
Radius	**R**						0,8		0,9		1		1,3		1,5
Hexalobular drive							T 10		T 15		T 20		T 25		T 30
A							2,8		3,35		3,95		4,5		5,6
Penetration depth	**t min.**						0,7		1,16		1,14		1,12		1,39
	t max.						0,83		1,32		1,53		1,51		1,78

Tolerances

Nominal size (mm)		h 13	h 14	h 15	js 14	js 16
over	to					
0	3	0 /– 0,14	0 /– 0,25	0 /– 0,40	±0,125	±0,30
3	6	0 /– 0,18	0 /– 0,30	0 /– 0,48	±0,15	±0,375
6	10	0 /– 0,22	0 /– 0,36	0 /– 0,58	±0,18	±0,45
10	18	0 /– 0,27	0 /– 0,43	0 /– 0,70	±0,215	±0,55
18	30	0 /– 0,33	0 /– 0,52	0 /– 0,84	±0,26	±0,65
30	50	0 /– 0,39	0 /– 0,62	0 /– 1,00	±0,31	±0,80
50	80	0 /– 0,46	0 /– 0,74	0 /– 1,20	±0,37	±0,95

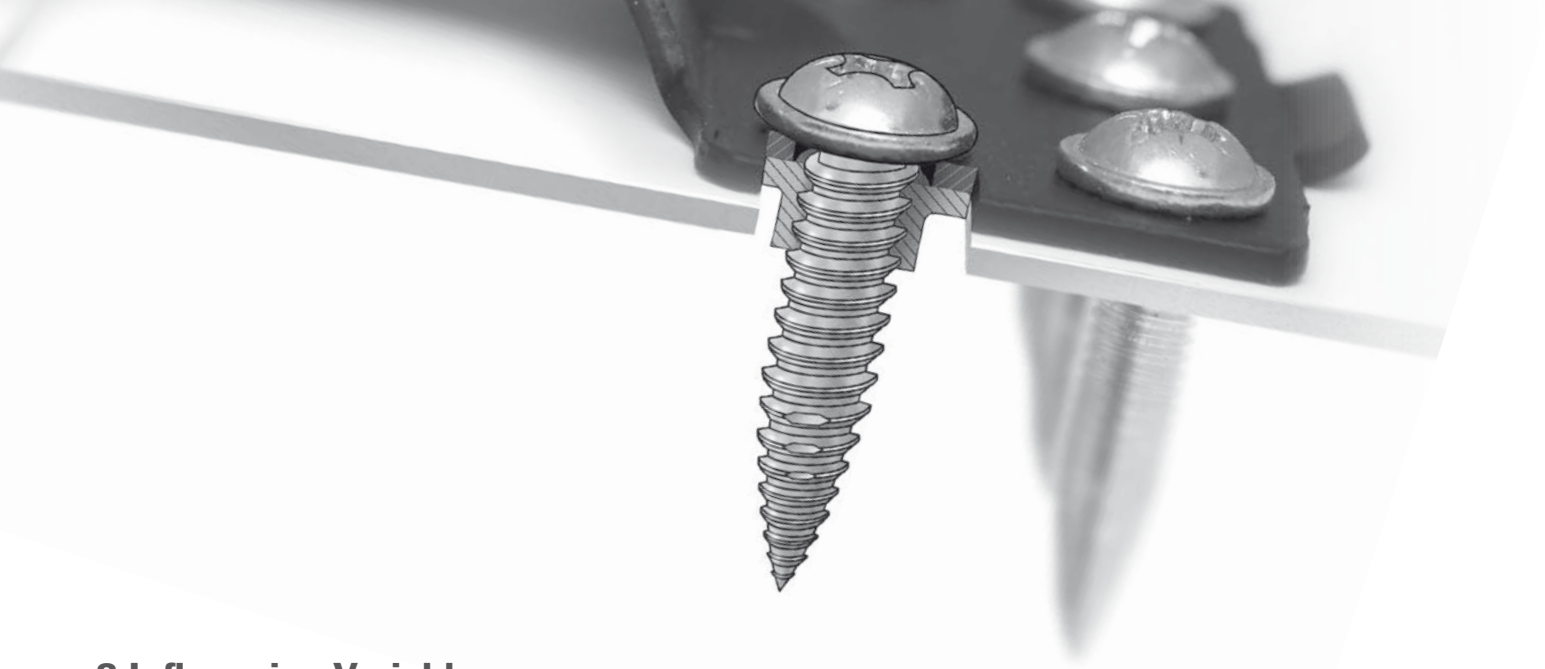
Head drives

H-cross recess (H) | H-cross recess combi (H ±) | Hexalobular drive (T) Hexalobular drive plus (TP) | Hexalobular combi drive (T ±) | 3-wing | Z-cross recess (Z) | Z-cross recess combi (Z ±) | One-way screw

Production range

Screws	M2	M2,5	M3	M3,5	M4	M5	M6
Length L (mm)			Usable thread length				
9	Possible lengths and usable thread lengths on request	Possible lengths and usable thread lengths on request	2,40				
10			3,40	2,40			
12			5,40	4,40	3,10		
14			7,40	6,40	5,10	2,90	
16			9,40	8,40	7,10	4,90	2,90
18			11,40	10,40	9,10	6,90	4,90
20			13,40	12,40	11,10	8,90	6,90
25				17,40	16,10	13,90	11,90
30				22,40	21,10	18,90	16,90
35					26,10	23,90	21,90
40					31,10	28,90	26,90
45						33,90	31,90
50						38,90	36,90
55						43,90	41,90
60							46,90
70							56,90

red line = minimal lengths for countersunk screws



3 Influencing Variables

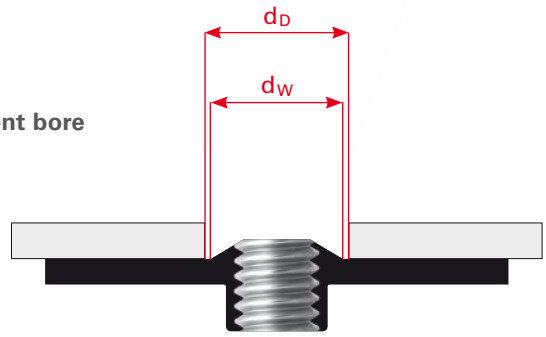
3 influencing variables are interesting when designing direct assembly in thin sheet metal:

1. Hole diameter

Must be included in the component.

The component that will be screwed on the sheet, has to allow for the formation of a bulge on the sheet concerning the hole diameter, which means dD is greater than d_W. A small amount of the formed material flows in the opposite direction to the screw-in direction and creates a build-up of material which has to be absorbed by the clearance hole of the component which needs to be mounted. To guarantee a safe contact placement of the screw head dD must not be chosen to big. The adjoining table gives a recommendation for the hole diameter of the component.

Component bore



d_D = Through hole
d_W = Bulge diameter

Schriever SBS®

Diameter	M 3	M 3,5	M 4	M 5	M 6
Hole diameter d_D	3,6-	4,3-	5,1-	6,7-	8,2-
Component (mm)	4,0	4,8	5,7	7,4	9,1

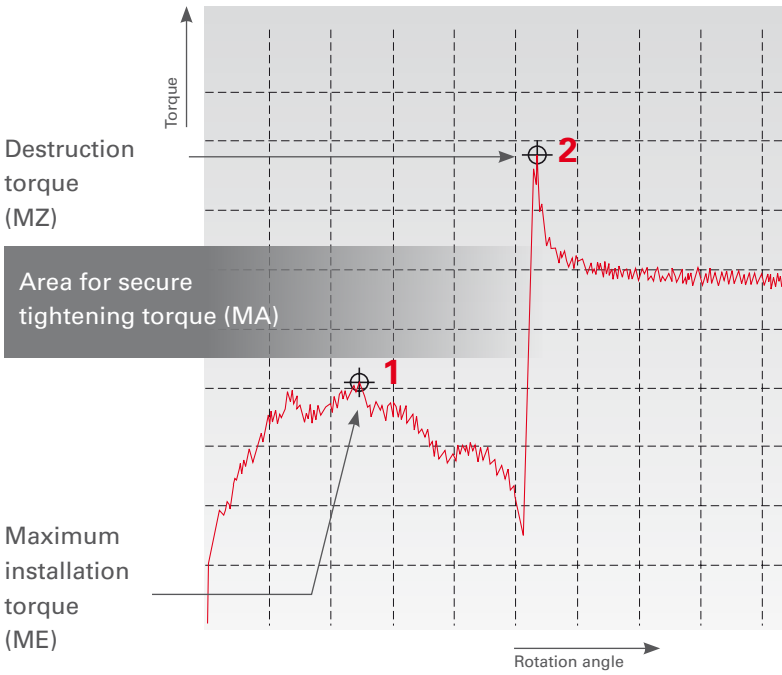
2. Insertion torque

To choose the correct screwing aggregate the insertion torque ME has to be possibly determined by testing. The highest insertion torque is basically to be expected at the end of the shaping process of the through hole (see illustration, phase 1).

3. Tightening torque

The tightening torque MA has to be chosen in order to avoid damage of the connection by reaching the destruction torque MZ (see illustration, phase 2). For the usage of the Schriever SBS®-screw in thin sheet metal applications with a nominal thickness diameter > 0.2 mm we possibly recommend a prepunched hole due to increased contact forces. The optimal hole diameter for the actual application depends on the requirement of the connection and should be determined and established specifically.

Torque in the screwing process



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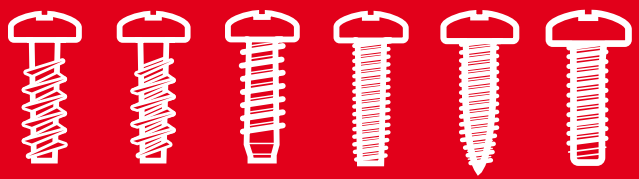

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9033	2143
9034	n.n.
9035	n.n.
9036	n.n.
9037	2147
9038	2151
9039	2152
9040	2153
9041	n.n.

The Schriever SBS® screws can also be used with all commercially available corrosion protection surfaces. Please feel free to contact us.

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