SCHRIEVER®

verbindet.

STS®

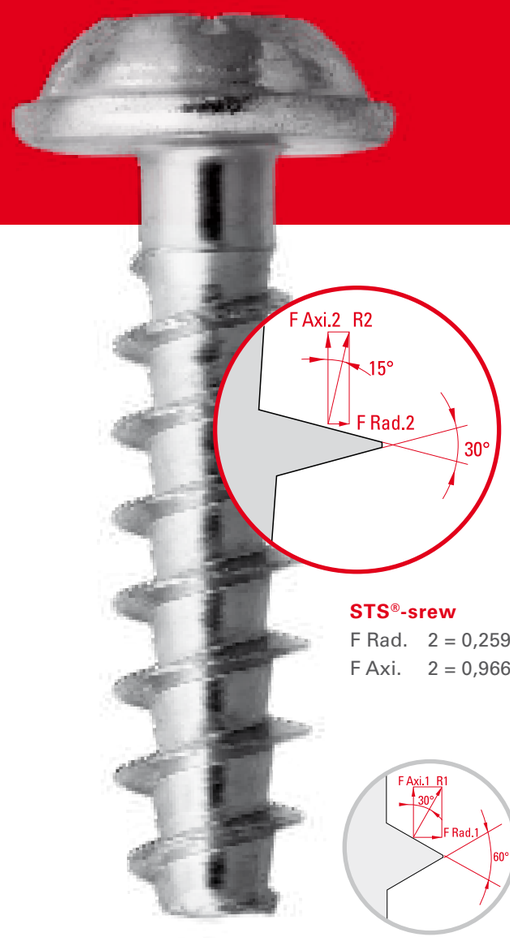
The ideal connection for thermoplastics

SCHRIEVER STS®

Yesterday: Problems with the assembly of construction, installation and load capacity.

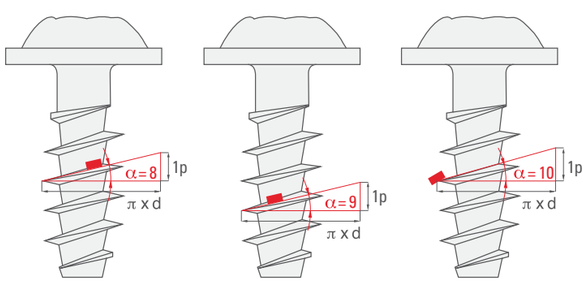
Today: SCHRIEVER STS®-screws.

STS®



STS®-srew
F Rad. 2 = 0,259 R
F Axi. 2 = 0,966 R

Comparison
self-tapping screw
F Rad. 1 = 0,500 R
F Axi. 1 = 0,867 R



Schematic diagram for the effect of the pitch angle on self-locking

Eight good reasons
in favour of the Schriever STS®-geometry

1. Best possible connection of thermoplastics
2. Minimal radial tension
3. High load capacity
4. Low thread forming torque
5. No risk of relaxation
6. No material damage
7. 8 ° thread pitch facilitates optimal self-locking
8. Cost-effective

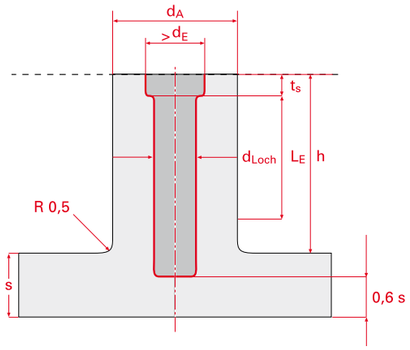
Vectorial influences
of main deformation direction

1. Low radial forces – minor radial extension
2. Our 30°-flank angle reduces the radial extension by 60° compared with conventional thread flanks (e.g. self-tapping screws)
3. A flank angle of 60° results in high seating stress in screw fittings and thus to an increased relaxation.

Our service
Our technical experts will assist you to ensure an optimal usage of the Schriever STS® in your specific of 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	Hole diameter	Outside diameter	Screw-in-depth
	d_{Loch}	d_A	L_E
ABS	0,80 x d	2,00 x d	2,00 x d
ABS/PC Blend	0,80 x d	2,00 x d	2,00 x d
ASA	0,78 x d	2,00 x d	2,00 x d
PA 4.6	0,73 x d	1,85 x d	1,80 x d
PA 4.6 GF 30	0,78 x d	1,85 x d	1,80 x d
PA 6	0,75 x d	1,85 x d	1,70 x d
PA 6 GF 30	0,80 x d	2,00 x d	1,90 x d
PA 6.6	0,75 x d	1,85 x d	1,70 x d
PA 6.6 GF 30	0,82 x d	2,00 x d	1,80 x d
PBT	0,75 x d	1,85 x d	1,70 x d
PBT GF 30	0,80 x d	1,80 x d	1,70 x d
PC	0,85 x d	2,50 x d	2,20 x d
PC GF 30	0,85 x d	2,20 x d	2,00 x d
PE LD	0,70 x d	2,00 x d	2,00 x d
PE HD	0,75 x d	1,80 x d	1,80 x d
PET	0,75 x d	1,85 x d	1,70 x d
PET GF 30	0,80 x d	1,80 x d	1,70 x d
PMMA	0,85 x d	2,00 x d	2,00 x d
POM	0,75 x d	1,95 x d	2,00 x d
POM GF 30	0,80 x d	1,95 x d	2,00 x d
PP	0,70 x d	2,00 x d	2,00 x d
PP GF 30	0,72 x d	2,00 x d	2,00 x d
PPTV 20	0,72 x d	2,00 x d	2,00 x d
PPO	0,85 x d	2,50 x d	2,20 x d
PS	0,80 x d	2,00 x d	2,00 x d
PVC (hart)	0,80 x d	2,00 x d	2,00 x d
PEEK	0,85 x d	2,00 x d	2,00 x d
SAN	0,77 x d	2,00 x d	1,90 x d
PPS	Please contact the Schriever Application Engineering Department		

Design recommendation
To obtain an optimal connection in thermoplastics we recommend a tube geometry subject to screw diameter and material grade. To assist with the most important data please refer to the table shown below.



d = nominal-Ø of screw
d_A ≥ (2 x d), see table
d_{hole} = (0,70 bis 0,85 x d), see table
t_s ≈ 0,4 x d
h ≥ L_E + 1 x d
L_E ≥ (2 x d), see table
s = without set parameter
d_E = 1,05 x d

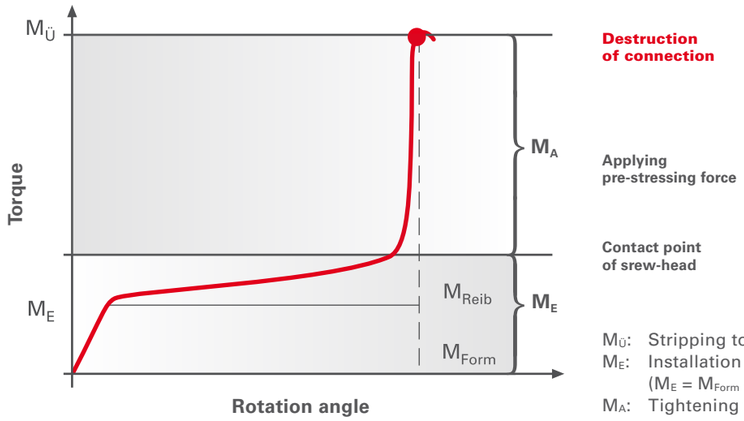
Material
Schriever STS®-srews are high-tensile hardened and tempered by default. We supply case-hardened as well as stainless (A2 [1.4567], A4 [1.4578]) on request.

Ordering example
STS® with nominal diameter = 3.0 mm
Length = 12 mm · head = KN 1031 · drive 'Pozidrive'
KN 1031 STS® 30 x 12 -Z

We supply customized designs deviating from our standard upon request.

STS®

In detail
The Schriever STS®-connection



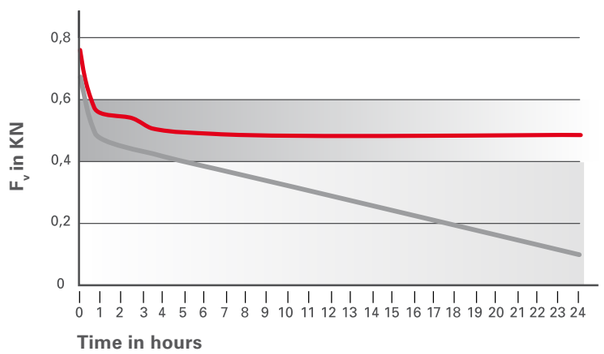
$M_Ü$: Stripping torque
M_E: Installation torque
($M_E = M_{Form} + M_{Reib}$)
M_A: Tightening torque

Our requirement for the Schriever STS®

In order to avoid relaxation and tension cracks caused by excessive pre-stressing forces it is necessary to keep the tightening torque at a minimum. Schriever's engineers recommend to calculate the insertion torque based on of the following formula:

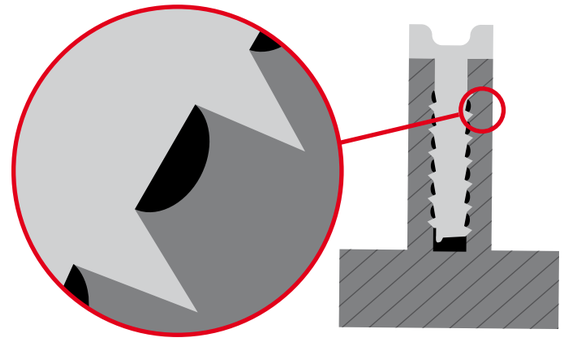
$M_A = 0{,}6 \times (0{,}4 \times M_Ü$ min. $+ 1{,}4 \times M_E$ max.)

Loss of pre–stressing force



Schriever STS®
Design advantages

The diagrams show in detail how our engineers have developed the specific advantages of the Schriever STS®-screw threads. An ideal material flow is ensured by the patented shape of thread and thread core.



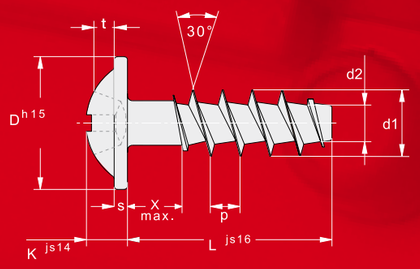
Production range

Screw	16	18	20	22	25	30	35	40	50	60	70	80
d1 (mm)	1,6	1,8	2,0	2,2	2,5	3,0	3,5	4,0	5,0	6,0	7,0	8,0
Length L (mm)												
3 ± 0,30												
3,5 ± 0,375												
4 ± 0,375												
4,5 ± 0,375												
5 ± 0,375												
6 ± 0,375												
7 ± 0,45												
8 ± 0,45												
10 ± 0,45												
12 ± 0,55												
14 ± 0,55												
16 ± 0,55												
18 ± 0,55												
20 ± 0,65												
22 ± 0,65												
25 ± 0,65												
30 ± 0,65												
35 ± 0,80												
40 ± 0,80												
50 ± 0,80												
60 ± 0,95												

$L_{min.}$ = L + 2 mm for countersunk head screws

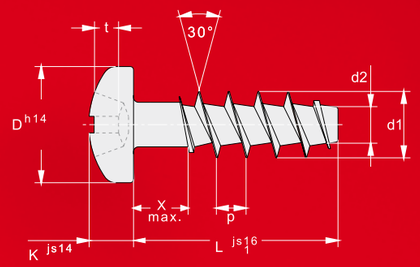
Minimum length

Maximum length



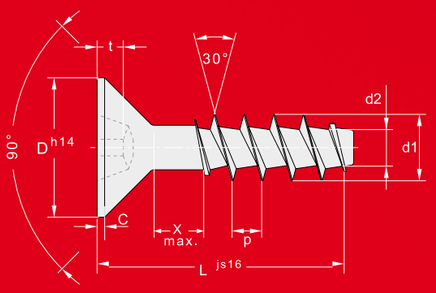
KN 1031

Dimensions		16	18	20	22		25		30		35		40		50		60		70		80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20		2,50		3,00		3,50		4,00		5,00		6,00		7,00		8,00
		on request				NEW		NEW		NEW		NEW		NEW		NEW		NEW		NEW	on request
Head-Ø	**D**		4,00	4,00	5,50	4,40	5,50	5,00	6,00	6,00	7,00	7,00	8,00	8,00	10,00	10,00	13,00	12,00	14,00	14,00	
Head height	**K**		1,20	1,40	1,40	1,60	1,40	1,80	1,60	2,10	2,50	2,40	2,50	2,50	2,60	3,20	3,60	4,00	3,60	4,60	
Flange thickness	**s**		0,50	0,50	0,60	0,50	0,60	0,60	0,60	0,70	0,80	0,80	0,80	0,90	1,00	1,10	1,20	1,30	2,00	1,50	
H-cross recess	**t min.**		0,70	0,51	0,86	0,68	0,86	0,82	0,86	1,15	1,22	1,07	1,37	1,33	1,80	1,98	2,49	2,24	3,00	2,84	
Penetration depth	**t max.**		1,00	0,97	1,32	1,14	1,32	1,28	1,32	1,61	1,72	1,70	1,82	1,96	2,46	2,61	3,15	2,90	3,66	3,50	
Z-cross recess	**t min.**		0,70	0,73	1,10	0,86	1,10	1,01	1,10	1,26	1,22	1,08	1,37	1,40	1,88	2,01	2,51	2,27	3,02	2,91	
Penetration depth	**t max.**		0,95	0,98	1,35	1,11	1,35	1,26	1,35	1,51	1,72	1,54	1,82	1,86	2,34	2,47	2,97	2,73	3,48	3,37	
Cross-size H/Z			0	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	



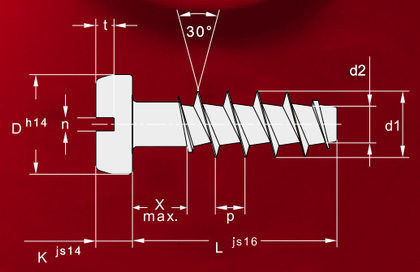
KN 1032

Dimensions		16	18	20	22		25		30		35		40		50		60		70		80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20		2,50		3,00		3,50		4,00		5,00		6,00		7,00		8,00
						NEW		NEW		NEW		NEW		NEW		NEW		NEW		NEW	on request
Head-Ø	**D**	2,60	3,20	3,50	4,20	3,90	4,20	4,40	5,60	5,30	6,90	6,10	7,50	7,00	8,20	8,80	10,80	10,50	12,50	12,30	
Head height	**K**	1,10	1,20	1,40	1,60	1,50	1,60	1,70	2,20	2,00	2,50	2,50	2,60	2,70	2,90	3,40	3,80	4,00	4,40	4,50	
H-cross recess	**t min.**	0,55	0,70	0,64	0,86	0,74	0,86	0,92	1,35	1,19	1,40	1,23	1,63	1,51	1,80	2,12	2,49	2,44	3,00	3,00	
Penetration depth	**t max.**	0,85	1,00	1,10	1,32	1,20	1,32	1,38	1,80	1,65	2,03	1,86	2,26	2,14	2,46	2,75	3,15	3,10	3,66	3,66	
Z-cross recess	**t min.**	0,55	0,70	0,82	0,92	0,92	1,10	1,08	1,58	1,36	1,47	1,26	1,70	1,62	1,88	2,32	2,51	2,57	3,02	3,14	
Penetration depth	**t max.**	0,80	0,95	1,07	1,17	1,17	1,35	1,33	1,83	1,61	1,93	1,72	2,16	2,08	2,34	2,67	2,97	3,03	3,48	3,61	
Cross-size H/Z		0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	



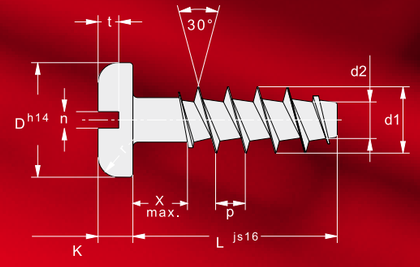
KN 1033

Dimensions		16	18	20	22		25		30		35		40		50		60		70		80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20		2,50		3,00		3,50		4,00		5,00		6,00		7,00		8,00
		on request	on request			NEW		NEW		NEW		NEW		NEW		NEW		NEW		NEW	on request
Head-Ø	**D**			3,80	3,80	3,80	5,00	4,70	5,50	5,50	6,50	7,30	7,00	8,40	7,50	9,30	10,80	11,30	12,50	13,60	
Cylindrical head height	**C max.**			0,35	0,35	0,35	0,55	0,55	0,55	0,55	0,65	0,65	0,70	0,70	0,75	0,75	0,85	0,85	0,90	0,90	
H-cross recess	**t min.**			0,95	0,95	0,95	1,25	0,97	1,40	1,10	1,40	1,33	1,40	1,59	1,90	2,04	2,10	2,59	2,80	3,02	
Penetration depth	**t max.**			1,25	1,25	1,25	1,55	1,43	1,70	1,56	1,90	1,96	1,90	2,22	2,40	2,67	2,60	3,22	3,30	3,68	
Z-cross recess	**t min.**			0,92	0,92	0,92	1,22	1,09	1,48	1,20	1,34	1,47	1,34	1,70	1,60	2,06	2,05	2,60	2,46	3,01	
Penetration depth	**t max.**			1,17	1,17	1,17	1,47	1,34	1,73	1,45	1,80	1,93	1,80	2,16	2,06	2,52	2,51	3,06	2,92	3,47	
Cross-size H/Z				1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	



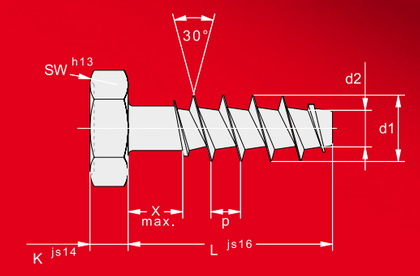
KN 1034

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**				3,80	3,80	5,00	5,50	6,00	7,00	8,50	not recommended	
Head height	**K**				1,60	1,60	1,70	2,00	2,20	2,60	3,30		
Slot width	**n**				0,60	0,60	0,80	0,80	0,80	1,00	1,20		
Slot depth	**t min.**				0,70	0,70	0,75	0,90	1,10	1,20	1,50		
	t max.				0,90	0,90	1,00	1,15	1,40	1,50	1,80		



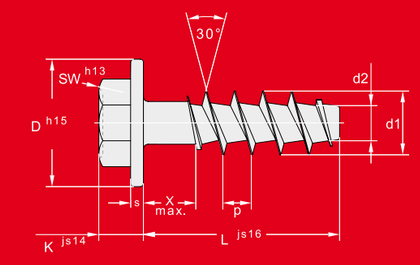
KN 1035

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**				4,20	4,20	5,60	6,00	6,90	8,20	9,50	not recommended	
Head height	**K min**				1,15	1,15	1,50	1,50	1,85	2,15	2,50		
	K max				1,35	1,35	1,75	1,75	2,10	2,45	2,80		
Radius	**r**				0,90	0,90	1,00	1,00	1,20	1,30	1,60		
Slot width	**n**				0,60	0,60	0,80	0,80	1,00	1,20	1,20		
Slot depth	**t min.**				0,55	0,55	0,75	0,75	0,95	1,15	1,35		
	t max.				0,80	0,80	1,00	1,00	1,25	1,50	1,70		



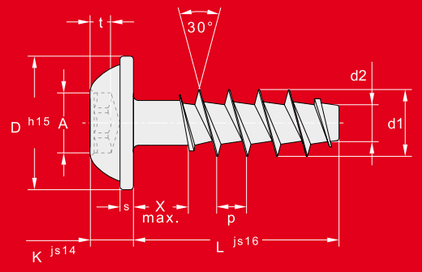
KN 1036

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Width across flats (AF size)	**SW**					3,20	4,00	5,50	7,00	8,00	10,00	10,00	
Head height	**K**					1,30	1,50	2,30	2,30	3,00	3,50	4,80	



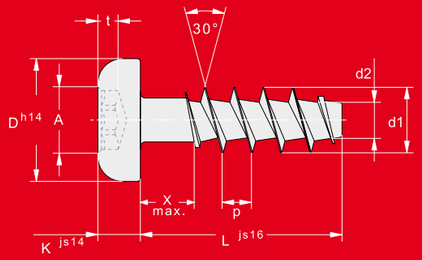
KN 1037

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	on request
Width across flats (AF size)	**SW**						4,00	5,00	5,50	7,00	8,00	8,00	
Head height	**K**						2,30	2,80	2,80	3,50	4,00	5,00	
Flange-Ø	**D**						6,50	7,00	8,00	10,00	11,50	13,50	
Flange thickness	**s**						0,60	0,70	0,80	0,80	1,00	1,20	



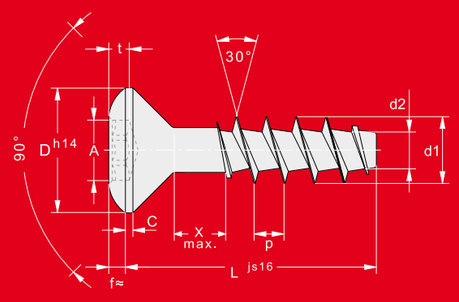
KN 1038

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**	on request	4,00	4,00	4,50	5,00	6,00	7,00	8,00	10,00	12,00	14,00	16,00
Head height	**K**		1,20	1,30	1,40	1,50	2,10	2,40	2,60	3,30	3,60	4,20	4,8
Flange thickness	**s**		0,40	0,40	0,50	0,50	0,60	0,70	0,80	1,00	1,20	1,40	1,6
Hexalobular drive			T 6	T 6	T 6	T 6	T 10	T 10	T 20	T 20	T 25	T 30	T 40
	A Ref.		1,75	1,75	1,75	1,75	2,80	2,80	3,95	3,95	4,50	5,60	6,75
Penetration depth	**t min.**		0,50	0,50	0,65	0,75	1,00	1,10	1,25	1,40	1,60	2,00	2,70
	t max.		0,65	0,65	0,80	0,90	1,30	1,40	1,70	1,80	2,00	2,40	3,20



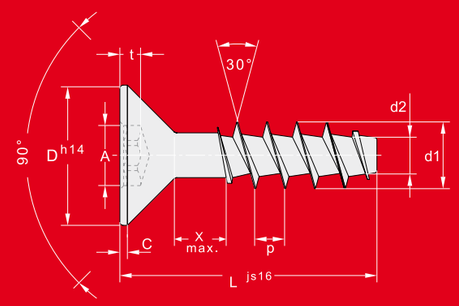
KN 1039

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**	3,20	3,60	3,60	4,00	4,20	5,60	6,90	7,50	8,20	10,80	12,50	14,00
Head height	**K**	1,10	1,30	1,40	1,50	1,60	2,10	2,30	2,60	2,90	3,80	4,40	5,00
Hexalobular drive		T 6	T 6	T 6	T 6	T 8	T 10	T 10	T 20	T 20	T 25	T 30	T 40
	A Ref.	1,75	1,75	1,75	1,75	2,40	2,80	2,80	3,95	3,95	4,50	5,60	6,75
Penetration depth	**t min.**	0,50	0,50	0,55	0,55	0,60	1,00	1,10	1,25	1,40	1,60	2,00	2,40
	t max.	0,65	0,65	0,80	0,80	0,90	1,30	1,40	1,70	1,80	2,00	2,40	2,90



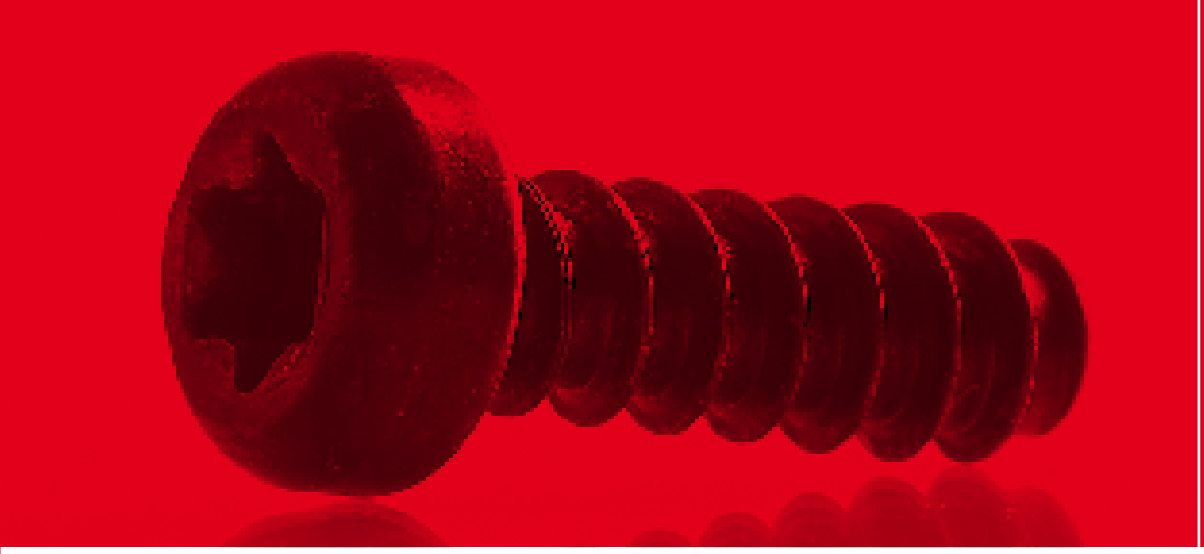
KN 1040

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**	on request	3,00	3,40	3,80	4,70	5,60	6,50	7,50	9,20	11,00	12,50	14,50
Cylindrical head height	**C max.**		0,35	0,35	0,35	0,35	0,55	0,55	0,65	0,75	0,85	0,85	0,90
	f ≈		0,35	0,40	0,50	0,60	0,75	0,90	1,00	1,25	1,50	1,80	2,00
Hexalobular drive			T 6	T 6	T 6	T 8	T 10	T 15	T 20	T 25	T 30	T 40	T 40
	A Ref.		1,75	1,75	1,75	2,40	2,80	3,35	3,95	4,50	5,60	6,75	6,75
Penetration depth	**t min.**		0,50	0,50	0,60	0,90	1,00	1,20	1,40	1,60	2,00	2,70	2,70
	t max.		0,65	0,65	0,80	1,10	1,30	1,50	1,80	2,00	2,40	3,20	3,20



KN 1041

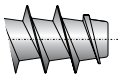
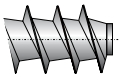
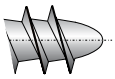
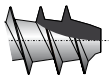
Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	**d1**	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Head-Ø	**D**	3,00	3,40	3,80	3,80	4,70	5,50	7,30	8,40	9,30	11,30	13,60	15,80
Cylindrical head height	**C max.**	0,35	0,35	0,35	0,35	0,55	0,55	0,65	0,70	0,75	0,85	0,90	0,95
Hexalobular drive		T 5	T 6	T 6	T 6	T 8	T 8	T 15	T 20	T 20	T 30	T 40	T 40
	A Ref.	1,45	1,75	1,75	1,75	2,40	2,40	3,35	3,95	3,95	5,60	6,75	6,75
Penetration depth	**t min.**	0,45	0,50	0,50	0,65	0,70	0,80	1,00	1,25	1,25	1,75	2,25	2,40
	t max.	0,60	0,65	0,65	0,80	0,90	1,00	1,30	1,70	1,70	2,20	2,70	2,90



STS®

Tolerances and thread dimensions

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

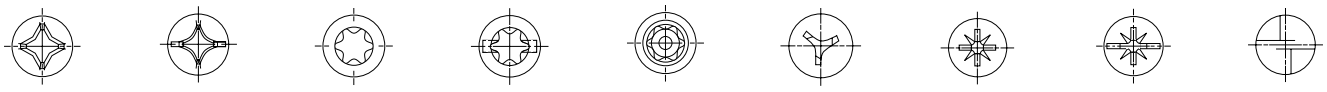
Thread tip	Desig-nation
Standard 	– –
Full dog point 	Ka
Search tip 	SP
Scraper groove 	SB

Other thread tips on request.

Dimensions		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	d1	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Tolerance outside-Ø		+0,14	+0,14	+0,14	+0,14	+0,14	+0,14	+0,18	+0,18	+0,18	+0,18	+0,22	+0,22
		0	0	0	0	0	0	0	0	0	0	0	0

Nominal diameter		16	18	20	22	25	30	35	40	50	60	70	80
Thread outside-Ø	d1	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Thread core-Ø	d2	0,92	1,04	1,15	1,25	1,40	1,66	1,91	2,17	2,68	3,19	3,70	4,21
Thread pitch	p	0,67	0,80	0,89	0,98	1,12	1,34	1,57	1,79	2,24	2,69	3,14	3,59
Thread run-out													
X max. / standard L >	3 x d1	1,60	1,80	2,00	2,20	2,50	3,00	3,50	4,00	5,00	6,00	7,00	8,00
Short ≤	3 x d1	0,80	0,90	1,00	1,10	1,30	1,50	1,80	2,00	2,50	3,00	3,50	4,00

Head drives



H-cross recess (H)

H-cross recess combi (H ±)

Hexalobular drive (T) Hexalobular drive plus (TP)

Hexalobular combi drive (T ±)

Hexalobular drive with locking pin (TT)

3-wing

Z-cross recess (Z)

Z-cross recess combi (Z ±)

One-way screw

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1031 NEU	1411
1032	1442
1032 NEU	1412
1033	1443
1033 NEU	1413
1034	1444
1035	1445
1036	1446
1037	1447
1038	1451
1039	1452
1040	1453
1041	1423

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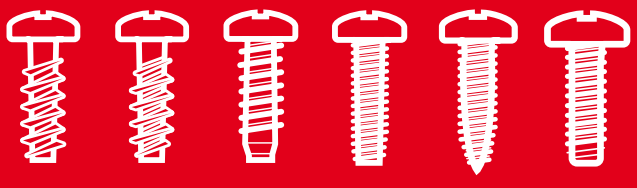

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