



SHEETtracs®

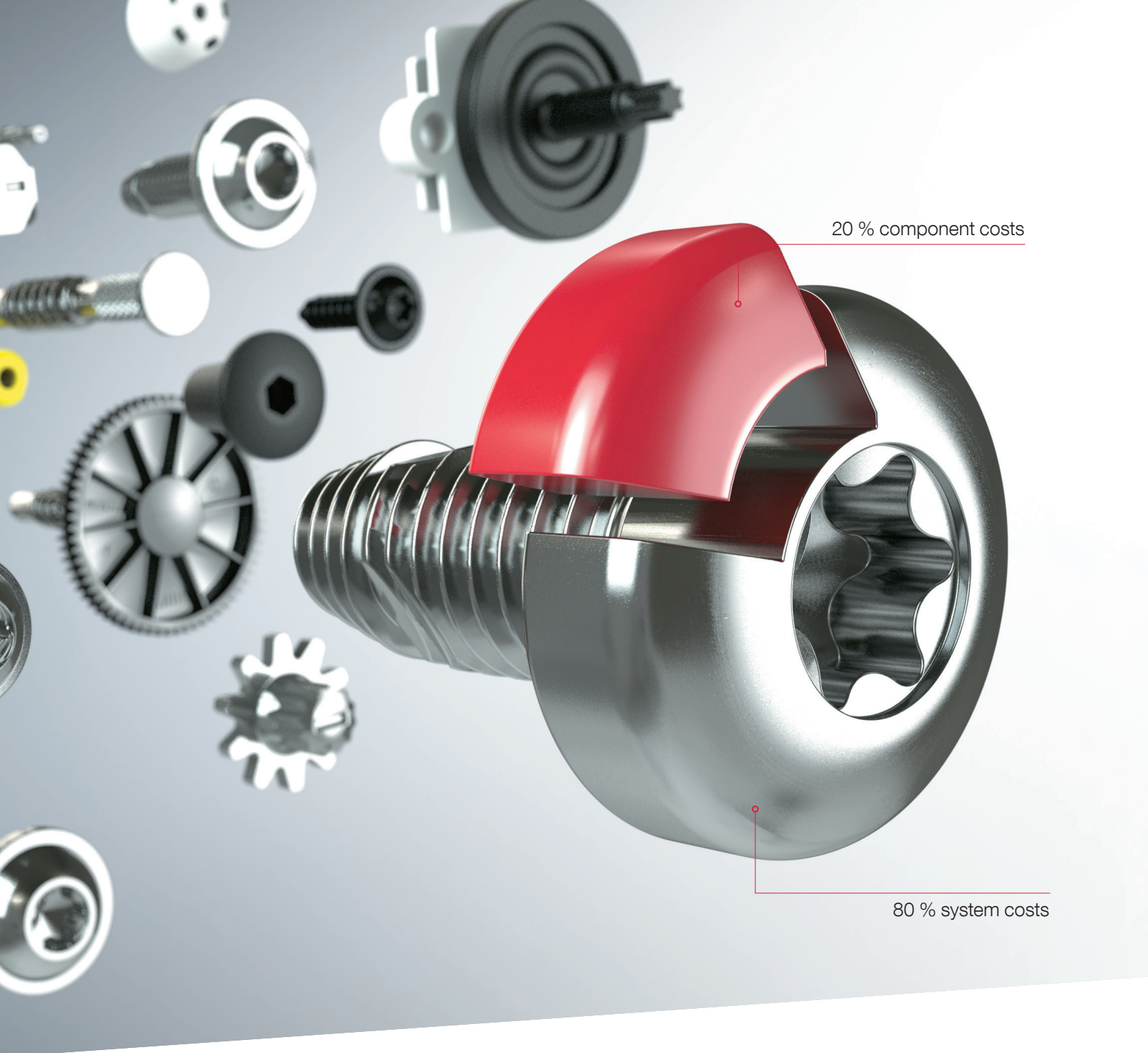


SHEETtracs®

Safe assembly of thin sheet metal joints with pilot hole

A collection of various mechanical parts and fasteners scattered on a grey background. The parts include screws, bolts, nuts, washers, gears, and other small components in various colors like silver, black, white, blue, red, and yellow. The text "... Always a Good Connection" is overlaid in the center in a white, sans-serif font.

... Always a Good Connection



20 % component costs

80 % system costs

ATF specializes in advanced fastening and forming technology and our customers are mainly from the automotive, industrial and aerospace industries.

We offer a wide range of innovative fastening solutions including engineered fasteners, cold formed specials, formed and stamped components and assemblies.

ATF takes pride in working closely with our customers to develop smart solutions. The goal is to provide the support and resources needed for a robust design solution that will decrease overall cost for our customer. The savings potential offered by this optimization approach is much higher compared to the individual component costs, which are usually only 10 -20 percent of our customers total cost.



The challenge

SHEETtracs® the process-reliable connection for thin sheet metal applications

Less material = less costs. This also applies for the sheet metal thickness: pre-punched sheet metals have become thinner and thinner, so thin sheet metal screws are required for their process-reliable assembly.

These screws have a metric 60° thread and are often made with cone-shaped points. The advantage of a metric thread is the smaller thread pitch in comparison with sheet metal screws, whereby more thread turns are engaged in the thin sheet metal.

However, as it is usually not the screw which represents the weak point of a joint but the formed female thread, SHEETtracs® was developed with a reduced flank angle:.





SHEETtracs®

A thread geometry for more stability

SHEETtracs® is a self-tapping screw for safe mounting of thin sheet metal joints with pilot hole. It is characterized by an asymmetrical flank angle of 45° (30°/15°). Due to the reduced material displacement, the SHEETtracs® screw creates a more stable female thread in the sheet metal, particularly in comparison to conventional 60° threads. This increases the stripping torque level of the joint and enables multiple repeat assemblies.

The circular cross section in the upper, load-bearing thread results in higher thread engagement in the sheet metal compared to non-circular thread geometries.

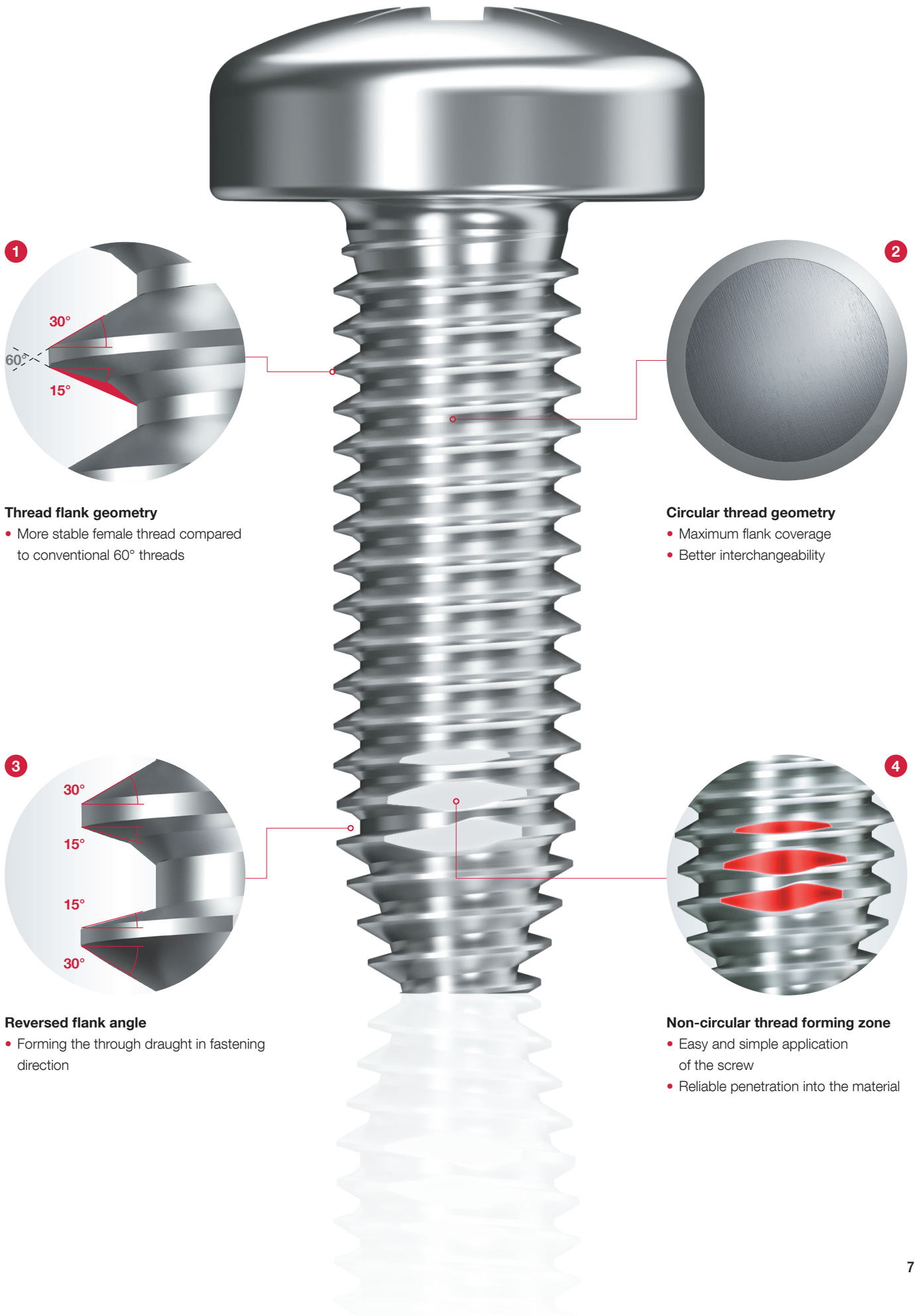
In the lower, tapered area of the screw, the flank angle is reversed, and the resulting through draught is formed mainly in fastening direction.

The non-circular thread forming zone ensures an easy, centred application and the raised thread areas ensure a secure penetration of the sheet metal material.

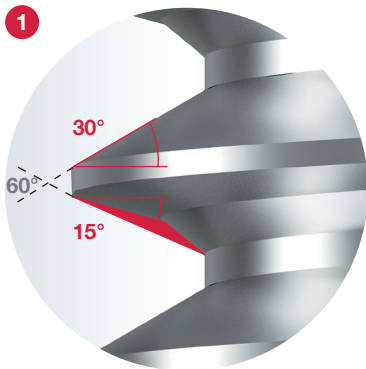
The metric pitch of SHEETtracs® facilitates interchangeability with standard metric screws, e.g. for repairs.

Characteristics at a glance

- High strength of the screw joint
- Simple and safe assembly due to easy alignment and low installation torque
- High stripping torque due to a robust female thread
- Metric compatibility



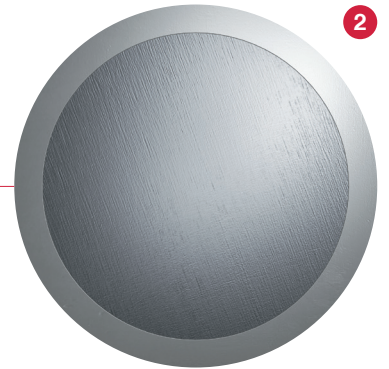
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Thread flank geometry

- More stable female thread compared to conventional 60° threads

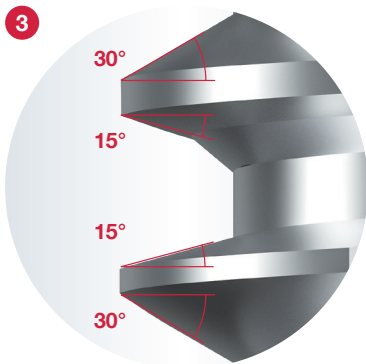
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Circular thread geometry

- Maximum flank coverage
- Better interchangeability

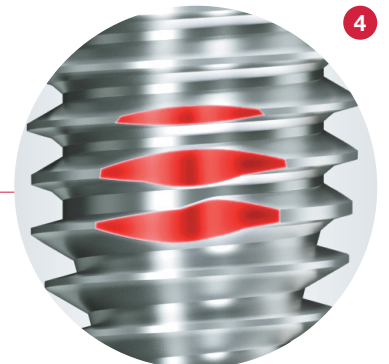
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Reversed flank angle

- Forming the through draught in fastening direction

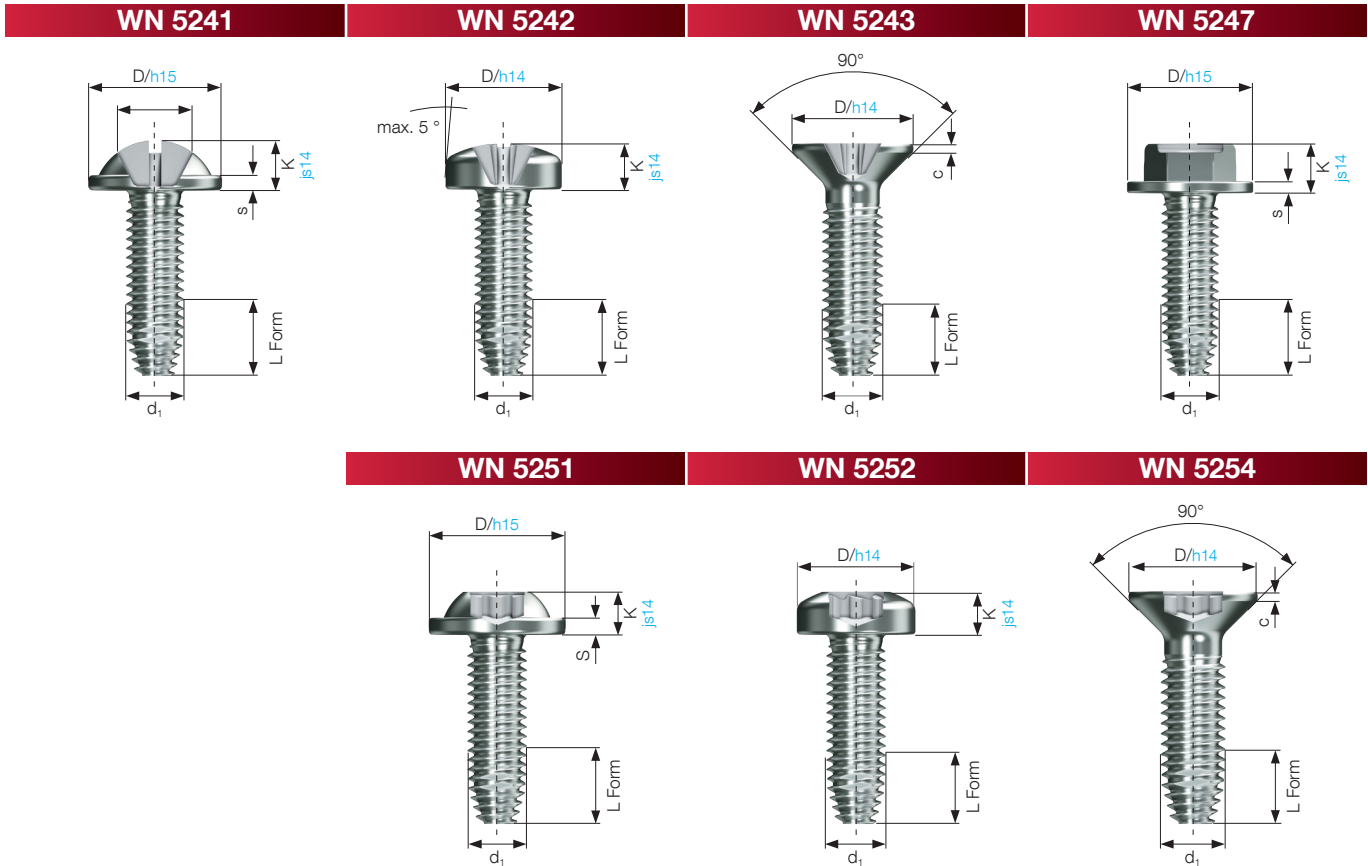
4



Non-circular thread forming zone

- Easy and simple application of the screw
- Reliable penetration into the material

Technical specifications
Designs



SHEETtracs®	25	30	35	40	50	60
Outer Ø	2,50	3,00	3,50	4,00	5,00	6,00
Length of forming areas max. L _{Form}	3,5	3,9	4,6	5,0	5,9	7,1

Nominal size ranges (mm)

Tolerance range	over 3		over 6		over 10		over 18		over 30	
	up to 3	up to 6	up to 10	up to 18	up to 30	up to 50				
h 14	0	0	0	0	0	0				
	- 0,25	- 0,30	- 0,36	- 0,43	- 0,52					
h 15	0	0	0	0	0					
	- 0,40	- 0,48	- 0,58	- 0,70	- 0,84					
js 14	±0,12	±0,15	±0,18							

All cross and TORX® recesses are also available as combi recesses. (exception: WN 5243 & WN 5254)



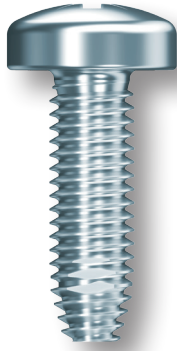
Ordering example
Description of an SHEETtracs® screw with pan head and TORX® recess, nominal Ø 4.0 mm and length L = 20 mm
EJOT SHEETtracs® screw WN 5252 40 x 20

SHEETtracs®			25	30	35	40	50	60
Outer Ø	d _i		2,50	3,00	3,50	4,00	5,00	6,00
Outer Ø tolerance			+0,10	+0,10	+0,10	+0,12	+0,12	+0,14
Pitch	P		0,45	0,50	0,60	0,70	0,80	1,00
WN 5241								
Head Ø	D _{max.}			7,50	9,00	10,00	11,50	14,50
Head height	K			2,40	2,50	3,20	4,00	4,60
Washer thickness	s			0,90	1,00	1,20	1,40	1,60
H cross recess	insertion depth t	min.		1,07	1,33	1,98	2,24	2,84
		max.		1,70	1,96	2,61	2,90	3,50
Z cross recess	insertion depth t	min.		1,08	1,40	2,01	2,27	2,91
		max.		1,54	1,86	2,47	2,73	3,37
Cross size H/Z				2	2	2	3	3
WN 5242								
Head Ø	D _{max.}		5,00	6,00	7,00	8,00	10,00	12,00
Head height	K		2,20	2,40	3,10	3,30	3,90	4,90
H cross recess	insertion depth t	min.	1,30	1,70	1,74	2,04	2,77	3,03
		max.	1,60	2,00	2,24	2,54	3,27	3,53
Z cross recess	insertion depth t	min.	1,27	1,68	1,65	1,90	2,64	3,02
		max.	1,52	1,93	2,11	2,36	3,10	3,48
Cross size H/Z			1	1	2	2	2	3
WN 5243								
Head Ø	D _{max.}		5,00	6,00	7,00	8,40	10,00	12,50
cyl. Head height	C _{max.}		0,55	0,60	0,65	0,70	0,75	0,85
H cross recess	insertion depth t	min.	1,25	1,50	1,40	1,62	2,10	2,80
		max.	1,55	1,80	1,70	2,12	2,60	3,30
Z cross recess	insertion depth t	min.	1,22	1,48	1,34	1,60	2,05	2,46
		max.	1,47	1,73	1,79	2,06	2,51	2,92
Cross size H/Z			1	1	2	2	2	3
WN 5247								
Washer Ø	D _{max.}			7,50	8,30	9,00	11,00	13,00
Head height	K			3,00	3,40	3,80	4,30	5,00
Width across flats	A/F			5,00	5,50	5,50	7,00	8,00
Washer thickness	s			0,70	0,90	0,90	1,10	1,30
WN 5251								
Head Ø	D _{max.}		6,00	7,50	9,00	10,00	11,50	14,50
Head height	K		2,00	2,25	2,50	3,00	3,60	4,40
Washer thickness	s		0,60	0,70	0,80	1,10	1,40	1,50
TORX®			T8	T10	T15	T20	T25	T30
	A _{Ref.}		2,40	2,80	3,35	3,95	4,50	5,60
Insertion depth t	min.		0,95	1,00	1,10	1,25	1,60	2,00
	max.		1,15	1,30	1,40	1,70	2,00	2,40
WN 5252								
Head Ø	D _{max.}		5,00	6,00	7,00	8,00	10,00	12,00
Head height	K		2,00	2,25	2,50	3,00	3,60	4,40
TORX®			T8	T10	T15	T20	T25	T30
	A _{Ref.}		2,40	2,80	3,35	3,95	4,50	5,60
Insertion depth t	min.		0,95	1,00	1,10	1,25	1,60	2,00
	max.		1,15	1,30	1,40	1,70	2,00	2,40
WN 5254								
Head Ø	D _{max.}		5,00	6,00	7,00	8,40	10,00	12,50
cyl. Head height	C _{max.}		0,55	0,60	0,65	0,70	0,75	0,85
TORX®			T8	T10	T15	T20	T25	T30
	A _{Ref.}		2,40	2,80	3,35	3,95	4,50	5,60
Insertion depth t	min.		0,70	0,75	0,85	1,10	1,15	1,40
	max.		0,90	1,10	1,15	1,55	1,55	1,80

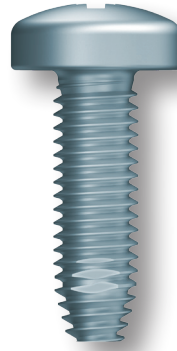
Technical specifications

Designs

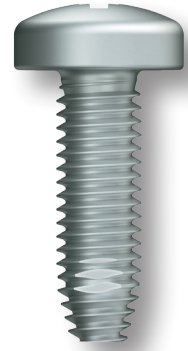
Material: Case-hardened steel, case-hardened, hexavalent chromium-free coatings



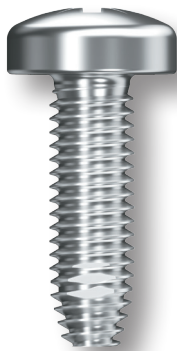
zinc-plated,
blue passivated



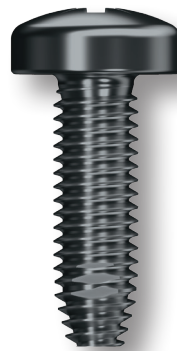
zinc-plated, blue/thick-film
passivated + EJOSEAL



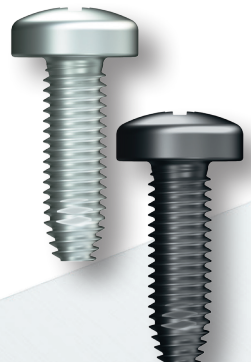
zinc-plated,
thick-film passivated



ZnFe, ZnNi,
transparent passivated
(with or without sealing/
top coat)



ZnFe, ZnNi,
black passivated
(with or without sealing/
top coat)



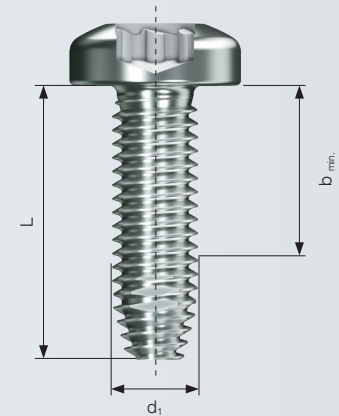
Zinc flake coatings
(with or without sealing/
top coat in silver or black)

Further materials and coatings are available upon request.

Manufacturing range

SHEETtracs®	25	30	35	40	50	60
Outer Ø d ₁ (mm)	2,50	3,00	3,50	4,00	5,00	6,00
Length L	Usable thread length b _{min.}					
6 + 0,60	2,50	2,10				
8 + 0,75	4,50	4,10	3,40	3,00		
10 + 0,75	6,50	6,10	5,40	5,00	4,10	
12 + 0,90	8,50	8,10	7,40	7,00	6,10	4,90
14 + 0,90	10,50	10,10	9,40	9,00	8,10	6,90
16 + 0,90	12,50	12,10	11,40	11,00	10,10	8,90
18 + 0,90	14,50	14,10	13,40	13,00	12,10	10,90
20 + 1,05		16,10	15,40	15,00	14,10	12,90
25 + 1,05			20,40	20,00	19,10	17,90
30 + 1,05				25,00	24,10	22,90
35 + 1,25					29,10	27,90
40 + 1,25						32,90
50 + 1,25						42,90
60 + 1,50						52,90
Partial thread length	10	10	12	14	16	18

Special lengths are available upon request.

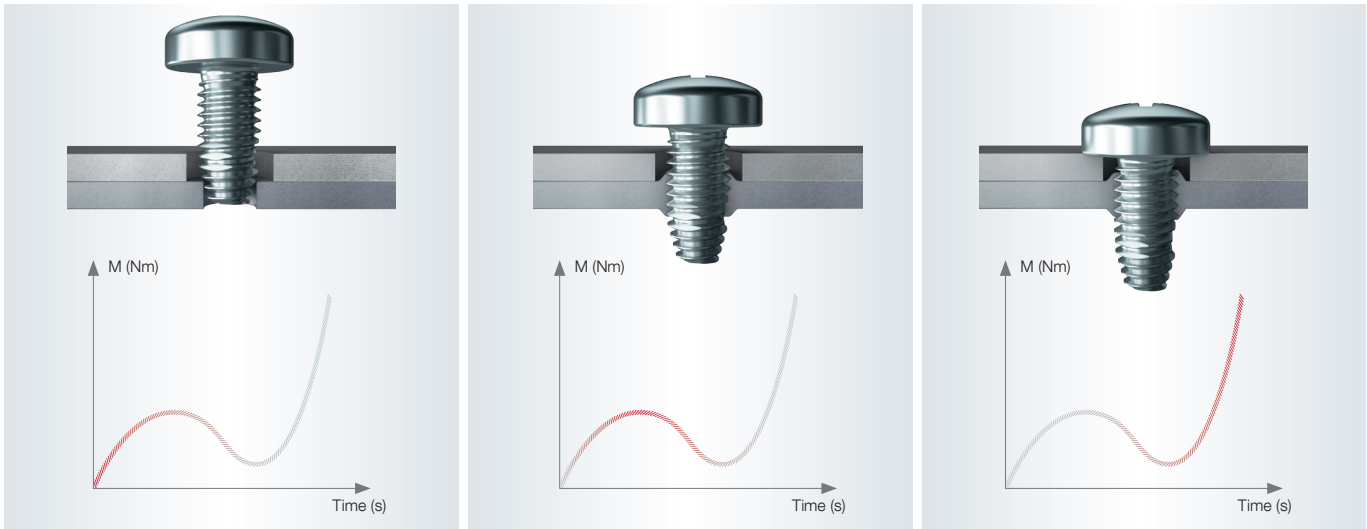


- Minimal length for versions with countersunk head
- Full thread
- Manufacturing range with partial thread



Application notes

Assembly stages



1 Positioning

2 Thread forming

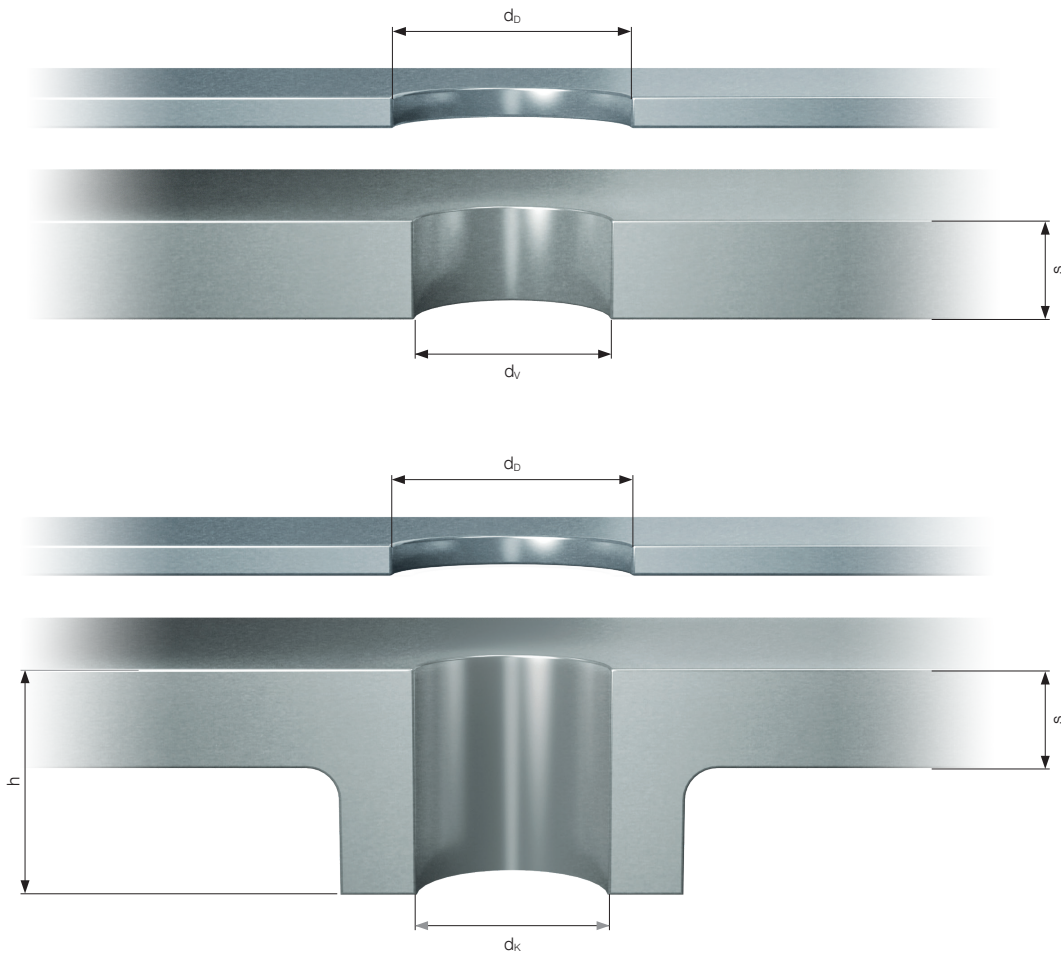
3 Tightening

Hole dimensioning for sheet metals

Recommended pilot hole diameter and tightening torque* for mild steels according to DIN EN 10130

SHEETtracs®	Outer Ø d ₁ (mm)	Sheet metal thckn. s (mm)	Pilot hole Ø d _v (tolerance +0.1)	Tightening torque M _A (Nm)
30	3,0	0,50 – 0,63	Ø 2,0	1,0
		0,63 – 0,88	Ø 2,1	1,2
35	3,5	0,63 – 0,88	Ø 2,2	1,3
		0,88 – 1,00	Ø 2,4	1,5
		1,00 – 1,25	Ø 2,6	1,5
40	4,0	0,63 – 0,88	Ø 2,4	2,0
		0,88 – 1,00	Ø 2,6	2,5
		1,00 – 1,25	Ø 3,0	2,5
		0,63 – 0,75	Ø 3,8	2,5
50	5,0	0,75 – 0,88	Ø 4,1	3,0
		0,88 – 1,00	Ø 4,2	3,5
		1,00 – 1,25	Ø 4,3	3,5
		1,25 – 1,50	Ø 4,4	4,0
60	6,0	0,88 – 1,00	Ø 4,8	4,0
		1,00 – 1,25	Ø 4,9	5,0
		1,25 – 1,50	Ø 5,1	6,0

* In thicker sheet metals or harder materials, the pilot hole diameter should be increased by approx. 0.2 mm.



Core hole diameter for sheet metal through draughts in steel according to DIN EN 10130

SHEETtracs®	25	30	35	40	50	60	
Outer Ø d _i (mm)	2,50	3,00	3,50	4,00	5,00	6,00	
Core hole Ø d _k (mm)	2,30	2,75	3,20	3,60	4,50	5,50	
Depth of through draught h	2,35		2,80	3,30	3,70	4,60	5,60
	$h = (1,5 - 2) s$						

Recommended clearance hole in the clamping part

Clearance hole Ø d _b (mm)	4,00	4,50	5,00	6,00	7,00	8,00
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Note:

It is recommended to check the values and the determination of the installation torque T_i and stripping torque T_s during component trials.

Therefore we offer the services of our ATF applications test lab.



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