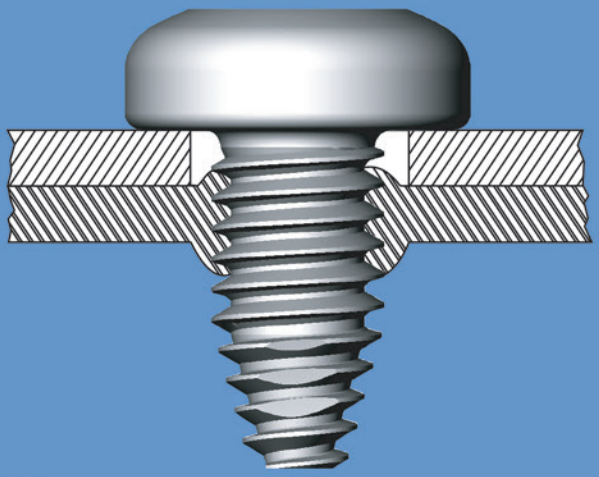
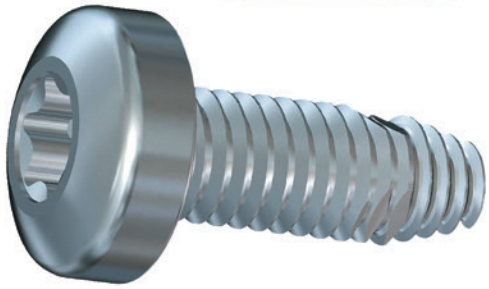
Semblex

SHEETtracs®





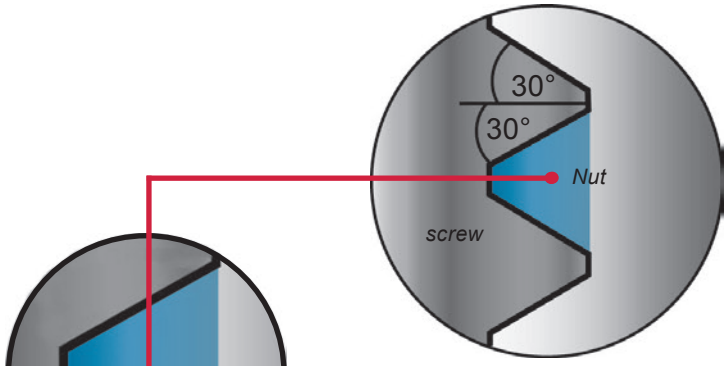
High Performance Fastener for Thin Sheet Metal with Pilot Holes

SHEETtracs®

Features and Benefits

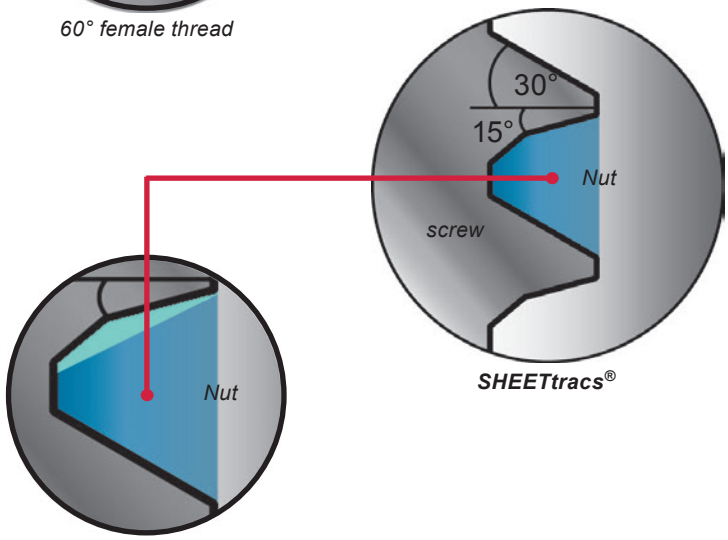
Today's manufacturing environment continues to explore ways to use thinner sheet metal to reduce cost and weight. As material thicknesses decrease, fastening can become more problematic. SHEETtracs® is a self tapping screw designed to be used in a pre-formed hole that produces assembly safe metal joining.

SHEETtracs® fasteners use a compound angled metric machine screw thread pitch to engage into sheet metal. The thinner asymmetric 45° thread flanks displace less material than common 60° threads resulting in stronger female threads and increased thread engagement.



60° thread

60° female thread



SHEETtracs®

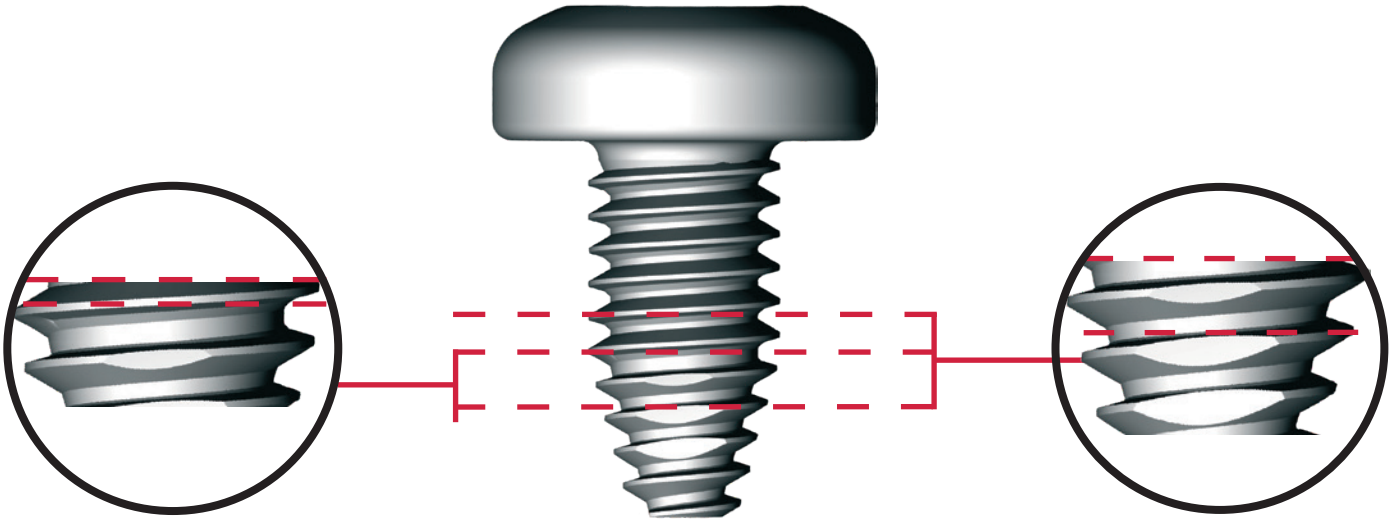
***SHEETtracs®** female thread with advanced load carrying capability*

SHEETtracs®

Features and Benefits

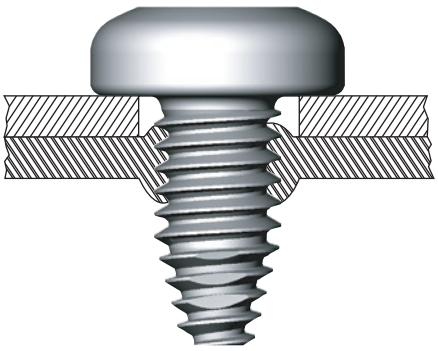
The reverse flank angle
in the thread forming zone is designed to maximize the formed extrusion height. The thread-forming zone only affects the lead threads of the screw and ends before reaching the full body diameter of the thread.

The non-circular thread forming zone
enables simple concentric screw installation while minimizing thread forming torque.



A large clean extrusion is
formed allowing the circular screw body to resist against low strip torque, achieve higher clamp load, and provide a uniform tightening torque.

Resistance to vibration
is elevated by the solid full body thread engagement. Multiple reinsertions are achievable in applications requiring serviceability.



SHEETtracs®

Fastener Standards

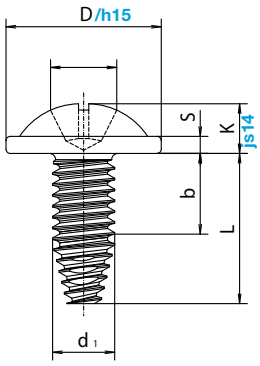
H-cross recess (Phillips®)

Z-cross recess (PoziDriv®)

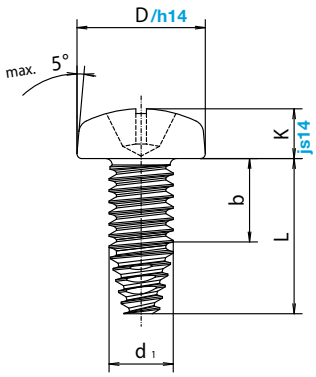
TORX®

TORX plus® / AUTOSERT®

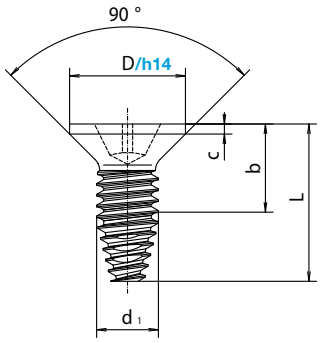
All cross recess and TORX® drives are also available as combination drives. (Except WN 5243 & WN 5254)



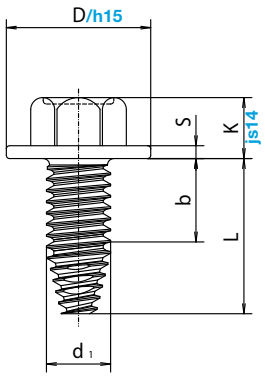
WN 5241



WN 5242



WN 5243

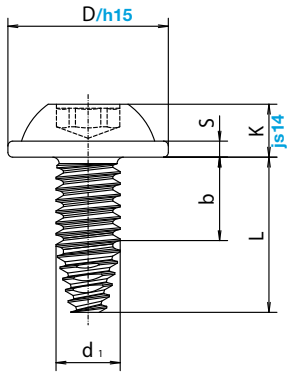


WN 5247

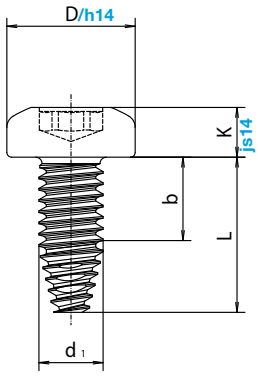
SHEETtracs®			25	30	35	40	50	60
External thread-Ø		d_1	2.50	3.00	3.50	4.00	5.00	6.00
External thread-Ø tolerance			+0.10	+0.10	+0.10	+0.12	+0.12	+0.14
Thread pitch		P	0.45	0.50	0.60	0.70	0.80	1.00
WN 5241								
Head-Ø		D		7.50	9.00	10.00	11.50	14.50
Head Height		K		2.40	2.50	3.20	4.00	4.60
Washer Thickness		s		0.80	0.90	1.10	1.30	1.50
H-cross-recess	Penetration depth	t min.		1.07	1.33	1.98	2.24	2.84
		t max.		1.70	1.96	2.61	2.90	3.50
Z-cross-recess	Penetration depth	t min.		1.08	1.40	2.01	2.27	2.91
		t max.		1.54	1.86	2.47	2.73	3.37
Driver Size				1	2	2	3	3
WN 5242								
Head-Ø		D	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	Penetration depth	t min.	1.30	1.70	1.74	2.04	2.77	3.03
		t max.	1.60	2.00	2.24	2.54	3.27	3.53
Z-cross-recess	Penetration depth	t min.	1.27	1.68	1.65	1.90	2.64	3.02
		t max.	1.52	1.93	2.11	2.36	3.10	3.48
Driver Size			1	1	2	2	2	3
WN 5243								
Head-Ø		D	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	Penetration depth	t min.	1.25	1.50	1.40	1.62	2.10	2.80
		t max.	1.55	1.80	1.70	2.12	2.60	3.30
Z-cross-recess	Penetration depth	t min.	1.22	1.48	1.34	1.60	2.05	2.46
		t max.	1.47	1.73	1.79	2.06	2.51	2.92
Driver Size			1	1	2	2	2	3
WN 5247								
Washer-Ø		D		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		SW		5.00	5.50	5.50	7.00	8.00
Washer Thickness		s		0.60	0.80	0.80	1.00	1.20

SHEETtracs®

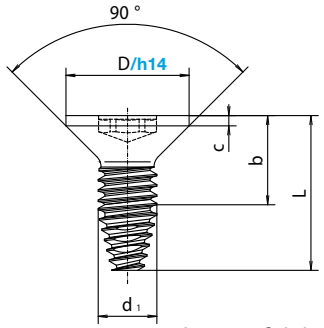
Fastener Standards



WN 5251



WN 5252



WN 5254

b = useful thread length
L = length tolerance

SHEETtracs®		25	30	35	40	50	60
External thread-Ø	d_1	2.50	3.00	3.50	4.00	5.00	6.00
External thread-Ø tolerance		+0.10	+0.10	+0.10	+0.12	+0.12	+0.14
Thread pitch	P	0.45	0.50	0.60	0.70	0.80	1.00
WN 5251							
Head-Ø	D	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
Penetration depth	t min.	0.95	1.00	1.10	1.25	1.60	2.00
	t max.	1.15	1.30	1.40	1.70	2.00	2.40
WN 5252							
Head-Ø	D	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
Penetration depth	t min.	0.95	1.00	1.10	1.25	1.60	2.00
	t max.	1.15	1.30	1.40	1.70	2.00	2.40
WN 5254							
Head-Ø	D	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
Penetration depth	t min.	0.70	0.75	0.85	1.10	1.15	1.40
	t max.	0.90	1.10	1.15	1.55	1.55	1.80

Head Geometry Tolerances

	Nominal Value [mm]					
Tolerance		over 3	over 6	over 10	over 18	over 30
	to 3	to 6	to 10	to 18	to 30	to 50
h 14	0 -0.25	0 -0.30	0 -0.36	0 -0.43	0 -0.52	
h 15	0 -0.40	0 -0.48	0 -0.58	0 -0.70	0 -0.84	
js 14	±0.12	±0.15	±0.18			

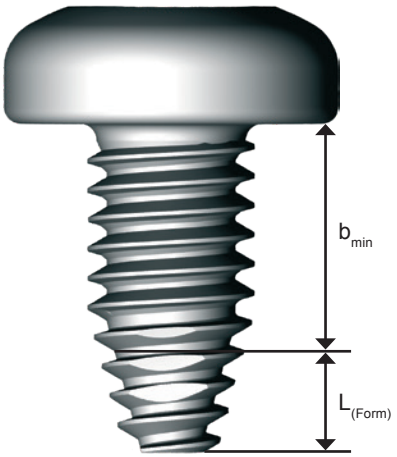
SHEETtracs®
Manufacturing Range

SHEETtracs®	25	30	35	40	50	60
d_1 [mm]	2.5	3.0	3.5	4.0	5.0	6.0
Length L [mm]	usable thread length [mm]					
6 + 0.60	2.5	2.1				
8 + 0.75	4.5	4.1	3.4	3.0		
10 + 0.75	6.5	6.1	5.4	5.0	4.1	
12 + 0.90	8.5	8.1	7.4	7.0	6.1	4.9
14 + 0.90	10.5	10.1	9.4	9.0	8.1	6.9
16 + 0.90	12.5	12.1	11.4	11.0	10.1	8.9
18 + 0.90	14.5	14.1	13.4	13.0	12.1	10.9
20 + 1.05		16.1	15.4	15.0	14.1	12.9
25 + 1.05			20.4	20.0	19.1	17.9
30 + 1.05				25.0	24.1	22.9
35 + 1.25					29.1	27.9
40 + 1.25						32.9
50 + 1.25						42.9
60 + 1.50						52.9
Partial thread length	10	10	12	14	16	18
Special length upon request						

Minimal length with counter-sunk head style

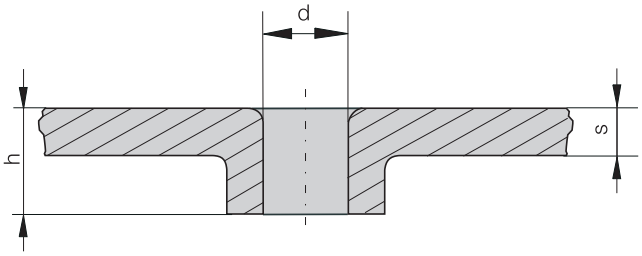
Full thread length

Partial thread length



Thread Forming Zone Specifications

SHEETtracs®	25	30	35	40	50	60
Nominal-Ø [mm]	2.5	3.0	3.5	4.0	5.0	6.0
length of $L_{(Form)}$ (forming zone) [mm]	4.40	4.95	5.65	6.05	7.15	8.60



The SHEETtracs® screw is well suited for fastening into prefabricated extrusions.

Picture: Installation into prefabricated extrusion

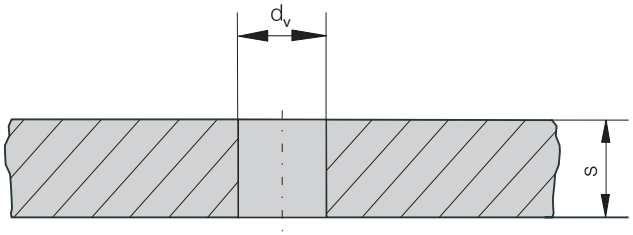
Prefabricated extrusion designs in steel according to DIN EN 10130						
SHEETtracs®	**25**	**30**	**35**	**40**	**50**	**60**
External diameter [mm]	**2.5**	**3**	**3.5**	**4**	**5**	**6**
Hole diameter d [mm]	2.30 2.35	2.75 2.80	3.20 3.30	3.60 3.70	4.60 4.70	5.50 5.60
Extrusion depth	h = (1.5 to 2) * s					

SHEETtracs®
Design Recommendations

The level of installation torque depends on several parameters. The most important are type of material and its strength, required insertion depth (material thickness), finish for screw and mating material, and pre-hole diameter. Below you will find general recommendations for hole sizes and theoretical tightening torques. Actual torque testing should be performed to validate or calculate the required assembly torque. Contact Semblex Engineering Services for assistance with testing.

In high-strength sheets with sheet thicknesses of 0.4 mm to appr. 2.0 mm, the FDS® fastener design should be considered. Please contact Semblex Engineering Services for design assistance.

Hole Dimensioning for Sheet Metal



Suggested Starting Pilot Hole Diameters and Expected Tightening Torque Performance

SHEETtracs®	External-Ø d_1 [mm]	sheet thickness s [mm]	pilot-hole-Ø d_v [mm] (Tolerance: +0.1)	tightening torque M_A [Nm]
30	3	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	0.63 - 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
50	5	0.63 - 0.75	Ø 3.8	2.5
		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	0.88 - 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

All data valid for thin sheets made of cold rolled soft steel acc. to DIN EN 10130 (DC 01 – DC 04). In thicker and/or harder materials, the pilot-hole diameter should be increased (~ 0.2 - 0.3mm). Lasered pilot-holes should also be increased by the same amount due to hardening of the edges.

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