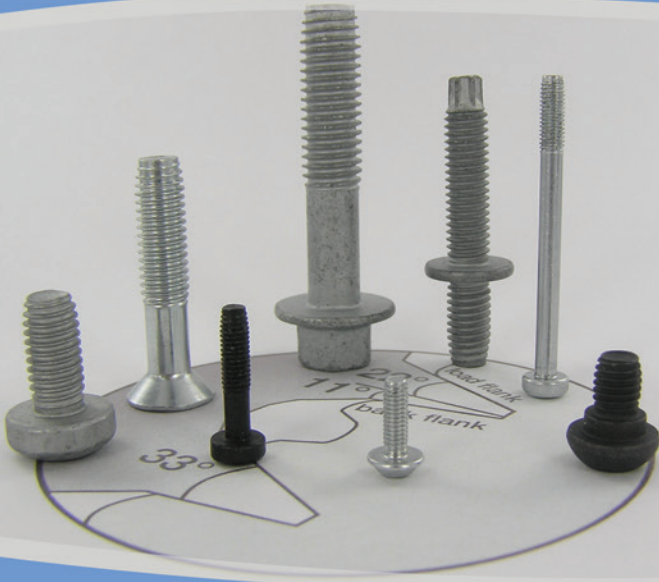
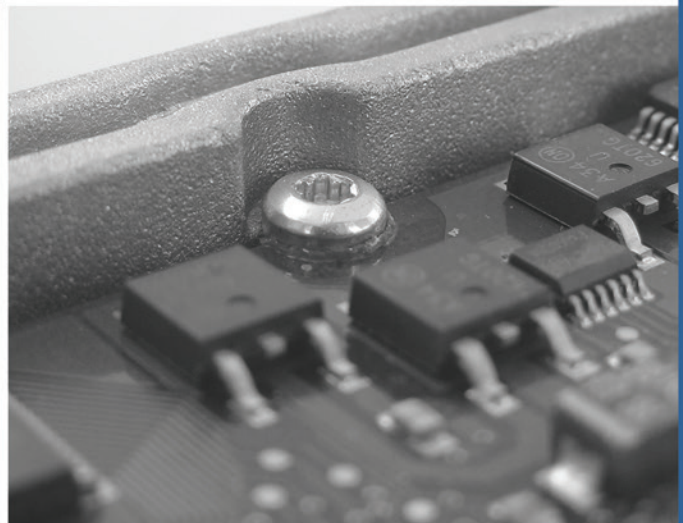




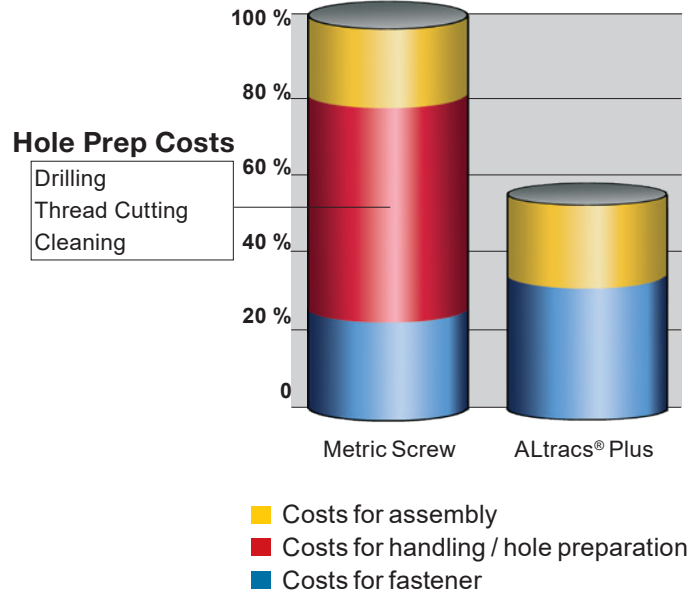
Thread Forming Technology for Light Metals





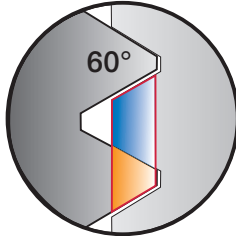
- High joint strength
- Safety against dynamic loads
- Consistently high clamp loads
- Self-locking vibration resistance

- Easy lead-in, low drive torque
- High stripping torque
- Opportunity to reduce installation depth
- Compatible with machine screw threads



ALtracs® Plus vs. Machine Screw

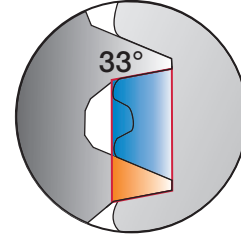
Compared to machine screws, cost savings of up to 40% can be achieved with thread forming fasteners. Self-tapping fasteners can be directly assembled into cast holes as opposed to the pre-drilling, thread tapping and subsequent cleaning of metal chips to prepare the hole to receive a machine screw. All these costs for hole preparation can be saved.



60° Thread

The 60 degree flank angle of a standard thread forming or machine screw has reduced shear area between threads.

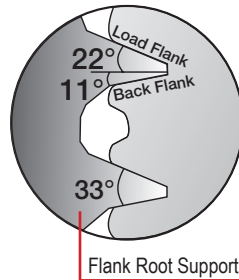
$$\frac{A_{\text{Nut}}}{A_{\text{Screw}}} \approx \frac{1.5}{1}$$



ALtracs® Plus Thread

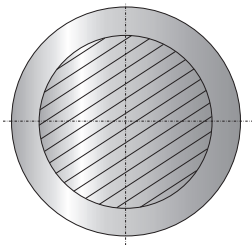
The unique ALtracs® Plus thread geometry provides greater shear area between threads resulting in higher pull out and strip out performance.

$$\frac{A_{\text{Nut}}}{A_{\text{Screw}}} \approx \frac{3}{1}$$



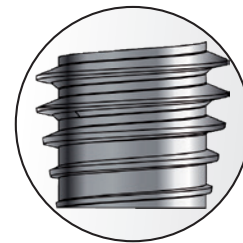
Flank Geometry

The smaller 33 degree flank angle of the ALtracs® Plus fastener creates a stronger internal thread in the mating material than screws with a 60 degree flank angle. The larger tooth area of the female thread results in a more robust joint. The asymmetric flank design optimizes material displacement during the thread forming process and ensures maximum thread engagement. The profile of the lower thread flank delivers increased strength which is critical for high load joints.



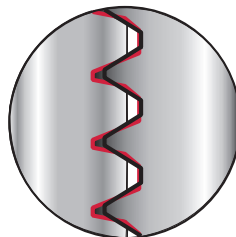
Thread Cross Section

The round body shape provides greater thread engagement compared to trilobular fasteners. This provides improved clamp retention and better long term joint behavior.



Thread Forming Region

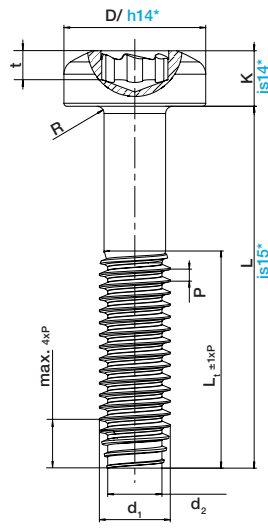
The tapered thread forming lead-in with sharp crested threads helps to minimize debris generation and lowers drive torque.



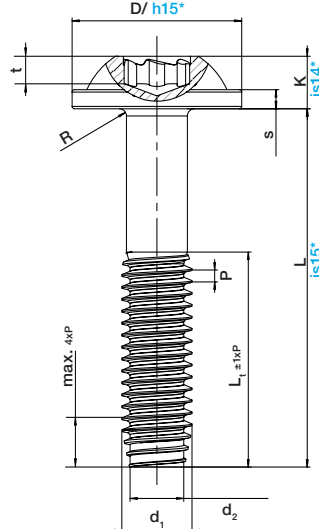
— ALtracs® Plus Thread
— Machine Screw

Thread Compatibility

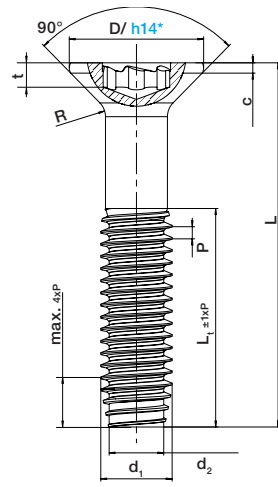
The ALtracs® Plus is designed to be completely interchangeable with machine screws. Therefore, ALtracs® Plus can be used in existing tapped machine screw threads of the same size or alternately, a machine screw of the same size can be used in the thread formed by an ALtracs® Plus fastener, eliminating any field service concerns.



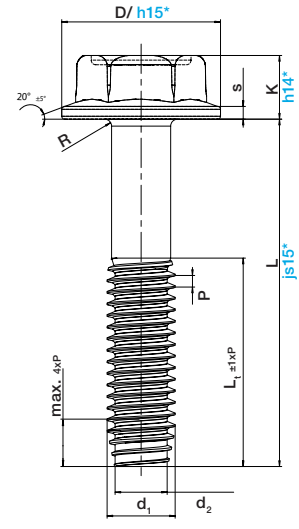
WN 5152



WN 5151



WN 5154



WN 5117

Semblex ALtracs® Plus		16	18	20	22	25	30	35	40	50	60	[70]	80	[90]	100	120	140
Nominal-Ø																	
External thread-Ø	d ₁	1.60	1.80	2.00	2.20	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	9.00	10.00	12.00	14.00
Thread core-Ø	d ₂	1.12	1.32	1.45	1.61	1.88	2.30	2.66	3.02	3.87	4.59	5.56	6.23	7.20	7.86	9.86	11.86
Thread pitch	P	0.35	0.35	0.40	0.45	0.45	0.50	0.60	0.70	0.80	1.00	1.00	1.25	1.25	1.50	1.75	2.00
Thread run-out	X _{max}	0.70	0.70	0.80	0.90	0.90	1.00	1.20	1.40	1.60	2.00	2.00	2.50	2.50	3.00	3.50	4.00
WN 5152																	
Head-Ø	D	upon request	4.00	4.40	5.00	6.00	7.00	8.00	10.00	12.00	upon request	16.00	upon request				
Head Height	K		1.50	1.60	2.00	2.40	2.70	3.10	3.80	4.60		6.00					
Radius	R _{max}		0.30	0.30	0.30	0.40	0.40	0.50	0.50	0.60		0.80					
TORXplus® / AUTOSERT®			6IP	7IP	8IP	10IP	15IP	20IP	25IP	30IP		40IP					
	A _{Ref}		1.75	2.05	2.40	2.80	3.35	3.95	4.50	5.60		6.75					
Insertion Depth	t	min.	0.65	0.70	0.90	1.10	1.10	1.50	1.75	2.20	2.60						
		max.	0.85	0.85	1.10	1.30	1.40	1.80	1.90	2.60	3.10						
WN 5151																	
Head-Ø	D	upon request	5.00	5.50	6.00	7.50	9.00	10.00	11.50	14.50	upon request	19.00	upon request				
Head Height	K		1.50	1.60	2.00	2.25	2.50	2.90	3.40	4.40		5.70					
Washer Thickness	s		0.60	0.60	0.60	0.70	0.80	1.00	1.20	1.60		2.00					
Radius	R _{max}		0.30	0.30	0.30	0.40	0.40	0.50	0.50	0.60		0.80					
TORXplus® / AUTOSERT®			6IP	7IP	8IP	10IP	15IP	20IP	25IP	30IP		40IP					
	A _{Ref}	1.75	2.05	2.40	2.80	3.35	3.95	4.50	5.60	6.75							
Insertion Depth	t	min.	0.65	0.70	0.90	1.00	1.10	1.30	1.50	1.90	2.60						
		max.	0.85	0.85	1.10	1.30	1.40	1.65	1.85	2.30	3.10						
WN 5154																	
Head-Ø	D	upon request	3.80	4.40	4.70	5.50	7.30	8.40	9.30	11.30	upon request	15.80	upon request				
Cyl. Head Height	c _{max}		0.35	0.45	0.55	0.55	0.65	0.70	0.75	0.85		0.95					
Radius	R _{max}		0.50	0.60	0.70	0.80	0.95	1.00	1.30	1.60		2.00					
TORXplus® / AUTOSERT®			6IP	7IP	8IP	10IP	15IP	20IP	25IP	30IP		40IP					
	A _{Ref}		1.75	2.05	2.40	2.80	3.35	3.95	4.50	5.60		6.75					
Insertion Depth	t	min.	0.50	0.70	0.70	0.80	0.95	1.10	1.25	1.55	1.90						
		max.	0.65	0.85	0.90	1.05	1.20	1.45	1.60	2.00	2.40						
WN 5117																	
Head-Ø	D	upon request								11.50	14.00	upon request	18.00	upon request			
Width Across Flats	SW									8.00	10.00		13.00				
Head Height	K									4.80	5.50		7.50				
Washer Thickness	s									1.0	1.10		1.20				
Radius	R _{max}									0.40	0.50		0.70				

Nominal Value [mm]								
Tolerance Range		over 3	over 6	over 10	over 18	over 30	over 50	over 80
	to 3	to 6	to 10	to 18	to 30	to 50	to 80	to 120
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	–	–	–	–	–
js 15	±0.20	±0.24	±0.29	±0.35	±0.42	±0.50	±0.60	±0.70

Semblex ALtracs® Plus	16	18	20	22	25	30	35	40	50	60	[70]	80	[90]	100	120	140
External thread - Ø d ₁	1.60	1.80	2.00	2.20	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	9.00	10.00	12.00	14.00
External thread - Ø tolerance	±0.04	±0.04	±0.04	±0.04	±0.05	±0.05	±0.05	±0.06	±0.06	±0.07	±0.07	±0.07	±0.09	±0.09	±0.09	±0.09
Core Thread - Ø tolerance	+0.12	+0.12	+0.12	+0.12	+0.14	+0.14	+0.14	+0.16	+0.16	+0.18	+0.18	+0.18	+0.22	+0.22	+0.22	+0.22
Partial Thread L - tolerance	±0.35	±0.35	±0.40	±0.45	±0.45	±0.50	±0.60	±0.70	±0.80	±1.00	±1.00	±1.25	±1.25	±1.50	±1.75	±2.00

For full thread, please note thread run-out x_{max}.

Manufacturing range and thread length: (Figures in dark gray field = thread length).

Partial thread length for countersunk heads on request.

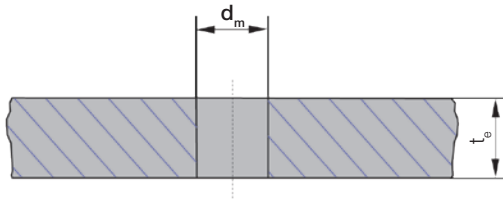
Semblex ALtracs® Plus	16	18	20	22	25	30	35	40	50	60	70	80	90	100	120	140
d ₁ [mm]	1.6	1.8	2.0	2.2	2.5	3.0	3.5	4.5	5.0	6.0	7.0	8.0	9.0	10.0	12.0	14.0
Length L [mm]																
3.5 ± 0.24	3.5															
4 ± 0.24	4	4	4													
4.5 ± 0.24	4.5	4.5	4.5	4.5												
5 ± 0.24	5	5	5	5	5											
6 ± 0.24	5	6	6	6	6	6										
7 ± 0.29	5	6	6	7	7	7	7									
8 ± 0.29	5	6	6	7	8	7	8	8								
9 ± 0.29	5	6	6	7	8	7	9	9								
10 ± 0.29	5	6	6	7	8	9	9	10	10							
12 ± 0.35	5	6	6	7	8	9	11	10	12	12						
14 ± 0.35	5	6	6	7	8	9	11	12	12	14	14					
16 ± 0.35	5	6	6	7	8	9	11	12	15	14	16	16				
18 ± 0.35		6	6	7	8	9	11	12	15	14	16	18	18			
20 ± 0.42			6	7	8	9	11	12	15	18	16	19	20	20		
22 ± 0.42				7	8	9	11	12	15	18	21	19	21	22		
25 ± 0.42					8	9	11	12	15	18	21	24	21	23	25	
30 ± 0.42						9	11	12	15	18	21	24	27	23	28	30
35 ± 0.50							11	12	15	18	21	24	27	30	28	32
40 ± 0.50								12	15	18	21	24	27	30	36	32
50 ± 0.50									15	18	21	24	27	30	36	42
60 ± 0.60										18	21	24	27	30	36	42
70 ± 0.60											21	24	27	30	36	42
80 ± 0.60												24	27	30	36	42
90 ± 0.70													27	30	36	42
100 ± 0.70														30	36	42

= min. length
(countersunk head)
Length "L" + 0.6 d₁

= max. length

with alternative thread
forming zone available

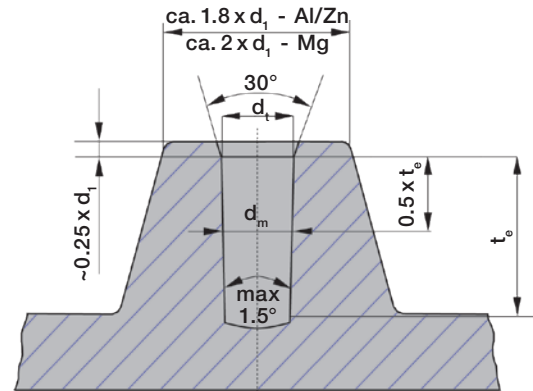
Manufacturing range does not
necessarily indicate stock items



d_1 = Nominal Diameter d_m = Hole Diameter Middle
 d_t = Hole Diameter Top t_e = Insertion Depth

All indications in mm.

For pre-hole design, please choose d_m or d_t



Recommendations for cast, drilled, punched or extruded pre-holes in aluminum, magnesium, zinc, copper, brass and bronze up to a hardness of 140HB

Hardness	Al, Zn, Cu up to 55 HB Mg up to 90 HB			Al, Zn, Cu 55-115 HB				Al, Zn, Cu 115-140 HB		
t_e	$1.0 \times d_1$	$1.5 \times d_1$	$2.0 \times d_1$	$0.5 \times d_1$	$1.0 \times d_1$	$1.5 \times d_1$	$2.0 \times d_1$	$0.5 \times d_1$	$1.0 \times d_1$	$1.5 \times d_1$
d_1	d_m	d_m [d_t]	d_m [d_t]	d_m	d_m	d_m [d_t]	d_m [d_t]	d_m	d_m	d_m [d_t]
1.6	1.46	1.48 [1.51]	$t_{\text{emax}} = 1.5 \times d_1$	1.46	1.48	1.49 [1.52]	$t_{\text{emax}} = 1.5 \times d_1$	1.48	1.49	1.51 [1.54]
1.8	1.63	1.65 [1.69]	$t_{\text{emax}} = 1.5 \times d_1$	1.63	1.65	1.67 [1.71]	$t_{\text{emax}} = 1.5 \times d_1$	1.65	1.67	1.68 [1.72]
2.0	1.83	1.85 [1.89]	$t_{\text{emax}} = 1.5 \times d_1$	1.83	1.85	1.87 [1.91]	$t_{\text{emax}} = 1.5 \times d_1$	1.85	1.87	1.89 [1.93]
2.2	1.98	2.00 [2.04]	2.03 [2.09]	1.98	2.00	2.03 [2.07]	$t_{\text{emax}} = 1.5 \times d_1$	2.00	2.03	2.05 [2.09]
2.5	2.20	2.25 [2.30]	2.30 [2.37]	2.20	2.25	2.30 [2.35]	2.35 [2.42]	2.25	2.30	2.35 [2.40]
3.0	2.65	2.70 [2.76]	2.75 [2.83]	2.65	2.70	2.75 [2.81]	2.80 [2.88]	2.70	2.75	2.80 [2.86]
3.5	3.10	3.15 [3.22]	3.20 [3.29]	3.10	3.15	3.20 [3.27]	3.25 [3.34]	3.15	3.20	3.25 [3.32]
4.0	3.55	3.60 [3.68]	3.65 [3.75]	3.55	3.60	3.65 [3.73]	3.70 [3.80]	3.60	3.65	3.70 [3.78]
5.0	4.40	4.50 [4.60]	4.60 [4.73]	4.40	4.50	4.60 [4.70]	4.70 [4.83]	4.50	4.60	4.70 [4.80]
6.0	5.30	5.40 [5.52]	5.50 [5.66]	5.30	5.40	5.50 [5.62]	5.60 [5.76]	5.40	5.50	5.60 [5.72]
7.0	6.20	6.30 [6.44]	6.40 [6.58]	6.20	6.30	6.40 [6.64]	6.60 [6.78]	6.30	6.40	6.60 [6.74]
8.0	7.00	7.20 [7.36]	7.40 [7.61]	7.00	7.20	7.40 [7.56]	7.50 [7.71]	7.20	7.40	7.50 [7.66]
9.0	7.90	8.10 [8.28]	8.30 [8.54]	7.90	8.10	8.30 [8.48]	8.40 [8.64]	8.10	8.30	8.40 [8.59]
10.0	8.80	9.00 [9.20]	9.20 [9.46]	8.80	9.00	9.20 [9.40]	9.40 [9.66]	9.00	9.20	9.40 [9.60]
12.0	10.60	10.80 [11.04]	11.00 [11.31]	10.60	10.80	11.00 [11.24]	11.20 [11.51]	10.80	11.00	11.20 [11.44]
14.0	12.30	12.60 [12.87]	12.90 [13.27]	12.30	12.60	12.90 [13.17]	13.20 [13.57]	12.60	12.90	13.20 [13.47]

Material

- ALtracs® Plus fasteners are manufactured from carbon steel and neutral hardened to HRC 33-39.
- Alternate materials available upon request.

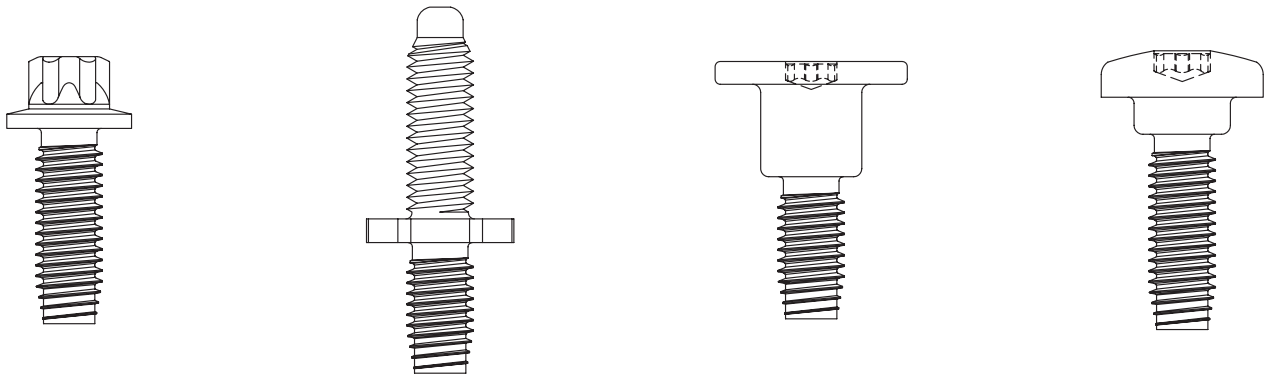
Coatings & Platings

- A wide variety of plating and coating options can be applied to meet specific customer requirements for corrosion resistance and joint performance.

Lubrication

- Lubrication is suggested for all thread forming applications in light metals. Contact our Sales or Engineering Services team for recommendations.

Specials / Examples



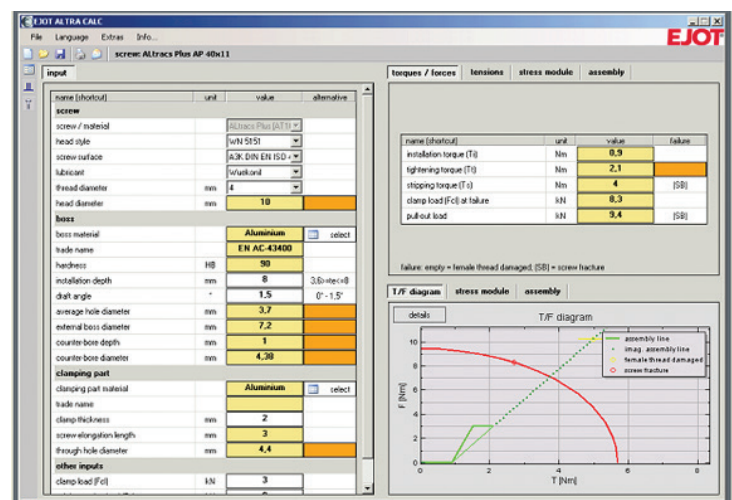
ALtracs® Plus fasteners can be manufactured with many popular internal and external drive systems to meet assembly requirements.

ALtra CALC

Theoretical Assembly Parameters

ALtra CALC validates applications, reducing engineering and development time and cost.

- Application and test assembly examples populate database
- Parameters help the designer to understand predicted joint behavior of the ALtracs® Plus fastener



Engineering Services

Design & Technical Assistance
VA/VE Project Support
Product Engineering Samples
Training Programs
On-Site Technical Support
Application Testing
Product Teardowns



Value Added Services

Technical Sales Team
Focused Manufacturing & Logistics Facilities
Integrated Supply Base
Sourcing Solutions
Customized Labeling and Packaging
EDI Capable
Global Partnerships - North America,
Europe & Asia

Certifications & Accreditations



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ACCREDITED

Testing Lab

Cert #0794.01

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