



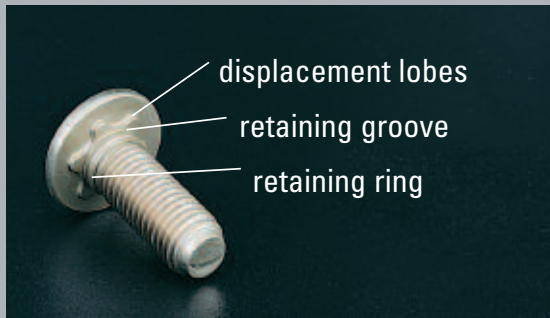
 **Semblex**

UNIQUE STRUX® DESIGN PROVIDES EXCEPTIONAL PERFORMANCE

STRUX®

Our high-performance STRUX® fasteners offer a **stronger** and **more reliable** assembly alternative to traditional clinch and weld studs. Along with **stud applications**, the STRUX® design can be used in joints that require **self-tapping fasteners**. In most cases, a STRUX® fastening solution can yield significant time and **cost savings** when compared to welded or other staked fasteners.

STRUX® FEATURES



Eliminates Welding

STRUX® fasteners eliminate the need for expensive and sometimes hazardous welding operations.

- No distortion due to excessive heat
- Aesthetic value of application is improved
- Potential for corrosion is reduced
- Elimination of costly production bottlenecks

Consistent Reliability

With proper installation, STRUX® fasteners can reduce the potential for failure. STRUX® products give you consistent push-out strength and torque values, whether it's the 10th or 10 millionth fastener being installed.

- Visual inspection of joint is fast and clean
- Consistent joint integrity
- Predictable performance

Resists Push-Out & Rotation

Once seated, the displacement lobes keep the STRUX® fastener from rotating during service. The torsional and push-out strength are limited only by the shear strength of the engagement material.

Critical Applications

The high-performance capabilities of STRUX® products makes them an excellent match for critical applications such as air bags and seating.

- Complete design assistance
- Application testing
- Assembly validation

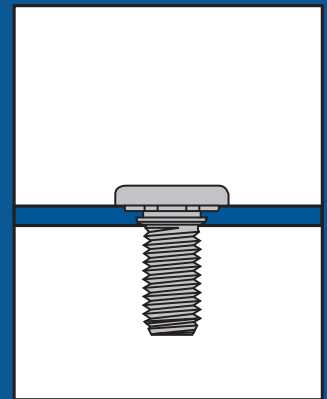
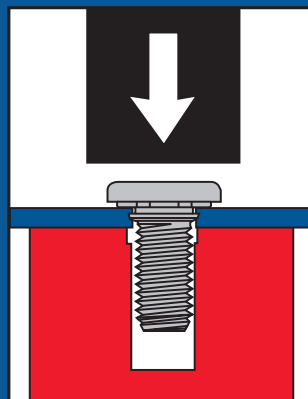
Easy Installation

STRUX® clinch fasteners can be assembled manually, or automatically with any equipment capable of feeding rivets, weld studs or conventional clinch studs. This includes hydraulic staking presses.

- Increased production rates when using progressive dies
- Improved product and joint integrity

Installation

The stud end is fed through a punched or drilled hole and into a lower die. A punch then applies force to the stud and the retaining ring passes through the hole. As pressure is applied, the displacement lobes are seated, forcing the engagement material into the retaining groove.



PRODUCT CONSISTENCY. IMPROVED JOINT INTEGRITY. LOWER ASSEMBLY COSTS

WELDING LIMITATIONS



- Typically more expensive to install
- Slower cycle time
- Flash build-up on threads, which requires re-tapping
- Potential distortion of mating part caused by heat generated during welding
- Hidden micro-cracks present in the weld
- High energy costs

STRUX® ADVANTAGES



- STRUX® fasteners are heat treated for improved strength
- Fast and easy inspection; allows non-destructive testing
- The STRUX® design ensures consistent, pre-determined performance values
- Allows you to work with plated parts and dissimilar materials
- Can be used in material as thin as 1mm (.040")
- Faster cycle times

STRUX® ASSEMBLY



- Any equipment capable of feeding rivets, weld fasteners or conventional clinch fasteners will work with STRUX® fasteners
- Increased production rates
- Assembly costs are reduced
- Potential elimination of secondary staking operations
- Improved overall assembly

STRUX® FASTENERS INCREASE PRODUCTIVITY AND RELIABILITY

Custom-engineered STRUX® fasteners give you a **cost-effective, high-performance** alternative to other staked or welded products. They are designed for maximum resistance to push-out and rotation, and are a perfect match for critical, high-production applications. STRUX® fasteners **eliminate problems associated with weld studs** such as poor product consistency, excessive equipment costs, the need for adequate ventilation and environmental hazards.



Exceeds Expectations

STRUX® fasteners typically exceed most industry performance requirements. Push-out and torsional resistance are limited only by the shear strength of the engagement material.

- More consistent fastener performance
- Improved product integrity

High Material Strength

Unlike most weld studs, STRUX® fasteners are heat treated for increased strength. This allows STRUX® products to replace larger diameter, conventional studs with no sacrifice to joint integrity.

- Available in a variety of low and medium-carbon steels
- Available in stainless steels
- Can be heat treated to ISO or SAE classes/grades, or to your specifications

Lower In-Place Costs

STRUX® fasteners can be assembled into punched or drilled holes manually, or with automatic feeding equipment. This can include hydraulic staking equipment or inline progressive die stamping presses. The consistent performance and increased strength of the STRUX® product provides a lower in-place cost than competitive products.

DESIGNED TO EXCEED CUSTOMERS EXPECTATIONS

DESIGN FLEXIBILITY



The self-clinching STRUX® design can often eliminate the space required for a wrenching surface. This is useful in areas where the backside of the mating material is inaccessible to tools.

Applications utilizing the STRUX® product can provide lower in-place cost through improved joint integrity, fewer failures and more consistent performance.

COST SAVING INSTALLATION



In applications requiring multiple studs, the STRUX® concept can easily be applied to component sub-assemblies. The combination of multiple fasteners into carrier designs facilitates prepositioning of fasteners during final assembly. These assemblies can ease assembly operations, lower installation costs and improve productivity.



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Improving assembly through engineered fastening solutions.

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Improving Assembly

The MATHread® and MATPoint® feature can be added to STRUX® studs to overcome the problem of cross-threading when assembling into a pretapped hole.

- Corrects cross-threading and no-start situations during assembly
- Allows rapid engagement increasing productivity
- Compensates for off-angle and off-center starts
- Displaces paint clogged internal threads
- Assists in component alignment

Additional Product Options

STRUX® fasteners can join dissimilar and non-weldable materials such as brass, copper and aluminum with ferrous materials. STRUX® products are also available in double ended studs, unthreaded pins, double grooves and flush head configurations.

PRODUCT SIZES

Diameters: M3(#6) to M12 (1/2)

Materials: Carbon Steel & Alloy Steel

Designs: Studs; Double Ended Studs; Shoulder Designs; Flush Head Designs; Combinations with Various Thread Types; Nuts

NOTE: Additional Diameters & Materials Upon Request

STRUX® CLINCH STUDS



Upon installation, the displacement lobes and retaining groove of the STRUX® fasteners combine to form a solid, rotation-resistant assembly. The product features are designed to effectively lock the material into place by creating material flow into the groove and around the lobes.

DEMANDING APPLICATIONS



Performance of the STRUX® design has been outstanding in the demanding world of automotive applications. It has also been successfully applied in the power tool, lawn & garden, and appliance industries. While STRUX® products are highly versatile, they are best matched to critical applications that require a high level of assembly strength and joint integrity.

DIMENSIONAL AND PERFORMANCE DATA

METRIC DIMENSIONAL AND PERFORMANCE DATA										
Thread Size	Retaining Ring $\pm .07$	C $\pm .13$	D $\pm .25$	K Ref	Material Thickness Min	Recommended Hole Size		Approx. Staking Force kN	Approx. Pushout kN	Approx. Unsupported Torsional Resistance Nm
						Min	Max			
M3 x 0.5	3.61	1.05	6.00	1.5	1.0	3.68	3.78	T.B.D	T.B.D	T.B.D
M4 x 0.7	4.61	1.40	7.75	1.5	1.0	4.68	4.78	13.3	1.04	4.80
				2.3	1.5			16.9	2.27	5.01
M5 x 0.8	5.61	1.75	8.75	1.5	1.0	5.68	5.78	13.3	1.09	4.00
				2.3	1.5			16.5	2.22	10.73
M6 x 1.0	6.61	2.10	11.00	1.5	1.0	6.68	6.78	20.2	1.42	7.69
				2.3	1.5			25.8	2.56	15.22
				3.4	2.3			26.7	4.78	15.22
M8 x 1.25	8.61	2.80	15.25	2.3	1.5	8.68	8.78	35.6	2.40	26.78
				3.4	2.3			42.3	6.09	40.06
				4.6	3.0			45.4	9.06	40.06
M10 x 1.5	10.61	3.50	19.75	3.4	2.3	10.68	10.78	66.7	5.92	60.49
				4.6	3.0			73.4	8.82	84.80
M12 x 1.75	12.61	3.80	20.00	3.4	2.3	12.68	12.78	73.4	7.26	81.14
				4.6	3.0			77.8	13.91	124.25

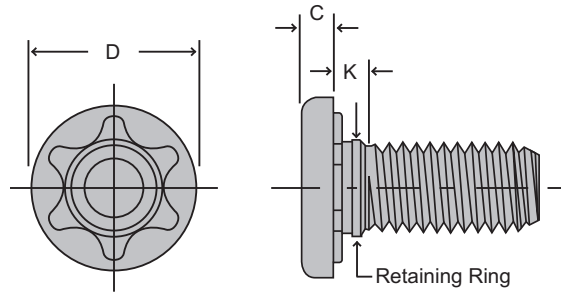
Underhead configuration is controlled by Semblex to achieve the performance requirements

The performance information provided is to be used only as a guideline, actual application conditions may vary.

All performance data is based on tests performed in low carbon steel (hardness 70 Rb Max.) under laboratory conditions. Performance data for materials other than steel, should be individually tested.

It is recommended that when specific performance values are required, the actual application be tested.

Contact Semblex Application Engineering for additional design assistance



INCH DIMENSIONAL AND PERFORMANCE DATA										
Thread Size	Retaining Ring $+ .002$ $- .003$	C $+ .005$	D $+ .010$	K Ref	Material Thickness Min	Recommended Hole Size		Approx. Staking Force* Tons	Approx. Pushout lb.	Approx. Unsupported Torsional Resistance in/lb.
						Min	Max			
#6	.149	.040	.260	.060	.036 (20 ga)	.151	.155	*Application testing is required to determine specific performance data for inch-sized studs. Please contact Semblex Application Engineering for assistance.		
#8	.176	.060	.350	.060	.036 (20 ga)	.178	.182			
				.095	.060 (16 ga)					
#10	.204	.070	.370	.060	.036 (20 ga)	.206	.210			
				.095	.060 (16 ga)					
1/4	.270	.090	.470	.060	.036 (20 ga)	.272	.276			
				.095	.060 (16 ga)					
				.135	.090 (13 ga)					
5/16	.331	.110	.600	.095	.060 (16 ga)	.333	.337			
				.135	.090 (13 ga)					
				.180	.120 (11 ga)					
3/8	.398	.130	.690	.135	.090 (13 ga)	.400	.404			
				.180	.120 (11 ga)					
1/2	.530	.175	.950	.135	.090 (13 ga)	.532	.536			
				.180	.120 (11 ga)					

SEMBLEX CORPORATION CAPABILITIES & SERVICES



SPECIALTY PRODUCTION & CAPABILITIES

- Cold Formed Specials
- Screw & Washer/Component (Sems) Assemblies
- Multi-Washer Sems Assemblies
- Double Ended Studs
- Special Rolled Configurations
- Value Added Secondary Operations & Machining
- Wide Range of Materials

MINIATURE CAPABILITIES

- Specialty Products
- Multi-Die Configurations
- Pins & Connectors
- Rivets (Solid & Semi-tubular)
- Capabilities down to M0.6 (approx. .025") in diameter

QUALITY

- TS16949 Certification
- ISO14001 Environmental Certification
- ISO9001 Certification
- ISO17025 Accredited Quality Laboratory
- ISO17025 Accredited Application Engineering Laboratory
- State-of-the-Art Sorting Capabilities

TECHNOLOGY

- Engineering Services
 - design assistance
 - application testing
 - training & educational programs
 - on-site support
 - product teardowns
 - VAVE support

SEMBLEX PATENTED AND TRADEMARKED PRODUCTS

- Rolok® *Thread Forming Screw*
- Tapmate™ *Thread Forming Screw*
- TriForm® *Thread Forming Screw*
- CaptiForm® *Captive Thread Forming Screw*
- Polyfast® *Thread Forming Screw*
- Plastilok® *Thread Forming Screw*
- Plasto-Driv® *Thread Forming Screw*
- Semblex Square Dome® *Washer*

LICENSED PRODUCTS

- ALtracs® *Thread Forming Screw*
- Delta PT® *Thread Forming Screw*
- PT® *Thread Forming Screw*
- Duro-PT® *Thread Forming Screw*
- PT® Type DG *Thread Forming Screw*
- MATHread® & MATPoint® *Anti-Cross Thread Fasteners*
- Strux® *Clinch Studs*
- Mag-Form® *Fastener*
- CTP™ *Fastener*
- Torx® *Drive System*
- Torx Plus® *Drive System* - Autosert® *Feature*
- Mortorq® *Spiral Drive System*
- ACR® *Phillips II® Drive System*
- ACR® *Tri-Wing® Drive System*
- Phillips Square-Driv® *Drive System*
- Pozidriv® *Drive System*
- Quadrex® *Drive System*
- Quadrex® *Plus Drive System*

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