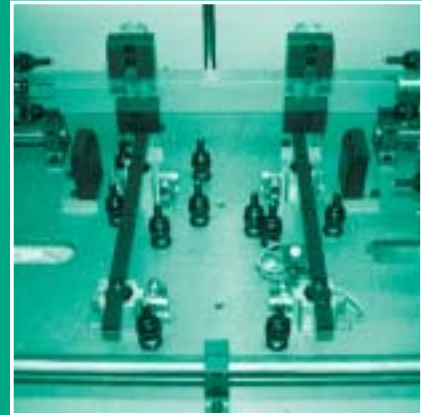


TEXTRON Fastening Systems
Avdel® Blind Fastening & Automation Systems

Speed Fastening™ Systems





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TEXTRON Fastening Systems

Your Single Source

In today's challenging global economy, effective support from suppliers is more vital than ever. Textron Fastening Systems (TFS) is poised to be your fully-integrated partner in every stage of the product cycle. With more than 11,000 employees serving customers in over 100 countries, TFS provides innovative fastening and assembly solutions on a global scale.

- Extensive Product Line
- Broad Range of Services
- Innovation in Fastening & Assembly
- Capabilities for Unique Solutions



Broad Product Line + Manufacturing Capabilities

Textron Fastening Systems has one of the broadest ranges of manufacturing and product capabilities available in the fastener industry. From threaded fasteners and blind rivets to cold formed components and engineered assemblies, we are the global leader in fastener manufacturing technology.

Blind Products

Avdel® and Cherry® brand products are designed to speed assembly and cut costs.

- Speed Fastening™ Systems, including Rivscrew® threaded rivets and Briv® speed rivets
- Breakstem rivets, including Avex® and Stavex® rivets and Monobolt® structural rivets
- Lockbolts, including Avdelok® systems
- Threaded inserts in a wide assortment of shapes and sizes
- Pierce rivets, including Fastriv® systems
- Fastening systems for aerospace applications
- Installation tooling

Threaded Fasteners

Proprietary and standard styles and drive systems engineered to meet the requirements of today's demanding materials.

- Fasteners for metals, including Taptite® and Crimptite® screws
- Fasteners for plastics, including Delta PT® and Plastite® screws
- Mag-Form® fasteners for magnesium applications
- Sems fasteners
- Clinch bolts and nuts, including Strux® and Rivtex® systems
- Camcar® socket screws
- TORX PLUS® Drive System
- Engineered miniatures down to M0.5 (#0000)

Engineered Components

TFS has the capabilities to meet a broad range of subassembly requirements.

- Cold formed components
- Stamped components
- Sükosim® sheet extrusions
- Fineblanked components
- Roll-formed components
- Engineered assemblies

TEXTRON Fastening Systems

Extensive Range of Services

Textron Fastening Systems offers established experience in engineering, logistics and assembly to optimise your operations. TFS works closely with major manufacturers in a number of industries, allowing customers to focus on their core competencies while TFS manages their fastening and assembly requirements.

Automated Assembly Systems

Drawing on its well-established product and application experience, Textron Fastening Systems can design the optimal installation system for your assembly process.

- Modular feed, power and placing units, including robotic positioning equipment or in-die systems as required
- Process control systems
- Supporting systems such as material flow/transfer line equipment between assembly cells

Engineering Support

TFS application engineers have the experience and equipment to uncover the optimal solution for your application.

- Application design and testing
- Technical support
- Modelling and rapid prototyping
- Value analysis and engineering (VA/VE)
- Product teardowns
- Assembly process reviews
- Fastener consolidation reviews
- Fastening and assembly training

Supply Chain Solutions

Our global manufacturing and supply capabilities allow us to deliver our technologies directly to your assembly line – improving cost control, reducing inventory and providing a consistent source of supply.

- Plant Provider programs
- Vendor-Managed Inventory programs
- Full-service Provider programs

Focused On You

Utilising applied creativity, sound experience and solution-driven processes, Textron Fastening Systems can increase efficiency and cut costs throughout your product cycle. Benefits of a close partnership with TFS include:

- Single source for an extensive range of products and services
- Lower in-place costs
- Global supply base
- Unique solutions

From application design to the plant floor, Textron Fastening Systems is ready to be your solutions provider.



TFS Speed Fastening™ Systems

Benefits of Assembly

Speed fastening is a unique assembly system designed for rapid and reliable fastening in medium and high volume applications.

Originally designed for the aviation industry, speed fastening is now used by many of the world's foremost manufacturing companies in sectors as diverse as household goods, lighting, electronic subassemblies, light metal fabrication and automotive. Speed fasteners are available in a wide range of materials, finishes, lengths and diameters and are ideal for fastening metals, plastics, composites and electronic components.

Speed fasteners are single piece fasteners which are either magazine fed or fed via a vibrating bowl to a wide choice of installation equipment. This ranges from the ultra-lightweight 753 handtool to fully automated, state of the art assembly systems.

Assembly into cast magnesium beam



Increased manufacturing throughput

A speed fastening system can be fully optimised to give cycle times of less than two seconds. This rapid, blind sided process delivers a throughput up to four times greater than a traditional threaded or riveted solution.

Reduced component handling

The fasteners are fed in a magazine or into a bowl feeder. This eliminates the need for individual component handling and saves damaged hands and time.

No component spillage

Because the fasteners are held captively they should not be dropped onto the floor or into the application. This avoids wasted time, improves product quality and improves the workplace environment.

No stem loss

Traditional breakstem fasteners all too often suffer from stem loss once installed. This can lead to application rattle, electrical short circuits or worse. Speed fasteners have no stems.

Improved joint quality

Speed installation technology provides a consistent, repeatable joint. What's more, unlike threaded fasteners, there is no requirement for torque control – no more problems of stripped holes or loose joints.

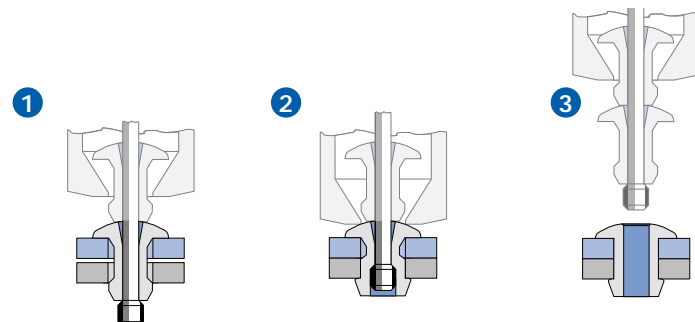
Improved joint performance

Once installed speed fasteners give excellent clamp up, shear and tension performance. They are also virtually immune from vibration loosening.

Process flexibility








Speed fastening systems can be used for low volume, off-line batch or jobbing shop work through to flow line processes. From hand held tools to multiheaded modular workstations, we can design a speed fastening system to suit your assembly requirements. The fasteners are available in a wide range of materials, finishes, lengths and diameters, ideal for fastening metals, plastics, composites and electronic components. A wide variety of products in many industries are assembled with these systems including automotive, electronics, domestic appliance and general industrial.

Typical Placing Sequence



- 1 The mandrel with pre-loaded fastener is located in the hole.
- 2 Tool activation pulls the mandrel through the fastener, expanding it within the hole to provide high clamp and secure joints.
- 3 At the end of the installation cycle, the next fastener is automatically delivered to the nose of the tool, ready to repeat the assembly process.

TFS Speed Fastening™ Systems Range Overview

Brand		Material	Key Features
Briv®		<ul style="list-style-type: none"> ■ Aluminium Alloy ■ Steel ■ Stainless Steel ■ Brass 	<ul style="list-style-type: none"> Bulbed tail Large headform High clamp and shear
Rivscrew®		<ul style="list-style-type: none"> ■ Steel 	<ul style="list-style-type: none"> Threaded fastener Removable with hex key and reusable Fastens into materials up to Vickers hardness Hv105
Chobert®		<ul style="list-style-type: none"> ■ Aluminium Alloy ■ Steel ■ Brass 	<ul style="list-style-type: none"> Internal tapered bore Controlled clamp High shear Ideal for soft and brittle materials
Grovit®		<ul style="list-style-type: none"> ■ Aluminium Alloy ■ Steel 	<ul style="list-style-type: none"> Designed for blind hole applications Annular grooves on body For use in wood, plastics, fibreglass and aluminium
Avtronic®		<ul style="list-style-type: none"> ■ Brass ■ Aluminium Alloy 	<ul style="list-style-type: none"> Attaches DIN 41612 connectors and other components to PCB's Annular grooves on body
Avsert®		<ul style="list-style-type: none"> ■ Brass 	<ul style="list-style-type: none"> Threaded stand-off pillars for PCB's Internally threaded bore Many stand-off heights
Avlug®		<ul style="list-style-type: none"> ■ Brass 	<ul style="list-style-type: none"> Solderable terminal posts for PCB's Rolled/knurled shank

Fan



Child car seat



Seat belt tensioner



Wing mirror



Airbag



Heatsinks to processor cartridges



Corrosion Resistance

A range of finishes is available for applications requiring increased corrosion resistance.

The table below compares the various features of these non-standard finishes and can be used as a guide to selecting the most appropriate finish for an application.

Corrosion conditions

- ✓ light Typically indoors and warm dry atmospheres
- ✓✓ moderate Typically indoors where moisture can occur. Outdoors in mild corrosive conditions
- ✓✓✓ severe Typically outdoors in moderate corrosion conditions for example light industrial and possibly external vehicle applications
- ✓✓✓✓ very severe Typically outdoors in severe corrosive conditions, marine, industrial, vehicle engine compartment or under body

	Corrosion Resistance	Galvanic Corrosion	Hexavalent Chromium	Electrical Conductivity	Temperature Resistance	Appearance	Availability	Cost
Electroplated zinc clear passivation	✓	See page 9	No	Conductive	Moderate	Metallic + Blue Tinge	Good	Low
Electroplated zinc chromate passivation	✓✓	See page 9	Yes	Conductive	Moderate	Iridescent Yellow	Good	Low
Electroplated zinc + JS500 passivation	✓✓	See page 9	Yes	Conductive	Moderate	Slightly Yellow Iridescent	Moderate	Low
Electroplated zinc/nickel chromate passivation	✓✓✓	See page 9	Yes	Conductive	Moderate	Iridescent Yellow	Good	High
Electroplated zinc/nickel clear passivation	✓✓✓	See page 9	Yes	Conductive	Moderate	Metallic + Blue Tinge	Moderate	High
Electroplated zinc/nickel black passivation	✓✓✓	See page 9	Yes	Conductive	Moderate	Black	Good	High
Electroplated zinc & Deltaseal	✓✓	None	None	Non Conductive	Good	Black Silver	Good	Moderate
Electroplated zinc/nickel & Deltaseal	✓✓✓	None	None	Non Conductive	Good	Black Silver	Good	High
Phosphate & Deltaseal	✓✓	None	None	Non Conductive	Good	Black Silver	Moderate	Moderate
Electroplated zinc/nickel & KTL	✓✓✓✓	None	None	Non Conductive	Good	Black	Moderate	High

Note

European Directive 2000/53/EC Vehicle End of Life (ELV) Legislation. Hexavalent chromium (Cr6+), lead, mercury and cadmium are substances banned from vehicles marketed after 1 July 2007. TFS Speed Fasteners do not contain cadmium or mercury.

However, yellow passivation treatment of zinc and zinc alloy plating contains hexavalent chromium (Cr6+) and hot tin dipped coating contains lead. In conjunction with metal finishing companies and the automotive companies Textron Fastening Systems is developing finishes which are free from Cr6+ and from lead. If you require further information on this work and the progress to eliminate Cr6+ and lead, please contact your local Textron Fastening Systems representative.

Galvanic Corrosion

Galvanic corrosion occurs when two dissimilar metals are in close contact with an electrolyte, a medium through which an electrical current can flow. The presence of water as moisture can act as an electrolyte. The rate of corrosion depends upon the differences in electrical potential, or anodic-cathodic relationship of the metals in the joint as defined by the Galvanic Series of Metals & Alloys. (See below).

A highly anodic metal in contact with a highly cathodic metal will corrode much more quickly than two highly cathodic metals or when the metals are closer together in the galvanic series.

When corrosion occurs it is the anodic metal most likely to corrode and the cathodic metal least likely to corrode.

To reduce the likelihood of galvanic corrosion in a fastened joint, it is recommended that the chosen metals are grouped together in the galvanic series chart. If that is not possible, other recommendations are:

- Select metals which are as close together in the chart as possible
- Provide a barrier between the metals, such as paint, non-metallic washer, gaskets or jointing compound
- Design the fastener as the cathode so that the cathodic area is as small as possible to the anode area
- Use a metallic finish on the fastener that is close on the chart to the mating metal
- Use a non-conductive and inert finish on the fastener

Galvanic Series

Anodic End (Most likely to corrode)

Magnesium and its alloys
Zinc and zinc plating on steel
Cadmium
Aluminium Alloys
Steel or Cast Iron
Alloyed Cast Irons
Type 304 Stainless Steel (active)
BS 3111 Type 394S17 Stainless Steel (active)
Type 316 Stainless Steel (active)
Tin-Lead, Lead and Tin
Nickel Plating (active)
Brasses
Copper
Bronzes
Copper-Nickel Alloy (Monel)
Silver Solder
Nickel Plating (passive)
Type BS 3111 394S17 Stainless Steel (passive)
Type 304 Stainless Steel (passive)
Type 316 Stainless Steel (passive)
Silver
Titanium
Gold and other precious metals

Cathodic End (Least likely to corrode)

Specifying a Speed Fastening™ System

To optimise the performance of your Speed Fastening System it is important to select the correct combination of fastener, nose equipment, mandrel and follower spring.

It is also critical to ensure that the combination selected is suited for use with your choice of installation process. If you need any help in specifying the required components then do not hesitate to contact your local TFS representative.

Fastener Selection

Standard Fasteners – Rivscrew®, Briv® & Chobert®

Removability

Rivscrew fasteners are ideal for applications requiring disassembly for repair or rework. They can simply be unscrewed using a standard hexagonal allen key.

Clamp

Briv fasteners should be specified in applications requiring high clamp loads. Chobert fasteners provide a lighter, controlled clamp making them ideal for softer or low strength materials.

Head Type

Both dome and countersunk headforms are available for Briv and Chobert fasteners.

Other head diameters may also be available as specials – please contact your local TFS representative.

With Rivscrew fasteners the standard placed product has a dome headform (formed during placement). Use of flat nose jaws to place Rivscrew gives a countersunk headform.

Specialist Fasteners

Avtronic®

Designed for attaching DIN and other connectors, card ejectors and heatsinks to printed circuit boards.

Avsert®

Cost effective stand-off pillars for printed circuit boards.

Avlug®

Cost effective terminal posts for printed circuit boards.

Fastener Material & Finish

Speed fasteners are available in stainless steel, steel, aluminium and brass. The choice of material should be made on the basis of performance (shear and tensile strength), suitability for use with the parent material and corrosion resistance.

For performance data please see the relevant technical data pages 14-43.

Details on corrosion resistance can be found on pages 8-9.

The standard finishes for speed fasteners are as follows:

Steel (not Rivscrew®)	Zinc plate and clear passivation
Steel (Rivscrew®)	Zinc plate and yellow passivation
Aluminium Alloy	Natural
Stainless Steel	Polished
Brass	Brightened or hot tin dipped (for solderability)

The following finishes are also available:

Steel	Enamel paint Zinc nickel Organic coatings
Aluminium Alloy	Anodising Enamel paint

Specifying a Speed Fastening™ System

Once fastener design has been determined, the system can be optimised by correct choice of nose equipment, mandrel and follower spring.

System Design

Nose Equipment

Nose equipment is available with standard jaws or cam operated jaws for faster reloading.

Flat Head Nose Equipment

This is suitable for placing most fasteners in most applications. To improve access the following variants are available: long, long curved, tapered. Flat head nose equipment is used with standard Rivscrew fasteners where a countersunk headform is desired.

Head Forming Nose Equipment

Two types of head forming nose equipment are available for Briv fasteners. Head forming nose equipment is designed to improve the clamp up of the fastener:

Recessed: increases clench without affecting grip range (ideally suited for applications towards the high end of the grip range)

Universal: maximises clench but reduces the grip range by approximately 0.4mm (ideally suited in minimum to middle grip applications).

Standard Rivscrew® nose equipment forms a dome head during placing.

Mandrels & Follower Springs

Each fastener type has a specific mandrel and follower spring designed for it. There are three further considerations to be made:

Length

Standard length mandrels are suited for standard handtools using standard nose equipment. For handtools using long nose equipment and for some automation modules a long mandrel should be used. The appropriate follower spring should also be selected using the tables in this brochure.

Head Size

For most applications a standard mandrel should be used. However, if the hole size is larger than that specified then the use of oversize mandrels should be considered. For Briv and Chobert fasteners oversize mandrels are available to increase the recommended hole size by up to 0.6mm.

Mandrel Life

Mandrel life is affected by broach load (the force required to pull the mandrel through the fastener). For each application a broach load test must be undertaken – the results of the test can then be used to determine mandrel life. Mandrels should never be used beyond this recommended life.

If the recorded broach load is higher than specified it may be necessary to use an alternative fastener or mandrel; using a speed fastening system out of specification can result in mandrel breakage and mandrel ejection from the tool.

Important Information

The information on these pages should be used in conjunction with the technical data pages for the individual fasteners. All test and performance data detailed in this brochure are average strength values, determined on representative samples and over multiple tests. Textron Fastening Systems recommends that you use this data as a guide only, since other factors may affect the performance of the fastener. We strongly recommend you test the fastener in your application to determine exact performance levels.

Selection Guide

This table is designed as a guide to help you select the most suitable Speed Fastener for your particular application. Further information to help you can be found on pages 10-11 and 6-7. Full technical and performance data for each speed fastener can be found on the pages referenced in the last column of this table.

Product Range	Material	Finish					Headform		Fastener Size (nom)										Thread Size		Series No.	Page No.			
		Natural	Zinc Plated	Polished or Brightened	Yellow Passivated	Electro Tin Plated	Tin Plated	Dome	Countersunk	1.6	2.4	2.5	2.8	3.0	3.2	3.5	4.0	4.8	6.0	6.4			M2.5	M3	
Briv®	Aluminium Alloy (5% Mg)	•					•		•						•	•	•	•					1801	14	
		•						•						•	•								1802	15	
	Steel		•				•							•	•	•	•						1821	16	
			•					•						•	•									1822	17
	Brass						•			•				•										1833	18
	Stainless Steel			•				•						•	•	•								1841	19
Chobert®	Steel		•				•						•	•	•			•					1121	21	
	Aluminium Alloy (3.5% Mg)	•					•						•	•	•	•		•					1131	22	
	Brass					•	•						•										1143	23	
Grovit®	Steel		•				•						•	•	•								1101	25	
	Aluminium Alloy (2.5% Mg)	•					•						•	•	•	•							1103	25	
Rivscrew®*	Steel		•		•		•				•	•		•	•								1722	31	
			•		•		•										•						1733	32	
			•				•											•					6mm	32	
Avtronic®	Brass					•	•						•	•									1188	35	
	Aluminium Alloy (5% Mg)	•					•						•	•									1189	35	
Avsert®	Brass						•													•	•		1117	38	
							•													•	•		1118	38	
Avlug®	Brass					•	•						•										1107	41	

Textron Fastening Systems policy is one of continuous product development and improvement and we reserve the right to change the specification of any product without prior notice.

*Rivscrew® 1722 - the placed headform depends on the nose equipment used, standard Rivscrew® nose equipment gives a dome headform. Please see pages 10-11 for further information.

Briv® - High Shear, High Clamp Fasteners



Briv®

Speed (repetition) fasteners with a bulbed tail providing consistent high clamp and shear. Can be used to assemble many materials including metal, plastic and aluminium alloy.

Typical Placing Sequence

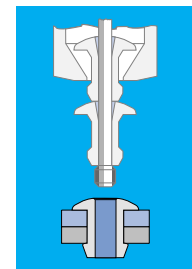
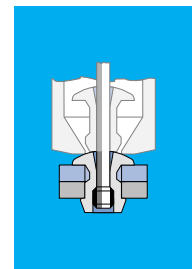
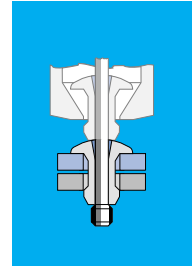
Specifications

Sizes: 2.4mm - 6.0mm

Materials: Aluminium alloy, steel, stainless steel and brass

Headforms: Dome/mushroom and countersunk

Features	Benefits
Bulbed tail and foreshortening of fastener during installation	– Ensures high clamp and vibration resistance
Bulbed tail and large headform	– Provides a large area for thin sheet and soft materials
Tapered tail	– For ease of hole entry
Expands radially during installation	– Ensures maximum hole fill
Stainless steel option	– Ideal for applications subject to high temperatures or corrosion
Hot tin dipped brass option	– For ease of soldering and good electrical continuity



Assembly Applications

Automotive - domestic appliances - electrical components - electrical engineering - general light fabrication - sheet metal

Vacuum pump for diesel engines



Domestic heating systems



Office furniture



Computer cabinet



Automotive plastic connector to moulded chassis



Automotive stereo speaker



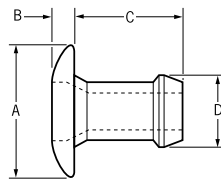


Aluminium Alloy, Dome Head

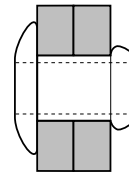
Material	Finish
Aluminium alloy (5% magnesium) to BS 1473 5056A DIN 1725 AlMg5 Werkstoff 3.3555	Natural



Option
2.5% magnesium, aluminium alloy. Replace part number 01801 with 01861.



BEFORE PLACING



AFTER PLACING

A = Head Diameter
B = Head Thickness
C = Length
D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	A		B	C	D	(Typical Values)		
	nom.	min.	max.	min.			max.	min.	max.	max.	max.	max.	Shear kN	Tension kN
2.4		1.14	2.42			64				3.98		0.2	0.4	
		2.15	3.43			52				5.00				
		3.17	4.45			44				6.02				
		4.19	5.47	2.36	2.44	01801-00310	38	3.76	4.11	0.89	7.04			2.344
		5.20	6.48			01801-00312	34				8.05			
		6.22	7.50			01801-00314	30				9.07			
		7.24	8.51			01801-00316	27				10.08			
		7.75	9.02			01801-00317	26				10.59			
3.2 (1/8")		0.64	1.91			64				3.86		0.7	1.3	
		1.14	2.42			58				4.37				
		2.15	3.43			50				5.39				
		3.17	4.45	3.26	3.34	01801-00408	42	5.91	6.53	0.99	6.41			3.137
		4.19	5.47			01801-00410	37				7.42			
		5.20	6.48			01801-00412	33				8.44			
		6.22	7.50			01801-00414	29				9.45			
		7.24	8.51			01801-00416	26				10.46			
4.0 (5/32")		1.57	2.93			52				4.91		1.1	1.7	
		2.66	3.94			44				5.92				
		3.68	4.96			38				6.94				
		4.69	5.97	3.97	4.04	01801-00511	34	7.56	8.18	0.99	7.95			3.874
		5.71	6.99			01801-00513	30				8.97			
		6.73	8.00			01801-00515	27				9.98			
		7.75	9.02			01801-00517	25				11.00			
	4.8 (3/16")		2.03	3.94			42				6.10			
		3.68	5.21			35				7.37				
		4.95	6.48			31				8.64				
		6.22	7.75	4.85	4.93	01801-00613	27	9.09	9.71	1.17	9.91	4.763		
		7.49	9.02			01801-00615	24				11.18			
		8.76	10.29			01801-00617	22				12.45			
		10.03	11.56			01801-00619	20				13.46			
6.0			2.66	3.94			35				6.93		1.6	3.2
		3.68	4.95			31				7.94				
		4.70	5.96	5.94	6.02	01801-06011	28	11.11	11.55	1.35	8.96	5.93		
		5.71	6.98			01801-06013	26				9.98			
		6.73	7.99			01801-06015	24				10.99			
		7.74	9.01			01801-06017	22				12.00			

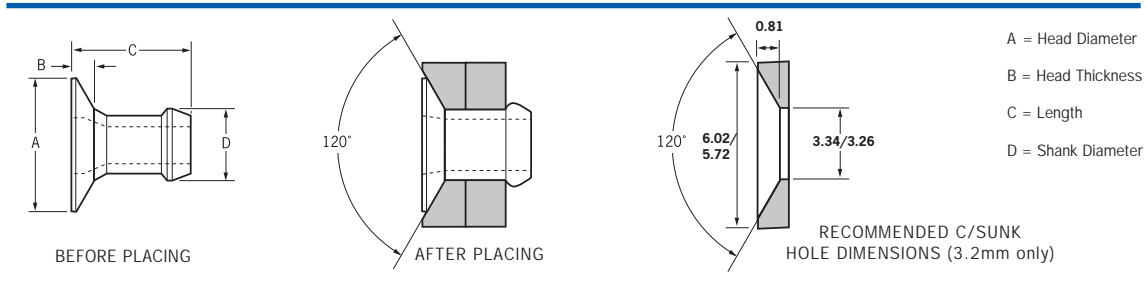
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



Aluminium Alloy, 120° Countersunk

Material	Finish
Aluminium alloy (5% magnesium) to BS 1473 5056A DIN 1725 AlMg5 Werkstoff 3.3555	Natural

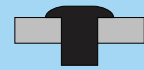


Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	Dimensions					(Typical Values)		
	nom.	min.	max.	min.			max.	A min.	A max.	B max.	C max.	D max.	Shear kN	Tension kN
3.2 (1/8")		1.52	2.79			64				4.77		0.7	1.3	
		2.54	3.81			52				5.79				
		3.56	4.83	3.26	3.34	01802-00408	44	5.08	5.97	0.89	6.81			3.163
		4.57	5.84			01802-00410	38				7.82			
		5.59	6.86			01802-00411	33				8.84			
4.0 (5/32")		1.57	2.93			59				5.18		1.1	1.7	
		2.15	3.43			54				5.69				
		2.66	3.94	3.97	4.04	01802-00507	49	6.09	6.98	1.02	6.19			3.899
		3.68	4.96			01802-00509	42				7.21			
		4.69	5.97			01802-00511	36				8.22			
	5.71	6.99			01802-00513	32				9.24				

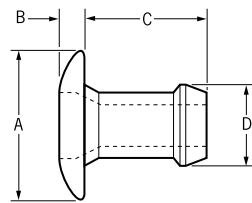
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

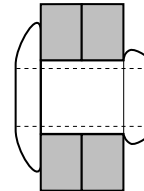


Steel, Dome Head

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 Q St 34-3	Zinc plated to BS EN 12329



BEFORE PLACING



AFTER PLACING

- A = Head Diameter
- B = Head Thickness
- C = Length
- D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*						(Typical Values)		
	nom.	min.	max.	min.			max.	Podded	A min.	A max.	B max.	C max.	D max.	Shear kN
3.2 (1/8")		0.64	1.91			01821-00403	64				3.86			
		1.14	2.42			01821-00404	58				4.37			
		2.15	3.43			01821-00406	50				5.39			
		3.17	4.45	3.26	3.34	01821-00408	42	5.91	6.53	0.99	6.41	3.136	1.1	1.8
		4.19	5.47			01821-00410	37				7.42			
		5.20	6.48			01821-00412	33				8.44			
		6.22	7.50			01821-00414	29				9.55			
		7.24	8.51			01821-00416	26				10.46			
4.0 (5/32")		1.57	2.93			01821-00505	52				4.91			
		2.15	3.43			01821-00506	48				5.41			
		2.66	3.94			01821-00507	44				5.92			
		3.68	4.96	3.97	4.04	01821-00509	38	7.56	8.18	0.99	6.94	3.899	1.6	2.8
		4.69	5.97			01821-00511	34				7.95			
		5.71	6.99			01821-00513	30				8.97			
		6.73	8.00			01821-00515	27				9.98			
		7.75	9.02			01821-00517	24				11.00			
4.8 (3/16")		1.65	3.30			01821-00606	46				5.39			
		2.03	3.94			01821-00607	42				6.10			
		3.68	5.21			01821-00609	35				7.37			
		4.95	6.48	4.85	4.93	01821-00611	31	9.09	9.71	1.17	8.64	4.788	2.2	3.7
		6.22	7.75			01821-00613	27				9.91			
		7.49	9.02			01821-00615	24				11.18			
		8.76	10.29			01821-00617	22				12.45			
6.0		2.66	3.94			01821-06007	35				6.93			
		3.68	4.95			01821-06009	31				7.94			
		4.70	5.96	5.94	6.02	01821-06011	28	11.11	11.55	1.35	8.96	5.93	2.5	4.2
		5.71	6.98			01821-06013	26				9.98			
		6.73	7.99			01821-06015	24				10.99			
		7.74	9.01			01821-06017	22				12.00			

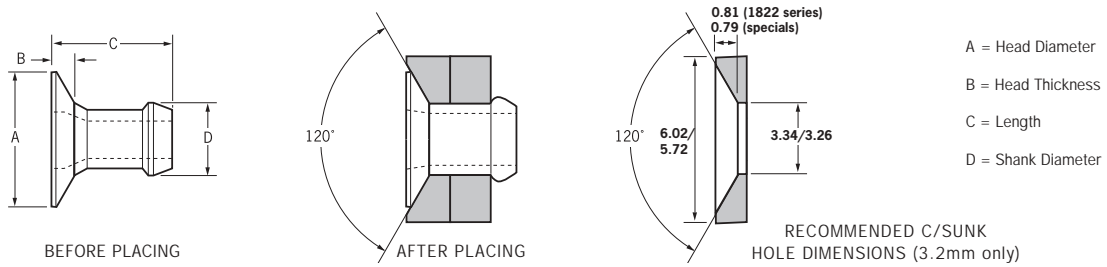
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



Steel, 120° Countersunk

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 Q St 34-3	Zinc plated to BS EN 12329



Dimensions and Performance Data

Fastener Size nom.	Grip Range		Hole Size		Part Number	Fasteners per pod*	Dimensions (mm)					(Typical Values)	
	min.	max.	min.	max.			A min.	A max.	B max.	C max.	D max.	Shear kN	Tension kN
3.2 (1/8")	1.52	2.79			01822-00406	64					4.77		
	2.54	3.81			01822-00407	52					5.79		
	3.56	4.83	3.26	3.34	01822-00408	44	5.08	5.84	0.76	6.81	3.163	0.9	1.6
	4.57	5.84			01822-00410	38					7.82		
	5.59	6.86			01822-00411	33					8.84		
4.0 (5/32")	1.57	2.93			01822-00505	59					5.18		
	2.15	3.43			01822-00506	54					5.69		
	2.66	3.94	3.97	4.04	01822-00507	49	6.09	6.98	1.02	6.19	3.899	1.6	2.8
	3.68	4.96			01822-00509	42					7.21		
	4.69	5.97			01822-00511	36					8.22		
	5.71	6.99			01822-00513	42					9.24		

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

Special Option

3.2mm (1/8") steel countersunk Briv® designed for thin sheet applications.

Dimensions and Performance Data

Fastener Size nom.	Grip Range		Hole Size		Part Number	Fasteners per pod*	Dimensions (mm)					(Typical Values)	
	min.	max.	min.	max.			A min.	A max.	B max.	C max.	D max.	Shear kN	Tension kN
3.2 (1/8")	1.27	2.29	3.26	3.34	01810-06480	72	5.08	5.84	0.74	4.32	3.163	0.9	1.6
	1.45	1.70	3.26	3.34	01810-10375	72	5.08	5.84	0.69	4.19	3.163	0.9	1.6

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



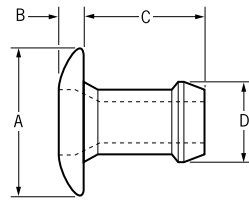
Brass, Dome Head

Material	Finish
Brass to BS EN 12166 CW 508L DIN 17660 Cu Zn37	Electro tin plated (1833) Brightened (1831)

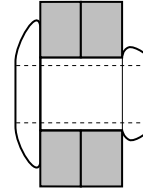


Options

For brass with brightened finish replace 01833 with 01831.
4.0mm (⁵/₃₂") and 4.8mm (³/₁₆") sizes available on request.



BEFORE PLACING



AFTER PLACING

- A = Head Diameter
- B = Head Thickness
- C = Length
- D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*						(Typical Values)		
	nom.	min.	max.	min.			max.	Podded	A	B	C	D	Shear kN	Tension kN
2.4		1.14	2.42			01833-00304	64				3.99			
		2.15	3.43			01833-00306	52				5.01			
		3.17	4.45	2.36	2.44	01833-00308	44	3.76	4.11	0.89	6.02	2.324	0.4	0.8
		4.19	5.47			01833-00310	38				7.04			
		5.20	6.48			01833-00312	34				8.06			
		6.22	7.50			01833-00314	30				9.07			
3.2 (¹ / ₈ ")		1.14	2.42			01833-00404	58				4.37			
		2.15	3.43			01833-00406	50				5.39			
		3.17	4.45	3.26	3.34	01833-00408	42	5.91	6.53	0.99	6.41	3.158	1.1	1.9
		4.19	5.47			01833-00410	37				7.42			
		5.20	6.48			01833-00412	33				8.44			
		6.22	7.50			01833-00414	29				9.45			

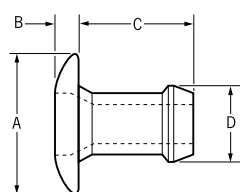
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

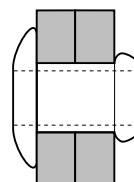


Stainless Steel, Dome Head

Material	Finish
Austenitic stainless steel to BS 3111 394S17 Werkstoff 1.4567	Polished



BEFORE PLACING



AFTER PLACING

- A = Head Diameter
- B = Head Thickness
- C = Length
- D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	Dimensions (mm)					(Typical Values)		
	nom.	min.	max.	min.			max.	A	B	C	D	Shear kN	Tension kN	
3.2 (¹ / ₈ "		1.14	2.42			58				4.37				
		2.15	3.43			50				5.39				
		3.17	4.45	3.27	3.34	01841-00408	42	5.91	6.53	0.99	6.41	3.136	1.3	2.0
		4.19	5.47			01841-00410	37				7.42			
		5.20	6.48			01841-00412	33				8.44			
4.0 (⁵ / ₃₂ "		1.57	2.93			52				4.91				
		2.66	3.94			44				5.92				
		3.68	4.96	3.97	4.04	01841-00509	38	7.56	8.18	0.99	6.94	3.874	2.4	3.5
		4.69	5.97			01841-00511	34				7.95			
		5.71	6.99			01841-00513	30				8.97			
4.8 (³ / ₁₆ "		2.03	3.94			42				6.10				
		3.68	5.21			35				7.37				
		4.32	5.84	4.85	4.93	01841-00610	32	9.09	9.71	1.17	8.00	4.763	3.5	5.1
		4.95	6.48			01841-00611	31				8.64			
		6.22	7.75			01841-00613	27				9.91			
	7.49	9.02			01841-00615	24				11.18				

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

Chobert® - For Soft and Brittle Materials



Chobert®

Speed (repetition) fasteners which provide high shear and controlled clamp - ideal for soft and brittle materials.

Typical Placing Sequence

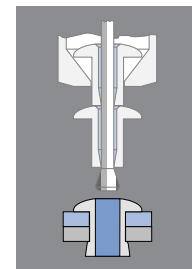
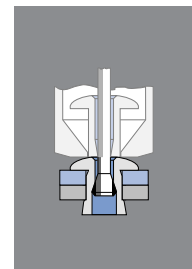
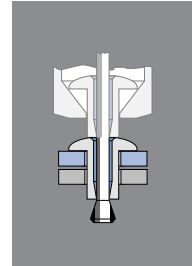
Specifications

Sizes: 2.4mm - 6.4mm ($\frac{3}{32}$ " - $\frac{1}{4}$ ")

Materials: Aluminium alloy, steel and brass

Headforms: Dome/countersunk

Features	Benefits
Internally tapered bore provides clamp control	Reduces potential damage to soft or brittle materials
Expands radially during installation	Ensures maximum hole fill
Hot tin dipped brass option	For ease of soldering and good electrical continuity



Assembly Applications

Automotive - domestic appliances - electrical components - electrical engineering - general light fabrication and sheet metal - injection moulded components - switchgear

Window hinge



PCB mounted socket



Tag for valve block



Composite material latch for wheel cover



Alloy tube with nylon bush



Name plate on stainless steel lever



Housing for car alarm



Cooler



Computer rack glass door hinge





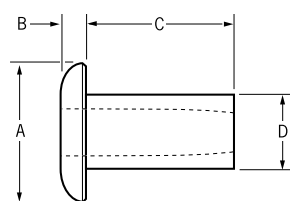
Steel, Dome Head

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 Q St 34-3	Zinc plated to BS EN 12329

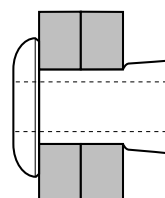


Option

120° countersunk head. Replace part number 01121 with 01122 for equivalent grip range. A, B and C dimensions may vary, details on request.



BEFORE PLACING



AFTER PLACING

A = Head Diameter
B = Head Thickness
C = Length
D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	A		B	C	D	(Typical Values) Shear kN	
	nom.	min.	max.	min.			max.	min.	max.	max.	max.		max.
3.2 (1/8")		0.00	1.57			71				3.2		1.4	
		0.79	2.36			57				4.0			
		1.57	3.18	3.26	3.34	01121-00406	51	4.9	5.5	1.2	4.8		3.26
		3.18	4.75			01121-00408	39				6.4		
		4.75	6.35			01121-00410	32				7.9		
		6.35	7.92			01121-00412	27				9.5		
4.0 (5/32")		1.57	3.18			47				4.8		2.4	
		3.18	4.75			38				6.4			
		4.75	6.35	4.09	4.16	01121-00510	31	5.9	6.5	1.5	7.9		4.04
		6.35	7.92			01121-00512	27				9.5		
		7.92	9.52			01121-00514	23				11.1		
		9.52	11.10			01121-00516	21				12.7		
4.8 (3/16")		0.00	1.57			50				4.0		3.2	
		1.57	3.18			38				5.6			
		3.18	4.75			33				7.2			
		4.75	6.35	4.85	4.93	01121-00611	28	8.3	8.9	1.8	8.8		4.85
		6.35	7.92			01121-00613	24				10.0		
		7.92	9.52			01121-00615	21				12.0		
		9.52	11.10			01121-00617	19				13.5		
		11.10	12.70			01121-00619	17				15.1		
6.4 (1/4")		3.18	4.75			32				7.2		4.4	
		4.75	6.35			27				8.8			
		6.35	7.92	6.35	6.42	01121-00813	24	9.9	10.5	2.1	10.0		6.35
		7.92	9.52			01121-00815	21				12.0		
		9.52	11.10			01121-00817	19				13.5		
		11.10	12.70			01121-00819	17				15.1		

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



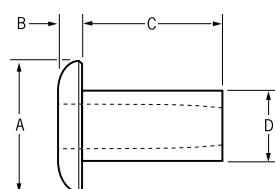
Aluminium Alloy, Dome Head

Material	Finish
Aluminium alloy (3.5% magnesium) to BS 1473 5154A DIN 1725 AlMg3.5 Werkstoff 3.3535	Natural

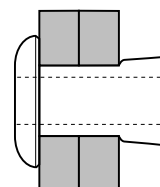


Options

2.5% aluminium alloy. Replace part number 01131 with 01125, please note reduction in shear strength, details on request. For 120° countersunk head, replace part number 01131 with 01132 for equivalent grip range. A, B and C dimensions may vary, details on request.



BEFORE PLACING



AFTER PLACING

A = Head Diameter
B = Head Thickness
C = Length
D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	A		B	C	D	(Typical Values) Shear kN	
	nom.	min.	max.	min.			max.	min.	max.	max.	max.		max.
2.4		0.00	1.57			73				3.2		0.5	
		1.57	3.18			52				4.8			
		3.18	4.75			01131-00308	41			6.4			
		4.75	6.35	2.49	2.55	01131-00310	33	3.8	4.2	0.9	7.9		2.48
		6.35	7.92			01131-00312	28				9.5		
		7.92	9.52			01131-00314	24				11.1		
		9.52	11.10			01131-00316	22				12.7		
3.2 (1/8")		0.00	1.57			71				3.2		0.8	
		1.57	3.18			51				4.8			
		3.18	4.75	3.28	3.34	01131-00408	39	4.9	5.5	1.2	6.4		3.26
		4.75	6.35			01131-00410	32				7.9		
		6.35	7.92			01131-00412	27				9.5		
		7.92	9.52			01131-00414	24				11.1		
4.0 (5/32")		1.57	3.18			47				4.8		1.6	
		3.18	4.75			38				6.4			
		4.75	6.35			01131-00510	31			7.9			
		6.35	7.92	4.09	4.16	01131-00512	27	5.9	6.5	1.5	9.5		4.04
		7.92	9.52			01131-00514	23				11.1		
		9.52	11.10			01131-00516	21				12.7		
		11.10	12.70			01131-00518	19				14.4		
		12.70	14.30			01131-00520	18				16.0		
4.8 (3/16")		0.00	1.57			50				4.0		2.0	
		1.57	3.18			38				5.6			
		3.18	4.75			01131-00609	33			7.1			
		4.75	6.35	4.85	4.93	01131-00611	28	8.3	8.9	1.8	8.7		4.85
		6.35	7.92			01131-00613	24				10.3		
		7.92	9.52			01131-00615	21				11.9		
		9.52	11.10			01131-00617	19				13.5		
		11.10	12.70			01131-00619	17				15.1		
		12.70	14.30										
6.4 (1/4")		3.18	4.75			32				7.1		2.7	
		4.75	6.35			27				8.8			
		6.35	7.92			01131-00813	24			10.3			
		7.92	9.52			01131-00815	21			11.9			
		9.52	11.10	6.35	6.42	01131-00817	19	9.9	10.5	2.1	13.5		6.35
		11.10	12.70			01131-00819	17				15.1		
		12.70	14.27			01131-00821	16				16.7		
		14.27	15.87			01131-00823	14				18.3		
		15.87	17.45			01131-00825	13				19.9		
		17.45											

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



Brass, Dome Head

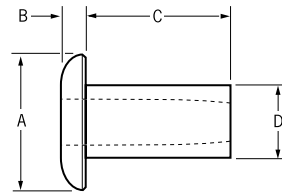
Material	Finish
Brass to BS EN 12166 CW 508L DIN 17660 Cu Zn37	Electro tin plated (1143) Brightened (1141)



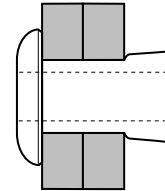
Options

For brass with brightened finish replace 01143 with 01141.

4.0mm (⁵/₃₂") and 4.8mm (³/₁₆") sizes available on request.



BEFORE PLACING



AFTER PLACING

A = Head Diameter
B = Head Thickness
C = Length
D = Shank Diameter

Dimensions and Performance Data

Fastener Size	Grip Range		Hole Size		Part Number	Fasteners per pod*	A		B	C	D	(Typical Values) Shear kN	
	nom.	min.	max.	min.			max.	min.	max.	max.	max.		max.
2.4		0.00	1.57			73				3.2			
		1.57	3.18			52				4.8			
		3.18	4.75	2.49	2.55	01143-00308	41	3.8	4.1	0.9	6.4	2.48	0.6
		4.75	6.35			01143-00310	33				7.9		
		6.35	7.92			01143-00312	28				9.5		
3.2 (¹ / ₈ ")		0.00	1.57			71				3.2			
		1.57	3.18	3.26	3.34	01143-00406	51	4.9	5.5	1.2	4.8	3.26	1.1
		3.18	4.75			01143-00408	39				6.4		
		4.75	6.35			01143-00410	32				7.9		

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

Grovit® - For Blind Hole Applications



Grovit®

Designed for blind hole applications in wood, plastics, fibreglass and aluminium. Can also be used in harder substrates.

Typical Placing Sequence

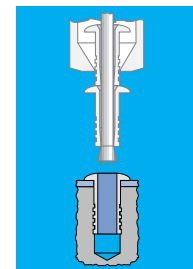
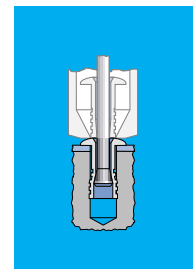
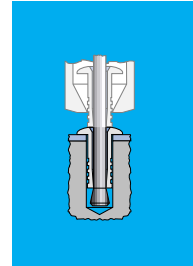
Specifications

Size: 2.4mm - 4.8mm

Materials: Zinc plated steel and aluminium alloy

Headforms: Dome/mushroom

Features	Benefits
Annular grooves on the body expand radially during installation	Provide a vibration resistant joint and increased pull-out resistance



Assembly Applications

Automotive - domestic appliances - electrical equipment - injection moulded components

PVC connector block in air conditioning unit



Trouser press



Grovit® in timber



Grovit® used as a quick connect low pressure bleed hose



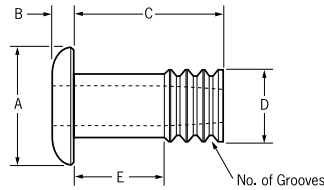
PVC strip connector



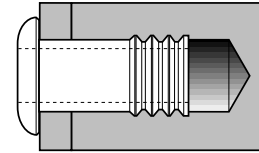


Steel, Dome Head

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 Q St 34-3	Zinc plated to BS EN 12329



BEFORE PLACING



AFTER PLACING

- A = Head Diameter
- B = Head Thickness
- C = Length
- D = Shank Diameter
- E = Unrolled Shank Length

Dimensions and Performance Data

Fastener Size nom.	Top Sheet max. thickness	Hole Size		Part Number Podded	Fasteners per pod*	A		B max.	C max.	D max.	E max.	No. of grooves	(Typical Values) Shear kN
		min.	max.			min.	max.						
3.2 (1/8")	3.6	3.45	3.55	01101-00410	32	4.9	5.6	1.0	8.7	3.43	3.9	3	1.4
	2.8			01101-00508	36				7.2		2.4	3	
4.0 (5/32")	4.4	4.40	4.50	01101-00512	25	5.9	6.6	1.3	10.3	4.37	3.9	4	2.4
	5.2			01101-00514	22				11.9		5.5	4	
4.8 (3/16")	3.2	5.07	5.17	01101-00609	31	8.3	9.0	1.7	7.9	5.05	3.1	3	3.2
	7.2	5.07	5.17	01101-00619	17	8.3	9.0	1.7	15.9	5.05	9.5	4	

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.



Aluminium Alloy, Dome Head

Material	Finish
Aluminium alloy AlMg2.5 (2.5% magnesium) to AA 5052 DIN 1725 Werkstoff 3.3523	Natural



Options
120° countersunk head. Replace part number 01103 with 01104.
Details available on request.

Dimensions and Performance Data

Fastener Size nom.	Top Sheet max. thickness	Hole Size		Part Number Podded	Fasteners per pod*	A		B max.	C max.	D max.	E max.	No. of grooves	(Typical Values) Shear kN
		min.	max.			min.	max.						
2.4	2.0	2.56	2.66	01103-00306	46	3.7	4.2	1.0	5.5	2.54	2.3	3	0.3
3.2 (1/8")	3.6	3.45	3.53	01103-00410	32	4.9	5.6	1.2	8.7	3.43	3.9	3	0.6
4.0 (5/32")	2.8	4.40	4.50	01103-00508	36	5.9	6.6	1.4	7.2	4.37	2.3	3	1.0
	5.2	4.40	4.50	01103-00514	22	5.9	6.6	1.4	11.9	4.37	5.5	4	1.0
4.8 (3/16")	3.2	5.07	5.17	01103-00609	31	8.3	9.0	1.7	7.9	5.05	3.1	3	1.5
	7.2	5.07	5.17	01103-00619	17	8.3	9.0	1.7	15.9	5.05	9.5	4	1.5

Dimensions in millimetres

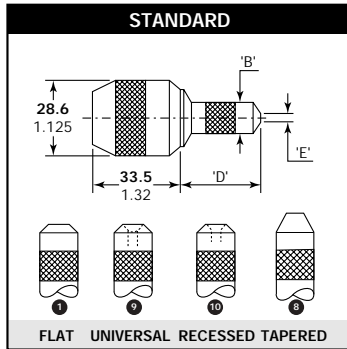
*Nominal value only. Tolerance ±1 fastener per pod.

Briv[®], Chobert[®] & Grovit[®] Nose Equipment

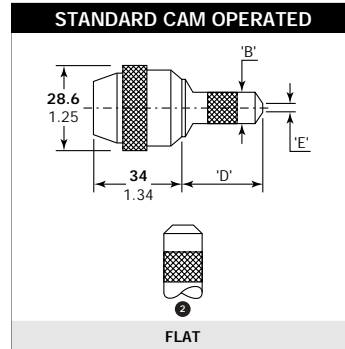
Nose equipment should be selected to suit the requirements of the application and the operator. Standard, standard tapered, long, long curved and limited access jaws offer options for different installation conditions. Please refer to page 11 for further information.

Cam operated jaws are available to minimise reloading times.

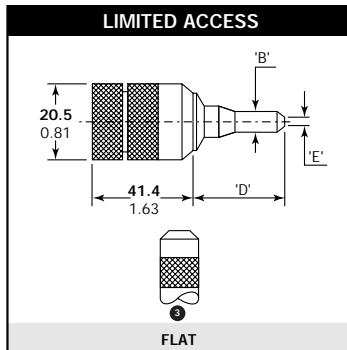
For Briv[®] fasteners head forming nose equipment can be used to affect final head shape and grip.



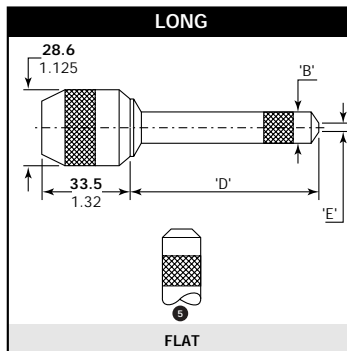
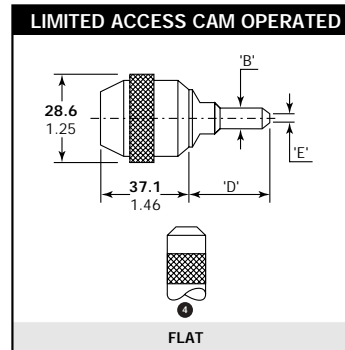
Suitable on applications with no or little access restriction.



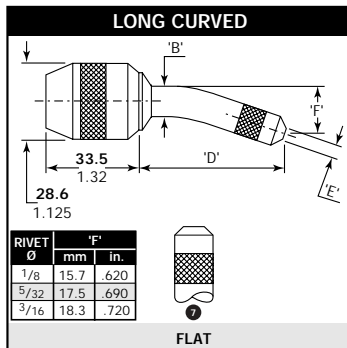
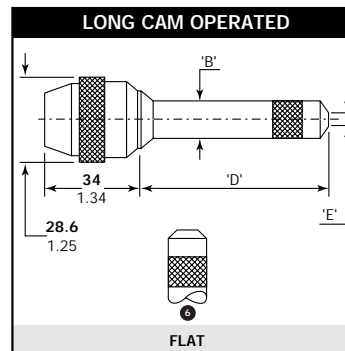
Equivalent functions to the Standard, Limited Access and Long jaws with the addition of a twist cam to ease and speed up the nose jaw opening thus the pod reloading procedure.



Allows access into very restrictive applications.



Allows more penetration into applications with no other access restriction.



Allows more penetration into applications with restricted access. Mandrels must be curved by hand to follow the shape of the jaw.

Dimensions shown in bold are millimetres. Other dimensions are in inches.

Briv[®], Chobert[®] & Grovit[®] Nose Equipment

Flat Head Nose Equipment

Fastener Size	Product Range	Nose	Refers to Number on Illustration	Part Number	Dimensions (mm)		
					B	D	E
2.4mm	Briv [®] /Chobert [®] /Grovit [®]	Standard	①	07150-03003	9.14	33.02	4.06
		Standard cam operated	②	07170-04500	9.14	33.02	4.06
		Limited access	③	07274-01000	5.59	27.18	4.06
		Limited access cam operated	④	07177-03003	5.08	29.97	4.06
		Standard tapered	⑧	07170-03103	9.14	33.02	4.06
3.2mm (1/8")	Briv [®] /Chobert [®] /Grovit [®]	Standard	①	07150-03004	10.41	29.97	5.08
		Standard cam operated	②	07170-04600	10.41	29.97	5.08
		Long	⑤	07150-04004	10.41	55.37	5.08
		Long cam operated	⑥	07170-05000	10.41	55.37	5.08
		Long curved	⑦	07150-05004	10.41	53.85	5.08
		Standard tapered	⑧	07170-03104	10.41	30.23	5.08
4.0mm (5/32")	Briv [®] /Chobert [®] /Grovit [®]	Standard	①	07150-03005	12.19	33.02	6.10
		Standard cam operated	②	07170-04700	12.19	33.02	6.10
		Long	⑤	07150-04005	12.19	58.42	6.10
		Long cam operated	⑥	07170-05100	12.19	58.42	6.10
		Long curved	⑦	07150-05005	12.19	56.64	6.10
4.0mm (5/32")	Chobert [®] /Grovit [®]	Standard tapered	⑧	07150-03105	11.18	33.02	6.10
4.8mm (3/16")	Briv [®] /Chobert [®] /Grovit [®]	Standard	①	07150-03006	14.22	29.97	8.38
		Standard cam operated	②	07170-04800	14.22	29.97	8.38
		Long	⑤	07150-04006	14.22	58.42	8.38
		Long cam operated	⑥	07170-05200	14.22	58.42	8.38
		Long curved	⑦	07150-05006	14.22	56.13	8.38
4.8mm (3/16")	Chobert [®] /Grovit [®]	Standard tapered	⑧	07150-03106	14.22	29.97	8.38
6.0mm	Briv [®]	Standard	①	07170-05800	16.33	30.65	13.14
		Standard cam operated	②	07170-05600	16.33	30.65	13.14
		Long	⑤	07170-05900	16.33	55.65	13.14
		Long cam operated	⑥	07170-05700	16.33	55.65	13.14
6.4mm (1/4")	Chobert [®]	Standard	①	07150-03008	16.26	29.97	9.91
		Standard cam operated	②	07170-04900	16.26	29.97	9.91
		Long	⑤	07150-04008	16.26	55.37	9.91
		Long cam operated	⑥	07170-05300	16.26	55.37	9.91

Head Forming Nose Equipment (not suitable for stainless steel or countersunk fasteners)

Fastener Size	Product Range	Nose	Refers to Number on Illustration	Part Number	Dimensions (mm)		
					B	D	E
2.4mm	Briv [®]	Standard universal	⑨	07150-03203	9.14	33.78	6.10
3.2mm (1/8")	Briv [®]	Standard recessed	⑩	07170-03004	10.41	30.48	7.62
		Standard universal	⑨	07150-03204	10.41	30.99	8.13
4.0mm (5/32")	Briv [®]	Standard recessed	⑩	07170-03005	12.19	33.53	10.41
		Standard universal	⑨	07150-03205	12.19	34.29	10.41
4.8mm (3/16")	Briv [®]	Standard recessed	⑩	07170-03006	14.22	30.48	11.94
		Standard universal	⑨	07150-03206	14.22	31.50	11.94

Some long and curved variants are available - please contact your local TFS representative for further details.

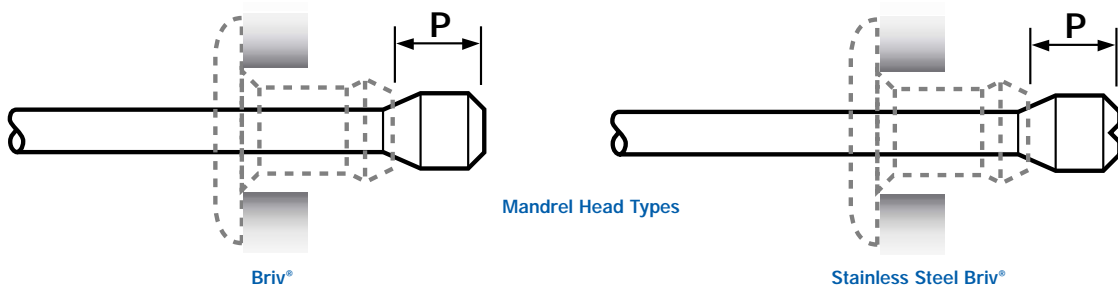
Mandrel and Spring Information for Briv®

Mandrel and Spring Information for Briv®

Fastener Size	Hole Size	Description	Head dia	Head Length (P)	Standard Nose Equipment		Long Nose Equipment	
					Mandrel Part Number	Spring Part Number	Mandrel Part Number	Spring Part Number
2.4mm	as rec	Standard green	1.83	3.02	07150-06013	07150-06803*	N/A	N/A
	brass, aluminium	+0.10 1st oversize yellow	1.93	3.12	07150-06113	07150-06803*	N/A	N/A
		+0.20 2nd oversize blue	2.01	3.20	07150-06213	07150-06803*	N/A	N/A
3.2mm (¹ / ₈ "	as rec	Standard green	2.34	3.05	07271-06414	07150-06814	07271-07414	07150-07814
	brass,	+0.13 1st oversize yellow	2.46	3.20	07271-06514	07150-06814	07271-07514	07150-07814
	aluminium, steel	+0.25 2nd oversize blue	2.59	3.38	07271-06614	07150-06814	07271-07614	07150-07814
3.2mm (¹ / ₈ "	as rec	Standard green	2.49	3.07	07170-06804	07150-06814	07170-07804	07150-07814
	stainless steel	+0.13 1st oversize yellow	2.62	3.25	07170-06824	07150-06814	07170-07824	07150-07814
4.0mm (⁵ / ₃₂ "	as rec	Standard green	2.79	3.45	07150-06015	07170-06875	07150-07015	07170-07875
	brass,	+0.13 1st oversize yellow	2.92	3.61	07150-06115	07170-06875	07150-07115	07170-07875
	aluminium, steel	+0.25 2nd oversize blue	3.05	3.78	07150-06215	07170-06875	07150-07215	07170-07875
4.0mm (⁵ / ₃₂ "	as rec	Standard green	3.05	3.20	07170-06805	07170-06875	07170-07805	07170-07875
	stainless steel	+0.13 1st oversize yellow	3.18	3.35	07170-06825	07170-06875	07170-07825	07170-07875
4.8mm (³ / ₁₆ "	as rec	Standard green	3.58	3.99	07150-06016	07170-06876	07150-07016	07170-07876
	brass,	+0.13 1st oversize yellow	3.71	4.17	07150-06116	07170-06876	07150-07116	07170-07876
	aluminium, steel	+0.25 2nd oversize blue	3.84	4.32	07150-06216	07170-06876	07150-07216	07170-07876
		+0.30 3rd oversize red	3.85	4.39	07150-06316	07170-06876	07150-07316	07170-07876
4.8mm (³ / ₁₆ "	as rec	Standard green	3.89	3.81	07170-06806	07170-06876	07170-07806	07170-07876
	stainless steel	+0.13 1st oversize yellow	4.01	3.96	07170-06826	07170-06876	07170-07826	07170-07876
6.0mm	as rec	Standard green	4.54	4.18	07150-06018	07150-06846	07150-07018	07150-07846
	aluminium, steel	+0.13 1st oversize yellow	4.67	4.34	07150-06118	07150-06846	07150-07118	07150-07846
		+0.25 2nd oversize blue	4.79	4.49	07150-06218	07150-06846	07150-07218	07150-07846

Notes: * 2.4mm Briv®: The follower recommended is for use with the standard flat nosepiece 07150-03003. For the tapered nosepiece use follower 07170-06873 and for the limited access nosepiece use 07170-06903.

For Hydra modules using standard nose equipment use a long mandrel and a standard spring.



Mandrels for stainless steel Briv® are easily identifiable by a 'V' cut in the end of the mandrel heads.

When using curved nose jaws, mandrels have to be bent by hand to match the curvature of the nose jaws, thus ensuring good feed of fasteners.

Mandrel and Spring Information for Chobert® & Grovit®

Mandrel and Spring Information for Chobert® and Grovit®

Fastener Size	Hole Size	Description	Head dia	Head Length (P)	Head Length S/R	Standard Nose Equipment		Long Nose Equipment	
						Mandrel Part No. <small>for S/R substitute 6 with 8*</small>	Spring Part Number	Mandrel Part No. <small>for S/R substitute 7 with 9*</small>	Spring Part Number
2.4mm	as rec	Standard green	1.84	4.22	1.80	07150-06003	07150-06803**	07150-07003	07150-07803
	brass, aluminium +0.04	1st oversize yellow	1.88	4.42	1.98	07150-06303	07150-06803**	S/R only***	07150-07803
	+0.09	2nd oversize blue	1.93	4.70	N/A	07150-06103	07150-06803**	07150-07103	07150-07803
3.2mm (1/8")	as rec	Standard green	2.24	5.49	2.29	07150-06004	07150-06804	07150-07004	07150-07804
	brass, +0.10	1st oversize yellow	2.34	6.02	2.49	07150-06104	07150-06804	07150-07104	07150-07804
	aluminium, steel +0.25	2nd oversize blue	2.49	6.81	2.79	07150-06204	07150-06804	07150-07204	07150-07804
	+0.35	3rd oversize red	2.59	7.32	3.00	07150-06304	07150-06804	07150-07304	07150-07804
4.0mm (5/32")	as rec	Standard green	2.72	6.20	2.54	07150-06005	07170-06875	07150-07005	07170-07875
	brass, +0.20	1st oversize yellow	2.92	7.21	2.95	07150-06105	07170-06875	07150-07105	07170-07875
	aluminium, steel +0.38	2nd oversize blue	3.10	8.13	3.30	07150-06205	07170-06875	07150-07205	07170-07875
	+0.63	3rd oversize red	3.35	9.45	3.81	07150-06305	07150-06805	07150-07305	07150-07805
4.8mm (3/16")	as rec	Standard green	3.35	6.27	2.59	07150-06006	07170-06876	07150-07006	07170-07876
	brass, +0.35	1st oversize yellow	3.71	8.13	3.30	07150-06106	07170-06876	07150-07106	07170-07876
	aluminium, steel +0.60	2nd oversize blue	3.96	9.45	3.81	07150-06206	07150-06806	07150-07206	07150-07806
6.0mm	as rec	Standard green	4.67	6.81	2.79	07150-06008	07150-06808	07150-07008	07150-07808
	aluminium, steel +0.30	1st oversize yellow	4.98	8.38	3.40	07150-06108	07150-06808	07150-07108	07150-07808

SR = short reach

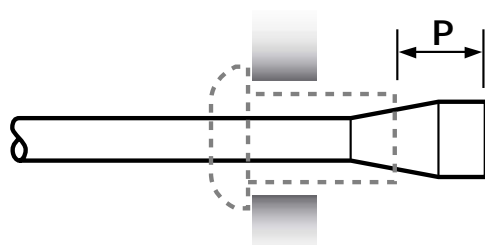
Notes:

* For the 2.4mm Chobert® the standard short reach, 1st oversize mandrel number is 07150-08103.

** 2.4mm Chobert®: The follower recommended is for use with the standard flat nosepiece 07150-03003. For the tapered nosepiece use follower 07170-06873 and for the limited access nosepiece use 07170-06903.

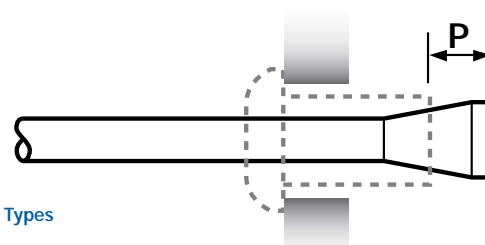
*** For the 2.4mm Chobert® the long, short reach, 1st oversize mandrel number is 07150-09103.

For Hydra® modules using standard nose equipment use a long mandrel and a standard spring.



Chobert® and Grovit®

Mandrel Head Types



Short Reach (Chobert® and Grovit®)

Rivscrew® - Threaded, Removable Fasteners



Rivscrew®

Threaded, removable speed (repetition) fasteners that combine the speed of rivet placement with the removability of a screw.

Typical Placing Sequence

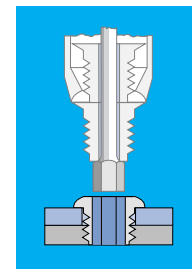
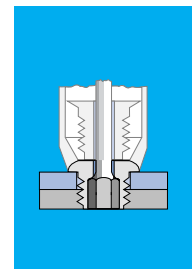
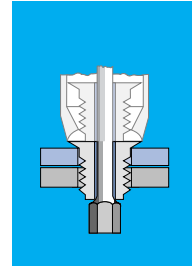
Specifications

Sizes: 2.8mm - 6.0mm

Material: Zinc plated steel

Headform: Dome/mushroom (can also be placed countersunk)

Features	Benefits
Expands radially during installation to form a thread in host material	– Eliminates the need for costly tapping or thread forming operations
Removable with a hex key and reusable	– For ease of servicing
Placed with a hexagon mandrel which expands the threaded diameter radially, adjacent to its six corners	– Provides a higher vibration resistant "thread lock" in the parent material compared to standard screws
Head forms during installation	– Provides high clench and secure clamp up
Can be used to fasten a wide range of materials up to Vickers hardness Hv105, including magnesium, nylon and die-cast zinc	



Assembly Applications

Aluminium die-cast boxes - cast magnesium - fastening into injection moulded plastic bosses - general engineering with nylon, polycarbonate, plastics, PCB's to chassis assemblies - semi-conductors to PCB's - semi conductors to thin wall and extruded heatsinks

Rivscrew® is removable and reusable



Automotive die-cast chassis with PCB



Low noise block for satellites



Lighting chokes to gear trays



Alternator diode plate to nylon moulding



Semi-conductors to heatsinks and printed circuit boards





Steel, Dome Head

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 QST 34-3	Zinc plated to BS 3382 and yellow passivated to BS 6338



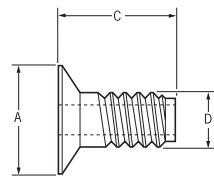
Option

Rivcrew® fasteners are now available with a pre-formed head (the head is not formed from countersunk to dome during installation). For pre-formed variants substitute part number 01722 with 01772. For further details please contact your local TFS representative.

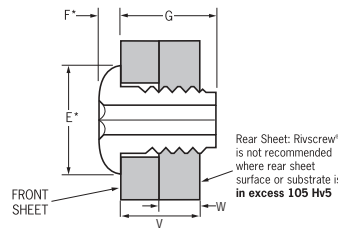
Rivcrew® can be removed and reused with an Allen key.

Dia	Hexagon key size
2.8	1/16 "
3.0	1/16 "
3.5	2 mm
4.0	2.5 mm

Rivcrew® can be installed **countersunk**. Please contact us for further details.



BEFORE PLACING



AFTER PLACING

Before Placing

- A = Head Diameter
- C = Length
- D = Shank Diameter

After Placing

- E = Head Diameter
- F = Head Thickness
- G = Underhead Length
- V = Maximum grip if used in through hole applications
- W = Minimum rear sheet thickness required for removability

Rear Sheet: Rivcrew® is not recommended where rear sheet surface or substrate is in excess 105 Hv5

Note: Rivcrew® fasteners are ideally suited for blind hole applications. Minimum hole depth should be W min plus an allowance for mandrel head protrusion.

Dimensions and Performance Data

*Dimensions E and F are generated during the installation process and should only be used as an indication of the minimum space required.

Fastener Size nom.	Grip Range		Hole Size				Part Number Podded	Fasteners per pod*	A min.	C max.	D max.	E* max.	F* max.	G max.	(Typical Values)		
	W min.	V max. Overall	Front Sheet min.	Rear Sheet max.	min.	max.									Shear kN	Tension kN	
2.8	1.62	2.85					01722-02806	62		5.2				4.0	0.9	0.7	
	1.62	3.85					01722-02807	52		6.1				5.0			
	1.62	4.83	2.95	3.02	2.62	2.70	01722-02809	43	5.4	5.9	7.1	2.6	6.1	1.4			6.0
	1.62	5.82					01722-02810	38		8.1				7.0			
	1.62	7.80					01722-02812	30		10.1				9.0			
3.0	1.62	2.85					01722-03006	62		5.2				4.0	0.9	0.8	
	1.62	3.85					01722-03007	52		6.1				5.0			
	1.62	4.83					01722-03009	43		7.1				6.0			
	1.62	5.82	3.07	3.15	2.82	2.89	01722-03010	38	5.4	5.9	8.1	2.8	6.1	1.4			7.0
	1.62	6.81					01722-03011	34		9.1				8.0			
	1.62	7.80					01722-03012	30		10.1				9.0			
	1.62	10.72					01722-03016	23		13.1				11.9			
3.5	1.62	2.85					01722-03506	62		5.2				4.0	1.0	1.0	
	1.62	3.85					01722-03507	52		6.1				5.0			
	1.62	4.83					01722-03509	43		7.1				6.0			
	1.62	5.82	3.50	3.58	3.10	3.17	01722-03510	38	5.6	6.0	8.1	3.1	6.1	1.4			7.0
	1.62	6.81					01722-03511	34		9.1				8.0			
	1.62	7.80					01722-03512	30		10.1				9.0			
	1.62	11.76					01722-03517	21		14.1				12.9			
4.0	1.62	2.85					01722-04006	62		5.2				4.0	1.3	1.2	
	1.62	3.85					01722-04007	52		6.1				5.0			
	1.62	4.83					01722-04009	43		7.1				6.0			
	1.62	5.82	4.19	4.27	3.61	3.68	01722-04010	38	5.8	6.2	8.1	3.6	6.4	1.4			7.0
	1.62	6.81					01722-04011	34		9.1				8.0			
	1.62	7.80					01722-04012	30		10.1				9.0			
	1.62	9.78					01722-04015	25		12.1				11.0			

*Ensures thread engagement in rear sheet and allows removal

*Nominal value only. Tolerance ±1 fastener per pod.

Dimensions in millimetres



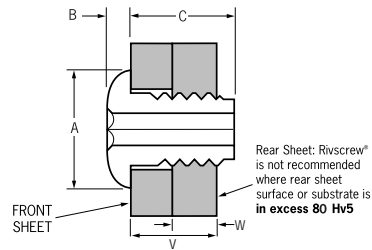
Steel, Dome Head

Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 QST 34-3	Zinc plated to BS 3382 and yellow passivated to BS 6338



Rivcrew® can be removed and reused with an Allen key.

Dia	Hexagon key size
4.8	2.5 mm



- A = Head Diameter
- B = Head Thickness
- C = Underhead Length
- V = Maximum grip if used in through hole applications
- W = Minimum rear sheet thickness required for removability

Dimensions

Fastener Size nom.	Grip Range		Hole Size				Part Number	Fasteners per pod*	A max.	B max.	C max.
	W min. Rear	V max. Overall	Front Sheet		Rear Sheet						
4.8	2.8	6.5	4.9	5.0	4.5	4.6	01733-04810	30	9.5	1.7	8.7
	2.8	11.5	4.9	5.0	4.5	4.6	01733-04816	20	9.5	1.7	13.5

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

Rivcrew® 1710



Steel, 6.0mm Dome Head

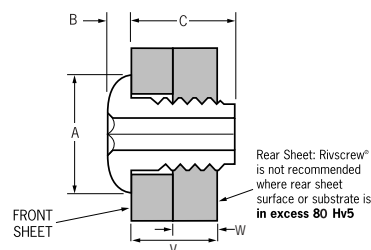
Material	Finish
Low carbon steel to BS 3111 Type 0 SAE 1008 DIN 1654 QST 34-3	Zinc plated to BS EN 12329



6mm Rivcrew® fasteners are designed for use in materials such as plastics, magnesium and some grades of aluminium. They are engineered to give the same performance levels in both drilled and tapered holes so they may be used in as cast conditions.

Rivcrew® can be removed and reused with an Allen key.

Dia	Hexagon key size
6.0	3.5 mm



- A = Head Diameter
- B = Head Thickness
- C = Underhead Length
- V = Maximum grip if used in through hole applications
- W = Minimum rear sheet thickness required for removability

Dimensions

Fastener Size nom.	Grip Range		Hole Size Front Sheet nom.	Rear Sheet			Part Number	Fasteners per pod*	A max.	B max.	C max.	(Typical Value)	
	W min. Rear	V max. Overall		Cast Hole top ∅	Drilled Hole bottom ∅ (depth 1.2mm)	Shear kN						Tension kN	
6.0	1.5	12.0	1.5	5.7/5.6	5.5/5.4	5.53/5.43	01710-10662	16	12.1	2.2	12.5	3.5	5.4

Dimensions in millimetres

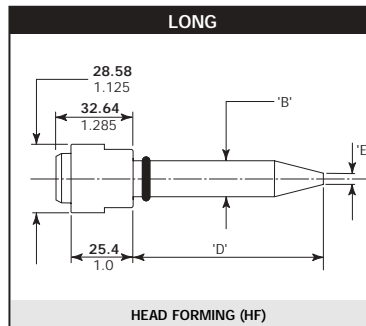
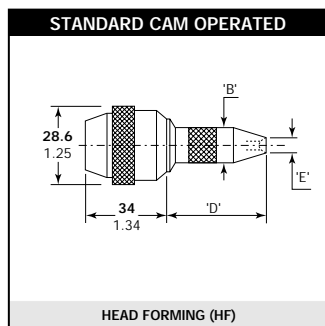
*Nominal value only. Tolerance ±1 fastener per pod.

Rivcrew® Nose Equipment, Mandrel & Spring Information

Rivcrew® Nose Equipment

Fastener Size	Nose	Part Number	Dimensions (mm)		
			B	D	E
3.0mm	Standard cam operated	07271-03000	10.41	29.97	6.10
	Long	07271-08600	15.5	67.10	6.35
3.5mm	Standard cam operated	07271-03500	10.41	29.97	6.10
	Long	07271-08700	15.5	67.10	6.35
4.0mm	Standard cam operated	07271-04000	10.41	29.97	6.35
	Long	07271-08800	15.5	67.10	7.10
4.8mm	Standard*	07150-03006	14.22	29.97	8.38
	Long	07150-04006	14.22	58.42	8.38

*Please refer to nose equipment illustrations on page 26.



Dimensions shown in bold are millimetres.
Other dimensions are inches.

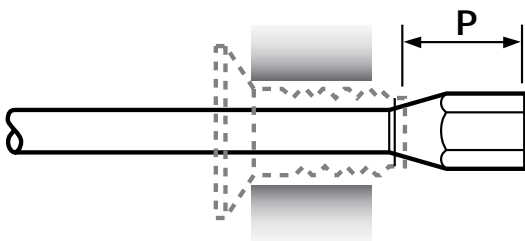
Suitable on applications with little or no access restriction.

Mandrel and Spring Information for Rivcrew®

Fastener Size	Hole Size	Head A/F	Head Length (P)	Standard Nose Equipment		Long Nose Equipment	
				Mandrel Part Number	Spring Part Number	Mandrel Part Number	Spring Part Number
2.8mm	as rec	1.65	3.23	07271-06030	07271-06630	07271-07030	07271-07630
3.0mm	as rec	1.65	3.23	07271-06030	07271-06630	07271-07030	07271-07630
3.5mm	as rec	2.10	3.35	07271-06035	07271-06635	07271-07035	07271-07635
4.0mm	as rec	2.62	3.81	07271-06140	07271-06640	07271-07140	07271-07640
4.8mm	as rec	2.62	3.81	07271-06140	07271-06640	07271-07140	07271-07640

* The nose equipment specified here for the 3.0, 3.5 and 4.0mm product will change the head form from countersunk to dome.

For applications requiring a countersunk finish or where using pre-formed head Rivcrew® fasteners, please contact your local TFS representative.



Mandrel Head Type - Rivcrew®

Avtronic® - For Attaching Connectors to PCB's



Avtronic®

Initially designed to attach DIN 41612 connectors to PCB's but can also be used to attach a wide range of other connectors and components.

Typical Placing Sequence

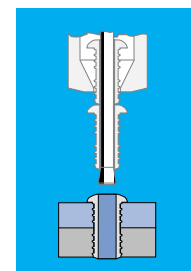
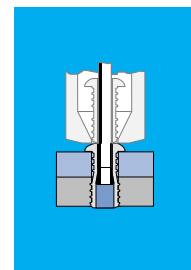
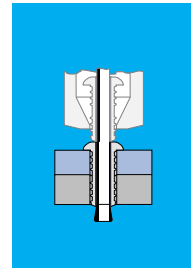
Specifications

Sizes: 2.5mm and 2.8mm

Materials: Electro tin plated brass and aluminium alloy

Headform: Dome

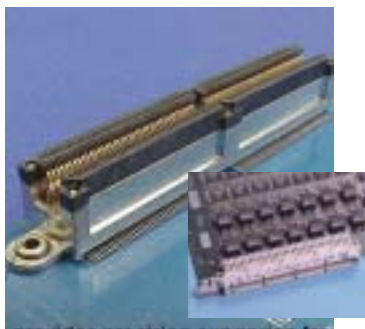
Features	Benefits
Annular grooves on the body expand radially during installation	Provides a vibration resistant joint, increased pull-out resistance and good residual clamp
Various body lengths provide a wide grip range	Accommodate most combinations of connector and PC board thickness
Ideal tack rivet	
Can be used in blind hole applications	



Assembly Applications

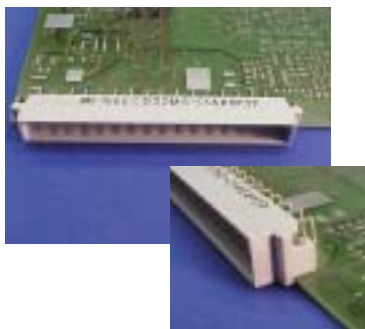
DIN 41612 and other connectors - brackets - card ejectors - heatsinks - stiffener bars - many other plastic and aluminium components

Surface mount connectors to PCB's



photos courtesy of TFS Australia

DIN 41612 male edge connector



Automotive vertical mount connectors



Traffic light reflector and contact point

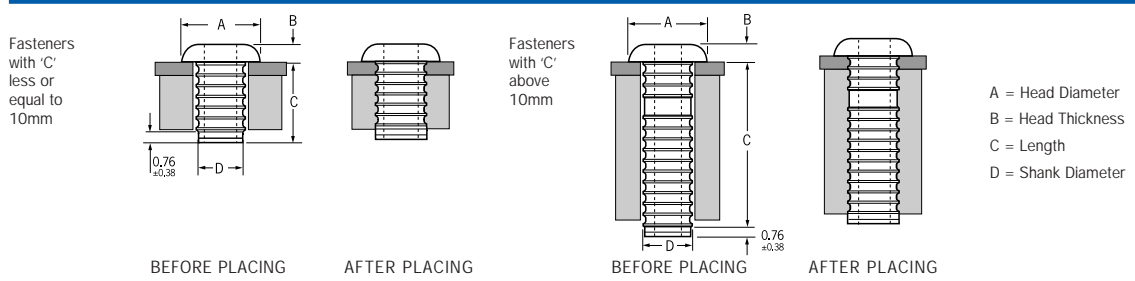


photos courtesy of Microsense Systems Limited



1189 - Aluminium Alloy, Dome Head
1188 - Brass, Dome Head

	Material	Finish
1189	Aluminium alloy (5% magnesium) to BS 1473 5056A DIN 1725 AlMg5 Werkstoff 3.3555	Natural
1188	Brass to BS EN 12166 CW 508L DIN 17660 Cu Zn37	Electro tin plated



Dimensions and Performance Data

Fastener Size	Hole Size		Part Number		Fasteners per pod*	A		B	C	D		Push Out kN	
	nom.	min. max.	Aluminium Alloy	Brass		min.	max.	max.	max.	min.	max.	1189	1188
2.5	2.50 2.60	01189-02506	01188-02506	51					5.2				
		01189-02508	01188-02508	41					6.8				
		01189-02510	01188-02510	33					8.4				
		01189-02512	01188-02512	28					10.0				
		01189-02514	01188-02514	24	3.8	4.2	1.0	11.5	2.31	2.47	0.030	0.045	
		01189-02516	01188-02516	21				13.1					
		01189-02518	01188-02518	19				14.7					
		01189-02520	01188-02520	17				16.3					
		01189-02522	01188-02522	16				17.9					
2.8	2.80 2.90	01189-02806	01188-02806	52					5.2				
		01189-02808	01188-02808	41					6.8				
		01189-02810	01188-02810	33					8.4				
		01189-02812	01188-02812	28					10.0				
		01189-02814	01188-02814	24	3.8	4.2	1.0	11.5	2.58	2.74	0.045	0.067	
		01189-02816	01188-02816	21				13.1					
		01189-02818	01188-02818	19				14.7					
		01189-02820	01188-02820	17				16.3					
		01189-02822	01188-02822	16				17.9					

Dimensions in millimetres

*Nominal value only. Tolerance ± 1 fastener per pod.

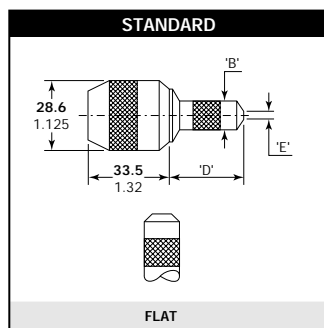
Avtronic® Nose Equipment, Mandrel & Spring Information

Avtronic® Nose Equipment

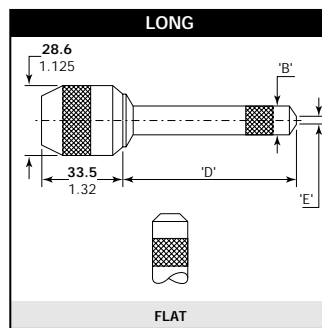
Fastener Size	Nose	Part Number	Dimensions (mm)		
			B	D	E
2.5mm	Standard	07150-03003	9.14	33.02	4.04
	Long	07150-04003	10.41	58.42	4.06
	Limited access cam operated	07271-08000*	10.41	29.97	4.06
2.8mm	Standard	07271-05600	9.14	33.02	4.06
	Long	07271-05900	10.41	58.42	4.06
	Limited access cam operated	07271-08100**	10.16	29.97	4.06

* The 2.5mm limited access nose equipment should be used with a standard length mandrel and spring.

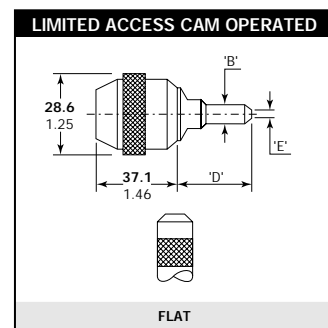
** The 2.8mm limited access nose equipment should be used with a standard length mandrel and spring part number 07170-06873.



Suitable on applications with no or little access restriction.



Allows more penetration into applications with no other access restriction.



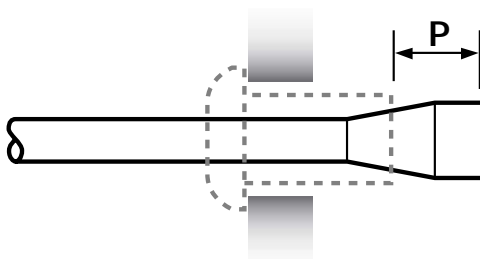
Allows access into very restrictive applications with the addition of a cam to ease and speed up the nose jaw opening thus the pod reloading procedure.

Dimensions shown in bold are millimetres. Other dimensions are in inches.

Mandrel and Spring Information for Avtronic®

Fastener Size	Hole Size	Description	Head dia	Head Length (P)	Standard Nose Equipment		Long Nose Equipment	
					Mandrel Part Number***	Spring Part Number	Mandrel Part Number	Spring Part Number
2.5mm	as rec	Standard green	1.78	3.56	07170-06025	07150-06803	07170-07025	07150-07803
	+0.07	1st oversize yellow	1.85	3.56	07170-06125	07150-06803	07170-07125	07150-07803
	+0.15	2nd oversize blue	1.93	3.56	07170-06225	07150-06803	07170-07225	07150-07803
2.8mm	as rec	Standard green	2.01	3.81	07170-06028	07170-06528	07170-07028	07170-07528
	+0.07	1st oversize yellow	2.08	3.81	07170-06128	07170-06528	07170-07128	07170-07528
	+0.15	2nd oversize blue	2.16	3.81	07170-06228	07170-06528	07170-07228	07170-07528

*** Mandrels for use with hydra modules substitute 07170 with 07471.



Mandrel Head Type - Avtronic®

Avsert® - Threaded Stand-off Pillars for PCB's



Avsert®

Threaded stand-off pillars for PCB's in a range of metric internal threads and many stand-off heights.

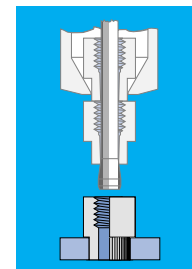
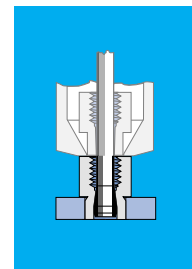
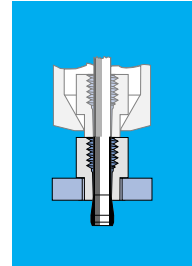
Specifications

Sizes: M2.5 X 0.45 and M3 x 0.5 threads

Material: Tin plated brass

Features	Benefits
Internally threaded bore	- Takes a threaded part eg. D-subminiature connectors
Available in many stand-off heights	- Accommodate a wide variety of components
Can be used for board thicknesses of 0.8-2mm or 0.8-2.4mm max	
Suitable as a female mating bush for D-subminiature connectors	

Typical Placing Sequence



Assembly Applications

Aluminium geartrays and extrusions - D-connectors - PCB's - telecomms equipment



photos courtesy of TFS Australia


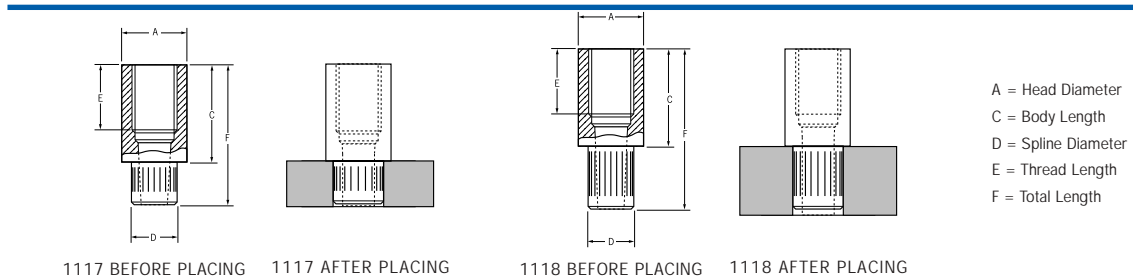
DB25 subminiature connector 4.40 UNC female



1117 - Brass, Max Board Thickness 2.0mm

1118 - Brass, Max Board Thickness 2.4mm

Material	Finish
Brass to BS EN 12166 CW 606N DIN 17660 Cu Zn37 Pb2	Tin plated

Dimensions and Performance Data - Avsert® 1117

Thread Size	Board Thickness		Hole Size		Part Number	Fasteners per pod*	A		C		D		E		F		Max Torque-to-Turn kN
	min.	max.	min.	max.			min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	
M2.5 x 0.45	0.8	2.0	2.70	2.80	01117-06555	36			5.4	5.6			3.4	8.2			0.96
					01117-06560	34			5.9	6.1			3.9	8.7			
					01117-06570	30	3.9	4.0	6.9	7.1	2.59	2.69	4.9	9.7			
					01117-06580	27			7.9	8.1			5.9	10.7			
					01117-06590	25			8.9	9.1			5.9	11.7			
M3 x 0.5	0.8	2.0	3.30	3.40	01117-07055	36			5.4	5.6			3.4	8.2			1.52
					01117-07060	34			5.9	6.1			3.9	8.7			
					01117-07070	30	4.7	4.8	6.9	7.1	3.17	3.28	4.9	9.7			
					01117-07080	27			7.9	8.1			5.9	10.7			
					01117-07090	25			8.9	9.1			5.9	11.7			

Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

Dimensions and Performance Data - Avsert® 1118

Thread Size	Board Thickness		Hole Size		Part Number	Fasteners per pod*	A		C		D		E		F		Max Torque-to-Turn kN
	min.	max.	min.	max.			min.	max.	min.	max.	min.	max.	min.	max.			
M2.5 x 0.45	0.8	2.4	2.70	2.80	01118-06555	30			5.4	5.6			3.4	9.5			0.96
					01118-06560	29			5.9	6.1			3.9	10.0			
					01118-06570	26	3.9	4.0	6.9	7.1	2.59	2.69	4.9	11.0			
					01118-06580	24			7.9	8.1			5.9	12.0			
					01118-06590	22			8.9	9.1			5.9	13.0			
M3 x 0.5	0.8	2.4	3.30	3.40	01118-07055	30			5.4	5.6			3.4	9.5			1.52
					01118-07060	29			5.9	6.1			3.9	10.0			
					01118-07070	26	4.7	4.8	6.9	7.1	3.17	3.28	4.9	11.0			
					01118-07080	24			7.9	8.1			5.9	12.0			
					01118-07090	22			8.9	9.1			5.9	13.0			

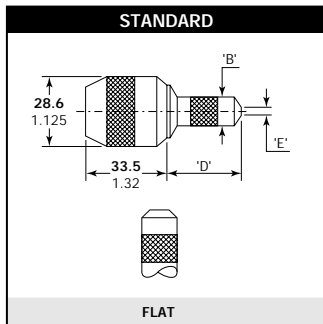
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

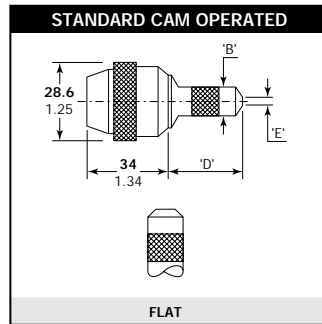
Avsert® Nose Equipment, Mandrel & Spring Information

Avsert® Nose Equipment

Fastener Size	Nose	Part Number	Dimensions (mm)		
			B	D	E
2.5mm (4-40UNC)	Standard	07150-03003	9.14	33.02	4.06
3.0mm (6-32UNC)	Standard	07150-03004	10.41	29.97	5.08
	Standard cam operated	07170-04600	10.41	29.97	5.08



Suitable on applications with no or little access restriction.

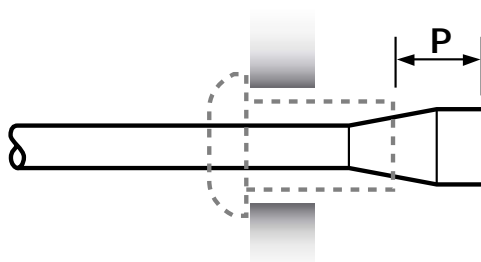


Equivalent functions to the standard jaw with the addition of a cam to ease and speed up the nose jaw opening thus the pod reloading procedure.

Dimensions shown in bold are millimetres. Other dimensions are in inches.

Mandrel and Spring Information for Avsert®

Fastener Size	Hole Size	Description	Head dia	Head Length (P)	Standard Nose Equipment	
					Mandrel Part Number	Spring Part Number
2.5mm	as rec	Standard green	1.84	3.68	07150-06003	07150-06803
3.0mm	as rec	Standard green	2.24	4.70	07150-06004	07150-06804



Mandrel Head Type - Avsert®

Avlug® - Solderable Terminal Posts



Avlug®

Secure, easy-to-solder terminal posts for PCB's.

Typical Placing Sequence

Specifications

Sizes: 1.6mm - 3.2mm ($1/16"$ - $1/8"$)

Material: Electro tin plated

Headform: Dome

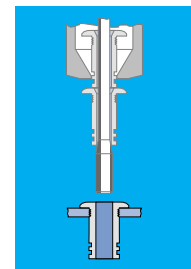
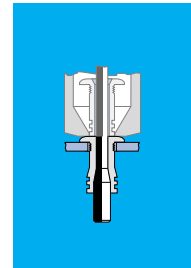
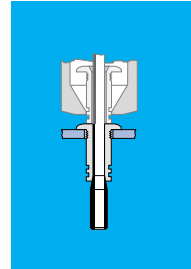
Features

Rolled/knurled shank

Benefits

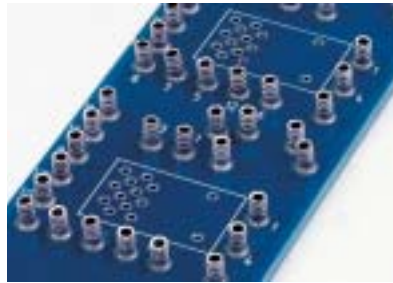
— Ensures secure placement in the PCB

Suitable for wire wrapping or a test point for CRO tubes



Assembly Applications

Terminal post - wire wrap



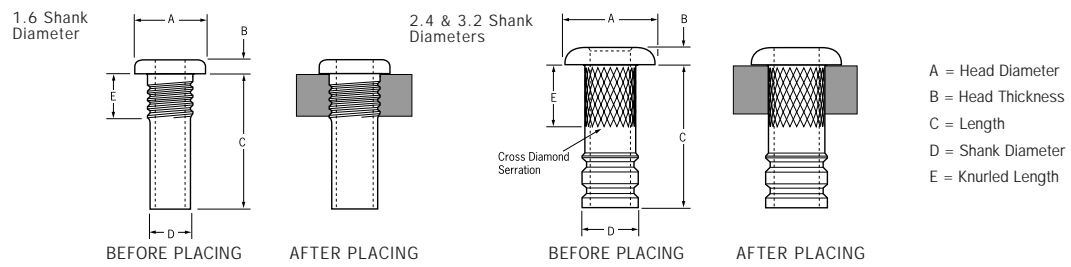
photos courtesy of TFS Australia





Brass, Dome Head

Material	Finish
Brass to BS EN 12166 CW 508L DIN 17660 Cu Zn37	Electro tin plated



Dimensions and Performance Data

Fastener Size	Hole Size		Part Number	Fasteners per pod*	A		B	C	D	E	No. of grooves
	nom.	min. max.			min.	max.	max.	max.	max.		
1.6	1.80	1.93	01107-00205	62	2.5	2.8	0.6	4.1	1.79	2.0	4
1.6	1.80	1.93	01107-00208	42	2.5	2.8	0.6	6.5	1.79	2.0	4
2.4	2.62	2.74	01107-00310	33	3.8	4.2	1.0	8.4	2.60	3.4	2
2.4	2.62	2.74	01107-00312	28	3.8	4.2	1.0	10.0	2.60	3.4	3
3.2 (1/8")	3.38	3.51	01107-00412	26	4.9	5.5	1.2	10.0	3.36	3.4	3

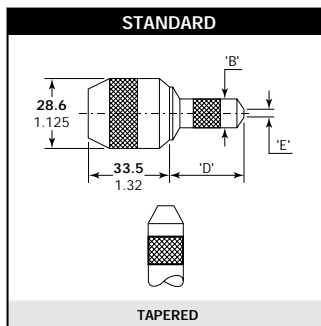
Dimensions in millimetres

*Nominal value only. Tolerance ±1 fastener per pod.

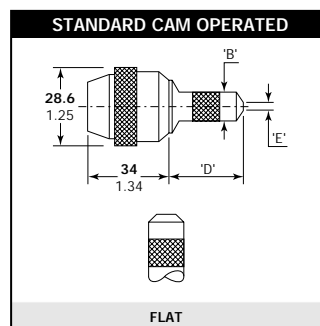
Avlug® Nose Equipment, Mandrel and Spring Information

Avlug® Nose Equipment

Fastener Size	Nose	Part Number	Dimensions (mm)		
			B	D	E
1.6mm*	Standard	07154-03102	5.46	25.40	2.67
	Standard	07150-03003	9.14	33.02	4.06
	Standard cam operated	07170-04500	9.14	33.02	4.06
2.4mm	Standard	07150-03103	9.14	33.02	4.06
	Standard cam operated	07170-04500	9.14	33.02	4.06
	Standard tapered	07150-03103	9.14	33.02	4.06
3.2mm	Standard	07150-03004	10.41	29.97	5.08
	Standard cam operated	07170-04600	10.41	29.97	5.08
	Standard tapered	07170-03104	10.41	30.23	5.08



Suitable on applications with no or little access restriction.



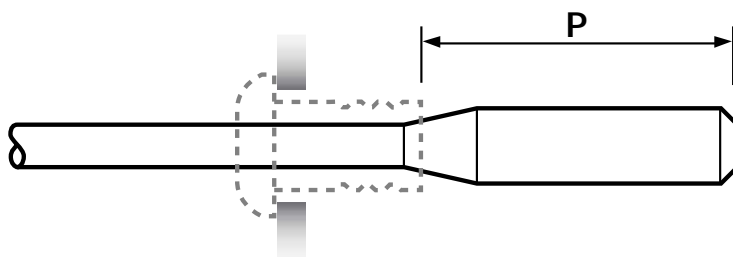
Equivalent functions to the Standard and Long jaws with the addition of a cam to ease and speed up the nose jaw opening thus the pod reloading procedure.

Dimensions shown in bold are millimetres. Other dimensions are in inches.

Handtool Mandrel and Spring Information for Avlug®

Fastener Size	Hole Size	Description	Head dia	Head Length (P)	Standard Nose Equipment		Long Nose Equipment	
					Mandrel Part Number	Spring Part Number	Mandrel Part Number	Spring Part Number
1.6mm*	as rec	Standard green	1.30	9.01	07154-06602	07154-06802	N/A	N/A
		1st oversize yellow	1.43	9.67	07154-06702	07154-06802	N/A	N/A
2.4mm	as rec +0.10	Standard green	1.93	8.97	07150-06603	07150-06803	07150-07603	07150-07803
		1st oversize yellow	2.06	12.14	07150-06703	07150-06803	07150-07703	07150-07803
3.2mm	as rec	Standard green	2.49	15.06	07150-06604	07150-06804	07150-07604	07150-07804

* Note that the 1.6mm Avlug® fasteners can only be installed using a 753 handtool with an air cursor.

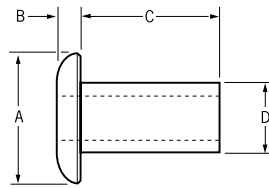


Mandrel Head Type - Avlug®

Miniature Speed Fasteners

A new development in the Speed Fastening range is in the area of miniature fasteners. These have been designed to provide an optimum level of joint performance whilst minimising the amount of space required on the joint surface.

Material	Finish
1.6mm Aluminium alloy (3.5% magnesium) to BS 1473 5154A DIN 1725 AlMg3.5 Werkstoff 3.3535	Natural
2.4mm Aluminium alloy (5% magnesium) to BS 1473 5056A DIN 1725 AlMg5 Werkstoff 3.3555	Natural



BEFORE PLACING

- A = Head Diameter
- B = Head Thickness
- C = Length
- D = Shank Diameter

Dimensions

Fastener Size	C		Hole Size		Part Number	Fasteners per pod*	A		B	D
	nom.	max.	min.	max.			min.	max.	max.	max.
1.6		4.11	1.80	1.93	01110-10400	63	2.54	2.80	0.61	1.78
		6.50	1.80	1.93	01110-10571	42	2.54	2.80	0.61	1.78
2.4		3.56	2.31	2.41	01810-06324	71	3.68	4.19	0.94	2.13
		4.57	2.31	2.41	01810-06314	55	3.68	4.19	0.94	2.13

Dimensions in millimetres

*Nominal value only. Tolerance ± 1 fastener per pod.

Please contact your local TFS representative for information on installation tools.

Installation Equipment



Handtools



Workstations



Bespoke Systems

From cost-effective handtools to bespoke assembly systems, Speed Fastening™ equipment offers rapid and reliable assembly. The equipment is an integral part of the speed fastening system and offers the following benefits:-

- High speed, repetitive fastener feed
- Typical assembly cycle times within two seconds
- Blind sided assembly
- Simple operation
- One tool places the entire range of speed fasteners with a simple modification
- Quick reloading
- Low maintenance costs
- Ideal for low volume batch work through to fully automated assembly lines

Speed Fastening™ Installation Equipment Matrix

			Fastener delivery			Equipment options											
			Magazine loaded	Preloaded on disposable mandrels	Bowl fed	Air cursor	Soft set	Automatic gap set	Fastener feed delay	Fastener counter	Auto trigger	Component detection	Automatic part ejection	Hydraulic pressure monitoring	Error Proofing	Pre-clamping	Hands free assembly
Variants	Use																
Hand held tooling																	
753 hydraulic pneumatic tool	Standard	Hand held fastening	S	X		X	X			X	X			X			
	Suspended	Hand held fastening lineside applications	S	X		X	X			X	X			X			
	Short barrel	Hand held fastening restricted access applications	S	X		X	X			X	X			X			
	Autoload	Hand held fastening; high volume lineside applications			S	X	X	X		X	X			X			
7271 pneumatic handtool	Standard	Hand held fastening	S	X							X						
	Broach load tool	Broach load testing	S	X													
Workstations - single head assembly																	
Fixed position, foot actuated	Bottom up 70510	Bottom up bench mounted assembly	S	X		X	X			X				X			
	Top down 7535	Top down bench mounted assembly	S	X		X	X			X				X			
	Rivmatic	Bottom up, continuous feed fastener workstation			S			S		S	X	X	X	X		X	X
Variable position, in line trigger	Balance arm 7535	Top down, XYZ motion, 800mm reach	S	X		X	X			X				X			
	Linear balanced 7535	Top down, free linear motion	S	X		X	X			X	X			X			
Workstations - multi head assembly																	
	Fixed position	Top down / bottom up; fixed fastener locations	S	X		X	X	X	X	X	X	X	X	X	X	X	X
	Variable pitch	Top down / bottom up; location variability in single axis	S	X		X	X	X	X	X	X	X	X	X	X	X	X
	Variable geometry	Top down / bottom up; location variability in XY axes	S	X		X	X	X	X	X	X	X	X	X	X	X	X
Automated assembly systems																	
	Mandrel injection & reload system - MIRS	Multi head, fixed centres assembly system			S					X		X		X	X	X	X
	Pick & multiplace system - PMP	Multi head, variable centres assembly system			S					X		X		X	X	X	X

S = standard X = option

Installation Equipment

Options

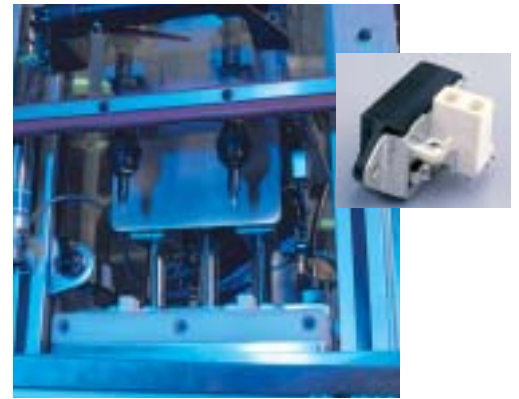
Option	Description	Benefits
Magazine loaded	Fasteners supplied in paper pod magazines	Up to 70 fasteners can be loaded at the same time
Preloaded on disposable mandrels	Fasteners supplied pre-loaded onto disposable mandrels	Reduces mandrel reload time
Bowl fed	Fasteners supplied loose	Eliminates time required for mandrel reload
Air cursor	Internal fastener feed mechanism required for miniature fasteners	Ideal for placing 1.6mm Avlug® fasteners, or where a mechanical cursor is not required
Soft set	Applies soft pre-broach force onto mandrel; detects fastener presence	Prevents actuation without fastener being present; ensures fasteners are level on multihead systems; ensures fastener position is controlled
Automatic gap set	Automatically sets the gap between nose piece and rivet head	Reduces mandrel reload time on multihead systems
Fastener feed delay	Fastener feed is delayed and triggered manually or by using sensors	Prevents component damage
Fastener counter	Counts the number of fastener actuations	Indicates when mandrel or mandrel jaw changes are required for maintenance purposes
Auto trigger	Tool is actuated by exerting pressure onto the nose tip of the tool	Ensures that components are clamped with the correct force prior to actuation
Component detection	Tool actuation will only be possible if sensors detect the presence of the component	Prevents actuation without component being present
Automatic part ejection	Parts are automatically ejected from the fastener heads after fastening	Increases speed of assembly
Hydraulic pressure monitoring	Alarm will trigger if actuation pressure is too low	Indicates possible fault with hydraulic pneumatic system
Pre-clamping	Components held together at predetermined force prior to fastener actuation	Improves joint quality
Hands free assembly	Components held in position during assembly	Operator is free to perform concurrent tasks
Error proofing	Guarding or clamping systems can be locked closed if all the correct conditions have not been met during the assembly sequence	Reduces the possibility of defective parts being produced



7535 balance arm workstation



Rivmatic® workstation



Twin head fixed pitch workstation



753 standard tool



23 placing heads to assemble a computer chassis

Handtools

753 Handtool

High performance, hydro-pneumatic handtool in heavy duty plastic, designed for rapid, blind side installation of speed fasteners. One tool places the entire range of speed fasteners.

Features	Benefits
STANDARD TOOL	
Average cycle time of less than 2 seconds	- Increased productivity - up to 1500 fasteners per hour
High capacity, magazine fed fasteners	- Reduced component handling and subsequent spillage
Robust & durable construction	- Suitable for most industrial environments
Lightweight construction and zero actuation recoil	- Reduced operator fatigue
Available with in-line handle and top or bottom hose configuration	- Optimised ergonomic performance for improved productivity
Low maintenance handtool	- Productive time is maximised No requirement for specialist maintenance training
Long life, self priming intensifier	- Consistent actuation and hence joint formation
Long reach barrel	- Can be used in many difficult access applications
OPTIONS	
Short barrel	
Tool is only 345mm long	- Can be used in areas with restricted operator space
Suspended	
Tool supported on a balancer	- Reduced operator fatigue
Tool suspended when not in use	- Tool can quickly and easily be moved or discarded - reducing downtime
Single handed use	- Other hand is free to hold or position work piece
Autoload	
Bowl fed fasteners	- Minimised reloading downtime maximises productivity
Diagnostic capability through operator interface	- Preventive maintenance regime can be implemented
Modular design with simple equipment access	- Very simple maintenance processes
Multiple hand tool nesting	- Reduced capital costs

7271 Handtool

High performance, pneumatic handtool in heavy duty plastic, designed for rapid, blind side installation of speed fasteners.

Features	Benefits
Average cycle time of less than 2 seconds	- Increased productivity - up to 1500 fasteners per hour
High capacity, magazine fed fasteners	- Reduced component handling and subsequent spillage
Robust & durable construction	- Suitable for most industrial environments
Broach load tool	
Accurate pressure gauge to record broach pressure	- Enables application to be checked and mandrel life to be calculated



753 Standard Tool



Suspended



Autoload



7271

Workstations - Single Head Assembly

Fixed position: foot actuated

Features	Benefits
Tool is actuated using foot pedal	<ul style="list-style-type: none"> Operator is free to use both hands to manipulate components Reduced operator fatigue
Bench mounted equipment	<ul style="list-style-type: none"> Easy and quick installation
Variable intensifier positioning	<ul style="list-style-type: none"> Work space utilisation can be maximised
70510 Bottom Up	
Bottom up fastening	<ul style="list-style-type: none"> Mandrel head can be used as fixture for components Quick and easy component alignment - reduces cycle times
Integral safety guard	<ul style="list-style-type: none"> Meets health & safety requirements
Bench mountable base	<ul style="list-style-type: none"> Base can be quickly attached or detached from an existing workbench
7535 Top Down	
Top down fastening	<ul style="list-style-type: none"> Ideal for applications requiring hands free blind access from above
Height adjustable arm can be configured to meet the operator's exact ergonomic needs	<ul style="list-style-type: none"> Reduced fatigue and improved productivity
90 degree head swivel for simple access	<ul style="list-style-type: none"> Reduced reload time
Rivmatic®	
Bowl fed system with continuous fastener feed	<ul style="list-style-type: none"> No reload time required - maximising throughput and productivity
Bottom up fastening	<ul style="list-style-type: none"> Mandrel head can be used as fixture for components Quick and easy component alignment - reduces cycle times
Diagnostic capability through operator interface	<ul style="list-style-type: none"> Preventive maintenance regime can be implemented
Modular design with simple equipment access	<ul style="list-style-type: none"> Very simple maintenance processes

Variable position: in line trigger

Features	Benefits
Top down fastening equipment with greater positional flexibility	<ul style="list-style-type: none"> Suited for multiple joint components Hands on control of actuation timing by the operator resulting in improved joint quality
In line trigger	<ul style="list-style-type: none"> Improved ergonomics and accuracy
Tool weight supported by balance arm	<ul style="list-style-type: none"> Reduced fatigue and improved productivity Eases tool movement allowing for easier and more accurate positioning
7535 Balance Arm	
Tool is mounted on an extendable balance arm with a reach of 800mm in each direction	<ul style="list-style-type: none"> Suitable for a wide range of applications Tool can be quickly and easily moved to or from the work piece area
7535 Linear Balanced	
Tool is mounted on a linear, vertically moveable arm	<ul style="list-style-type: none"> Tool can be quickly and easily moved to or from the work piece area



70510 Bottom Up



7535 Balance Arm



7535 Top Down



Rivmatic®

Workstations - Multi-head Assembly

Multi head assembly workstations are designed for the synchronous placement of multiple fasteners. Systems can be simple fixed, two head workstations or complex systems where as many as 60 fasteners can be placed at the same time. Most multi headed systems are customised to some extent which means that the user can enjoy the benefits of an assembly solution designed to their own specific requirements.

Features	Benefits
Synchronous fastener placement - more than 60 fasteners can be placed in less than 2 seconds	– Maximised productivity and throughput
In built fixturing	– Reduced assembly time
Modular assembly technology	– Reduced maintenance costs
Diagnostics capability	– Improved quality control – Preventive maintenance regimes can be implemented
In line integration	– These workstations can be readily integrated into existing production facilities
TYPES OF MULTI HEAD ASSEMBLY SYSTEMS	
Fixed position heads	– Ideal for single high volume applications
Variable pitch heads	– Suited for use with applications of similar geometry but where the hole separation may vary
Variable geometry systems	– Complete flexibility - with a variable geometry system a large number of applications can be fastened with quick and simple changeovers

Automated Assembly Systems

Automated assembly systems are designed for integration within production lines and offer a complete operator free assembly solution.

Features	Benefits
Bowl fed fasteners	– Continuous fastening
In line integration	– These workstations can be readily integrated into existing production facilities
Diagnostic capability through operator interface	– Preventive maintenance regime can be implemented
Modular design with simple equipment access	– Very simple maintenance processes
Variable broach force	– Optimised for each application to maximise first time quality
High speed soft set	– Improves positional accuracy of fastener at placement head, reducing the likelihood of operational error
MANDREL INJECTION & RELOAD SYSTEM (MIRS) Multi head fixed centre system ideal for rapid synchronous fastening	
Nose jaw cartridge system	– Rapid jaw change out to maximise uptime
Cylindrical, solid nose jaw	– Improved wear characteristics giving reduced maintenance costs – Smaller geometries available for difficult to access locations
PICK & MULTI PLACE (PMP) Single or multi head variable centre fastening system	
Flexible module manipulation	– Different applications can be assembled without the need for hardware changes

Options for Single, Multi-head and Automated Assembly Systems

Options (please refer to page 45 for further details)

Option	Description	Benefits
Soft set	Applies soft pre-broach force onto mandrel; detects fastener presence	Prevents actuation without fastener being present Automatically levels fasteners in multi head systems - improving quality Improves positional accuracy of fastener at placement head reducing the likelihood of operational error
Automatic gap setting	Automatically sets the gap between nose piece and rivet head	Reduces mandrel reload time on multi head systems
Fastener feed delay	Fastener feed is delayed and triggered manually or using sensors	Prevents component damage
Fastener counter	Counts the number of fastener actuations	Indicates when mandrel or mandrel jaw changes are required for maintenance purposes Ensures the correct number of fasteners are placed per application
Auto trigger	Tool is actuated by exerting pressure onto the nose tip of the tool	Ensures that components are clamped with the correct force prior to actuation
Component detection	Tool actuation will only be possible if sensors detect the presence of the component. Inductive proximity, optical, micro switch or roller switches may all be used.	Prevents actuation without component being present
Automatic part ejection	Parts are automatically ejected from the fastener heads after fastening	Increases speed of assembly
Hydraulic pressure monitoring	Alarm will trigger if actuation pressure is too low	Indicates possible fault with hydraulic pneumatic system
Pre-clamping	Components held together at predetermined force prior to fastener actuation	Improves joint quality
Hands free assembly	Components held in position during assembly	Operator is free to perform concurrent tasks
Error Proofing	Guarding or clamping systems can be locked closed if all the correct conditions have not been met during the assembly sequence.	Reduces the possibility of defective parts meeting the customer Simple diagnostics can be used to identify the problem



MIRS System to assemble vacuum pump



PMP System



29 placing heads to assemble computer chassis



10 placing heads to assemble automotive sealing strips

Bespoke Assembly Systems

Increase Productivity and Cut Costs

Many contract manufacturers work with TFS to develop new methods to increase productivity and ensure quality. A few years ago, one of these manufacturers had a request to weld and grind a customer's computer chassis assemblies. Using these methods, including the necessary weld clean-up, would have resulted in long assembly times for each chassis. It was obvious that a more efficient method was required in order to meet output requirements.

Manufacturing and process engineers met with TFS to discuss methods of replacing some of the welding operations with fasteners. A TFS Speed Fastening™ system, specifically Briv® fasteners were chosen to replace many of the welds. They could drastically reduce manufacturing costs by increasing throughput.

Briv® speed fasteners have wide hole fill capabilities, so with the use of different tool mandrels, they easily

adapt to differences in the punched hole size that result from die wear.

Next, four multi-head, semi-automated tools were designed to form a complete assembly line. One of these machines featured 34 heads to assemble several chassis components simultaneously. The flexible automation design allowed the same machines to assemble 5 different chassis designs on one line, freeing up valuable production space on the shop floor.

After the original concept was developed, adaptations were made to accommodate product design changes and then a prototype was built. This test machine passed with flying colours.

The systems' combination of flexibility and speed allows the manufacturer to meet their customer's daily quantity requirements easily. Each chassis can now be completed with a time

reduction of over 38% when compared to the welding option. This resulted in demonstrable savings in labour costs and floor space. The flexibility integral to the line design also allowed for very quick changeovers from one chassis to the next.

Quality has also been retained. Part sensors on the machines ensure quality throughput and the Briv® fasteners provide optimal joint integrity. Engineering managers report that squareness and strength have been maintained with very little fall-out, resulting in minimal rework.

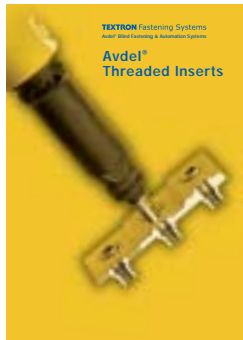
Safety of the machines' operators has not been compromised with these new assembly methods. Minimal part handling, use of ergonomic opti-touch sensors to activate the machine and an anti-tie-down feature (which ensures both hands are in the opti-touch actuators through the entire cycle of the machine) all help to protect the workers.

Views of the 34 head machine



The Range of TFS Blind Fastening & Lockbolt Systems

Please contact us to request a copy of any of the four brochures detailed below. Alternatively you can view them on our website: www.avdel.textron.com



Threaded Inserts

- The range of Avdel® Threaded Inserts
- Technical Data
- Selection Guides
- Customised Designs and Finishes
- Installation Tools



Lockbolt Systems

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- Technical Data
- Selection Guides
- Installation Tools



Breakstem Systems

- The range of Avdel® Breakstem Fasteners
- Technical Data
- Selection Guides
- Installation Tools
- Bespoke Assembly Equipment



70510 Workstation

- Features and Benefits
- Specification

TEXTRON Fastening Systems

Avdel® Blind Fastening & Automation Systems

AUSTRALIA

Textron Fastening Systems Pty Ltd

891 Wellington Road
Rowville
Victoria 3178
Tel: +613 9764 3877
Fax: +613 9755 7352
E-mail: custserv@textronfast.com.au

AUSTRIA

Avdel Verbindungselemente GmbH

Industriestrasse B-13 Halle 2
A-2345 Brunn/Gebirge
Tel: +43 2236 33273
Fax: +43 2236 33274

CANADA

Avdel Division of Textron Canada Ltd

87 Disco Road
Rexdale
Ontario M9W 1M3
Tel: +1 416 679 0622
Fax: +1 416 679 0678
E-mail: rbevan@act.textron.com

CHINA

Textron Fastening Systems China Ltd

Room 1708 Nanyang Plaza
57 Hung To Road
Kwun Tong
Kowloon
Hong Kong
Tel: +852 2950 0630
Fax: +852 2950 0022
E-mail: tfschina@netvigator.com

FRANCE

Avdel® s.a.

33 bis, rue des Ardennes
BP4, 75921 Paris Cédex 19
Tel: +33 1 4040 8000
Fax: +33 1 4040 8040
E-mail: info@avdel.fr

GERMANY

Textron Verbindungstechnik GmbH

Klusriede 24
D - 30851 Langenhagen
Tel: +49 511 7288 0
Fax: +49 511 7288 133
E-mail: info@avdel.de

ITALY

Textron Sistemi di Fissaggio SRL

Via Manin 350-21
It- 20099 Sesto San Giovanni
Milano
Tel: +39 02 262 9171
Fax: +39 02 242 4956

JAPAN

Avdel Kabushiki Kaisha

7F, New Erimo Building
2-2-1, Senba Nishi
Mino
Osaka 562-0036
Tel: +81 727 30 0838
Fax: +81 727 30 0837
E-mail: webadm@avdel.co.jp

KOREA

Textron Fastening Systems Korea

583-1 Munhyung-Ri
Opo-Eup Kwangju-City
Kyunggi-Do,
Korea 464-890
Tel: +82 31 767 4667 9
Fax: +82 2 3471 8917
Email: paul@tfskorea.com

SPAIN

Textron Sistemas de Fijación S.A.

c/ Puerto de la Morcuera, s/n
Poligono Industrial Prado Overa
Autovia Madrid Toledo Km 7.8
Es - 28916 Leganes (Madrid)
Tel: +349 134 16767
Fax: +349 134 16740
E-mail: textronespana@tfsspain.com

UNITED KINGDOM

Textron Fastening Systems Ltd

Mundells
Welwyn Garden City
Hertfordshire
AL7 1EZ
Tel: +44 1707 668668
Fax: +44 1707 338828

USA

Avdel Cherry Textron

614 NC Highway 200 South
Stanfield,
North Carolina 28163-0486
Tel: +1 704 888-7100
Fax: +1 704 888-0258
E-mail: info@tfsi.textron.com

Textron Fastening Systems HQ

516 Eighteenth Avenue
Rockford, Illinois 61104-5181
Tel: +1 815 961 5000
Fax: +1 815 961 5010

Your local distributor for TFS Speed Fastening™ Systems is:



www.avdel.textron.com