PSM International

FASTENERS FOR SPECIAL MATERIALS

Wherever you are... *we have the solution!*

FASTENERS FOR SPECIAL MATERIALS

INTRODUCTION

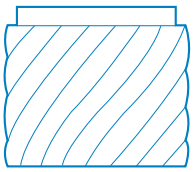
The introduction of new materials and their successful use by designers are usually dependant on a mechanical fastening system to allow dismantling for adjustment, servicing or repair.

The captive fasteners shown in this catalogue have been designed to meet the needs of designers who require the strength of a steel thread when using lightweight alloys such as magnesium and resin based printed circuit boards.

The information in this catalogue is intended as a general guide.

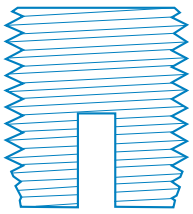
For further advice please consult your local PSM Sales Engineer or our Applications Engineers. The PSM Technology Centre can also provide pre-production test facilities for accurate performance data.

PRECISION HARDENED INSERTS & STUDS



PRECISION HARDENED INSERTS & STUDS - These fasteners have been designed to provide a hardened steel thread to resist tensile and torsional loading in the softer aluminium and zinc based diecastings.

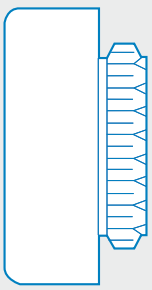
HARDENED STEEL SCREW-SERTS



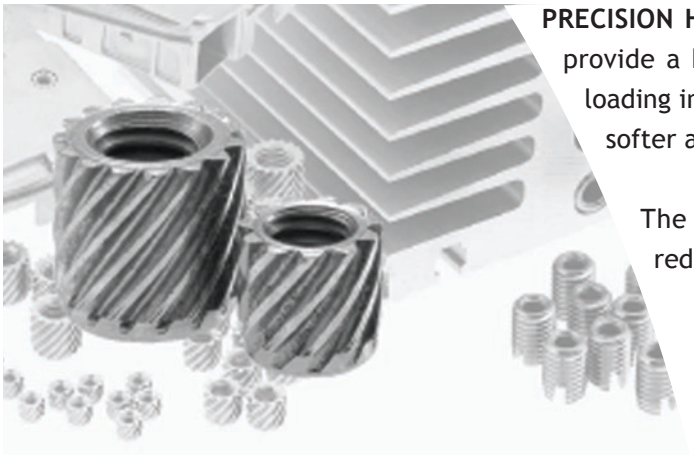
HARDENED STEEL SCREW-SERTS - The Screw-sert range of fasteners have been designed to provide a hardened steel thread in the softer aluminium and zinc based diecastings, magnesium and thermosetting plastics.

PRINTED CIRCUIT BOARD FASTENERS

PRINTED CIRCUIT BOARD FASTENERS - These fasteners have been designed to provide a metallic deep tapped thread into resin based printed circuit boards.



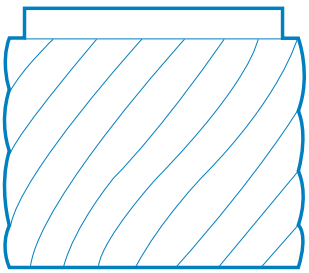
PRECISION HARDENED INSERTS & STUDS



PRECISION HARDENED INSERTS & STUDS have been designed to provide a hardened steel thread to resist tensile and torsional loading in the softer aluminium and zinc based diecastings.

The external spiral knurl cuts into the parent material reducing radial stresses in the casting.

ADVANTAGES



- EASY ASSEMBLY WITH ANY SQUEEZE PRESS
- LOW BURSTING STRESS ALLOWS THE USE OF THINNER WALLED BOSSES
- STEEL THREAD PROVIDES A HIGH DEGREE OF RE-USABILITY
- INSTALLED INTO PLAIN CORED HOLE
- ELIMINATES TAPPING OPERATIONS

DESIGNGUIDE

JOINT DESIGN

To achieve optimum pull-out performance the joint must be designed with a stationary mating component in contact with the face of the insert.

HOLE PREPARATION

Holes may be cored or drilled. The taper on a cored hole should be 0.5~ inclusive and the hole diameter recommended should apply at the point reached bythe bottom of the insert.

INSTALLATION

See page 8.

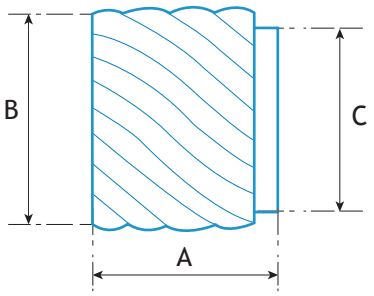
WALL THICKNESS

The minimum wall thickness will vary with the ductility of the diecasting alloy, but as a general guide wall thickness should not be less than the nominal thread diameter.

Specific use of materials like magnesium and applications requiring thinner boss walls may require subtle changes to the design of the insert. In either case consultation with the PSM Technology Centre or local Sales Office and pre-production testing is essential.

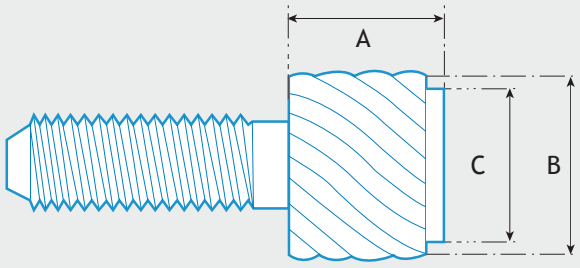
TECHNICAL DATA PHI & PHS

INSERTS



Product Code PHI

STUDS



Product Code PHS

STANDARD MATERIAL-Case Hardened Mild Steel
STANDARD FINISH-Zinc & Chromate

DIMENSIONS

INTERNAL THREAD SIZES		A Length	B Knurl Diameter	C Pilot Diameter	Recommended Hole Size
Unified	ISO Metric	mm	mm	mm	mm
4	2.5	4.5	5.3	4.8	4.85
-	3	4.5	5.3	4.8	4.85
6	3.5	5.6	6.2	5.5	5.60
8	4	6.9	7.7	7.1	7.20
10	5	6.9	7.7	7.1	7.20
1/4	6	9.5	10.3	9.5	9.60

STUD LENGTHS - Lengths Available ('L')

MILLIMETRES	5	6	8	10	12	14	16	18	20
INCHES	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8

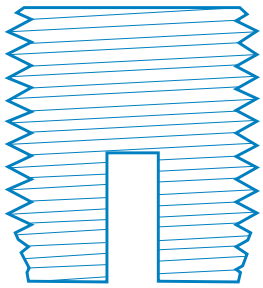
HOW TO SPECIFY

PHI		PHS	
PRODUCT CODE	PHI-M3	PRODUCT CODE	PHS-M3-10
THREAD SIZE	PHI-M3	THREAD SIZE	PHS-M3-10
		LENGTH	PHS-M3-10

HARDENED STEEL SCREW-SERTS

The PSM **SCREW-SERT** range of fasteners have been designed to provide a hardened steel thread in the softer aluminium and zinc based diecastings, magnesium and thermosetting plastics. The external thread cuts into the parent material reducing radial stresses in the casting.

ADVANTAGES



- STEEL THREAD PROVIDES HIGH DEGREE OF RE-USABILITY
- ELIMINATES TAPPING OPERATIONS
- HIGH PULL-OUT RESISTANCE
- INSTALLED INTO PLAIN CORED HOLE
- HIGH MECHANICAL STRENGTH ENABLES USE OF REDUCED DIAMETER FASTENERS
- IDEAL WHERE JACK-OUT IS UNAVOIDABLE

DESIGNGUIDE

HOLE PREPARATION

Hole diameter will vary with the type of material used.
For this reason the data table shows the hole size ranges for the different material classes.

Holes may be cored or drilled. The taper on a cored hole should be 1° inclusive and the hole diameter should apply at the point reached by the bottom of the insert.

A 60° countersink at the top of the hole is strongly recommended 1 order to avoid the risk of chipping to the surrounding surface.
The depth of the countersink should be equal to the external thread pitch of the insert.

The depth of blind holes must be a minimum of 1.2 x insert length.

TYPE OF LOADING

Direct torque loads should be avoided with this type of insert.

INSTALLATION

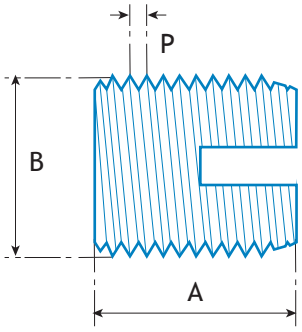
See page 8.

WALL THICKNESS

A general guide to minimum wall thickness is given in the table, but this will vary according to the ductility of the die casting alloy. Special modified inserts can be supplied to cater for applications where smaller bosses are required in certain materials such as magnesium. Please contact PSM Technology Centre or your local Sales Office for assistance.

TECHNICAL DATA SCT

INSERT



Product Code SCT

STANDARD MATERIAL - Case Hardened Mild Steel

DIMENSIONAL REFERENCES

INTERNAL THREAD SIZES		A	B	C	Minimum Wall Thick ness
Unified	ISO Metric	mm	mm	mm	
4	2.5	6.0	4.5	0.50	8.0
-	3	6.0	5.0	0.50	8.0
6	3.5	8.0	6.0	0.75	10.0
8	4	8.0	6.5	0.75	10.0
10	5	10.0	8.0	1.00	13.0
-	6a*	12.0	9.0	1.00	15.0
1/4	6	14.0	10.0	1.50	17.0
5/16	8	15.0	12.0	1.50	18.0
3/8	10	18.0	14.0	1.50	22.0
1/2	12	22.0	16.0	1.50	26.0
-	14	24.0	18.0	1.50	28.0
-	16	22.0	20.0	1.50	27.0

DIMENSIONAL REFERENCES

High Strength >320 N/mm² (>35 H.BAR)	MATERIAL CLASS Medium Strength 235-320 N/mm² (25-35 H.BAR)	Low Strength <235 N/mm² (<25 H.BAR)
4.2-4.3	4.1-4.2	4.1-4.2
4.8-4.9	4.7-4.8	4.6-4.7
5.6-5.7	5.5-5.6	5.4-5.5
6.1-6.2	6.1-6.2	5.9-6.0
7.5-7.6	7.4-7.5	7.2-7.4
8.5-8.7	8.4-8.5	8.2-8.4
9.3-9.4	9.1-9.3	8.7-9.0
11.2-11.3	11.0-11.2	10.8-11.0
13.2-13.4	13.0-13.2	12.8-13.0
15.2-15.4	15.0-15.2	14.8-15.0
17.2-17.3	17.0-17.1	16.8-17.0
19.2-19.4	19.0-19.2	18.8-19.0

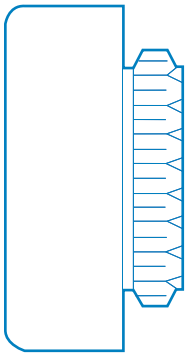
HOW TO SPECIFY

SCT	
PRODUCT CODE	SCT-S-M3
MATERIAL	SCT-S-M3
THREAD SIZE	SCT-S-M3

PRINTED CIRCUIT BOARD FASTENERS

The PSM **SCREW-SERT** range of fasteners have been designed to provide a hardened steel thread in the softer aluminium and zinc based diecastings, magnesium and thermosetting plastics. The external thread cuts into the parent material reducing radial stresses in the casting.

ADVANTAGES



- SIMPLE PRESS-IN INSTALLATION
- HIGH PULL-OUT
- GUARANTEED NOT TO CRACK BRITTLE PCB

DESIGNGUIDE

HOLE PREPARATION

Holes must be held to a tolerance of -0.000 +0.075mm.

INSTALLATION

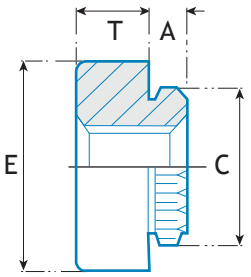
All Self-Broaching fasteners are easy to install as no special tooling is required. However - this must always be carried out using a squeeze action - never a shock load. (See page 8).

POSITIONING THE FASTENER

The recommendations given in the table must be closely followed to prevent chipping at the edge of the board.

TECHNICAL DATA

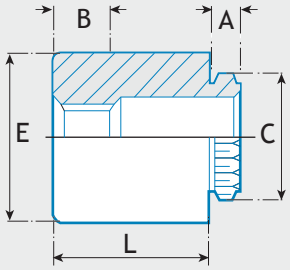
BUSH



Product Code PCBR

STAND ARD MATERIAL-Mild Steel (Electrotinned)

STAND OFF



Product Code SCBR

DIMENSIONS

INTERNAL THREAD SIZES		A	B	C	T	E	Hole Size in board	Minimum distance from centre line to board edge
Unified	ISO Metric	mm	mm	mm	mm	mm	mm	mm
2	2	1.5	2.0	4.06	1.5	5.54	3.7	3.5
-	2.5	1.5	2.0	4.55	1.5	5.54	4.2	4.5
4	3	1.5	2.0	4.55	1.5	5.54	4.2	4.5
6	3.5	1.5	2.0	5.74	2.0	7.00	5.4	5.0
8	4	1.5	3.0	6.68	2.0	8.72	6.4	6.5
10	5	1.5	3.0	7.24	3.0	9.53	6.9	7.0
1/4	6	1.5	6.0	8.66	6.0	10.00	8.3	8.0

STANDOFF - Lengths Available ('L')

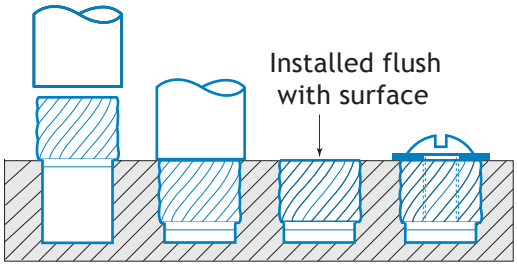
MILLIMETRES	3	4	5	6	8	10	12	14	18	20	25
INCHES	1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2	3/4	7/8	1

HOW TO SPECIFY

PCBR		SCBR	
PRODUCT CODE	PCBR-M3	PRODUCT CODE	SCBR-M3
THREAD SIZE	PCBR-M3	THREAD SIZE	SCBR-M3
		LENGTH	SCBR-M3-10

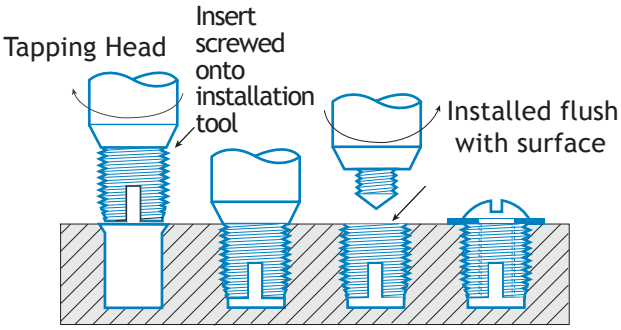
RECOMMENDED INSTALLATION SEQUENCES

PRECISION HARDENED INSERTS & STUDS



The insert must be installed by a steady squeeze action press with tooling that will allow the insert to rotate.
Care must be taken during installation to ensure that the insert is kept axially square, avoiding side loads that may damage the boss.

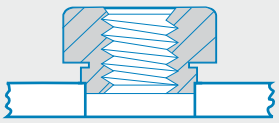
SCREW-SERT INSERTS & STUDS



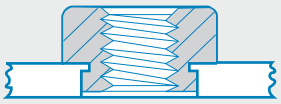
The insert is installed using traditional tapping principles. Installation can be carried out using a hand tool (for low volumes), a tapping head attachment for a pillar drill, a standard tapping machine or fully automatic installation equipment.

PRINTED CIRCUIT BOARD FASTENERS

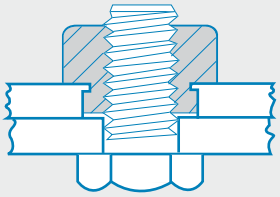
1. Form a hole in the material to size recommended and install the fastener square in the hole.



2. Apply pressure to the head of the fastener sufficient to totally install the broaching feature into the board, locking the fastener securely in place.



3. Insert fixing screw or bolt from side opposite to the fastener head.



TOTAL ASSEMBLY SOLUTIONS

PSM's philosophy is to provide a total package of fastener design, prototype production, application advice, installation systems and technical liaison for design and production engineers worldwide.