

# TRISERT-3<sup>®</sup> FOR CRITICAL APPLICATIONS



The standard Trisert range has for many years included three primary designs, Double Ended, Reduced Headed and Regular Headed variants. These solve most application problems in thermoset and thermoplastic grades, including the latest engineering plastics. The concept of the Trisert design is to provide a reliable and efficient post-mould process, where the installation torque can be controlled and monitored for greater reliability. As the internal thread is used to install the Trisert, every insert is therefore automatically checked in the moulding for the existence of a good thread.

Trisert-3 is the latest addition to this family and has been developed to expand the proven Trisert range into more critical applications.

Trisert-3 has three cutting features to provide more balanced cutting forces and therefore reduced installation

torque, compared to the many cross-slot designs available, that only have two cutting features.

The Trisert-3 design maintains the complete cylinder design that provides a stronger body, size-for-size, than the slotted design and also allows it to be used in pull-through applications, without any problems due to increased assembly torque associated with slotted inserts.

Trisert-3 is available in two lengths - regular and long - and is based upon the Trisert Reduced Headed design. This provides an increased bearing surface that not only allows higher tightening torques to be applied, but also provides more support to softer mating components. The head diameter is designed to exactly fit the counter bore in the prepared hole, and thus presents a neat flush fit finish, where required.

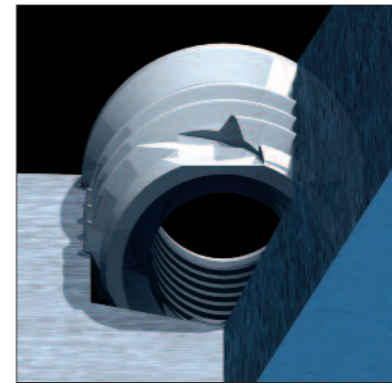
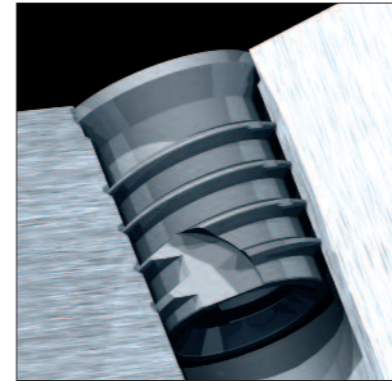
## MATERIAL GRADES

In most applications into plastic, the standard brass Trisert offers a satisfactory and economic solution with good wear resistance and strength. Also it will withstand corrosion in most environments without any second operation surface treatment.

In order to meet the requirements of a wider range of host materials and harsher applications, the selection of the material for the Trisert-3 was very important. Thus the Trisert-3 is offered in two grades of Stainless Steel (303 and 316) and also in case hardened steel with a zinc nickel, trivalent passivated finish.

A key feature of the Trisert-3 is its ability to withstand critical environmental conditions, such as marine and chemical/food processing, while still retaining good wear resistance and strength.

## TRISERT-3 REDUCED HEADED



The concept of the Trisert-3 design is to provide a reliable, strong and wear resistant thread in applications, environments and materials that would be unsuitable for brass inserts.

### Product Features

The design combines three cutting facets with three shallow flutes offering balanced cutting and enhanced back out performance.

The internal thread is not interrupted by cutting features and therefore will guarantee a free running internal thread without the risk of swarf jamming the screw.

The Steel variant is case hardened and is offered with a zinc nickel trivalent passivated finish to meet the requirements of RoHS and provide good corrosion resistance.

Installation may be by hand tool or Tappex FlexiArm complete with air tool and Tappex Production Driver. Additionally the installation torque can be controlled and monitored for increased reliability.

In the case of metal alloys, the use of cutting fluid is necessary to enhance the cutting action of the insert and ease installation. Alufluid supplied by Tapmatic has proven very effective.

As with the brass insert, the internal thread is used for installation. Every insert is therefore automatically checked for the presence of a good thread.

The reduced head design offers greater surface area over which application loads can be taken without increasing the receiving hole diameter.

The head diameter is designed to fit the counter bore in the receiving hole and therefore provide a flush finish.

### Material Grades for Trisert-3

A key feature of this type of insert is its ability to withstand harsh environments and corrosive atmospheres whilst retaining good wear resistance and strength.

### Steel

#### Case Hardened Zinc Nickel and Trivalent Passivate

- RoHS Compliant
- Corrosion resistance up to 720hrs to red rust
- Coating is hard and wear resistant
- Low sensitivity to temperature and temperature cycling - up to 140°C
- When passivate layer breaks down the white corrosion product is not excessive

### STAINLESS Steel

Conventional stainless steel has at least 12% chromium to provide corrosion resistance via the formation of a thin coating of chromium oxide, known as the passivity film, which forms spontaneously upon contact with an oxidising agent. Generally the higher the chromium content, the better the corrosion resistance.

Trisert-3 is available in two grades of Stainless Steel which are passivated to remove impurities from the surface left by the machining process. These impurities, if left, would interrupt the passivity film and create sites where corrosion could start.

### Grade 303

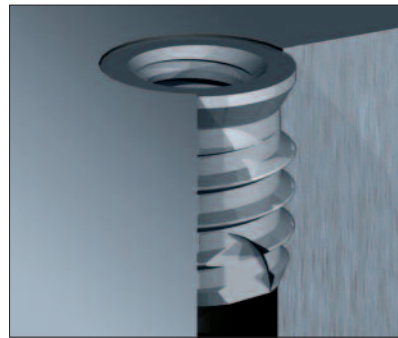
This grade offers a good combination of machinability, corrosion resistance and toughness. In general, 303 has good resistance to mildly corrosive atmospheres but the sulphide inclusions act as pit initiation sites. It should not be exposed to marine or other similar environments, as these will result in rapid pitting corrosion. It is also subject to stress corrosion cracking in chloride containing environments above about 60°C.

### Grade 316

This is the standard grade of austenitic stainless steel containing molybdenum. The molybdenum gives 316 better overall corrosion resistance, and its austenitic structure provides excellent toughness, even down to cryogenic temperatures.

It has excellent corrosion resistance in a range of atmospheric environments and many corrosive media. It is regarded as the standard "marine grade stainless steel", but it is not resistant to warm sea water. In many marine environments 316 does exhibit surface corrosion, usually visible by brown staining. This is particularly associated with crevices and rough surface finish.

## TRISERT-3 REDUCED HEADED



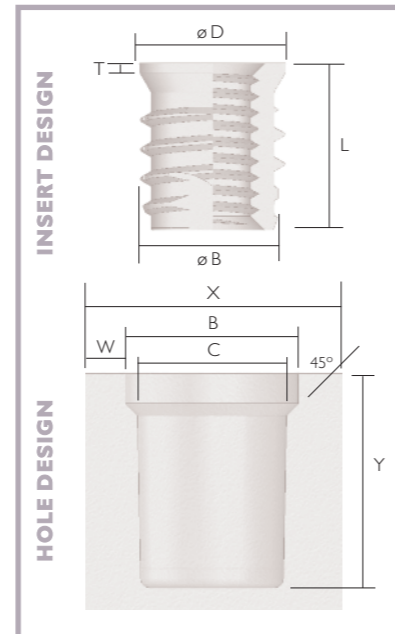
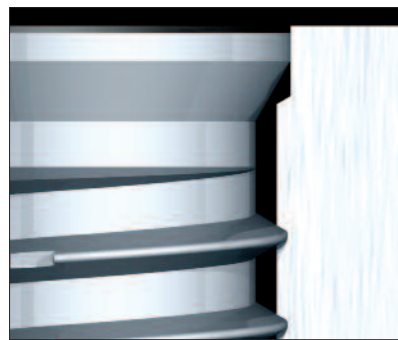
Due to the various mechanical characteristics, a precise hole size specification is imperative.

A minimum hole depth of 1.2 x the insert length would normally be specified, with the insert installed to a maximum of 0.3mm sub flush to the surface.

Stainless steel threaded fasteners generally should not be assembled using very high speed equipment, as mating surfaces will be subject to galling and may cold-weld together leaving a falsely tightened joint.

It is therefore recommended that when a stainless steel screw is assembled to a stainless steel Trisert-3, a suitable lubricant containing Molybdenum Di-sulphide and PTFE is used.

However, although lubricants can assist on the assembly of a joint, they will dramatically lower the torque resistance and could cause the thread to fail if tightening torques are not adjusted.



## TRISERT-3 BLIND ENDED



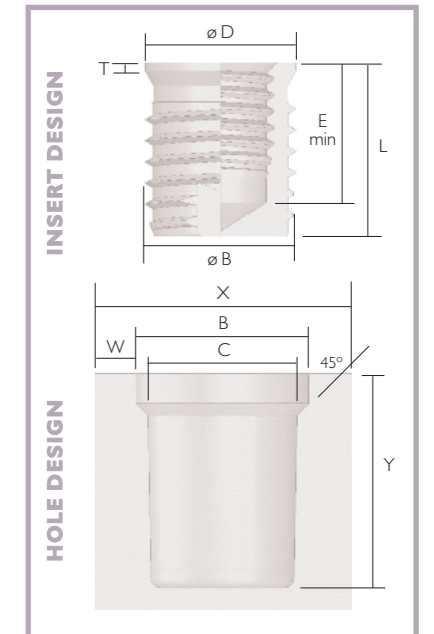
Self-tapping, reduced headed, blind ended, stainless steel inserts available in regular and long lengths in thread size M10.

### Product Features

With the same external features as the standard Trisert-3 the blind ended version is supplied with a closed end.

This variant offers all the benefits of the standard part enhanced by the specific advantages offered by a blind insert where the application dictates this is required.

Offered in M10 and Stainless Steel only, other thread sizes will be considered when requested.



New for 2010 - M12 versions in both insert types

TRISERT-3 REDUCED HEADED													
SIZE	PITCH INTERNAL	DIA. EXTERNAL B	LENGTH L	HEAD THICKNESS T	HEAD DIA. D	HOLE		HOLE DEPTH Y	BOSS DIA. X	WALL THICKNESS W	PART NO.s CASE HARDENED	PART NO.S STAINLESS STEEL	PART NO.S STAINLESS STEEL
						DIA. C	DIA. C						
						PLASTICS	ALLOYS						
								STEEL	303	316			
M3	0.50	4.73	5.25	0.38	4.70	4.10 - 4.40	4.35 - 4.55	5.80	7.70	1.65	6238M3	6238M3-303	6238M3-316
M3	0.50	4.73	6.25	0.38	4.70	4.10 - 4.40	4.35 - 4.55	6.90	7.70	1.65	6270M3	6270M3-303	6270M3-316
M4	0.70	6.31	7.10	0.38	6.30	5.80 - 6.10	5.95 - 6.15	7.90	10.70	2.30	6238M4	6238M4-303	6238M4-316
M4	0.70	6.31	8.40	0.38	6.30	5.80 - 6.10	5.95 - 6.15	9.30	10.70	2.30	6270M4	6270M4-303	6270M4-316
M5	0.80	7.50	8.40	0.40	7.50	6.90 - 7.20	7.15 - 7.35	9.30	12.60	2.70	6238M5	6238M5-303	6238M5-316
M5	0.80	7.50	10.00	0.40	7.50	6.90 - 7.20	7.15 - 7.35	11.00	12.60	2.70	6270M5	6270M5-303	6270M5-316
M6	1.00	8.69	9.80	0.45	8.60	8.00 - 8.40	8.35 - 8.55	10.80	14.70	3.15	6238M6	6238M6-303	6238M6-316
M6	1.00	8.69	12.00	0.45	8.60	8.00 - 8.40	8.35 - 8.55	13.20	14.70	3.15	6270M6	6270M6-303	6270M6-316
M8	1.25	11.06	12.40	0.50	11.10	10.10 - 10.60	10.55 - 10.85	13.70	18.60	4.00	6238M8	6238M8-303	6238M8-316
M8	1.25	11.06	14.00	0.50	11.10	10.10 - 10.60	10.55 - 10.85	15.40	18.60	4.00	6270M8	6270M8-303	6270M8-316
M10	1.50	13.95	12.00	0.75	14.10	13.00 - 13.50	13.45 - 13.65	13.20	23.70	5.10	6239M10	6239M10-303	6239M10-316
M10	1.50	13.95	16.00	0.75	14.10	13.00 - 13.50	13.45 - 13.65	17.60	23.70	5.10	6238M10	6238M10-303	6238M10-316
M10	1.50	13.95	18.00	0.75	14.10	13.00 - 13.50	13.45 - 13.65	19.80	23.70	5.10	-	6270M10-303	6270M10-316

These materials and coatings are RoHS compliant

NOTE - all dimensions in mm

TRISERT-3 BLIND ENDED														
SIZE	PITCH INTERNAL	DIA. EXTERNAL B	LENGTH L	BOLT ENGAGEMENT E	HEAD THICKNESS T	HEAD DIA. D	HOLE		HOLE DEPTH Y	BOSS DIA. X	WALL THICKNESS W	PART NO.s CASE HARDENED	PART NO.S STAINLESS STEEL	PART NO.S STAINLESS STEEL
							DIA. C	DIA. C						
							PLASTICS	ALLOYS						
									STEEL	303	316			
M10	1.50	13.95	16.00	8.30	0.75	14.10	13.00 - 13.50	13.45 - 13.65	17.60	23.70	5.10	-	6238M10B-303	6238M10B-316
M10	1.50	13.95	18.00	10.30	0.75	14.10	13.00 - 13.50	13.45 - 13.65	19.80	23.70	5.10	-	6270M10B-303	6270M10B-316

### HOLE DIAMETER TOLERANCE INFORMATION

The information given under hole diameter 'C' are suggested dimensions for a range of grades of materials and applications. The hole diameter for ALLOYS is determined by considering the ductility of the material. In most cases Cast alloys (low ductility) require a smaller hole; Extruded alloys (high ductility) require a larger hole. The hole diameter for PLASTICS is determined by considering the hardness of the material. Generally the softer grades of plastic require the smaller hole while harder grades or those with a filler require a larger hole. We would recommend testing the suitability of a particular hole size for the specific grade of material to be used.

### DETAILED HOLE INFORMATION IS AVAILABLE FOR SPECIFIC APPLICATIONS AND MATERIALS

Information given under the hole design section above is intended to indicate approximate dimensional requirements for satisfactory installation of the insert, it is not intended for production tooling.

### Trisert-3 Principal Advantages

- Available in 316 Stainless Steel, 303 Stainless Steel and Steel Case Hardened Zinc Nickel, plated and Trivalent Passivated.
- The reduced head provides a large bearing surface to support the load transmitted through the bolt.
- Quicker installation when compared to similar self tapping inserts.
  - Stainless Steel parts have a greater helix angle
- Free running internal thread.
  - No peripheral through holes or slots which can allow swarf into the bore of the insert
  - Cutting features designed to encourage swarf to move forward ahead of the insert.
- Compatible with brass Trisert hole sizes where both corrosive and non-corrosive environments must be considered.
- Reduced external diameter as cutting edges are fully supported.
- Ease of identification for manipulative orientation.
- Steel variant is case hardened for use into alloys and critical hard composites.
- Steel variant offers a fully RoHS compliant corrosion resistant plated finish giving a salt spray resistance of up to 720 hrs to red rust.
  - Zinc Nickel and Trivalent Passivate
- The regular length insert will, under most circumstances, be strong enough where a free running re-usable thread is required; however a long version is available for higher load applications.
- The insert has a self locking feature to help resist rotation where nylon patched bolts are used or where the application is subject to vibration.
- The range includes thread sizes: M3, M4, M5, M6, M8, M10.
- Also available as a blind ended variant in thread size M10 (316 and 303 Stainless Steel only).