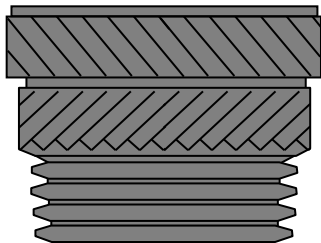




TRI-STEP ALUMINIUM INSERTS



The TRI-STEP™ aluminium threaded insert range is designed for heat or ultrasonic installation into thermoplastic materials. It has been developed to specifically meet the demanding Requirements of the Automotive industry. It provides the benefits of high performance, excellent location, large bearing surface, weight reduction and low In-place cost of typically 20% to 30% over conventional insert.

Benefits:

The combination of a number of factors contributes to make the Tri-Step Aluminium Insert a highly efficient in-place cost product resulting in significant financial and technical benefits to the user. These are summarised as follows:

Performance and Alignment:

- Equivalent pull out and direct torque performance to inserts made from brass
- Insert and hole geometry eliminate misalignment of insert during installation and insert spring back at the end of the installation process
- High surface contact area where the insert meet the screw gives greater resistance to Jack-out

Process Efficiencies:

- 40% better thermal conductivity of Aluminium compared to Brass or Steel reduces the heating preparation time prior to installation of the insert and cools more rapidly once installed
- 66% reduction in insert travel time due to the insert and the hole geometry
- Elimination of 1 to 2 second dwell time that is required with tapered inserts to prevent spring back

Ecological:

- 66% weight reduction using Aluminium compared to Brass or Steel inserts allowing for more fuel efficiencies when used in the automotive applications
- Lead Free



DESIGN GUIDE

Hole Preparation

The specified hole diameters apply at the bottom of each bore. A 1° inclusive moulding taper must be used, slightly increasing the hole diameter at the top of each bore. Hole diameter tolerance - 0.00 +0.10mm. Hole depth should exceed the insert length (A) by a minimum of 0.5mm.

Installation

The insert may be installed using either a pre-heating process or by using heat generated by ultrasonic.

An insert at the correct temperature should soften the plastic without melting, allowing plastic to flow into the knurls and vanes. Excessive heat can affect insert performance and generate plastic flash on the top surface of the boss. Inserts should be installed flush to slightly proud, to the top surface of the boss.

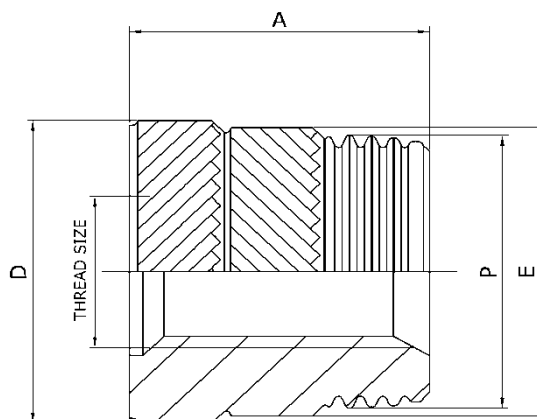
Boss Diameter

The boss diameter shown (d5) is a minimum recommendation, where moulding design permits, this should be increased for greater boss strength.

How to specify

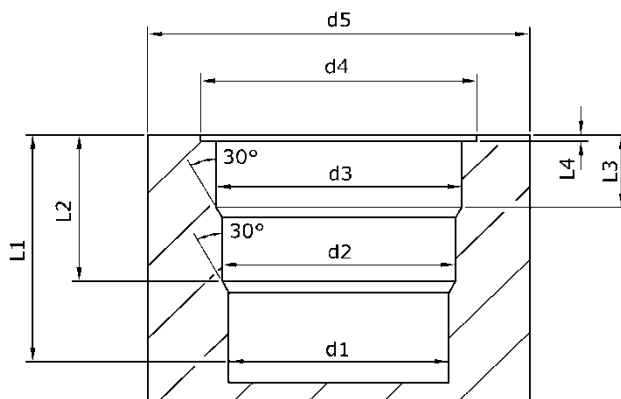
Product Code **TST-A-M6**
Material **TST-A-M6**
Thread Size **TST-A-M6**

Insert Dimensions



	A	D	E	P
M6	11.0	12.0	11.4	10.8
M8	13.5	14.0	13.4	12.8

Hole Dimensions



	d1	d2	d3	d4	d5	L1	L2	L3	L4
M6	10.25	10.9	11.5	13.0	18.0	11.0	7.1	3.5	0.5
M8	12.3	12.9	13.5	15.0	22.0	13.5	8.7	4.3	0.5

PERFORMANCE GUIDE

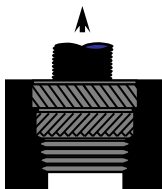
TRI-STEP was developed specifically for the automotive industry, in particular for the demanding engine compartment components. In most instances glass fibre reinforced nylon type PA6GF30 is the selected plastic material for these applications. Therefore, this material was selected to provide a typical guide to performance.

TEST CONDITIONS

Moulded PA6GF30 test bosses
Holes moulded to our design guide recommendations
Production manufactured inserts
Heat installation at a nominal temperature of 300° C
Tests conducted using grade 12.9 Cap Head Screws
Results based on ten individual tests

PULL OUT

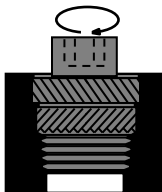
The most important performance characteristic, it ensures joint integrity under application conditions and in combination with the mating part, resists torque induced tensile loading.



M6	6575 - 7487N
M8	7727 - 8780N

BODY TORQUE

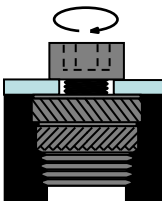
Measures the inserts resistance to turning if subjected to a direct torque loading.



M6	23 - 26Nm
M8	36 - 40Nm

MAXIMUM TORQUE

Measures the thread failure torque of the insert when assembled with a metal mating part.



M6	24 - 28Nm
M8	38 - 43Nm