

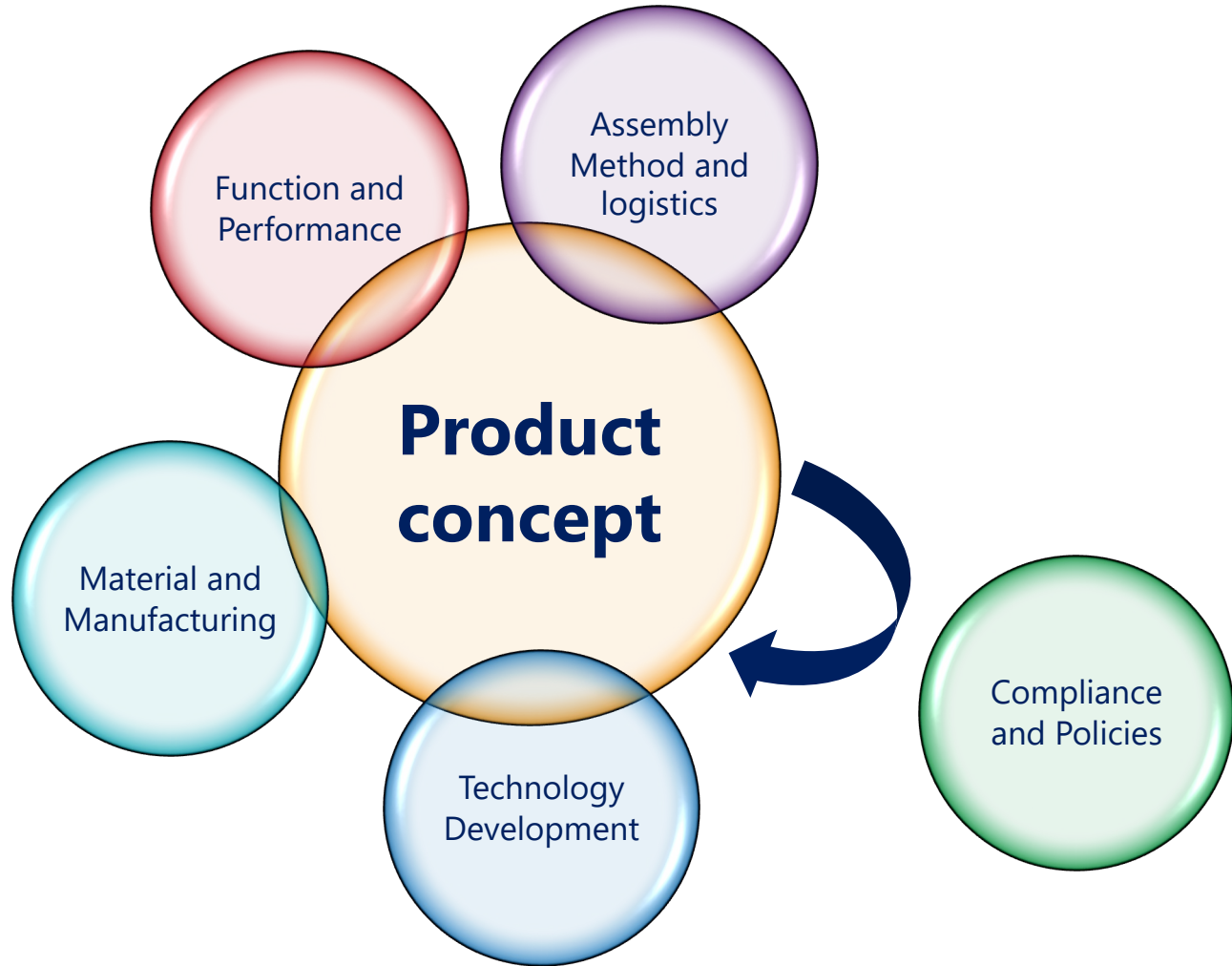


part of the Trifast plc Group

**Our fasteners enable
innovation today to
build a better tomorrow**

www.trfastenings.com

**When to think
about fasteners in
future mobility**



When:

- Changes can be made at lowest cost
- Products can be enhanced
- Encompass design
- Distortions and disruptions





3 Engineering principles to design now for the future

- **Modular build**
 - Increase adaptability
 - Enables incremental technology advancement
 - Improved aftermarket servicing possibilities
 - Improve disassembly for recyclability
- **Standardisation and Rationalisation**
 - Reduction of design stage and application testing requirements
 - Reduction of time to market
 - Increased expected reliability through use of proven technology
 - Part count reduction and less tooling variation
- **Reduce complexity**
 - Allows greater focus on core technologies and development
 - Supplier on-shoring and near-shoring and availability
 - Get support





We supply components to over 5,000 companies globally across a wide range of industries



Light vehicle



Heavy vehicle



Health & home



Energy, tech & infrastructure

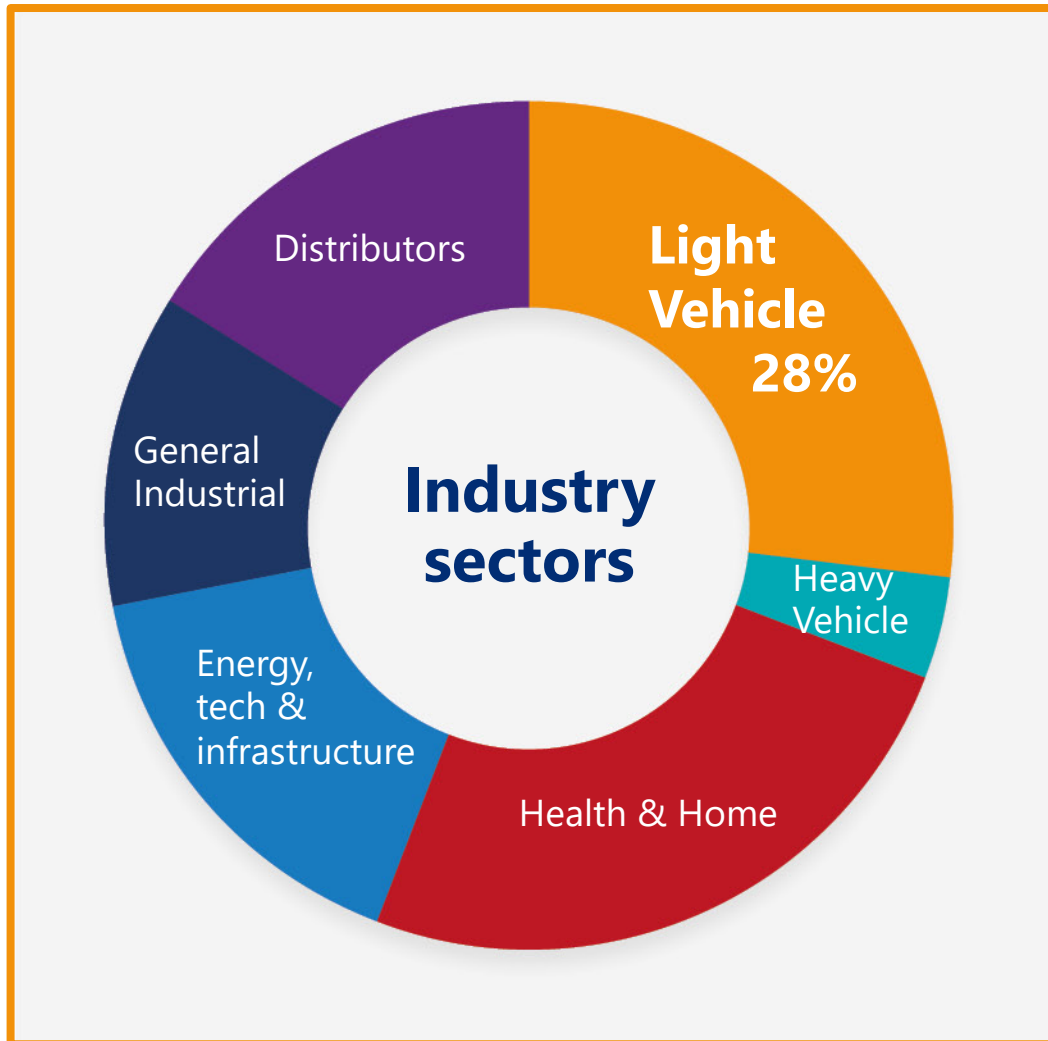


General industrial



Distributors





Manufacturing

5 manufacturing sites with IATF 16949




Full BOM capabilities

(Bill Of Materials)



Global automotive sales team

GAD (global account directors)
SAM (sales account managers)



Application engineering

- Research & development
- CAD design & development
- Prototype & testing
- Technical & Innovation Centres
- Internal/external design team



Supply

Global approved vendor list, regional sourcing teams with global supply



Group interface management

- EDI portal
- Global Enquiry Portal & database



Global presence with worldwide reaching experience and support

TR part of the Trifast plc Group

UK

Trifast plc & Group Services head office - Uckfield

- Belfast
- Birmingham
- East Grinstead
- East Kilbride
- Lancaster
- Manchester
- Newton Aycliffe

Europe

- Germany - Verl
- Holland - Oldenzaal
- Hungary - Szigetszentmiklos
- Ireland - Mallow
- Italy - Fossato di Vico
- Poland - Warsaw
- Spain - Barcelona
- Sweden - Nacka, Tidaholm & Gothenburg



Global facilities



In **17** countries, supplying over **70** countries



7 manufacturing sites
5 with IATF



3 technical & innovation centres



c.**1,400** employees



Producing approx. **8 billion** parts annually



Light vehicle



Health & home



Distributors



Heavy vehicle



Energy tech & infrastructure



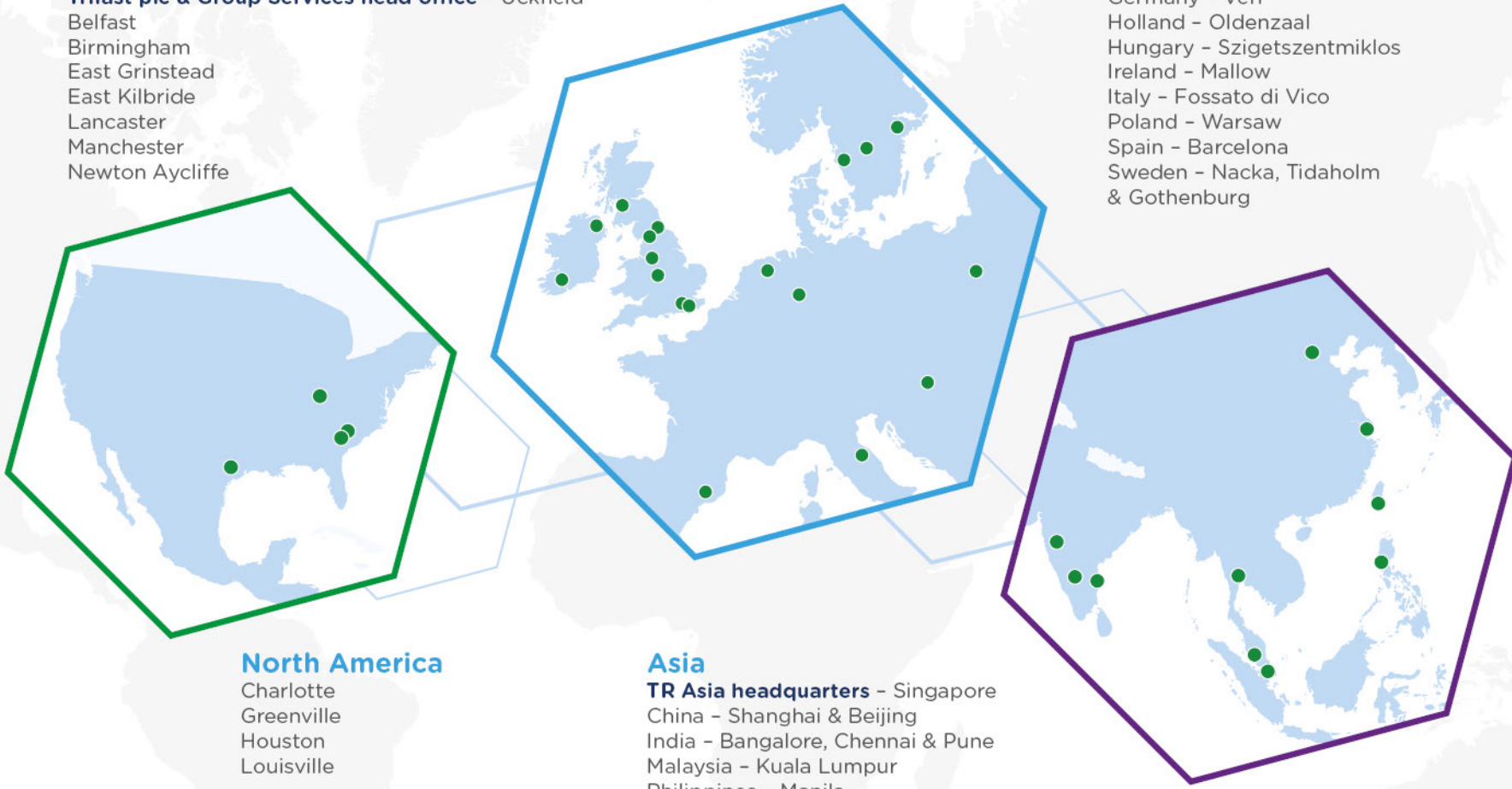
General Industrial

North America

- Charlotte
- Greenville
- Houston
- Louisville

Asia

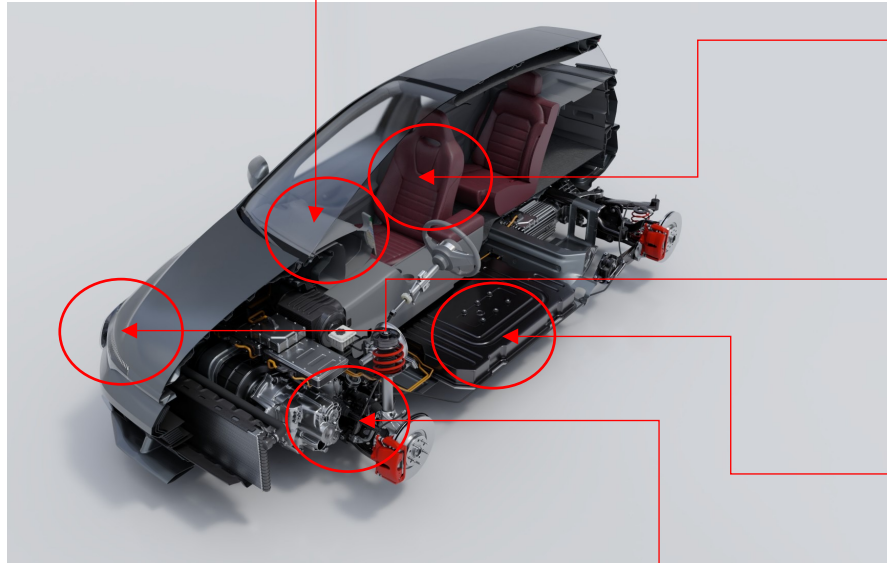
- TR Asia headquarters** - Singapore
- China - Shanghai & Beijing
- India - Bangalore, Chennai & Pune
- Malaysia - Kuala Lumpur
- Philippines - Manila
- Taiwan - Kaohsiung
- Thailand - Bangkok





Light Vehicles – a snapshot of applications

TR part of the Trifast plc Group



Vehicle interior

- In-mould airbag nuts
- Clips
- Thread for plastic
- PAB bolt

Various types of air-bag nuts, which can be moulded into the IP
 Custom clips for mounting display, attachment of IP to BIW
 Screws to drive directly into IP
 Connection to BIW, Airbag

Seating and passenger safety

- Marriage bolts
- Locking nuts
- Self-piercing Studs
- Thread for plastic
- Thread rolling screws

M10 fasteners to join the back rest with the base of the seat
 M6 and M8. Nylon insert or all metal for airbag applications or any threaded fastener joint
 Rails, slides
 Into injection moulded parts, such as motors, webbing
 Many applications to drive directly into the frame of the seat

Light Clusters

- Adjustment screw
- Clips
- Springs
- Thread for plastic

Double sided threaded fasteners for adjustment of cluster
 Custom clips for mounting clusters into mirror assembly
 Serviceable springs
 Screws to drive directly clusters, assemblies

Battery Pack and DC applications

- Compression limiters
- Lock nuts
- Metric bolts
- Copper connectors
- Busbar components
- Cable management
- Cable glands

To relieve stress in composite battery panels
 Nylon insert or all metal for fastener retention in soft joints with limited pre-load
 High specification, removable fasteners for maintenance, repair and end-of-life disassembly
 Silver-plated, high-power connectors
 Copper or other metal battery cells and module connectors
 Clips to securely retain high voltage cables or wiring loom
 Entry points in sealed units of high power cables

Drive train and brake

- Circlips
- Hose clips
- Bespoke bolts

Brake system assembly
 Hose clips and other parts for hydraulic braking system
 High strength bolts in brake and drive train assembly



- Demonstrating product range, share of wallet
- Range extensions
- Supporting cost of ownership initiatives
- Customisation in specific applications
- 3D printing for visual prototyping



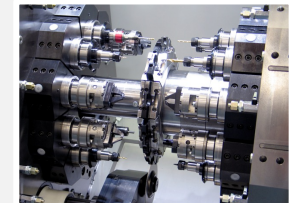
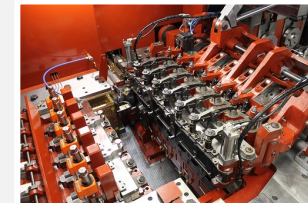
Compression Limiters & Thread Forming Screws for Plastic



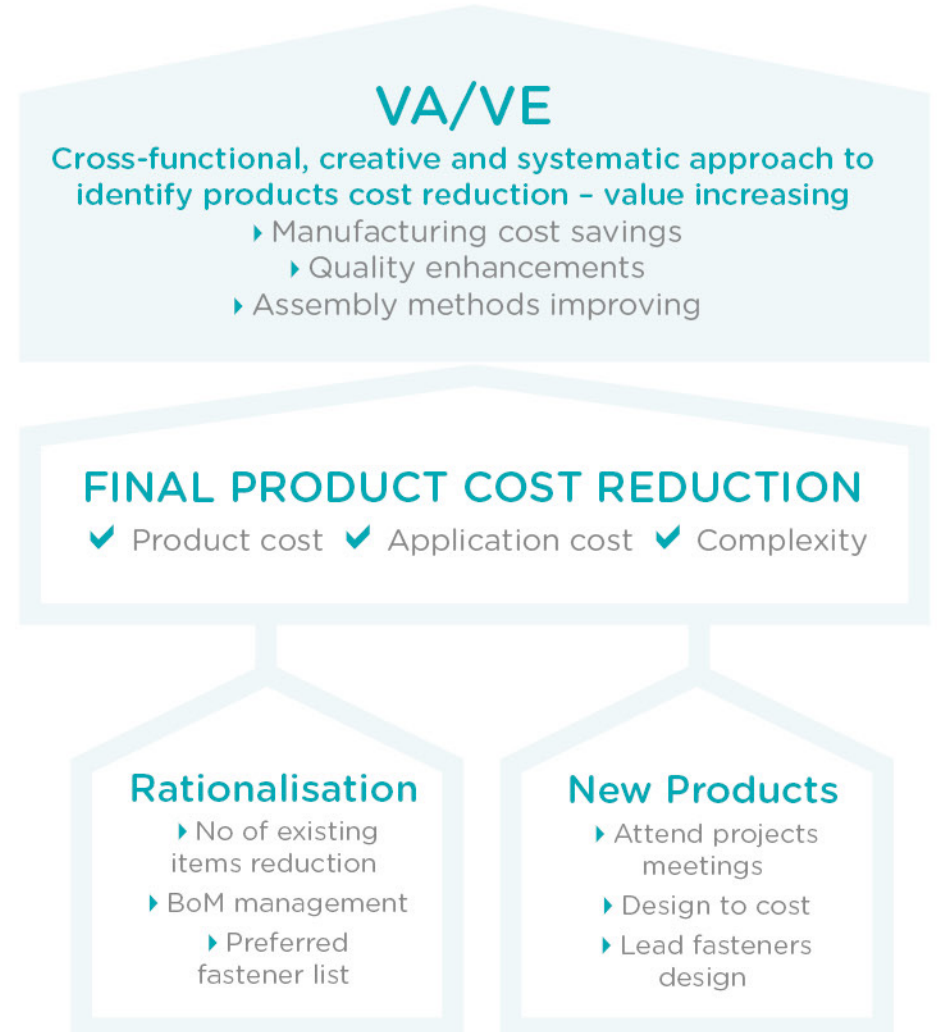
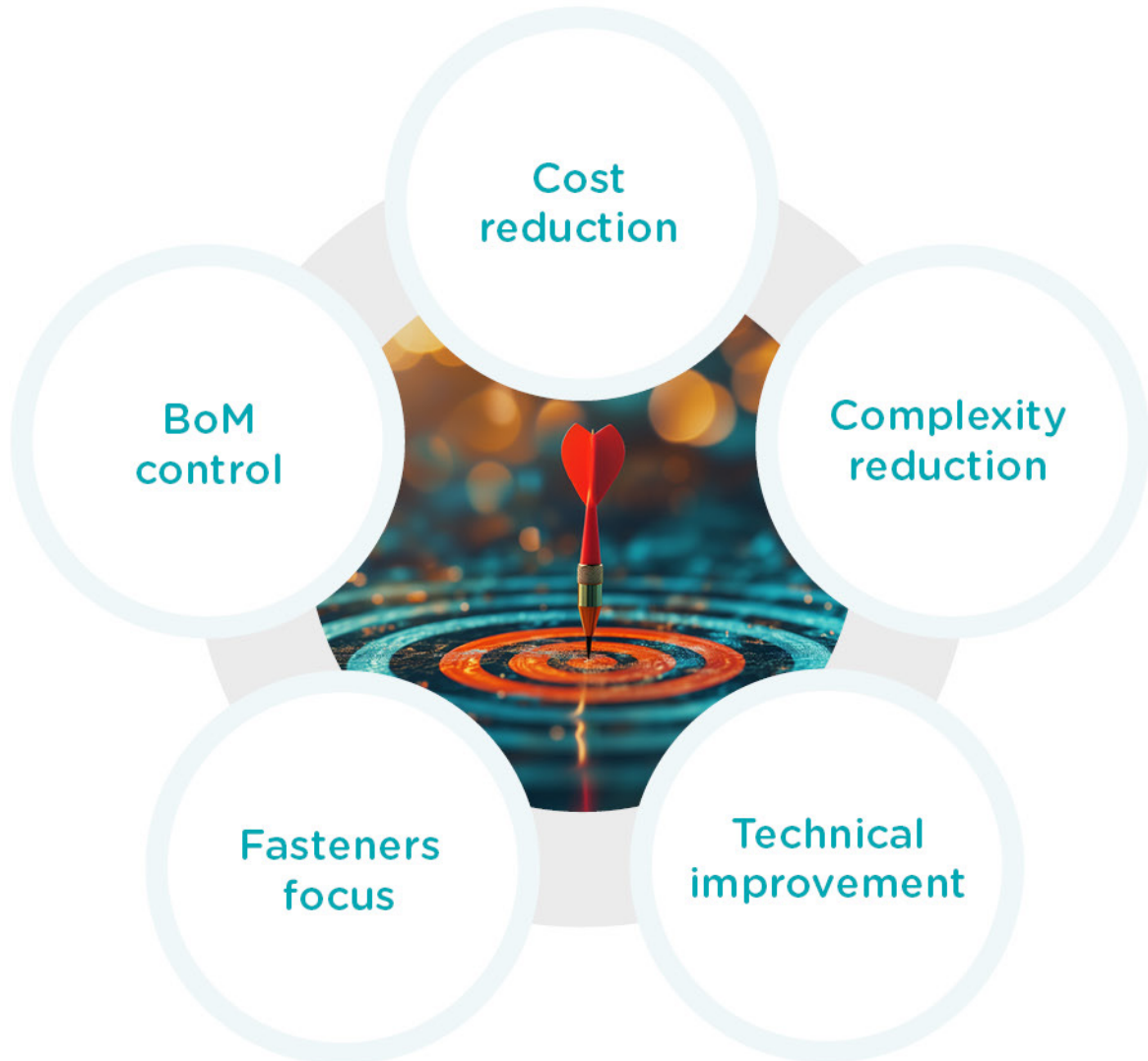
- New product range introduction
- Driven by new market technologies including EV & EVB
- Collaboration with customer
- Niche opportunities – customer does not have the expertise e.g. they are plastic moulders

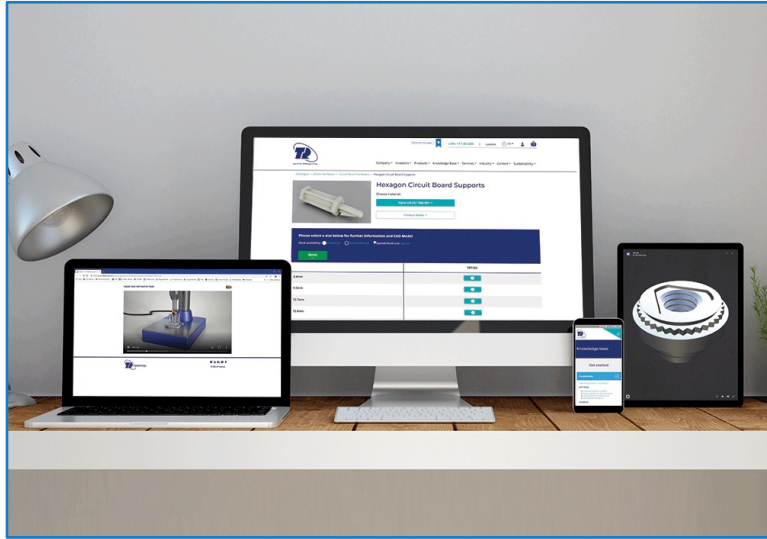


High Power Charging Pins (EV)
In-house cold-forming/external precision machining



- Changing manufacturing models
- Utilising disruptive factors:
 - Technology – EV & FCEV
 - Legislative compliance & ESG
 - Emerging trends e.g. composites
 - Anticipating customer needs





Directly from www.trfastenings.com, such as:

- Cable management
- Cable glands (plastic and Inox)
- Clips

Made to drawing

Concept and Product development

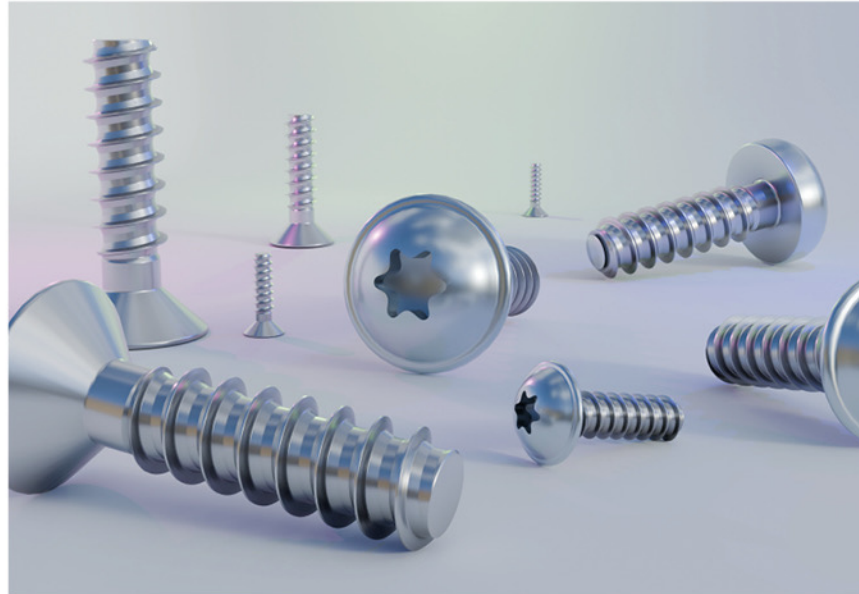




The Plas-Tech 30-20® is an addition to the Plas-Tech® range

The Plas-Tech 30-20® is available in a standard range and also bespoke products. Parts are made to order.

Contact the TR Engineering Team for further information: engineering@trfastenings.com



Features & Benefits:



Minimal radial stress: the faceted thread profile directs material flow to reduce radial stress



Superior vibration resistance: the full engagement of the self-locking, angled thread design avoids loosening



High torsional strength and tensile strength: a large core thread profile provides high strength



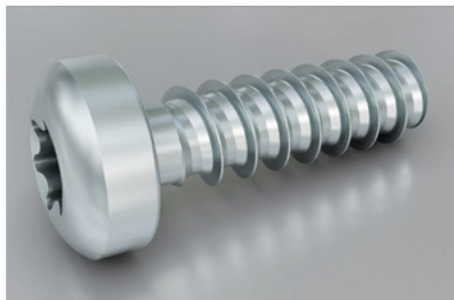
Optimal thread pitch: ensuring fastener engagement with a minimum number of rotations, keeping installation times to a minimum



High reusability: the fastener can be removed and re-installed a number of times



Consistent installation: ideal for automated or robotic installation



**Pan Head
Recess T Drive**



**Flange Head
Recess T Drive**



**Countersunk Head
Recess T Drive**



**Suited to
robotic
assembly**



Understanding CBAM

Carbon Border Adjustment Mechanism



Fit for 55 is a legislative package, the goal of which is to reduce GHG emissions by **55% by 2030**. The basic approach of the regulation is when **goods from third countries are imported into the EU, they should bear a levy equal to the CO₂ costs of EU manufacturers**.

CBAM is a policy that aims to reduce carbon leakage and protect the EU's climate ambition.

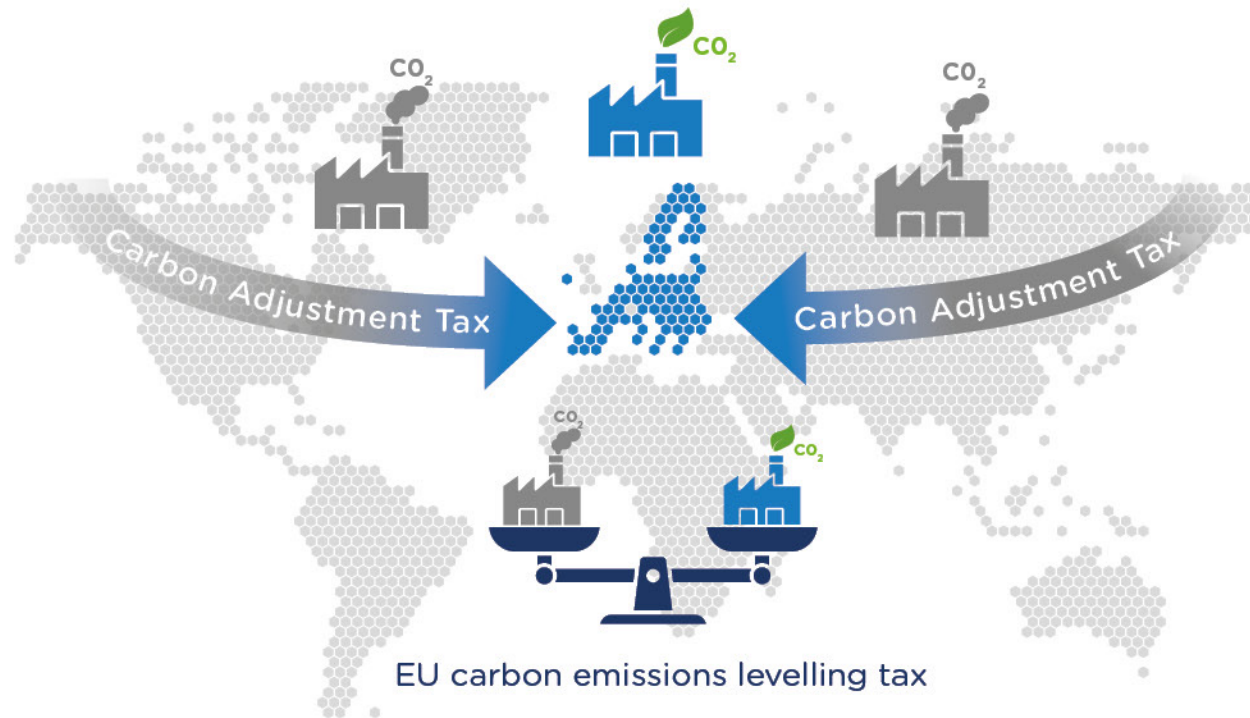
What goods are in scope of CBAM?

CBAM initially covers several specific products in some of the most carbon-intensive sectors.

These include:

-  Aluminium
-  Cement
-  Electricity
-  Fertilizers
-  Hydrogen
-  Iron and steel
(and certain precursors)*
-  Bolts and screws
a limited number of downstream products - example**

The tariff code of the goods defines whether a product is subject to CBAM measures.



CBAM
Paving the way for fair climate trade

* The precursors for steel are iron ore, coal and limestone for the primary route, or scrap metal for the secondary route.

** Downstream products were added at the eleventh hour on the 1st of October 2022, just before the member states ratified the regulation on the 8th of November 2022.



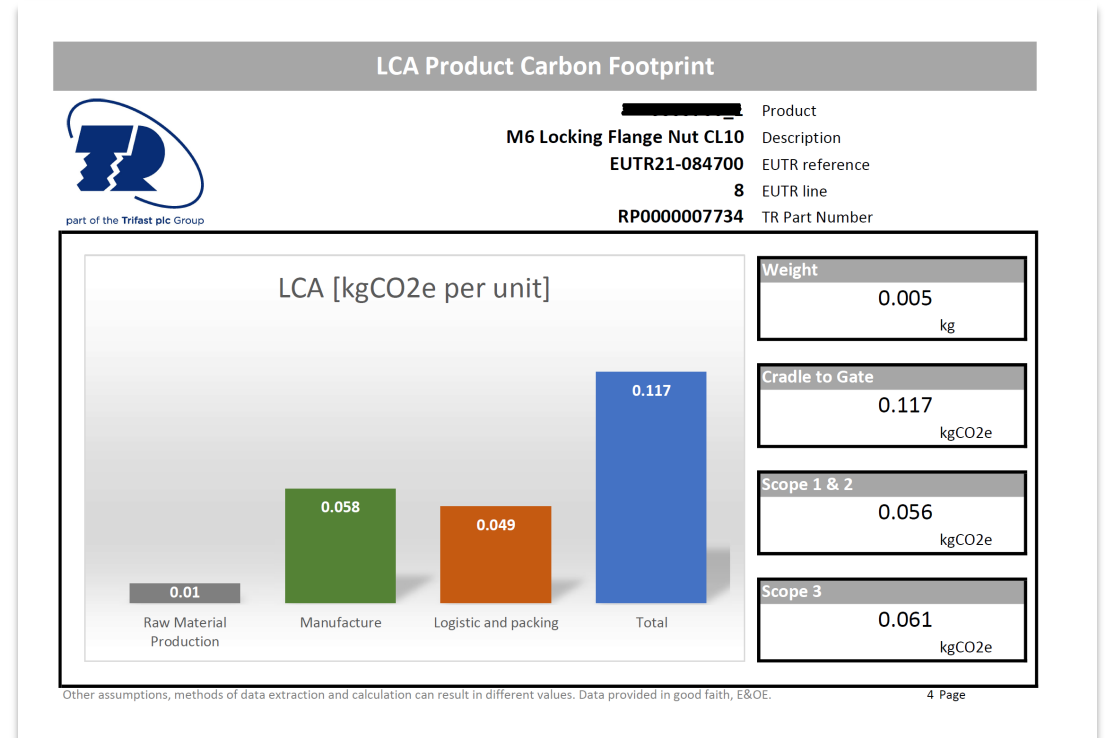
CBAM, LCA and CO2e calculations

No final international agreement on CBAM and GHG calculations:

- Ringfencing of factors
- Accurate rates
- Overheads

Standardisation and legal agreement to change supply landscape:

- Near and on-shoring, i.e. TR Italy production
- Review of materials and coatings – fit for purpose
- Re-usability

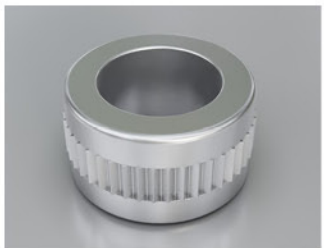


Example of CO2e calculation output at product level



These products are used extensively in plastic mouldings as through-holes, reducing the stress generated by threaded fasteners

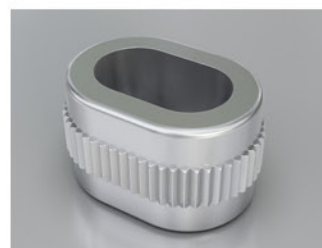
They play an increasingly important role in large automotive applications in particular the electric vehicle (EV) and battery (EVB) sectors, as well as other industries.



Symmetrical



Flanged



Oval



Round

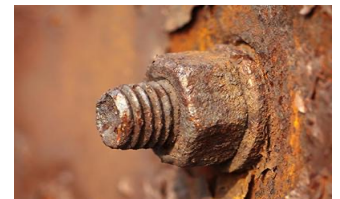




Design for Recyclability

creating a product that can easily be taken apart for recycling and reuse at the end of its lifecycle.

Consideration	Features	Risk to recyclability
Ease of Removal	Reversible joins <ul style="list-style-type: none"> • Threaded fasteners • Clips • ... 	Energy-Intensive removal <ul style="list-style-type: none"> • Adhesive, welding Time-Intensive removal <ul style="list-style-type: none"> • Permanent mechanical fixings (rivets)
Separation and Segregation	Separation into dedicated waste streams <ul style="list-style-type: none"> • Similar materials – join waste stream • Easily removable 	Contamination of waste streams <ul style="list-style-type: none"> • Lower recycling yield • Non-recyclable
Effect of aging during service life	Build in redundancy <ul style="list-style-type: none"> • Material and coating choice • Fit for purpose 	Corroded or permanent joints
Standardisation	Consistence and ease of disassembly	Reduced efficiency and automation possibilities





Total cost of ownership

As a full service provider we are able to assist in reducing the total cost of ownership for companies by working with them from early engineering and design stage, right through to specification, manufacturing, quality and logistics.

We adopt a three-tier approach that includes local, national and international teams. TR understands that a global solution creates some challenges; including communication, culture and security.

TR's global delivery model has been designed from the ground up to address these challenges. Most importantly, our global delivery operations provide customers with both the quality and economic advantages that they require.

Manufacturing

7 manufacturing facilities with an annual output of approximately 8 billion components. (ISO 9001, ISO 14001, IATF 16949).



Supplier

A global network of AVL approved suppliers enabling an international source of supply.



Design & engineering

A team of specialists on hand to help, from developing new products from concept to VA/VE support for the life of the product. Early involvement is key to success.



Logistics

Tailored services to meet exact customer requirements ensuring they receive a Lean Supply Chain Solution.



Quality

Meeting the customer's quality needs and specifications as their enhanced demands increase.



Distributor

A network of valued distributors in the UK and Europe actively selling our proprietary products to end users.





part of the Trifast plc Group

**Our fastenings enable
innovation today to build
a better tomorrow**

Thank you