Automotive Fasteners & Components

www.trfastenings.com
TR is actively working with a number of organisations involved in the design, manufacture and development of Electric Vehicles (EVs) and Battery Pack Modules (EVB).

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Introduction

Global footprint, local support.

TR is a full service provider to the automotive industry. We are able to facilitate 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.

Our team of Engineers are on hand to become technology partners with niche vehicle and start-up electric vehicle manufacturers, using our industry experience to develop a cost effective BoM (Bill of Materials), leveraging industry volumes, and reducing complexity.

We offer a wide range of high quality fasteners and C-class products. In addition, we have developed an application engineering support function and an advanced supply chain structure.

TR supplies over 63 billion components every year to over 5000 companies globally. Many of these have specific needs in both product and quality requirements. Our job is to meet these needs to the required industry standard, through the extent of our product range and scope of our quality certification.
Manufacturing

TR Manufacturing

Our factories are dedicated to producing high volume parts specifically to customer drawings. In addition, our strategic partnerships with other major manufacturers allow us to offer a wide range of special parts, including:

- Cold-headed products
- Complex multi-stage forging
- Special parts to customer drawings
- Turned & machined parts

Our manufacturing network spans two continents and produces 33% of all the components we sell.

As a manufacturer we appreciate the importance of quality, cost and consistency. We can ensure parts are made in the right part of the world to meet your cost and delivery needs.

- 8 factories
- In-house heat treatment facilities
- Automated optical sorting facilities to strive towards a zero defect policy
- Specialised packing capability

Annual output over 8 billion parts

TR SFE (Taiwan) x 2
TR Formac (Singapore)
TR VIC (Italy)
TR PSEP (Malaysia) x 2
TR Formac (Malaysia)
TR Hank (UK)
What We Supply

ST & PF Screws: For all CR, panels, seats, ST screws for thin sheet metal, thread forming screws for plastic panels.

Metric Screws & Bolts: Metric screws & fluted screw for interior & exterior applications, seats, DP & IP.

Spring Steel Clips: Spring steel fasteners for A, B and C-pillar, panels, IP, DP, TC, luggage compartment & roof.

Washers: Washers for bolts & axles, interior applications, seats, headliners, IP & DP.

Rubber Bumpstop, Damper Grommets: For interior applications, TC, greenhouse & IP.

Bushings: Bushings for airbag applications, door grill handles, IP & interior high torque load requires a bushing.

Spring Staples & Hog Rings: Spring staples & hog rings for IP, TC & seats.


Plastic Parts: Plastic fasteners for IP, seats, TC, door reinforcement & edge protection.

Special Parts: Fasteners for special applications, rear seat, sitting applications, belt restraints, plant bins & trays.

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TR has invested in a number of manufacturing licences.

**TORX PLUS®**
Available in a standard or tamper proof version, the Torx Plus® design increases torque transfer, therefore extending tool life and increasing productivity during assembly.

**STRUX®**
Strux® self clinching studs and nuts offer a stronger and more reliable assembly to traditional clinch fasteners. Resistant push out or rotation when installed, Strux® fasteners save significant time and cost compared to welded or other staked fasteners during installation, particularly when combined with Mathread®.

**MATHREAD®**
A patented system to prevent cross threading - the unique first threads align with the bolts accurately ensuring optimum assembly time. This feature has been incorporated in the design of the engine sump plug for a newly developed model. The clear advantage is felt at both original assembly and subsequent servicing, thread damage is avoided. The principal usage is in the automotive industry.

**MORTORQ® SUPER**
A design that provides an enhanced drive capability and up to 25% material reduction to the head. This shallow head fastener has an attractive appearance and provides customers with the opportunity to reduce weight in vehicles. This drive is also available in a tamper resistant style.

**SPIRALFORM®**
A thread forming fastener design ensuring an optimum contact with metallic mating materials to provide consistently high strength capable joints.
TR Quality

TR operates in a quality focused environment to ensure customer requirements are fully integrated in our processes.

- **Quality Management Systems** - IATF 16949, ISO 9001 and ISO 14001 form the backbone of our management system and are supported by processes that ensure we meet our customers’ expectations.
- **Product Quality** - TR use a fully integrated PPAP package that captures product requirements and enables realisation of product approval based on an agreed timeline. Feasibility review is carried out by TR Engineers with both design and application knowledge. We adopt a lean approach to product development – by providing input to our customers’ design verification programs, we ensure that product quality requirements are understood and appropriately managed to reduce unnecessary inspection costs.
- **Supply Chain Quality** - TR recognise the importance of every stage of the supply chain in delivering quality product to the customer. From the supplier of raw materials to re-house processes and outside service providers, the team works to ensure quality is fundamental in every process.
- **Quality Targets** - At TR everyone is responsible for quality and by focusing on customers’ requirements we are able to drive home our “zero defect” philosophy with quality ingrained in our processes.
- **Quality Deliverables** - Accuracy of information and customer response are key to achieving results and on-time delivery within our customer projects.
- **Quality Equipment** - Our feasibility teams ensure that the selected quality equipment provides the most efficient path to demonstrating product compliance. Where possible we use computerised inspection equipment to enable focused reviews and analysis of trends which are fed into product development processes.

### Quality Control / Assurance

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### Automotive standards
- IATF 16949
- ISO 9001

### Health & Safety standards
- OHSAS 18001

### Environmental standards
- ISO 14001
Electric Vehicle Charging Units

TR has extensive product ranges and technical expertise to support the design, manufacture and development of charging units for Electric Vehicles.

TR is actively working with a number of organisations involved in the design, manufacture and development of Electric Vehicles (EVs), Battery Pack Modules (EBM) and Electric Vehicle Charging Units for both commercial and residential use. As this sector continues to emerge and develop, TR is able to supply an extensive product range and has the necessary technical knowledge, expertise and experience to support this industry.

TR’s qualified engineers and sales staff are on hand to advise design, production and purchasing teams on a number of matters, from Design for Manufacture (DFM) to new fastener technology, sourcing insight and cost reduction.

Industry Targets

The rapid growth of the EV sector is further accelerated by political-economic developments such as the Government’s initiative to ensure that by 2040, all new vehicles will either be electric or hybrid, zero-emission models.

EV charging stations typically include the following fastener groups, many of which include TR’s own branded product ranges:

- Standard Fastenings: DIN/ISO/ANSI (Steel and Stainless Steel), Threadlocking Screws
- Fasteners for Plastic: DIN/ISO/ANSI (Steel and Stainless Steel), Threadlocking Screws
- Fasteners for Sheet Metal: DIN/ISO/ANSI (Steel and Stainless Steel), Threadlocking Screws
- Enclosure Hardware: Locking Systems, Locks, Lock Components, Hinges and Latches, Clamps and Terminals
- Plastic Hardware: Circuit Board Hardware, Cable Management, Rivets, Machine Screws, Nuts
TR recognises that development of applications is a time consuming process, which is why our team of fastening specialists is on hand to support and guide you from developing new products to adapting existing ranges.

TR follow a simple process that can be adapted for your individual application.

• Function: Confirm the performance requirements of the fastener and application, does the product need to screw, clinch, rivet, weld, glue or clip together?

• Application Environment: Our team will assist you to ascertain whether the product will require any specific design features for your application.

• Assembly Method: Fastener installation is a key part of the assembly process. Early involvement in the design or specification stage by our application engineers allows streamlining of your manufacturing planning process leading to systematic reductions in cost in assembly and production.


• Evaluation: Prototype parts allow you to test the application and assess if amendments to the specification are required.

TR adopts a full service provider ethos, supporting your designers and engineers to ensure your finished part is as required for your application. TR’s team of global specialists will work with you from design through to manufacturing and will be on hand to guide and advise where required.

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**Application Engineering**

**Research & Development**

**CAD Design & Development**

**Prototype & Testing**

**Technical and Innovation Centres**

TR Offers

TR’s Technical and Innovation Centre - Gothenburg
Full Service Provider

Our global footprint.

As a full service provider, TR needs to be able to give a quality service from design through to VA/VE initiatives. TR’s application engineers regularly work side by side with product designers at the early stages of a design and then provide technical assistance.

TR are pioneers in effectively developing the global delivery model. Utilising 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, TR’s global delivery operations provide our customers with both the quality and economic advantages that they require.

A typical TR DLF (Direct Line Feed) system.

This diagram depicts how the average DLF system works, although all TR DLF systems are tailored to individual customer requirements. The first 3 points show the initial set up procedure, after that the system operates in a cyclical manner.

1. 2. 3.

1. Service Level Agreement (SLA)
2. TR installs racks and bins directly into production area
3. Initial stock supplied
4. Production takes stock from bins
5. On agreed day, TR DLF operator visits customer
6. TR DLF operator scans all bins that need replenishment
7. TR DLF operator downloads information to TR location
8. TR DLF operator delivers stock and replenishes bins

Locations in 18 countries
Supply into 61 countries