



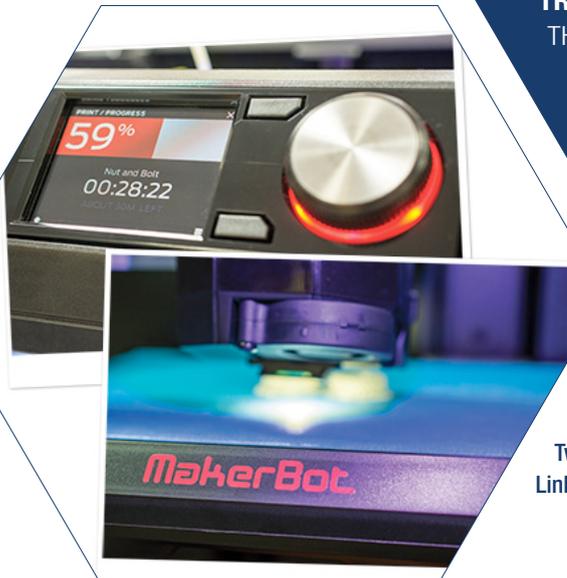
## TR PRESS PACK PRESS RELEASES

**TR FASTENINGS** IS RECOGNISED THROUGHOUT  
THE INDUSTRY FOR WORLD CLASS PRODUCTS  
& SERVICES

WE MANUFACTURE, STOCK & DISTRIBUTE  
A VAST RANGE OF INDUSTRIAL  
FASTENERS & COMPONENTS

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2014



### TR Fastenings Provides Bespoke Solutions for Cash Bases' Customised Cash Drawers

A global manufacturer and distributor of industrial fastenings, TR Fastenings has positioned itself as a market leader with one particular product range – sheet metal fasteners.

From Hank Self-Clinch, Hank Rivet Bushes, weld nuts and weld studs, to blind rivets, K-nuts, cage and swage nuts, these versatile components form the core of TR's extensive portfolio and are used across numerous sectors, including medical equipment, marine, electronics, automotive, telecommunications and general engineering.

TR Fastenings works with many market leaders in these industries, such as Cash Bases, based in Newhaven in East Sussex, which manufacture customised cash drawers. The relationship between TR and Cash Bases dates back over two decades, and TR not only supplies suitable fasteners and fixings but provides technical advice and support with the research and development of new products, such as the newly launched SMARTtill system.

The SMARTtill is set to revolutionise cash management in the retail industry and has been readily adopted by Tesco, which recently placed orders for 11,400 for use in its Tesco Extra and Superstore outlets. The till offers automated cash management technology and monitors point-of-sale transactions in real time. It also enables the retailer to monitor the cash flows of any given till, ensuring adequate change values are available and alerting management when cash levels reach minimum or maximum values, ultimately leading to a more seamless customer experience.

With such high demand expected for these 'intelligent' cash drawers, Cash Bases required the latest process technology and so, following TR Fastenings' advice, has invested in the new Haeger 824 Window Touch 4E, which features easy and fast tooling set up and retrieval, an auto feed system (feeding 40 plus fasteners a minute) and an advanced logic insertion system. Distributed in the UK by Shear-Form, the new press has halved production time, according to Phil Gibbs, Factory Manager at Cash Bases.

*"TR Fastenings is far more than just a supplier," Gibbs adds. "Its extensive product and technical knowledge enables us to work together at every stage, from product design to the production line. We've built up a strong relationship with TR over the past 20 years and we look forward to continuing working closely with them in the future."*

**View our case study on YouTube: <http://youtu.be/swAqzAe3k3U>**

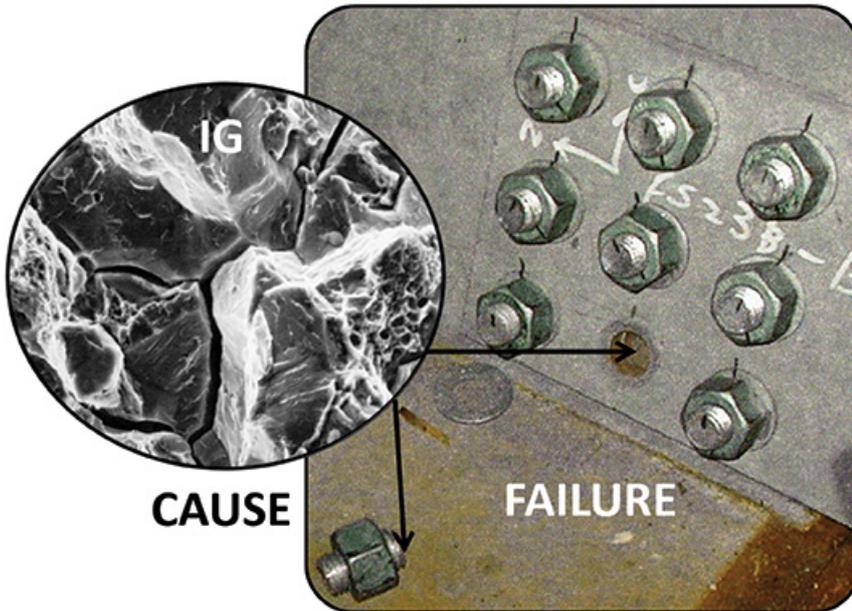
# TR Press Release

## Why Fasteners Fail After Passing the Stress Test By Dr Lou Raymond

2014

**When a fastener fails because of hydrogen embrittlement, the blame often tends to be unfairly pointed at the supplier.**

TR Fastenings, a leading global manufacturer and distributor of industrial fastenings, has experienced various cases in the past where large bolted joints have passed the stress test, yet unexpectedly failed in service; however, this has been shown to be due to the way they have been used and not due to any manufacturing errors. If a bolt is designed to hold 100 kg and 200 kg is applied, it will break! Once installed and in service, environmental exposure can cause analogous situations when stressed above a threshold stress that causes time delayed failure.



“We are a manufacturer and supplier of components and we don’t always get told where our fasteners end up,” says Geoff Budd, managing director of TR Fastenings. “And that is why this is such an important topic. People think when they have this sort of

failure it is caused by problems during manufacture, but actually it’s often the specific way that they are used that has brought on the phenomenon. That is why we want to educate customers, so we are hugely grateful for the research undertaken by Dr. Louis Raymond into this subject.”

One of the world’s leading experts on hydrogen embrittlement, US-based Dr. Raymond is a renowned materials scientist with over 30 years’ experience as consultant, educator, diagnostician, and forensic scientist. In the following, Dr. Raymond answers frequently asked questions related to the cause of fastener failures.

Q – How can a fastener experience a hydrogen embrittlement service failure after it has passed all of the standard ASTM or ISO stress testing requirements?

A – Post mortem analysis of broken fasteners that attribute the cause of the failure to hydrogen embrittlement, is often quickly and erroneously, put the blame on the fastener manufacturer. Failure analysts that find intergranular cracking (IG) on the fracture surface are quick to attribute it as a hydrogen embrittlement failure to improper plating procedures, such as omitting post plating baking treatments; - but these requirements are not enough to prevent failure by hydrogen embrittlement, once the fastener is put into service. In fact, the same conditions that allow the hydrogen to be removed by baking after plating, allow the hydrogen to re-enter even more aggressively once the fastener is installed, after it is under an applied service stress.

The mere presence of water, often due to condensation, will dissociate to generate the hydrogen in the

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2014

presence of plating such as cadmium on steel. The potential for generating conditions for failure by hydrogen embrittlement after manufacture under installed conditions are not adequately addressed by the designer. Environmental effects due to galvanic coupling in the presence to dissimilar metals present in the entire assembly, or even galvanic coupling with the plating alone, must be evaluated to obtain the desired service life. A variety of failure analysis techniques must be applied to identify how the hydrogen is produced. Therefore, a fastener can be manufactured to satisfy all standard test requirements that are used to establish the fastener as being free of hydrogen embrittlement from the plating process, but the fastener must still be found to not fail from hydrogen embrittlement in service.

Q – When a fastener breaks in-service, how is hydrogen embrittlement identified as the cause?...

A – The characteristics of hydrogen embrittlement in steel are identified by fractographic analysis using the scanning electron microscope. Its features are described as intergranular, with secondary cracks and tear ridges on the grain facets. The origin is below the service of a notch or thread root. The failure is described as a time-delay fracture or the fracture occurs over a period of time once the fastener is installed.



Q - When a fastener fails by hydrogen embrittlement due to processing or plating, what are the characteristics of fracture?...

A – The photographic fingerprint of a hydrogen embrittlement failure is called “Intergranular” (IG) fracture.

Q – What features separate cause of hydrogen embrittlement due to plating and processing from that due to a service environment?...

A – None, the fracture face features are identical to a fastener that fails in an environment that produces hydrogen.

Q – Doesn't application of Post Plating Baking Standards prevent hydrogen embrittlement failure in service?...

A – No, the standards only assure that the manufacturing and plating process do not result in hydrogen embrittlement of the fasteners.

Q – Can a part that has successfully passed the Post Plating Baking Standards eventually fail in service because of hydrogen embrittlement?...

A – Yes, inherent in a plated fastener is the potential of a galvanic couple, which is produced by a combination of the plating and the steel of the fastener. Under these conditions, only moisture or condensate from the atmosphere is required to activate the galvanic couple, which then will produce hydrogen on the surface of the fastener during service usage.

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Q – Will this hydrogen cause embrittlement?...

A – Yes, hydrogen produced on the surface will diffuse into the steel just as during the plating process. In fact, because the fastener is now under stress, it acts more like a sponge and absorbs a lot more hydrogen than it would while it is being plated; since during plating, the fastener is not under a state of stress except for residual fabrication stresses.

Q – If a fastener were manufactured to satisfy all of the Post Plating Baking Standards designed to prevent hydrogen embrittlement, is it possible for a service failure to occur by hydrogen embrittlement?...

A – Yes, under certain conditions, a fastener that is plated and meets all of the Post Plating Baking Standard requirements to prevent hydrogen embrittlement during manufacturing and processing could fail if the parts were exposed to a moist environment. In fact, the results of sustained load, notched round tensile tests per ASTM Standard F519 on hydrogen embrittlement that are used to certify manufacturing and plating processes, have been found to be dependent on the humidity of the room during test.



Q – If a fastener were manufactured without a Post Plating Baking treatment designed to prevent hydrogen embrittlement, would a hydrogen embrittlement failure occur in a dry environment?...

A – Yes, If the fastener were embrittled due to processing and plating and did not meet the requirements of the Post Plating Baking Stress Test Standards, it would also fail over a period of time once put into service or being stored, even if it were placed in a desiccant or in an atmosphere free of moisture.

Q – How does one protect against hydrogen embrittlement failures during service once the part had been manufactured and plated free of hydrogen?...

A – Only by taking the correct preventative action during designs of the fastener systems such as the use of a dichromate or a non-conductive, rust-prevention grease during storage. Other measures should be directed at reducing galvanic couples in the fastener system. The most severe test would be to assemble the fastener with washers as an entire unit with all dissimilar metals present and expose it to 96-hour salt fog test per ASTM G46 or an alternate immersion test per ASTM G44.

Q – After the fastener is found to fail in service, how can one identify the exact cause of failure?...

A – Only with a very thorough failure analysis that takes into account each step of the process and uses advanced analytical techniques. A thorough post-failure analysis must take into account the degradation and strength of the fastener due to the environment in order to determine if the service conditions were the cause of failure. After the part breaks in service, it is too late for any economic solution to the problem. It is then the responsibility of the designer to select the appropriate plating/fastener combination for a given application. Currently, this area is severely neglected throughout the industry and needs immediate attention.

# TR Press Release

## TR Southern Fasteners Joins British & Irish Association of Fastener Distributors



2013



**TR Southern Fasteners is delighted to announce that it has become a member of the British & Irish Association of Fastener Distributors (BIAFD), a highly-respected trade organisation which represents its members on issues directly related to the fastener industry, including raw material and supply chain trends, legislation and regulation, and product development.**

Last year, several leading Irish fastener distributors approached the organisation, interested in membership. Following an overwhelming vote of support by BAFD members, the association now not only welcomes distributors from Ireland but has also reflected the extension in a name change to the British & Irish Association of Fastener Distributors.

TR Southern Fasteners was amongst the first companies to decide that it would be hugely beneficial to join, both to the company itself and to its customers.

Dara Horgan, General Manager, of TR Southern Fasteners, comments: “Our decision to join the BIAFD forms part of our ongoing strategy to provide the highest standard of service as one of Ireland’s leading fastener manufacturers and distributors, whilst also reflecting our commitment to the fastener industry.”

### **Global Reach, Local Presence**

As part of the TR Fastenings group, TR Southern Fasteners is supported by extensive global resources and manufacturing operations in the UK and Asia. This combination allows TR’s Irish locations to supply a vast range of fasteners and associated components to small, medium and large Irish manufacturers and engineering subcontractors while meeting each individual company’s needs. Customers come from many different industries, including electronics, automotive, IT, home appliances, security, medical, agricultural farm machinery and general industry.

Core products sold by the company include general fasteners (for instance, nuts, bolts, screws, washers) in steel, stainless steel and brass; and TR branded products including: self-clinch fasteners, screws and inserts for plastic, security fasteners and thread-locking nuts. Finally the company also prides itself in manufacturing studbolts to order on-site in its Mallow facility.

Since TR Southern Fasteners was established in 1973 it has grown from 3 to 12 employees and prides itself in employing local people and having a low staff turnover - some employees boast over 25 years’ service in the company.

# TR Press Release

## TR Fastenings: Holding industry together



2014

### An interview for The European with Malcolm Diamond, MBE, Executive Chairman, Trifast plc

TR Fastenings designs, manufactures and distributes mechanical fasteners on a global basis and delivers to more than 50 countries through its 25 locations across Europe, Asia and the US.

Although supplying multinational original equipment manufacturers (OEMs) as its foundation business model – which currently yields 40 per cent of the sales – this strategy is underpinned by five additional target markets:

- TR Direct: standardised off-the-shelf fasteners for next day delivery to OEMs in the UK
- Lancaster Fastener Company: expanding range of catalogued standard and specialised fasteners for next day delivery to distributors in the UK, Europe and beyond.
- Plastic fasteners and spacers for global OEMs – available both from inventory and to customer specification.
- Manufacturing licences acquired for specialised highly engineered large volume fastener applications for automotive and electronics OEM multinationals.

We caught up with Executive Chairman, Malcolm Diamond, to discuss different markets, the factors underpinning the company's growth and the opportunities on the horizon.

Q: What makes Europe an attractive market to you?

Malcolm Diamond: As TR Fastenings, our trading subsidiary already has successful logistics distribution facilities in Norway, Sweden, Holland, Southern Ireland and Hungary plus our recent acquisition of VIC in Italy (that is a major fastener manufacturer with distribution facilities already well established), it is our ambition to spread our network further within Europe where multinational OEMs have assembly plants. Of particular interest is Central and Eastern Europe, which still offers relatively low cost/high skill resources that attract inward investment for high volume manufacturing and assembly.

Q: Why was VIC in Italy such an important acquisition?

MD: We had already established a relationship based on mutual respect with Carlo Perini (son of the founder and now VIC Managing Director) several years ago, and when the major private equity shareholder reached its five year investment anniversary, it recognised that VIC would benefit from being part of a larger global fastener group, and TR was one of several potential acquirers that they had identified.

Several meetings were held, which clearly pointed to both an excellent cultural and strategic fit that motivated both parties to aim for a mutually beneficial successful merger. VIC's strategy was to have the networked resources to grow further within Europe whilst developing the white goods and first tier automotive sectors in Asia and the US. TR has the sales, marketing and logistics capabilities already in place to support these aims.

Anti-dumping duties imposed by the EU on some Asian products present a certain level of threat to many



# TR Press Release

## TR Fastenings: Holding industry together



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European fastener distributors. Therefore, to have VIC's high quality fastener manufacturing capacity, that is price competitive and consistently profitable within the EU, is a logical risk management opportunity that we were delighted to have been offered. Prior to this, our domestic appliance customer sector was relatively small, and now it represents nearly 20 per cent of the group's revenue thus significantly raising our capability profile to potential new customers on a global basis.

Q: Outline your expansion strategy in Europe.



MD: We operate 13 business teams within the UK and mainland Europe and every team has budgeted for organic growth over the forthcoming period. However, with the fastener supply market forecasted for around 4 per cent annual growth for the next five years – but highly fragmented and with no obvious market leader, it is clearly an opportunity for consolidation.

TR is constantly evaluating potential right fit companies to add to the group, but with the strict criteria we apply with regard to their potential growth, current profitability and ambitious

management who want to stay in office post deal, then our choices become more selective.

As TR is rare in combining manufacturing with distribution (thus fulfilling the role of a full service provider), then our search for acquisitions covers both disciplines. However, unless the distributor fulfils a niche market position, then our preference is to increase our manufacturing activities. High volume assembly OEM's in automotive, electronics and domestic appliances expect design and engineering support for new product development and for line side production trouble-shooting, and the engineering capability that TR has by being a manufacturer is essential to these customer sectors.

Q: How's the European branch performing compared to the US and Asia?

MD: Fundamentally, there is no real variation in performance around the group, as fortunately we are enjoying encouraging business dynamics right across all of our activities – both with regard to revenue and improving margins. We acknowledge the low level of confidence that the EU has suffered over the past five years, but the fastener market is still huge – even during this recent savage recession, and TR's market share is so small that it falls well below any constraint for our future growth. In simple terms, if the "cake" becomes smaller, then we just sell harder for a bigger slice, and throughout our 40+ year history we have sustained our growth through at least three recessions. The only exception being 2007-2009 when there was a change of leadership – along with a switch in core strategy that failed. Under the current management structure put in place in April 2009, we have delivered high quality product through quality customer service as well as shareholder value, via a mix of self-help initiatives, and new business and rebuilt our position through the revitalised network of high calibre motivated people.

Q: The group revenue grew by 7 per cent from 2012/2013 to 2013/2014. Outline the factors behind this.

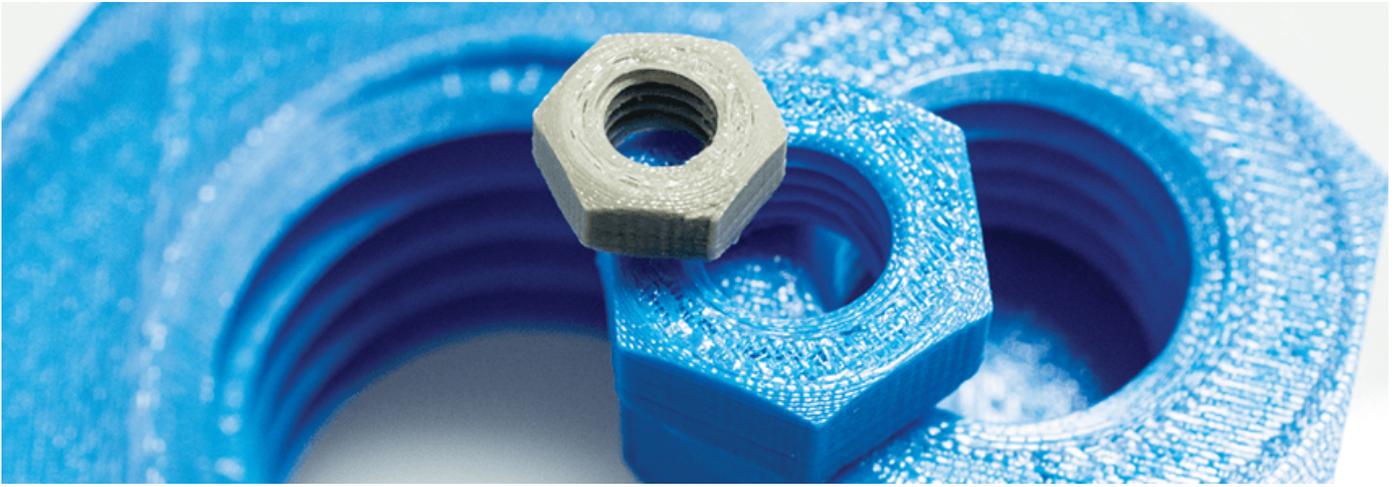
MD: Clearly TR benefited from improving market demand, but fundamentally we have become more competitive within a very price driven environment, and so have grown by gaining new customers and selling more to existing ones. For the past three years our teams have recognised the improvements in operating

# TR Press Release

## TR Fastenings Invests in 3D Printing



2014



**Leading global manufacturer and distributor of industrial components TR Fastenings has invested in a highly sophisticated 3D printer for the purpose of creating testing and prototyping parts, predominantly for the automotive industry.**

The 3D printer, which is based at the company's headquarters in East Sussex, will use molten plastic to produce the prototypes, enabling customers to see what a particular part might look like before they commit to ordering a large quantity. The investment underpins the company's commitment to the latest technology processes – particularly those that support continuous improvement and innovation in customer care.

TR Fastenings' core business is aimed at being the principle provider of assembly components to a fast growing range of high volume multinational OEMs, whereby global consistency of price, quality and delivery is a minimum requirement for being nominated as a preferred strategic supplier. With more than 90% of TR Fastenings' revenue deriving from non-standard components to customer specification, engineering product development is a key group activity, often demanding design and pre-production component prototyping.

*"In the past, not only did the manufacturing of component parts take an average of two weeks to complete but the costs exceeded thousands of dollars, thus prompting a reassessment of optimal prototyping for customer product development,"* commented Malcolm Diamond, Chairman of TR Fastenings.

*"Extensive research by my colleagues in our marketing and IT system teams into US and UK based 3D printing manufacturers has led to our first investment in a highly sophisticated industry standard printer and we are delighted by the response from our customers."*



2014



**At its recent meeting in Stratford upon Avon the Executive of the British & Irish Association of Fastener Distributors elected Geoff Budd as its Chairman for the next two years.**

Geoff Budd is a Director of Trifast plc and European Managing Director of TR Fastenings. With more than 38 years' wide-ranging experience in the fastener industry he is ideally qualifying to take on the BIAFD role for which he won unanimous approval from the association's executive. "I am honoured to have been asked to take on the Chairmanship of BIAFD and look forward to representing the interests of its members," he commented.

Geoff Budd assumes the chair from Keith Harrison, Managing Director of the UK's Hexstone Group of Companies. At the meeting, BIAFD members warmly expressed their appreciation for Keith's two-year period as chairman and director of the association.

Andy Witts, of Bollhoff Fastenings Ltd, was re-elected as Vice-Chairman and David Furness, of Rapiestar Ltd, as Finance Officer and Director. David Jackson, of Stainless Threaded Fasteners, continues in office for a further year as chairman of the BIAFD's Stainless Steel Fastener Group.

The BIAFD is a founder member of the European Fastener Distributors Association (EFDA) and has a longstanding commitment to ensuring its members are "better informed". It holds two general meetings a year, and between meetings delivers news on fastener industry related issues through a regular series of email bulletins. Recent key topics include EU antidumping, CE Marking for fasteners, global economic and raw materials trends. The BIAFD is launching a completely revised Introductory Fastener Training Manual for its members to use with new entrants and to update longer serving employees.

Membership is open to any UK or Irish distribution company for which fasteners is a primary product range and that has traded for a minimum of two years. Associate membership is available to organisations providing services to the fastener distribution sector.

**For more information visit [www.bafd.org](http://www.bafd.org) or email [info@bafd.org](mailto:info@bafd.org)**



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