



“Food for Thought Series” – Part 4 Thin Sheet On-Cost Reduction

All of the previous thought promoting efforts in the “Food for Thought” series have been aimed toward generating discussion on the variety of ways that threaded fastener systems can be developed into an integral part of what is generally viewed as a structural assembly. The aim has been and will continue to be offering design and production engineers a basis from which they can develop their own choice as to the system that is best suited for their needs. So, in this particular article, the emphasis is placed on looking at the “lighter side of life”.

A contemporary requirement, in almost all sectors of the manufacturing industry, is to reduce the weight and cost of components that make up the finished assembly. Sheet metal components have been seen to follow the pattern of reduced weight by utilizing thinner materials and introducing appropriate “stiffening” features in the pressing or other component manufacturing systems. Similar advances have been made in the use of sheet aluminum components.

With the reduction in component thickness, particularly in the areas that have been designated as “fastener fixing sites”, problems have been identified in the selection of an appropriate screw or bolt system. Clamping devices of the nut, bolt or stud and the washer type are often considered the only visible solution to the problems associated with the nut anchor material failure of the thin sheet metal and light alloy components.

The reversal to assemblies that are of the “old” traditional nut and bolt devices is often undertaken at an unnecessary on-cost. Rather than accept this on-cost, why not look at the problems that have been introduced by the reduction of component material thickness and resolve these problems with a cost effective fastener system that is as easy to apply as a “self-tapping” screw?

REMINC innovators have considered the problems of jointing thin sheet metal components and have developed the FASTITE® 2000™ range of self-tapping screws that have been specifically aimed toward reducing the adverse effects of nut thread stripping and screw “spinning”.

Thus, one screw, the FASTITE® 2000™ screw, to replace three fastener components – screw, nut and washer – lowering your overall cost of assembly!

REMINC STAFF

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SPOTLIGHT ON YUKIO MORI



Yukio provides our sister company CONTI extensive support in technical, marketing and licensing fields, with a particular focus in the Pan Asian market. He has been involved with the development of the TAPTITE® TRILOBULAR™ program in Pan Asia since its inception in the 1960's. Yukio's technical knowledge of the program products and his astuteness as to both the North American and Pan Asian markets continues to contribute to the success of our global programs.

R E G I S T E R



CEO'S COMMENTS

"PLAN FOR PROFIT"

Companies often overlook several opportunities for profit improvement within their organizations. These opportunities are numerous and varied. Yet, they are at many times obvious. I will mention a few below, but I guarantee any one or all of these "obvious" factors will improve the profitability of a company if "taken to heart". Remember, in today's business world, the obvious is now considered one of the most overlooked aspects for success.

The first reason is the growing concern of the "shorter-term" solution, possibly as a result of today's economy. Decisions and solutions that provide a profit in the shorter-term rarely provide one in the longer-term. One needs to think ahead of the competition as if one were playing a game of chess. Not only consider one's own future moves, but anticipate the competition's moves also.

Secondly, the employee/management relationship situation within a company is another critical reason affecting profit achievement. Employees can be innovative, creative, determined and dedicated, or they cannot. In general, human nature drives most employees with a desire to do the best job they are capable of given the tools they have received. To insure your company makes a profit, give the employees the correct tools! If there is uncertainty about what tools are required, ask. Employees will respect this inquiry and reward the company in return.

A final and very important reason within many companies is another component of employee relations, but one that seems to be less prevalent in many companies today than in the past; individual recognition for deserving employees. An employee is a company's most valuable asset. Honestly rewarding an employee for a "job well done" provides well-deserved recognition and motivates others within the organization to follow suit. As I often state, this is another example of a potential "win-win" situation.



REMINC Responds!

FIELDING THE QUESTIONS

Q. *Can electroplated finishes be used on TAPTITE 2000® fasteners? Are finishes different for different grades of fasteners?*

A. These two questions are asked frequently and have a combined acceptable answer. We will explain the acceptable criteria for TAPTITE® products below.

Electroplated finishes, such as zinc, are used on TAPTITE 2000® screw sizes M5 (# 10) and smaller and proper baking techniques are always used to avoid hydrogen embrittlement.

For bolt sizes, M6 (1/4") and larger, TAPTITE 2000® fasteners are supplied with CORFLEX® "I" induction hardened points for steel applications and CORFLEX® -"N" heat treatment (without an induction hardened point) for zinc and aluminum applications. In addition, CORFLEX® - "I" fasteners are typically supplied in one of three grade strengths: property class grades 8.8, 9.8 or 10.9. With various grade strength options, other factors require consideration.

Grades 8.8 and 9.8 CORFLEX® - "I" fasteners are often supplied with electroplated finishes, since the thread body maximum surface hardness does not exceed HRC39 (382 Vickers). Most experts agree that electroplating should not be used on Grade 10.9 screws, since the allowance of carbon enrichment of the screw surface can exceed HRC39.

Electroplating is generally not used on Grade 10.9 CORFLEX® - "N" fasteners. An electroplated finish, such as zinc, is not ideal for an aluminum application. Film-like finishes with some lubricity are preferred coatings for CORFLEX® - "N" fasteners in aluminum, since these types of finishes will prevent galling.

Q. *When you reference a "thin" material in your articles, how is thin defined?*

A. Typically a customer expects a specific material thickness as an answer to this question, but the nut member material must be referenced to the size of fastener that is being used. For example, a 1.0mm thick plate is a full 1.0 x diameter thick for an M1.0 fastener, but only 0.25 x diameter thick for a M4.0 fastener. At REMINC, we classify a nut member as "thin" when the thickness is equal to or less than 1/3 of the fastener nominal diameter. Thus, even material as thick as 2.5mm can be considered "thin" if compared to an M8 fastener.

FASTITE® 2000™ FASTENERS FOR THIN SHEET METAL

The FASTITE® 2000™ screw, the newest member of the TAPTITE 2000® family of fasteners, was designed for the some of the thinnest nut member materials that are assembled with threaded fasteners. The nut material may be very thin (see question #2 in this issue), but the assembly problems are large. Thin nut members create some of the most difficult fastening problems for end-users. While almost everyone is quick to recognize that low strip-out performance is the number one problem when assembling sheet metal components, having the fastener drive straight and obtaining statistically consistent performance also add to the difficulties experienced.

The concept for the FASTITE® 2000™ screw for sheet metal was developed shortly after the development of TAPTITE 2000® fasteners. After an authorized manufacturer brought to our attention the assembly problems an electrical lighting fixture manufacturer was experiencing in thin sheet metal, the FASTITE® 2000™ design was developed. Several iterations of the initial design concept were developed and then manufactured simultaneously for proof testing. After evaluating the prototype parts, the final result was a screw that surpassed our initial expectations. The FASTITE® 2000™ screw, originally referred to as a FASTITE® screw, was well received by the lighting producer, who currently uses these FASTITE® 2000™ screws.

FASTITE® 2000™ screws incorporate some of the features which we have learned in the past improve performance in marginal nut members, as well as incorporating new design elements. The old and new features have been consolidated into an efficient new design. FASTITE® 2000™ screws utilize a CA point to allow easy entry into very small pilot holes, as successfully used on EXTRUDE-TITE® fasteners. The Radius Profile™ thread form of the TAPTITE 2000® fastener was employed, but with a twin-lead thread, also know as a twin-start or twin-helix thread. The twin-lead thread not only helps to center the screw in the hole and start straighter than a single lead thread, but also provides opposing threads in the thin nut member (see picture) to increase thread engagement.

The perpendicularity of the fastener to the nut member, along with the opposing thread feature, increase the strip-out torque in the thin assemblies. To further increase material contact, the fastener is manufactured with a reduced out-of-round, and the threaded shank immediately under the head is tapered slightly; both of these features increase the radial contact with the nut member, resulting in increased strip-out resistance.

Since a major contributor to the strip-out torque performance in thin materials is the underhead surface, an undercut head feature is standard on every FASTITE® 2000™ screw to allow the nut member material to flow up into this zone upon tightening the fastener, increasing the underhead friction. Serrations along the underhead surface of the head diameter are an optional feature; one that is recommended for most applications.

The net result of all of the above features is the best performing fastener for thin metal assemblies that has ever been offered in the TRILOBULAR™ products portfolio. Feel free to learn more about FASTITE® 2000™ screws and download a FASTITE® 2000™ fastener brochure at our web site www.taptite.com.



Standard type AB screws lean over as the screw tends to align with the helix angle of the thread. Stripped threads or loose assemblies result.



FASTITE® 2000™ fasteners start straight and finish straight, providing a secure tight assembly. The twin-lead thread centers the fastener in the hole.

REMINC Training / Brochure Request Form

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Name: _____

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- Contact me regarding a training visit
- REMINC General Products Catalog
- TAPTITE 2000® Products Application Guide
- TAPTITE 2000® Product Brochure
- REMFORM® Product Brochure
- REMFORM® "F" Product Brochure
- TRU-START® Product Brochure
- FASTITE® 2000™ Product Brochure
- "54 Ways TAPTITE 2000® Fasteners Lower the Cost of Assembly" Request Form

Mail this form to REMINC at 25 Enterprise Center, Middletown, RI 02842 USA or fax it to fax #: (401) 841-5008

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1958 - 2003
Celebrating 45 Years
Lowering the Cost of
Assembly

