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Are you buying to obsolete specifications?

By Carmen Vertullo

Fastener specifications and standards for parts you routinely order for your customers might have changed. Sometimes these changes happen without your awareness, which can cause you and your customer an expensive heartache.

The Pacific-West Fastener Association devoted its June 5, 2012 dinner meeting to this topic, convening a panel of knowledgeable experts to share what every fastener distributor needs to know.

On the panel were Toby Anderson from Bay Bolt, Bill King from Porteous Fastener Co., Carmen Vertullo from Carver Consulting, and Andy Cohn from Duncan Bolt.

While fastener specifications do not change very often (certainly not as often as needed), there have been more changes than usual over the past few years, and many suppliers and users are not aware of the changes. The program focused on inch-based fastener standards.

ASTM B633, ASTM F1941

ASTM B633 has been the default standard for zinc electroplating of fasteners and other components since 1978. While it has had some recent changes and remains an active standard, the important change is that it has been replaced as the default standard for zinc electroplating of fasteners by ASTM F1941.

F1941 deals specifically with threaded fasteners and addresses many of the shortcomings of B633 when applied to threaded fasteners. F1941 also includes other coatings such as zinc-nickel, zinc-cobalt and cadmium, it provides for classification of trivalent and hexavalent supplementary coatings, and it addresses the management of hydrogen embrittlement risk when plating high-hardness fasteners.

The Industrial Fasteners Institute (IFI) has published a technical bulletin on the differences between B633 and F1941 and that bulletin is available for download at the Pac-West website Fastener Technology and Compliance Library. Here's a link to the bulletin: <http://www.pac-west.org/assets/docs/ifiplatingadvisory.pdf>

ASTM A153, ASTM F2329

These standards cover zinc hot dip galvanizing. Similar to the B633/F1941 scenario, F2329 is specifically suited for threaded fasteners and is an improvement over the more general A153. F2329 should be specified when hot dip galvanizing any kind of nut, bolt, washer, screw or threaded component.

ASME B18.16.6, IFI 101/107

ASME B18.6.6 is a new standard for nylon insert locknuts. It is designed to replace the nylon insert locknuts covered in IFI 101/107. The dimensional and performance requirements are essentially unchanged. The performance grades have been identified as NE2, NE5 and NE8 to match SAE J429 and SAE J995, a nice technical convenience.

Marking requirements are the same as IFI 101/107, so all existing product is in compliance with B18.6.6. This is an unusual ASME standard, in that it covers both dimensional and performance requirements.

ASTM F1554, ASTM A307

F1554 is a standard for steel anchor bolts in three different yield strength levels, 36, 55 and 105 KSI. Most notable is the move away from ASTM A307 Grade C anchor bolts to this specification.

The panel discussed a perceived weakness in F1554 that allows some manufacturers to produce bolts that do not technically meet the specification requirements. The standard allows for the finished product to be qualified based on the raw material test reports with no further testing required, provided that no subsequent heat treatment is conducted. Sometimes manufacturers use other manufacturing processes, such as drawing down the bar stock diameter that may change the physical properties of the finished product. The panel opined that in order to maintain consistency of product these processes should be addressed in the standard as well.

SAE J429

J429 is the specification for some of the most common bolts and screws used in inch-based OEM and MRO operations. It covers mainly Grades 2, 5 and 8 hex cap screws.

There have been two recent changes to J429. The first is that the quality and testing methods, which formerly resided in J429, have been removed and the specification now refers to ASTM F606 for testing methods. The two requirements are virtually identical so there is no impact on the product or the manufacturers.

The second change is very substantial. Formerly the standard allowed for the use of boron steel to manufacture only Grades 5.2 and 8.2, which required a different grade marking than Grades 5 and 8. The standard now allows boron steel for the manufacture of Grades 5 and 8, as well as Grades 5.2 and 8.2. Boron is only permitted in alloy steel for Grade 8.

SAE J995

J995 is the companion specification to SAE J429. It covers Grades 2, 5 and 8 nuts for use with Grades 2, 5 and 8 bolts and screws. The latest revision of J995 now includes provisions for all nut styles in Grade 2 (hex, heavy hex, jam, slotted, etc), whereas the previous revision only contained provisions for Grade 2 square nuts.

ASTM F568M, ISO 898-1

F568M is a little used ASTM standard covering steel and alloy steel metric fasteners. The standard was withdrawn in January 2012 because ISO 898-1 is the preeminent world standard for metric externally threaded fasteners.

ASME B18.21.1, ASME B18.2.2, ASME B18.6.3

These three ASME standards cover the dimensional requirements for washers, nuts and small screws respectively. Their changes have to do with consolidation of standards.

B18.21.1 combines washer specifications for flat washers and lock washers into one standard and now includes fender washers.

B18.2.2 combines all types of non-locking nuts (machine screw nuts, hex, square, hex flange, and coupling nuts) into one standard. The primary change was the addition of machine screw and coupling nuts.

B18.6.3 combines machine screws and tapping screws into one standard.

Consensus Standards Organizations

All fastener distributors should have current standards on hand for all the products they sell and should check the websites of the consensus standards organizations (CSOs) to determine if a standard is current.

- ASTM International (founded as the American Society for Testing and Materials) develops many types of standards relating to materials, processes and testing, a small percentage of which involve fasteners. www.astm.org
- ASME (the American Society of Mechanical Engineers) develops many types of engineering standards, a small percentage of which are dimensional standards relating to fasteners. www.asme.org
- SAE International (known as the Society of Automotive Engineers) develops standards for advancing the science and art of transportation vehicles, a small percentage of which relate to fasteners. www.sae.org
- IFI (the Industrial Fasteners Institute) represents the interests of North American fastener manufacturers. It compiles fastener specifications and technical information for use by all fastener suppliers and users and occasionally develops standards where there is a need not met by any of the other CSOs. <http://www.indfast.org>

Another way to stay abreast of fastener specification changes is through active participation in the CSO committees that develop and maintain the standards.

Other Resources

Changes to the *IFI Fastener Standards Book, 8th Edition* were covered briefly by the panelists and the new *IFI Technology Handbook* was presented as a resource for distributors and end users. This 313-page book contains comprehensive, basic and insightful information about fastener technology and fastener standards history. Although not a book of standards, this is great resource should be in every technical library and is available for purchase at www.pac-west.org. Click on Resources and Online Store.

Other IFI resources for keeping up to date on changes include the IFI Technology Connection, various IFI publications and IFI Technical Bulletins.

Pac-West's Fastener Training Institute offers training programs that cover specifications, particularly the Certified Fastener Specialist (CFS) program/

Disclaimer

As always, confirm all technical information independently before putting it to use for your company or offering it to your customers.

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