

Inspecting Nuts Can Minimize Customer Problems

By Joe Greenslade

Distributors seem to put more effort into inspecting screws and bolts than inspecting the nuts they sell. It should be realized that internally threaded fasteners are as important in joining as are their externally threaded counterparts.

Listed below are the basic dimensional and physical characteristics covered in most nut specifications:

When an assembly or applications problem occurs, both the male and female threaded components must be reviewed to determine the true culprit.

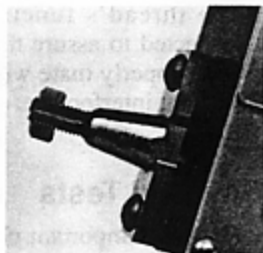
Dimensional Inspection

- Nut thickness is inspected to assure proper length of thread engagement to prevent thread stripping.
- The across flats (AF) dimension is inspected to assure the wrench will fit the nut.
- The across corners (AC) dimension is inspected to assure the nut corners will not round off during tightening when torque is applied by the wrench.
- The thread's minor diameter is the nut's most important thread dimension and should always be inspected. If the

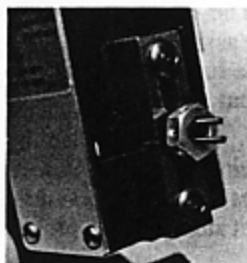
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Bi-Point® internal thread gage.



Measuring nut functional diameter.



Measuring nut minor diameter.



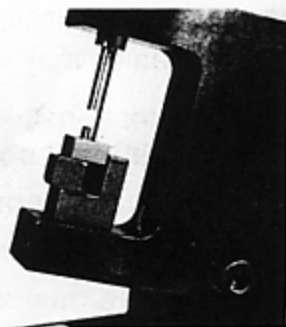
HexChek® nut measuring gage.



Measuring nut thickness.



Measuring nut across flats (AF).



Measuring nut across corners (AC).



Joe Greenslade is President of Greenslade and Company, Inc. located in Rockford, Illinois. His firm specializes in providing manufacturing tooling and inspection equipment to suppliers of screws, bolts, rivets, and nuts throughout the world.

Joe is an inventor, author, and lecturer. He holds eleven U.S. Patents, has written over 80 technical articles for industrial trade journals, and has spoken frequently at trade association meetings and technical conferences on issues related to industrial quality for

the past ten years.

He is an Associate Member of the Industrial Fastener Institute and a member of the American Society of Mechanical Engineers BI Thread Specification Committee. In 1992, Joe was recognized for his technical and innovative contributions to the fastener industry when, at age 44, he became the youngest person to be inducted into the National Industrial Fastener Show "Hall of Fame."

Inspecting Nuts

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thread's minor diameter is oversized the nut thread is likely to strip out when tension is applied to the bolt during joint tightening or during the operating of the assembled product.

- The thread's functional diameter is inspected to assure that the nut's thread will properly mate with the bolt's thread without interference.

Physical Tests

- The most important physical characteristic of nuts is their ability to meet the proof load requirements. The compliance of this characteristic assures the user that the nut can hold the full tensile load of the bolt used without stripping or distortion.
- Hardness testing is a requirement for all nut grades. The hardness test is an indirect method of predicting nut strength to

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assure the nut's load carrying capability.

When an assembly or applications problem occurs, both the male and female threaded components must be reviewed to determine the true culprit. Frequently, time is wasted in the analysis of a fastener problem by thoroughly scrutinizing the bolt and ignoring the nut. It should not always be assumed the screw or bolt is at fault when a problem arises in an assembly. When try-

ing to resolve a fastening problem, a prompt analysis should be made of the male threaded component, the female threaded component, and the method of assembly. The real problem cannot be accurately determined until all aspects of the fastening process are evaluated.

To eliminate problems that affect the customer, screws, bolts, and nuts should be reviewed by the supplier before shipment. As a minimum, distributors should do a visual inspection of all fasteners to catch obvious problems. They should also do the few inspections that assure proper function of the parts. In the case of nut products, if all characteristics listed above are not routinely inspected, at least the minor diameter and hardness should be inspected prior to shipment. Experience has shown that non-conformance in one or both of these two characteristics are the most common causes of performance problems. A few logical inspections prior to shipment can save a lot of after-shipment headaches for both distributors and their customers. □

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Greenslade & Company

2234 Wenneca Street

Fort Worth, TX 76102

817-870-8888, 817-870-9199 Fax