



Fermi National Accelerator Laboratory

FERMILAB-TM-1814

ASTM Hardness & Yield Strength Testing on Stockroom Bolts

R. Rucinski

*Fermi National Accelerator Laboratory
P.O. Box 500, Batavia, Illinois 60510*

December 1992

Disclaimer

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ASTM HARDNESS & YIELD STRENGTH TESTING
ON STOCKROOM BOLTS

R. Rucinski

I have tested some 1/4"-28-UNF x 1-1/2" long bolts which were pulled from the stock bin at Lab 3 in December of 1989. The purpose of the testing was to make sure the bolts were of ASTM quality and could be used with confidence to their ASTM rated strength. {There has been a crisis in the United States by the influx of inferior, "bogus", bolts.}

All the bolts tested met ASTM specifications in the areas tested. The bolts were tested for hardness and yield strength per ASTM designation F 606-86, Standard Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets.

HARDNESS: Required hardness per ASTM designation F 593-86, Standard Specifications for Stainless Steel Bolts, Hex Cap Screws, and Studs is Rockwell B65 to B95.

Eight bolts were tested in four locations on a Model 3JR 3939 Wilson Mechanical Instrument Co. Inc. machine at the Mechanical Assembly Building (FNAL prop. No. 4169). The average hardness of the four locations are given below.

Bolt 1	Rockwell B86	Bolt 5	Rockwell B87
Bolt 2	Rockwell B91	Bolt 6	Rockwell B89
Bolt 3	Rockwell B84	Bolt 7	Rockwell B89
Bolt 4	Rockwell B87	Bolt 8	Rockwell B92

YIELD STRENGTH: Required yield strength at an offset of 0.2% of gage per ASTM designation F 593-86 is 30 ksi.

Four bolts were tested in an INSTRON testing machine (FNAL prop. No. 2384). The yield strength at an offset of 0.2% of gage are given below.

Bolt 1	90 ksi	Bolt 3	79 ksi
Bolt 2	92 ksi	Bolt 4	82 ksi