

# Stressproof® Steel Bars

## Specifications

Stressproof® is made by a patented process which consists of drawing the bar through a special die under heavy draft, then stress relieving it in a precisely controlled furnace. Stressproof® offers wearability without case hardening, strength without heat treating, plus excellent machinability and tool life. Other benefits include resistance to fatigue and stress, balanced working, and minimum warpage and distortion. Stressproof® can also be induction hardened but should be watched for quench cracks, and, being a resulfurized steel, a magnetic particle inspection operation should be performed after heat treating.

### Chemistry\*

Carbon	0.40/0.48%
Manganese	1.35/1.65%
Phosphorus	0.040 Max%
Sulfur	0.24/0.33%
Silicon	0.15/0.35%

\*AISI 1144 heats to be used for Stressproof® are usually nitrogen-treated, and contain nitrogen in quantities normally associated with steel produced by the electric furnace process

### Mechanical Properties

Tensile Strength	115,000 psi (Min)
Yield Strength	100,000 psi (Min)
Machining Characteristics	83% of 1212
Elongation	**
Reduction of Area	**

\*\*Will meet ASTM A311 Class B. Value varies with size.

### Microstructure

Pearlite & ferrite

### Size Range

Rounds	1/4" through 4-1/2"
Hexagons	1/4" through 2"

### Tolerances\*

Rounds	
1/4" to 1-1/2" incl	0.004"
Over 1-1/2 to 2-1/2" incl	0.005"
Over 2-1/2" to 4" incl	0.006"
Over 4" to 4-1/2" incl	0.007"

\*Tolerances provide for undersize variation only.

### Finish

- Standard "as-drawn" finish is smooth, accurate, and dark in color.
- Ground and polished with special close tolerances available on order.

Hexagons	
1/4" to 3/4" incl	0.004"
Over 3/4" to 1-1/2" incl	0.005"
Over 1-1/2 to 2" oncl	0.006"

	ASTM A311	Stressproof®
Mechanical Property Tests	1 tension test every 50,000 lbs. or less of same lot for Tensile, Yield, Elongation/2", R/A	1 tension test for every 50,000 lbs. or less of same lot for Tensile, Yield, Elongation/2", R/A. If restraightened, the same number of tests are again required.
Seam Depth Specification	No specification	Maximum seam depth of 0.010 up to 5/8" diameter. Thereafter 0.001 per each 1/16" of diameter, i.e., 1" diameter = 0.016" max depth of seam. Seams deeper than this are rejectable. This specification is 3% less than the standard for AISI 1144 grade.
Surface Testing	No specification	Every order is AQL inspected for surface defects with a comparator or roto bar tester. Seams deeper than that stated above are rejected in house.
Machinability Testing	No specification	One or more machinability tests are run every 10,000 lbs or less of same lot. If final test is negative, the Stressproof® lot is rejected.
Warpage Testing	No specification	One warpage test is taken of first bar produced by a new or reground specially designed drawing die. If this test indicates stresses are out of specification, the die is not used.
Drawing Die Testing	No specification	An optical comparator test is made of a mold from each new or reground die measuring the internal geometry of the die. Routine warpage tests are also conducted throughout the life of the die.



America's Largest Independent Cold Finished Steel Bar Producer

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