

AISI 4140, QUENCH AND TEMPER TO 120 KSI - MINIMUM YIELD STRENGTH**1. SCOPE**

This specification defines the requirements for Cold Drawn Steel Bar conforming to AISI chemistry specifications and ASTM A29 dimensional tolerances.

2. APPLICATION

This specification includes material requirements, ordering information and quality requirements to be used by Engineering, Purchasing and Manufacturing.

3. DRAWING SPECIFICATIONS

3.1 C.D. Round AISI 4140, Q&T, 120 KSI Min.Yield, 331 Max. BHN, 16% Min. Elong. in 2".

3.2 C.D. Round AISI 4140, Q&T, 120 KSI Min.Yield, 331 Max. BHN, 16% Min. Elong. in 2", Ground and Polished.

4. RELATED SPECIFICATIONS**4.1 REFERENCE STANDARDS**

ASTM A29 - Standard Specifications for Steel Bar, Carbon and Alloy, Hot Wrought and Cold Finished, General Requirements.

ASTM A331 - Standard Specification for Steel Bar, Alloy, Cold Finished, Standard Quality.

ASTM A322 - Standard Specification for Steel Bars, Alloy, Standard Grades

86050124(FNHA-2-A-027.00) - General Requirements for Carbon and Alloy Steel Bars, Hot Rolled and Cold Finished.

WS 50.02 material 42CrMoS4 V+S

WS 50.03 material 42CrMoS4 SH+V

86599841(FNHA-2-A-412.01) Matl. List

4.2 This standard replaces the following company standard:

Versatile

MS - 629.

5. ORDERING INFORMATION

5.1 AISI 4140 Steel Cold Drawn Bar, Standard Quality.

5.2 Dimensions (size, bar length, and whether cut length or random length).

5.3 Condition: Cold drawn, quenched and tempered, or cold drawn, quenched and tempered, ground and polished.
Hot-rolled may be used as alternate material, provided mechanical properties and dimensional tolerances meet specifications.

5.4 Leaded steel, if required.

5.5 Grain size, if required.

6. CHEMICAL COMPOSITION FOR AISI 4140 STEEL AND 42CrMoS4 STEEL

Chemistry:	4140-4142	42 CrMoS 4
Carbon,%	0.38 to 0.45	0.36 to 0.47
Manganese,%	0.75 to 1.00	0.56 to 0.94
Phosphorus,%	0.035 max.	0.040 max.
Sulfur,%	0.040 max.	0.015 to 0.040
Silicon,%	0.15 to 0.35	0.43 max.
Nickel,%	---	---
Chromium,%	0.80 to 1.10	0.85 to 1.25
Molybdenum,%	0.15 to 0.25	0.12 to 0.33

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7. DIMENSIONAL TOLERANCES

7.1 Size tolerances for Cold Drawn Rounds - see Table 1 and Table 2. 7.2 Length tolerance for cut lengths + 2" / - 0, unless otherwise specified by part number drawing.

7.3 Straightness tolerances for Cold Drawn Rounds - see Table 3.

8. MECHANICAL PROPERTIES

Cold Drawn, Quenched and Tempered Properties:

Tensile Strength, psi, typical	153 000
Yield Strength, psi, minimum	120 000
Elongation in 2", typical %	16
Reduction in Area, typical %	45
Rockwell C Hardness, typical	32
Brinnell Hardness, typical	302

TABLE 1. Size Tolerance for 4140 C.D. Quenched and Tempered, Ground and Polished Rounds

Size, inches	CD Ground and Polished Tolerance from Specified Size, Minus only, inches
To 1 1/2, incl.	0.001
Over 1 1/2 to 2 1/2, incl.	0.0015
Over 2 1/2 to 3, incl.	0.002
Over 3 to 4, incl.	0.003

TABLE 2. Size Tolerance for 4140 C.D. Quenched and Tempered Rounds

Size, inches	Cold Drawn Tolerance from Specified Size, Minus only, inches
To 1 1/2, incl.	0.005
Over 1 1/2 to 2 1/2, incl.	0.006
Over 2 1/2 to 4, incl.	0.007
Over 4 to 6, incl.	0.008
Over 6 to 8, incl.	0.009
Over 8 to 9, incl.	0.010

TABLE 3. Straightness Tolerance for 4140 C.D. Quenched and Tempered Rounds

Size, inches	Length, feet	Straightness Tolerance, inches, Maximum Deviation from Straightness in any 10 ft. Portion of Bar
Less than 5/8	Less than 15	3/16
Less than 5/8	15 and over	5/16
5/8 and over	Less than 15	1/8
5/8 and over	15 and over	3/16



NAME

STD 4140 (120K) CD RD

ENGINEERING SPECIFICATION

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