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By Vishwas Agarwal

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(535A99) • World Equivalent Grades of EN No. 31 (535A99) • BS 970-1955: EN No. 32C (080M15) • World Equivalent Grades of EN No. 32C (080M15) Bright Bar • World Equivalent Grades of EN No. 32C (080M15) Case Hardening • BS 970-1955: EN No. 32M (210M15) • World Equivalent Grades of EN No. 32M (210M15) • BS 970-1955: EN No. 39B (835M15) • BS 970-1955: EN No. 40B (722M24) • BS 970-1955: EN No. 41B (905M39) • BS 970-1955: EN No. 42 (070A72/070A78) • World Equivalent Grades of EN No. 42 (070A72) • World Equivalent Grades of EN No. 42 (070A78) • BS 970-1955: EN No. 43A (080M50) • World Equivalent Grades of EN No. 43A (080M50) • BS 970-1955: EN No. 43B (060A62) • World Equivalent Grades of EN No. 43B (060A62) • BS 970-1955: EN No. 43E (080A67) • World Equivalent Grades of EN No. 43E (080A67) • BS 970-1955: EN No. 44,44B (060A96) • World Equivalent Grades of EN No. 44,44B (060A96) Spring • World Equivalent Grades of EN No. 44,44B (060A96) Forging • BS 970-1955: EN No. 45 (250A53) • World Equivalent Grades of EN No. 45 (250A53) • BS 970-1955: EN No. 45A (250A58) • World Equivalent Grades of EN No. 45A (250A58) • BS 970-1955: EN No. 56A (410S21) • World Equivalent Grades of EN No. 56A (410S21) • BS 970-1955: EN No. 56B (420S29) • World Equivalent Grades of EN No. 56B (420S29) • BS 970-1955: EN No. 56C (420S37) • World Equivalent Grades of EN No. 56C (420S37) • BS 970-1955: EN No. 56AM (416S21) • World Equivalent Grades of EN No. 56AM (416S21) • BS 970-1955: EN No. 56AM (416S41) • World Equivalent Grades of EN No. 56AM (416S41) • BS 970-1955: EN No. 56BM (416S29) • World Equivalent Grades of EN No. 56BM (416S29) • BS 970-1955: EN No. 56CM (416S37) • World Equivalent Grades of EN No. 56CM (416S37) • BS 970-1955: EN No. 57 (431S29) • World Equivalent Grades of EN No. 57 (431S29) • BS 970-1955: EN No. 58E (304S15) • World Equivalent Grades of EN No. 58E (304S15) • BS 970-1955: EN No. 60 (430S17) • World Equivalent Grades of EN No. 60 (430S17) • BS 970-1955: EN No. 201 (130M15) • World Equivalent Grades of EN No. 201 (130M15) • BS 970-1955: EN No. 202 (214M15) • World Equivalent Grades of EN No. 202 (214M15) • BS 970-1955: EN No. 353 (315M17) • World Equivalent Grades of EN No. 353 (315M17) • BS 970-1955: EN No. 354 (320M17) • World Equivalent Grades of EN No. 354 (320M17) • BS 970-1955: EN No. 355 (822M17) • World Equivalent Grades of EN No. 355 (822M17)

FREE CUTTING STEELS

• Free Cutting Carbon Steel, Resulfurized, ASTM 1108 • Free Cutting Carbon Steel, Resulfurized, ASTM 1109 • Free Cutting Carbon Steel, Resulfurized, ASTM 1116 • Free Cutting Carbon Steel, Resulfurized, ASTM 1137 • Free Cutting Carbon Steel, Resulfurized, ASTM 1140 • Free Cutting Carbon Steel, Resulfurized, ASTM 1146 • Free Cutting Carbon Steel, Resulfurized, ASTM 1151 • Free Cutting Carbon Steel, Rephosphorized and Resulfurized, ASTM 1212 • Free Cutting Carbon Steel, Rephosphorized and Resulfurized, ASTM 1213 • Free Cutting Carbon Steel, Rephosphorized and Resulfurized, ASTM 1215 • Free Cutting Carbon Steel, Rephosphorized and Resulfurized, ASTM 12L13 • Free Cutting Carbon Steel, Rephosphorized and Resulfurized, ASTM 12L14

HEAT TREATABLE STEELS

• Heat Treatable Alloy Steel, Cr Mo, ASTM 5130/5130H • Heat Treatable Alloy Steel, Cr ASTM 5132/5132H • Heat Treatable Alloy Steel, Cr ASTM 5135/5135H • Heat Treatable Alloy Steel, Cr ASTM 5140/5140H • Heat Treatable Alloy Steel, Cr ASTM 5046/5046H • Heat Treatable Alloy Steel, Cr ASTM 50B40/50B40H • Heat Treatable Alloy Steel, Cr Mo, ASTM 4130/4130H • Heat Treatable Alloy Steel, Cr Mo, ASTM 4135/4135H • Heat Treatable Alloy Steel, Cr Mo, ASTM 4140/4140H • Heat Treatable Alloy Steel, Cr Mo, ASTM 4142/4142H • Heat Treatable Alloy Steel, Cr Mo, ASTM 4150/4150H • Heat Treatable Alloy Steel, Mn, ASTM 1340/1340H • Heat Treatable Alloy Steel, Ni Cr Mo, ASTM 4337 • Heat Treatable Alloy Steel, Ni Cr Mo, ASTM 9840 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1020 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1022 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1023 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1025 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1030 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1035 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1039 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1040 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1045/1045H • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1046 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1050 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1055 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1060 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1064 • Heat Treatable Carbon Steel, Nonresulfurized, ASTM 1090 • Heat Treatable Carbon High-Mn Steel, ASTM 1527 • Heat Treatable Carbon High-Mn Steel, ASTM 1541/1541H

HIGH STRENGTH LOW ALLOY (HSLA) STEELS

• High-Strength Steel; Carbon and Low Alloy Definition • High-Strength Steel; Carbon and Low Alloy AISI Designation System • High-Strength Steel; Carbon and Low Alloy Product Description • High-Strength Steel; Carbon and Low Alloy Fabricating and Processing • High-Strength Steel; Carbon and Low Alloy Grade Description • Structural Quality (S) Steels; Recommended Practice for Mechanical Properties • High-Strength Steel; ASTM and SAE Specifications • Structural Quality (S) Steels; ASTM Recommended Practice for Chemical Composition • Low-Alloy Sheet, Strip and Plate, Recommended Inside Bend Radius • Low-Alloy (X) steels; Mechanical Properties (Sheet, Strip, Plates, Bar, shapes) • Weathering, Low-Alloy Steel; Mechanical Properties (Sheet, Strip, Plates, Bar, Shapes) • Low Alloy Improved Formability (XF) Sheet, Strip and Plate Recommended inside Bend Radius • SAE Designations: Tensile Properties in accordance with ASTM A370 • SAE High Strength, Low Alloy Steel Plate, Shapes and Bar: 180° Bend Test Requirements • SAE High Strength, Low Alloy Steels: Approx. Order of Increasing Excellence • SAE High Strength, Low Alloy Steels, Sheet, Strip, Plate - Min. inside Radii for Cold Bending • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A242(1) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM 514(A) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM 514(F) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A537 • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A588(A) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A588(B) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A588(C) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A618(II) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A618(III) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A633(C) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A633(D) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A656(II) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A690 • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A709(C) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A714(III) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(1) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(2) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(4) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(5) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(6) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A715(7) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A724(A) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A724(B) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM A734(B) • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM AH32 • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM AH36 • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM B • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM J • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM K12003 • World Equivalent Grades-High Strength Steel, Low - Alloy ASTM LF6 • World Equivalent Grades-High Strength Steel, Maraging ASTM A538(A) • World Equivalent Grades-High Strength Steel, Maraging ASTM A538(B) • World Equivalent Grades-High Strength Steel, Maraging ASTM A538(C) • World Equivalent Grades-High Strength Steel, Structural ASTM 50-1 • World Equivalent Grades-High Strength Steel, Structural ASTM 50-2 • World Equivalent Grades-High Strength Steel, Structural ASTM 50-3 • World Equivalent Grades-High Strength Steel, Structural ASTM 50-4 • World Equivalent Grades-High Strength Steel, Ultrahigh-Strength ASTM 300M • World Equivalent Grades-High Strength Steel, Ultrahigh-Strength ASTM A579(13) • World Equivalent Grades-High Strength Steel, Ultrahigh-Strength ASTM A579(81) • World Equivalent Grades-High Strength Steel, Ultrahigh-Strength ASTM A579(82) • World Equivalent Grades-High Strength Steel, Ultrahigh-Strength ASTM A579(83)

SPRING STEELS

• Spring Steel - Carbon, Nonresulfurized ASTM 1070 • Spring Steel - Carbon, Nonresulfurized ASTM 1078 • Spring Steel - Carbon, Nonresulfurized ASTM 1095 • Spring Steel - Alloy, Mn, ASTM 1345/1345H • Spring Steel - Alloy, Cr, ASTM 50B50/50B50H • Spring Steel - Alloy, Cr, ASTM 5155/5155H • Spring Steel - Alloy, Cr V, ASTM 6150/6150H • Spring Steel - Alloy, Si Mn, ASTM 9255 • Spring Steel - Alloy, Si Mn, ASTM 9260/9260H

Steel, Mo High-Speed ASTM M6 • Tool Steel, Mo High-Speed ASTM M7 • Tool Steel, Mo High-Speed ASTM M10 • Tool Steel, Mo High-Speed ASTM M30 • Tool Steel, Mo High-Speed ASTM M33 • Tool Steel, Mo High-Speed ASTM M34 • Tool Steel, Mo High-Speed ASTM M35 • Tool Steel, Mo High-Speed ASTM M36 • Tool Steel, Mo High-Speed ASTM M41 • Tool Steel, Mo High-Speed ASTM M42 • Tool Steel, Mo High-Speed ASTM M43 • Tool Steel, Mo High-Speed ASTM M44 • Tool Steel, Mo High-Speed ASTM M46 • Tool Steel, Mo High-Speed ASTM M47 • Tool Steel, Mo High-Speed ASTM M48 • Tool Steel, Mo High-Speed ASTM M50 • Tool Steel, Mo High-Speed ASTM M52 • Tool Steel, Mo High-Speed ASTM M61 • Tool Steel, Mo High-Speed ASTM M62 • Tool Steel, Oil-Hardening Cold Work ASTM CA2 • Tool Steel, Oil-Hardening Cold Work ASTM CD2 • Tool Steel, Oil-Hardening Cold Work ASTM O1 • Tool Steel, Oil-Hardening Cold Work ASTM O2 • Tool Steel, Oil-Hardening Cold Work ASTM O6 • Tool Steel, Oil-Hardening Cold Work ASTM O7 • Tool Steel, Mold Steel, ASTM P2 • Tool Steel, Mold Steel, ASTM P3 • Tool Steel, Mold Steel, ASTM P4 • Tool Steel, Mold Steel, ASTM P5 • Tool Steel, Mold Steel, ASTM P6 • Tool Steel, Mold Steel, ASTM P20 • Tool Steel, Mold Steel, ASTM P21 • Tool Steel, Shock Resisting, ASTM S1 • Tool Steel, Shock Resisting, ASTM S2 • Tool Steel, Shock Resisting, ASTM S4 • Tool Steel, Shock Resisting, ASTM S5 • Tool Steel, Shock Resisting, ASTM S6 • Tool Steel, Shock Resisting, ASTM S7 • Tool Steel, Tungsten, High-Speed, ASTM F1 • Tool Steel, Tungsten, High-Speed, ASTM F2 • Tool Steel, Tungsten, High-Speed, ASTM T1 • Tool Steel, Tungsten, High-Speed, ASTM T2 • Tool Steel, Tungsten, High-Speed, ASTM T4 • Tool Steel, Tungsten, High-Speed, ASTM T5 • Tool Steel, Tungsten, High-Speed, ASTM T6 • Tool Steel, Tungsten, High-Speed, ASTM T8 • Tool Steel, Tungsten, High-Speed, ASTM T15 • Tool Steel, Water-Hardening ASTM W1 • Tool Steel, Water-Hardening ASTM W2 • Tool Steel, Water-Hardening ASTM W5 • Hardness Value Recommendation for Various Kinds of Tools

IMPORTANT ASTM STANDARDS

• ASTM Steels: Introduction • ASTM A36: Chemical Composition • ASTM A36: Applications and Characteristics • ASTM A36: Tensile Properties for Plate, Shapes and Bar • ASTM A131: Chemical Composition • ASTM A131: Applications and Characteristics • ASTM A131: Physical and Mechanical Properties (Thermal Treatment) • ASTM A131: Tensile Properties • ASTM A135: Chemical Composition • ASTM A135: Applications and Characteristics • ASTM A135: Tensile Properties of Electric Resistance Welded Steel Pipe • ASTM A139: Chemical Composition • ASTM A139: Applications and Characteristics • ASTM A139: Tensile Properties of Electric Fusion, Arc Welded Steel Pipe • ASTM A227, A227M: Chemical Composition • ASTM A227, A227M: Applications and Characteristics • ASTM A227M: Tensile Requirements (Metric Units) • ASTM A228: Chemical Composition • ASTM A228: Applications and Characteristics • ASTM A228: Mechanical Properties (Spring Quality, Steel Music Wire) • ASTM A229: Chemical Composition • ASTM A229: Applications and Characteristics • ASTM A229: Tensile Properties of Oil-Tempered Steel Spring Wire • ASTM A230: Chemical Composition • ASTM A230: Applications and Characteristics • ASTM A230: Tensile Properties of Oil-Tempered, Valve, Quality Carbon Steel Wire • ASTM A231, A232: Chemical Composition • ASTM A231, A232: Applications and Characteristics • ASTM A231, A232: Tensile Properties of Cr-V Steel Spring, Valve Spring Wire • ASTM A283: Chemical Composition • ASTM A283: Applications and Characteristics • ASTM A283: Mechanical Properties (Elongation of Plates wider than 610mm) • ASTM A284: Chemical Composition • ASTM A284: Applications and Characteristics • ASTM A284: Mechanical Properties (Elongation of Plates wider than 610mm) • ASTM A308: Chemical Composition • ASTM A308: Application and Characteristics • ASTM A366, A569: Chemical Composition • ASTM A366, A569: Applications and Characteristics • ASTM A401: Chemical Composition • ASTM A401: Applications and Characteristics • ASTM A401: Tensile Properties of Cr-Si Steel Spring Wire • ASTM A424: Chemical Composition • ASTM A424: Applications and Characteristics • ASTM A424: Mechanical Properties • ASTM A446: Chemical Composition • ASTM A446: Applications and Characteristics • ASTM A446: Mechanical Requirements for Base Metal • ASTM A463: Chemical Composition • ASTM A463: Applications and Characteristics • ASTM A463: Physical Properties-Thickness, Weight of Al Coated Steel Sheets • ASTM A485: Chemical Composition • ASTM A485: Applications and Characteristics • ASTM A500: Chemical Composition • ASTM A500: Applications and Characteristics • ASTM A500: Tensile Properties of Cold Formed Welded and Seamless Carbon Steel Tubing • ASTM A501: Chemical Composition • ASTM A501: Applications and Characteristics • ASTM A501: Tensile Properties of Hot Formed Welded and Seamless Carbon Steel Tubing • ASTM A514: Chemical Composition • ASTM A514: Applications and Characteristics • ASTM A514: Tensile and Hardness Requirements • ASTM A525, A525M, A526, A527, A528, A642: Chemical Composition • ASTM A525, A525M, A526, A527, A528, A642: Applications and Characteristics • ASTM A525M: Mechanical Properties (Coating Bend Tests) • ASTM A529: Chemical Composition • ASTM A529: Applications and Characteristics • ASTM A529: Tensile Properties (Plates wider than 610mm) • ASTM A570: Chemical Composition • ASTM A570: Applications and Characteristics • ASTM A570: Tensile Properties (Specimens in Longitudinal Direction) • ASTM A573: Chemical Composition • ASTM A573: Applications and Characteristics • ASTM A573: Tensile Properties (Plates wider than 610mm) • ASTM A591: Chemical Composition • ASTM A591: Applications and Characteristics • ASTM A591: Physical Properties (Minimum Coating Test Limits) • ASTM A599: Applications and Characteristics • ASTM A599: Mechanical Properties (Coating, Designations) • ASTM A611: Chemical Composition • ASTM A611: Applications and Characteristics • ASTM A611: Tensile Properties taken on Longitudinal Test Specimens • ASTM A619, A620: Chemical Composition • ASTM A619, A620: Applications and Characteristics • ASTM A621, A622: Chemical Composition • ASTM A621, A622: Applications and Characteristics • ASTM A678: Chemical Composition • ASTM A678: Applications and Characteristics • ASTM A678: Tensile Properties (Plates wider than 610mm) • ASTM A699: Chemical Composition • ASTM A699: Applications and Characteristics • ASTM A699: Tensile Properties • ASTM A709: Chemical Composition • ASTM A709: Applications and Characteristics • ASTM A709: Tensile and Hardness Properties • ASTM A710: Chemical Composition • ASTM A710: Applications and Characteristics • ASTM A710: Physical and Tensile Properties (Thermal Treatment)

FERROUS METAL STANDARDS

• ASTM Ferrous Metal Standards • ASTM Discontinued Ferrous Metal Standards • JIS Ferrous Metal Standards • JIS Discontinued Ferrous Metal Standards • EN Current Steel Standards • EN Standards with Superseded AFNOR-BS-DIN Standards • Former AFNOR-BS-DIN Standards Superseded by EN Standards • ISO Ferrous Metal Standards

PHYSICAL AND MECHANICAL DATA OF STEEL

• Definitions of Mechanical Properties for different types of Steel • Definitions of Notch Bar Impact Test • Tension (Definition, Symbol, Dimensions) • Torsion (Definition, Symbol, Dimensions) • Fatigue (Definition, Symbol, Dimensions) • Creep (Definition, Symbol, Dimensions) • Impact (Definition, Symbol, Dimensions) • Hardness (Definition, Symbol, Dimensions) • Static Hardness (Definition, Symbol, Dimensions) • Measurement of Hardness and Thickness (Definition, Symbol, Dimensions) • Magnetic Particle Inspection (Definition, Symbol, Dimensions) • Fluorescent Penetrants (Definition, Symbol, Dimensions) • Ultrasonic Testing (Definition, Symbol, Dimensions) • Eddy Current Testing (Definition, Symbol, Dimensions) • Nondestructive Testing (NDT) (Definition, Symbol, Dimensions) • Coordinate Measuring Machine of Nondestructive Testing (Definition, Symbol, Dimensions) • Angle Measuring Instruments of Nondestructive Testing (Definition, Symbol, Dimensions) • Basic Principles, Application of Various Methods for Nondestructive Testing • Appearances and Causes of Flaws during Nondestructive Testing Methods • Symbols, Units of Physical Quantity • Symbols, Units of Test Piece Gauge Length

CONVERSION FACTORS AND WEIGHT TABLES

• Established units of Frequent Use in Engineering Practice and their Conversion into SI Units • Conversion of Force Units • Conversion of Pressure, Mechanical Stress Units • Conversion of Energy, Work, Quantity of Heat Units • Conversion of Power, Energy Flux, Heat Flow Units • Conversion of Stress to Hot Yield Strength - Yield Strength, Tensile Strength (SI Units) • Conversion of Impact Strength to Impact Value (ISO V Notched Bar Specimens) • Conversion of British and US Units to Metric • Conversion of mm to inches to mm • Conversion of inches to mm • Conversion of Decimal of an inch to mm • Conversion of Inches and Fraction of an Inch to mm • Conversion of Feet to metre • Conversion of square inches (in²) to square centimetre (cm²) • Conversion of cubic inches (in³) to cubic centimetre (cm³) • Conversion of cubic feet (ft³) to cubic metre (m³) • Conversion of kilograms (kg) to pounds (lb) to kilograms (kg) • Conversion of British thermal units (Btu) to Kilojoule (kJ) • Conversion of Centigrades (°C) to Degrees Fahrenheit (°F) to Centigrades • Conversion of tonf/in² to mn/m² (MPa) (Pressure Mechanical Stress) • Conversion of ksi to N/mm² (MPa) (Tensile Strength) • Conversion of ft.lbf to J (joule) (Energy Work) • Weight Tables of Round, Triangular Cross Sections • Weight Tables of Square, Hexagonal, Octagonal Cross Sections • Weight Tables of Flats • Weight Tables of Steel Tubes