

TECHNICAL DATASHEET

[455/XM-16]

Datasheet No. SX-0014 · Version 260723

► GENERAL DESCRIPTION

AISI 455 (Custom 455, UNS S45500) is a high-strength martensitic precipitation-hardening stainless steel. Through solution treatment and age-hardening processes, this material can achieve extremely high strength levels while maintaining good toughness and excellent corrosion resistance. It is well suited for high-load applications and critical structural components.

► DESIGNATIONS & STANDARDS

DIN	ASTM	UNS	EN 10088
1.4543	A564/F899/A693	S45500	X3CrNiCuTiNb12-9

► PRODUCT FORMS & APPLICABLE STANDARDS

Product Form	Applicable Standards
Bar / Rod	ASTM F899 Class 5; ASTM A564 Type XM-16; AMS 5617 Grade 1; AMS 5617 Grade 2;
Wire	ASTM F899 Class 5; ASTM A564 Type XM-16; AMS 5672
Tube / Pipe	ASTM F899 Class 5; AMS 5578

► CHEMICAL COMPOSITION (MASS %) *In accordance with: [ASTM F564]*

Element	C	Mn	P	S	Si	Cr	Ni	Mo	Ti	Cu	Nb+Ta	Fe
Content (%)	≤0.03	≤0.50	≤0.015	≤0.015	≤0.05	11.00-12.50	7.50-9.50	0.50	0.9-1.40	1.50-2.50	0.10-0.5	Balance

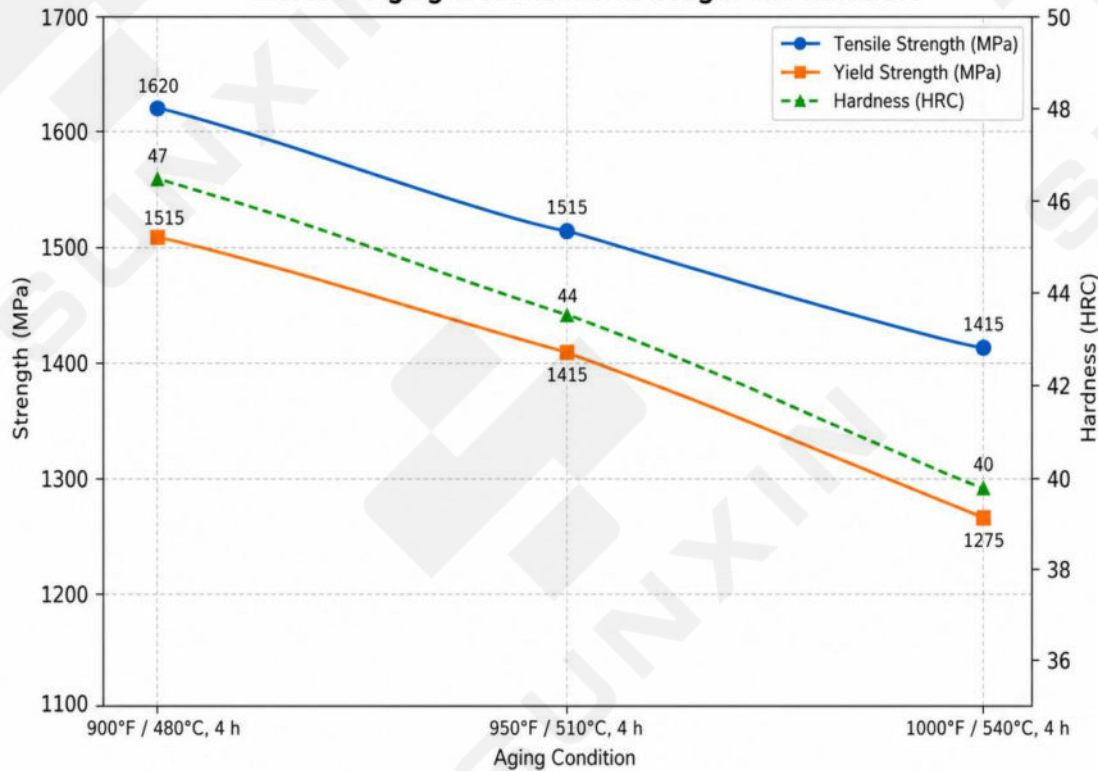
► SOLUTION TREATMENT

Condition	Heating Temperature	Holding Time (h)	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (4D)	Reduction of Area (%)	Hardness (HRC)
Solution Annealed	1525 ± 25 °F/830 ± 15 °C	1	/	/	/	/	≤36

► AGING TREATMENT

Condition	Heating Temperature	Holding Time (h)	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (4D)	Reduction of Area (%)	Hardness (HRC)
Aged	900F/480°C	4	≥1620	≥1515	8	30	≥47
Aged	950°F/510°C	4	≥1515	≥1415	10	40	≥44
Aged	1000°F/540°C	4	≥1415	≥1275	10	40	≥40

Effect of Aging Treatment on Strength and Hardness



► APPLICATIONS

Condition	Dimension
Medical	High-strength surgical tools / Dental instruments / Guide pins / Micro shafts / Medical device elastic parts
Aerospace	Fasteners / Pin shafts / Shaft components / Transmission components / High-strength small structural parts
Industrial	Springs / Valve parts / Pump shafts / Fasteners / Precision mechanical parts
Mechanical engineering	High-strength micro shafts / Gripper connecting pins / Elastic connectors / Corrosion-resistant transmission components

► AVAILABLE FORMS

Available Form	Size Range	Surface Finish	Length (Customizable)	Tolerance (Customizable)	Delivery Condition
Bar	φ1.0-φ200.0mm	Ground / Precision Polished	3M/PCS	h6-h9	Solution Annealed
Wire	φ1.0-φ3.0mm	Ground / Precision Polished	1M/PCS	h6-h9	Solution Annealed
Tube	OD: 1.0-10.0mm ID:0.08mm-2.0mm	Ground / Precision Polished	3M/PCS	h6-h9	Solution Annealed

*Materials/ specifications or special requirements not shown in the table can all be customized.
Please contact our sales team.*

► TESTING & CERTIFICATION

TESTING CAPABILITIES	QUALITY & TRACEABILITY
- Chemical: OES · O/N/H analyzer - Mechanical: tensile · Rockwell/Vickers · impact - NDT: ultrasonic testing (UT) - Metallography: optical & electron microscope - Dimensional: straightness / roundness / coaxiality	- ERP full-process traceability · heat-number control - Batch consistency control - Third-party testing: on request/ at extra cost - Standards: ASTM · ISO · EN · AMS · DIN - MTC with each shipment



*We make no express or implied warranties regarding the above or other uses.**