TECHNICAL DATA SHEET

316 Stainless Steel Wire

Technical Data Sheet — 316 / 316L / 316LVM

Ken-tron draws 316, 316L, and 316LVM stainless steel wire for the aerospace, automotive, defense, medical, electronics, and weaving industries. Our wire division specializes in small-diameter, close-tolerance wire manufactured to your exact specifications.

316 / 316L / 316LVM
Alloy Variants

2,500–2,550 °F
Melting Range

2.0–3.0%
Molybdenum Content

ASTM F138-19
Medical Grade Standard

GRADE OVERVIEW

316 SS

ASTM A493 / A555

Standard grade. Industrial, mechanical, and spring applications.

316L SS

ASTM A493 / A555 / AMS 5653

Low carbon. Preferred for welded assemblies; resists sensitization.

316LVM

ASTM F138-19

Vacuum melted. Implantable medical devices and high-purity electronics.

CHEMICAL COMPOSITION

Key Elements — 316LVM (ASTM F138-19 Medical Grade)

Cr	Ni	Mo	Mn	Si	C	P	S	Fe
Chromium	Nickel	Molybdenum	Manganese	Silicon	Carbon	Phosphorus	Sulfur	Iron
17–19%	**13–15%**	**2.25–3%**	**2% max**	**0.75% max**	**0.03% max**	**0.025% max**	**0.01% max**	**Balance**

316LVM — ASTM F138-19 (Medical)

Element	wt%
Carbon (C)	0.03 max
Chromium (Cr)	17.0 – 19.0
Nickel (Ni)	13.0 – 15.0
Molybdenum (Mo)	2.25 – 3.00
Manganese (Mn)	2.00 max
Silicon (Si)	0.75 max
Phosphorus (P)	0.025 max
Sulfur (S)	0.010 max
Nitrogen (N)	0.10 max
Copper (Cu)	0.50 max
Cobalt (Co)	0.10 max
Iron (Fe)	Balance

316 / 316L — ASTM A493 / A555 (Industrial)

Element	316 / 316L wt%
Carbon (C)	0.08 / 0.03 max
Chromium (Cr)	16.0 – 18.0
Nickel (Ni)	10.0 – 14.0
Molybdenum (Mo)	2.0 – 3.0
Manganese (Mn)	2.00 max
Silicon (Si)	1.00 max
Phosphorus (P)	0.045 max
Sulfur (S)	0.030 max
Nitrogen (N)	0.10 max
Iron (Fe)	Balance

Note: ASTM F138 (medical grade) imposes tighter limits on sulfur (0.010 vs. 0.030 max), phosphorus (0.025 vs. 0.045 max), and adds limits on copper and cobalt — specifically to protect long-term biocompatibility in implantable devices.

MECHANICAL PROPERTIES

Temper	Tensile Strength	Yield Strength (0.2%)	Elongation	Hardness
Annealed (Soft)	75 ksi min (515 MPa)	30 ksi min (205 MPa)	40% min	95 HRB max
1/16 Hard	85 ksi min (585 MPa)	45 ksi min (310 MPa)	35% min	—
1/8 Hard	100 ksi min (690 MPa)	55 ksi min (380 MPa)	25% min	—
1/4 Hard	125 ksi min (860 MPa)	75 ksi min (515 MPa)	10% min	—
1/2 Hard & above	Consult Ken-tron	Consult Ken-tron	—	—

Custom tempers available. Ken-tron specializes in small-diameter, close-tolerance wire. Target tensile windows tighter than listed ranges can be achieved by controlling cold reduction between annealing cycles. Contact our engineering team to discuss your requirements.

PHYSICAL & THERMAL PROPERTIES

Physical Properties

Density	0.289 lb/in³ (7.99 g/cm³)
Melting Range	2,500 – 2,550 °F (1,371 – 1,399 °C)
Modulus of Elasticity (tension)	28.0×10^6 psi (193 GPa)
Modulus of Elasticity (torsion)	11.2×10^6 psi (77 GPa)
Magnetic Permeability (annealed)	≤ 1.02 (non-magnetic)
Electrical Resistivity (68°F)	29.4 μΩ·in (74.0 μΩ·cm)
Specific Heat (32–212°F)	0.12 BTU/(lb·°F) — 0.50 kJ/(kg·K)
Thermal Conductivity (212°F)	9.4 BTU·in/(hr·ft²·°F) — 16.3 W/(m·K)

Coefficient of Thermal Expansion

20–100°C (68–212°F)	15.9×10^{-6} in/in·°C
20–200°C (68–392°F)	16.5×10^{-6} in/in·°C
20–300°C (68–572°F)	17.0×10^{-6} in/in·°C
20–400°C (68–752°F)	17.5×10^{-6} in/in·°C
20–538°C (68–1000°F)	18.0×10^{-6} in/in·°C

CORROSION RESISTANCE

The addition of 2.0–3.0% molybdenum to 316 stainless steel provides significantly superior resistance to chloride-induced corrosion compared to standard 304 stainless. 316 resists: **general corrosion** in a wide range of acidic and alkaline media; **pitting corrosion** in seawater and industrial chloride environments; **crevice corrosion** in tight-clearance assemblies; **intergranular corrosion** — especially 316L/LVM which prevents sensitization at welds; and **stress corrosion cracking** (better resistance than 304 in moderate chloride environments).

316 vs. 304 Stainless Steel Wire — Comparison

Property	304 SS	316 SS
Molybdenum Content	None	2.0 – 3.0%
Nickel Content	8.0 – 10.5%	10.0 – 14.0%
Chloride Resistance	Moderate	Superior
Pitting Resistance (PREN)	~18–20	~24–28
Medical Implant Grade	Not standard	Yes (316LVM / F138)
Cost	Lower	Higher (Mo premium)

FABRICATION NOTES

Cold Forming	Type 316 can be readily formed and drawn. It work-hardens more rapidly than carbon steels but is comparable to other austenitic stainless grades.
Heat Treatment	Not hardenable by heat treatment. Strength is developed through cold working only. Annealing at approximately 1,900–2,050°F (1,038–1,121°C) followed by rapid cooling restores ductility between drawing passes.
Welding	316 is weldable by common fusion and resistance methods. 316L / 316LVM are preferred for welded assemblies as they minimize sensitization risk in the heat-affected zone. Refer to industry guidelines for welding austenitic stainless steels.
Magnetic Response	Fully annealed 316 is essentially non-magnetic (μ ≤ 1.02). Cold working may induce slight magnetic response; for applications requiring strict non-magnetic properties, specify fully annealed temper.

APPLICABLE STANDARDS & SPECIFICATIONS

Standard	Scope	Grade
ASTM A493	Wire and wire rods for cold heading and cold forging	316, 316L
ASTM A555/A555M	General requirements for stainless steel wire and wire rods	316, 316L
ASTM A666	Annealed or cold-worked austenitic stainless steel flat wire	316, 316L
ASTM F138-19	Wrought 316LVM bar and wire for surgical implants	316LVM
AMS 5648	Corrosion and heat resistant 316 bar, wire, forgings (aerospace)	316
AMS 5653	Corrosion resistant 316L steel wire, low carbon (aerospace)	316L
ISO 5832-1	Implants for surgery — wrought stainless steel	316L

TYPICAL APPLICATIONS BY INDUSTRY

Industry	Typical Applications	Typical Grade
Medical / Surgical	Implantable devices, catheters, guide wires, sutures, dental instruments, orthopedic implants	316LVM (F138)
Aerospace & Defense	Cable assemblies, safety wire, control cables, connector springs	316 / 316L (AMS)
Automotive	Exhaust springs, fuel system lines, sensor springs, cable shields	316 / 316L
Electronics	Precision springs, shielding braids, woven EMI mesh, thermocouple sheaths	316L / 316LVM
Weaving / Filtration	Wire cloth, filtration screens, conveyor belts, architectural mesh	316 / 316L
Marine & Chemical	Rigging wire, springs and fixtures in chloride-rich environments	316 / 316L
Springs & Fasteners	Compression, extension, torsion springs; staples; cold-headed fasteners	316 (ASTM A493)

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Ready to specify 316 SS wire for your application?

Ken-tron's wire division specializes in small-diameter, close-tolerance drawn wire made to customer specifications — including custom tempers, unusual diameters, and specialty surface requirements.

Request a quote: ken-tron.com/drawn-wire-rfq/