Nickel Silver

NS101 / CW402J ● NS104 / CW403J ● NS106 / CW409J
SILVERSPEED-XL

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Nickel silvers are copper alloys with additions of zinc and nickel. With an attractive colour varying from pale gold to silvery white, they are capable of providing a unique combination of strength, high modulus spring properties, corrosion and oxidation resistance, anti-galling properties, excellent cryogenic performance and numerous other attributes combined with ease of forming, machining, plating and joining.

Columbia Metals is one of the few stockholders that maintains a comprehensive stock of nickel silver in round bar and sheet form. The four grades of nickel silver in stock are described below.

NS101 / CW402J (CuNi10Zn42Pb2)

NS101 is the general purpose grade of nickel silver most commonly used for hot stamping to complex shapes and as machining rod for a wide variety of electrical and electronic components. It has good corrosion and tarnish resistance and is frequently specified for many architectural applications where best use is made of its pleasing silvery gold colour and resistance to atmospheric corrosion.

Frequently used applications of NS101 include gears, pinions, clock and watch parts, screws and other types of fasteners, hot stampings and forgings, keys, lock parts, door furniture, grills, decorative and architectural metalwork, darts, fishing tackle, camera, binocular and microscope parts, musical instrument valves and fittings, electrical and electronic pins and connectors and switchgear components.

NS104 / CW403J (CuNi12Zn24)

This is a sheet grade for general purpose applications where the additional strength of half hard temper material imparts rigidity and spring properties. The presence of nickel provides corrosion and tarnish resistance to levels well in excess of normal brasses. NS104 is soldered and silver brazed without difficulty and is widely used for electrical and electronic components as well as for general engineering and aesthetic purposes.

NS106 / CW409J (CuNi18Zn20)

NS106 is one of the most popular grades of nickel silver for deep drawing, spinning and other cold forming operations. It combines good strength and ductility with outstanding resistance to wear, corrosion and tarnish. It accepts a high degree of polish to a silvery white colour, aesthetically pleasing in its own right, while also providing an excellent base material for plated silverware - still one of its traditional uses. The alloy also finds many electrical and electronic applications and is readily soldered and silver brazed. The sheets are stocked in soft temper suitable for extensive cold working.

This grade is commonly used for architectural metalwork, cutlery, lighting fittings, medals and medallions, trophies, cosmetic jewellery, relay and contact springs, wiper blades, lamp caps, camera parts, nameplates, dials, slide fasteners, musical instruments, spectacle frames and hinges, rivets, clips and eyelets.

SILVERSPEED-XL (CuNi7Zn3Pb3Mn2)

Exclusively stocked by Columbia Metals, this grade is a superlative free-machining alloy with machinability almost the same as free-cutting brass. It is highly recommended for the production of intricate components by complex machining operations. It has identical application and performance characteristics as NS101 but with an invaluable increase of around 20% in machinability.

PLEASE CONTACT US FOR AN IMMEDIATE QUOTATION OR TECHNICAL ADVICE

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Nickel Silver

Technical Data

Nominal Composition (%)

	Cu	Ni	Fe	Mn	Pb	Zn
NS101	44.0 - 47.0	9.0 - 11.0	0.4 max	0.2 - 0.5	1.0 - 2.5	Rem
NS104	60.0 - 65.0	11.0 - 13.0	0.25 max	0.05 - 0.30	0.04 max	Rem
NS106	60.0 - 65.0	17.0 - 19.0	0.30 max	0.05 - 0.50	0.03 max	Rem
SILVERSPEED-XL	47.0 - 50.0	6.0 - 8.0	0.30 max	1.5 - 3.0	2.3 - 3.3	Rem

Mechanical Properties (typical)

	NS101	NS104	NS106	SILVER-SPEED-XL
Ultimate Tensile Strength (N/mm^2)	520	530	390	560
0.2% Proof Strength (N/mm^2)	230	320	120	450
Elongation (%)	20	30	45	20
Hardness (HV)	130	140	80	185

Typical Physical Properties

	NS101	NS104	NS106	SILVER-SPEED-XL
Density (g/cm^3)	8.47	8.65	8.75	8.44
Melting Range (°C)	940 - 980	1000 - 1060	1060 - 1110	850 - 870
Thermal Conductivity (W/m°C)	46	33	25	30
Electrical Resistivity (μΩ.cm)	18	22	29	34
Electrical Conductivity (% IACS)	9	8	6	5
Magnetic Permeability	1.05 max	1.05 max	1.05 max	1.05 max
Modulus of Elasticity (N/mm^2)	100,000	123,000	135,000	120,000

Round Bar Weight and Stock Sizes

Diameter	Weight		Diameter	Weight		Diameter	Weight	
ins	kg/ft	kg/m	ins	kg/ft	kg/m	ins	kg/ft	kg/m
1/8″	0.02	0.07	7/16″	0.25	0.82	13/16″	0.86	2.83
5/32″	0.03	0.11	1/2″	0.33	1.07	7/8″	1.00	3.28
3/16″	0.05	0.15	9/16″	0.41	1.36	1″	1.31	4.29
1/4″	0.08	0.27	5/8″	0.51	1.68	1.1/8″	1.65	5.43
5/16″	0.13	0.42	11/16″	0.62	2.03	1.1/4″	2.04	6.70
3/8″	0.18	0.60	3/4″	0.74	2.41	1.1/2″	2.94	9.65

Sheet
4′ x 2′ and 5′ x 2′ sheets from 0.5mm to 1.6mm thick

NB Weight data for guidance only