

## AISI 302/304/304L STAINLESS STEEL BALLS

Unhardened austenitic stainless steel balls, they display good mechanical characteristics, toughness and corrosion resistance. AISI 304L provides lower carbon content, AISI 302 better mechanical characteristics. Balls are provided in the passivated condition.

### Applications

Special bearings and pumps, aerosol pumps, gardening and household sprayers, perfume miniature pumps, seams, medical application valves, agricultural backpack sprayers. They are used in foodstuff, aerospace and military industry.

### Chemical composition

Type	%C	%Si	%Mn	%P	%S	%Cr	%Ni	%N
302	0.150 max	1.00 max	2.00 max	0.045 max	0.030 max	17.00-19.00	8.00-10.00	0.100 max
304	0.080 max	0.75 max	2.00 max	0.045 max	0.030 max	18.00-20.00	8.00-10.50	0.100 max
304L	0.030 max	0.75 max	2.00 max	0.045 max	0.030 max	18.00-20.00	8.00-10.50	0.100 max

### International standards

ITA	USA	GER	FRA	UK	RUS	CHN	JAP
X10CrNi18-8	302	1.4310	Z11CN18-08	301S21	12KH18N9	1Cr18Ni9	SUS301
X5CrNi18-10	304	1.4301	Z7CN18-09	304S15	08KH18N10	0Cr18Ni9	SUS304
X2CrNi18-9	304L	1.4307	Z3CN18-10	304S11	04KH18N10	00Cr19Ni10	SUS304L

### Physical / mechanical / thermal / electric / magnetic properties

Property	Symbol	U.o.M.	Type	Notes	Values
Density	$\delta$	[g/cm <sup>3</sup> ]	Physical	Room temp.	7.95
Young's modulus	E	[GPa]	Mechanical	-	200
Specific heat	c	[J/kg·K]	Thermal	Room temp.	500
Coefficient of linear thermal expansion	$\alpha$	[10 <sup>-6</sup> /°C]	Thermal	( $\Delta T=0-100^{\circ}\text{C}$ )	17.5
Thermal conductivity	$\lambda$	[W/(m·K)]	Thermal	Room temp.	15.8
Electric resistivity	$\rho$	[ $\Omega \cdot \text{m} \cdot 10^{-9}$ ]	Electric	-	710
Relative magnetic permeability	$\mu$	-	Magnetic	Paramagnetic	1.025*

### Technical data

Property	Type	U.o.M.	Values	U.o.M.	Values
Hardness	Mechanical	[HRC]	10 - 25 (1)*	[HRC]	25 - 39 (2)*
Ultimate tensile strength	Mechanical	[MPa]	500 - 1300	[psix10 <sup>3</sup> ]	72 - 188
Service temperature	Thermal	[°C]	-196 / 700	[°F]	-320.8 / 1697

### Range

Diameters (min/max)	U.o.M.	Diameters (min/max)	U.o.M.	Precision Grade (ISO 3290)
0.300 - 300.000	[mm]	1/64 - 12	["]	**G10-16-20-25-28-40-50-60-100-200-500-1000-2000

### Corrosion Resistance

Very good corrosion resistance with respect to organic substances, oxidating solutions, foodstuff, sterilizing solutions. Good resistance with respect to atmospheric corrosion and dyes. They are subjected to pitting and crevice corrosion in presence of hot chloride solutions and to stress corrosion when temperature exceeds 60°C. They do not resist to sulfuric acid solutions. AISI 302 shows slightly best corrosion resistance with respect to AISI 304/304L stainless steels.

### Notes

Property	Description
Hardness*	Balls can be supplied in the ANNEALED (HRC 10-25) or COLD WORKED (HRC 25-39) conditions.
Magnetism	Eventual magnetism of AISI 316 balls and in general of all austenitic stainless steels strictly depends by the manufacturing process, specific inquiries for non magnetic balls should be requested.
Precision Grade**	On special request and for big quantities, we can supply G10 and G16 precision grade balls. Diameters from 3.000 mm to 1/2".