

# Technical Brief: Physical and Mechanical Properties of Solid Zinc Strip- Comparison to Other Metals

English Units	Rolled Strip Zinc Alloys				Brass	Copper	Stainless Steel	DQ Steel	Aluminum
	190	500	710	750	70/30	ETP	304	1008	3003
<b>Physical Properties</b>									
Density (lb/in <sup>3</sup> )	0.259	0.259	0.259	0.259	0.308	0.321	0.290	0.284	0.099
Melting Point (°F)	792	786	792	792	1680	1950	2550	2730	1190
Coefficient of Thermal Expansion (µin/in · °F)	17.6	16.7	15.4	12.7	11.1	9.4	9.6	7.0	12.9
Electrical Conductivity (% IACS)	27	27	26	26	28	100	2	10	42
Electrical Resistivity (Ω · cir. Mil/ft)	37.20	38.68	39.58	39.70	36.99	10.23	431.88	107.07	24.72
Thermal Conductivity (BTU/ft · hr · °F)	60.5	60.5	60.5	60.5	70.0	224.0	9.4	33.4	94.1
Specific Heat (BTU/lb · °F)	0.096	0.094	0.096	0.096	0.090	0.092	0.120	0.115	0.213
Specific Gravity	7.18	7.14	7.18	7.18	8.47	8.89	7.90	7.90	2.74
<b>Mechanical Properties</b>									
Tensile Strength (ksi)	22-29	10-22	21-28	21-32	44-99	32-57	75-150	38-50	16-29
% Elongation (in 2")	35-70	15-75	30-45	30-50	3-68	4-45	0-40	35-45	4-40
Hardness (R15T)	59-69	20-45	50-68	58-72	60-91	50-80	88 max.	73-77	40-75
Shear Strength (ksi)	24-28	12-21	24-28	24-28	31-48	22-29	60-120	45-52	11-16

Special Mechanical Test Parameters: Ref. ASTM B69-98a, Section 7.1.1: for Tensile Properties testing, the recommended rate of separation of the heads should be 0.125 in./in./min., which is equivalent to a cross head speed of 0.250 in./min.; and Section 7.1.2: for Hardness testing, the dwell time of the major load should be 15 seconds.

• Note: All data for "Other Metals" was taken from ASM Metals Handbook, with the exception of Olsen Ductility and Hardness (R15T).



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Metric Units	Rolled Strip Zinc Alloys				Brass	Copper	Stainless Steel	DQ Steel	Aluminum
	190	500	710	750	70/30	ETP	304	1008	3003
<b>Physical Properties</b>									
Density (g/cm <sup>3</sup> )	7.17	7.14	7.17	7.17	8.52	8.89	8.00	7.87	2.73
Melting Point (°C)	422	419	422	422	916	1065	1400	1500	643
Coefficient of Thermal Expansion (µm/m · K)	31.6	30.0	27.7	22.8	19.9	17.0	17.2	12.6	23.2
Electrical Conductivity (% IACS)	27	27	26	26	28	100	2	10	42
Electrical Resistivity (µΩ · cm)	6.35	6.43	6.58	6.60	6.15	1.70	71.80	17.80	4.11
Thermal Conductivity (W/m · K)	105	105	105	105	120	388	16	58	163
Specific Heat (J/kg · K)	400	392	400	400	375	380	500	481	893
Specific Gravity	7.18	7.14	7.18	7.18	8.47	8.89	7.90	7.90	2.74
<b>Mechanical Properties</b>									
Tensile Strength (MPa)	152-200	69-152	145-193	145-220	303-683	221-393	517-1034	262-345	110-200
% Elongation (in 50mm)	35-70	15-75	30-45	30-50	3-68	4-45	0-40	35-45	4-40
Hardness (R15T)	59-69	20-45	50-68	58-72	60-91	50-80	88 max.	73-77	40-75
Shear Strength (MPa)	165-193	83-145	165-193	165-193	214-331	152-200	414-827	310-359	76-110

**Special Mechanical Test Parameters:** Ref. ASTM B69-98a, Section 7.1.1: for Tensile Properties testing, the recommended rate of separation of the heads should be 0.125 in./in./min., which is equivalent to a cross head speed of 0.250 in./min.; and Section 7.1.2: for Hardness testing, the dwell time of the major load should be 15 seconds.

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