

Stainless Steel Physical Properties Chart

Density, elastic modulus, mean coefficient of thermal expansion, thermal conductivity, specific heat, electrical resistivity, magnetic permeability and melting range for wrought stainless steels in the annealed condition, metric with the imperial equivalents in parentheses. A reference summary of the published ASM table and not an Aobo Steel standard.

Reference only. Aobo Steel does not set these values as a company standard. Verify them against the applicable product specification before design use.

Type	UNS number	Density g/cm ³	Elastic modulus GPa	Mean CTE from 0 °C (32 °F) to			Thermal conductivity		Specific heat (a) J/kg·K	Electrical resistivity nΩ·m	Magnetic permeability (b)	Melting range °C (°F)
				100 °C	315 °C	538 °C	at 100 °C	at 500 °C				
201	S20100	7.8 (0.28)	197 (28.6)	15.7 (8.7)	17.5 (9.7)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	690	1.02	1400-1450 (2550-2650)
202	S20200	7.8 (0.28)	—	17.5 (9.7)	18.4 (10.2)	19.2 (10.7)	16.2 (9.4)	21.6 (12.5)	500 (0.12)	690	1.02	1400-1450 (2550-2650)
205	S20500	7.8 (0.28)	197 (28.6)	—	17.9 (9.9)	19.1 (10.6)	—	—	500 (0.12)	—	—	—
301	S30100	8.0 (0.29)	193 (28.0)	17.0 (9.4)	17.2 (9.6)	18.2 (10.1)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1420 (2550-2590)
302	S30200	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1420 (2550-2590)
302B	S30215	8.0 (0.29)	193 (28.0)	16.2 (9.0)	18.0 (10.0)	19.4 (10.8)	15.9 (9.2)	21.6 (12.5)	500 (0.12)	720	1.02	1375-1400 (2550-2550)
303	S30300	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1450 (2550-2590)
304	S30400	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1450 (2550-2650)
304L	S30403	8.0 (0.29)	—	—	—	—	—	—	—	—	1.02	1400-1450 (2550-2650)
302Cu	S30430	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	—	11.2 (6.5)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1450 (2550-2650)
304N	S30451	8.0 (0.29)	196 (28.5)	—	—	—	—	—	500 (0.12)	720	1.02	1400-1450 (2550-2650)
305	S30500	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	720	1.02	1400-1450 (2550-2650)
308	S30800	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	15.2 (8.8)	21.6 (12.5)	500 (0.12)	720	—	1400-1420 (2550-2590)
309	S30900	8.0 (0.29)	200 (29.0)	15.0 (8.3)	16.6 (9.2)	17.2 (9.6)	15.6 (9.0)	18.7 (10.8)	500 (0.12)	780	1.02	1400-1450 (2550-2650)
310	S31000	8.0 (0.29)	200 (29.0)	15.9 (8.8)	16.2 (9.0)	17.0 (9.4)	14.2 (8.2)	18.7 (10.8)	500 (0.12)	780	1.02	1400-1450 (2550-2650)
314	S31400	7.8 (0.28)	200 (29.0)	—	15.1 (8.4)	—	17.5 (10.1)	20.9 (12.1)	500 (0.12)	770	1.02	—
316	S31600	8.0 (0.29)	193 (28.0)	15.9 (8.8)	16.2 (9.0)	17.5 (9.7)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	740	1.02	1375-1400 (2500-2550)
316L	S31603	8.0 (0.29)	—	—	—	—	—	—	—	—	1.02	1375-1400 (2500-2550)
316N	S31651	8.0 (0.29)	196 (28.5)	—	—	—	—	—	500 (0.12)	740	1.02	1375-1400 (2500-2550)
317	S31700	8.0 (0.29)	193 (28.0)	15.9 (8.8)	16.2 (9.0)	17.5 (9.7)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	740	1.02	1375-1400 (2500-2550)
317L	S31703	8.0 (0.29)	200 (29.0)	16.5 (9.2)	—	18.1 (10.1)	14.4 (8.3)	—	500 (0.12)	790	—	1375-1400 (2500-2550)
321	S32100	8.0 (0.29)	193 (28.0)	16.6 (9.2)	17.2 (9.6)	18.6 (10.3)	16.1 (9.3)	22.2 (12.8)	500 (0.12)	720	1.02	1400-1425 (2550-2600)
329	S32900	7.8 (0.28)	—	—	—	—	—	—	460 (0.11)	750	—	—
330	N08330	8.0 (0.29)	196 (28.5)	14.4 (8.0)	16.0 (8.9)	16.7 (9.3)	—	—	460 (0.11)	1020	1.02	1400-1425 (2550-2600)
347	S34700	8.0 (0.29)	193 (28.0)	16.6 (9.2)	17.2 (9.6)	18.6 (10.3)	16.1 (9.3)	22.2 (12.8)	500 (0.12)	730	1.02	1400-1425 (2550-2600)
384	S38400	8.0 (0.29)	193 (28.0)	17.2 (9.6)	17.8 (9.9)	18.4 (10.2)	16.2 (9.4)	21.5 (12.4)	500 (0.12)	790	1.02	1400-1450 (2550-2650)

Part 1 of 2, covering 201 to 384. ASM Handbook, Volume 1, Typical physical properties of wrought stainless steels, annealed condition, Table 21.

Density is at room temperature, elastic modulus is in tension, mean CTE runs from 0 °C (32 °F) to the temperature shown.

Stainless Steel Physical Properties Reference · Aobo Steel

Type	UNS number	Density g/cm ³	Elastic modulus GPa	Mean CTE from 0 °C (32 °F) to			Thermal conductivity		Specific heat (a) J/kg·K	Electrical resistivity nΩ·m	Magnetic permeability (b)	Melting range °C (°F)
				100 °C	315 °C	538 °C	at 100 °C	at 500 °C				
405	S40500	7.8 (0.28)	200 (29.0)	10.8 (6.0)	11.6 (6.4)	12.1 (6.7)	27.0 (15.6)	—	460 (0.11)	600	—	1480-1530 (2700-2790)
409	S40900	7.8 (0.28)	—	11.7 (6.5)	—	—	—	—	—	—	—	1480-1530 (2700-2790)
410	S41000	7.8 (0.28)	200 (29.0)	9.9 (5.5)	11.4 (6.3)	11.6 (6.4)	24.9 (14.4)	28.7 (16.6)	460 (0.11)	570	700-1000	1480-1530 (2700-2790)
414	S41400	7.8 (0.28)	200 (29.0)	10.4 (5.8)	11.0 (6.1)	12.1 (6.7)	24.9 (14.4)	28.7 (16.6)	460 (0.11)	700	—	1425-1480 (2600-2700)
416	S41600	7.8 (0.28)	200 (29.0)	9.9 (5.5)	11.0 (6.1)	11.6 (6.4)	24.9 (14.4)	28.7 (16.6)	460 (0.11)	570	700-1000	1480-1530 (2700-2790)
420	S42000	7.8 (0.28)	200 (29.0)	10.3 (5.7)	10.8 (6.0)	11.7 (6.5)	24.9 (14.4)	—	460 (0.11)	550	—	1450-1510 (2650-2750)
422	S42200	7.8 (0.28)	—	11.2 (6.2)	11.4 (6.3)	11.9 (6.6)	23.9 (13.8)	27.3 (15.8)	460 (0.11)	—	—	1470-1480 (2675-2700)
429	S42900	7.8 (0.28)	200 (29.0)	10.3 (5.7)	—	—	25.6 (14.8)	—	460 (0.11)	590	—	1450-1510 (2650-2750)
430	S43000	7.8 (0.28)	200 (29.0)	10.4 (5.8)	11.0 (6.1)	11.4 (6.3)	26.1 (15.1)	26.3 (15.2)	460 (0.11)	600	600-1100	1425-1510 (2600-2750)
430F	S43020	7.8 (0.28)	200 (29.0)	10.4 (5.8)	11.0 (6.1)	11.4 (6.3)	26.1 (15.1)	26.3 (15.2)	460 (0.11)	600	—	1425-1510 (2600-2750)
431	S43100	7.8 (0.28)	200 (29.0)	10.2 (5.7)	12.1 (6.7)	—	20.2 (11.7)	—	460 (0.11)	720	—	—
434	S43400	7.8 (0.28)	200 (29.0)	10.4 (5.8)	11.0 (6.1)	11.4 (6.3)	—	26.3 (15.2)	460 (0.11)	600	600-1100	1425-1510 (2600-2750)
436	S43600	7.8 (0.28)	200 (29.0)	9.3 (5.2)	—	—	23.9 (13.8)	26.0 (15.0)	460 (0.11)	600	600-1100	1425-1510 (2600-2750)
439	S43035	7.7 (0.28)	200 (29.0)	10.4 (5.8)	11.0 (6.1)	11.4 (6.3)	24.2 (14.0)	—	460 (0.11)	630	—	—
440A	S44002	7.8 (0.28)	200 (29.0)	10.2 (5.7)	—	—	24.2 (14.0)	—	460 (0.11)	600	—	1370-1480 (2500-2700)
440C	S44004	7.8 (0.28)	200 (29.0)	10.2 (5.7)	—	—	24.2 (14.0)	—	460 (0.11)	600	—	1370-1480 (2500-2700)
444	S44400	7.8 (0.28)	200 (29.0)	10.0 (5.6)	10.6 (5.9)	11.4 (6.3)	26.8 (15.5)	—	420 (0.10)	620	—	—
446	S44600	7.5 (0.27)	200 (29.0)	10.4 (5.8)	10.8 (6.0)	11.2 (6.2)	20.9 (12.1)	24.4 (14.1)	500 (0.12)	670	400-700	1425-1510 (2600-2750)
PH 13-8 Mo	S13800	7.8 (0.28)	203 (29.4)	10.6 (5.9)	11.2 (6.2)	11.9 (6.6)	14.0 (8.1)	22.0 (12.7)	460 (0.11)	1020	—	1400-1440 (2560-2625)
15-5 PH	S15500	7.8 (0.28)	196 (28.5)	10.8 (6.0)	11.4 (6.3)	—	17.8 (10.3)	23.0 (13.1)	420 (0.10)	770	95	1400-1440 (2560-2625)
17-4 PH	S17400	7.8 (0.28)	196 (28.5)	10.8 (6.0)	11.6 (6.4)	—	18.3 (10.6)	23.0 (13.1)	460 (0.11)	800	95	1400-1440 (2560-2625)
17-7 PH	S17700	7.8 (0.28)	204 (29.5)	11.0 (6.1)	11.6 (6.4)	—	16.4 (9.5)	21.8 (12.6)	460 (0.11)	830	—	1400-1440 (2560-2625)

Part 2 of 2, covering 405 to 17-7 PH. ASM Handbook, Volume 1, Typical physical properties of wrought stainless steels, annealed condition, Table 21.

Table notes

- (a) At 0 to 100 °C (32 to 212 °F). (b) Approximate values.
- CTE, coefficient of thermal expansion.
- **Note.** two melting ranges are printed inconsistently in the source and are reproduced as shown: type 302B, 1375–1400 °C (2550–2550 °F), and type 303, 1400–1450 °C (2550–2590 °F).
- Magnetic permeability is an approximate value; the ferritic and martensitic types (405, 410, 420, 430, 440A, 440C, and others) are magnetic and the austenitic types are essentially non-magnetic (value 1.02). Verify against the applicable product specification before design use.

Aobo Steel, tool steel supplier

Aobo Steel supplies forged tool steel and free-cutting engineering steels from Huangshi, Hubei, China, where the local supply chain covers ESR melting, vacuum degassing and LF refining, forging, hot rolling, turned and peeled bar, heat treatment and third party inspection. We have worked in steel since 2003 and supply to order in cold work grades such as D2, D3 and O1, hot work grades such as H10 and H13, and stainless grades 420, 440C and 4Cr13.

Reference data compiled from ASM Handbook, Vol 1 (10th ed.), Table 21, and from the Aobo Steel stainless steel physical properties chart.

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