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Grade reference: heat treatment, stainless finishes and PREN

Mill heat-treatment schedules for C40E, 42CrMo4, 34CrNiMo6 and 100Cr6, stainless sheet finishes, and calculated PREN envelopes based on chemistry with a documented reuse basis.

Heat treatment temperatures (°C), as published per source

Related designation	Grade in the mill sheet	Soft anneal	Normalising temperature (°C)	Hardening temperature and quench	Temper	Notes	Source
EN8 / BS 080M40	C40E / 1.1186	690, air	850-890, air	830, water; or 870, oil/polymer	550-660, air	Stress relief: 50 °C below tempering temperature. Hot forming: 1100 down to 850 °C.	Lucefin, C40E technical card, rev. 2024, pp. 1-2
BS 709M40	42CrMo4 / 1.7225	680-720, furnace	850-880, air	820-860, oil or water	540-680, air	Soft-annealed (+A) condition: 241 HB maximum. The mill also lists SAE 4140H and 4140RH.	Saarstahl, 42CrMo4 / 42CrMoS4, p. 1
BS 817M40	34CrNiMo6 / 1.6582	650-680, furnace	850-880, air	830-860, oil	540-660, air	Hot forging or rolling: 1100 down to 850 °C. The mill also lists SAE 4337 and 4340.	Saarstahl, 34CrNiMo6, p. 1
BS 535A99	100Cr6 / 1.3505	780-800, furnace	870-900, air	830-870, oil; or 800-830, water	150-180	Hardened and tempered surface hardness: approximately 62 HRC.	Saarstahl, 100Cr6, p. 1

Unit: °C
Last verified: 23 November 2026
Source: Lucefin, C40E technical card, rev. 2024, pp. 1-2
Source: Saarstahl, 42CrMo4 / 42CrMoS4, p. 1
Source: Saarstahl, 34CrNiMo6, p. 1
Source: Saarstahl, 100Cr6, p. 1
Read each temperature with the cooling medium shown in its cell. Section size, hold time and acceptance criteria follow the ordered material and process specification.

Stainless steel sheet finishes

Finish	EN 10088-2 code	How it is made	Appearance	Typical uses
No. 1	1D	Hot rolled, heat treated, pickled	Slightly coarse surface with very low reflectivity; not as smooth as 2D or 2B. Grinding marks are permissible.	Corrosion- and heat-resisting uses where appearance does not matter; common finish for further processing.
2B	2B	Cold rolled, heat treated, pickled, skin passed	Bright, moderately reflective. The annealed and descaled coil gets a final light pass through polished rolls.	The general-purpose cold rolled finish: used as is, or as a first step before polishing.
BA	2R	Cold rolled, bright annealed	Smoother and brighter than 2B; approaches a mirror-like appearance.	Appliances, kitchenware, automotive and decorative parts (as listed by Nose-SUS); also used for further processing.
No. 4	2J (brushed) / 2K (satin)	Mechanically polished in one direction	Bright, fine unidirectional polishing lines. EN 10088-2 lets the buyer specify the brush, belt grade or roughness.	General-purpose polished finish: restaurant and kitchen equipment, shop fronts, dairy equipment.
HL (hairline)	Not an EN code (decorative)	Polished with long, continuous lines	Long, continuous polishing lines along the sheet.	The most common decorative finish for building and architectural panels (as listed by Nose-SUS).
No. 8 (mirror)	2P	Mechanically polished to a mirror	The most reflective finish commonly produced on sheet; essentially free of grit lines. Not a standard mill finish.	Decorative, architectural and reflector uses.

Last verified: 22 November 2026
Source: Euro Inox, Guide to Stainless Steel Finishes, 3rd edition 2005 (EN 10088-2 Annex B finish codes and notes)
Source: Australian Stainless Steel Development Association (ASSDA), Surface finishes: mill forms
Source: Nose Stainless (Japan), Stainless steel surface finish reference table (JIS G 4304/G 4305 finishes)
EN codes and notes from Euro Inox's guide to EN 10088-2 Annex B; ASTM-style names and uses from ASSDA; HL and further uses from a JIS-based supplier table. ASTM A480 itself was not read; check the finish clause of the standard on your order.

PREN from available composition limits

Grade	Calculated envelope and heat requirement	Composition table used
SS 317L	27.9 to 34.8	ATI 317L plate analysis limits, mass %
Duplex 2304	22.5 to 29.7	Jindal J-2304 flat-product analysis limits, mass %
NITRONIC 50 / XM-19	28.7 to 39.8	Electralloy published product analysis ranges and maxima, mass %

Formula: PREN = Cr + 3.3 Mo + 16 N, using mass %. A maximum-only limit has a lower mathematical bound of zero
Unit: PREN to 1 decimal
Last verified: 23 November 2026
Source: ATI, ATI 317L austenitic stainless steel
Source: Jindal Stainless, Stainless Steel Products brochure
Source: Electralloy, Nitronic 50 stainless steel product data sheet
Each envelope combines independent chemistry limits. Only sources with publication review and upper limits for Cr, Mo and N are included. Use the measured heat analysis for other grades.