

SPECIAL STEEL

When a specific balance of ultimate strength, toughness, fatigue life and corrosion resistance is required beyond ordinary stainless, purpose-built specialty steels answer. Alltium Aerometrix supplies precipitation-hardening stainless, austenitic and martensitic stainless, high-strength low-alloy landing-gear steels, ultra-high-strength maraging grades, tool steels and anti-galling alloys — the workhorses of landing gear, actuation, fasteners, valves and tooling.

Precipitation-Hardening Stainless

Martensitic/semi-austenitic stainless that reaches high strength through a simple low-temperature ageing step with minimal distortion, while retaining good corrosion resistance — the go-to for structural fittings, shafts, valves and fasteners.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
15-5 PH (H1025) <i>15-5PH / XM-12</i> Day-one	Cr 15, Ni 5, Cu 3.5, bal Fe	UTS 1070 / YS 1000 / El 12% ρ 7.80 g/cm ³ 35 HRC Tmax 315°C	High strength + good corrosion resistance + toughness; cleaner (higher toughness) than 17-4 Forms: Bar, Plate, Forging, Wire Use: Aerospace structural fittings, shafts, valves
17-4 PH (H900) <i>17-4PH / 630</i> Day-one	Cr 16, Ni 4, Cu 4, Nb 0.3, bal Fe	UTS 1310 / YS 1170 / El 10% ρ 7.80 g/cm ³ 40 HRC Tmax 315°C	The most widely used PH stainless: high strength, single-step age hardening, good machinability Forms: Bar, Rod, Plate, Forging, Wire Use: Shafts, valve & pump parts, fasteners, oil & gas
13-8 Mo PH (H1000) <i>PH13-8Mo / XM-13</i> To-order	Cr 13, Ni 8, Mo 2.2, Al 1.1, bal Fe	UTS 1520 / YS 1410 / El 10% ρ 7.76 g/cm ³ 47 HRC Tmax 425°C	Highest strength & toughness of the PH stainless family; excellent transverse properties Forms: Bar, Forging Use: Critical aerospace fittings, landing-gear parts, valves

Austenitic Stainless

Chromium-nickel stainless: non-magnetic, tough, weldable and corrosion-resistant including cryogenic service. 316L (molybdenum-bearing, low-carbon) is the corrosion and marine standard.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
316L <i>1.4404 / SS316L</i> Day-one	Cr 17, Ni 12, Mo 2.5, bal Fe	UTS 560 / YS 290 / El 45% ρ 8.00 g/cm ³ 217 HB Tmax 800°C	Low-carbon, weldable, corrosion resistant (incl. chlorides); non-magnetic; cryogenic capable Forms: Bar, Plate, Sheet, Tube, Wire, Forging, Powder Use: Corrosion & cryogenic, chemical, marine, hydraulic, AM

Austenitic Stainless (stabilised)

Titanium-stabilised 321 resists sensitisation (grain-boundary carbide precipitation) at high temperature — the austenitic grade for aircraft exhaust and hot ducting.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
321 <i>1.4541 / SS321</i> To-order	Cr 17, Ni 9, Ti 0.4 (stabilised), bal Fe	UTS 620 / YS 240 / El 45% ρ 8.00 g/cm ³ 217 HB Tmax 900°C	Titanium-stabilised to resist sensitisation at high temperature; superior hot-service austenitic Forms: Sheet, Plate, Bar, Tube Use: Aircraft exhaust, high-temperature ducting, bellows

Martensitic Stainless

Hardenable stainless: 410 for general valve and blade service, 440C for high-hardness bearings and cutting edges.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
410 / 440C <i>1.4006 / 1.4125</i> To-order	410: Cr 12.5, bal Fe. 440C: Cr 17, C 1.0, bal Fe	UTS 480-760 / YS 275-450 / El 12-20% ρ 7.75 g/cm ³ 410: 40 HRC / 440C: 58	Hardenable stainless; 410 general-purpose, 440C high-hardness bearing/knife grade Forms: Bar, Rod, Plate, Wire Use: Valve parts, turbine blades (410), bearings

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
		HRC Tmax 650°C	& cutlery (440C)

High-Strength Low-Alloy

Deep-hardening nickel-chromium-molybdenum steels with high toughness and fatigue strength — the classic landing-gear, shaft and gear steels. 4340 is the reference grade.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
AISI 4340 4340 / 1.6565 / 40NiCrMo Day-one	Ni 1.8, Cr 0.8, Mo 0.25, C 0.4, bal Fe	UTS 1280 / YS 1230 / El 12% ρ 7.85 g/cm ³ 40 HRC Tmax 425°C	Deep-hardening, high toughness & fatigue; the classic landing-gear / shaft steel Forms: Bar, Rod, Forging, Plate, Tube Use: Landing gear, shafts, gears, torsion bars, high-stress structure

Ultra-High-Strength Low-Alloy

Silicon-modified 4340 (300M) is among the strongest steels used in airframes — the premier landing-gear and arrestor-hook alloy, run at ultimate strengths near 1,900 MPa.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
300M 300M / 4340M / AMS 6417 Day-one	Ni 1.8, Cr 0.8, Mo 0.4, Si 1.6, V 0.08, C 0.42, bal Fe	UTS 1930 / YS 1585 / El 10% ρ 7.83 g/cm ³ 53 HRC Tmax 290°C	Silicon-modified 4340 - one of the strongest airframe steels; premier landing-gear alloy (site headline grade) Forms: Bar, Forging Use: Landing gear, arrestor hooks, ultra-high-stress structure

Chromoly Low-Alloy

Weldable, tough chromium-molybdenum steel (4130) — the tube-frame, engine-mount and roll-cage steel across aerospace and motorsport.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
4130 4130 / 25CrMo4 / Chromoly To-order	Cr 0.95, Mo 0.2, C 0.3, bal Fe	UTS 670 / YS 435 / El 25% ρ 7.85 g/cm ³ 197 HB Tmax 425°C	Weldable, tough, moderate strength; the tube-frame & engine-mount steel Forms: Tube, Bar, Sheet, Plate Use: Welded tube structures, engine mounts, roll cages, pressure

Maraging Steel

Iron-nickel-cobalt-molybdenum steels that reach extreme strength with good toughness via simple ageing (no quench distortion). Rocket-motor cases, high-load landing-gear and tooling. Export-sensitive.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
Maraging 250 / 300 / 350 18Ni-250/300/350 / C250-C350 To-order	Ni 18, Co 8-12, Mo 4.8-5, Ti 0.4-1.4, low C	UTS 1700-2400 / YS 1650-2350 / El 6-10% ρ 8.10 g/cm ³ 50-58 HRC Tmax 400°C	Extreme strength with good toughness; simple ageing (no quench distortion); export-sensitive Forms: Bar, Plate, Forging, Tube Use: Rocket-motor cases, landing gear, tooling, F1 driveline

Tool Steel

Hardenable tooling alloys: H13 hot-work dies, D2 cold-work wear tooling, and M2 high-speed cutting tools — for the dies, moulds and fixtures behind production.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
H13 / D2 / M2 Hot-work / Cold-work / High-speed To-order	H13: Cr 5, Mo 1.5, V 1, C 0.4. D2: Cr 12, C 1.5. M2: W 6, Mo 5, C 0.85	UTS 1200-2000 / YS - / El -% ρ 7.80 g/cm ³ H13: 52 / D2: 60 / M2: 64 HRC Tmax H13: 540°C	Tooling alloys: H13 hot-work dies, D2 cold-work wear, M2 cutting tools Forms: Bar, Plate, Round Use: Dies, moulds, punches, cutting tools, jigs & fixtures

Anti-Galling Austenitic

Nitronic 60 (Bohler N701) resists galling and wear without hard-facing and holds up at temperature — valve stems and seats, wear pins, bushings and fasteners.

Grade	Nominal composition (wt %)	UTS / YS / El (MPa, %)	Key properties & applications
Nitronic 60 (Bohler N701) <i>Nitronic 60 / 218 / Alloy 218</i> Day-one	Cr 17, Mn 8, Ni 8.5, Si 4, N 0.13, bal Fe	UTS 690 / YS 415 / El 35% ρ 7.62 g/cm ³ 95 HRB Tmax 815°C	Outstanding galling & wear resistance without hard-facing; good high-temp oxidation resistance Forms: Bar, Rod, Wire, Plate Use: Valve stems & seats, fasteners, wear pins, bushings

Forms by industry —

Aerospace: Bar, forging, tube, sheet — landing gear, fittings, exhaust, engine mounts

Automotive: Bar, forging, tube — crankshafts, gears, roll cages, driveline, dies

Oil & Gas: Bar, forging, tube — valves, wellhead, drill collars, tool joints (17-4/4340/316L)