SPACE & SATELLITES

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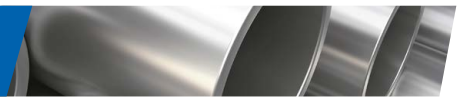
S+D METALS
SUPPORTING YOUR SUCCESS

HIGH PERFORMANCE ALLOYS



Even today, nickel-based alloys developed decades ago are proving essential in space applications and enabling humanity to grow beyond the boundaries of earth. From cutting edge rocket engineering to precision components in satellites, antenna and radio telescopes the unique properties of titanium, nickel-based alloys and precipitation hardened steel grades can provide solutions to the most challenging engineering questions.

The high strength-to-weight ratio of titanium alloys allows for considerable weight savings to be made – essential for maximising payload capacity. Precipitation hardened stainless steels offer varied combinations of high strength, hardness, excellent corrosion resistance and ease of fabrication making them highly versatile for a range of machined components. For modern rocket engines high temperature high strength materials are required but they must also be able to withstand the cryogenic temperatures associated with the liquid oxygen fuel systems. Nickel-based alloys can be utilised at both ends of the broad temperature ranges found in the rocket engine system from fuel injectors to exhaust systems and many applications in between.

Our extensive stock portfolio includes nickel-based, cobalt-based and titanium alloys and precipitation hardened steels which are used in these critical applications and we hope to introduce you to just a few key grades here.

ALLOY PROPERTIES

	Specifications	Key attributes	Application
ALLOY 625 **N06625** **2.4856**	Bar: AMS 5666, ASTM B446 Sheet/plate: AMS 5599, 5879	A Ni-Cr-Mo alloy with good oxidation resistance and high strength from cryogenic temperatures to 815 °C.	Fuel injectors, bellows, ducting and exhaust systems
ALLOY 718 **N07718** **2.4668**	Bar: AMS 5662, AMS5663, ASTM B637 Sheet/plate:AMS 5596, ASTM B670	Combines high strength at temperatures up to 700 °C with excellent corrosion resistance.	Thrust chamber components, outer casing, turbopump components
ALLOY X **N06002** **2.4665**	Bar: AMS 5754, ASTM B572	Excellent strength and oxidation resistance up to 1200 °C	Engine manifold, rings and seals
ALLOY L605 **R30605**	Bar: AMS 5759, DMD415-22, ASTM F90	A high strength cobalt-based alloy with good oxidation resistance at temperatures up to 980 ºC	Power system technologies
ALLOY 36 **K93603** **1.3912**	Bar: ASTM F-1684 Sheet/plate: ASTM F1684	A binary iron-nickel (36% Ni) alloy which has a very low coefficient of thermal expansion.	Satellite, antenna and telescope components
Ti-6-4 (Gd5) **R56400** **3.7164**	Bar: AMS 4928, ABS 5453 Sheet/plate: AMS 4911, ASTM B265, ABS 5326C, ABS 5125A	High strength-to-weight ratio used up to a maximum temperature of 500 ºC	Rocket casing, blades and casing for propellant turbo pump
17-4PH **S17400** **1.4548**	Bar: AMS 5622, AMS 5643	A highly versatile grade offering high strength and good corrosion resistance	Rocket wing, tail and structural parts, motor casing, turbo pump assembly impeller, shafts and fasteners
15-5PH **S15500** **1.4545**	Bar: AMS 5659	Very similar to its predecessor (17-4PH) but with enhanced toughness and ductility	
13-8Mo **S13800** **1.4534**	Bar: AMS 5629	Good resistance to stress corrosion cracking combined with high level mechanical properties	Rocket engine mounts, hold down clamps and fasteners

Approximate maximum operating temperatures depending on load and environmental conditions.

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