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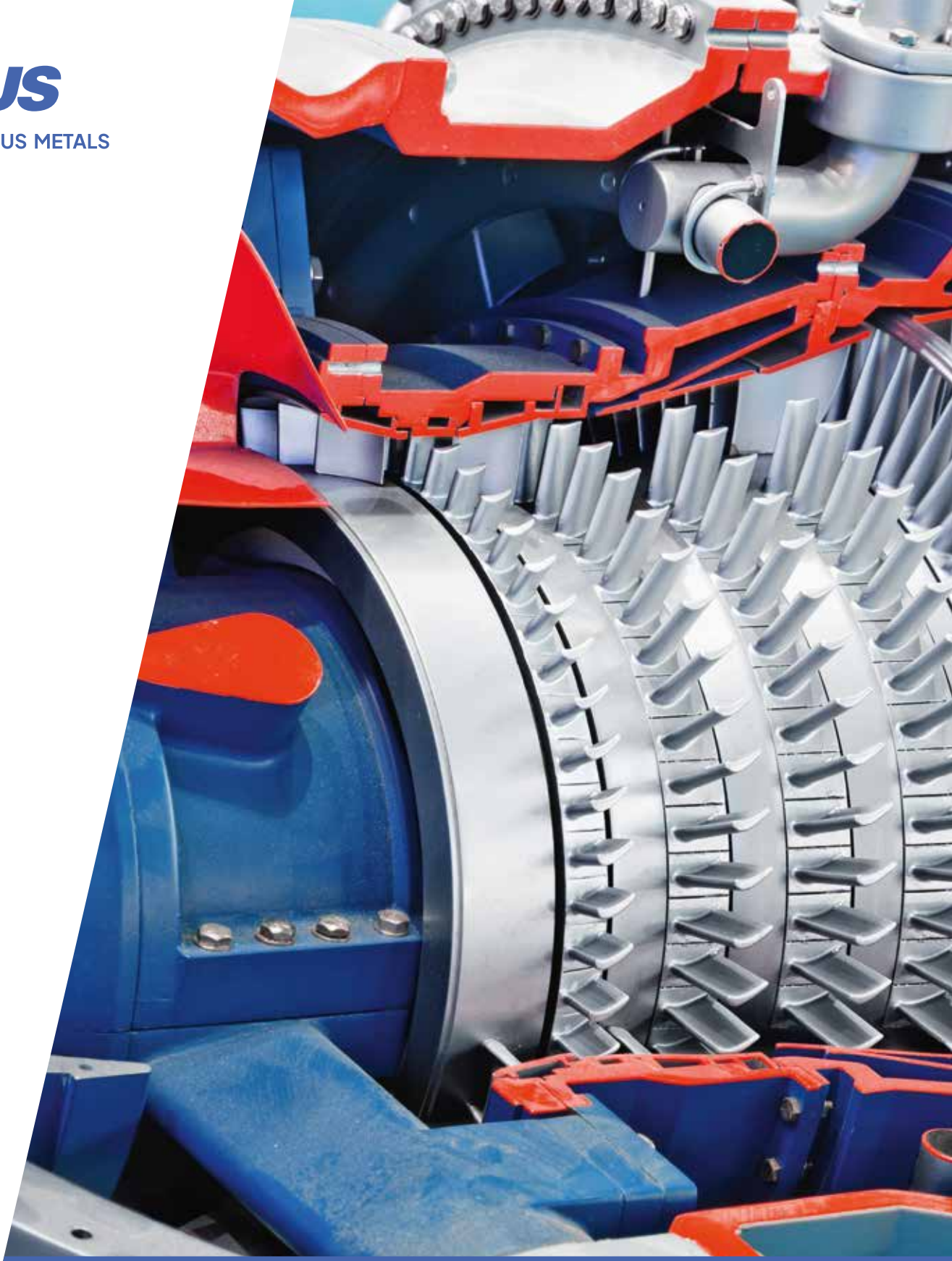

LAND-BASED GAS TURBINES

Uses of high temperature Alloys

Materials used in the hot section of gas turbines are subject to very high temperatures and require high strength and excellent creep resistance as well as oxidation and corrosion resistance. Nickel-based and cobalt-based superalloys are the most used materials in gas turbines because of their high strength, creep properties and high temperature corrosion resistance.

The cobalt-based grades **Alloy L-605 and Alloy 188** find application in the hot section of the turbine and combustion chamber liners and ducts. **Alloy L-605** has high strength and is resistant to oxidation and scaling at temperatures up to 980 °C. This grade also has good wear and galling properties. **Alloy 188** has excellent high temperature strength and oxidation at temperatures up to approximately 1090 °C and is also particularly resistant to sulphidation.

The nickel-based grades **Alloy 617, Alloy HX and Alloy 263** have high strength, excellent high temperature corrosion resistance and are highly formable making them especially suitable for casings and sheet fabrications such as combustors and ducting. In very high temperature operating environments **Alloy 230** with its exceptional strength and long-term resistance to oxidation at temperatures up to 1150 °C can be used.

Materials with high creep strength are required for high temperature fasteners and **Alloys 80A and 90** are often used in these applications. These grades have good resistance to corrosion and oxidation combined with excellent high temperature mechanical properties and creep resistance and can be used up to 815°C-920°C. These alloys along with **Alloy 75** also find application in the turbine casing, rings and seals. For more information please contact us via info@bibusmetals.com.

Alloy Properties

	Composition (%)	Key attributes	Application
Alloy 75 N06075/2.4951	76Ni – 20Cr – 4Fe	Moderate high temperature strength and good oxidation resistance	Casings, rings and seals
Alloy 80A N07080/2.4952	76Ni – 19.5Cr – 3Fe – 1.4Al – 2.4Ti	Highly alloyed, age hardenable alloy with excellent high temperature strength for service at temperatures up to ~815 °C	High temperature fasteners, casings, rings and seals
Alloy 90 N07090/2.4632	60Ni–19.5Cr – 16Co – 10Mo – 1.5Al – 2.5Ti	Excellent creep resistance and cyclic oxidation resistance for service up to ~920 °C	High temperature fasteners, turbine blades and vanes
Alloy 263 N07263/2.4650	51Ni – 20Cr – 20Co – 5.8Mo – 0.5Al – 2.2Ti	Excellent creep resistance and cyclic oxidation resistance for service up to ~920 °C	Combustors, ducting, exhaust systems
Alloy 617 N06617/2.4663	52Ni –22Cr–1.5Fe – 9.5Mo–12.5Co–1.2Al	Excellent strength and oxidation resistance up to 1200 °C	Combustion cans, liners and transition ducts
Alloy HX N06002/2.4665	47Ni – 22Cr – 18Fe – 1.5Co – 9.0Mo	Excellent strength and oxidation resistance up to 1200 °C	Casings, rings and seals, sheet fabrications
Alloy 230 N06230/2.4733	57Ni – 22Cr – 14W – 5Co – 3Fe	Excellent high temperature strength and oxidation resistance at temperatures up to 1150 °C	Combustion cans and transition ducts
Alloy L-605 R30605/2.4964	50Co – 20.5Cr – 15W – 10Ni – 3Fe – 1.5Mn	A high strength cobalt-based alloy with good oxidation resistance at temperatures up to 980 °C and good resistance to wear and galling	Rings, blades and combustion chamber parts, bearings
Alloy 188 R30188/2.4683	38Co – 22Ni – 22Cr – 14W – 3Fe – 1.2Mn	A cobalt-based alloy with good high temperature strength and good oxidation and sulphidation resistance up to 1090 °C	Gas turbine combustors, liners and transition ducts

Approx maximum operating temperatures depending on load and environmental conditions.