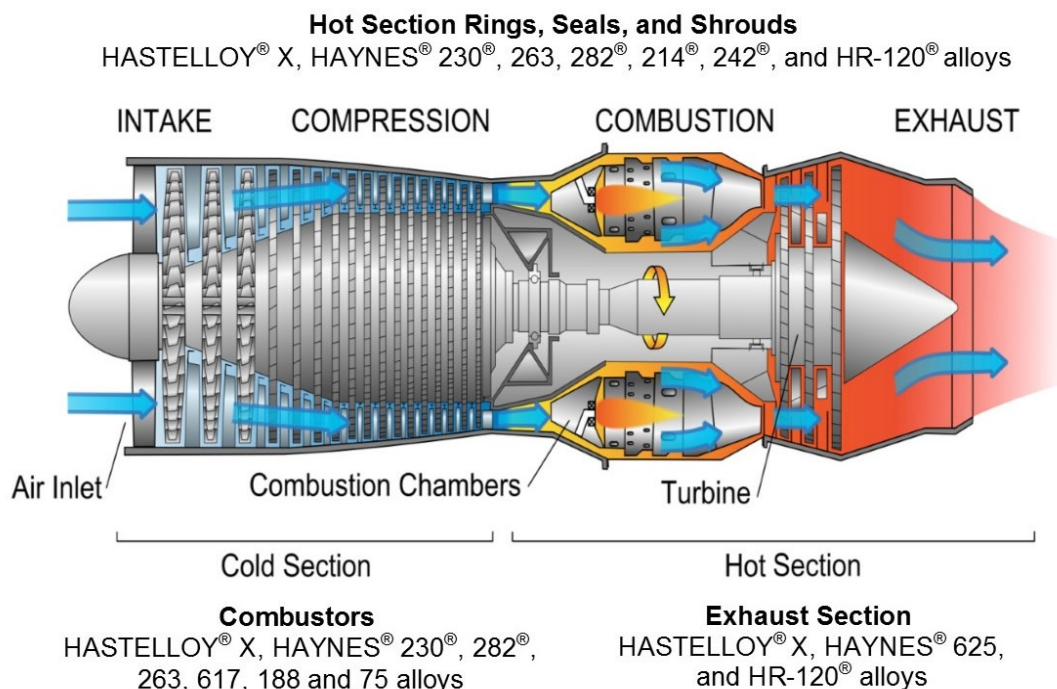


Haynes International Gas Turbine Alloys

For more than 100 years, Haynes International has been a leader in the development, manufacturing, and distribution of high-performance alloys for mission-critical applications.

We are proud of our extensive history with gas turbines that dates back to early aero engines. Today, our products are used in parts for almost every commercial airplane, in many military aircraft, as well as aboard vehicles exploring the frontiers of space. We are committed to delivering the highest quality products, solutions, and service that the aerospace industry demands.



HAYNES® 233™ alloy [Ni-19Cr-19Co-7.5Mo-3.25Al-0.1C-0.004B]

HAYNES® 233™ alloy is a new, superior turbine hot gas path alloy with outstanding creep strength coupled with excellent oxidation resistance at temperatures up to 2100°F (1149°C) - a combination of properties never before achieved in a readily fabricable alloy. The alloy achieves its exceptional oxidation resistance via formation of a protective alumina scale, while the high creep strength is a result of solid-solution and carbide strengthening. Finally, the alloy can be readily fabricated using conventional methods since it exhibits good hot workability, cold formability, and weldability. These capabilities offer the highest performance yet achieved in metallic aerospace and industrial gas turbine combustors, transition pieces, rings and casts, and other hot structures.

HAYNES® 282® alloy [Ni-20Cr-10Co-8.5Mo-2.1Ti-1.5Al-0.06C-0.005B]

HAYNES® 282® alloy is a new, wrought, gamma-prime strengthened superalloy developed for high-temperature structural applications, especially those in aero and industrial gas turbine engines. Since its introduction in 2005, it has been quickly adopted by many OEM's for its unique combination of creep strength, thermal stability, weldability, and fabricability not available in other commercial alloys. The excellent creep strength in the temperature range of 1200 to 1700°F (649° to 927°C) surpasses that of Waspaloy alloy and approaches that of R-41 alloy. The features of this alloy make it suitable for critical gas turbine applications, such as combustion liners, transition pieces, forged rings and cases, exhaust and shroud structures, and other hot gas path components.

Haynes International Gas Turbine Alloys

HAYNES® 230® alloy [Ni-22Cr-14W-2Mo-0.5Mn-0.4Si-0.3Al-0.1C-0.02La]

HAYNES® 230® alloy is the premium solid-solution, turbine hot gas path alloy available today. It offers a better combination of high-temperature strength, resistance to prolonged exposures to oxidizing environments up to 2100°F (1149°C), excellent long-term thermal stability, and fabricability than any commercially available high-temperature alloy. It is used for combustion cans, transition ducts, flame holders, turbine shrouds, thermocouple sheaths, and other important gas turbine components.

HASTELLOY® X alloy [Ni-22Cr-18Fe-9Mo-1.5Co-0.6W-0.1C]

For nearly 70 years, HASTELLOY® X alloy has been and continues to be the workhorse alloy for combustion parts in industrial gas turbine applications all over the world. The alloy offers a very good balance of high-temperature strength, oxidation resistance, and fabricability at lower cost than many other materials. This alloy is widely used in industrial gas turbine and aircraft engine fabricated combustor and exhaust components, such as transition ducts, combustor cans and liners, injector nozzles and spray bars, flame holders, exhaust struts and many other hot gas path components.

HAYNES® 617 alloy [Ni-22Cr-12.5Co-9Mo-1.2Al-1Fe-0.3Ti-0.07C]

HAYNES® 617 alloy is a common high temperature alloy in use on many industrial gas turbines since it offers excellent high-temperature strength and good oxidation resistance up to 2000°F (1095°C), together with good thermal stability and fabricability. This alloy is used in transition ducts, large burner can structures, and similar hot gas path components.

HAYNES® 214® alloy [Ni-16Cr-4.5Al-3Fe-0.04C-0.01Y]

HAYNES® 214® alloy is the most oxidation resistant, wrought nickel alloy commercially available, offering outstanding resistance to 2300°F (1260°C) via formation of a highly protective alumina scale. Strengths are very good at intermediate temperatures to 1650°F (900°C), and the alloy can be conventionally formed and joined. This alloy is used in demanding, specialized gas turbine parts, such as honeycomb seals, combustor splash plates, and other static oxidation-limited parts.

Accreditations:

AS9100
ISO9001:2008
ISO14001:2004
ISO50001:2011
OSHAS 18001:2007
AD2000-Merkblatt W 0
Nadcap
European PED97/23/EC

Approvals:

BAE Systems
Cessna
General Electric
ITP
Pratt & Whitney
Rolls-Royce
Siemens
Snecma Moteurs/Groupe SAFRAN
Spirit Aero Systems



We offer service centers and sales offices worldwide. Our service centers' capabilities extend from specialized cutting to supplying parts cut to specific drawings and specifications, which reduce your labor time and material waste. We can be a partner in your entire material management system. We are continuously expanding our capabilities to increase your operation's efficiency and shorten your cycle time. Our highly trained staff and technicians are dedicated to providing solutions that exceed your expectations.

Whether you need on-demand delivery of finished goods, end-use technical support or a partner with a global presence, Haynes International provides value far beyond the alloys themselves.