Steel, Stainless Steel, High & Super Alloy-
Heat, Wear, Abrasion, Pressure & Corrosion Resistant
Castings, Spares, Replacement Parts, Custom-Made Components
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Engineering, Materials & Metallurgical Consulting

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Cast Cobalt Alloys

Wear (Abrasion-Corrosion-Erosion) Resistant Cast Cobalt Alloys

Alloys for Abrasive, Sliding, Galling & Erosive Wear End-Applications

Alloy No. 3	Co-30Cr-3Ni-12W-3Fe-Si-Mn-C
Alloy No. 6	Co-29Cr-3Ni-4W-3Fe-Si-Mn-C-1.5Mo
Alloy No. 12	Co-30Cr-3Ni-8W-3Fe-Si-Mn-C
Alloy No. 19	Co-30Cr-3Ni-10W-3Fe-Si-Mn-C
Star J	Co-32Cr-2.5Ni-18W-3Fe-Si-Mn-C
Alloy 98M2	Co-30Cr-4Ni-18W-2.5Fe-Si-Mn-C-0.8Mo-1.1B-4.2V


Heat Resistant Cast Cobalt Alloys

Alloy No. 21	Co-27Cr-3Ni-3Fe-Si-Mn-C-5.5Mo-0.007B
Alloy No. 25	Co-20Cr-10Ni-15W-3Fe-Si-Mn-C
Alloy No. 31	Co-25Cr-10Ni-7.5W-2Fe-Si-Mn-C-0.50Mo
Alloy X-40/45	Co-26Cr-10Ni-8W-2Fe-Si-Mn-C-0.01B
Alloy FSX-414	Co-29Cr-10Ni-7W-2Fe-Si-Mn-C-0.01B
Alloy WI-52	Co-20Cr-1Fe-11W-2Fe-Si-Mn-C-2.0Nb/Cb


Example of parts

Liners, Pistons, Plugs, Pins, Injectors, Rings, Valve Components, Seat Rings,
Pump Parts, Shafts, Blades, Bushings, Nozzles, Wear Parts, Chemical Resistant
Hardware, Bushes for Molten Zinc Galvanizing, Molten Metal Applications like Thermo-wells/Probes


Metallurgical Notes:

Cobalt-base super-alloys tend to be complex combination of elements; each alloy is designed for specific purpose and end application. If required, cast components can also be weld-corrected with the aid of compatible welding TIG fillers and coated MMAW electrodes that are often used for hard-facing and cladding purpose. The matrix of cast cobalt alloys is face-centered cubic (fcc). Modern alloys typically gain their strength through a number of complex carbides (depending upon the chemistry) and in some alloys, through the use of solid-solution strengthening. Some newly developed alloys gain strength through inter-metallic compounds like Ni_3Ti. The cobalt alloy phases represent a wide variety of alloying concepts that are used to produce a desired carbide morphology and matrix combination to yield the best properties for industry specific end application. Many different types of carbides have been identified in these alloys, including MC, M_6C, M_7C_3, $M_{23}C_6$, and Cr_2C_3; where M represents the metal atom. These carbides can be significantly affected by casting parameters and resulting solidification rates. For example, there is a common lamellar carbide phase comprised of both an $M_{23}C_6$ and probably M_6C in as-cast HS-21. This phase is often considered to reduce ductility due to its brittle nature. It is possible to control the frequency and size of the phase through chemistry modification to reduce total carbon or to adjust casting parameters to increase solidification rates, directional solidification and thus retard precipitation. Several of the cobalt alloys can be altered by similar techniques to obtain micro-structural control of the precipitates. Doping alloys with boron enhanced its ductility while niobium alloying helps combat thermal cycling and thermal fatigue.

Talk to us of requirements of components, spares and replacement parts. In case, drawings are not available, new replacement part could be developed from sample, old or used OEM part.