

IRON CASTINGS - TECHNICAL DATA

GRAY & HIGH ALLOY IRONS



MONMET

Monmet helps our customers solve their problems with an unmatched expertise in alloy and process selection.

| ALLOY | ASTM SPECIFICATION | CHEMICAL COMPOSITION (Maximum unless range specified) | | | | | | MINIMUM MECHANICAL PROPERTIES | | | | EQUIVALENT FOREIGN SPECS | | CHARACTERISTICS & APPLICATIONS |
|-------------------------------------|---------------------------|--|----------|-----------|-----------|-------------------|---------------|-------------------------------|------------------------|-----------------|------------------------|--------------------------|---------------------------|--|
| | | C % | Si % | Mn % | Ni % | Cr % | Other % | CONDITION | TENSILE STRENGTH (KSI) | ELONGATION | BRINELL HARDNESS (BHN) | BRITISH STANDARD | GERMAN STANDARD | |
| GRAY IRONS | A48: CLASS 20 | 3.1-3.9 | 2.0-2.9 | 0.3-0.9 | | | | As cast | 20 | | 150-180 | BS 1452 100, 150 | DIN 1691 GG-10 | These low strength gray irons CLASS 20 & CLASS 25 are characterized by excellent machineability, high damping capacity & low modulus of elasticity. The grades are used for small & light cylinder blocks & heads, pistons, pump bodies, transmission cases, gear boxes, etc. |
| | A48: CLASS 25 | 3.0-3.7 | 2.0-2.7 | 0.3-0.9 | | | | As cast | 25 | | 167-220 | BS 1452 180 | DIN 1691 GG-15 | |
| | A48: CLASS 30 | 2.8-3.5 | 1.7-2.5 | 0.3-0.9 | | | | As cast | 30 | | 179-230 | BS 1452 200 | DIN 1691 GG-15 | These medium strength gray irons have slightly lower damping capacity, but higher tensile & compressive strength & hardness, and low coefficient of friction. They can be used for brake drums, clutch plates, pistons, cylinder blocks, heads, heavy duty transmission cases & gear boxes, machine tool beds, headstock, tables, press frames and crank cases. |
| | A48: CLASS 35 | 2.6-3.5 | 1.5-2.3 | 0.3-0.9 | | | | As cast | 35 | | 180-235 | BS 1452 220,250,260 | DIN 1691 GG-20 | |
| | A48: CLASS 40 | 2.4-3.5 | 1.5-2.3 | 0.3-0.9 | | | | As cast | 40 | | 190-248 | | | |
| | A48: CLASS 45 | 2.3-3.4 | 1.4-2.2 | 0.3-0.9 | | | | As cast | 45 | | 200-260 | BS 1452 300 | DIN 1691 GG-25 | The high strength & hardness of these grades make them useful for applications such as heavy service gears, sheaves, cable drums, crane wheels, rollers, dies, chucks & pulleys. |
| | A48: CLASS 50 | 2.3-3.4 | 1.4-2.2 | 0.3-0.9 | | | | As cast | 50 | | 220-290 | BS 1452 350 | DIN 1691 GG-30 | |
| A48: CLASS 60 | 2.2-3.4 | 1.3-2.0 | 0.3-0.11 | | | | As cast | 60 | | 240-350 | BS 1452 400 | DIN 1691 GG-35 | | |
| ABRASION RESISTANT HIGH ALLOY IRONS | A532: CLI-A (NiHard-1) | 2.8-3.6 | 0.8 | 2.0 | 3.3-5.0 | 1.4-4.0 | Mo 1.0 | As cast/SR Harden | | | 530-550 600 Min | BS 4844 2B | DIN 1695 G-X330NiCr42 | These high carbon Ni-Cr white irons possess excellent resistance to abrasion, erosion & wear. The alloys achieve most of their properties in the AS CAST condition. Applications include grinding balls, mill liners, slurry pumps, impellers and roll heads. |
| | A532: CLI-B (NiHard-2) | 2.4-3.0 | 0.8 | 2.0 | 3.3-5.0 | 1.4-4.0 | Mo 1.0 | As cast/SR Harden | | | 530-550 600 Min | BS 4844 2A | DIN 1695 G-X260NiCr42 | |
| | A532: CLI-C (NiHard-3) | 2.5-3.7 | 0.8 | 2.0 | 4.0 | 1.0-2.5 | Mo 1.0 | As cast/SR Harden | | | 530-550 600 Min | | | The unique structure of the alloy provides greater resistance to impact loads than Ni Hard Type 1 & 2. Applications include impellers, liners, paddles & grinding rings. |
| | A532: CLI-D (NiHard-4) | 2.5-3.6 | 2.0 | 2.0 | 4.5-7.0 | 7.0-11.0 | Mo 1.5 | As cast/SR Harden | | | 480-510 600 Min | BS 4844 2C, 2D, 2E | DIN 1695 G-X300CrNiSi952 | |
| | A532: CLII-B (15% Chrome) | 2.0-3.3 | 1.5 | 2.0 | 2.5 | 14.0-18.0 | Mo 3.0 Cu 1.2 | Anneal Harden | | | 400 Max 600 Min | BS 4844 3A | DIN 1695 G-X300CrMo153 | These high carbon Cr-Mo irons possess excellent resistance to abrasion, erosion & wear under moderate impact conditions at temperatures up to 1500 F. Castings poured in these alloys are machineable in softened condition (400 BHN Max.). Hardness higher than 600 BHN is achieved through heat treatment after rough machining. Applications include sand & slurry pumps, blasting equipment, blow bars, pulverising balls & mill liners. |
| | A532: CLII-D (20% Chrome) | 2.0-3.3 | 2.2 | 2.0 | 2.5 | 18.0-23.0 | Mo 3.0 Cu 1.2 | Anneal Harden | | | 400 Max 600 Min | BS 4844 3C | DIN 1695 G-X260CrMoNi2021 | |
| A532: CLIII-A (25% Chrome) | 2.0-3.3 | 1.5 | 2.0 | 2.5 | 23.0-30.0 | Mo 3.0 Cu 1.2 | Anneal Harden | | | 400 Max 600 Min | BS 4844 3D, 3E | DIN 1965 G-X300CrMo271 | | |
| AUSTENITIC HIGH ALLOY IRONS | A436: NIREST-1 | 3.0 | 2.8 | 1.5 | 13.5-17.5 | 1.5-2.5 | Cu 5.5-7.5 | As cast SR | 25 | | 131-183 | BS 3468 F1 | DIN 1694 GGL-NiCuCr1562 | The austenitic structure and high nickel content of these alloys provide its corrosion & heat resisting properties. The presence of graphite, distributed throughout, makes these alloys highly resistant to galling & metal-to-metal wear at low & high temperatures, up to 1500 F. The chromium bearing grades provide for improved cavitation & erosion resistance. The high nickel grades, such as Types 3-5, are recommended for severe thermal shock service between room temperature & 800 F and have low thermal expansivity & non-magnetic characteristics. |
| | A436: NIREST-1B | 3.0 | 2.8 | 1.5 | 13.5-17.5 | 2.5-3.5 | Cu 5.5-7.5 | As cast SR | 30 | | 149-212 | BS 3468 F2, L-NiCuCr1563 | DIN 1694 GGL-NiCuCr1563 | |
| | A436: NIREST-2 | 3.0 | 2.8 | 1.5 | 18.0-22.0 | 1.5-2.5 | Cu 0.5 | As cast SR | 25 | | 118-174 | BS 3468 L-NiCr202 | DIN 1694 GGL-NiCr202 | The corrosion resistance of the Austenitic Gray Irons lies between the Gray Iron & Austenitic Chromium-Nickel Stainless Steels such as CF8 & CF8M. |
| | A436: NIREST-2B | 3.0 | 2.8 | 1.5 | 18.0-22.0 | 3.0-6.0 | Cu 0.5 | As cast SR | 30 | | 171-248 | BS 3468 L-NiCr203 | DIN 1694 GGL-NiCr203 | |
| | A436: NIREST-3 | 2.6 | 2.0 | 1.5 | 28.0-32.0 | 2.5-3.5 | Cu 0.5 | As cast SR | 25 | | 118-159 | BS 3468 F3 | DIN 1694 GGL-NiCr303 | |
| | A436: NIREST-4 | 2.6 | 5.0-6.0 | 1.5 | 29.0-32.0 | 4.5-5.5 | Cu 0.5 | As cast SR | 25 | | 149-212 | BS 3468 L-NiCuCr3055 | DIN 1694 GGL-NiSiCr3055 | Ni Resist Alloys find extensive use in the petroleum industry to combat sulfide corrosion. These alloys are suitable for use in high temperature application (1500 F) as well as applications in pumps, diffusers & roller vane pumps. |
| A436: NIREST-5 | 2.4 | 2.0 | 1.5 | 34.0-36.0 | 0.1 | Cu 0.5 | As cast SR | 20 | | 99-124 | BS 3468 L-Ni35 | | | |
| A436: NIREST-6 | 3.0 | 1.5-2.5 | 1.5 | 18.0-22.0 | 1.0-2.0 | Cu 3.5-5.5 Mo 1.0 | As cast SR | 25 | | 124-176 | | | | |

Monmet offers a complete range of iron castings from gray, ductile, ni-hard, ni-resist and high chrome white irons.

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