

TECH-PTA / LASER SELECTOR CHART


COLMONOY®
 (nickel-based)

| ALLOY | NOMINAL COMPOSITION (%) | | | | | | | | | ROCKWELL HARDNESS (C-scale) | SUPPLIED AS | DESCRIPTION AND GENERAL USES |
|-----------------------|-------------------------|--------|------|------|-----|------|---|-----|-------------|-----------------------------------|-----------------|--|
| | B | C | Cr | Fe | Mo | Si | W | Ni | Others | | | |
| with Chromium | | | | | | | | | | | | |
| 30 | 1.3 | 0.15 | 3.4 | 1.3 | | 3.2 | | Bal | | 22-30 | Atomised Powder | Nickel-based hard surfacing alloy suitable for application by plasma transferred arc (PTA) and laser techniques. Colmonoy 30 is widely used in the glass industry for the protection of moulds. |
| 33 | 1.0 | 0.3 | 5.8 | 1.5 | | 4.1 | | Bal | | 36 | Atomised Powder | Versatile Nickel-based hard surfacing alloy suitable for Plasma Transferred Arc (PTA) and Laser deposition. Applications include cladding of steel industry transporter rolls, drill bits and pumps within the oil and gas sector plus the repair of aluminium bronze castings in the glass industry. |
| 42 | 1.8 | 0.5 | 10.0 | 2.5 | | 3.2 | | Bal | | 35-40 | Atomised Powder | Optimised Colmonoy 4 formulation for plasma transferred arc (PTA) and Laser application. Has greater impact resistance and workability than Colmonoy 5. For dies, moulds, valves, and plungers. Finished with carbide tools and grinding. |
| 45 | 2.3 | 0.4 | 12.0 | 3.5 | | 3.0 | | Bal | | 40-46 | Atomised Powder | Optimised Colmonoy 45 formulation for plasma transferred arc (PTA) and Laser application. Used for riser pins, gate valves and seats. Has potential use for parts in the glass industry. |
| 52 | 2.5 | 0.5 | 14.3 | 4.5 | | 3.3 | | Bal | | 45-50 | Atomised Powder | Optimised Colmonoy 5 formulation for plasma transferred arc (PTA) and Laser application. Has greater ductility, better impact resistance and workability than Colmonoy 6. For wear rings, plungers, dies. Finished with carbide tools and grinding. |
| 56 | 1.9 | 0.9 | 18.0 | 5.4 | | 5.3 | | Bal | | 53-58 | Atomised Powder | Specifically designed for protecting and restoring plastics extrusion screws using plasma transferred arc (PTA) and Laser application. Between Colmonoy 6 and 5 in chemistry and hardness. Better ductility and impact resistance than Colmonoy 6. Finished with carbide tools and grinding. |
| 62 | 2.9 | 0.7 | 16.5 | 4.5 | | 4.5 | | Bal | | 55-60 | Atomised Powder | The original, nickel-based hard-surfacing alloy designed for plasma transferred arc (PTA) and Laser application. Optimised formulation to offset dilution and alloy loss from the arc. Extremely resistant to wear, especially under corrosive conditions. Low coefficient-of-friction. Can be hot-formed. Finished by grinding. |
| 625 | - | <0.075 | 22 | <5.0 | 9.0 | <0.5 | | Bal | Nb: 3.75 | 97 HRB (Nominal) | Atomised Powder | Nickel-based hard surfacing alloy with high fatigue strength and toughness for application by Plasma Transferred Arc (PTA) or Laser Techniques. For use as a buffer layer for non-magnetic down-hole tools, marine, processing, aerospace and nuclear applications. |
| with Aluminium | | | | | | | | | | | | |
| 215 | 1.1 | 0.1 | 3.0 | 1.0 | | 2.8 | | Bal | Al: 1.0 | 22-30 | Atomised Powder | Designed to hardface grey cast iron moulds for the glass industry. The alloy contains aluminium to help absorb the gas produced during the welding process. Finished with carbide or CBN tools. |
| 211 | 1.5 | 0.1 | 2.3 | 0.5 | | 2.8 | | Bal | Al: 1.0 | 27-34 | Atomised Powder | Designed to hardface grey cast iron moulds for the glass industry. The alloy contains aluminium to help absorb the gas produced during the welding process. Finished with carbide or CBN tools. |
| 315 | 1.5 | 0.25 | 4.5 | 1.2 | | 3.5 | | Bal | Al: 1.0 | 28-35 | Atomised Powder | Designed to hardface oxidizable grey cast iron moulds for the glass industry. The alloy contains aluminium to absorb gas which may evolve during the welding process. Finished with carbide or CBN tools. |

SURFACING ALLOYS TECH-PTA / LASER SELECTOR CHART



COLMONOY® (nickel-based)

| ALLOY | NOMINAL COMPOSITION (%) | | | | | | | | | ROCKWELL HARDNESS (C-scale) | SUPPLIED AS | DESCRIPTION AND GENERAL USES |
|-----------------------------------|-------------------------|-----|------|-----|----|-----|------|-----|--------|-----------------------------------|------------------|--|
| | B | C | Cr | Fe | Mo | Si | W | Ni | Others | | | |
| with Chromium and Tungsten | | | | | | | | | | | | |
| 57 | 2.5 | 0.5 | 11.5 | 3.5 | | 3.5 | 16.0 | Bal | | 52-57 | Atomised Powder | Specifically formulated for overlaying the flights of new and rebuilt extrusion or injection molding screws. Other potential applications where resistance to abrasion and corrosion are important include food processing industry feed screws, air locks and scraper blades. Finished with carbide tools, wet grinding, or dry lapping. Also available for Laser Cladding. |
| 88¹ | 3.0 | 0.8 | 17.0 | 3.5 | | 4.0 | 17.0 | Bal | | 59-64 | Atomised Powder | Unique alloy containing chromium and tungsten borides and carbides for maximum abrasion and corrosion resistance. For high-temperature, highly abrasive applications, glass mould plungers, pump plungers and sleeves, valve seats, plastics extrusion screws. Finished by grinding or CBN tools. |
| with Tungsten Carbide | | | | | | | | | | | | |
| 7331-60² | 0.7 | 2.5 | 2.4 | 0.7 | | 1.8 | 57.4 | Bal | | 30-40 | Composite Powder | A blended two-part hard surfacing powder containing 60% tungsten carbide particles in a nickel based matrix affording excellent abrasion resistance and moderate impact resistance. Typical applications include, mixers, extruders, blender parts, down hole oil tools, ground engaging tools. |
| 83³ | 1.0 | 1.9 | 20.3 | | | 1.7 | 34.1 | Bal | | 50-55 | Composite Powder | A tough nickel-chromium-tungsten-boron matrix alloy containing chromium carbides with the addition of extremely hard tungstencarbide particles for excellent abrasive wear protection. Excellent edge retention. Specifically for plasma transferred arc (PTA) application. Also available for Laser Cladding. |

WALLEX® (cobalt-based)

| | | | | | | | | | | | | |
|-----------|-----|------|------|-------|-----|-------|-----|-------|---------|-------|-----------------|---|
| 21 | | 0.25 | 27.0 | 3 max | 5.5 | 1 max | | 2.75 | Co: Bal | 28-35 | Atomised Powder | A cobalt-chromium-molybdenum based alloy with excellent high temperature properties. Combined resistance to galling, cavitation, erosion and corrosion with toughness and work hardening properties. |
| 6 | | 1.0 | 28.0 | 2.0 | | 1.25 | 4.5 | 3 max | Co: Bal | 38-46 | Atomised Powder | A cobalt-chromium based alloy powder providing resistance to impact, abrasion, erosion, corrosion and oxidation at high temperatures. Uses include valves and seats, edger rolls, hot shear knives and blades, hot trim dies and swaging mandrels. |
| 12 | | 1.5 | 29.0 | 2.0 | | 1.5 | 8.5 | 3 max | Co: Bal | 43-53 | Atomised Powder | A cobalt-chromium-tungsten based alloy powder with high heat, abrasion, wear and corrosion resistance. It has a low coefficient of friction and is non-galling. For veneer pressure bars, bushings, control plates, knives and saw teeth. |
| 42 | 1.7 | 0.9 | 18.5 | 2.5 | | 3.0 | 8.0 | 13.5 | Co: Bal | 45-50 | Atomised Powder | A cobalt-nickel alloy powder that forms deposits similar to those of Wallex 50, but softer. Finished with carbide tools and grinding. Developed as a lower temperature alternative for many cobalt applications. Also available for laser cladding. |

¹ U.S. Patent No. 5,141,571

² Contains tungsten-carbide particles (hardness 2200 HV)

³ U.S. Patent No. 4,731,253