WALLCOLMONOY
SURFACING ALLOYS

Image shows the leading edge with tile loss and erosion of the cementing matrix powder. Further use would result in rapid tile loss. Colmonoy® 7541-55F improves performance in reducing wear rates in this area

Colmonoy® 7541-55F

Nickel-Based Hard-Surfacing Alloy for Fuseweld™ Application

Description:

Colmonoy® 7541-55F is a composite blend of nickel based matrix including tungsten carbide particles providing a tough, wear resistant deposit ideally suited to abrasion by fine to medium particles. The deposit is also resistant to high temperature abrasive and light to medium/moderate impact. Colmonoy® 7541-55F can be spray deposited and fused to achieve a nominal hardness of **52 Rockwell C.**

For use on steels, stainless steels, cast irons and nickel alloys. Protection of parts subject to high stress abrasion and erosion with fine to medium particles and components subject to light to medium impact.

Components such as sand extruder's, ceramic extruder's, mixer paddles for the brick and tile industry, conveyor screws, decanter screws, exhaust fans, stabilisers, drill bits and steering pads for the oil and gas extrusion industry.

Nominal Composition - % by Weight:

B	C	Cr	Fe	Si	W	Ni
0.75	3.0	3.4	1.5	1.5	50	Bal

Forms Available:

Colmonoy© 7541-55F is supplied as a nickel-based tungsten carbide bearing composite powder, specifically suited for fuse weld application.

Alloy	Particle Size / Mesh Size	Application
Colmonoy® 7541-55F	125 – 20 µm 120 - 625 mesh	Fuseweld™

Application Methods:

Colmonoy® 7541-55F is applied by Fusewelder or similar torch. The Fuseweld™ Process is a coating application method to apply metallurgically bonded coatings to the edges and corners of moulds and blanks. Small shafts, the leading edge of flights for augers and centrifuge scrolls, key-ways, splines, and cams can all be efficiently coated or rebuilt with this process.

Machining, Grinding and Lapping:

There are several techniques used for material removal that produce high quality finished products. Machining can be done, using cubic boron nitride tooling. Use GE's BZN compacts (such as BRNG-43T) or Kennametal's CNMA 433KC-210. Use a negative rake tool, with a 15-degree lead angle. It should have a 1.2mm (3/64-in.) Radius and T-land edge preparation. Set tool at centreline of work. Feed at 0.005-0.010 IPR, with depth of cut up to 3.18mm (0.125-in.), at 200-300 SFM or higher.

The coatings can be machined with difficulty by carbide-tipped tools, such as Kennametal K6, Carboloy 883 or equivalent. For roughing, grind the tool with a slight lead and rake angle, and a slight radius (approx. 0.79mm (1/32")). Use a fine feed, about 0.075mm (0.003") per revolution, with a depth of cut about 0.38mm (0.015") at 15 SFPM. Set tool about 0.79mm (1/32") below centre. For finishing, grind the tool with the same slight lead and rake angles and with about a 1.6mm (1/16") radius. Use a fine feed, about 0.076mm (0.003") per revolution, with a maximum cut of 0.13mm (0.005") at approximately 45 SFPM.

Grinding is used after machining to remove the last 0.13-0.15mm (0.005-0.006") of material. Actually, the entire finishing is most commonly done by grinding, which eliminates machining. Grinding produces a near-frictionless mirror finish. Such smooth surfaces usually wear better, because they generate less heat and friction. Whereas a diamond wheel is preferred, green silicon carbide wheels (hardness H to K) can be used. Use 24 to 36 grit for roughing and 60 grit or finer for finishing. Grind wet when possible; do not let the wheel get loaded; dress frequently. Take light, fast cuts. (Manufacturer can provide full details for grinding.)

Dry lapping can be used to give the alloy an excellent finish. Silicon carbide, boron carbide and diamond dust are all capable of cutting the Colmonoy coating, but they must be embedded in a cast iron or steel wheel to properly lap deposits of Colmonoy 7541-55F alloys. Apply with a steady pressure and avoid overheating. If the lapping compounds are used loose, they will cut the nickel matrix before the chromium carbides, giving the surface an etched appearance.

Safety:

Do not heat any part of the cast iron over 815ºC during welding as this will cause oxidation of the surface and create hard spots adjacent to the deposit. If this critical temperature is approached, welding should be stopped and the part allowed to cool to 315-425ºC. The powder is applied by pressing the lever on the torch, which admits the powder to the gas stream. After passing through the flame, the molten particles are deposited on the work. When a small amount of alloy has been deposited, the powder is stopped (by releasing the lever), and the torch flame used to fuse the deposited material to the base metal. This spray-fuse cycle is repeated until sufficient build-up has been achieved. On all except large mass parts, the Fusewelder® Torch does all the heating required: pre-heating, spraying and fusing. Deposits as easily finished by grinding or by filing.

Warning: Thermal spray torches and heating torches used for application of this product utilise compressed gases including oxygen and a flammable fuel gas. Follow your employers safety procedures when using and handling these gases and equipment. Infrared and ultraviolet radiation (light) emitted from flame and hot metal can injure eyes and burn skin. Use appropriate personal protective equipment.

Storage Requirements:

Keep thermal spray powders in a closed container and protect against moisture pick-up. The containers should be tumbled before using the powder. If moisture is absorbed from the atmosphere, it can be removed and flow ability can be restored by drying the powder, with the seal removed and lid loosened, at 66-93°C (150-200°F) for two hours prior to use.

The information provided herein is given as a guideline to follow. It is the responsibility of the end user to establish the process information most suitable for their specific application(s). Wall Colmonoy Limited (UK) assumes no responsibility for failure due to misuse or improper application of this product, or for any incidental damages arising out of the use of this material.

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