

COLMONOY Spraywelder™



Powder Application Made Easy

Hardsurfacing machine components which are subject to abrasive and/or corrosive wear is accepted as a proven maintenance procedure. The question is no longer whether to hardsurface, but which hardsurfacing process to use. The following factors should be considered:



- Type of base metal (ferrous and high alloy)
- Type of wear
- Service life
- Maximum wear tolerance
- Repair costs

In the Sprayweld Process™, a powdered alloy is flame sprayed on a part and then the sprayed overlay is fused to the base metal by a heat source. This creates a smooth, nonporous, welded overlay within 0.010" of finished dimensions.

The Sprayweld Process offers numerous advantages which favor its use in many applications:

- Faster, uniform application
- Minimal powder consumption
- Close tolerances
- Less finishing time
- Wide range of applicable alloys

Compare rod application to the efficiency of the Colmonoy Sprayweld Process:

	Sleeve Overlaid by Rod	VS	Sleeve with Sprayweld Process
			
	Rod Application		Sprayweld Process
Time	40 Minutes		3 Minutes
Material	Rod, 32 oz (907g)		Powder, 11 oz (312g)
Quality	Chance of porosity; low spots		No porosity
Accuracy <small>(within finished dia.)</small>	0.150 inch (3.8mm)		0.020 inch (0.51mm)

5-Step Sprayweld Process:

1. Surface Preparation

The surface to be overlaid should be clean and free of oil or oxides which could prevent the overlay from forming a good mechanical bond with the base metal during the spray operation. Surface preparation involves the following:

- Degreasing
- Undercutting
- Grit blasting

Often there are surfaces adjacent to the area being sprayed that should be kept free of any sprayed deposits. In such cases, Microbraz® Green Stop-Off™ may be applied to prevent thermal spray materials from bonding to protected areas.

2. Preheating

Preheating time varies with the type of base:

- Mild steels (max. 0.25% carbon) - max. 300° F (150° C)
- Austenitic stainless steels (300 series) - 600° F (315° C)
- Martensitic steels (4340 and 400 series) - 650-750° F (340-400° C)

3. Spraying

The essential purpose of the spraying operation is to produce a uniform, mechanically bonded overlay which will require minimal finishing.

This is done by utilizing the following:

- Colmonoy Spraywelder (including pistol, panel and hoses)
- Sprayweld powder (optimum mesh for the Spraywelder) or other powdered alloy
- Oxy-acetylene or propylene gases
- Compressed air
- Variable-speed turning device (such as a lathe)
- Clean, dry air

4. Fusing

Oxy-acetylene torch fusing is the most common method. Other acceptable fusing methods include controlled atmosphere furnace, induction, laser and synthetic fuels. Regardless of the method, the objective is to transform the mechanical bond created in the spraying operation into a metallurgical, or welded bond.

The Colmonoy overlay and base metal surface must reach a temperature range of 1850-2050° F (1010-1120° C), at which point the overlay will wet and bond with the base metal surface without running or losing its shape. To ensure that the overlay is properly bonded, it is recommended to heat check all components.

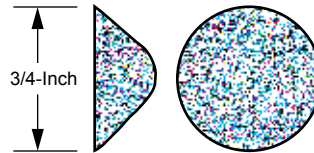
5. Finishing

Colmonoy alloys are easily finished by grinding or machining. Request data sheet Tech-2 for finishing recommendations.

For complete details on the Colmonoy Sprayweld Process, request data sheet SW-1.

The Spraywelder has Built-In Efficiency:

High Spray Rates - Specially designed nozzles achieve optimum performance with all of our various powder groupings. Spray rates up to 19 lbs/hr (9 kg/hr) are achieved with our standard model, and up to 35 lbs/hr (16 kg/hr) with our high-output unit, the Model J-3.



Spray pattern of Colmonoy 6 through a Model J-3 Spraywelder using a D nozzle (shown actual size). 98% of the sprayed powder hits the part within a 3/4-inch-diameter target!

Tight Spray Patterns - The nozzles and focused air jets achieve the narrowest spray pattern commercially available. More alloy is delivered to the part faster, with less overspray, minimizing operator time and consumable investment.

Dense Coatings - Flame energy of up to 92,000 BTU's and increased target efficiency mean extremely hot spray particles are delivered to the base metal. The final result is a strong, dense overlay.

Reliability - The Spraywelder pistol is designed and built for years of daily use. O-rings are used throughout the unit and gas passages are drilled into a solid aluminum body. The valve assembly is piston-activated for positive, leak-proof control over all gases and maximum safety. The air-cooled pistol handles the hottest jobs.

Easy Operation - The Spraywelder includes a control panel which can be positioned up to 10 feet away. All gas pressure and flow adjustments are located on the panel. The panel also secures the quick-release detachable 20 lb (9 kg) production-size hopper, which feeds the gun through a vibrator-less compressed air circuit (no expensive inert gases necessary). The light-weight pistol is compact and operates in any position.

Safety - Built-in dual flash-back arrestors prevent accidental ignition in oxygen and fuel-gas supply hoses.

Versatility - The Spraywelder applies a wide range of powdered alloys, including Colmonoy Sprayweld powders (optimized for use with the Spraywelder), other spray-and-fuse alloys and metallizing powders, such as SoloCoat™ and CoISpray™ powders.

The Complete Spraywelder Includes:

- Pistol and selected tip
- Tool post holder
- Panel with hopper, carburetor, gauges and flow meters for regulating powder, air, oxygen and fuel-gas rates
- Air filter/regulator with gauge and fitting
- Complete hose kit with dual flash-back arrestors
- Operating manual, including parameter charts for spraying different powders
- Tool and parts kit (wrenches, tip cleaners, o-rings, etc.)



Spraywelder Accessories for More Versatility:

Colmonoy Fan Spray Adapter

The Fan Spray Adapter mounts easily to the Spraywelder pistol and provides fast, efficient coverage of large areas.

The adapter's 1 x 2-1/2 inch oval-shaped spray pattern eliminates wavy build-up and reduces the number of passes required to coat large, flat or bowed surfaces.



Spraywelder Pistol Extension

The pistol extension is available in lengths of 18 to 40 inches (457-1016 mm) for spraying inner diameters.

Features include a 90-degree head and a water- or air-cooled design.



Spraywelder Equipment Group

The equipment group includes all the tools needed to complete the setup of a Spraywelder station (except air, oxygen and acetylene):

- Two-stage oxygen and acetylene regulators
- Fusing torch butt
- Oxygen and acetylene Y-connectors
- Heating tips, type II (sizes 8, 12 and 15)
- Supply hose, 15 ft (5 m)
- Friction lighter
- Temperature crayons (200°, 500° and 650° F)
- Microbraz Green Stop-Off

Sprayweld™ Powders FOR SMOOTH, LONG-WEARING OVERLAYS

Colmonoy Sprayweld Powders*	Alloy	Hardness Rockwell C	Fusing Temp. °F (°C)
Premium Nickel-Chromium-Boride Alloys Crushed powders have more surface area than spherical atomized powders. They heat and fuse faster, and form denser mechanical bonds.	Colmonoy 6	56-61	1890 (1030)
	Colmonoy 56	50-55	1885 (1030)
	Colmonoy 5	45-50	1880 (1025)
	Colmonoy 4	35-40	1925 (1050)
High Wearing Tungsten Alloys Atomized nickel-based alloys containing chromium carbides and alloyed tungsten for resistance to high abrasion, heat and fretting corrosion.	Colmonoy 88	59-64	1930 (1055)
	Colmonoy 72	57-62	1940 (1060)
	Colmonoy 84	40-45	2000 (1095)
Corrosion-Resistant Alloys Atomized nickel-based alloys with chromium and molybdenum for increased corrosion and oxidation resistance.	Colmonoy 69SC	58-63	1890 (1030)
	Colmonoy 98	55-60	1860 (1015)
Chromium-Carbide Alloys Atomized nickel-based alloys containing chromium carbides for abrasion and corrosion resistance.	Colmonoy 62SA	56-61	1875 (1025)
	Colmonoy 52SA	45-50	1950 (1065)
	Colmonoy 42SA	35-40	1800 (980)
Cobalt Alloys Cobalt-based nickel-chromium alloys for good metal-to-metal wear resistance under corrosive and high-heat conditions.	Wallex 55	58 min.	2030 (1110)
	Wallex 50	56-61	2000 (1095)
	Wallex 40	41-46	2080 (1140)
Composite Alloys Uniquely formulated nickel-based composites containing tungsten carbide for resistance to sliding abrasion.	Colmonoy 730	58-63	1940 (1060)
	Colmonoy 750	58-63	1940 (1060)
	Colmonoy 75	58-63	1920 (1050)
	Colmonoy 635	58-63	1875 (1025)

*Colmonoy Sprayweld powders may be used with many popular thermal spray systems.

U.S. Patent Nos: Colmonoy 88 - 5,141,571; Colmonoy 72 - 2,868,639; Colmonoy 98 - 5,183,636.

Request the Colmonoy Alloy Selector Chart, data sheet Tech-1, for a complete list of available alloys and properties.

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). WCC assumes no responsibility for failure due to misuse or improper application, or for any incidental damages arising out of the use of this material or process.



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