ROCKMOUNT
Welding Alloys

Cryotherm®

Low Temperature Metalizing Process

The ultimate powder spraying technology.

Features

- Easy and inexpensive to rebuild a shaft.
- Uses a standard oxyacetylene rig.
- Goes on without warpage under 500°F.
- We have a powder for every application and every surface.

Overview

The **Cryotherm** process is as simple as this: Put shaft in lathe – machine worn area – spray bond coat – choose a surface coat based on the hardness you desire - spray metal – machine to size and you're in business. The **Cryotherm** process greatly reduces repair time and replacement part costs for jobs including shafts, rolls, journals, sleeves, armatures, end bells, packing glands, seal areas and much more.

There is no special training required, it's like spray painting. All you need is a lathe, oxyacetylene equipment and the **Cryotherm torch and powders**. The low temperature process makes it possible for shaft repair work to be completed "in house".

Cryotherm Kit

Everything you need in one case; torch, bonding powder, final coat powders, Cryotherm Degreaser, carbide cutting tools and tool post adapter.

Cryotherm Powders

Rockmount has six different powders to suit a wide range of applications

Powder	Description	Availability
Cryotherm Bond	Bond coat alloy for all metals.	Kit and separately
Cryotherm M	Machinable finish coat for all metals.	Kit and separately
Cryotherm G	Hard, grindable final coat alloy for all metals.	Kit and separately
Cryotherm AB	Low-friction finish coat for bearing surface on all metals.	Kit and separately
Cryotherm S	General purpose powder for heavy deposits on all metals.	Separately only
Cryotherm G-1	Hard, grindable alloy for all metals, except pure copper.	Separately only

Cryotherm® Bond

ROCKMOUNT
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Spray Powder - Gas

Bond coat alloy for all metals.

Features

- Produces Metallurgical Bond
- Low Preheat Temperature
- Bonds At Low Temperature
- Easy To Use
- Minimal Preparation
- Excellent On All Types of Cylindrical Surfaces: Shafts, Journals, and Bearings

Characteristics

Cryotherm Bond is the component of the **Cryotherm** process, which permits rebuilding of worn or undersize cylindrical parts without the usual danger of distortion, warping metallurgical changes in the base metal. This is made possible by an exothermic reaction which produces a metallurgical bond at less than 500°F (250°C). Use with the **Cryotherm Torch** to prepare final coating, **Cryotherm Bond** is easy to use for even inexperienced operators, yet the results are uniformly excellent.

Application

Clean piece to be rebuilt with **Cryotherm Degreaser** (available separately). Mount part in lathe and undercut work area at least 0.015" (0.030 for copper alloys), extending undercut 1/2" beyond worn region. Thread undercut - about 30 threads per inch. Apply **Cryotherm Degreaser** again and then - Do not touch undercut area.

Set acetylene pressure at 5 psi and oxygen at 7 psi, which should produce a slightly carburizing flame. Preheat workpiece to 200°F (100°C) while turning in lathe at 50-125 surface feet per minute. Set torch 6" – 7" from work and open powder valve. Start and finish deposit 3/4" beyond undercut region. Apply to 0.005" minimum thickness.

Technical

Macro Hardness	65 RB
Density	7.2 g / cc
Weight	.037 # / sq. ft. / .001"

Container Size

Available in 1# and 5# containers.

Can be used with any compatible cold spray torch.

Cryotherm® M

ROCKMOUNT
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Spray Powder - Gas

Machinable finish coat alloy for all metals, except pure copper.

Features

- Excellent Corrosion Resistance
- Deposit Retains Lubrication
- Bonds At Low Temperature
- Hardness 80 RB
- Low Friction Surface
- Machinable
- Builds To 0.125" Thick
- Work Hardens

Characteristics

Cryotherm M is a general purpose, low temperature powder used on top of **Cryotherm Bond** to produce a surface which is wear and corrosion resistant, yet machinable. The deposited hardness plus the work-hardening characteristic produce a low friction, long-wearing surface. Deposit properties are further enhanced by the fact that the surface retains lubrication. The corrosion resistance of the alloy is equal or superior to that of most stainless steels.

Application

Apply over a base coat of **Cryotherm Bond,** using the same torch settings, distance, and lathe speed as for **Cryotherm Bond.** Apply in even passes until thickness equals final diameter plus approximately 0.020".

Finish using a sharp **Carbide** tool. Use carburizing flame. Caution: Do no overheat, as temperature over 750°F (400°C), can be detrimental.

Technical

Macro Hardness	80 RB
Density	7.4 g / cc
Weight	.039 # / sq. ft. / .001"
Spray Coverage	3.0m^2 / hr / 0.1mm

Container Size

Available in 1# and 5# containers.

Can be used with any compatible cold spray torch.

Cryotherm® G

ROCKMOUNT
Welding Alloys

Spray Powder - Gas

Hard, grindable final coat alloy for all metals, except pure copper.

Features

- Excellent Corrosion Resistance
- Hardness 24 RC
- Grinds To Mirror Finish
- Excellent Wear and Abrasion Resistance
- Builds Up To 0.100" Thickness
- High Density Deposit
- Low Application Temperature
- Low Friction Surface

Characteristics

Cryotherm G is a "cold" spray powder alloy which produces a hard, dense, low friction surface exhibiting excellent corrosion and wear resistance. It's combination of properties make it ideal for applications where abrasion and wear conditions are severe.

Cryotherm G can be applied to thickness up to 0.100", and grinding produces a smooth, long-wearing finish.

Application

Apply over base coat **Cryotherm Bond,** using the same torch settings, distance, and lathe speed as for **Cryotherm Bond.** Apply to thickness equal to finish diameter plus approximately 0.020". Finish to desired dimensions by grinding. Use carburizing flame.

Caution: Do no overheat, as temperature over 750°F (400°C) can be detrimental.

Technical

Macro Hardness	24 RB
Density	7.6 g / cc
Weight	.040 # / sq. ft. / .001"

Container Size

Available in 1# and 5# containers.

Can be used with any compatible cold spray torch.

Cryotherm® AB

ROCKMOUNT
Welding Alloys

Spray Powder - Gas

Low-friction finish coat for bearing surface on all metals. Machinable aluminum-bronze finish coat for all metals, except pure copper.

Features

- Bonds At Low Temperature
- Low Friction Surfaces
- Excellent Heat Conduction
- Retains Lubrication
- Wear Resistant Aluminum Bronze
- Hardness RB 50
- Build To 0.125”
- Superior Machinability

Characteristics

Cryotherm AB is a wear resistant, highly machinable “cold” spray powder alloy which is perfect for applications where a true bearing surface is required. The aluminum-bronze structure of **Cryotherm AB** provides a deposit which is self-lubricating, resists galling and has excellent thermal conductivity.

Application

Use the same torch to work distance and lathe speed as applying **Cryotherm Bond** but use an oxidizing flame. (Acetylene, 5psi & Oxygen 11-13psi). Incorrect torch settings will result in heavy smoke. Apply to required thickness plus .020”, using even traverses of the turning shaft.

Caution: Do not overheat, as temperature over 750°F (400°C), can be detrimental. Build up may be finished using a sharp **Carbide** bit.

Technical

Macro Hardness	50 RB
Density	6.0 g / cc
Weight	.033 # / sq. ft. / .001”

Container Size

Available in 1# and 5# containers.

Can be used with any compatible cold spray torch.

Cryotherm® S

ROCKMOUNT
Welding Alloys

Spray Powder - Gas

Maximum build-up on badly worn shafts. Excellent on impellers, motor shafts and journals.

Features

- Unlimited Deposit Thickness
- Excellent Machineability
- Atomized Powder (not pulverized)
- High Compression Strength
- Excellent Color Match To Mild Steel
- Sprays to 750°F
- Consistent Hardness Throughout Build-Up
- Can be used as a cushion for other powders.

Characteristics

Cryotherm S is a general purpose, low temperature powder used on **Cryotherm Bond** to produce a surface which offers wear and moderate corrosion resistance while retaining maximum machinability. Excellent for extremely heavy deposits and as a cushion for all other powders. Extremely high compression strength.

Application

Apply over base coat **Cryotherm Bond,** using the same torch settings, distance, and lathe speed as for **Cryotherm Bond.** Apply in even passes until thickness equals final diameter plus approximately 0.020".

Finish using a sharp **Carbide** tool. Use neutral flame.

Caution: Do no overheat, as temperature over 750°F (400°C), can be detrimental.

Technical

Macro Hardness	82 RB
Density	7.2 g / cc
Weight	.037 # / sq. ft. / .001"

Container Size

Available in 1# and 5# containers.

Can be used with any compatible cold spray torch.

Cryotherm® G1

ROCKMOUNT
Welding Alloys

One Step Powder - Gas

For hard, grindable deposits on shaft bearing surfaces and abrasion resistant coatings, except pure copper.

Features

- One Step Process – No Bond Coat Required
- Excellent Corrosion Resistance
- High Density Deposit
- Grind To Mirror Finish
- High Hardness
- Retains Lubrication
- Low Friction Surface
- Deposit Thickness Up To 0.160"

Characteristics

Cryotherm G1 is a self-bonding, one step cold spray type powder that produces deposits which are highly resistant to abrasion, cavitation and erosion wear. It will extend the service life of shaft bearing and seal surfaces. Its high density deposits provide corrosion resistance and can be ground to a mirror finish. The **Cryotherm** process permits rebuilding of worn or undersize cylindrical parts without the usual dangers of distortion, warping or metallurgical changes in the base metal. This is made possible by an exothermic reaction which produces a metallurgical bond less than 500°F (250°C). Can be applied to carbon steel, stainless steel, cast iron, bronze and aluminum.

Application

Clean piece to be rebuilt with a **Cryotherm Degreaser** (available separately). Mount part in lathe and undercut work area at least 0.015" (0.030 for copper alloys), extending undercut 1/2" beyond worn region. Threaded undercut (about 30 threads per inch) is ideal. Do not touch undercut area. Set acetylene pressure at 5psi and oxygen at 6 psi and adjust flame to carburizing or neutral. Preheat workpiece to 200°F (100°C) while turning in lathe at 50-125 surface feet per minute. Flat surfaces to be sprayed should be in vertical position. Torch 6" – 7" from work and open powder valve.

Technical

Macro Hardness	40-45 RB
Carbides	75-80 RC
Service Temperature	Up to 1600°F (760°C)

Container Size

Available in 1# and 5# containers.