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SURFACE ENGINEERING BULLETIN

SermaLube 20

SUBJECT

The use of SermaLube 20 – A Dry Film Lubricant

GENERAL DESCRIPTION

SermaLube 20 is an inorganically bonded molybdenum disulfide-graphite coating which provides a low friction surface that reduces wear and prevents galling and seizure of sliding surfaces. The coating is entirely inorganic and is a water based mixture of powders in a heat curing binder. The binder is not composed of silicates or phenolic base materials. The minimum curing temperature of SermaLube 20 is 600°F.

SermaLube 20 has properties that make it extremely useful as a dry film lubricant since the binder is flexible and allows low hydrodynamic shearing. SermaLube 20 is completely inorganic, permitting usage in cryogenics, vacuum and nuclear applications and/or applications with service temperatures as high as 1000°F (538°C).

PRODUCT SPECIFICATION

SermaLube 20 is supplied as a two (2) part mix, which requires mixing just prior to use.

Part 1 – Binder

Color	Red-Orange
Weight per gallon	10.4 – 12 lbs
Specific gravity	1.22 – 1.28
Viscosity @ 78°F #2 Zahn Cup	15 – 17 seconds
Shelf life	1 year

Part 2 – Lubricant Powder

Color	Gray - Black
Apparent Density (ASTM B-417)	0.6 – 0.8 g/cm^3
Shelf life	1 year

MIXING INSTRUCTIONS

Add the contents of Part 2 (powder) gradually to Part 1 (liquid), stirring continuously and thoroughly. After the contents are mixed, cap the container and shake vigorously. Allow the mixture to react for a minimum of one (1) hour before using.

Mix or shake thoroughly before using and during usage to prevent settling of the powders in the compound. The pot life of the mixed coating is 5 days.

For smaller quantities, use a ration of 10 milliliters of Part 1 (liquid) to 8 grams of Part 2 (powder). Partially used containers should be kept well sealed to ensure full shelf life.

Product Data after Mixing:

Total Solids	50% minimum
Weight per gallon	12.5 # minimum
Pot Life	5 days

SURFACE PREPARATION

The performance of SermaLube 20 dry film lubricant is greatly affected by surface cleanliness and texture. Therefore, for optimum performance, the following surface preparation is recommended:

1. Degrease or solvent clean to remove any organic contamination.
2. Dry grit blast with clean 120 to 140 mesh aluminum oxide.
3. Remove all residual blasting media using a soft bristle brush and light air blast.
4. Handle blasted parts using lint free cotton gloves to avoid surface contamination.

COATING APPLICATION

The preferred method of application is by air spraying using standard air atomizing equipment to obtain very fine atomization. Coating thickness should be .0002 to .0005 inches for best results. Spray only in a well ventilated spray booth. Respirators should be worn while spraying the material.

Other methods such as dipping or brushing can be used; however, drying and curing adjustments may be required to obtain good adhesion.

CURING PROCEDURE

1. Air dry until tack free but no longer than 30 minutes
2. Dry thoroughly at 175 + 25°F for a minimum of one hour.
3. Cure coating at 625 ± 25°F for two hours.

For optimum performance burnish the cured coating with a fine brass or stainless steel wire brush. Vibro tumbling with stainless steel needles may also be used. Allow coated parts to age 24 hours before putting into service.

PROPERTY OF APPLIED FILM

The following coefficient friction values were obtained on 4130 steel "V" blocks and pins using a high temperature modified Falex Lubricant tester at 300 pounds applied load, running at 3.5 feet per minute surface speed.

	Coefficient of Friction	
Temperature	Oxidizing Atmosphere	Non-Oxidizing Atmosphere
Room Temp.	.15 to .23	
150 to 800 °F	.09 to .13	.09 to .13
800 to 1000°F	.12 to .20	.09 to .13
1000 to 1300°F	.19 to .79	.09 to .13
1400 to 1500°F	.40 +	.09 to .13

Surface adhesion – good (5B) per ASTM D335g Method B

Load carrying capacity – 8,000 to 12,000 PSI

Maximum Surface Temperature - 700°F in air
1500°F in non-oxidizing atmosphere

Hardness – Medium soft

Chemical resistance Solvents - excellent
Water - excellent
Acids - fair
Alkali - poor

EQUIPMENT MAINTENANCE

Uncured SermaLube 20 can easily be removed by washing in tap water. Cured SermaLube 20 can be removed by soaking in hot alkali solution such as sodium hydroxide (5 lbs/gallon) at 175°F, followed by a water rinse.

TOXICITY AND SAFETY DATA

SermaLube 20 is an acidic material containing hexavalent chromium compounds. While spraying avoid breathing the mist of the atomized coating. Well ventilated spraying areas with a high exhaust rate (150 feet per minute or greater) should be used and respirators should be worn. For complete health, safety and handling information refer to the Material Safety Data Sheet for this product.