SANDSTROM SERIES #103

SOLID FILM LUBRICANT: HEAT CURE

FORM E103: CONCENTRATED (DIP OR SPRAY)

FORM E106: READY TO APPLY (FOR SPRAY)

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DESCRIPTION

Sandstrom #103 contains molybdenum disulfide, PTFE and corrosion inhibiting pigments. This material prevents galling and provides unique wear properties, corrosion protection and exceptional chemical and fluid resistance. Sandstrom #103 can be applied over all metals by spray application.

OUTSTANDING FEATURES/BENEFITS

- No viscosity change at varying temperatures
- 2 Forms available for the ease of your application method:
  - Concentrated formula for dip application or spray
  - Ready to apply for spray application- no thinning necessary
- Offers some of the highest corrosion protection for manganese phosphate and grit blasted bare steel of the Sandstrom dry film lubricant line
- **CONTAINS NO GRAPHITE**

TYPICAL USES

- Automotive starter shafts

Additionally, Sandstrom #103 is an excellent solution to the problem of lubricating parts:

- That may be operated in corrosive atmospheres
- That may be stored for long periods
- That are seldom lubricated once they leave the factory and where permanent lubrication is desired
- Where operating pressures exceed the load-bearing capacities of ordinary oils and greases
- Where "clean operation" is desired - will not collect dirt and debris like grease and oils
- Where parts may be subjected to frequent disassembly
- Where a protective coating and sacrificial break-in lubricant is needed
- Where fretting and galling is a problem (such as splines, universal joints and keyed bearings)
- Where easy release is desired (such as threads of all kinds)

NOTICE

Before using this product, read all warnings, limitations and safety information printed on the product label, Safety Data Sheet (MSDS) and Technical Data Sheet. The properties listed on this sheet are not intended for use as a specification. Please contact our Technical Service Team.

Refer to our website for answers to common questions:
https://www.sandstromproducts.com/resources/FAQs/

LIMITATIONS

- Do not use where there is potential for contact with food.
- Product is not LOX compatible

COMPOSITION AND PHYSICAL PROPERTIES

Vehicle	Epoxy	**Shelf Life**	12 Months from Date of Shipment
Lubricating Pigment	Molybdenum Disulfide & PTFE	**Storage Conditions**	40°F - 100°F
Color	Flat Dark Gray	**Freeze/Thaw Stability**	Stable
Finish	Flat	**Dry Film Thickness**	0.5 mil
Odor	Strong solvent		

E103 CONCENTRATED FORM FOR DIP		**E106 READY TO APPLY FORM FOR SPRAY**	
Net Weight per gallon^ *ASTM D1475*	9.85 ± 0.2 lbs.	**Net Weight per gallon^** *ASTM D1475*	8.20 ± 0.2 lbs.
Weight Solids^ *ASTM D2369*	57.0 ± 2.0%	**Weight Solids^** *ASTM D2369*	35.5 ± 2.0% (Theoretical)
Volume Solids	40.0 ± 1.0% (Theoretical)	**Volume Solids**	19.0 ± 2.0% (Theoretical)
VOC	4.15	**VOC**	4.84
Viscosity^	65 - 75 KUs @ 77°F Stormer Viscometer	**Viscosity^** *ASTM D4212*	38 - 42 seconds @ 77°F #1 EZ Zahn
Flash Point	21°F	**Flash Point**	-4°F ± 2°F Setaflash
Coverage Rate*	1270 sq. ft. / gallon @ 0.5 mil	**Coverage Rate***	672 sq. ft. / gallon @ 0.5 mil

*Actual figures do not include spray loss. Also allow for surface irregularities and porosity, as well as material loss when mixing.
^ Property tested with each production batch.

PERFORMANCE AND FUNCTIONAL PROPERTIES

Corrosion Protection:		**Chemical/Fluid Resistance**	Exceptional includes Skydrol & Brake Fluid
ASTM B117 *Grit Blasted Bare Steel*	750+ hours*	**Load Carry Capacity** *ASTM D2625B*	1000 lbs.
ASTM B117: Steel *MIL-DTL-16232 Type M Class 3*	1500+ hours*	**Operating Temperature Range**	- 320°F to +500°F
ASTM B117: Steel *MIL-DTL-16232 Type Z Class 3*	1000+ hours*	**Wear Life** *ASTM D2625A*	60 - 100 minutes

*Tests halted before failure.
^ Property tested with each production batch.

GENERAL
Sandstrom #103 is a paint-like material consisting of lubricative pigments dispersed in a thermosetting resin system thinned with appropriate solvents. For maximum service, the APPLICATION INSTRUCTIONS MUST BE FOLLOWED CLOSELY.

FILM THICKNESS & ENGINEERING TOLERANCE
As supplied, Sandstrom #103 will yield a film thickness of about 0.0005 inches per coat. Usually engineering tolerances will permit necessary minimum film buildup of 0.0002 to 0.0003 inches without interference. If excess buildup does occur and a force fit is necessary, burnishing lightly will assist in mating the parts. The remaining excess will be worn away in the first few cycles of operation. Whenever possible, the proper tolerances should be designed into the part.

COVERAGE
One gallon of Form E103 will cover 1270 sq. ft. with a dry film thickness of 0.0005 inches. One gallon of Form E106 will cover 672 sq. ft. with a dry film thickness of 0.0005 inches. Coverage depends upon method of application and other variables such as overspray and type of surface to be coated. Above coverage rates are based on 100% efficiency.

SURFACE PREPARATION
Please contact Sandstrom Products Company for substitute surface preparations if recommended steps cannot be followed.

Application on steel. Pre-clean surface with aliphatic naphtha or any other EPA compliant cleaner that sufficiently cleans surface to pass ASTM F22. Abrasive blast surface with 180-220 grit aluminum oxide (25-50 RMS optimum). Phosphate IAW MIL-DTL-16232 (weight should be 11-22 g/m^2), type M, class 3 (optimal performance) or type Z, class 3.

Application on stainless steel. Pre-clean the steel surface with aliphatic naphtha or any other EPA compliant cleaner that sufficiently cleans surfaces to pass ASTM F22. Abrasive blast the surfaces with 180-220 grit aluminum oxide (25-50 RMS optimum). Passivate the surfaces with ASTM A967, types nitric 1, nitric 2 or nitric 3, as applicable.

Application on aluminum. Pre-clean surface with aliphatic naphtha or any other EPA compliant cleaner that sufficiently cleans surface to pass ASTM F22. Sulfuric acid anodize IAW MIL-A-8625 Type I, II or III Class 1. Seal with hot deionized water (>180°F for 30 minutes).

Application on titanium. Abrasive blast surface with 180-220 grit aluminum oxide (25-50 RMS optimum) and alkaline anodize.

Application on copper alloys. Pre-clean surface with aliphatic naphtha or any other EPA compliant cleaner that sufficiently cleans surface to pass ASTM F22. Pretreat surface using one of the following methods (in order of preference):
a) Black oxide treatment (according to MIL-F-495).
b) Bright dip or grit blast (25 - 50 RMS optimum).

IMPORTANT! ***DO NOT TOUCH CLEAN SURFACE WITH FINGERS - OIL FROM THE HANDS WILL INTERFERE WITH PROPER COATING ADHESION.*** Whenever possible, treat both contact surfaces (i.e., the shaft and the bearing).

STIRRING
IMPORTANT! THIS LUBRICANT CONTAINS HEAVY PIGMENTS WHICH SETTLE RAPIDLY. THEREFORE, IT SHOULD BE STIRRED THOROUGHLY BEFORE USE AND **CONTINUOUSLY** DURING APPLICATION.

THINNING
For dip application of Form E103. Use as supplied, no thinning is necessary.
For standard air spray of Form E103. Reduce 1:1 by volume with a blend of 2:1.5 by volume of Acetone to MIBK.
For electrostatic spray of Form E103. Reduce 1:1 by volume with Toluene.
For conventional spray of Form E106. Use as supplied, no thinning is necessary.

APPLICATION
Keep container closed when not in use to keep loss of solvents at a minimum and avoid a change in volume solids. See Thinning Instructions above.

BAKING
Flash off coated parts at 77°F ± 5°F and ≤ 70% relative humidity for at least 30 minutes before baking.

BAKE SCHEDULE for both Forms:

Bake for 30 minutes at 350°F *or* 15 minutes at 400°F.

NOTE: If blistering occurs, solvent is being entrapped and flash-off time and/or solvents may need to be adjusted.

IMPORTANT! The time begins when **the part** has reached temperature, NOT when it is placed in the oven. In cases of very thick metals, extra time may be required to bring the part up to the proper temperature. Thermocouples may be used to determine the true temperature of the metal.

IT IS IMPERATIVE TO USE A PROPERLY VENTED OVEN (DIRECT VENT TO THE OUTSIDE).

CLEANUP
Use Methyl Ethyl Ketone for cleaning tools.

REMOVAL
In the event it is necessary to remove product, physical removal is best (such as grit blasting, sanding or grinding).

WARNINGS: Constant stirring is imperative for best results.

DANGER! USE WITH ADEQUATE VENTILATION.

Strict compliance to the instructions given in Surface Preparation, Stirring and Baking is very essential for obtaining optimum results.