9A-XF
SOLID FILM LUBRICANT: HEAT CURE
SERIES E753
EXTRA FINE PIGMENT PARTICLE MAKEUP

DESCRIPTION
Sandstrom 9A-XF Dry Film Lubricant is a paint-like coating containing molybdenum disulfide and corrosion inhibiting pigments. This heat curing material prevents corrosion, galling, seizing, and fretting. It is a low-friction coating which exhibits long wear life when operated at -320°F to +500°F under loads exceeding 100,000 psi. 9A-XF should be applied where maximum wear life and corrosion protection from a dry film lubricant are required.

9A-XF can be applied to a wide variety of surfaces by spraying or dipping. Once Sandstrom 9A-XF has been heat cured, it is virtually unaffected by atmospheric and fretting corrosion, solvents, acids, oils, degreasers, and is not re-softened at elevated temperatures.

Sandstrom 9A-XF offers similar performance properties as 9A but features extra fine pigment particles with a higher viscosity.

Use Sandstrom #099 as an alternative to 9A-XF where low VOC and no lead are preferred. Sandstrom #099’s performance is comparable to 9A-XF.

OUTSTANDING FEATURES/BENEFITS
• Excellent Corrosion Protection
• Chemical Resistance
• Long Wear Life
• CONTAINS NO GRAPHITE

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.

TYPICAL USES
Sandstrom 9A-XF is an excellent solution to the problem of lubricating parts:
• That will 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 parts may be subjected to frequent disassembly.
• Where “clean operation” is desired (9A-XF will not collect dirt and debris like grease and oils).
• 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 fasteners and PVC molds).

COMPOSITION AND PHYSICAL PROPERTIES

| Property                | Specification  
|------------------------|---------------
| Net Weight per gallon  | ASTM D1475    |
| 9.5 lbs. ± 0.2 lb.     | Vehicle       |
| Weight Solids          | Epoxy-Phenolic|
| 40% ± 1%               | Lubricating Pigment |
| VOC – water            | Molybdenum Disulfide |
| 5.622 lbs./gallon      | Color         |
| Viscosity              | Flat Dark Gray, Black |
| 46 - 50 seconds, #1 Zahn cup @ 77°F | Cleanup |
| Shelf Life             | See CLEANUP |
| 1 year from date of shipment | Thinner |
| Storage Conditions     | See THINNING |
| Below 100°F            | Coverage Rate |
| Flash Point            | ASTM D1400    |
| 23° ± 2°F Setalash     | 660 sq. ft./gal @ 0.5 mil |
| Dry Film Thickness     | 0.5 mil       |

*Actual figures do not include spray loss. Also allow for surface irregularities and porosity, as well as material loss when mixing.

PERFORMANCE AND FUNCTIONAL PROPERTIES

| Property                  | Specification  
|---------------------------|---------------
| Corrosion Protection:     | ASTM B117: Steel |
| MIL-DTL-16232 Type M Class 3 | > 1500 hours * (at 0.5 mil) |
| Operating Temperature Range | -320°F to +500°F |
| *Tests halted before failure.
GENERAL
Sandstrom 9A-XF is a paint-like material consisting of lubricative pigments dispersed in a thermostetting resin system thinned with appropriate solvents. For maximum service, the APPLICATION INSTRUCTIONS MUST BE FOLLOWED CLOSELY.

FILM THICKNESS & ENGINEERING TOLERANCE
As supplied, Sandstrom 9A-XF will yield a film thickness of about 0.0005 inches per dip 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 this material will cover 660 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 complaint 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/m²), type M, class 3 (optimal performance) or type Z, class 3.

Application on stainless steels. 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). Passivate surface with ASTM A967, types nitric 1, nitric 2 or nitric 3, as applicable.

Application on aluminum and aluminum alloys. 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 and seal surface.

Application on titanium and titanium alloys. Degrease surface to be coated 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) and alkaline anodize.

Application on copper and copper alloys. 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). Form a black oxide finish on surface.

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 spraying * - Use 2 parts 9A-XF to 1 part PM solvent.
For dipping * - Use slow-drying thinner mixture of PM and PMA, blended 1:1 (Sandstrom D122 Thinner), as to provide proper run-off characteristics. The suggested starting point is 4 parts 9A-XF to 1 part thinner mixture.

APPLICATION
Sandstrom 9A-XF should be sprayed or dipped to the desired film thickness (usually 0.0003 to 0.0007 inches). Allow parts to flash off at least 30 minutes at 77°F ± 5°F and ≤ 70% relative humidity. Lower temperatures and/or higher humidity may require a longer dry time to prevent film defects.

BAKING
Bake for 1 hour @ 400°F in a forced draft oven to yield optimum corrosion protection and wear life.

IMPORTANT! The hour begins when the part has reached 400°F, NOT when it is placed in the Class A oven. In cases of very thick metals, an extra hour may be required to bring the part up to the proper temperature. Thermocouples may be used to determine the true temperature of the metal. However, if the metallurgical properties are adversely affected by baking at this temperature (i.e., ALUMINUM, in some cases), we recommend use of Sandstrom LC-300, which cures for one hour at 300°F (149°C). Sandstrom #099 could also be used, as it cures in temperatures ranging from 300°F to 400°F.

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

CLEANUP
Use the same solvents for cleaning tools as are recommended for thinning.

REMOVAL
In the event it is necessary to remove Sandstrom 9A-XF, 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, Thinning, Application, and Baking is very essential for obtaining optimum results.***