



SANDSTROM 28A

SOLID FILM LUBRICANT: AIR DRY
SERIES E728 (BULK) & E628 (AEROSOL)

QUALIFIED TO:
 -MIL-PRF-46147 TYPE I FORM 1 (BULK) FORM2 (AEROSOL)
 -MIL-L-23398 TYPE I (BULK) TYPE II (AEROSOL)
 -SAE AS1701 CLASS II

RoHS COMPLIANT



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DESCRIPTION

Sandstrom 28A Solid Film Lubricant is a thermoplastic coating containing molybdenum disulfide and corrosion inhibiting pigments. This air drying material prevents corrosion, galling, seizing and fretting. It is a low-friction coating that exhibits long wear life when operated at -320°F to +300°F under loads exceeding 100,000 psi. Sandstrom 28A should be applied where baking with the longer wearing, heat cured #099, Sandstrom 9A or LC-300 is not desirable or practical.

Once 28A has been applied to a properly prepared surface and allowed to cure, it is virtually unaffected by atmospheric and fretting corrosion, acids, oils and degreasers. Sandstrom 28A can be applied to all metallic and non-metallic surfaces by spray application.

OUTSTANDING FEATURES/BENEFITS

- Excellent corrosion protection without the use of toxic heavy metals.
- Air dry coating with multiple container options to suit a variety of application needs (Marker/Brush pen, Aerosol, Bulk)
- **CONTAINS NO GRAPHITE or TOXIC HEAVY METALS**
- **UTILIZES NON-HAP SOLVENTS**

LIMITATIONS

STORE AT TEMPERATURES BELOW 100°F.

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.

Note: Sandstrom 28A replaces 26A, 27A and #238.

TYPICAL USES

Sandstrom 28A is an excellent in-plant or field solution to the problem of lubricating parts:

- Where application of a baked-on lubricant is not possible.
- 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 (Sandstrom 28A will not collect dirt and debris as do 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).

COMPOSITION AND PHYSICAL PROPERTIES

Net Weight per gallon <i>ASTM D1475</i>	9.90 ± 0.2 lbs. (Theoretical)	Lubricating Pigment	Molybdenum Disulfide
Weight Solids	<i>Bulk –E728:</i> 24% minimum <i>Aerosol –E628:</i> 30 grams minimum	Color	Flat Dark Gray
VOC	5.06 lbs./gal. (606 g/L) (Theoretical)	Shelf Life	1 Year from Date from Manufacture per MIL & AS SPECIFICATIONS. Two years Date of Shipment for all other applications. Consult your drawing for governing specifications.
Viscosity	15 - 25 seconds, #2 EZ Zahn @ 77°F	Storage Conditions	Below 100°F
Coverage Rate * <i>ASTM D1400</i>	500 sq. ft./gal @ 0.5 mil	Freeze/Thaw Stability	Stable
Dry Film Thickness	0.3 mil	Flash Point	23°F
		Boiling Point	78.6°C / 173.5°F

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

IMPORTANT NOTICE TO BUYER / WARRANTY AND LIMITATIONS ON OUR LIABILITY

We warrant our products to be free of manufacturing defects and that they meet our current published physical properties and specifications. All information and suggestions presented are rendered gratis and are accurate to the best of our knowledge. They are based on technical data we believe to be reliable and are intended for use by persons having skill and "know-how" at their own discretion and risk. Prior to use, customers are cautioned to determine the suitability of our products for any given application through their own testing. NO WARRANTY IS MADE, EXPRESS OR IMPLIED, REGARDING SUCH INFORMATION. THE DATA ON WHICH IT IS BASED OR THE RESULTS OBTAINED FROM ITS USE OR THAT OUR PRODUCT SHALL BE MERCHANTABILITY OR FIT FOR ANY PARTICULAR PURPOSE. SUCH STATEMENTS ARE NOT INTENDED TO SUGGEST INFRINGEMENT OF ANY PATENT. Since conditions of use of our products are beyond our control, all suggestions and statements are made without guarantee, warranty or other responsibility, express or implied, on our part. We assume no responsibility for results obtained, or damages incurred, from their use beyond replacing material proved to be defective or refunding the purchase price of such material at our option. Acceptance of delivery of our product means you have accepted the terms of this warranty, whether or not purchase orders of other documents state terms that vary from this warning. No seller is authorized to make any representations or warranty or assume any other liability on our behalf with any sales of our products. SANDSTROM PRODUCTS COMPANY

PERFORMANCE AND FUNCTIONAL PROPERTIES			
Chemical/Fluid Resistance:		Coefficient of Friction <i>ISO 16047 Standard</i>	0.07
<i>MIL-PRF-46147 Table I Fluids ASTM D2510A, ASTM D2510C</i>	Pass ^	Load Carry Capacity <i>ASTM D2625B</i>	2500 - 3000 lbf ^
<i>MIL-L-23398 Table III Test Fluids ASTM D2510A, ASTM D2510C</i>	Pass ^ *includes Skydrol	LOX Capability <i>ASTM D2511</i>	100% compatible & shock resistant
Corrosion Protection:		Operating Temperature Range <i>Continuous Use Limits</i>	-320°F to +300°F
<i>ASTM B117: Steel MIL-DTL-16232 Type Z Class 3</i>	1000 hrs. * ^	Thermal Stability <i>ASTM D2511</i>	Pass
<i>ASTM B117: Aluminum MIL-A-8625 Type 2</i>	1000 hrs. * ^	Thermal Stability Range <i>AS1701F sec. 4.2.3</i>	-320°F to +450°F
<i>Sulfurous Acid-Salt Spray FED-STD-791 Method 5331.1</i>	4 cycles *	Wear Life <i>ASTM 2625A</i>	100 -200 minutes ^
* Tests halted before failure		^ 6 & 18 Hour Dry	

GENERAL

Sandstrom 28A is a paint-like material consisting of lubricative pigments dispersed in a thermoplastic resin system thinned with appropriate solvents. For maximum service, the APPLICATION INSTRUCTIONS MUST BE FOLLOWED CLOSELY.

FILM THICKNESS & ENGINEERING TOLERANCE

As supplied, Sandstrom 28A will yield a film thickness of about 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 theoretically cover 500 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/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 with hot deionized water (>180°F for 30 minutes).

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).

IMPORTANT NOTICE TO BUYER / WARRANTY AND LIMITATIONS ON OUR LIABILITY
We warrant our products to be free of manufacturing defects and that they meet our current published physical properties and specifications. All information and suggestions presented are rendered gratis and are accurate to the best of our knowledge. They are based on technical data we believe to be reliable and are intended for use by persons having skill and "know-how" at their own discretion and risk. Prior to use, customers are cautioned to determine the suitability of our products for any given application through their own testing. NO WARRANTY IS MADE, EXPRESS OR IMPLIED, REGARDING SUCH INFORMATION, THE DATA ON WHICH IT IS BASED OR THE RESULTS OBTAINED FROM ITS USE OR THAT OUR PRODUCT SHALL BE MERCHANTABLE OR FIT FOR ANY PARTICULAR PURPOSE. SUCH STATEMENTS ARE NOT INTENDED TO SUGGEST INFRINGEMENT OF ANY PATENT. Since conditions of use of our products are beyond our control, all suggestions and statements are made without guarantee, warranty or other responsibility, express or implied, on our part. We assume no responsibility for results obtained, or damages incurred, from their use beyond replacing material proved to be defective or refunding the purchase price of such material at our option. Acceptance of delivery of our product means you have accepted the terms of this warranty, whether or not purchase orders of other documents state terms that vary from this warning. No seller is authorized to make any representations or warranty or assume any other liability on our behalf with any sales of our products. SANDSTROM PRODUCTS COMPANY

STIRRING

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

THINNING

For conventional spray - Apply Sandstrom 28A as supplied. If reduction is desired, use 3 parts Sandstrom 28A to 1 part D169 Thinner.

For dipping - No thinning required.

APPLICATION

Sandstrom 28A should be sprayed or dipped to the desired film thickness (usually 0.0003 to 0.0007 inches). Allow the surface to dry **at least** 30 minutes to 1 hour before doing light assembly work.

It is important to keep container closed when not in use to keep loss of solvents at a minimum and avoid a change in volume solids.

Note: All instructions are based on product and part temperatures of 77°F ± 5°F and <70% relative humidity. Should product need temperature adjustments, use a hot or cold water bath.

TOUCH-UP MARKER PEN

The touch-up pen should be shaken well before use (30 seconds minimum). Marker has 2 ends for applying the coating. One end contains a small brush. The opposite end has a marker tip. This end is a pump action nib. On the initial use of the nib press down firmly at an angle to start the flow of the coating, (this may take a few seconds). Once the coating is flowing less pressure is required. When finished with the marker, cap it promptly to keep the nib from drying out.

DRYING/CURING

Sandstrom 28A may be air dried or force cured. If parts are to be air dried, allow at least 6 hours @ 77°F ± 5°F and ≤70% relative humidity before putting into service.

After a flash time of 30 minutes, 28A can be force cured according to the following schedule:

- 90 minutes @ 150°F or
- 45 minutes @ 175°F or
- 25 minutes @ 200°F.

IMPORTANT! The time begins when **the part** has reached temperature, NOT when it is placed in the Class A oven.

CLEANUP

Use the same solvents for cleaning tools as are recommended for thinning or use MEK.

REMOVAL

Soak the coated part for 10 – 20 minutes in a 1:1 by volume blend of Acetone to PM Solvent. Then use a soft bristle brush to remove coating from the surface. If necessary, perform a second rinse with a clean solvent blend to remove any remaining coating.

WARNINGS: Constant stirring is imperative for best results.

DANGER! USE WITH ADEQUATE VENTILATION.

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