

3017 – Perma-Slik “R” Series Solid Film Lubricant

Recommended Application Procedures

1.0 PURPOSE

The purpose of this specification is to define the preparation and application of Perma-Slik R type coatings. Design requirements should indicate if the parts can be coated all over, or if certain areas need be masked or machined to compensate.

2.0 PRETREATMENT OF PARTS

Prior to the application of any Perma-Slik R type coating, it is extremely important that the base substrate be properly prepared. Improper pretreatment may result in adhesion loss and reduced wear life.

2.1 The first step to proper pretreatment is degreasing to remove any oil, dirt, or other foreign matter from the part. It should be noted that chlorinated solvents should be avoided when cleaning titanium alloys.

2.1.1 Vapor or aqueous degreasing using an appropriate solvent is recommended, however other suitable methods may be substituted based on the specific OEM part.

2.2 After degreasing, parts shall be subjected to grit blasting to remove scale, rust and other foreign matter, or clean per OEM requirements.

2.2.1 220 mesh aluminum oxide at 30 to 50 psi blast pressure (using a siphon feed blast cabinet) should be used for grit blasting to achieve a surface finish of 20 to 35 micro inches (Ra) unless otherwise specified by the OEM. Blasting should be performed in such a manner as to achieve the desired finish with minimal dimensional change. Pressure feed blast systems usually require a much lower blast pressure to achieve the recommended surface finish.

2.2.2 Parts should once again be thoroughly cleaned to remove any residual blast media. This is accomplished by first blowing the parts with compressed air, and then re-cleaning per section 2.1.

2.3 Additional Substrate Preparation

2.3.1 After grit blasting and degreasing, stainless steel parts should be passivated per MIL-DTL-5002 or QQ-P-35B.

2.3.2 Steel parts may be coated after grit blasting and degreasing. If required, steel parts may be phosphate, however, phosphating is not recommended for parts which will be subjected to operating temperatures >800°F (427°C).

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- 2.3.3 Titanium, Nickel, and Cobalt parts should be coated after grit blasting and degreasing. When processing these metals, use non-halogenated solvents such as isopropyl alcohol or acetone
- 2.3.4 Aluminum parts should be pretreated according to existing standards, anodize per MIL-A-8625 or chemical conversion coat MIL-C-5541.
- 2.3.5 Nickel and Chrome plate may be coated after a light grit blast and degreasing.

3.0 PREPARATION AND APPLICATION OF PERMA-SLIK R TYPE COATINGS INORGANIC BONDED SOLID FILM LUBRICANTS

3.1 Preparation

- 3.1.1 To assure a homogeneous coating, Perma-Slik R type coatings must be thoroughly mixed. The recommended method is to use a low-shear mixing blade, such as a "Jiffy" type blade, with the use of an air mixer or equivalent. The coating should be mixed for a minimum of 10 minutes at low to moderate speed so a vortex is not created. Occasionally scrape the bottom of the container to ensure all the solids have been completely dispersed.
- 3.1.2 Perma-Slik R type coatings can be applied by spray, dip, or dip/spin. The coatings may require dilution depending on the application method used. Toluene or heptane are the preferred diluting solvents. Xylene or VM&P mineral spirits can be added to the diluting solvent up to 20% by volume, to "slow down" the evaporation rate and to improve flow and leveling.

3.13 Dilution Ratios

The following ranges are offered as a guideline for dilution for various application methods. All dilution ratios are in parts by volume:

Spray (air atomized or HVLP)	2:1 to 1:1	product:solvent
Dip	neat to 2:1	product:solvent
Dip/Spin	neat to 1:1	product:solvent

3.2 Application

- 3.2.1 Coating should take place as soon as possible after the pretreatment. Should time exceed eight hours before coating, the parts should once again be degreased before coating application.

NOTE: To assure a clean surface before application, personnel should be extremely careful in handling pretreated parts. White cotton gloves are recommended when handling pretreated parts.

- 3.2.2 Coating can be accomplished by spray. For spraying, we recommend any conventional spray gun that utilizes a 0.040" to -0.070" fluid nozzle such as an Anest Iwata W-71, or a Binks model 2100 however, equivalent spray equipment may be suitable.
- 3.2.3. When spraying, an atomization pressure of 30 to 40 psi is recommended. Perma-Slik R type coatings should be applied in light, even passes gradually building to the desired thickness.

3.2.4 Control of the coating thickness is extremely important as the thickness is directly related to the wear life of the coated surface. A coating thickness of 0.0003" to 0.0007" is recommended; however, the actual coating thickness and degree of precision to be maintained should be specified on the applicable drawing.

4.0 **CURING**

4.1 Perma-Slik R type coatings utilize an ambient, moisture cure coating system. Cure time is dependent on ambient temperature and relative humidity. For best results, the temperature should be between 60°F to 100°F (16°C to 38°C) with a relative humidity of at least 50%. Perma-Slik R type coatings usually dry to the touch in a few minutes, and fully cure within 6 hours at the above mentioned temperatures and humidity.

5.0 **QUALITY**

5.1 Finished surfaces should exhibit a smooth appearance, free of blisters, chips, peeling, runs and sags.

5.2 Parts should be inspected by visual means, and checked for thickness by use of a micrometer or electronic thickness tester (e.g. eddy current, magnetic induction or beta-backscatter).

6.0 **EQUIPMENT LIST**

6.1 Proper equipment is needed to ensure quality parts are processed with Perma-Slik R type coatings. Following is a list of recommended equipment for processing parts.

6.1.1 Spray Booth of appropriate size to handle required production. The booth should have a face velocity of 100 ft./min. to comply with OSHA requirements.

6.1.2 Spray Gun – Anest Iwata W-71 or Binks model 2100 with a 0.040" to 0.070" nozzle set-up or equivalent. We recommend that the fluid nozzle and needle be made of stainless steel.

6.1.3 Air Mixer with "jiffy" style mixing blade or equivalent.

6.1.4 Vapor Degreaser (recommended) or suitable alternative degreasing station.

6.1.5 Grit Blast Cabinet with 200-300 mesh aluminum oxide.

6.1.6 Micrometer or Electronic Thickness Tester (recommended method).

6.1.7 TT-C-49 Microcrystalline Zinc Phosphate Line for less than 500°F applications on steel.

6.1.8 MIL-DTL-5002 or QQ-P-35B Passivation Tank for applications on stainless steel.