



Solvent Processing Guidelines for Lubrizol TPU

Precautions

- Lubrizol thermoplastic polyurethanes are hygroscopic. Drying prior to solvating is suggested. Drying may be accomplished according to the suggested times and temperatures on the technical data sheet for each product.
- General drying conditions are: 65°C (shore A products) - 80°C (shore D products) desiccant drying for 2-4 hours or 75°C in a circulating air oven for 5 hours.
- **Solutions and solvents should be handled under a fume hood or in a well-ventilated area.**

Solution Preparation

- Lubrizol TPUs are hygroscopic (they attract and hold water). Therefore, the pellets may need to be dried prior to preparing solutions.
- The urethane solids should be added to the solvent system of choice and completely dissolved prior to use.
- Lubrizol TPUs can be dissolved in several solvents, such as Tetrahydrofuran (THF), Dimethylacetamide (DMAC), or Methylene Chloride (MC) depending on the grade. Refer to the Lubrizol Life Science Medical Device Literature under "Solvent Effects Testing" for additional details:
<http://go.lubrizol.com/solventprocessing>.

Solution Preparation (Continued)

- THF and MC evaporate more quickly than DMAC. A combination of solvents may be indicated by particular applications.
- Pellets may be solvated in a heated glass reactor held at 60°C (equipped with a cold water condenser) or may be solvated at room temperature by rolling in a rotating flask. The heated reactor will solvate the pellets in a few hours, whereas the rotating flask may require two days to solvate high resin percentages.
- The recommended solids content, by weight, for initial trials are between 3% and 7%.
- The viscosity of the solution is directly related to the solids content. The viscosity of the solution affects the uniformity and consistency of the finished product. Viscosity can be increased by adding more solids or decreased by adding more solvent.

Lacquer Dip Casting

- Mandrels of the desired shapes should be cleaned with acetone prior to use.
- In many cases, elevated temperature can facilitate lacquer application. Recommended starting temperatures are 55°C for the mandrel and 65°C for the lacquer solution. These temperatures should be used only with DMAC. THF and MC do not require heating.
- Test runs are necessary to optimize the solids content and viscosity required for application.
- The eventual thickness of each layer will be determined by the solids content whereas the ease of application will be determined by the viscosity.
- The mandrel should be introduced gradually into the lacquer until the mandrel is completely covered and then withdrawn at a controlled rate that is consistent with the flow rate of the lacquer.

- Each coating should be air or oven dried until a “skin” forms. Subsequent dips should be dried likewise. Drying above the boiling point of the solvent is not recommended due to the possibility of bubbles forming in the coated layers.
- Once the desired thickness is attained, the part should be allowed to de-aerate for at least 24 hours prior to demolding or handling.

Lacquer Coating

- Follow the same steps as for casting.
- At least two coats are recommended for reasonable uniformity and integrity.

Spray Coating

- Spraying should be accomplished with high quality industrial equipment.
- Solution viscosity should be adjusted for uniform spray output.
- Spray coated components should be de-aerated for 24 hours prior to handling.

Solvent manufacturing methods offer processing versatility. Our polymer expertise enhances performance by enabling your unique processing requirements.

For more information, visit www.lubrizol.com/Health.