

Application of Rulon® and PTFE for Linear Bearing Systems with CE211R Adhesive System

Required Material

- Rulon/Teflon – Cut to required size and etched with sodium ammonia on one side
- CE211R Two Part Bonding System
- 3 Mixing Sticks (One for Part A, One for Part B, One for COMBINED MIX)
- 16T Spatula (Comes with CE211R Kit)
- 60-80 Grit Emery Cloth or Grinding Disc
- Isopropyl Alcohol
- Lint free cleaning rags
- Clamps or Weights



Preparing the Linear Slides

- Pre-clean the metal surfaces using isopropyl alcohol.
- Abrade surface to a minimum 75Ra to maximum 175Ra finish (mill or grind).
- Shot blasting can also be used to prepare the metal slide if above finish can be attained.

✦ TIP: Use 100psi oil free air pressure with 36 grit aluminum oxide for best results.

- Clean surfaces once again with isopropyl alcohol and clean, lint free cloths.

✦ TIP: Final wipe down should be IMMEDIATELY BEFORE BONDING. Both the metal bonding surface and the etched (black side) of the Rulon/Teflon material should be cleaned. DO NOT TOUCH EITHER SURFACE WITH BARE HANDS AFTER CLEANING. Wear latex or plastic gloves for protection.

✦ TIP: If the slides are going to be sitting for more than a few minutes before bonding, be sure to cover the slides with clean rags to prevent moisture or other debris from forming.

Prepare the Rulon/PTFE Material

- Cut Rulon/Teflon to the proper size using a straight edge, razor or proper cutting tool.
- ✎ TIP: When using razor to cut through the material be sure to cut all the way through the Rulon to prevent possible tearing or stressing of the edges.
- Clean the etched side (black) of the Rulon/Teflon with the isopropyl alcohol and protect it from any contamination.

Prepare CE211R Adhesive

- Mix Part A and Part B separately using stir sticks. DO NOT USE THE SAME STICK IN BOTH PARTS OR IT WILL CONTAMINATE THE BATCH.
- Parts are to be mixed together at a 1:1 ratio by weight or volume in a separate container with a clean stir stick. MIX TIME SHOULD BE A MINIMUM OF 5 MINUTES TO INSURE THE PROPER DISTRIBUTION OF GLASS LEVELING BEADS IN THE ADHESIVE.
- ✎ TIP: CE211R is available in Dual Pak applicator guns to insure accurate mixing. Contact TriStar for more information.
- Pot life of CE211R is approximately 40 minutes after mixing. Be sure to only mix the amount of adhesive you can use in this time period. Full cure of CE211R is 24 hour but rigid gelling takes place within 8 hours..
- Apply adhesive using the supplied 16T spatula by using a cross hatch design. Apply film of adhesive to the metal slide in a left to right direction. Apply film of adhesive to the etched (black) side of the Rulon/Teflon in a top to bottom direction. This will produce a cross hatch configuration for better adhesive flow. CE211R has .003" diameter glass beads in the mixture to insure a uniform bond line thickness after clamping pressure is applied.
- Once the Rulon/Teflon has been positioned in its proper place on the slide, place wax paper over the exposed surface and clean any residue around the edges with a dry, clean cloth.
- ✎ TIP: Do not mix adhesive in temperatures below 50°F (10°C)
- ✎ TIP: When humidity is above 60% extra care needs to be taken to avoid water droplets form developing on bonding surfaces. Use of heat lamps in over the surface can help as does a small fan. The fan will keep airflow moving above the bonding area and will prevent settlement of moisture.

Clamp the Rulon/Teflon in Place

- Using clamps or weights, secure the Rulon/Teflon in position on the slide. 10-15psi load is all that is necessary. DO NOT DISTURB THE BONDED SLIDES FOR AT LEAST 2 hours.

CE211R is set at 8 hours with full cure at 24 hours.

Machine or Scrape the Rulon/Teflon

- Once the 5 hour cure of the CE211R is complete you can mill, grind, scrape the Rulon/Teflon to finished dimensions.

✂ TIP: DO NOT MACHINE OIL GROOVES MORE THAN 50% OF THE THICKNESS OF THE RULON/TEFLON MATERIAL. FAILURE TO DO SO COULD LEAD TO BOND LINE FAILURES WHERE THE METAL SUBSTRATE IS EXPOSED.

✂ TIP: OIL GROOVES SHOULD HAVE SMOOTH RADII FOR PROPER OIL FLOW.

Final Cleanup

- After machining and scraping is completed, check oil grooves for any adhesive or Rulon/Teflon residue. Remove using an X-ACTO knife or similar small bladed instrument.
- Wipe down all surfaces with isopropyl alcohol to be sure all surface are free of defects.

Troubleshooting Problems

99% of the problems utilizing the Rulon/Teflon linear bearing material can be tracked to cleanliness issues or improper mixing of the adhesive. If the above instructions are followed closely, you should have no bond failures and will enjoy years of outstanding performance. There are some things to look for when you do experience a bond failure.

1. If the Rulon/Teflon tears away from the metal slide uniformly:
 - A. Look at which side most of the adhesive is still sticking to. If it is primarily on the Rulon/Teflon: the slide was either not rough enough or the adhesive was improperly mixed.
 - B. If the adhesive is on the metal slide and the adhesive has broken away in random areas from the Rulon/Teflon: there was a cleaning issue with the Rulon/Teflon.
2. If the Rulon/Teflon tears away from the metal slide with random adhesive spots left behind on the slide and the Rulon/Teflon: there was some form of contamination. If there are rust colored spots on the slide or Rulon/Teflon: moisture was on the surface before the adhesive was applied. If there are spots of white residue on either surface: there was oil or grease on the surface before bonding.
3. A perfect bond can easily be identified by the fact that if you pull the Rulon/Teflon from the metal slide, you will actually leave behind the etched surface and the adhesive on the slide. The Rulon/Teflon will now have a blue/gray surface exposed.

Contact TriStar Engineering if you have any issues with these procedures

The use of Rulonflon/T and the CE211 family of adhesives is easy to apply when the procedures are followed as noted above. Cleanliness, attentiveness to detail and more cleanliness will insure years of successful use of this excellent bearing material. The machine industry as well as other manufacturers of sliding components has relied on the quality and performance of the Rulon/Teflon material for nearly 50 years. TriStar Plastics wants you to rely on us and our many years of practical application of this product so please don't hesitate to contact us with any questions.

Note: These instructions include CE211/CE211R procedures.

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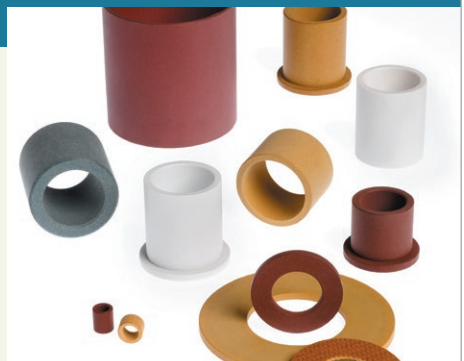
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