

Sample Preparation for Testing Mooney Viscosity of Millathane® Millable Polyurethanes

Due to the nature of millable urethane production, it's important to prepare samples and test them in a consistent manner to get the best reproducibility and accuracy.

Sample Preparation

Full Bale Sample Preparation

Blending an entire bale (a half-cylinder as shown below) is the recommended method to get the most uniform Mooney viscosity test results and is the method that TSE uses for quality control of production material. To do this, a bale is placed onto a mill with the nip opening set to approximately 0.25-0.375 inches (6.4-9.5 mm), depending on the size of the mill. Pass the material without banding approximately 6 times until the material is homogeneous. Test per Testing procedure, below.

Lab Mill Sample Preparation

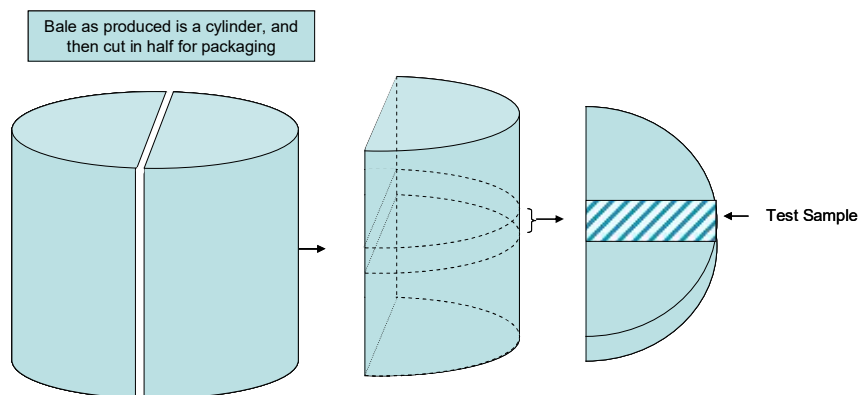
Step 1a. Millathane 5004 and Premilled Millathane urethanes

Take sample from the material as received. Follow Step 2, below.

Step 1b. Baled/Virgin Millathane grades

Remove one of the bales from the box and remove it from its bag. The bale will be (roughly) in a half-moon shape by the height of the box. Lay the sample on its flat side and cut about a 1 inch (25.4 mm) wide sample from the center of the bale, giving a half-moon sample about 1 inch thick. Cut about a 2 inch (50.8 mm) wide sample through the center of this material, giving a rectangular sample weighing approximately 250 grams. Follow Step 2, below.

Step 2. The sample from Step 1 will be passed through a cool ($75\pm 9^{\circ}\text{F}$; $24\pm 5^{\circ}\text{C}$) mill that has a nip opening of 0.055 ± 0.005 in. (1.4 ± 0.1 mm). Pass the sample through the mill 9 times, not allowing it to band, folding it in half after the previous pass. Pass the sheeted polymer from the ninth pass through the mill without folding the sample onto itself (giving 10 passes total through the mill).



Testing

Allow the samples to cool 30-60 minutes. Die out samples and test Mooney Viscosity per ASTM D1646, ML(1+4)/100°C for all grades except Millathane CM which is tested MS(1+10)/100°C. ML samples should be 34 +/- 3 grams and MS samples should be 28 +/- 3 grams.