Melt Flow Test Procedure

Procedure Description
A. ASTM Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer (D 1238-88)
1. The test protocol above is used for defining all of the equipment used during the test (ie. die size, cylinder, barrel, piston, etc.).
2. The protocol is followed in general except for the specific instructions presented in steps B - F of this procedure.

B. Summary of Melt-Flow Test Conditions
1. 190°C, 21.6 kg, 5.5 minutes preheat, 20 cc of sample

C. Sampling the Test Material
1. Since the POLYOX™ Water-Soluble Resins (WSR) are provided as a powder, it is critical that the sample be homogeneous.
   a) When sampling from a bottle or small container, vigorously shake and invert the bottle several times.
   b) When sampling from a drum or super-sack, use a grain sampler to extract a core sample before testing. Recommended grain sampler can be obtained from Fisher Scientific (Cat. No. 14-208).
2. This method is also applicable for a homogeneous sample of pelletized resin.

D. Sample Size
1. Use approximately 20 cc of resin. Volume, not weight is important, since the goal is to fill up the volume of the cylinder. Graduated cylinders are particularly useful for determining amounts.

E. Loading Sample into Plastometer
1. Pour pellets/powder into the barrel of the Plastometer until full.
2. Tamp down the material until it is well packed and there is room for more material.
3. Repeat steps 1 and 2 until all 20 cc of the sample is loaded into the barrel. The barrel should be at least 90% full. If it is not, add more sample.
4. Start the 5.5 minute preheat cycle, using a timer.

F. Starting the Test
1. Insert piston into the barrel.
2. Load half of the 21.6 kg weights onto the piston and start the timer. If your Plastometer has an automatic weight table, lower the table completely down so that it is not in use for this test.
3. Observe the material extruding from the bottom of the barrel. The sample should be extruding at a rate such that the lower of the 2 scribed marker lines on the piston reaches the top of the barrel after the 5.5 minute preheat cycle (+/- 15 seconds is acceptable). More weights may have to be added or taken off during the preheat time to ensure that the piston has lowered to the appropriate place by the end of the preheat cycle.
4. Just before the preheat time reaches its completion, place all of the weights (21.6 kg) on the piston. When the lower of the 2 scribed lines reaches the top of the barrel, cut off the extrudate and reset the timer. Take a one minute cut of the sample (if possible). Depending upon the resulting flow rate, a slightly shorter (30 second) or longer cut (2 minute) may be substituted for the normal 1 minute cut. Weigh the extrudate and multiply by the appropriate factor to obtain the standard (gms/10 minute) melt-flow value.
5. Repeat the entire procedure 3 times and average the results.

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