TECHNOMELT Materials

Thermal Guidelines for Hot Melt Thermoplastic Adhesive Resins

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The Henkel TECHNOMELT line of polyamide resins offers exceptional resiliency to thermal degradation, provided a few important processing steps are followed. The TECHNOMELT resins have a nylon-like backbone, and all typical safeguards for traditional injection molding also apply.

Polyamide resins are the reaction product of dicarboxylic acids and diamines. The resins are purposely unbalanced to the acid or amine side, which clearly distinguishes them from typical nylon plastic. This imbalance is what gives the resin its low pressure molding properties as well as its mechanical and adhesive properties.

Amine-terminated resins show very little thermal stability inside a melting tank and will degrade within hours if left at melting temperature or higher.

The rest of the TECHNOMELT Low Pressure Molding line of resins, however, are acid-terminated and have much longer thermal resistance.

Based on historical testing and data, the following recommendations should be followed when using the TECHNOMELT products*****:

1) At the beginning of each heat history, new material should be added to the melt tank to completely cover the heating fins.
   a) A heat history is defined as the point at which the material is heated up and has reached its melting point until it has been cooled down past its melting point (in most cases an 8- or 16-hour production shift).
2) Material in the melting tank should see no more than three melt histories or 18-24 hours at melting temperature.
   a) Historical data has shown that at greater than 50 hours at temperature and exposed to oxygen, the TECHNOMELT material will begin to degrade, losing some of its tensile properties such as elongation and low modulus, and will increase in viscosity, resulting in much lower open time, compromising adhesion. Open time is defined as the amount of time the resin maintains its ability to mechanically adhere to a given substrate.
   b) The reuse of runners and re-grind should be limited to 25% of overall melt tank resin amount. The use of this material should be accounted for as material that has already seen a melt history.
3) The opening and closing of the melt tank lid should be limited to avoid the introduction of oxygen into the system. The presence of oxygen and heat facilitates the degradation of plastics through oxidation.
   a) Clear signs of thermal degradation include, but are not limited to:
      1. Darkening of the material (applicable when using amber material).
      2. The presence of char particles in the melting tank (typically on the walls and fins).
      3. The presence of an oily and sticky substance condensing on the lid of the melt tank. This substance is the free dicarboxylic acid that has evaporated out of the resin.
      4. Needing to increase pressure or temperature to completely fill a mold cavity to avoid short shots.

* The guidelines given represent knowledge gained from typical manufacturing practices and are in no way a guarantee of resin performance after the initial melt process