Processing Precautions

Mitsui AURUM® Thermoplastic Polyimide Resins containing PTFE

AURUM® thermoplastic polyimide resins are melt-processable and as such, can be injection molded, extruded, and converted into parts and shapes by various other melt processing methods. As high temperature plastics, these resins need very high heats to facilitate processing. The typical melt temperature range is 380-430°C. Extra caution should be used when processing AURUM® resins containing PTFE because of these high processing temperatures.

Heating PTFE above 300°C may liberate a fine particulate fume. Inhalation may produce polymer fume fever, a temporary flu-like condition with fever, chills, nausea, shortness of breath, chest tightness, muscle or joint ache, and sometimes cough and elevated white blood cell count. The symptoms are often delayed 4 to 24 hours after exposure. These signs are generally temporary, lasting 24-48 hours and resolve without further complications. However, some individuals with repeated episodes of polymer fume fever have reported persistent pulmonary effects. Protection against polymer fume fever should also provide protection against any potential chronic effects.

Exposure to decomposition products from PTFE heated above 400°C may cause pulmonary inflammation, hemorrhage or edema. These more serious consequences of exposure may occur from extreme thermal decomposition of PTFE, which can liberate fume particles, and toxic gases (carbonyl fluoride, hydrogen fluoride, and other fluorinated gases) especially under conditions of poor ventilation and/or confined spaces. These decomposition products may initially produce chest tightness or pain, chills, fever, nausea, with shortness of breath, cough, wheezing and progression into pulmonary edema. Edema may be delayed in onset and requires medical treatment. In severe cases, if medical intervention is delayed, pulmonary edema may become life threatening. Recovery is generally complete within a few days; in some rare cases, persistent lung function abnormalities have been reported.

As the exclusive distributor of Mitsui AURUM® resins in North America, the DuPont Company advocates a proactive approach to mitigating the risks associated with processing PTFE containing grades (listed in Table 1 below). The same ventilation guidance applies for wastes or plops generated during cleanout or purging of extruders or injection molding machines that process PTFE-containing AURUM® resins.

Caution should also be exercised when using other resins for extruder cleanout which may decompose under the conditions used for PTFE containing grades.

The enclosed DuPont publication “Proper Use of Local Exhaust Ventilation during Processing of Plastics” provides guidance in safely processing these resins.

In the event fumes are inhaled, please take the following First Aid measures:

1. Remove the individual to fresh air.
2. If not breathing, give artificial respiration
3. If breathing is difficult, give oxygen
4. Call a physician

Table 1. Active AURUM® Grades Containing PTFE

JCF3030	JNF3020	J-3124
JCF6525	JQF3030	
JRF3025	JRF3012	

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