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Plastics- Flammability Testing of Plastics

Plastics have become one of the most useful types of material known to mankind. Plastic is a high molecular weight material composed of repeating organic molecules (monomers). Due to their chemical composition, plastics can often easily ignite when exposed to sufficient heat in the presence of oxygen.

Due the tendency for plastics to burn, considerable efforts have been directed to study and minimize the flammability issues of these materials. Examples of such efforts are the use of design of experiments to classify and measure burning characteristics of plastics and the addition of flame retardant chemicals to prevent or minimize the combustion of these materials.

There are a variety of industrial flammability tests that are widely used in industry. Each one is designed to measure different fire response characteristics. Unfortunately, most of them fail to predict the behavior of plastics under the massive effect of heat present in a large-scale fire. Different sectors of the industry adopt different flame test specifications. The specification that best meets needs is the flammability specification known as UL–94.

The UL–94 contains 6 different flame tests. They are divided into two categories: vertical and horizontal testing. In the vertical flame test, a flame is applied to the base of the specimen held in the vertical position and the extinguishing times are determined upon removal of the test flame. In the horizontal flame tests, the flame is applied to the free end of specimens held in horizontal position and the rate of burning is determined as the flame front progresses between two bench marks.

All methods described in the UL–94 specification involve the use of a standard specimen size, a controlled heat source and a conditioning period for the specimen prior to the test. These parameters vary according to the test chosen. Before testing, the specimens must be conditioned. There are two methods to condition the specimen. One method requires that the specimens be maintained at 70ºC for 7 days in an air-circulating oven. After the 7 days period, thespecimen is removed from the oven and cooled down in a desiccator for at least 4 hours prior to testing. The other method requires maintaining the specimens at 23ºC and 50% relative humidity for at least 48 hours prior to the testing. Some tests in UL–94 require testing on specimens conditioned in both manners.

The Solution

Intertek Turkey is pleased to announce that the test equipment has been installed and the test according to UL 94 method can be conducted beginning from April 2011.

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