CIMTO

Testing of packaging

plastic packaging

Plastic containers are most often used for the packaging of chemicals. Their testing is quite a demanding process, to which we dedicate considerable attention.

Our work is grounded in the authorisation of the Ministry of Transport and certification in transport packaging for dangerous goods and the relevant accreditation.

Our company carries out testing of two types of chemicals: bulk (solid, rigid) and liquid.

Packages for two types of chemical substances

- **loose (solid, rigid):**
  potassium cyanide, sodium hydroxides in pellets, loose pool chemistry, etc.
- **liquid:**
  acids, alkalis, petroleum products, antiseptics, wetting agents or liquid pool chemistry, etc.

What parameters must these packages have?

One of the main requirements for plastic packaging is their chemical compatibility with bottled chemical substances, particularly liquid. Refill in this case consists of a standard liquid, which faithfully simulates the behavior of the original.

This test is performed in accordance with the **ČSN EN ISO 16101 (Packaging - Transport packaging for dangerous goods - Plastics compatibility testing)** norm, with 6 standard liquids:

1. wetting solution,
2. acetic acid,
3. n-butyl acetate (causes cracks in the walls),
4. a mixture of hydrocarbons (the so-called White spirit, causing swelling),
5. nitric acid (active oxidation and causes molecular degradation), and
6. water for liquids that do not attack plastics.

Subsequently, the plastic packaging is frozen before the drop test, and for a period of 24 hours at a temperature of -18 °C. After the successful freezing and a visual inspection of the samples tested, it is subjected to a number of falls. The height of the fall is determined by international regulations and is dependent on the packing group for which the packaging is intended.

There are three packaging groups according to the hazards of the contents of the packaging:

Packaging Group I: Great Danger - high hazard level

Packaging Group II: Medium Danger - medium hazard level

Packaging Group III: Minor Danger - low hazard level

The most hazardous packing group - I/X - is tested at the height of a fall of 1.8 m, packing group II/Y at a height of 1.2 m, packing group III/Z at the height of 0.8 m. Testing for the more hazardous packing groups can also be used for substances included in the lower hazard groups because testing is basically done on the heaviest possible burden.

Among other tests of packaging of liquids is a leakage test, where the applied pressure (positive pressure) of air must be in the packaging groups I/X of at least 30 kPa (in the other two groups at least 20 kPa) and the test of internal (hydraulic) pressure, when for a group of I/X in plastic packaging requires the smallest test pressure of 250 kPA for a period of 30 minutes. Another important is a stacking test, which in the case of plastic packaging for liquid lasts 28 days at a temperature of 40 °C with the respective load.

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