

Process Safety and Dangerous Goods

Classification of dangerous goods

Every year, an estimated amount of more than 500 million tonnes of chemicals is being transported worldwide.

To ensure maximum safety during production, storage, transport, supply and use of hazardous materials, a variety of national and international regulations exists. TNO has experience in both testing and classification of hazardous materials and developing test methods and criteria.

Regulations

The basis of the various transport regulations is formed by the UN Recommendations on the Transport of Dangerous Goods (Model Regulations).

The relevant test methods and classification criteria are included in the UN Manual of Tests and Criteria. The classification procedures and criteria have been adopted into several national and international regulations (ADR, RID, IMDG, etc.).

Within the European Union, regulations for the classification and labeling of new chemicals are laid down in Directive 67/547/EEC. The relevant methods for the determination of physico-chemical properties are comprised in Directive 92/69/EEC.

In the near future, within the framework of the Globally Harmonized System (GHS), harmonization and rationalization of classification criteria and test methods will be a key issue. Through its international network.



Fire engulfment test of an intermediate bulk container filled with 600 kg of an organic peroxide.

TNO is involved in the latest developments in this area.

Examples of work and equipment

- Detonation and deflagration tests;
- Autoclaves (up to 1500 bar, 200 °C);
- Vessels for runaway and vent sizing (up to 230 litres);
- Fire engulfment testing of organic peroxides;
- Thermal stability testing;
- Small-scale screening tests.

Classification testing at TNO

- Classification of explosives;
- Classification of organic peroxides and self-reactives;
- Detonation testing of fertilizers (in accordance with ISO 17025);
- Physico-chemical properties testing (in accordance with GLP);
- Flammability testing.
- Thermal stability testing.

TNO and dangerous goods

Several internationally recognized test were originally developed by TNO. Equipment, facilities and experience for complete classification of dangerous goods are available, including large-scale facilities.

Experts from TNO participate in international bodies and working groups dealing with dangerous goods (UN, EU, CEN). TNO frequently participates in programmes for the rationalisation and harmonisation of test methods.

TNO is the Netherlands competent authority for the classification of explosives, self-reactive substances and organic peroxides (ADR/RID).



TNO Defence, Security and Safety

'TNO Defence, Security and Safety' is the title under which TNO operates as a strategic partner for the Dutch Ministry of Defence and makes innovative contributions to enhance the safety and security of the Netherlands both at home and abroad. We also use our accumulated knowledge for businesses, industries and foreign governments.

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Process Safety and Dangerous Goods

Within the field of safety of dangerous goods and industrial processes, we offer services on:

- Process safety;
- Product safety;
- Explosion safety and control;
- Product and process optimisation.

Whenever possible, we endeavour to give added value to your investment in safety by combining safety with (economic) optimisation of design, maintenance, control and production. A team of specialists is available to apply the expertise for finding a solution to your problem.

Please visit our website at: www.tno.nl/prosafe