

packaging of dangerous goods

documentation sheet 460e

The packaging of dangerous goods is an important subject for TNO in its packaging research and testing activities.

Besides the normal packaging functions there is the safety aspect for packagings for dangerous goods which means that loss of the substance during storage, transport and handling must be prevented.

For transport packagings a world wide system for requirements for packagings for dangerous goods is operative based on recommendations of the United Nations.

Activities

The main activities of TNO in the field of packaging of dangerous goods are:

- Official central testing and certification authority in the Netherlands of transport packagings according to UN. This also includes compatibility testing of plastics packagings according to RID/ADR (European rail and road transport). Also TNO registers the UN-certificates issued.
- Research related to the evaluation and development of requirements for the packagings for dangerous goods. This includes specific applications and also the requirements for unit loads.
- Research related to individual tests in the UN-programme. This includes for instance quantification of leak testing, development of a model for calculation of pressure increase in packagings for liquids due to temperature rise and developments of dummy substances in the drop test.
- Research related to design and optimization of packagings. Important items here are the combination packagings and the computer aided design (CAD) of single packagings.
- Development of detailed testing programmes based on UN also in international cooperation (IAPRI).
- Research related to the interaction of substances with plastics packagings.
- Research and testing on Intermediate Bulk Containers for dangerous goods.
- Research related to the behaviour of packed goods in extreme situations (e.g. fire, drop, immersion in water).
- Testing of packagings for radioactive substances.
- Expertise and consultancy for industry, insurance, authorities, etc.
- Quality assurance of production of packagings.

Equipment

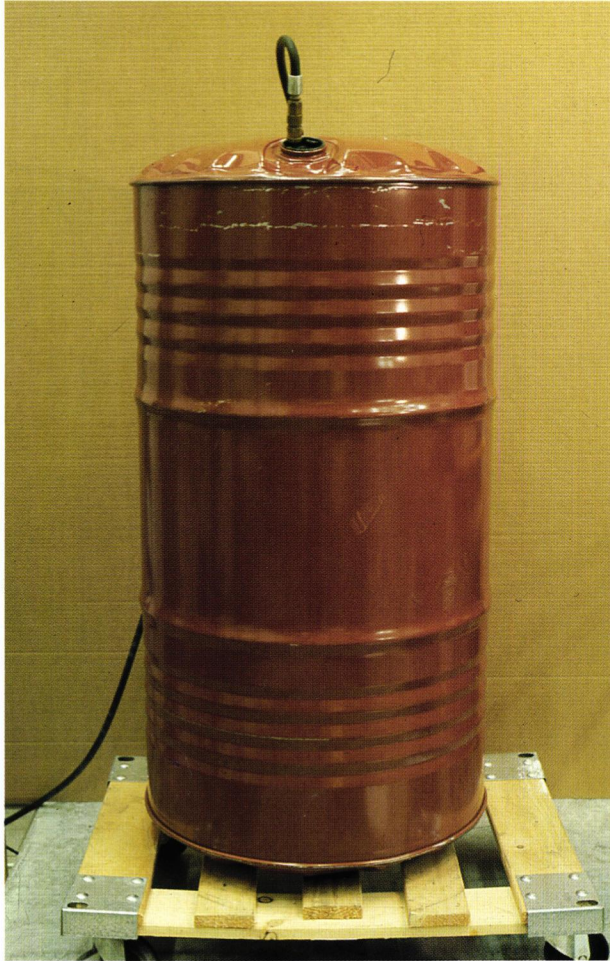
All necessary testing equipment is available for performing the packaging testing and research. This is both for filled packagings and for material testing. For more specific testing facilities are available at the specialized material research institutes of TNO.



UN-certification of packagings.



Top lift testing equipment for flexible IBC's.



Deformation of steel drum due to internal pressure increase.



Resulting damage of solid and liquid packagings after 12 m droptest.

Illustration above solid and illustration below liquid packagings.

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