



FAQ - FREQUENTLY ASKED QUESTIONS

## UN Transportation Classification

We have compiled descriptions of the UN transport classifications and corresponding tests to give you an overview of our services. If you want to learn more about our services and how you can benefit from them, then please contact us.

### 1. Why Should I Use Testing and Classification Services for Transport of Dangerous Goods?

The UN mandates classification of some substances for transport to ensure that the packaging and shipping conditions are safe and pose no threat to human life or the environment. Preventing accidents or disasters is also, of course, in your best interest as your assets and reputation are protected.

### 2. What Types of Substances Are Classified?

We test for six classification classes: explosives (class 1); aerosols (class 2); flammable liquids (class 3); solid and liquid oxidising substances (class 5); corrosive substances (class 8); and all three subdivisions of class 4. Class 4 includes self-reactive substances and highly flammable solids; self-heating solids and pyrophoric liquids and solids; and substances evolving flammable gases when in contact with water.

### 3. How Are Explosives (Class 1) Tested?

A variety of tests are performed on **explosives**. These include the UN gap test to measure the ability of a substance under confinement to propagate detonation and the Koenen test to determine the sensitivity of a substance to intense heat under high confinement. Moreover, we perform time pressure tests to determine the effects of igniting a substance under confinement. The BAM fallhammer test serves to measure the sensitivity to drop weight impact and the BAM friction test is carried out to measure the sensitivity to friction stimuli. Both tests serve to determine if the substance is too dangerous to transport in the form tested. To measure the stability of substances when subjected to elevated thermal conditions, we conduct the **thermal stability test**. The small scale burning test determines the response of a substance to fire.

#### 4. Which Tests Are Carried out on Aerosols (Class 2)?

Chemical heat combustion, ignition distance, enclosed space ignition, mist flammability and the aerosol foam flammability test among others.

#### 5. What Does Class 4 Testing Involve?

Tests on class 4 substances include, but are not limited to, the burning rate test, the pyrophoric solids test and the dangerous when wet test. The burning rate test involves igniting a 250 mm x 20 mm x 10 mm powder train using a suitable ignition source and measuring the burning rate (time). The pyrophoric solids test involves pouring a powder sample from a height of one meter onto a non-flammable surface and observing whether the sample ignites during its descent or after settling. The dangerous when wet test is comprised of four parts, each of which involves exposing a small amount of solid sample to a limited amount of water. The samples are observed to determine whether gas is evolved and whether

such gas is flammable. The volume of gas evolved is measured to determine the gas evolution rate.

#### 6. Which Tests Are Carried out on Class 5 Substances?

The solid oxidising substances test and the oxidising liquids test. The former involves mixing powder samples with sawdust in various proportions and observing the combustion characteristics when a conical pile of the sample/sawdust mixture is ignited by a hot loop ignition source. The latter involves mixing a 2.5-gram sample of the suspected liquid oxidiser with an equivalent sample of dried fibrous cellulose. The mixture is then loaded into the test cell and ignited using a fuse wire. A pressure transducer fitted to the test cell is used to measure the maximum deflagration pressure and maximum rate of pressure rise. The results for the sample and mixture are then compared to results for testing of mixtures of cellulose and known oxidisers to determine the classification and packing group.

Would you like to get more information?

Contact Us

## DEKRA Process Safety

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to provide sustainable performance improvement. Partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

### Process Safety Management (PSM) Programmes

- > Design and creation of relevant PSM Programmes
- > Support the implementation, monitoring, and sustainability of PSM Programmes
- > Audit existing PSM Programmes, comparing with best practices around the world
- > Correct and improve deficient Programmes

### Process Safety Information/Data (Laboratory Testing)

- > Flammability/combustibility properties of dusts, gases, vapours, mists, and hybrid atmospheres
- > Chemical reaction hazards and chemical process optimization (reaction and adiabatic calorimetry RC1, ARC, VSP, Dewar)
- > Thermal instability (DSC, DTA, and powder specific tests)
- > Energetic materials, explosives, propellants, pyrotechnics to DOT, UN, etc. protocols
- > Regulatory testing: REACH, UN, CLP, ADR, OSHA, DOT
- > Electrostatic testing for powders, liquids, process equipment, liners, shoes, FIBCs

### Specialist Consulting (Technical/Engineering)

- > Dust, gas, and vapour flash fire and explosion hazards
- > Electrostatic hazards, problems, and applications
- > Reactive chemical, self-heating, and thermal instability hazards
- > Hazardous area classification
- > Mechanical equipment ignition risk assessment
- > Transport & classification of dangerous goods

We have offices throughout North America, Europe, and Asia.

For more information, visit [www.dekra-process-safety.co.uk](http://www.dekra-process-safety.co.uk)

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