Working on the safety of your LPG containers

Bonfire test LPG automotive container (R67)

Liquefied Petroleum Gas (LPG) is generally considered as an environmentally friendly automotive fuel, particularly in densely populated areas where vehicles cause specific pollution problems. Due to the properties of LPG we have to pay special attention to the related safety aspects.
In ECE Regulation No. 67 (R67), the specific requirements with respect to the equipment to be used, is written down.
To demonstrate the safety of the container configuration in a fire, the specifications of a (Bonfire) test were developed by RDW Vehicle Technology and Information, the Dutch Authority for the homologation of LPG container configurations, in close harmony with Kiwa.

Regulation No. 67 (R67)
The Economic Commission for Europe (ECE) has introduced Regulation to provide uniform provisions concerning:

1 The approval of specific equipment of motor vehicles using LPG in their propulsion system;
2 The approval of a vehicle fitted with specific equipment for the use of LPG in its propulsion system with regard to the installation of such equipment.

One of the tests we perform is a Bonfire test to demonstrate that a container complete with the fire protection system, will prevent the burst of the container when tested under the specified conditions.

The Bonfire test
Kiwa is commissioned by the Dutch Authority for the homologation of LPG container configurations, as a Notified Body for the performance of Bonfire tests according to R67.
In a Bonfire test, we expose a container (80% filled with commercial LPG) to a uniform fire source through which the LPG container is completely engulfed by the flame. As a result of the fire, the temperature of the container increases as well as the pressure inside the container. During the Bonfire test, we study the functioning of the Pressure Relief Device (PRD) as installed on the container.
The container successfully passes the test if the container does not burst.

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Test location/test facility
For the performance of the Bonfire test we use a test site, in the vicinity of Apeldoorn. This site has the great advantage that there are no limitations with respect to other nearby activities and that the entrance to the site is restricted.

The LPG container, to be tested, is horizontally positioned on a frame above the Bonfire (reservoir filled with fuel). The frame has such a height that the container is completely engulfed by the flames of the Bonfire and direct contact between the wall of the container and the fuel in the reservoir is avoided.

Test data
During the Bonfire test we measure the pressure inside the container, the flame temperature just below the container and the wall temperature.
We record the test on (video) tape to record the behaviour of the Bonfire and the container during the test.

Experience
We already have a lot of experience with the performance of Bonfire tests on LPG automotive containers. In addition to this we also perform Bonfire tests on CNG cylinders.

Please contact us for any questions or enquiries and let us help and surprise you!

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