

## **Proposal for Supplement 1 to the 02 series of amendments to UN Regulation No. 67 (Part I Approval of specific equipment / Part II Approval of vehicles)**

The text reproduced below was prepared by the expert from Liquid Gas Europe. It is based on informal document GRSG-112-31, working document ECE/TRANS/WP.29/GRSG/2017/16 and the discussions during two meetings of a Task Force as described in informal documents GRSG-114-08, GRSG-115-05 and informal document GRSG-116-05.

Liquid Gas Europe, the European LPG Association, actively supports all LPG related UN regulatory activities.

### **Background**

Liquid gas Europe doesn't agree to use the odorant in the n-pentane as it is not requested in any test in the UN Regulations neither in EN and ISO standards and there is no specific need to add Sulphur.

### **Proposal 1**

#### **18. Test on non-metallic material inside a container.**

**All components connecting the pressure relief valve and/or the pressure relief device with the gaseous phase in the LPG container shall be tested using the following procedure.**

**The tests shall be carried out on two samples, "a" and "b":**

**Sample "a" shall be aged according to paragraph 18.1.1. or 18.1.2.**

**The aged sample "a" shall undergo the vibration test according to paragraph 18.2.**

**The virgin sample "b" shall be used as a reference for the flow test according to paragraph 18.3.**

#### **18.1. Ageing tests on sample "a"**

##### **18.1.1. Ageing procedure 1 (component disassembled)**

**18.1.1.1. Disassemble, using instructions from the manufacturer, all non-metallic materials from the component in contact with the vapour LPG.**

**18.1.1.2. Age the non-metallic materials using the test description of Annex 15, paragraph 11.1.**

**18.1.1.3. Check compliance to Annex 15, paragraph 11.2.**

**18.1.1.4. Reassemble the aged non-metallic materials to the component using the instructions from the manufacturer.**

##### **18.1.2. Ageing procedure 2 (entire component).**

**18.1.2.1. Expose the entire component to n-Pentane according to Annex 15, paragraph 11.1.**

**18.1.2.2. Check compliance to Annex 15, paragraph 11.2.**

## **Justification 1**

Rubber seals & diaphragms (in conformity with EN549) in permanent contact either with gaseous or liquid phases and regularly submitted to operating pressures varying from 0,5 bar to more than 5 bar are currently used everywhere in the gas industry in Europe with a very good safety record since decades. There is more than 25 years positive experience on LPG seals and diaphragms based on the existing EN 549 and its predecessors EN 278, EN 279 and EN 291.

Rubber materials over this period will have been exposed to both vapour and liquid. For example, there are 200 million of cylinders in the market, equivalent related quantities of regulators, valves etc. and LPG Equipment standards refer to EN 549.

According to the EN12806 "Automotive liquefied petroleum gas components-Other than containers" the LPG compatibility test is standardised and shall be carried out in accordance with EN 549.

According to the EN 549 standard the tests required to prove resistance of rubber materials for seals and diaphragms for gas appliances and gas equipment to LPG don't require to add odorant.

For the above well justified reasons, there is not specific need to add odorant in ageing tests.

## **Proposal 2**

**18.2. Flow test with dummy tank of sample "a" and reference sample "b".**

**Perform for both samples the flow test according to paragraph 6.15.8.3.**

**Requirements:**

**Both aged and non-aged samples shall comply with the flow requirements as per paragraph 6.15.8.3.**

**Following this process, the non-metallic components of both samples shall undergo a visual inspection. Any rupture, deformation or other abnormalities occurring during the flow test shall be observed and result into a non-conformity.**

## **Justification 2**

Regarding the venting test of the PRV, Liquid Gas Europe believes that both samples, the aged sample "a" that has undergone a vibration test and the performance of a virgin sample "b", shall fulfil the flow test stipulations as referred to existing point of R67 as pass/fail criteria, without specifying any unjustified time requirement.

Both samples shall be installed into a dummy container, which can be a usual type-approved container as well, and the container shall be pressurized according the flow test stipulations of the Regulation.

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