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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS
Sub-Committee of Experts on the Transport of Dangerous Goods
(Seventeenth session,
Geneva, 6-17 December l999,
agenda item 5 (a))

MISCELLANEOUS DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Listing and classification

Lighters and lighter refills pressure test

Transmitted by the expert from the People's Republic of China

Background

Lighters and lighter refills are important dangerous goods. The total export volume in the People's Republic of China was above US $ 700 million in 1998. Tests are conducted conforming to section 6.2.2 of the Recommendations on the Transport of Dangerous Goods, placing lighters and lighter refills in hot water-flume at 55 °C for more than 30 minutes to observe whether it leaks or deforms forever.

At the same time, according to the special requirements 201 in the List of Dangerous Goods of the Recommendations on the Transport of Dangerous Goods, all lighters and lighters refills should withstand twice internal vapour pressure of liquefied petroleum gas at 55 °C. However, the requirements are only common requirement and do not list the respective test methods.

It is necessary to point out that the ability of lighters and lighter refills to withstand pressure is the main indicator in measuring their safe performance. ISO9994:1995, U.S. ASTM/ANSI F400-87, European Standard EN123:1980 and Canada Hazardous Goods (lighter) Regulations have defined requirements on lighters and lighter refills pressure test.

At the same time, some accidents concerning safety often occur due to lighters and lighter refills withstanding pressure below standard. During 1997-1998, only the lighters produced in the People's Republic of China have caused dozens of accidents in the same way, causing great loss of property and leaving people dead or injured. Consequently it is esteemed that it is necessary to stipulate a pressure test for lighters and lighter refills to ensure that lighters and lighter refills do not leak due to increasing internal pressure under normal transportation conditions.

Samples have been drawn from 60 different lots of goods of 30 export lighter manufacturers and tests performed, the total number of samples being about 10,600. The details are shown in Annexes 1 and 2.

From test results, it was found that after reexamination by pressure tests refilled nitrite 15% of qualified lighters tested in a hot-water flume at 55 °C and 2% of unqualified ones are qualified after reexamination. So, samples were drawn randomly from the lighters tested in 55 °C hot water and tested in real transport. It was found that still a large part had dangerous damages and justified the results of the pressure tests.

As a whole, it is necessary that lighters be tested in a pressure test refilled with nitrite after the hot water bath. It is suggested to add the pressure test in the UN Recommendations on the Transport of Dangerous Goods.

Proposal

Add the following new section:

"6.2.3 Lighters and lighter refills pressure test

6.2.3.1 Each lot of lighters and lighter refills should draw samples in conformity to the rule, and perform the pressure test: Unlock the CR mechanism, taping down the fuel release lever and paste firmly to empty the fuel, drill a hot [3.06 mm (1/8")] in broad surface of each lighter's fuel reservoir. Mount a lighter in the pressure test device which can produce 2MPa standard internal pressure vertically and immerse the assembly in water in a 4L container. Pressurize the lighter with nitrogen at a rate not exceeding 150 kPa/s to a pressure of 1500 kPa, and cut off the gas supply, record the internal pressure of the lighter after one minute and the leak location. It also can use the same effect way which can attain above purpose.

6.2.3.2 Lighters and lighter refills not broken, and internal pressure descend not exceeding 250 kPa/min."

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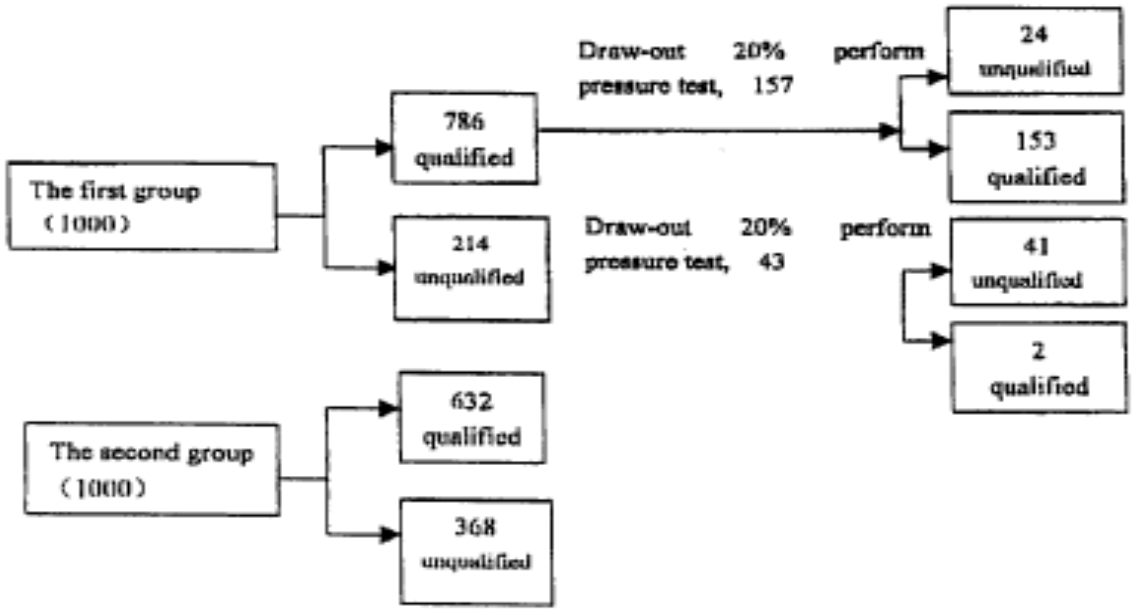
Annex 1

40 lots of disposable lighters that amount to 10,000 are mixed (with 2 lots lighters of 5,000 without flame-height adjustments), renumbered, 2,000 lighters drawn out at random, divided into two groups and inspected respectively (see figure A): in the first group, lighters numbered from 1 to 1,000, undertake the test performed in a 55 °C hot water bath; in the second group, lighters numbered from 1,001 to 2,000, undertake the pressure test. The result shows that 214 lighters are unqualified in the first group and 368 lighters unqualified in the second group. Subsequently, 20% of 786 qualified lighters in the first group are drawn out at random and the pressure test performed to testify the results of the 55 °C hot water bath test (for results of the test see table A1 in Addendum 1 to this document). The results show 24 lighters to be unqualified; at the same time, 20% of 214 unqualified lighters in the first group are drawn out at random and the pressure test performed (for results of the test see table A2 in Addendum 1 to this document). The results show that 2 lighters qualified. Due to the hole on the body of the lighter after the pressure test in the second group, the 55 °C hot water bath test to testify the results of the pressure test cannot be performed.

Figure A



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Annex 2

20 lots of refillable lighters that amount to 600 are mixed (with 16 lots of metal and 4 lots of plastic), renumbered, 120 lighters are drawn out at random, divided into two groups and inspected respectively (see figure B): in the first group, lighters numbered from 1 to 60, perform the test in a 55 °C hot water bath; in the second group, lighters numbered from 61 to 120, perform the pressure test. The results show that 12 lighters are unqualified in the first group and 26 lighters unqualified in the second group. Subsequently, 20% of 48 qualified lighters in the first group are drawn out at random and the pressure test performed to testify the results of the 55 °C hot water bath test (for results of the test see table B1 in Addendum 1 to this document). The results show 3 lighters to be unqualified; at the same time, 20% of 12 unqualified lighters in the first group are drawn out at random and the pressure test performed (for results of the test see table B2 in Addendum 1 to this document). The results show 1 lighter qualified. Due to the hole on the body of the lighter after the pressure test in the second group, the 55 °C hot water bath test to testify the results of the pressure test cannot be performed.

Figure B