

**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals**

**Sub-Committee of Experts on the Transport of Dangerous Goods**

**23 June 2017**

**Fifty-first session**

Geneva, 3-7 July 2017

Item 2 (b) of the provisional agenda

**Explosives and related matters:**

**Review of Tests in parts I, II and III of the Manual of Tests and Criteria**

## **Recommendations for Improvement of Series 8 (c) Koenen Test**

**Transmitted by the Institute of Makers of Explosives (IME)**

### **Background**

1. At the forty-seventh session it was concluded by the Explosives Working Group that the Koenen Test (UN Test 8(c)) was unsuitable for ammonium nitrate emulsions (ANEs). Previous studies conclusively showed that for ANEs, and specifically emulsions, the extended time required for a response in the Koenen Test has the effect of weakening the steel tube. This weakening of the steel results in false positives. At the forty-eighth session, Canada proposed the Minimum Burning Pressure (MBP) Test as an alternative to the Koenen Test, and subsequent discussions at the forty-ninth session by the Explosives Working Group raised the option of applying the MBP test to emulsions alone.

2. Emulsion manufacturers are thus in a position where one of the classification tests has been deemed unsuitable for that form of ANEs.

### **Discussion**

3. The Koenen Test was developed in the 1950s using substances that were very reactive, typically reacting under 10 seconds. ANEs, with their high water content take 10 to 30 times longer to respond in the Koenen Test, which can result in false positives, as described above.

4. It is therefore plausible that the Koenen Test could be modified to accommodate the relatively insensitive ANEs by altering the criterion of the orifice, or adding a criterion of time. These parameter modifications would compensate for the weakening of the steel tube.

### **Proposal**

5. To address the need for a more appropriate test for ANEs, the Working Group should consider developing a testing program for a modified Koenen Test for ANEs.

6. During the period of this test development, the Working Group should consider adopting the MBP test, with an appropriate threshold pressure, as an interim alternative test for ANEs, and specifically emulsions, to enable emulsion manufacturers to classify their products.

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