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**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  
(Twenty-first session, 1-10 July 2002,  
agenda item 12)

Sub-Committee of Experts on the Globally  
Harmonized System of Classification and  
Labelling of Chemicals  
(Third session, 10-12 July 2002, agenda item 2)

**OTHER BUSINESS**

**Classification criteria for aerosols**

**Draft amendments to the third revised edition of the Manual of Tests and Criteria**

**Note by the Secretariat**

The Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals agreed at its second session that Annex 11 of the GHS could be deleted provided that the tests be included in the Manual of Tests and Criteria (ST/SG/AC.10/C.4/4, para. 32).

The secretariat has prepared a proposal of amendments to the Manual of tests and Criteria for this purpose.

Insert a new section 31 in the Manual of Test and Criteria (ST/SG/AC.10/11/Rev.3) as follows:

## **"SECTION 31**

### **CLASSIFICATION PROCEDURES, TEST METHODS AND CRITERIA RELATING TO FLAMMABLE AEROSOLS OF CLASS 2**

#### **31.1 Purpose**

31.1.1 This section presents the United Nations scheme for the classification of flammable aerosols. The text should be used in conjunction with the classification principles given in Chapters 2.2 and 3.3 (special provision 63) of the Model Regulations, the flow charts given here in figures 31.1, 31.2 and 31.3 and the tests prescriptions given in sub-sections 31.4, 31.5 and 31.6 of this Manual.

31.1.2 The test procedures outlined here adequately assess the relative hazard of flammable aerosols so that an appropriate classification can be made.

31.1.3 For the purposes of this section the following definitions apply:

*Aerosols or aerosol dispensers* are non-refillable receptacles meeting the requirements of section 6.2.4 of the Model Regulations, made of metal glass or plastics and containing a gas, compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.

*Flammable components* are flammable liquids, flammable solids or flammable gases and gas mixtures. This designation does not cover pyrophoric, self-heating or water-reactive substances.

**NOTE 1:** *A flammable liquid means a liquid having a flash point of not more than 93 °C. Test methods for determining the flash point are given in sub-section 32.4 of this Manual;*

**NOTE 2:** *For the definition of flammable solids, see paragraph 2.4.2.2 of the Model Regulations. Classification procedures, test methods and criteria relating to flammable solids of Division 4.1 are given in sub-section 33.2 of this Manual;*

**NOTE 3:** *A flammable gas is a gas having a flammable range with air at 20 °C and a standard pressure of 101.3 kPa.*

#### **31.2 Scope**

31.2.1 Aerosols offered for transport should be subjected to the classification procedures as set out in special provision 63 of Chapter 3.3 of the Model Regulations and, for flammability, in this sub-section. The classification procedure shall be undertaken before a new product is offered for transport.

#### **31.3 Classification procedure for flammable aerosols**

31.3.1 Aerosols shall be classified as flammable or extremely flammable according to their heat of combustion and to their flammable component contents, as follows:

- (a) The aerosol product is classified as extremely flammable if the product contains 85% or more flammable components and the chemical heat of combustion exceeds or is equal to 30 kJ/g;
- (b) The aerosol product is classified as non-flammable if the product contains 1% or less flammable components and the chemical heat of combustion is less than 20 kJ/g.

31.3.2 In the case of spray aerosols the classification shall be made taking into account the chemical heat of combustion and on the basis of the results of the ignition distance test, as follows:

- (a) If the chemical heat of combustion is less than 20 kJ/g:
  - (i) The aerosol is classified as flammable if ignition occurs at a distance equal or greater than 15 cm but less than 75 cm;
  - (ii) The aerosol is classified as extremely flammable if ignition occurs at a distance of 75 cm or more;
  - (iii) If no ignition occurs in the ignition distance test, the enclosed space test shall be performed and in this case, the aerosol is classified as flammable if the time equivalent is less than or equal to 300 s/m<sup>3</sup> or the deflagration density is less than or equal to 300 g/m<sup>3</sup>; otherwise the aerosol is classified as non flammable;
- (b) If the chemical heat of combustion is equal to or more than 20 kJ/g, the aerosol is classified as extremely flammable if ignition occurs at a distance of 75 cm or more; otherwise the aerosol is classified as flammable.

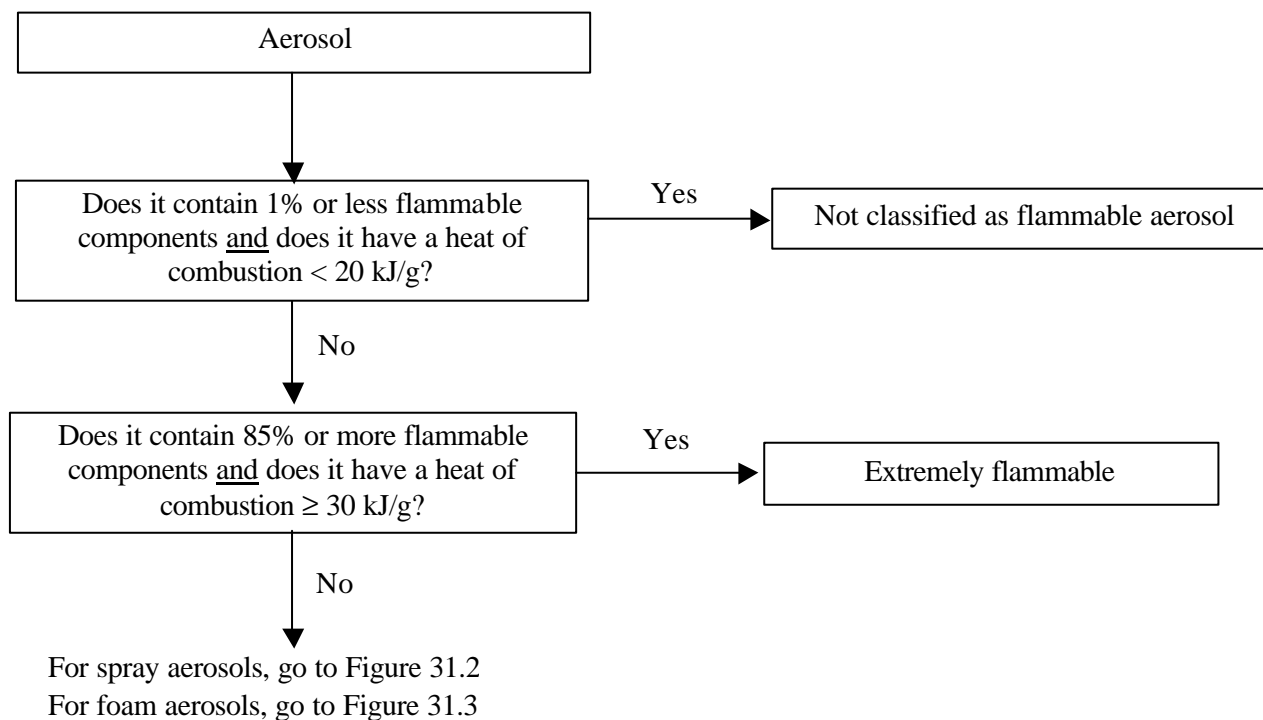
31.3.3 The chemical heat of combustion shall be determined following the methods described in the following standards: ASTM D 240, ISO/FDIS 13943:1999 (E/F) 86.1 to 86.3 and NFPA 30B.

31.3.4 In the case of foam aerosols, the classification shall be made on the basis of the results of the foam test (see sub-section 31.6 of this Manual). The aerosol product shall be classified as extremely flammable if:

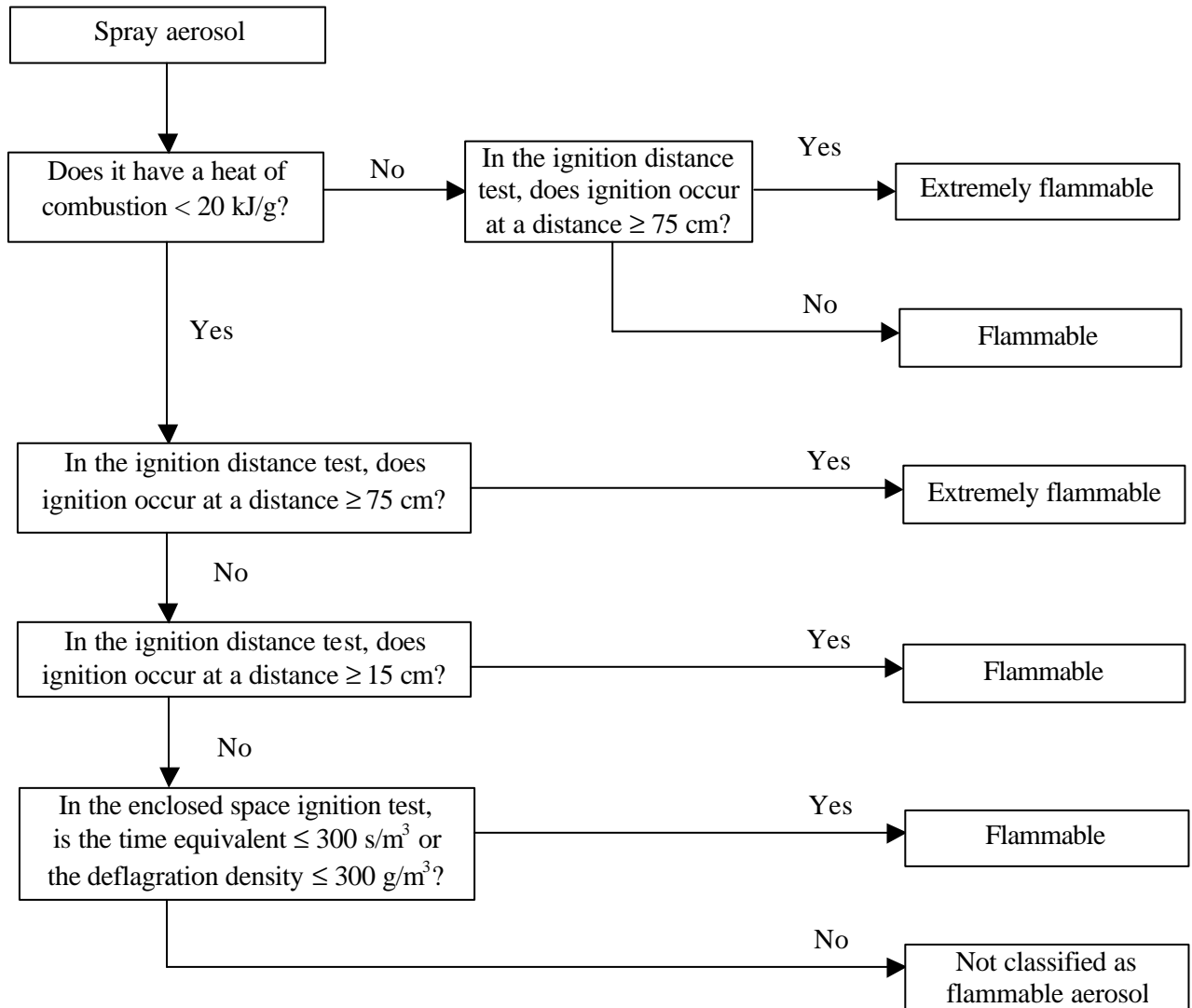
- (i) The flame height is 20 cm or more and the flame duration is 2 s or more; or
- (ii) The flame duration is 7 s or more and the flame height is 4 cm or more.

31.3.5 The classification criteria for aerosols, spray aerosols and foam aerosols is summarized in figures 31.1, 31.2 and 31.3 respectively.

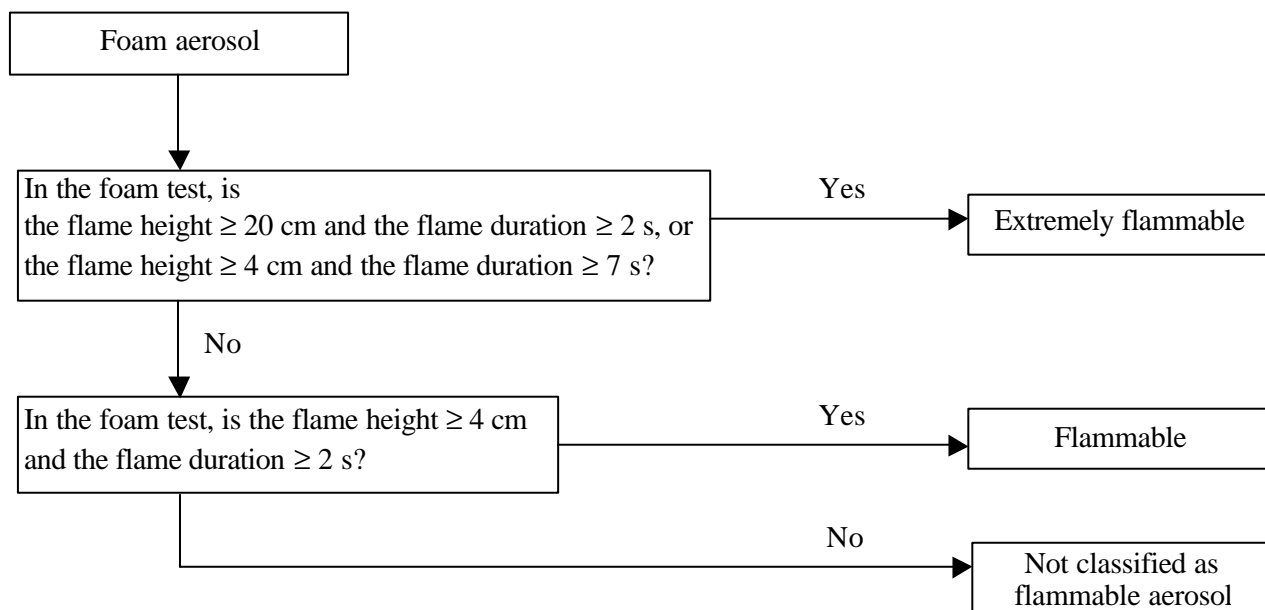
**FIGURE 31.1: OVERALL PROCEDURE FOR CLASSIFICATION  
OF FLAMMABLE AEROSOLS**



**FIGURE 31.2: PROCEDURE FOR CLASSIFICATION OF SPRAY AEROSOLS**



**FIGURE 31.3: PROCEDURE FOR CLASSIFICATION OF FOAM AEROSOLS**



## **31.4 Ignition distance test for spray aerosols**

### **31.4.1 *Introduction***

31.4.1.1 This test standard describes the method to determine the ignition distance of an aerosol spray in order to assess the associated flame risk. The aerosol is sprayed in the direction of an ignition source at intervals of 15 cm to observe if ignition and sustained combustion of the spray takes place. Ignition and sustained combustion is defined as when a stable flame is maintained for at least 5 s. The ignition source is defined as a gas burner with a blue, non-luminous flame 4-5 cm in height.

31.4.1.2 This test is applicable to aerosol products with a spray distance of 15 cm or more. Aerosol products with a spray distance of less than 15 cm such as dispensing foams, mousses, gels and pastes or fitted with a metering valve, are excluded from this test. Aerosol products that dispense foams, mousses, gels or pastes are subject to testing under the aerosol foam flammability test.

### **31.4.2 *Apparatus and material***

31.4.2.1 The following apparatus is required:

Water bath maintained at 20°C	accurate to $\pm 1$ °C
Calibrated laboratory scales (balance)	accurate to $\pm 0.1$ g
Chronometer (stopwatch)	accurate to $\pm 0.2$ s
Graduated scale, support and clamp	graduations in cm
Gas burner with support and clamp	
Thermometer	accurate to $\pm 1$ °C
Hygrometer	accurate to $\pm 5$ %
Pressure gauge	accurate to $\pm 0.1$ bar

### **31.4.3 *Procedure***

#### **31.4.3.1 *General requirements***

31.4.3.1.1 Before testing, each aerosol dispenser shall be conditioned and then primed by discharging for approximately 1 s. The purpose of this action is to remove non-homogeneous material from the diptube.

31.4.3.1.2 The instructions of use shall be strictly followed, including whether the dispenser is intended to be used in the upright or inverted position. When shaking is required, shake immediately before testing.

31.4.3.1.3 The test shall be carried out in a draught-free environment capable of ventilation, with the temperature controlled at  $20\text{ °C} \pm 5\text{ °C}$  and relative humidity in the range 30 - 80%.

31.4.3.1.4 Each aerosol dispenser is to be tested:

- (a) when full according to the complete procedure, with the gas burner in the range of 15 – 90 cm distance from the actuator of the aerosol can;

- (b) when 10 - 12% full nominal (% by mass) only one test, either at 15 cm distance from the actuator when the spray from a full can did not ignite at all, or at the flame ignition distance of the spray of a full can plus 15 cm.

31.4.3.1.5 During the test, the can shall be positioned as indicated by label instructions. The ignition source shall be positioned accordingly.

31.4.3.1.6 The following procedure requires testing the spray at intervals of 15 cm between the burner flame and the aerosol actuator, in the range of 15 - 90 cm. It is efficient to start at 60 cm distance between burner flame and aerosol actuator. The distance between burner flame and aerosol actuator shall be increased by 15 cm in the case of an ignition of the spray at 60 cm distance. The distance shall be decreased by 15 cm in the case of no ignition at 60 cm distance between burner flame and aerosol actuator. The aim of the procedure is to determine the maximum distance between aerosol actuator and burner flame that leads to sustained combustion of the spray or to determine that ignition could not be obtained at 15 cm distance between the burner flame and the aerosol's actuator.

#### 31.4.3.2 *Test procedure*

- (a) A minimum of 3 full aerosol dispensers per product shall be conditioned to  $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  with at least 95% of the dispenser immersed in the water for at least 30 min before each test (if the aerosol is fully immersed, 30 min conditioning is sufficient);
- (b) Comply with general requirements. Record the temperature and relative humidity of the environment;
- (c) Weigh an aerosol dispenser and note its mass;
- (d) Determine the internal pressure and initial discharge rate at  $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  (to eliminate faulty or partly filled aerosol dispensers);
- (e) Support the gas burner on a flat horizontal surface or fix the burner to a support by means of a clamp;
- (f) Ignite the gas burner; the flame shall be non-luminous and approximately 4-5 cm high;
- (g) Place the actuator's exit orifice at the required distance from the flame. The aerosol shall be tested in the position it is designed to be used, e.g. upright or inverted;
- (h) Level the actuator's orifice and burner flame, ensuring that the orifice is properly directed towards and aligned with the flame (see Figure 31.4.1). The spray shall be expelled through the top half of the flame;
- (i) Comply with the general requirements regarding shaking of the dispenser;
- (j) Actuate the valve of the aerosol dispenser, to discharge its contents for 5 s, unless ignition occurs. If ignition occurs, continue discharging and time the duration of the flame for 5 s, from the start of ignition;

- (k) Note the ignition results for the distance between the gas burner and the aerosol dispenser in the table provided;
- (l) If no ignition occurs during step (j), the aerosol shall be tested in alternative orientations, e.g. inverted for upright use products, to check if ignition is obtained;
- (m) Repeat steps (g) to (l) twice more (a total of 3) for the same can at the same distance between the gas burner and the aerosol actuator;
- (n) Repeat the test procedure for another two aerosol cans of the same product at the same distance between gas burner and aerosol actuator;
- (o) Repeat steps (g) to (n) of the test procedure at a distance between 15 and 90 cm between the actuator of the aerosol can and the burner flame depending on the outcome of each test (see also 31.4.3.1.4 and 31.4.3.1.5);
- (p) If no ignition occurs at 15 cm, the procedure is finished for initially full cans. The procedure is also finished when ignition and sustained combustion is obtained at a distance of 90 cm. If ignition could not be obtained at 15 cm distance, record that ignition did not occur. The maximum distance between burner flame and the aerosol's actuator for which an ignition and sustained combustion was observed is noted as the "ignition distance", in all other circumstances;
- (q) One test shall also be conducted on 3 cans of 10 - 12% nominal fill level. These cans shall be tested at a distance between the aerosol's actuator and the burner flame of "the flame ignition distance of full cans + 15 cm";
- (r) Discharge an aerosol can to a 10 - 12% nominal fill level (by mass) in bursts of 30 s maximum. Observe a 300 s minimum time period between bursts. During this interim period dispensers shall be placed in the water bath for conditioning;
- (s) Repeat steps (g) to (n) for 10 - 12% nominal fill aerosol cans, omitting steps (l) and (m). This test shall only be performed with the aerosol in one position, e.g. upright or inverted, corresponding with that which produced the ignition (if any) for filled cans;
- (t) Record all results in the Table 31.4 as shown below.

31.4.3.2.1 All experiments shall be performed in a fume hood in a room that may be well ventilated. Ventilation of the fume hood and room can be applied for at least 3 min after each test. Take all necessary safety precautions to prevent the inhalation of combustion products.

31.4.3.2.2 The cans with a 10 - 12% nominal fill level shall be tested only once. The result tables need only one result per can indicated.

#### **31.4.4      *Test criteria and method of assessing results***

31.4.4.1 All the results shall be recorded. Table 31.4 below shows the model of "result table" to be used.

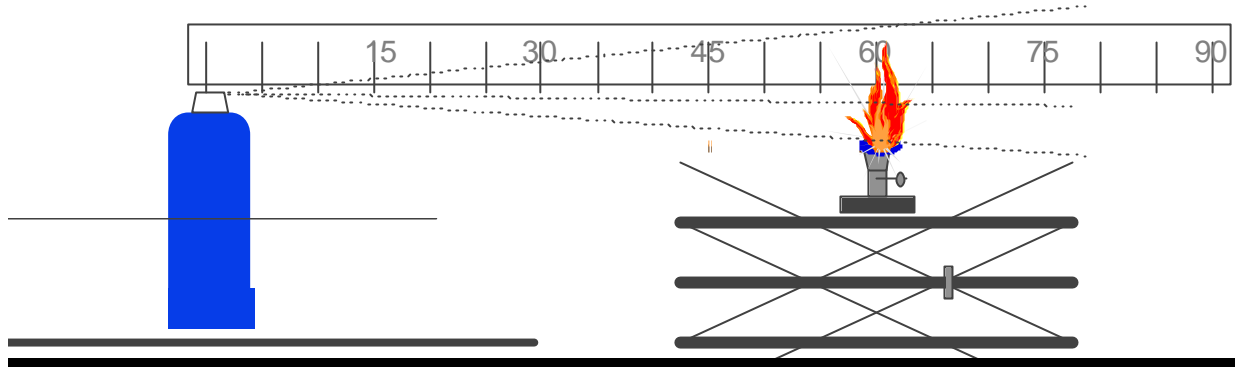
**Table 31.4**

Date		Temperature °C		
		Relative humidity %		
Name of product				
Net volume		Can 1	Can 2	Can 3
Initial level of filling		%	%	%
Dispenser distance	Test	1        2        3	1        2        3	1        2        3
15 cm	Ignition? Y or N			
30 cm	Ignition? Y or N			
45 cm	Ignition? Y or N			
60 cm	Ignition? Y or N			
75 cm	Ignition? Y or N			
90 cm	Ignition? Y or N			
Observations – including can position				

31.4.4.2 Spray aerosols shall be classified as flammable, extremely flammable or non flammable according to the following criteria:

- (a) An aerosol with a chemical heat of combustion less than 20 kJ/g is classified as flammable if ignition occurs at a distance equal or greater than 15 cm but less than 75 cm;
- (b) An aerosol with a chemical heat of combustion less than 20 kJ/g is classified as extremely flammable if ignition occurs at a distance of 75 cm or more;
- (c) If for an aerosol with a chemical heat of combustion less than 20 kJ/g, no ignition occurs in the ignition distance test, the enclosed space ignition test described in sub-section 31.5 of this Manual shall be performed;
- (d) An aerosol with a chemical heat of combustion equal to or more than 20 kJ/g is classified as extremely flammable if ignition occurs at a distance of 75 cm or more. Otherwise the aerosol is classified as flammable.

Figure 31.4.1



## **31.5 Enclosed space ignition test**

### **31.5.1 *Introduction***

31.5.1.1 This test standard describes the method to assess the flammability of products emerging from aerosol dispensers due to their propensity to ignite in an enclosed or confined space. The contents of an aerosol dispenser are sprayed into a cylindrical test vessel containing a burning candle. If an observable ignition occurs, the elapsed time and amount discharged is noted.

### **31.5.2 *Apparatus and material***

31.5.2.1 The following apparatus is required:

Chronometer (stopwatch)	accurate to $\pm 0.2$ s
Water bath maintained at 20 °C	accurate to $\pm 1$ °C
Calibrated laboratory scales (balance)	accurate to $\pm 0.1$ g
Thermometer	accurate to $\pm 1$ °C
Hygrometer	accurate to $\pm 5\%$
Pressure gauge	accurate to $\pm 0.1$ bar
Cylindrical test vessel	as detailed below

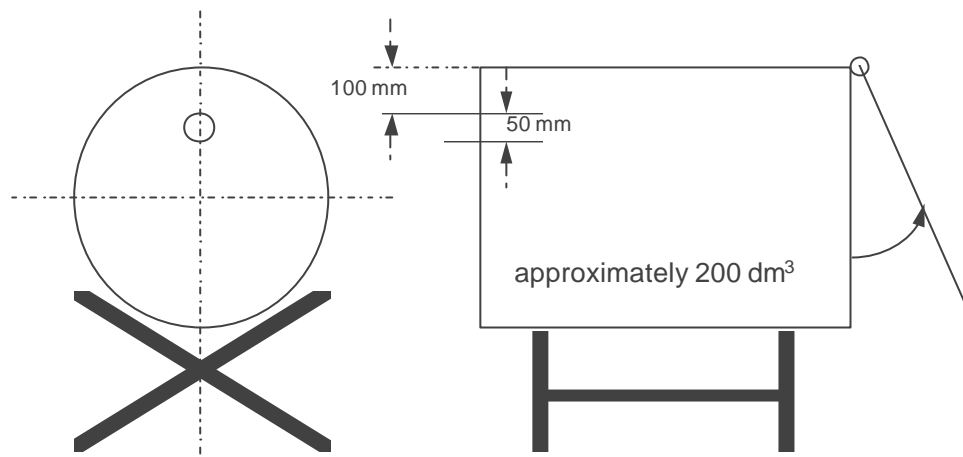
#### **31.5.2.2 *Preparation of test apparatus***

31.5.2.2.1 A cylindrical vessel approximately 200 dm<sup>3</sup> (55 gallons) volume, approximately 600 mm in diameter and approximately 720 mm long and open at one end shall be modified as follows:

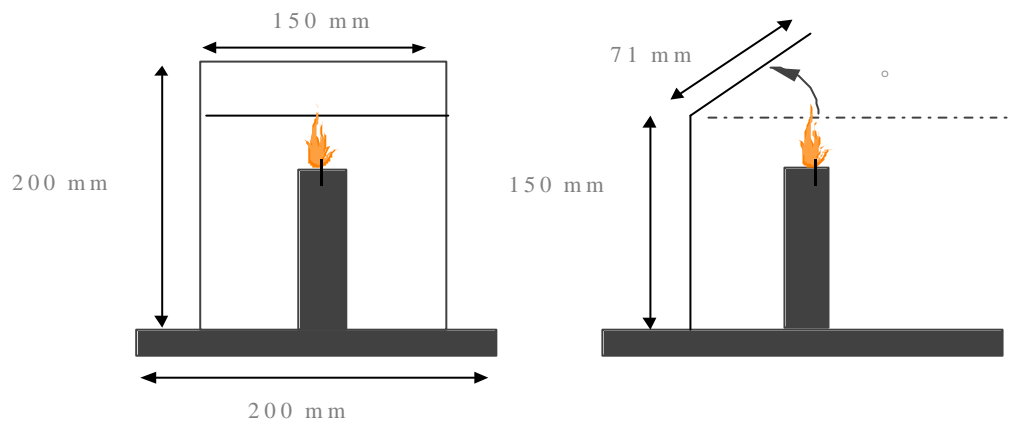
- (a) A closure system consisting of a hinged cover should be matched to the open end of the receptacle; or
- (b) A plastic film 0.01 to 0.02 mm thick may be used as a closure system. If the test is carried out with a plastic film this must be used as described below:

Stretch the film over the open end of the drum and hold it in place with an elastic band. The strength of the band shall be such that when placed around the drum resting on its side, it stretches by only 25 mm when a mass of 0.45 kg is attached to its lowest point. Cut a 25 mm slit in the film, starting 50 mm from the edge of the drum. Ensure that the film is taut;
- (c) At the other end of the drum drill a 50 mm diameter hole 100 mm from the edge in such a way that the orifice is uppermost when the receptacle is laid down and ready for the test (Figure 31.5.1);
- (d) On a 200 x 200 mm metal support place a paraffin wax candle 20 to 40 mm in diameter and 100 mm high. The candle shall be replaced when having a height of less than 80 mm. The candle's flame is protected from the action of the spray by a 150 mm wide, 200 mm high deflector. This includes the plane inclined at 45° produced 150 mm from the base of the deflector (Figure 31.5.2);
- (e) The candle placed on the metal support shall be positioned midway between the two ends of the drum (Figure 31.5.3);

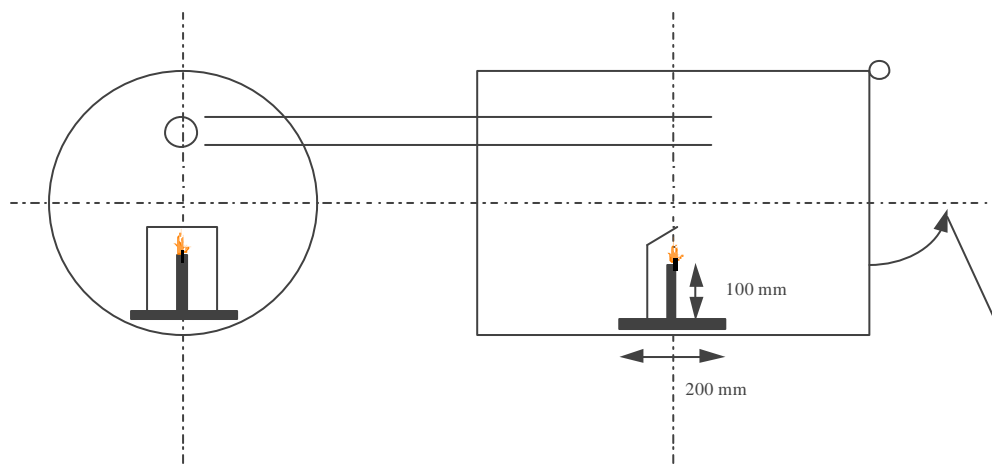
**Figure 31.5.1**



**Figure 31.5.2**



**Figure 31.5.3**



- (f) The drum is laid on the ground or on a support at a spot where the temperature is between 15 °C and 25 °C. The product to be tested will be sprayed within the drum of roughly 200 dm<sup>3</sup> in which there will be a source of ignition.

31.5.2.2.2 Usually, the product leaves the aerosol can at an angle of 90° relevant to the vertical axis of the can. The layout and procedure described refers to this kind of aerosol product. In the case of unusually operating aerosols (e.g. vertical-spray aerosol dispensers) it will be necessary to record changes to equipment and procedures in accordance with good laboratory practice, such as ISO/IEC 17025:1999 General requirements for the competence of testing and calibration laboratories.

### **31.5.3**            *Procedure*

#### **31.5.3.1**            *General requirements*

31.5.3.1.1 Before testing, each aerosol dispenser shall be conditioned and then primed by discharging for approximately 1 second. The purpose of this action is to remove non-homogeneous material from the diptube.

31.5.3.1.2 The instructions of use shall be strictly followed, including whether the dispenser is intended to be used in the upright or inverted position. When shaking is required, shake immediately before testing.

31.5.3.1.3 The tests shall be carried out in a draught-free environment capable of ventilation, with the temperature controlled at 20 °C ± 5 °C and relative humidity in the range 30 - 80%.

#### **31.5.3.2**            *Test procedure*

- (a) A minimum of 3 full aerosol dispensers per product shall be conditioned to 20°C ± 1 °C in a water bath with at least 95% of the dispenser immersed in the water for at least 30 min (if the aerosol is fully immersed, 30 min conditioning is sufficient);
- (b) Measure or calculate the actual volume of the drum in dm<sup>3</sup>;
- (c) Comply with general requirements. Record the temperature and relative humidity of the environment;
- (d) Determine the internal pressure and initial discharge rate at 20 °C ± 1 °C (to eliminate faulty or partly filled aerosol dispensers);
- (e) Weigh one of the aerosol dispensers and note its mass;
- (f) Light the candle and apply the closure system (cover or plastic film);
- (g) Place the aerosol dispenser actuator orifice 35 mm or closer for a wide spray product, from the centre of the entrance hole in the drum. Start the chronometer (stopwatch) and following the instructions for use of the product; direct the spray towards the centre of the opposite extremity (cover or plastic film). The aerosol shall be tested in the position it is designed to be used, e.g. upright or inverted;

- (h) Spray until ignition occurs. Stop the chronometer and note the time elapsed. Re-weigh the aerosol dispenser and note its mass;
- (i) Ventilate and clean the drum removing any residue likely to affect subsequent tests. Allow the drum to cool if necessary;
- (j) Repeat the test procedure steps (d) to (i) for another two aerosol dispensers of the same product (3 in total, note: each dispenser is only tested once);

31.5.3.3 When the result of the test in the position in which the dispenser is designed to be used gives a negative result, the test shall be repeated in the position of the dispenser most likely to result in a positive result.

#### **31.5.4      *Test criteria and method of assessing results***

31.5.4.1 A test report containing the following information shall be drawn up:

- a) The product tested and its references;
- b) The internal pressure and discharge rate of the aerosol dispenser;
- c) The temperature and relative air humidity of the room;
- d) For each test, the discharge time (s) needed to achieve ignition (if the product does not ignite, state this);
- e) The mass of the product sprayed during each test (in g);
- f) The actual volume of the drum (in dm<sup>3</sup>).

31.5.4.2 The time equivalent ( $t_{eq}$ ) needed to achieve ignition in one cubic metre can be calculated as follows:

$$t_{eq} = \frac{1000 \times \text{discharge time (s)}}{\text{Actual volume of drum (dm}^3\text{)}}$$

31.5.4.3 The deflagration density ( $D_{def}$ ) needed to achieve ignition during the test may also be calculated as follows:

$$D_{def} = \frac{1000 \times \text{Amount of product dispensed (g)}}{\text{Actual volume of drum (dm}^3\text{)}}$$

31.5.4.4 An aerosol with a chemical heat of combustion less than 20 kJ/g for which no ignition occurs in the ignition distance test is classified as flammable if the time equivalent is less than or equal to 300 s/m<sup>3</sup> or the deflagration density is less than or equal to 300 g/m<sup>3</sup>. Otherwise the aerosol is classified as non-flammable.

## **31.6 Aerosol foam flammability test**

### **31.6.1 Introduction**

31.6.1.1 This test standard describes the method to determine the flammability of an aerosol spray emitted in the form of a foam, mousse, gel or paste. An aerosol, which emits a foam, mousse, gel or paste is sprayed (approx. 5 g) on a watchglass and an ignition source (candle, wax taper, match or lighter) is placed at the base of the watchglass to observe if ignition and sustained combustion of the foam, mousse, gel or paste occurs. Ignition is defined as a stable flame maintained for at least 2 s and a minimum 4 cm in height.

### **31.6.2 Apparatus and material**

31.6.2.1 The following apparatus is required:

Graduated scale, support and clamp	gradations in cm
Fire-resistant watchglass roughly 150 mm in diameter	
Chronometer (stopwatch)	accurate to $\pm 0.2$ s
Candle, wax taper, match or lighter	
Calibrated laboratory scales (balance)	accurate to $\pm 0.1$ g
Water bath maintained at 20 °C	accurate to $\pm 1$ °C
Thermometer	accurate to $\pm 1$ °C
Hygrometer	accurate to $\pm 5\%$
Pressure gauge	accurate to $\pm 0.1$ bar

31.6.2.2 The watchglass is placed on a fire-resistant surface within a draught-free area that may be ventilated after each test. The graduated scale is positioned exactly behind the watchglass and held vertically by means of a support and clamp.

31.6.2.3 The scale is positioned in such a way that its origin is on a level with the watchglass base in a horizontal plane.

### **31.6.3 Procedure**

#### **31.6.3.1 General requirements**

31.6.3.1.1 Before testing, each aerosol dispenser shall be conditioned and then primed by discharging for approximately 1 second. The purpose of this action is to remove non-homogeneous material from the diptube.

31.6.3.1.2 The instructions of use shall be strictly followed, including whether the dispenser is intended to be used in the upright or inverted position. When shaking is required, shake immediately before testing.

31.6.3.1.3 The tests shall be carried out in a draught-free environment capable of ventilation, with the temperature controlled at 20 °C  $\pm$  5 °C and relative humidity in the range of 30 – 80%.

#### **31.6.3.2 Test procedure**

- (a) A minimum of four full aerosol dispensers per product shall be conditioned to 20°C  $\pm$  1°C with at least 95% of the dispenser immersed in the water for at least

30 min before each test (if the aerosol is fully immersed, 30 min conditioning is sufficient);

- (b) Comply with general requirements. Record the temperature and relative humidity of the environment;
- (c) Determine the internal pressure at  $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$  (to eliminate faulty or partly filled aerosol dispensers);
- (d) Measure the discharge or flow rate of the aerosol product to be examined, so that the amount of test product dispensed can be more accurately gauged;
- (e) Weigh one of the aerosol dispensers and note its mass;
- (f) On the basis of the measured discharge or flow rate and following the manufacturer's instructions, release approximately 5 g of the product onto the centre of the clean watchglass with the aim of producing a mound no higher than 25 mm;
- (g) Within 5 s of completion of discharge, apply the source of ignition to the edge of the sample at its base and at the same time start the chronometer (stopwatch). If necessary, the ignition source shall be removed from the edge of the sample after approximately two seconds, in order to clearly observe if ignition has occurred. If no ignition of the sample is apparent, the ignition source shall be reapplied to the edge of the sample;
- (h) If ignition occurs note the following points:
  - (i) The maximum height of the flame in cm above the base of the watchglass;
  - (ii) The flame duration in s;
  - (iii) Dry and re-weigh the aerosol dispenser and calculate the mass of the released product;
- (i) Ventilate the test area immediately after each test;
- (j) If ignition is not obtained and the released product remains in the form of a foam or paste throughout its period of use, steps (e) to (i) should be repeated. Allow the product to stand for 30 sec, 1 min, 2 min or 4 min before applying the ignition source;
- (k) Repeat the test procedure steps (e) to (j) twice more (a total of 3) for the same can;
- (l) Repeat the test procedure steps (e) to (k) for another two aerosol cans (3 cans in total) of the same product.

#### **31.6.4      *Test criteria and method of assessing results***

31.6.4.1      A test report containing the following information shall be drawn up:

- (a) whether the product ignites;
- (b) maximum flame height in cm;

- (c) duration of flame in s;
- (d) the mass of the product tested.

31.6.4.2 The aerosol product shall be classified as extremely flammable if the flame height is 20 m or more and the flame duration is 2 s or more; or if the flame duration is 7 s or more and the flame height is 4 cm or more."

### **CONSEQUENTIAL AMENDMENTS TO THE MANUAL OF TESTS AND CRITERIA**

General table of contents and table of contents of Part III should be updated accordingly.

30.1.1 Add a new subparagraph (a) to read as follows:

- "(a) Flammable aerosols (see section 31 of this Manual and special provision 63 of Chapter 3.3 of the Model Regulations);"

Rename the following subparagraphs accordingly.

30.1.2 In the last sentence, delete "31" and "2,".

### **CONSEQUENTIAL AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS**

Chapter 3.3, special provision 63:

In the first sentence, insert the words "on the heat of combustion and" after "depend" and the words "and, if applicable, on test results." after "aerosol dispenser.".

Amend paragraph (a) to read: "Division 2.1 applies if the aerosol is classified as flammable or extremely flammable according to the classification procedures, test methods and criteria of section 31 of the Manual of Tests and Criteria;".

### **CONSEQUENTIAL AMENDMENT TO THE GHS**

In chapter 2.6, para. 2.8, replace "See Annex 11" by "See sub-sections 31.4, 31.5 and 31.6 of the Manual of Tests and Criteria"

Delete Annex 11.

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