

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

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Item 3 of the provisional agenda

Listing, classification and packing

Comments on ST/SG/AC.10/C.3/2016/5 Clarification relating to the test method for readily combustible solids (UN Test N.1)

Transmitted by the expert from the United States of America

Introduction

2. In document ST/SG/AC.10/C.3/2016/5 “Clarification relating to the test method for readily combustible solids - UN Test N.1” (Germany) the Sub-Committee is invited to consider amendments to the current N.1 test criteria and method of assessing results. Specifically, the Sub-Committee is asked to consider whether the “whole length of the sample” in 33.2.1.4.4.1 (last sentence) refers to:

- the 250 mm length specified for the mould; or
- the 100 mm length (“timing zone”) over which the rate of burning is measured.

Current text of 33.2.1.4.4.1:

33.2.1.4.4.1 Powdered, granular or pasty substances should be classified in Division 4.1 when the time of burning of one or more of the test runs, in accordance with the test method described in 33.2.1.3.4.2¹, is less than 45 s or the rate of burning is more than 2.2 mm/s. Powders of metals or metal alloys should be classified when they can be ignited and the reaction spreads over the whole length of the sample in 10 minutes or less.”

2. The amendments proposed in 2016/5 take the view that the “whole” length referred to for the classification of metal powders is the 250 mm length of the mould, however in the opinion of this delegation the correct interpretation of the current text is that the length referred to is the 100 mm length of the timing zone for the following reasons:

- (a) 33.2.1.4.3.2.3 states “. . . When the pile has burned a distance of 80 mm, measure the rate of burning over the next 100 mm. For substances other than metal powders, note whether or not the wetted zone stops propagation of the flame for at

¹ Note: Paragraph 33.2.1.3.4.2 is an incorrect reference (the paragraph does not exist). The correct reference is paragraph 33.2.1.4.3.2.

least 4 minutes. . .” Structurally this implies the 100 mm distance applies to both metal powders and substances other than metal powders as the use of the wetted zone is specified to be for “substances other than metal powders”.

(b) The use of a timing zone that is a specified portion of the sample that the propagation of the burn will stabilize along the sample after initiation of the burning and prior to measuring the burning rate, thus enhancing the accuracy of the test. Note that both the screening and the burning rate tests specify a timing length that is shorter than the 250 mm powder train (200 mm and 100 mm, respectively), presumably to allow the burn to stabilize. The timing zone also reduces the difficulty in assessing the exact point when some powders ignite.

(c) The use of the 100 mm timing zone ensures the criteria for inclusion of metal powders in Division 4.1 align with the provisions of the preliminary screening test in 33.2.1.4.3.1. If the text is amended to refer to the 250 mm length as proposed in 2016/5, metal powders would be classified as 4.1 PGIII when the average burn rates are between 25 – 50 mm/min. If the section was interpreted to apply to the 100mm timing zone, the average burn rates for a 4.1 PGIII assignment would be between 10 – 20 mm/min. This represents a 250% increase in average burn rate between the screening and classification criteria. To illustrate, the following table is provided:

	Average Burn Rate (mm / min)		
	Screening	PGIII	PGII
250 mm	10	25 – 50	> 50
100 mm	10	10 – 20	> 20

Table 1. Table of minimum average burn rates required for (a) full testing (screening) and (b) classification (PGIII).

(d) Ensuring all metal powders identified by screening as candidates for Division 4.1 are appropriately classified as flammable solids is in line with the intent of the preliminary screening in 33.2.1.4.3.1. If a 250 mm length is specified as proposed in 2016/5, substances with a burning rate between 10 and 25 mm/min would be candidates by screening but not assigned to Division 4.1 under the criteria for assessment. Such an approach would be inconsistent with the way screening procedures are intended to apply.

Conclusion

3. In summary, in the opinion of this delegation the proposed clarification is inconsistent with the intent of the current text – if a clarification is deemed necessary a 100 mm length should be specified as opposed to the 250 mm length proposed in 2016/5.