



**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****Forty-fifth session**

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Item 3 of the provisional agenda

**Global harmonization of transport of dangerous
goods regulations with the Model Regulations****Assignment of flammable liquids in packing group II to
packing group III according to their viscosity****Transmitted by the International Paint and Printing Ink Council
(IPPIC)¹****Background**

1. In accordance with the provisions of 2.3.2.2 in the Model Regulations, viscous flammable liquids of Class 3, such as paints, enamels, lacquers and varnishes, can be placed in packing group III on the basis of their viscosity, coupled with other criteria. The table in 2.3.2.2(a) includes viscosity criteria expressed as the flow time in seconds from a flow cup test.
2. Many products of the paint and printing ink industry are thixotropic in nature, which means that they are viscous at rest but become thinner on application of shear or agitation (such as stirring or brushing). During transport these viscous flammable liquids have the potential to thin under movement, but their viscosity cannot be properly characterized using a flow cup test since they will not run through the cup under static conditions.
3. To enable more accurate determination of viscosity for substances of this type, and thereby to improve safety when assigning the packing group, IPPIC believes it is appropriate to include additional viscosity criteria in the Model Regulations as an alternative where a flow cup test is unsuitable. Kinematic viscosity (extrapolated at near-

¹ In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

zero shear rate), derived from measurements of dynamic viscosity coefficient at various shear rates, is an appropriate parameter for this purpose.

4. Kinematic viscosity criteria, along with an explanatory footnote on the method of determination, were historically included in paragraph 2.2.3.1.4 of RID/ADR/ADN. At its autumn 2013 session, the Joint Meeting (WP.15/AC.1) adopted a proposal to align the text of 2.2.3.1.4 with that of 2.3.2.2 in the Model Regulations, thereby deleting the kinematic viscosity criteria and footnote. In order to prevent a negative impact on safety, these have been reinstated at the spring 2014 session of the Joint Meeting by adoption of proposal 2 in document ECE/TRANS/WP.15/AC.1/2014/20 submitted by the European Council of the Paint, Printing Ink and Artists' Colours Industry (CEPE). The capacity limit of 450 litres, as included in the Model Regulations, was also adopted. It was noted that CEPE, through its international organisation IPPIC, would propose introducing the kinematic viscosity criteria into the Model Regulations.

5. In this document IPPIC proposes the amendment of 2.3.2.2(a) in the Model Regulations to include kinematic viscosity criteria for viscous flammable liquids. The modified table and explanatory footnote proposed are identical to those which were included, and have been reinstated, in 2.2.3.1.4 of RID/ADR/ADN. No other amendment to 2.3.2.2 is required, as the remaining text is already fully aligned between the Model Regulations and RID/ADR/ADN.

6. IPPIC notes the comments of the United Kingdom in informal document INF.29 for the March 2014 Joint Meeting, regarding an inconsistency between RID/ADR and the Model Regulations, and believes these merit further discussion. The issue described, however, applies generally to the provisions for viscous flammable liquids and is not believed to affect the substance of the proposal in this document.

Proposal

7. In 2.3.2.2, amend sub-paragraph (a) to read as follows:

“(a) The viscosity¹ ~~expressed as the flowtime in seconds~~ and flash-point are in accordance with the following table:

Kinematic viscosity (extrapolated) v (at near-zero shear rate) mm²/s at 23°C	Flow-time t in seconds	Jet diameter (mm)	Flash-point, closed-cup (°C)
20 < v ≤ 80	20 < t ≤ 60	4	above 17
80 < v ≤ 135	60 < t ≤ 100	4	above 10
135 < v ≤ 220	20 < t ≤ 32	6	above 5
220 < v ≤ 300	32 < t ≤ 44	6	above -1
300 < v ≤ 700	44 < t ≤ 100	6	above -5
700 < v	100 < t	6	no limit

Insert footnote 1 as follows:

¹ *Viscosity determination: Where the substance concerned is non-Newtonian, or where a flow-cup method of viscosity determination is otherwise unsuitable, a variable shear-rate viscometer shall be used to determine the dynamic viscosity coefficient of the substance, at 23°C, at a number of shear rates. The values obtained are plotted against shear rate and then extrapolated to zero shear rate. The dynamic viscosity thus obtained, divided by the density, gives the apparent kinematic viscosity at near-zero shear rate.*

7. As a consequential amendment, re-number footnote 1 in 2.3.4 (Determination of initial boiling point) as footnote 2.