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INLAND TRANSPORT COMMITTEE

Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the
European Agreement concerning the International Carriage
of Dangerous Goods by Inland Waterways (ADN)
(ADN Safety Committee)

Fifteenth session
Geneva, 24-28 August 2009
Item 4 (c) of the provisional agenda

PROPOSALS FOR AMENDMENTS TO THE REGULATIONS ANNEXED TO ADN

Other amendment proposals

Density

Transmitted by the Government of Austria [1, 2]

1.   From the physical point of view, there are two kinds of "density" that are important for the transport of dangerous goods: The "mass density" ("masse volumique", "Dichte"), that is expressed in kg/m³, and the "relative density" ("densité relative", "relative Dichte"), that is a number without any unit of measure.

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[1] Distributed in German by the Central Commission for the Navigation of the Rhine (CCNR) under the symbol CCNR/ZKR/ADN/WP.15/AC.2/2009/10.

[2] In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.7 (b)).

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2.   The ADN mixes up these two terms in all language versions at the moment and there are also differences between the language versions regarding the use of these terms:

3.   The definitions under 1.2.1 only define the term "mass density" at present:

1.2.1

"Mass density shall be expressed in kg/m3. In the event of repetition, the number alone shall

be used;"

"*Dichte*: Die Dichte wird angegeben in kg/m3. Bei der Wiederholung wird nur die Zahl genannt;"

"*Masse volumique:* la masse volumique est indiquée en kg/m3. En cas de répétition seul le nombre est indiqué;"

4.   In accordance with 1.2.2.1 it is also allowed to use the unit kg/l.

5.   In Part 2, only "Dichte" in accordance with this definition and with the permitted units is used in the German edition. The English edition uses the undefined terms "density" and "relative density" with the unit kg/l, which is impossible, because "relative density" does not have a unit of measure. In the French edition the undefined term "densité" with the unit kg/l is used beside the correct term "masse volumique".

6.   In the German edition of Part 3 the term "Dichte" is used wrongly to describe the relative density ("relative Dichte") (for example: the density of water is 1000 kg/m³ and the relative density is 1,0). However in remark 22 in column 20 of Table C and in the footnotes the correct term "relative Dichte" is used. Also in 3.5.3.2 the term "relative Dichte" is used. In the English edition the correct term "relative density" is used in all the cases. In the French version the correct term "densité relative" is used in the description of Table C and in the footnotes, but in the table itself only the term "densite" is used.

7.   In 7.1.6.11 the undefined term "specific density" ("spezifische Dichte", "densité specifique") is used with the unit kg/dm³, which is not allowed according to 1.2.2.1.

8.   According to 7.2.4.21.3 the certificate of approval provides the "relative density" ("relative Dichte", "densité relative").

9.   In accordance with 8.2.2.3.3.1 and 8.2.2.3.3.2 the specialization courses have to include the term "density" ("Dichte", "densité"), but not the term "relative density" ("relative Dichte", "densité relative").

10.   In the English and German versions of the model for a certificate of approval for tank vessels in 8.6.1.3 and the provisional certificate of approval for tank vessels in 8.6.1.4 the term "mass density" ("Dichte") is used in point 11 in contradiction with 7.2.4.21.3. As Table C provides the "relative density" ("relative Dichte"), the certfcate of approval should provide the same information. The French version uses the term "masse volumique (densité)", which is also in contradiction with 7.2.4.21.3 and Table C.

11.   In accordance with 9.3.2.11.1 and 9.3.3.11.1 of the English and French editions the maximum "relative density" ("densité" ou "densité relative") has to be indicated in the certificate of approval. The German version uses the term "Dichte" in contradiction with 7.2.4.21.3, Table C and the English and French versions.

12.   Therefore the following corrections and amendments are proposed:

1.2.1

FR	Add a definition for relative density: "*densité relative*: le rapport de la masse volumique d'une matière à la masse volumique de l'eau pure à 3,98 °C (1000 kg/m^3); il s'agit d'une grandeur sans dimension;"
EN	Add the following definition: "*relative density* (or specific density) describes the ratio of the density of a substance to the density of pure water at 3,98 °C (1000 kg/m³) and is dimensionless;"
DE	Add the following definition: "*relative Dichte* (oder spezifische Dichte) beschreibt das Verhältnis der Dichte eines Stoffes zur Dichte von reinem Wasser bei 3.98 °C (1000 kg/m³) und ist dimensionslos;"

2.2.2.3

FR	Replace "densité" with "masse volumique" (3 times)
EN	Replace "density" with "mass density" (8 times) and replace "relative density" with "mass density" (5 times).
DE	No change

3.2.3

FR	Replace "densité" with "densité relative" in the heading of column (12) of Table C.
EN	No change
DE	Replace "Dichte" with "relative Dichte" in the description of column (12) and in the heading of column 12 in table C.

3.2.4

FR	
EN	Replace "density" with "relative density" in the flowchart in the description of column (12) on page 200 and under 2.2 of 3.2.4.2 on page 207.
DE	Replace "Dichte" with "relative Dichte" in the flowchart in the description of column (12) and under 2.2 of 3.2.4.2.

7.1.6.11

FR	Replace "0,75 kg/dm³" with "750 kg/m³" in the description of CO 02.
EN	Replace "0,75 kg/dm³" with "750 kg/m³" in the description of CO 02.
DE	Replace "0,75 kg/dm³" with "750 kg/m³" in the description of CO 02.

8.2.2.3.3.1 and 8.2.2.3.3.2

FR	Replace "densité" with "masse volumique, densité relative" two times.
EN	Replace "density" with "mass density, relative density" two times.
DE	Replace "Dichte" with "Dichte, relative Dichte" two times.

8.6.1.3 and 8.6.1.4

FR	Under point 11 replace "masse volumique (densité)" with "densité relative"
EN	Under point 11 replace "density" with "relative density"
DE	Under point 11 replace "Dichte" with "relative Dichte"

9.3.2.11.1 and 9.3.3.11.1

FR	No change
EN	No change
DE	Replace "Dichte" with "relative Dichte".

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