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**COMMITTEE OF EXPERTS ON THE TRANSPORT
OF DANGEROUS GOODS**

**Sub-Committee of Experts on the
Transport of Dangerous Goods**
(Eighteenth session, 3-14 July 2000,
agenda item 3 (a))

TRANSPORT IN BULK IN PORTABLE TANKS AND FREIGHT CONTAINERS

Miscellaneous draft amendments to Chapters 4.2 and 6.6

Refrigerant gases
Section 4.2.4 Portable tank instructions

Transmitted by the expert from Italy

Introduction

In revising the Tables of RID/ADR concerning filling degrees and test pressures it was discovered that some values, referring to refrigerant gases, were incorrect.

A proposal for amending RID/ADR was then presented to the RID/ADR Joint Meeting (document TRANS/WP.15/AC.1/1999/32), stating also that, if agreed, the relevant proposals will be submitted to the UN Sub-Committee of Experts.

The proposal was adopted at the last Joint Meeting (13-24 March 2000).

Proposal 1

In the portable tank instructions T50 point 4.2.4.2.6 change the maximum filling ratio for:

Refrigerant gas R 404 A	from	0.82 Kg/l	to	0.84 Kg/l
Refrigerant gas R 407 A	from	0.94 Kg/l	to	0.95 Kg/l
Refrigerant gas R 407 B	from	0.93 Kg/l	to	0.95 Kg/l

Justification

The values given in the portable tank instructions T50 are based on the UN Recommendations, Rev.10, originated by ST/SG/AC.10/C.3/R.774, dated 25 April 1996.

The data sheets attached to this document show the following values of density at 50 °C:

R 404 A	0.89 Kg/l
R 407 A	1.00 Kg/l
R 407 B	1.00 Kg/l

Therefore according to point 4.2.2.7.2 of general provision for the use of portable tank maximum filling degrees are:

R 404 A	$0.95 \times 0.89 = 0.84$
R 407 A	$0.95 \times 1.00 = 0.95$
R 407 B	$0.95 \times 1.00 = 0.95$

Proposal 2

In the portable tank instructions T50 point 4.2.4.2.6 change the values of maximum allowable working pressure as follows:

R 404 A	Small		none		none
	Bare	from	28.2 bar	to	28.3 bar
	Sunshield	from	25.2 bar	to	25.3 bar
	Insulated	from	22.1 bar	to	22.5 bar
R 407 A	Small	from	32.3 bar	to	31.3 bar
	Bare	from	29.0 bar	to	28.1 bar
	Sunshield	from	25.7 bar	to	25.1 bar
	Insulated		none		none
R 407 B	Small	from	34.0 bar	to	33.0 bar
	Bare	from	30.5 bar	to	29.6 bar
	Sunshield	from	27.0 bar	to	26.5 bar
	Insulated		none		none

R 407 C	Small	from	30.2 bar	to	29.9 bar
	Bare	from	27.0 bar	to	26.8 bar
	Sunshield	from	24.1 bar	to	23.9 bar
	Insulated	from	21.4 bar	to	21.3 bar

Justification

According to point 6.7.3.1 of requirements for the design, construction, inspection and testing of portable tanks intended for the transport of non-refrigerated liquefied gases, the maximum allowable working pressure is the absolute vapour pressure of non-refrigerated liquefied gas at the design reference temperature minus 1 bar.

The values of the absolute vapour pressures at 65 °C, 60 °C, 55 °C program "NIST THERMODYNAMIC PROPERTIES OF REFRIGERANTS AND REFRIGERANT MIXTURES (Rev. 5.10)" are:

R 404 A	65 °C	32.55 bar	rounded up to	32.6 bar
	60 °C	29.29 bar	rounded up to	29.3 bar
	55 °C	26.28 bar	rounded up to	26.3 bar
	50 °C	23.50 bar	rounded up to	23.5 bar
R 407 A	65 °C	32.29 bar	rounded up to	32.3 bar
	60 °C	29.07 bar	rounded up to	29.1 bar
	55 °C	26.08 bar	rounded up to	26.1 bar
	50 °C	23.32 bar	rounded up to	23.4 bar
R 407 B	65 °C	33.92 bar	rounded up to	34.0 bar
	60 °C	30.55 bar	rounded up to	30.6 bar
	55 °C	27.42 bar	rounded up to	27.5 bar
	50 °C	24.53 bar	rounded up to	24.6 bar
R 407 C	65 °C	30.82 bar	rounded up to	30.9 bar
	60 °C	27.73 bar	rounded up to	27.8 bar
	55 °C	24.86 bar	rounded up to	24.9 bar
	50 °C	22.22 bar	rounded up to	22.3 bar

Therefore the values of the test pressure should be:

R 404 A	Small	31.6 bar
	Bare	28.3 bar
	Sunshield	25.3 bar
	Insulated	22.5 bar

R 407 A	Small	31.3 bar
	Bare	28.1 bar
	Sunshield	25.1 bar
	Insulated	22.4 bar
R 407 B	Small	33.0 bar
	Bare	29.6 bar
	Sunshield	26.5 bar
	Insulated	23.6 bar
R 407 C	Small	29.9 bar
	Bare	26.8 bar
	Sunshield	23.9 bar
	Insulated	21.3 bar
