



**Economic and Social
Council**

**Distr.
GENERAL**

**TRANS/WP.15/AC.1/1999/32
26 July 1999**

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

**Working Party on the Transport
of Dangerous Goods**

**Joint Meeting of the RID Safety Committee
and the Working Party on the Transport of
Dangerous Goods**

**(Geneva, 14-24 September 1999
Bern, 20-24 March 1999)**

AMENDMENTS TO CLASS 2

UN 1959, 1965, 3220, 3337, 3338, 3339, 3340

Submitted by the Expert from Italy

DIFLUOROETHYLENE - item 2°F - UN 1959 (REFRIGERANT GAS R1132a)

Proposal 1.1

In Supplement No. 1 / Alphanumeric list ~~delete~~ "Vinylidene fluoride – 1959 – 2 – 2°F".

***/** Distributed by the Central Office for International Carriage by Rail (OCTI) under the symbol OCTI/RID/GT-III/1999/32.

Justification

The name “Vinylidene fluoride” is not the official name given in marginal 2201 / 201, and it is no longer an accepted synonym as it was until the 1995 editions of RID/ADR.

HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. - item 2°F, UN 1965 -MIXTURE B1

Proposal 2.1

In the tables of marginal 2201 / 201 replace “... 2.3 MPa (23 bar)” with “... 2.6 MPa (26 bar)”.

Justification

The mixtures B1 and B2 are two new groups of mixtures originating from mixture B, introduced for the first time in the 1999 edition of RID/ADR.

The main difference among the 3 mixtures is the density at 50°C.

As shown in marginal 2250 / 250, the mixtures B, B1 and B2 have the same test pressure for receptacles.

Since this test pressure is calculated, according to marginal 2219(d) / 219 (d), on the basis of the value of vapour pressure at 70°C minus 100 kPa, this means that also the values of the three vapour pressures at 70°C given in marginal 2201 / 201 must be the same (2.6 MPa).

This is confirmed also by the identity of the test pressures for shells, with or without thermal insulation, given in marginals 211 251 / 2.5.2.5 and 212 251 / 2.5.2.5, which are based on vapour pressures at 65°C and 60°C.

PENTAFLUOROETHANE - item 2°A - UN 3220 (REFRIGERANT GAS R 125)

Proposal 3.1

In the tables of marginal 2250 / 250 change in the first line the value of the pressure test corresponding to the filling degree of 0.95 kg/l from “3.4 MPa” to “4.9 MPa”.

Justification

The value of the critical temperature for Pentafluoroethane is 66.3°C.

According to marginal 2219(c) / 219(c) the filling degree shall be such that the internal pressure at 65°C does not exceed the test pressure.

Owing to the proximity to the critical temperature the variation of the vapour pressure at 65°C with the filling degree is extremely high.

Data published by D. R. Defibaugh and G. Morrison “Compressed Liquid Densities and Saturation Densities of Pentafluoroethane (R125)” show the following internal pressures for different filling degrees in the region of 65°C:

Temperature (°C)	Pressure (kPa)	Density (kg/l)
65.882	3816.3	0.8179
65.895	4067.3	0.8613
65.885	4547.7	0.9098
65.874	5069.3	0.9440
65.880	5535.5	0.9671
65.885	6168.6	0.9922

The pressure test of 3.4 MPa given in marginal 2250/250 of the 1999 edition of RID/ADR is not correct and is unsafe, and is recommended that the value of 4.9 MPa given in the 1997 edition of RID/ADR be used.

This value is near the values indicated below of 5069.7 kPa at a temperature of 65.874°C with a filling degree of 0.9440 kg/l.

- 4. REFRIGERANT GAS R 404 A - item 2°A - UN 3337**
REFRIGERANT GAS R 407 A - item 2°A - UN 3338
REFRIGERANT GAS R 407 B - item 2°A - UN 3339
REFRIGERANT GAS R 407 C - item 2°A - UN 3340

Proposal 4.1

In the tables of marginals 2250 / 250, 211 251 / 2.5.2.5 and 212 251 / 2.5.2.5 change the maximum filling degree 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 ADR / RID are based on the UN publication “Transport of dangerous goods Rev.10”, originating from 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 marginals 2219(d) / 219 (d), 211 251(3) / 2.5.2.3 and 212 251(3) / 2.5.2.3 the 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	$0.95 \times 1.00 = 0.95$

Note

This proposal will also be submitted to the UN Sub-Committee of Experts to be incorporated in the next revision of the publication “Transport of Dangerous Goods”.

Proposal 4.2

In the tables of marginal 2250 / 250 change the values of the test pressures as follows:

- R 404 A	from	“3.6 MPa”	to	“3.5 MPa”
- R 407 A	from	“3.6 MPa”	to	“3.5 MPa”
- R 407 B	from	“3.8 MPa”	to	“3.7 MPa”
- R 407 C	from	“3.5 MPa”	to	“3.4 MPa”

Justification

The values of the vapour pressures at 70°C from the calculation program “NIST THERMODYNAMIC PROPERTIES OF REFRIGERANTS AND REFRIGERANT MIXTURES (Rev. 5.10)” are:

- R 404 A	3.60 MPa	rounded up to	3.6
- R 407 A	3.57 MPa	rounded up to	3.6
- R 407 B	3.75 MPa	rounded up to	3.8
- R 407 C	3.41 MPa	rounded up to	3.5

Therefore the values of the test pressure, according to marginal 2219 (d) / 219 (d), should be

- R 404 A	3.5 MPa
- R 407 A	3.5 MPa
- R 407 B	3.7 MPa
- R 407 C	3.4 MPa

Note

This proposal will also be submitted to the UN Sub-Committee of Experts to be incorporated in the next revision of the publication “Transport of Dangerous Goods”.

Proposal 4.3

In the tables of marginals 211 251 / 2.5.2.5 and 212 251 / 2.5.2.5 change the minimum test pressures for shells with thermal insulation relevant to:

- Refrigerant gas R 407 A	from	“2.9 MPa”	to	“2.8 MPa”
- Refrigerant gas R 407 B	from	“3.4 MPa”	to	“3.0 MPa”

and change the minimum test pressures for shells without thermal insulation relevant to:

- Refrigerant gas R 407 A	from	“3.3 MPa”	to	“3.2 MPa”
- Refrigerant gas R 407 B	from	“3.4 MPa”	to	“3.3 MPa”
- Refrigerant gas R 407 C	from	“3.1 MPa”	to	“3.0 MPa”

Justification

The values given in ADR / RID are based on the UN publication “Transport of dangerous goods - Rev. 10”, originating from ST/SG/AC.10/C.3/R.774 dated 25 April 1996.

The data sheets attached to this document show the following values of vapour pressures:

	at 60°C	at 65°C
- R 407 A	2.90 MPa	3.23 MPa
- R 407 B	3.05 MPa	3.40 MPa
- R 407 C	-----	3.02 MPa

Therefore according to marginals 211 251(3) / 2.5.2.3 and 212 251(3) / 2.5.2.3 the test pressures for shells with thermal insulation are:

- R 407 A	$2.9 - 0.1 = 2.8$ MPa
- R 407 B	$3.1 - 0.1 = 3.0$ MPa

and for shells without thermal insulation:

- R 407 A	$3.3 - 0.1 = 3.2$ MPa
- R 407 B	$3.4 - 0.1 = 3.3$ MPa
- R 407 C	$3.1 - 0.1 = 3.0$ MPa
