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NEW PROPOSALS OF AMENDMENTS TO RID/ADR/ADN

**Inscriptions on the tank-containers and indications in the tank certificate
according to 6.8.2.5.2 and 6.8.2.3.1**

Transmitted by the Government of Belgium */

1. Introduction

During the ARD/RID joint meeting of September 2004, France submitted document TRANS/WP15/AC.1/24 in order to clarify how the special provisions of column (13) in table A of chapter 3.2 should be applied.

The tank working group of the joint meeting shared the opinion that difficulties of interpretation exist with regard to the implementation of certain special provisions which have quite obviously not been drafted sufficiently clearly for users (cfr. point 10 of TRANS/WP.15/AC.1/96/Add.1).

The following problems arose:

- Certain special provisions are not mandatory in all cases. Take TE6, for instance ("Tanks may be equipped with a device of a design which precludes its obstruction by the substance carried and which prevents leakage and the build-up of excess overpressure or underpressure inside the shell"): if such a device is installed, it has to be of a special design, but it is also acceptable to have no device at all. Certain

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experts were of the opinion that TE6 has to be inscribed on the tank and in the tank-certificate in both cases, while others thought that this should only be done when the device of special design is installed. In the latter case of course, the substance could be loaded in a tank that does not bear the TE6 code present in column (13). Such a situation would be extremely confusing for the loader.

- The transitional measures of chapter 1.6 do not appear in table A.

2. Proposed solutions

2.1. Belgium is of the opinion that the problems mentioned above are best solved by adding a text at the end of each TC, TE and TA special provision that clarifies in which case the provision has to be inscribed on the tank and/or in the tank certificate. The intention being that every special provision code will be present on every tank and/or certificate that corresponds to the requirements of that provision.

2.2. However, in several cases it becomes clear that this way forward would require the indication of a code on nearly every tank-container in order to deal with a problem that is specific to one or only a very few substances. In such a case, it seems appropriate to require dedicated tanks for these substances, taking into account that:

- often several of these special provisions are applicable to the same substances;
- because the alternate use of the dedicated tanks for other substances and groups of substances is now permitted where this is specified in the certificate of type approval, this way forward will not create any problems;
- in a few cases the special provision allows for a less stringent requirement (e.g. in TC2 the wall thickness of aluminium tanks need not exceed 15 mm, even where calculation in accordance with 6.8.2.1.17 gives a higher value), meaning that the other dangerous substances are not allowed in these tanks even if the tank code and other special provisions would seem to indicate the opposite.

3. Proposals

3.1. Add a (+) to the tank code in column (12) of table A of chapter 3.2 for the following UN-numbers : UN 1796, 1829, 2031, 2032, 2211, 2304, 2984, 3176, 3250, 3256, 3257.

3.2. Change the content of the special provisions mentioned below as indicated (the added text is given in thick lettering):

TC1 The requirements of 6.8.5 are applicable to the materials and construction of these shells.

If the materials and construction of the shell fulfil the conditions of 6.8.5, TC1 shall be part of the indications and inscriptions required by 6.8.2.3.1 and 6.8.2.5.2.

- TC2** Shells, and their items of equipment, shall be made of aluminium not less than 99.5% pure or of suitable steel not liable to cause hydrogen peroxide to decompose. Where shells are made of aluminium not less than 99.5% pure, the wall thickness need not exceed 15 mm, even where calculation in accordance with 6.8.2.1.17 gives a higher value.
If the tank is designed to transport substances of UN 2014, 2015 and/or 2984, TC2 shall be part of the indications required by 6.8.2.3.1.
- TC3** The shells shall be made of austenitic steel.
If the tank is designed to transport substances of UN 2426, TC3 shall be part of the indications required by 6.8.2.3.1.
- TC4** Shells shall be provided with an enamel or equivalent protective lining if the material of the shell is attacked by UN No. 3250 chloroacetic acid.
If the tank is designed to transport substances of UN 3250, TC4 shall be part of the indications required by 6.8.2.3.1.
- TC5** Shells shall be provided with a lead lining not less than 5 mm thick or an equivalent lining.
If the tank is designed to transport substances of UN 1744, TC5 shall be part of the indications required by 6.8.2.3.1.
- TC6** Where the use of aluminium is necessary for tanks, such tanks shall be made of aluminium not less than 99.5% pure; the wall thickness need not exceed 15 mm even where calculation in accordance with 6.8.2.1.17 gives a higher value.
If the tank is designed to transport substances of UN 1796, UN 2031 and/or 2032, TC6 shall be part of the indications required by 6.8.2.3.1.
- TC7** *(ADR only).*
- TE3** Tanks shall in addition meet the following requirements. The heating device shall not penetrate into, but shall be exterior to the shell. However, a pipe used for extracting the phosphorus may be equipped with a heating jacket. The device heating the jacket shall be so regulated as to prevent the temperature of the phosphorus from exceeding the filling temperature of the shell. Other piping shall enter the shell in its upper part; openings shall be situated above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable caps. The tank shall be equipped with a gauging system for verifying the level of the phosphorus and, if water is used as a protective agent, with a fixed gauge mark showing the highest permissible level of the water.
If the tank is designed to transport substances of UN 1381 and/or UN 2447, TE3 shall be part of the indications required by 6.8.2.3.1

TE4 Shells shall be equipped with thermal insulation made of materials which are not readily flammable.

If the tank is designed to transport substances of UN 2304, 2448 and/or 3176, TE4 shall be part of the indications required by 6.8.2.3.1.

TE5 If shells are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.

If the tank is designed to transport substances of UN 1389, UN 1391, UN 1392, UN 1407, UN 1415, UN 1420, UN 1421, UN 1422, UN 1423, UN 1428, UN 2257, UN 3401, UN 3402, UN 3403 and/or UN 3404, TE5 shall be part of the indications required by 6.8.2.3.1.

TE 6 Tanks may be equipped with a device of a design which precludes its obstruction by the substance carried and which prevents leakage and the build-up of excess overpressure or underpressure inside the shell.

If the tank is designed to transport substances of UN 2304, 2448, 3176 and/or 3257, TE6 shall be part of the indications required by 6.8.2.3.1.

TE7 The shell-discharge system shall be equipped with two mutually independent shutoff devices mounted in series, the first taking the form of a quick-closing internal stop-valve of an approved type and the second that of an external stop-valve, one at each end of the discharge pipe. A blank flange, or another device providing the same measure of security, shall also be fitted at the outlet of each external stop-valve. The internal stop-valve shall be such that if the pipe is wrenched off the stop-valve will remain integral with the shell and in the closed position.

If the tank is designed to transport substances of UN 2015, TE 7 shall be part of the indications required by 6.8.2.3.1.

TE8 The connections to the external pipe-sockets of tanks shall be made of materials not liable to cause decomposition of hydrogen peroxide.

If the tank is designed to transport substances of UN 2014, 2015, 2984 and/or 3149, TE8 shall be part of the indications required by 6.8.2.3.1.

TE9 Tanks shall be fitted in their upper part with a shut-off device preventing any build-up of excess pressure inside the shell due to the decomposition of the substances carried, any leakage of liquid, and any entry of foreign matter into the shell.

If the tank is designed to transport substances of UN 2015 and/or UN 2426, TE9 shall be part of the indications required by 6.8.2.3.1.

TE10 The shut-off devices of tanks shall be so designed as to preclude obstruction of the devices by the solidified substance during carriage. Where tanks are sheathed in thermally-insulating material, the material shall be of an inorganic nature and entirely free from combustible matter.

If the tank is designed to transport substances of UN 2426 and/or UN 3375, TE 10 shall be part of the indications required by 6.8.2.3.1.

TE11 Shells and their service equipment shall be so designed as to prevent the entry of foreign matter, leakage of liquid or any building up of dangerous excess pressure inside the shell due to the decomposition of the substances carried.

If the tank is designed to transport substances of UN 1791, UN 1908, UN 2014, UN 2984 and/or 3149, TE 11 shall be part of the indications and inscriptions required by 6.8.2.3.1.

TE12 Tanks shall be equipped with thermal insulation complying with the requirements of 6.8.3.2.14. If the SADT of the organic peroxide in the tank is 55 °C or less, or the tank is constructed of aluminium, the shell shall be completely insulated. The sun shield and any part of the tank not covered by it, or the outer sheathing of a complete lagging, shall be painted white or finished in bright metal. The paint shall be cleaned before each transport journey and renewed in case of yellowing or deterioration. The thermal insulation shall be free from combustible matter. Tanks shall be fitted with temperature sensing devices.

Tanks shall be fitted with safety valves and emergency pressure-relief devices. Vacuum-relief devices may also be used. Emergency pressure-relief devices shall operate at pressures determined according to both the properties of the organic peroxide and the construction characteristics of the tank. Fusible elements shall not be permitted in the body of the shell.

Tanks shall be fitted with spring-loaded safety valves to prevent significant pressure build-up within the shell of the decomposition products and vapours released at a temperature of 50 °C. The capacity and start-to-discharge pressure of the safety-valve(s) shall be based on the results of the tests specified in special provision TA2. The start-to-discharge pressure shall, however, in no case be such that liquid could escape from the valve(s) if the tank were overturned.

The emergency-relief devices may be of the spring-loaded or frangible types designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of complete fire-engulfment as calculated by the following formula:

$$q = 70961 \times F \times A^{0.82}$$

where:

q = heat absorption [W]

A = wetted area [m²]

F = insulation factor

$F = 1$ for non-insulated tanks, or

$$F = \frac{U(923 - T_{PO})}{47032} \text{ for insulated tanks}$$

where:

K = heat conductivity of insulation layer [$\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$]

L = thickness of insulation layer [m]

$U = K/L$ = heat transfer coefficient of the insulation [$\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$]

T_{PO} = temperature of peroxide at relieving conditions [K]

The start-to-discharge pressure of the emergency-relief device(s) shall be higher than that specified above and based on the results of the tests referred to in special provision TA2. The emergency-relief devices shall be dimensioned in such a way that the maximum pressure in the tank never exceeds the test pressure of the tank.

NOTE: An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the Manual of Tests and Criteria.

For tanks equipped with thermal insulation consisting of a complete cladding, the capacity and setting of the emergency-relief device(s) shall be determined assuming a loss of insulation from 1% of the surface area.

Vacuum-relief devices and spring-loaded safety valves of tanks shall be provided with flame arresters unless the substances to be carried and their decomposition products are non-combustible. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

If the tank is designed to transport substances of UN 3109, UN 3110, UN 3119 and/or UN 3120, TE 12 shall be part of the indications required by 6.8.2.3.1.

TE13 Tanks shall be thermally insulated and fitted with a heating device on the outside.

If the tank is designed to transport substances of UN 1829, TE 13 shall be part of the indications required by 6.8.2.3.1.

TE14 Tanks shall be equipped with thermal insulation. The thermal insulation directly in contact with the shell shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the tank was designed.

If the tank is designed to transport substances of UN 3257, TE 14 shall be part of the indications required by 6.8.2.3.1.

TE15 Tanks fitted with vacuum valves which open at a negative pressure of not less than 21 kPa (0.21 bar) shall be considered as being hermetically closed. For tanks intended for the carriage of solid substances (powdery or granular) of packing groups II or III only, which do not liquefy during transport, the negative pressure may be reduced to not less than 5 kPa (0.05 bar).

If the tank is hermetically closed, TE 15 shall be part of the indications and inscriptions required by 6.8.2.3.1 and 6.8.2.5.2.

TE16 *(RID only.)*

TE17 *(RID only.)*

TE18 *(ADR only.)*

TE19 *(ADR only.)*

TE20 Notwithstanding the other tank-codes which are permitted in the hierarchy of tanks of the rationalized approach in 4.3.4.1.2, tanks shall be equipped with a safety valve.

If the tank is designed to transport substances of UN 2211, TE 20 shall be part of the indications required by 6.8.2.3.1.

TE21 The closures shall be protected with lockable caps.

If the closures of the tank are protected with lockable caps, TE 21 shall be part of the indications and inscriptions required by 6.8.2.3.1 and 6.8.2.5.2.

TE22 *(RID only.)*

TE23 Tanks shall be equipped with a device of a design which precludes its obstruction by the substance carried and which prevents leakage and the build-up of excess overpressure or underpressure inside the shell.

If the tank is designed to transport substances of UN 3375, TE 23 shall be part of the indications required by 6.8.2.3.1.

TE24 If tanks, intended for the carriage and handling of bitumen, are equipped with a spray bar at the end of the discharge pipe, the closing device, as required by 6.8.2.2.2, may be replaced by a shut-off valve, situated on the discharge pipe and preceding the spray bar.

If the tank is designed to transport substances of UN 3176, UN 3256 and/or 3257, TE 24 shall be part of the indications required by 6.8.2.3.1.

TA1 Tanks shall not be approved for the carriage of organic substances.

If the tank is designed to transport substances of UN 3375 and/or UN 2426, TA1 shall be part of the indications required by 6.8.2.3.1.

TA2 This substance may be carried in fixed or demountable tanks or tank-containers under the conditions laid down by the competent authority of the country of origin, if, on the basis of the tests mentioned below, the competent authority is satisfied that such a transport operation can be carried out safely. If the country of origin is

not party to ADR, these conditions shall be recognized by the competent authority of the first ADR country reached by the consignment.

For the type approval tests shall be undertaken :

- to prove the compatibility of all materials normally in contact with the substance during carriage;
- to provide data to facilitate the design of the emergency pressure-relief devices and safety valves taking into account the design characteristics of the tank; and
- to establish any special requirements necessary for the safe carriage of the substance.

The test results shall be included in the report for the type approval.

If the tank is designed to transport substances of UN 3109, 3110, 3119 and/or 3120, TA2 shall be part of the indications required by 6.8.2.3.1.

TA3 This substance may be carried only in tanks with the tank code LGAV or SGAV; the hierarchy in 4.3.4.1.2 is not applicable.

If the tank is designed to transport substances of UN 3375, TA3 shall be part of the indications required by 6.8.2.3.1.
