



ASSOCIATION  
OF AMERICAN  
RAILROADS

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*Executive Director - Tank Car Safety*

July 28, 2006

CASUALTY PREVENTION CIRCULAR

(CPC-1175)

SUBJECT: AAR Requirements for Tank Cars in  
Anhydrous Ammonia or Chlorine Service

T87.2/T87.3

TO THE MEMBERS AND PRIVATE CAR OWNERS:

The attached proposed additions to Chapter 2 of M-1002, *Specifications for Tank Cars*, have been approved by the Tank Car Committee and are herewith being issued for public comment prior to being placed in effect.

The goal of these proposals is to enhance safety in the rail transportation of hazardous materials by reducing the probability of release of product from a tank car, given a derailment. The expected performance improvement will be calculated using the information available in RSI/AAR Tank Car Safety Project Report RA 05-02. The target figures for improvements to heads, shells, head shields and jackets were selected based on earlier work done by the University of Illinois at Urbana-Champaign and are intended to reflect a verifiable level of risk reduction. These improvements, in conjunction with the top fittings protection design criterion, are intended to achieve the desired overall reduction in risk.

Under the provisions of Standard S-050, which may be found in each section of the Manual of Standards and Recommended Practices, notice of proposed modifications shall be published in a Circular soliciting written comments from interested parties. Comments on the proposals covered in this report are to be submitted to my attention at the Association of American Railroads, 50 F Street, N.W., Washington, D.C. 20001 within 30 days from the date of this circular. Comments will be considered by the Tank Car Committee prior to taking final action on affected proposals.

All parties interested in the activities of the Committee should forward their commentary or requests for consideration of specific handling or revision of the *Specifications for Tank Cars* to my attention for handling with the Committee.

Respectfully Submitted,

P. G. Kinnecom

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### **2.1.8 Ammonia, Anhydrous**

#### **2.1.8.1 Definitions :**

**Base car** - 100-ton 112J340W car with 115.909 inches inside diameter, 0.608" thick heads and shell, TC128 steel, 1/2" thick ceramic fiber or mineral wool, and 11 gauge steel jacket with full height 1/2-inch thick head shields)

**CPR** = Conditional Probability of Release

**HS** = Expected reduction in CPR resulting from changes to the head shields.

**H** = Expected reduction in CPR resulting from changes to the heads.

**JT** = Expected reduction in CPR resulting from changes to the jacket.

**S** = Expected reduction in CPR from changes to the shell.

#### **2.1.8.2 Implementation**

Car owners are to provide plans which must provide for compliance (per paragraph 2.1.8.3) for 50 percent of their fleet used to transport Anhydrous Ammonia by December 31, 2012 and 100 percent of subject fleet by December 31, 2017. Car owners are to submit implementation plans to AAR by December 31, 2007 and provide progress reports by March 31 each year.

#### **2.1.8.3 New and Existing Cars**

Effective January 1, 2007, tank cars ordered built new for anhydrous ammonia service must comply with DOT specification 112J500W and be equipped with full-height 1/2" thick or equivalent head shields and top fittings protection in accord with paragraph 2.1.8.4.

Alternatively, cars may comply with the following:

Tank cars which have been equipped with top fittings protection in accord with paragraph 2.1.8.4 and built or modified to demonstrate a 32% or greater reduction in CPR relative to the base car using the following formula are also acceptable:

$$(HS+H) + (JT+S) = 32\%$$

Alternative validation methodology and analysis techniques may be utilized, subject to approval by the AAR Tank Car Committee.

#### **2.1.8.4 Top Fittings Protection**

Top fittings protection must be designed to withstand, without loss of lading except through the pressure relief device, a rollover with a linear velocity of 9 mph minimum, applied at the geometric center of the loaded tank as a transverse vector. The rolling surface is assumed to be flat, level, and rigid.

## 2.1.9 Chlorine

### 2.1.9.1 Definitions :

**Base car** - 90-ton 105A500W car with 102 inches inside diameter, 0.787" thick heads and shell, TC128 steel, 2" fiberglass insulation over 2" ceramic fiber or mineral wool, and 11 gauge steel jacket and jacket heads

**CPR** = Conditional Probability of Release

**HS** = Expected reduction in CPR resulting from changes to the head shields.

**H** = Expected reduction in CPR resulting from changes to the heads.

**JT**= Expected reduction in CPR resulting from changes to the jacket.

**S**= Expected reduction in CPR from changes to the shell.

### 2.1.9.2 Implementation

Car owners are to provide plans which must provide for compliance (per paragraph 2.1.9.3) for 50 percent of their fleet used to transport Chlorine by December 31, 2012 and 100 percent of subject fleet by December 31, 2017. Car owners are to submit implementation plans to AAR by December 31, 2007 and provide progress reports by March 31 each year.

### 2.1.9.3 New and Existing Cars

Effective January 1, 2007, tank cars ordered built new for chlorine service must comply with DOT specification 105J600W and be equipped with full-height ½" thick or equivalent, head shields and top fittings protection in accord with paragraph 2.1.9.4. Alternatively, cars may comply with the following:

Tank cars which have been equipped with top fittings protection in accord with paragraph 2.1.9.4 and built or modified to demonstrate a 45% or greater reduction in CPR relative to the base car using the following formula are also acceptable:

$$(HS+H) + (JT+S) = 45\%$$

Alternative validation methodology and analysis techniques may be utilized, subject to approval by the AAR Tank Car Committee.

### 2.1.9.4 Top Fittings Protection

Top fittings protection must be designed to withstand, without loss of lading except through the pressure relief device, a rollover with a linear velocity of 9 mph minimum, applied at the geometric center of the loaded tank as a transverse vector. The rolling surface is assumed to be flat, level, and rigid.