Federal Institute for Materials Research and Testing

Recognized technical code (Anerkanntes Technisches Regelwerk, ATR) for the construction, equipment, test, approval and marking of not hand wheel operated ball valves as demountable accessories of transportable pressure equipment (ATR D 1/13)

Based on Section 8 No 10 of the Ordinance on the Transport of Dangerous Goods by Road, Rail and Inland Waterways (GGVSEB) of 17 June 2009 (Federal Law Gazette I p. 1389) as amended by the Ordinance of 19 December 2012 (Federal Law Gazette I p. 2715), the BAM Federal Institute for Materials Research and Testing in agreement with the Federal Ministry of Transport, Building and Urban Development promulgates the recognized technical code for the construction, testing, approval and marking of not hand wheel operated LPG ball valves (ATR D 1/13) in accordance with section 6.2.5 of RID and ADR1 as set out below.

This technical code is recognized for the approval of not hand wheel operated ball valves for refillable gas cylinders for LPG or LPG charged with compressed gas if these cylinders have a test pressure of 30 bar and are used exclusively in hot air balloons as propellant gas tanks. The recognition of the present ATR as a code is restricted to the approval in accordance with 6.2.5 of RID/ADR in conjunction with Directive 2010/35/EU and thus to land transport (carriage by rail, road and inland waterways).

The present code may be applied to land transport from the date of its publication in the Federal Ministry of Transport Gazette. The Federal Ministry of Transport, Building and Urban [illegible]ill submit this code to the competent OTIF and UNECE2 Secretariats in accordance with section 6.2.5 of RID/ADR.

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1 RID = Regulations governing the International Carriage of Dangerous Goods by Rail
ADR = European Agreement concerning the international carriage of dangerous goods by Road

2 OTIF = Intergovernmental Organisation for International Carriage by Rail (Bern)
ECE = United Nations Economic Commission for Europe (Geneva)

1 Introduction

1.1 The present ATR contains the requirements relating to the construction, testing, approval and marking of not hand wheel operated (e.g. lever or pneumatically operated) ball valves which are not covered by the standards referenced in 6.2.4 of RID/ADR. These ball valves are intended to be mounted on gas cylinders with a test pressure of 30 bar for LPG, or LPG charged with compressed gas, for the purpose of carriage as pressure receptacles by land if the pressure receptacle is used as a propellant gas tank of a hot air balloon.

1.2 Unless otherwise stipulated in the present ATR, not hand wheel operated ball valves shall be constructed, tested, approved and marked in accordance with standard EN ISO 15995:2010. The required and/or permitted deviations from standard EN ISO 15995:2010 are described in section 3 below.

1.3 The structural differences between conventional LPG gas cylinder valves and not hand wheel operated ball valves for the quick release of a larger amount of the stored gas have been taken into account in drawing up the present ATR.

2 Scope

2.1 Not hand wheel operated ball valves are demountable accessories in accordance with Directive 2010/35/EU on transportable pressure equipment, transposed in Germany by means of the Ordinance on transportable pressure equipment (Ortsbewegliche-Druckgeräte-Verordnung, ODV), Article 1 of the 6th Ordinance amending dangerous goods regulations of 29 November 2011 (Federal Law Gazette I p. 2349), which have to be constructed, tested, approved, marked, placed on the market and used for carriage on the basis of 6.2.5 of RID/ADR.

2.2 The procedure described in 1.8.7 and 6.2.3.6 of RID/ADR shall be used for conformity assessment.

2.3 A conformity reassessment of not hand wheel operated ball valves placed on the market before the entry into force of the present ATR shall not be permissible even if conformity with the present ATR has been demonstrated.

2.4 Rules and regulations that apply to the approval or use of gas cylinders, e.g. as a component of an aircraft, shall not be affected by the present ATR except where these cylinders are carried as dangerous goods.

3. Requirements to be met by not hand wheel operated ball valves

3.1 Definitions

For the purposes of the present ATR, the definitions of standard EN ISO 15995:2010 shall apply, with the word “valve” being replaced by the word “ball valve” and the word “hand wheel” by “lever”, as well as the following definition:

Moving torque
Torque required for moving the ball valve under pressure from the completely open to the completely closed position, neglecting the existing detachment torque in the stop area of the completely open position.

3.2 General requirements

Not hand wheel operated ball valves shall meet the general requirements of 6.2.1, 6.2.3 and 6.2.5 of RID/ADR relating to design, construction, testing, approval and marking as well as the specifications of standard EN ISO 15995:2010, unless deviating requirements are expressly permitted or additional requirements are expressly stipulated in the present ATR.

3.3 Deviating/additional requirements

The deviations or additions described below refer to standard EN ISO 15995:2010. Sections of this standard that are not mentioned below shall be met fully as specified in the standard.

3.3.1 Valve operating mechanism

In addition to section 4.3.1, the valve operating mechanism shall be marked at least with “-” (close) and “+” (open).

3.3.2 Excess flow device (flow limiter)

By derogation from section 4.3.6, the excess flow device required for gas passageways with large cross-sectional areas shall be dispensed with. Thus, section 4.4.4 is not applicable either.

Note: *For use with a cylinder of a hot air balloon, a high gas flow rate is required. Accordingly, no excess flow device shall be used.*

3.3.3 Torques to ensure leak tightness

By derogation from sections 4.5.3, 4.6, 4.7 and 4.8, with regard to achieving the required leak tightness, the moving torque (see 3.3.1 of the present ATR) shall be checked instead of the torque requirements during all leak tightness tests. The maximum permissible moving torque for this shall be calculated in Nm by the formula D × 7/65, where D is the length of the lever in mm.

3.3.4 Requirements to be met by ball valves for cylinders of a limited water capacity

By derogation from the last paragraph of section 5.1, Annex B shall not apply.

3.3.5 Leak tightness tests

By derogation from table 2 in section 5.3.1, a test pressure of 30 bar shall be used for test sequence 2 of the leak tightness tests.

3.3.6 Valve closure test

By derogation from section 5.6, this test shall not apply.

3.3.7 Resistance to excessive closing torque test

By derogation from section 5.12, the minimum closing torque value of 20 Nm shall be replaced by the closing torque to be calculated in accordance with B.2.2.2, where D is the length of the lever. This test shall exclusively be carried out for manually operated ball valves.

By derogation from the second paragraph of section 5.12.2, the requirement relating to the operating torque shall be replaced by the requirement that the maximum permissible moving torque calculated in accordance with 3.3.2 of the present ATR shall not be exceeded.

3.3.8 Resistance to excessive opening torque test

By derogation from section 5.13, the stipulated minimum opening torque value of 22 Nm shall be replaced by the opening torque to be calculated in accordance with B.2.2.2, where D is the length of the lever, for not hand wheel operated ball valves. This test shall exclusively be carried out for manually operated ball valves.

By derogation from the second paragraph of section 5.13.2, the requirement relating to the operating torque shall be replaced by the requirement that the maximum per-

missible moving torque calculated in accordance with 3.3.3 of the present ATR shall not be exceeded.

3.3.9 Endurance test

By derogation from section 5.17.1, a test pressure of 30 bar shall be used for the endurance test.

By derogation from section 5.17.1, when opening the ball valves as required during the endurance test, they shall be opened completely. For this, the maximum permissible moving torque calculated in accordance with 3.3.3 of the present ATR shall be used, which shall be applied to the respective stop positions (completely open and completely closed position).

By derogation from section 5.17.1, the number of cycles for Part 1 of the test shall be 3,000.

By derogation from section 5.17.1, Part 2 shall not apply.

By derogation from section 5.17.2, the check of the torques shall be waived for not hand wheel operated ball valves.

Note: *Even in the case of commercial use, cylinders of hot air balloons are not used for more than 100 rides per year and their closures are opened and closed only once per ride. Cylinders of hot air balloons are not filled by means of automatic filling systems in which the load is applied vertically.*

4 Marking

The test pressure TP with the value “XX” in [bar] applied during the leak tightness and endurance tests in accordance with the present ATR shall be marked as follows: “TPXXBAR”.

In addition to the markings required in accordance with section 7 of standard EN ISO 15995:2010, ball valves in accordance with the present ATR shall be marked with the number of the present ATR as follows: “ATR D 1/13”.

5 Operating provisions

5.1 Ball valves shall only be mounted on gas cylinders whose test pressure is equivalent to the test pressure of the ball valve.

If the LPG is charged with a compressed gas, the filling ratio and the pressure of the charged gas shall be such that the pressure of the gas in the gas cylinder at 65 °C does not exceed the test pressure of 30 bar.

Note: *For some users, the stored liquefied gas (LPG) is charged with a compressed gas (normally nitrogen) in order to achieve a gas supply that is as steady as possible. The maximum pressure occurring at 65 °C depends on the filling factor of the LPG and the superimposed gas cushion (gas type and pressure). The gas pressure occurring in the gas cylinder at 65 °C is calculated on the basis of 6.7.2.1 (b) (i) and (ii) of ADR[3].*

5.2 Securing during carriage

To avoid inadvertent activation and a resulting release of the gas during carriage, ball valves shall be equipped with a device which reliably prevents the operation of the opening mechanism (e.g. the lever) during carriage and whose activation status is clearly visible.

5.3 Operating instructions

The manufacturer shall explain in the operating instructions differences in use in comparison with conventional LPG cylinder valves (e.g. with regard to the number of activations, the missing excess flow device, etc.).

The maximum permissible filling ratio and, where the LPG is charged with a compressed gas (see 5.1), the maximum superimposed pressure depending on the filling ratio shall be clearly indicated in the operating instructions.

The operating instructions shall clearly indicate the transport modes for which the ball valve has been approved.

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[3] Test pressure calculations are carried out, among others, by Division 2.1 “Gases, Gas Plants” of the BAM Federal Institute for Materials Research and Testing.