

**BAM**

Bundesanstalt für
Materialforschung
und -prüfung

**Recognized technical code
(Anerkanntes Technisches Regelwerk, ATR)**

**for the construction, testing, approval and marking
of gas cylinder quick-release valves**

(ATR D 2/11)

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 4 March 2011 (Federal Law Gazette I, p. 347), the BAM Federal Institute for Materials Research and Testing in agreement with the Federal Ministry of Transport, Building and Urban Development promulgates, in accordance with section 6.2.5 of RID and ADR¹, the recognized technical code for the construction, testing, approval and marking of gas cylinder quick-release valves (ATR D 2/11) as set out below.

The BAM promulgates this ATR also based on Section 6 paragraph 5 of the Transport of Dangerous Goods by Sea Ordinance in the version promulgated on 22 February 2010 (Federal Law Gazette I, p. 238) as amended by Article 2 of the Ordinance of 3 August 2010 (Federal Law Gazette I p. 1139) in conjunction with section 6.2.3.1 of the IMDG Code².

The present Code may be applied from the date of its publication in the Federal Ministry of Transport Gazette. The Federal Ministry of Transport, Building and Urban Development will submit this Code to the competent OTIF and ECE³ Secretariats in accordance with section 6.2.5 of RID/ADR.

1. Introduction

- 1.1 The present ATR provides a framework for the construction, testing, approval and marking of gas cylinder quick-release valves which are mounted on gas cylinders for the carriage of dangerous goods and not covered by the standards referenced in section 6.2.4 of RID/ADR.
- 1.2 If possible and applicable, gas cylinder quick-release valves are constructed, tested, approved and marked in accordance with standard EN ISO 10297:2006 as a recognized standard for closures of pressure receptacles referenced in RID/ADR. Deviations from standard EN ISO 10297:2006 are described below under no. 3. The application-related differences in the design of conventional gas cylinder valves used in industrial applications and gas cylinder quick release valves for the quick-release of the contained gas were considered when the present ATR was drawn up. Gas cylinder quick-release valves are used in a closed condition for extended periods of time and are often only operated in emergency situations (e.g. fire fighting and avalanche airbag applications) or within the framework of technical applications (e.g. expulsion of tear gases). In most cases, the valves are only operated once or a few times.

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 IMDG Code = International Maritime Dangerous Goods Code

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

2 Scope

- 2.1 The present recognized technical code may be applied to the approval of gas cylinder quick-release valves used in refillable gas cylinders for carriage by rail, road, inland waterways and sea.
- 2.2 In addition, gas cylinder quick-release valves of type A (see no. 3.1) which are to be used in non-refillable gas cylinders may be tested in accordance with the present ATR. The approval of these gas cylinder quick-release valves shall, however, not be in accordance with this ATR but as a single unit with the non-refillable gas cylinder in accordance with the applicable provision and standard. In that case, the gas cylinder quick-release valve in accordance with the present ATR replaces the valve in accordance with standard EN ISO 13340:2001 as stipulated in standard EN 12205:2001.
- 2.3 Gas cylinders fitted with a gas cylinder quick-release valve approved in accordance with the present ATR shall not be carried by air.
- 2.4 Gas cylinder quick-release valves in accordance with the present ATR shall be constructed, tested, approved, marked, placed on the market and used for carriage in accordance with the Ordinance on transportable pressure equipment (Ortsbewegliche Druckgeräte Verordnung, ODV), Article 1 of the 6th Ordinance of 29th November 2011 (Federal Law Gazette I p. 2349) amending ordinances on the transport of dangerous goods, in conjunction with section 6.2.5 of RID/ADR and section 6.2.3 of the IMDG Code.
- 2.5 For conformity assessment, the procedure described in section 1.8.7 and sub-section 6.2.3.6 of RID/ADR shall be applied.
- 2.6 A reassessment of conformity of gas cylinder quick-release valves placed on the market before the entry into force of the present ATR shall be permitted where compliance with the requirements of the present ATR is demonstrated.

3 Requirements for gas cylinder quick-release valves

3.1 Definitions

Within the framework of the present ATR, the definitions of standard EN ISO 10297:2006 as well as the following definitions shall apply:

Gas cylinder quick-release valve

A valve/device for gas cylinders which is fitted with at least one actuation device and designed for the quick release of gas. There are valve types A to E.

Note 1 In some cases, the actuation device will only be fitted when and where the cylinder or the system is placed in service.

Note 2 The gas cylinder quick-release valve may have an additional operating device (e.g. hand wheel or lever) with an associated additional sealing system. This operating device may be used as an alternative actuation device e.g. for test actuations without complete release of the gas. Its sealing system offers a second possibility for sealing the valve if the first sealing system fails.

Actuation device

A manually, mechanically, electrically, magnetically, thermally, hydraulically, pneumatically or pyrotechnically operated device for opening the associated sealing system.

Sealing system

System for sealing a valve, e.g. by means of a metal or non-metal seat, piston/flap, bursting/piercing disc or by differential pressure.

Gas cylinder quick-release valve of type A (one-time actuation)

Gas cylinder quick-release valve for one-time actuation for the purpose of forcedly and completely discharging the pressure receptacle whose sealing system is destroyed by the actuation device when the valve is actuated and must be replaced or reconditioned before the valve is used again, if necessary.

Gas cylinder quick-release valve of types B to E (multiple actuation)

Gas cylinder quick-release valve for multiple, if necessary intermittent, actuation for the purpose of completely or (in the case of intermittent actuation) partly discharging the pressure receptacle whose sealing system is not destroyed by the actuation device when the valve is actuated; if the valve is to be used again, only the actuation device needs to be replaced or reconditioned, if at all.

Type B valve: actuation up to 10 times,

Type C valve: actuation up to 100 times,

Type D valve: actuation up to 500 times,

Type E valve: actuation up to 2000 times.

3.2 General requirements

- 3.2.1 Gas cylinder quick-release valves shall comply with the general requirements of sections 6.2.1, 6.2.3 and 6.2.5 of RID/ADR or 6.2.1 and 6.2.3 of the IMDG Code as regards design, construction, testing, approval, and marking as well as the requirements of standard EN 10297:2006, unless the present ATR expressly allows differing requirements or stipulates additional requirements.
- 3.2.2 Gas cylinder quick-release devices shall not be used for gas cylinders which contain substances to be classified as toxic (classification code T, TF, TC, TO, TFC or TOC or Class 6.1 packing groups I, II and III) or as highly corrosive (classification code C or CO or Class 8 packing group I).

3.3 Differing/additional requirements

3.3.1 Excessive torque tests

The tests prescribed in section 6.10 of standard EN ISO 10297:2006 shall only be carried out for gas cylinder quick-release valves with a manually operated rotating operating device.

3.3.2 Leak tightness tests

The external leak tightness test prescribed in section 6.11.3 of standard EN ISO 10297:2006 shall not be carried out for gas cylinder quick-release valves whose sealing system is imperatively closed during carriage and also closed during use.

The leak tightness test at 0.1 bar or 0.5 bar in accordance with Table 2 of standard EN ISO 10297:2006 shall not be carried out for gas cylinder quick-release valves. The leak tightness test at 10 bar in accordance with Table 2 of standard EN ISO

10297:2006 shall only be carried out for gas cylinder quick-release valves which can be actuated intermittently and can release the gas partially.

3.3.3 Endurance tests

The endurance test prescribed in section 6.12 of EN ISO 10297:2006 shall be carried out on at least one actuation device of gas cylinder quick-release valves of types B to E with the number of cycles given in the table below. This test is not applicable for gas cylinder quick-release valves of type A.

Table: Number of cycles to be completed during the endurance test

Valve type	Number of cycles
A	not applicable
B	13
C	130
D	650
E	2600

By derogation from section C.4.2 of Annex C of standard EN ISO 10297:2006, the pause at each fully open position of the gas cylinder quick-release valve (sealing system open) may be reduced to not less than 3 s thus increasing the number of cycles to 6 cycles per minute.

If the additional sealing system (if any) may be subject to pressure differences (i.e. different pressures on the two sides of the sealing system) several times during use and the number of occurrences of these differences is greater than the number of cycles the actuation device and associated sealing system are subjected to during the endurance test, the additional sealing system shall also be subjected to an endurance test in accordance with section 6.12 of standard 10297:2006 with a number of cycles to be indicated by the manufacturer.

3.3.4 Marking

The gas cylinder quick-release valves shall be marked in accordance with section 7 of standard EN ISO 10297:2006; they shall, however, not be marked with "ISO V". In addition, the number of the present ATR and the valve type (see 3.1) shall be indicated as follows: "ATR D 2/11 Z"; Z shall be replaced with the valve type as specified in the table under no. 3.1, e.g. "ATR D 2/2011 type E"

3.3.5 Securing arrangements during carriage

In order to prevent inadvertent actuation and release of gas during carriage, the actuation device of the quick-release valve shall be fitted with securing arrangements or the valve outlet shall be equipped with a pressure retaining gas-tight closure.

3.3.6 Operating Instructions

The manufacturer shall indicate in the operating instructions the type marked on the valve and explain the related restrictions on use. For gas cylinder quick-release valves of types B to E (see no. 3.1), the manufacturer shall additionally indicate in the operating instructions the maximum permissible number of cycles to be completed during the endurance test of the additional sealing system (if any). In the operating instructions it shall be clearly indicated that cylinders fitted with valves in accordance with the present ATR shall not be carried by air.

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