

COMPANION G2 UN composite cylinder handling manual

1 Introduction

This document is a part of the COMPANION G2 documentation. For detailed information on the cylinder's design, marking, etc. see other parts of the documentation.

2 Scope

This document describes essential basic principles and rules which any user, owner and/or other personnel involved should follow for safe use of any COMPANION G2 type cylinders.

3 Product description

COMPANION G2 is a line of composite cylinder with a non-load-sharing liner. Cylinders are intended for liquefied petroleum gas (LPG) use (including UN 1011, 1075, 1965, 1969, 1978) at temperatures from -40 °C to 65 °C. The nominal water capacity and other parameters of cylinders are given in Table 1. The maximum pressure allowed is 30 bar at 65°C. The design life of the cylinders is unlimited. Cylinders are protected by casing, which made of impact proof plastic with antistatic additive. An appropriate conformity certificate, valid for the specific region of use, will be provided.

Table 1 – Specifications of the cylinders

Specs/Model	12	18	24	26
Water capacity, L	12.7	18.2	24.4	26.2
Height, mm	396	481	583	612
Diameter, mm	310	310	310	310
Empty weight, kg	3.6	4.2	5.0	5.2

4 Care of the cylinders

Care and handling of COMPANION G2 cylinders is different from that of steel or aluminium cylinders. The rules and recommendations listed below must be followed to ensure proper care of the cylinders:

- The vacuuming of cylinders is strictly prohibited.
- Intentional expose of cylinders to elevated temperatures is prohibited.
- Maximum working temperature is 65°C (149°F).
- Cylinders heated above 65°C (176°F) have to undergo full inspection.
- Disassembling of a cylinder or removing of any parts by unauthorised personnel is strictly prohibited.
- Exposure of cylinders to a hot water or steam is strictly prohibited.
- Storage of unpressurised cylinders is not recommended.
- Storage of cylinders under direct sunlight is not recommended.
- If a cylinder is dropped from a height of 1.2 meters (four feet) or higher, a complete inspection must be carried out by authorised personnel.
- Wash cylinders with water.
- Tar oil, labels and other foreign matter may only be cleaned from the cylinder's surface manually or with the use of water-jet cleaning. Chemical cleaning, solvents and/or aggressive surfactants are prohibited.

- Cylinder should not be partially or completely submerged into water for a long time.
- Cylinders should not be stored mechanically squeezed by package or in any other manner for a long time.

5 Inspection of the cylinder before filling

The best approach is to follow the EN 1439:2008 “Procedure for checking LPG cylinders before, during and after filling”, but at the very least the following steps and requirements must be fulfilled.

- Inspect the cylinder to ensure that the required permanent markings are on the cylinder.
- Check that the markings are complete and make sure that the latest test/inspection date is not more than ten years old (or less than the term prescribed by the regulations of the specific region of use).
- Check that the date of the next periodical control (if any) is not due.
- Inspect the cylinder visually according to Table 2 below for the criteria for acceptance/rejection.
- If any damage is observed that meets, or is more severe than, the rejection limits, the cylinder must be appropriately marked, permanently removed from service and passed for detailed analysis to the manufacturer or its authorized representative. Repair of the cylinder is not permitted.
- Personnel with the written authorization of the manufacturer can only perform removal or replacement of the outer casing.
- All new COMPANION G2 cylinders sent to customers are pressurised by air. The internal pressure should be checked before releasing the air and the first filling. The pressure level must not be less than 4.5 bar.

Table 2 – The criteria for acceptance/rejection based on visual inspection

Defect description	Criteria for allowance
Casing	
Scratches	Allowed, but not through scratches
Dents	Allowed after inspection by authorised person only
Cracks	Allowed after inspection by authorised person only
Damage to labelling	Not allowed, the information must be renewed
Sticker damage	Not allowed, must be renewed
Handle insert is absent	Allowed after inspection and repair by authorised person only
Any damage caused by fire	Not allowed
Any damages caused by aggressive substances	Not allowed
Composite overwrap	
Scratches of a depth greater than 0.5 mm and longer than 30 mm	Not allowed
Denting of outer surface or of composite material structure	Not allowed

Rupture of armouring fibre	Not allowed
Delaminating	Not allowed
Lines and sediments of resin	Allowed, maximum total area 100 cm ²
Any damages caused by aggressive substances	Not allowed
Other	
Sign damaging	Allowed but the information must be renewed
Deformation which changes external look	Not allowed
Any damage caused by fire	Not allowed
Damage to neck thread	Allowed after repair by authorised person
Damage of neck assembly (cracks, deformation, etc.)	Not allowed
Scratches and small deformations of bottom flange	Allowed
Dirt and grease on the surface	Allowed after cleaning
Loss of liner shape in the empty cylinder	Allowed
Valve damage (any types)	Not allowed
Rotating of composite shell in casing	Allowed

6 Filling of cylinders

Cylinders should be filled according to the requirements of all local normative documents valid for the specific region of use. In addition to the requirements of the standards and regulations it is strongly recommended that the rules and recommendations bellow are followed:

- Cylinders should only be filled at specialised premises or filling stations according to safety regulations at gas facilities. Using of Auto LPG facilities is strictly prohibited.
- The relative humidity at the premises during filling should not be less than 65 %. If the humidity is lower or unknown, humidification of the upper part of the cylinders using water or a wet cloth is strongly recommended before filling.
- The air in cylinders must be released before filling.
- The vacuuming of cylinders is strictly prohibited.
- Valve installation and removal can only be performed by qualified personnel.
- Inspection (by weight or volume) of the quantity of gas filled must be carried out after filling to make sure that the maximum amount of gas has not been exceeded.
- If a cylinder has been overfilled, it is necessary to release the gas safely according to all rules and conditions defined by normative documents valid for the specific region. Cylinder must then be reinspected.
- The pressure while filling cannot be more than the cylinder's working pressure.
- A leak test must be performed on each cylinder after filling. Leaking cylinders must be separated from the others and marked with the appropriate marking.
- Air may escape from cavities under label ring or composite shell after cylinder filling and sometimes it looks like leakage. For quickest test and most reliable results, it is recommended to use gas analyser.
- Before storage or delivery of the filled cylinders, each valve must be reinspected for the presence of the safety cap and the proper marking.

7 Filling of cylinders used in countries which are members of the ADR

During filling all local regulations including ADR requirements should be followed. Cylinders are intended for liquefied petroleum gases. For additional information regarding filling, handling, transportation, storage etc. see the last valid version of the ADR (packing instruction P200, special provisions 274, 583, 639 and etc.), directives of the European Parliament and Council 2008/68/EC and 2010/35/EU or their latest versions.

Table 3 – Filling of the cylinders

UN	Name and description	Filling ratio	Water capacity, L				
			12.7	18.2	24.4	26.2	
			Maximum weight of gas allowed, kg				
1011	BUTANE	0.52	6.60	9.46	12.69	13.62	
1075	PETROLIUM GASES, LIQUIFIED	*)					
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S	Mixture A	0.5	6.35	9.10	12.20	13.10
		Mixture A01	0.49	6.22	8.92	11.96	12.84
		Mixture A02	0.48	6.10	8.74	11.71	12.58
		Mixture A0	0.47	5.97	8.55	11.47	12.31
		Mixture A1	0.46	5.84	8.37	11.22	12.05
		Mixture B1	0.45	5.72	8.19	10.98	11.79
		Mixture B2	0.44	5.59	8.01	10.74	11.53
		Mixture B	0.43	5.46	7.83	10.49	11.27
	Mixture C	0.42	5.33	7.64	10.25	11.00	
1969	ISOBUTAN	0.49	6.22	8.92	11.96	12.84	
1978	PROPAN	0.43	5.46	7.83	10.49	11.27	

*) according to the ADR clause 2.2.2.3 "List of collective entries" this entry usually means mixtures of propane and butane. In this case UN 1965 filling ratios should be used. In case of use of any LPGs not mentioned in the Table 2 decision about such filling and filling ratios must be made relying on the maximum gas pressure at the temperature of 65°C, which in no cases can exceed 30 bar. Further instructions on calculation of filling ratios can be found in packing instruction P200 of the ADR.

8 Storage and transportation

Cylinders should be stored in accordance with all local standards and regulations. In addition to the regulations it is strongly recommended that the rules and recommendations listed below are followed:

- Cylinders can be stacked during storage and transportation to a height of not more than four layers. Filled cylinders must be packed and transported maximally in two layers.
- Cylinder valves should be equipped with protective caps.
- Cylinders should not be stored in direct sunlight.
- Cylinders should be appropriately fixed during transportation.

9 Periodic inspection and testing

For detailed instructions regarding inspection and testing of the cylinders, please see the appropriate normative documents valid for the specific region.

