भारतीय मानक

Indian Standard

IS 8198 (Part 6) : 2025

संपीड़ित गैसों के लिए स्टील सिलेंडर — रीति संहिता

भाग 6 तरलीकृत क्लोरीन गैस

(दूसरा पुनरीक्षण)

Steel Cylinders for Compressed Gases — Code of Practice

Part 6 Liquefied Chlorine Gas

(Second Revision)

ICS 23.020.30

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

April 2024 **Price Group 8**

Gas Cylinders Sectional Committee, MED 16

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gas Cylinders Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1979 and subsequently revised in 1988. This standard is being revised to keep pace with the latest technological developments and international practices. Also, in this revision, the standard has been brought into the latest style and format of Indian Standards, and references of Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016. Hazard Identification as per Globally Harmonized System (GHS) has been added in the standard.

For safe handling of cylinders containing liquid chlorine gas, one should be thoroughly conversant with properties and characteristics of chlorine. There are several precautions and safe practices which are to be observed on account for the nature of chlorine and also because of the pressure to which the cylinders are subjected.

Manufacturers, fillers and users of gas cylinders covered by this code should be familiar with the precautions laid down in this code in order to ensure safe and efficient operating conditions. For general information on different gases conveyed in cylinders, SP 9 : 1973 ‘Technical data sheet for gases conveyed in cylinders’, may also be referred to.

Other standards in this series are listed below:

Part 1 Atmospheric gases

Part 2 Hydrogen gas

Part 3 High pressure liquefiable gases

Part 4 Dissolved acetylene gas

Part 5 Liquefied petroleum gas (LPG)

Part 7 Ammonia gas

Part 8 Common organic refrigerant gases

Part 9 Sulphur dioxide gas

Part 10 Methyl bromide gas

Part 11 Methyl chloride gas

Part 12 Gases for medical use

Manufacture possession and use of any gas when contained in cylinders in compressed or liquefied form is regulated under the *Gas Cylinders Rules*, 1981 of the Government of India as amended from time to time. Although the code has been prepared in consultation and agreement with the statutory authorities under these rules, should anything in the code conflict with the provisions of gas cylinder rules, the latter shall be adhered to.

In using this code, IS 4263 : l 967 ‘Code of safety for chlorine’ and IS 646 : 2020 ‘Liquid chlorine, technical — Specification (*third revision*)’ shall also be borne in mind.

The quantities in this standard have been expressed in technical metric units. However, in view of the introduction of International System (SI) units in the country, the relevant SI units and the corresponding conversion factors are given below for guidance:

Pressure : 1 kgf/cm^2 = 98.066 5 kPa (kilopascal) = 0.980 665 bar
Stress : 1 kgf/mm^2 = 9.806 65 N/mm^2 (newton per square millimetre)

Indian Standard

STEEL CYLINDERS FOR COMPRESSED GASES — CODE OF PRACTICE

PART 6 LIQUEFIED CHLORINE GAS

(Second Revision)

1 SCOPE

This standard (Part 6) covers filling, inspection, testing, maintenance and use of portable stee1 cylinders for storage and transportation of liquefied chlorine gas in cylinders.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 7241 shall apply.

4 PROPERTIES AND PHYSICAL CONSTANTS

4.1 The properties and physical constants of chlorine gas are described briefly in Table 1. The vapour of chlorine at different temperatures is given in Table 2.

Table 1 Properties and Physical Constants of Liquefied Chlorine Gas

(*Clause* 4.1)

Sl No.	Property Type /Physical Constant	Properties/Value
(1)	(2)	(3)
i)	Physical properties	Greenish-yellow, characteristic highly irritating and penetrating odour.
ii)	Chemical properties	Neither explosive nor flammable, like oxygen it is capable of supporting combustion of certain substances, toxic and corrosive.
iii)	Chemical symbol	Atomic Cl Molecular Cl_2
iv)	Atomic weight	35.457
v)	Specific gravity compared to air at 1 atm and 0 °C	2.49
vi)	Critical temperature	144 °C
vii)	Liquid density at 15 °C	1.424
viii)	Roiling point at 760 torr	− 34 °C

Table 2 Vapour Pressure of Chlorine at Different Temperatures

(*Clause* 4.1)

Sl No.	Temperature °C	Vapour Pressure Kgf/cm^2 (abs)
(1)	(2)	(3)
i)	− 34.6	1.03
ii)	− 30.0	1.27
iii)	− 20.0	1.90
iv)	− 10.0	2.70
v)	0	3.78
vi)	+ 10	5.12
vii)	+ 20	6.69
viii)	+ 30	8.89
ix)	+ 40	11.5
x)	+ 50	14.5
xi)	+ 60	18.2
xii)	+ 65	19.9
xiii)	+ 70	22.3
xiv)	+ 80	27.0
xv)	+ 90	32.5
xvi)	+ 100	38.8
xvii)	+ 110	45.8
xviii)	+ 120	54.1
xix)	+ 130	63.4
xx)	+ 140	73.8
xxi)	+ 144	78.6

4.2 Maximum Permissible Toxicity

1 ppm by volume (This is the maximum concentration in air to which nearly all workers may be exposed day after day without adverse effects. Concentration above 2 ppm to 3 ppm in the air is readily detectable by a normal person. Inhalation of air containing 40 ppm to 60 ppm of chlorine for a period ranging from 30 min to 60 min is quite dangerous).

4.3 Chemical Reaction with Metals and Non-metals

Dry chlorine reacts with aluminium, tin, arsenic, gold, mercury, selenium, tellurium, and titanium. Metals resistant to dry chlorine are steel, iron, copper, nickel, and lead. Even small amounts of moisture when mixed with chlorine from hypochlorous and hydrochloric acids that are very corrosive to most of the metals. Only silver, platinum, tantalum and titanium can resist attack by moist chlorine (*see* IS/ISO 11114-1 and IS/ISO 11114-2).

5 APPROVED SPECIFICATIONS AND GENERAL GUIDANCE FOR MANUFACTURE

5.1 The cylinders used for storage and transportation of atmospheric gases shall conform to one of the specifications approved by the statutory authority. The list of approved specifications for filling in this country is available with *Chief Controller of Explosives, Nagpur*.

5.2 Additional wall thickness amount shall be added at appropriate places to take care of horizontal and

vertical acceleration and deceleration during normal handling and transportation, so that permitted stresses are not exceeded under given service conditions as agreed between the manufacturer and the purchaser.

If there is a pronounced departure proposed from normal practice, or if there is any unusual feature introduced then the statutory authority shall be consulted.

5.3 Cylinders manufactured in accordance with approved specifications shall be provided with an additional wall thickness of 1.5 mm to allow for corrosion during service. It shall be borne in mind that corrosion allowance is not related to the thickness of the container so that any additional thickness allowed for corrosion should be constant 1.5 mm rather than a given proportion of thickness.

6 INSPECTION

6.1 Inspection During Manufacture

One of the inspecting agents approved by the statutory authority shall visit the manufacturing works to check and verify the following:

6.1.1 That the chemical composition and physical properties of the steel used of the manufacture of cylinders strictly conform in all respects to the required specifications and that this chemical analysis of the material has been verified.

6.1.2 That a steel maker's guarantee certificate ensuring that the steel used for making the cylinder is manufactured in accordance with the approved process and is available with the manufacturer, and that the material used for making each cylinder has been examined by him and found to be sound in all respects.

6.1.3 That all cylinders which pass the above tests and accepted have been officially stamped by him.

6.1.4 That the mechanical properties, the wall thickness, inner and outer surfaces of the cylinders were found satisfactory and in accordance with the requirements.

6.1.5 That the length, capacity, and the mass of each cylinder were found within tolerance limits.

6.1.6 The hydrostatic test for each cylinder has been witnessed and has passed the same [*see* **15** of IS 3196 (Part 4)].

6.1.7 That the heat treatment of the cylinders was supervised and found to be in conformity with the requirements.

6.2 Inspection During Usage

All the cylinders shall be examined for the following when received for filling.

6.2.1 That the cylinder conforms to one of the specifications approved by the statutory authority for use in this country.

6.2.1.1 A cylinder, either not conforming to any of the standard specification or when the specification is not known, shall not be accepted for filling unless approved and cleared by the statutory authority.

6.2.1.2 That the cylinder is properly identified from the stamp marking with the documentation provided by customer and the cylinder is within validity period of the filling permission, or the retesting certificate.

6.2.2 That the statutory requirements regarding valves, markings, fittings, and paintings are complied with.

6.2.3 That the external condition of the cylinder body is sound. Any defect, such as dent, bulge, cut, gouge, corrosion, etc, which is liable to weaken the cylinder wall as certified by a competent person will render the cylinder unfit for further use. The acceptability limit of such damaged cylinders is detailed in IS 5845.

6.2.4 That the outlet threads of valves are in good condition. That the spindle is sound and not broken and the gland washers which shall be of good quality and compatible with chlorine are not worn out.

6.2.5 That the cylinder is not due for periodic inspection and testing as indicated from the marking son the cylinder.

6.3 Periodic Inspection and Testing

Cylinders shall be periodically tested and inspected as follows:

6.3.1 All cylinders when received for filling shall be checked by the filler if they are due for hydrostatic re-testing. Hydrostatic test shall be carried out in accordance with IS 5844.

6.3.2 The cylinders are to be tested periodically as stipulated by the statutory authority (*see* IS 15975.

6.3.3 The examination and testing of cylinder shall be done by a competent person approved by the statutory authority.

6.3.4 All cylinders in service, shall be carefully examined internally and externally for any damage.

In case of suspected damage to the parent metal, all protective coating and foreign matter, if any, shall be removed where necessary prior to such examination so that the surface can be properly examined. The damage, if any, shall be carefully ascertained, the acceptability limit of the same is detailed in IS 5845.

6.3.5 The internal examination shall be conducted by a low voltage electric lamp or preferably fiber optic illumination which will give adequate illumination to have a clear view so that the defect, if any, can be detected.

7 DISPOSAL OF CONDEMNED CYLINDERS

7.1 Cylinders which do not comply with the requirements of inspection and testing shall be destroyed in accordance with IS 9200.

7.2 Record of such cylinders shall be closed and kept for a period of one year.

8 FITTINGS

8.1 Cylinders shall be fitted with a valve conforming to IS 3224.

8.2 The cylinder shall have its valve protected against damage by the provision of a stout metal cap or shroud, securely attached to the body of the cylinder.

8.3 Safety device shall not be provided for chlorine cylinders (*see* IS 5903).

8.4 The colour of the paint on the cylinders (*see* IS 4379) shall always be maintained by periodically repainting them.

9 FILLING

9.1 While filling, the cylinder shall be filled in such a manner that the filling ratio does not exceed 1.19 (*see* IS 3710).

9.2 The amount of liquid chlorine charged into each cylinder shall be determined by weighing after the cylinder has been disconnected from the line and on no account the cylinder shall be charged in excess of the filling ratio.

9.3 All the cylinders shall be carefully examined for leaks after filling. Where leaks cannot be stopped, the cylinder shall be emptied and inspected for the cause of leakage.

9.4 Emptying of the cylinder shall not be accelerated by direct heating of the cylinder.

9.5 Cylinder shall be filled in an approved filling station only.

9.6 Filling staff shall identify the cylinders from their golden-yellow colour and the chlorine symbol as (*see* IS 4379) punched on the cylinder before proceeding to fill them. The colour shall be considered as secondary. Check that the cylinder is fitted with the valve with correct outlet and not damaged.

10 MARKING AND LABELLING

10.1 Marking

10.1.1 *On Cylinders*

Each cylinder shall be permanently marked on the valve end of the cylinder with the following markings:

a) Serial number, identification and symbol of the manufacturer;

b) Number of the standard to which the cylinder conforms;

c) Test pressure;

d) Date of hydrostatic stretch test with code mark of the station where the test was carried out;

e) Water capacity in litres;

f) Tare mass;

g) Working pressure; and

h) Chlorine symbol.

10.1.2 *On Valves*

The following markings shall be made on cylinder valves:

a) Number of the standard;

b) Chlorine symbol, Cl;

c) Test pressure; and

d) Manufacturer’s symbol and year of manufacture.

10.2 Labelling

Each filled cylinder shall carry a label tacked to the cylinder, detailing the name of the filling station, its location, name of the gas in capital, ‘CHLORINE’, and the warning instructions as described in **20**.

11 STORAGE

11.1 Cylinders shall be stored in a dry ventilated place away from excessive heat or danger of fire, and protected from accumulation of snow and ice. It is preferable that the chlorine storage room be fire proof.

11.2 Cylinders shall never be stored near gangways, elevators or near ventilating systems.

11.3 Dangers can be reduced by storing cylinders so that the oldest stock can be used first.

11.4 Keeping the full and empty cylinders separate and storing in an orderly way will reduce the necessary handling and confusion and permit frequent inspection for signs of leaks or other dangers. Valve protection hoods shall always be kept in place except when cylinders are actually being emptied.

11.5 Cylinders shall be stored in an upright position. Tonne containers shall be stored on their side preferably on steel rails slightly above the floor.

12 HANDLING

12.1 Adequate care shall be taken in handling the cylinders so that these are not dropped or struck against each other violently.

12.2 Cylinders shall be moved on properly balanced hand trucks, preferably with rubber tyres. A clamp or chain support, two-thirds of the way up the cylinder or purpose-built pallets/drum cradles shall be used.

12.3 Hoisting of cylinders is not recommended. However, if hoisting cannot be avoided, a lifting clamp cradle or carrier shall always be used. Chlorine cylinders shall never be hoisted with lifting magnet, ropes or chain sling. A cylinder shall never be lifted by its hood as it is not strong enough to support the weight.

12.4 The cylinders shall not be used as rollers to move other equipment.

12.5 In case of tonne containers, stationary or movable jib cranes or travelling overhead rail hoists of at least two tonnes capacity and capable of clearing the load at least 2 m above the track rail, are suitable for lifting tonne containers.

12.6 A beam equipped with hooks to grip the edge of the tonne container is a satisfactory device for lifting the tonne container.

12.7 Travelling overhead hoists, or specially equipped trucks and dollies may be used for moving tonne containers to storage or point of use.

13 TRANSPORTATION

13.1 Cylinders may be shipped by truck, rail, or water.

13.2 Cylinders shall not be loaded on vehicles in such a manner that they may bounce or strike against each other.

13.3 During transport, cylinders shall not project in horizontal plane beyond the sides or ends of the vehicle. Cylinders are best transported upright rather than horizontal position.

13.4 Cylinders on vehicle shall be blocked or braced and secured to prevent movement or falling down. For this purpose built cages/pallets may be used, two-thirds of the way up the cylinder or purpose-built pallets/drum cradles may be used.

13.5 There shall not be any sharp projections on the inside of the vehicle which can damage the cylinder wall.

13.6 Leaky or defective cylinders shall not be transported.

13.7 When cylinders are transported by rail, it shall be done in accordance with the *Railway Red Tariff Rules*. Cylinders shall be pasted with label for dangerous and poisonous gas as recommended by the railways.

13.8 The transport contractor or the personnel's involved for transport of cylinders shall be informed of the special care that has to be taken for chlorine cylinders and shall be well informed about the toxicity of chlorine.

14 REMOVING CHLORINE FROM CYLINDERS

14.1 Connections

14.1.1 Outlet threads on container valves are not tapered pipe threads. Connections shall be made with yoke and adoptor with requisite gasket.

14.1.2 Flexible 12.7 mm copper tube of at least 35 kgf/cm^2 working pressure shall be used for connections between cylinder and stationary piping.

14.1.3 A shut off valve suitable for liquid chlorine service shall be provided at the beginning of the stationary piping to simplify the changing of the containers.

14.2 Valves

14.2.1 To unseat the valve, the end of the wrench shall be struck with the help of hand and then opened slowly.

14.2.2 One complete turn permits maximum discharge point. The valve shall not be forced beyond this.

14.2.3 If the valve is too tight to open, the packing gland nut shall be slightly loosened to free the stem.

14.2.4 Large wrenches or pipe wrenches shall not be used on valve opening.

15 DISCHARGE

15.1 Cylinders discharge gas when upright, and liquid when inverted.

15.1.1 Inverted cylinders shall be supported at the shoulders and held in place by clamps or chains about the cylinder body.

15.2 Tonne containers are unloaded from a horizontal position, one valve above the other. The upper valve discharges chlorine gas, and the lower liquid chlorine.

15.2.1 Tonne containers shall be placed in a cradle or carefully blocked during discharge.

16 GAS FLOW

16.1 The rate of gas flow can be increased by improving air circulation about the container or by increasing the room temperature if it is below normal. Heat shall not be applied directly to the cylinder for any reason.

16.2 If a high rate of gas flow is required, chlorine shall be withdrawn as liquid and converted to gas by means of a vaporizer.

16.3 Joining together or manifolding of the outlets of several cylinders to increase the flow rate shall not be done.

16.4 The amount of chlorine remaining in a cylinder shall be best found by comparing the mass of the cylinder with the tare mass when empty. If the container is placed on a scale during unloading, the amount remaining is known at all times.

16.5 When chlorine is being absorbed in a liquid, there is sometimes a tendency for the liquid to be sucked back into the container as it becomes empty. This may result in serious accidents.

16.5.1 A vacuum break loop or device as indicated in Fig. 1 shall be employed, whenever chlorine from cylinders or containers is absorbed in a liquid.

17 GENERAL PRECAUTIONS

17.1 Cylinders shall be handled by properly instructed and trained persons.

17.2 Attempts shall never be made to remove the valve from the cylinder body except by complaint from persons fully conversant with the job.

17.3 Cylinders with defects shall be immediately labelled appropriately and returned to the supplier.

17.4 Marking of a cylinder shall never be defaced and identification colour should never be changed.

17.5 If any incident occurs to the cylinder, the supplier shall be immediately informed giving the cylinder number, nature of damage and, if possible, the reasons for the incidence.

17.6 When there is a doubt in proper handling of the cylinder, the manufacturer or supplier of the cylinder shall be consulted.

17.7 The cylinder shall not be filled with any other gas.

18 CHLORINE LEAKS

18.1 Chlorine leaks shall always be taken care of immediately or they will become worse.

18.2 Corrective measures shall be undertaken by trained men only, wearing proper safety equipment.

18.3 In case of leakage, all persons in the affected area shall be warned and evacuated.

18.4 Leaky cylinder shall be moved quickly to safe open area.

18.5 If chlorine is leaking as liquid, the cylinder shall be turned so that the leaking side is on the top, so that only the gas leaks, thus reducing egress rate of gas.

18.6 Water shall not be poured on chlorine leak.

18.7 Leaks at valve inlet, and body usually require special handling and emergency equipment.

18.8 Leaks around valve stems and valve discharge outlet shall he stopped by closing the valve or tightening the packing gland nut or replacing the gaskets.

18.9 A leaking container shall not be transported.

18.10 Suitable gas masks with eye shields shall be available within easy reach whenever cylinders and containers are handled.

18.11 For handling leaks in chlorine cylinders, chlorine emergency/safety kits shall be used. The safety kits shall be designed to contain the leaks in and around the cylinder valves and in the side wall of the cylinder valves. The illustrations are provided in Fig 1. Alternatively, kits recommended by *Chlorine Institute, USA* may be used.

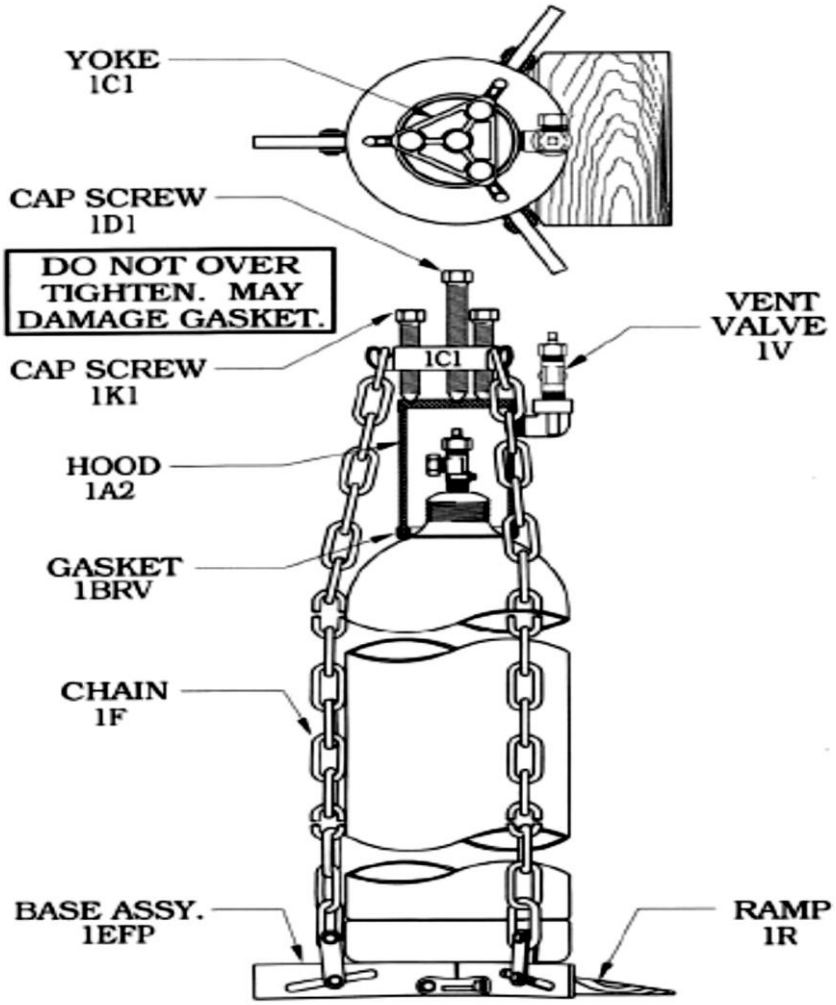

FIG. 1A EMERGENCY HOOD FOR LEAKS AROUND THE VALVE

Key

(3) Cap Screws	1K1	Cap screw	1D1
Hood	1A2	Yoke	1C1
Gasket	1BRV	Ramp	1R
Chain	1F	Base assembly	1EFP
Vent valve	IV		

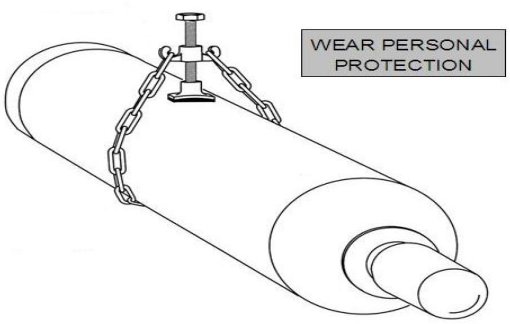

FIG. 1B DEVICE FOR BODY LEAKS (PATCH ASSEMBLY)

NOTE — At all times, before and after application of emergency devices, position cylinder such that the source of the leak is in the gas phase.

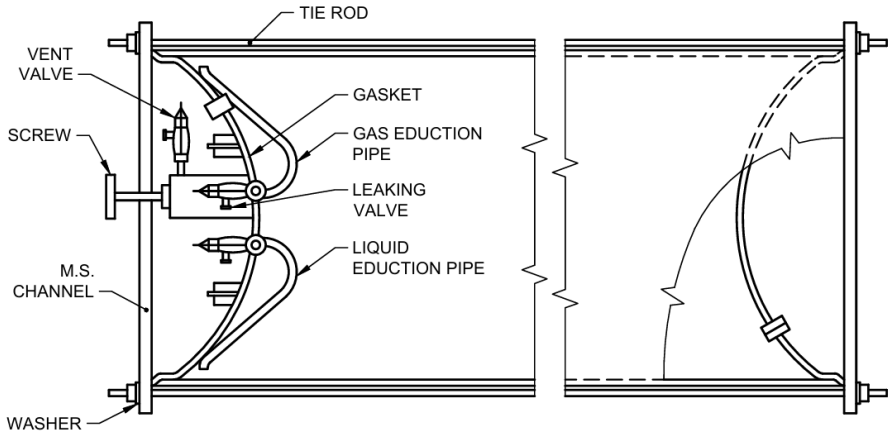

FIG. 1C EMERGENCY HOOD FOR CHLORINE TONNER VALVE LEAKS

FIG. 1 CHLORINE EMERGENCY/SAFETY KIT ILLUSTRATION

19 RECORDS

19.1 Filling station shall maintain the following record in respect of each cylinder examined and tested for filling:

a) Name of the manufacturer and the owner;

b) Cylinder numbers;

c) Specifications to which the cylinder conforms;

d) Date of original hydrostatic test;

e) Test reports and certificates furnished by the manufacturer;

f) Test pressure;

g) Maximum working pressure;

h) Water capacity in litres;

j) Date of last hydrostatic test;

k) Tare mass of cylinder;

m) Variation, if any, in tare mass marked on the cylinder and actual tare mass at the time of hydrostatic test;

n) Type of valve fitted;

p) Mass of chlorine charged;

q) Maintenance attended; and

r) Remarks.

19.1.1 Permission obtained from the statutory authority permitting the use of cylinder shall be preserved till the cylinder is condemned.

20 HAZARD IDENTIFICATION AS PER GLOBALLY HARMONISED SYSTEM (GHS)

20.1 Classification of the Hazardous Chemical

Classification according to *Industry Code of Practice on Chemicals Classification and Hazard Communication*, 2014 is as follows:

i)	Press. Gas (Liq.)	H280
ii)	Acute Tox. 3 (Inhalation)	H331
iii)	Skin Irrit. 2	H315
iv)	Eye Irrit. 2	H319
v)	STOT SE 3	H335
vi)	Aquatic Acute 1	H400

20.2 Label Elements

Labelling according to *Industry Code of Practice on Chemicals Classification and Hazard Communication*, 2014 is as follows:

Hazard Pictograms (GHS-MY)	:	 GHS04 GHS06 GHS09
Signal Word (GHS MY)	:	Danger
Hazard Statements (GHS MY)	:	H280 — Contains gas under pressure; may explode if heated. H315 — Causes skin irritation. H319 — Causes serious eye irritation. H331 — Toxic if inhaled. H335 — May cause respiratory irritation. H400 — Very toxic to aquatic life.

Precautionary Statements (GHS MY)		
Prevention	:	P261 — Avoid breathing dust/fume/gas/mist/vapours/spray. P264 — Wash hands, forearms and face thoroughly after handling. P271 — Use only outdoors or in a well-ventilated area. P273 — Avoid release to the environment. P280 — Wear protective gloves/protective clothing/eye protection/face protection.
Response	:	P302 + P352 — IF ON SKIN: Wash with plenty of water P304 + P340 — IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305 + P351 + P338 — IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P311 — Call a POISON CENTER/doctor. P321 — Specific treatment (see supplemental first aid instruction on this label). P332 + P313 — If skin irritation occurs: Get medical advice/attention. P337 + P313 — If eye irritation persists: Get medical advice/attention. P391 — Collect spillage. P332 + P313 — If skin irritation occurs: Get medical advice/attention. P337 + P313 — If eye irritation persists: Get medical advice/attention. P391 — Collect spillage.
Storage	:	P403 + P233 — Store in a well-ventilated place. Keep container tightly closed. P405 —Store locked up. P410 + P403 — Protect from sunlight. Store in a well-ventilated place.
Disposal Considerations	:	P501 — Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

20.3 Personal Protective Equipment

Wear safety shoes while handling containers.

Keep suitable chemically resistant protective clothing readily available for emergency use (*see* EN 943-1). Wear safety shoes while handling containers such as liquid, solid, and gaseous chemicals. (*see* ISO 20345).

20.3.1 Hand Protection

Wear working gloves when handling gas containers as per IS 8807. Wear cold insulating gloves when transfilling or breaking transfer connections. Wear chemically resistant protective gloves. Consult glove manufacturer´s product information on material suitability and material thickness. The breakthrough time of the selected gloves must be greater than the intended use period.

20.3.2 Eye Protection

Wear goggles and a face shield when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers.

20.3.3 Respiratory Protection

Gas filters may be used if all surrounding conditions, for example, type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, for example, connecting or disconnecting containers. Recommended: Filter B (grey). Consult respiratory device supplier's product information for the selection of the appropriate device. Gas filters do not protect against. Keep self-contained breathing apparatus readily available for emergency use. Self-contained breathing apparatus is recommended, where unknown exposure may be expected, for example, during maintenance activities on installation systems.

21 TRANSPORT INFORMATION

21.1 UN Number

UN-No.(UN RTDG)	:	1017
UN-No. (IMDG)	:	1017
UN-No. (IATA)	:	1017

21.2 Proper Shipping Name

Proper Shipping Name (UN RTDG)	:	CHLORINE
Proper Shipping Name (IMDG)	:	CHLORINE
Proper Shipping Name (IATA)	:	Chlorine

21.3 Transport Hazard Class(es)

UN RTDG

Transport Hazard Class(es) (UN RTDG) : 2.3 (5.1, 8)

Danger Labels (UN RTDG) : 2.3, 5.1, 8

:

IMDG

Transport Hazard Class(es) (IMDG) : 2.3 (5.1, 8)

Danger Labels (IMDG) : 2.3, 5.1, 8

:

IATA

Transport Hazard Class(es) (IATA) : 2.3 (5.1, 8)

:

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No./Other Standards	*Title*
IS 3196 (Part 4) : 2001	Welded low carbon steel cylinders exceeding 5 litre water capacity for low pressure liquefiable gases — Specification: Part 4 Cylinders for toxic and corrosive gases
IS 3224 : 2021	Valve for compressed gas cylinders excluding liquefied petroleum gas (LPG) cylinders — Specification (*fourth revision*)
IS 3710 : 1978	Filling ratios for low pressure liquefiable gases contained in cylinders (*first revision*)
IS 4379 : 2021	Identification of contents of industrial gas cylinders (*second revision*)
IS 5845 : 2024	Inspection of low pressure welded steel gas cylinders other than lpg cylinders in use — Code of practice (*third revision*)
IS 5844 : 2014	Hydrostatic stretch testing of compressed gas cylinders — Recommendation (*first revision*)
IS 5903 : 2014	Recommendation for safety devices for gas cylinders (*first revision*)
IS 7241 : 2024	Gas cylinder technology — Glossary of terms (*second revision*)
IS 8807 : 1978	Guide for selection of industrial safety equipment for protection of arms and hands
IS 9200 : 2021	Methods of disposal of unserviceable compressed gas cylinders — Code of practice (*second revision*)
IS 15975 : 2020	Gas cylinders — Conditions for filling gas cylinders (*first revision*)
IS/ISO 11114-1 : 2020	Gas cylinders — Compatibility of cylinder and valve materials with gas contents: Part 1 Metallic materials (*first revision*)
IS/ISO 11114-2 : 2021	Gas cylinders — Compatibility of cylinder and valve materials with gas contents:: Part 2 Non-metallic materials (*second revision*)
EN 943-1 : 2015	Protective clothing against dangerous solid, liquid and gaseous chemicals, including liquid and solid aerosols — Part 1: Performance requirements for Type 1 (gas-tight) chemical protective suits
ISO 20345 : 2021	Personal protective equipment — Safety footwear

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Gas Cylinder Sectional Committee, MED 16

Organization	*Representative*(*s*)
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Ashok Leyland Limited, Chennai	SHRI VED PRAKASH GAUTAM SHRI FAUSTINO V. (*Alternate*)
Automotive Research Association of India, Pune	DR S. S. THIPSE SHRI S.D. RAIRIKAR (*Alternate*)
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Directorate General of Quality Assurance, New Delhi	COL SABIR HUNDEKAR
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Organization	*Representative*(*s*)
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The composition of the Committee, responsible for the formulation of this standard is given in Annex B.

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Headquarters:

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Regional Offices: *Telephones*

Central : 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002 { 2323 7617

Eastern : 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091 { 2367 0012 2320 9474

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019 { 265 9930

Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113 { 2254 1442 2254 1216

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