IS 646:2020 Liquid Chlorine - Technical - Specification (third revision)

Liquid Chlorine - Technical Grade refers to chlorine in its liquid state, which is a highly reactive and corrosive chemical element commonly used in industrial applications. The "technical grade" designation indicates that the chlorine is not of the highest purity (like that found in "reagent" or "pharmaceutical grade" chlorine), but rather it meets the requirements for typical industrial and commercial use.

In liquid form, chlorine is typically stored and transported under pressure, as it is a gas at room temperature but becomes a yellow-green liquid when compressed or chilled. Technical-grade liquid chlorine typically contains small amounts of impurities, such as chlorinated organic compounds, hydrochloric acid, and other byproducts from its production process.

Key Characteristics:

- **Appearance**: Yellow-green liquid
- **Boiling Point**: -34.04°C (-29.27°F) at standard atmospheric pressure
- **Uses**: Water treatment (disinfection), production of chlorine-based chemicals (e.g., PVC, solvents), bleaching, and industrial processes.
- **Safety**: Highly toxic and corrosive; requires proper handling and safety measures to prevent exposure and accidents.

The exact chemical composition of technical-grade liquid chlorine can vary slightly depending on the manufacturer or production process, but it is generally suitable for industrial processes rather than applications requiring high-purity chlorine.

IS 646:2020 prescribes the requirements and the methods of sampling and testing for technical-grade liquid chlorine, used in the bleaching of pulp and textiles, water sterilization, and manufacture of chemicals.

Although the technical-grade chlorine is packed and sold as a liquid, it is usually used as a gas. In India, Chlorine is deemed to be an explosive, when contained in any metal container, in a compressed or liquefied state as per the Indian Explosives Act 1984. The filling, possession, transport and importation are governed by Gas Cylinder Rules, 2016.

The standard has the following key requirements:

Sl. No.	Characteristic	Requirement
1.	Chlorine in vapourized liquid, percent by volume, Min.	99.8
2.	Moisture, parts per million (ppm)	150
3.	Mercury (as Hg), parts per million (ppm)	20
4.	Arsenic (as As), parts per million (ppm), Max	200
5.	Lead (as Pb), parts per million (ppm), Max	200

The test methods to ascertain the prescribed requirements have also been provided in IS 646:2020.

Additionally, IS 646:2020 specifies the following requirements w.r.t packing and marking:

Packing and Marking: The Standard specifies that the Chlorine shall be supplied in the liquefied condition in suitable cylinders or other containers whose capacity shall be subject to agreement between the purchaser and the supplier. The Standard also refers to the Gas Cylinder Rules 2016 for the compliance of the cylinders and containers.

IS 646 ensures the safe, efficient, and environmentally responsible use of Liquid Chlorine-technical grade. It covers key aspects such as properties, packaging, and quality control ensuring that industries using liquid chlorine adhere to high standards of safety and regulatory compliance.