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## 1 Purpose

The purpose of this specification is to describe the requirements for flexible tubing used at Water Corporation chlorine, ammonia, and carbon dioxide gas withdrawal facilities.

## 2 Scope

This specification applies to all Water Corporation facilities that use flexible tubing to transfer chlorine, ammonia, or carbon dioxide gas from drums or cylinders (under vacuum conditions), or where flexible tubing is used in the chlorination, ammonia and/or carbonation rooms.

## 3 Definitions

LDPE            Low Density Polyethylene

LLDPE         Linear Low Density Polyethylene

## 4 References

AS 2927:2019 - The Storage and Handling of Liquefied Chlorine Gas

AS 2022:2003 – Anhydrous ammonia storage and handling

AS 4332:2004 - The storage and handling of gases in cylinders

AS 1345:1995 Identification of the contents of pipes, conduits and ducts

Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 WA

## 5 Specification

Flexible tubing is used at specific locations throughout a facility to transfer chlorine, ammonia, or carbon dioxide gas under vacuum from drums or cylinders to another instrument or step of that chemical process. The identification and integrity of these tubes are critical to the safe operation of the facility by the operators and therefore must adhere to the following requirements:

- LDPE or LLDPE flexible tubing shall be used
- Chlorine and Ammonia: Yellow colour shall be used
- Carbon Dioxide: Clear (translucent) colour shall be used
- Tubing to be labelled with the words Chlorine Gas or Ammonia Gas or Carbon Dioxide Gas
- Minimum pressure ratings
  - Minimum working pressure for 3/8" & 1/2" OD tube – 800 kPa (120psi) @ 60°C
  - Minimum working pressure for 5/8" OD tube – 600 kPa (87psi) @ 60°C
  - Minimum burst pressure for 3/8" & 1/2" OD tube – 2400 kPa (360psi) @ 60°C
  - Minimum burst pressure for 5/8" OD tube – 1900 kPa (275psi) @ 60°C
- Tensile strength: 17.0 N/mm<sup>2</sup>
- Elongation at break: 550%
- Tubing dimensions shall be as specified by the compression fitting supplier. Standard tubing dimensions for compression fittings supplied with Evoqua / Wallace & Tiernan chlorinators, ammoniators and carbonators are:
  - 13mm x 16mm (1/2" x 5/8")
  - 10mm x 13mm (3/8" x 1/2")
  - 7mm x 10mm (1/4" x 3/8")
- Chlorine and Ammonia gas flexible tubing is to be replaced every 12 months, or sooner if signs of fatigue or brittleness are observed during inspections.
- Carbon Dioxide gas flexible tubing is to be replaced if there are signs of fatigue or brittleness observed during inspections, or at a minimum 5 yearly intervals.

### Document Revision History

May 2022	Document developed by SZ & reviewed by NH
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