



**Ranhill
SAJ**

SPECIFICATION FOR CHLORINE USED FOR POTABLE WATER SUPPLY

MATERIAL REQUIREMENTS

**SPECIFICATION SAJ CH/ CL/ 001
(REV 5.0/09.2018)**

QUALITY ASSURANCE DEPARTMENT
RANHILL SAJ SDN BHD

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1.0 General

- 1.1 Features required for this specification are as follows or otherwise the MS 171:2013, Specification for Chlorine for use in Potable Water Supply.

2.0 Features required

- 2.1 Chlorine used for potable water supply shall comply with requirements as specified in **Table 1-Product Specification**.

Table 1 – Product Specification

Parameter	Requirements	Test Method
A. Chemical requirements	Solid	
Chlorine content, % (v/v)	99.5 min	Annex A
Water content, % (w/w)	0.01 max	Annex B
B. Impurities	Limit	
Non-volatile residue, mg/kg	300 max	Annex C
Nitrogen Trichloride (NCl ₃) content, mg/kg	30 max	Annex D

- 2.2 Physical properties of Chlorine used for potable water supply are as follows **Table 2 – Physical Properties**.

Table 2 – Physical Properties

No.	Physical Properties	Descriptions
1.	Appearance	i. Clear amber liquid ii. Vaporizing to a greenish yellow gas iii. 2.5 times heavier than normal temperature/pressure iv. Suffocating and characteristic odour
2.	Water Solubility	i. 7.26g/liter at 20°C ii. 100kPa
3.	Density	i. Liquid – 1.409g/ml at 20°C ii. Gas – 2.945kg/m ³ at 100kPa at 20°C
4.	Vapour pressure	i. 669 kPa at 20°C
5.	Boiling point	i. -34°C at 100kPa
6.	Liquefaction point	i. -101°C at 100kPa
7.	Specific heat	i. Liquid : 920 J/kg.K at -34°C ii. 475 J/kg.K at 0°C
8.	Viscosity (dynamic)	Liquid : 4.78×10 ⁻⁴ Pa.s at -34°C Gas : 1.333×10 ⁻⁸ Pa.s at 20°C

- 2.3 All chlorine supplied shall not contain any impurities and additives.

3.0 Test and Inspection

- 3.1 All chlorine shall comply with test in accordance with the requirement of specification and a copy of the certificate should be made available to end-users.

4.0 Packing and Storage

- 4.1 Chlorine shall be delivered in dry and clean approved steel drum/cylinder.
- 4.2 Chlorine shall be stored under pressure in mild steel, well-ventilated, non-combustible construction area and away from direct sunlight.
- 4.3 Chlorine is stable up to 12 months under proper storage conditions.

5.0 Mandatory Marking

- 5.1 Each drum/cylinder of Chlorine shall have the following mark legibly on it;
- "chlorine", trade name and grade
 - Tare and Gross weight
 - Name, address and telephone number or supplier and/ or manufacturer
 - Date of manufacturing/packaging and any other markings as required by applicable laws.

6.0 Certificate of analysis

- 6.1 A certificate of analysis, with the indication of country of origin should accompany all deliveries for the chemical and be given to Ranhill SAJ's.
- 6.2 The contents of the certificate of analysis shall include the following;
- Chlorine content, % v/v;
 - Water content, % w/w;
 - Residual on evaporation, mg/kg; and
 - Nitrogen trichloride (NCl₃), mg/kg.

7.0 Delivery Inspection and Evaluation

- It is the responsibility of the tenderer to inform SAJ Ranhill for inspection purposes during manufacturing and before delivery.
- SAJ Ranhill reserve the right to inspect and witness the testing of product offered without any prior notice.
- At anytime, when requested, SAJ Ranhill will supervise a factory inspection of the product offered for evaluation purpose.
- If at any time the supplier fails to deliver the required sample, the products is deemed fail to meet the specification.

8.0 Certification

- 8.1 Manufacturer and/or supplier of the product are required to provide the copy of the certificate and testing report from SIRIM, IKRAM and SPAN or other recognize certification bodies.
- 8.2 Tests report required should be those tests conducted within a year period.
- 8.3 SAJ Ranhill has the right to refuse offer or reject supply if those documents required are not enclosed or results provided are not complied to SAJ Ranhill requirement.