	Procedure : Specification for Water Facility Maintenance Chemical – Calcium Hypochlorite (Chloride of Lime / Bleaching Powder)	
	Department : Material Evaluation Technical Committee (METC)	
	Document No: PBA/CHEM.SPEC/CH	Revision No : 00
	Classification : Public	Effective Date : 31 May 2023

## 1.0 General

Calcium Hypochlorite, also known as Chloride of Lime, Bleaching powder and Chlorinated Lime is generally used for cleaning / disinfection of water tanks and pipelines.

Though this chemical is used for cleaning / disinfecting agent, all chemicals (Calcium Hypochlorite) shall be of a grade suitable for the treatment of drinking water and shall contain no soluble minerals or organic substances capable of producing deleterious or injurious effects on public health.

The Calcium Hypochlorite shall be in accordance to MS 1584:2003; Specification for Calcium Hypochlorite used for Potable Water Supply.

## 2.0 Scope

The specification for Water Facility Maintenance Chemical – Calcium Hypochlorite is a guideline for the Calcium Hypochlorite suppliers to comply — in order to supply the Calcium Hypochlorite for PBAPP's use in potable water supply service.

## 3.0 SPAN Requirements

All suppliers of the chemical must be registered in the Suruhanjaya Perkhidmatan Air Negara (SPAN) Listing / Registration of Suppliers, and the registration must be valid during period of supplying of the chemical.


## 4.0 Safety & Health Requirements

4.1 All suppliers shall fully comply with the clauses / requirements in:

- a) Occupational Safety and Health Act , 1994,
- b) Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013,
- c) Industry Code of Practice on Chemicals Classification and Hazard Communication 2014 (ICOP 2014),
- d) Any Regulations / Orders; and
- e) As well as other applicable laws

## 5.0 Halal Certificates Requirements

All chemicals (Calcium Hypochlorite) shall have valid HALAL certificate.

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## 6.0 Chemical Requirement

### 6.1 Physical Properties

#### 6.1.1 Appearance -

Calcium Hypochlorite shall be of free flowing, white powder or granule.

#### 6.1.2 Solubility -

Theoretical solubility is approximately 180 g/L, but practical solubility is closer to 30 g/L.

#### 6.1.3 Bulk Density -

Granular powder; 0.5 g/cm<sup>3</sup> – 0.8 g/cm<sup>3</sup>.

### 6.2 Chemical Properties


6.2.1 Calcium Hypochlorite is a strong oxidant, it reacts with acids and acidic salts to form chlorine. In the presence of inflammable substances, it causes fires and explosions of organic compounds, oxidation reactions occur with release of heat and of moisture, it is highly corrosive to most metals.

### 6.3 Purity Criteria

6.3.1 Calcium Hypochlorite shall not contain any impurities and additives in such concentrations that are capable of producing deleterious or injurious effects on the health of those consuming water that has been properly treated with this product.

6.3.2 The Calcium Hypochlorite must comply with the requirements as specified in Table 1.

Parameter	PBAPP Specifications	Test Method
<u>Chemical requirement</u>		
Available Chlorine , % (w/w)	<u>Type 2</u> 65% minimum	Appendix A MS 1584:2003
<u>Physical requirement</u>		
Moisture, % (w/w)	5% maximum	Appendix B MS 1584:2003
Insoluble matter, % (w/w)	4%	Appendix C

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	maximum	MS 1584:2003
Sodium chloride, % (w/w)	18 % maximum	Appendix D MS 1584:2003

Table 1: Requirements for Calcium Hypochlorite

#### 6.4 Toxic Substances

The content of toxic substances in the product must comply with the requirements specified in Table 2.

Parameter	Maximum Limit in mg/kg of available chlorine	Test method
Arsenic (As)	10	Appendix E MS 1584:2003
Selenium (Se)	20	
Antimony (Sb)	15	
Cadmium (Cd)	10	
Nickel (Ni)	10	
Lead (Pb)	15	
Chromium (Cr)	15	
Mercury (Hg)	7	Appendix G MS 1584:2003


Table 2: Content of Toxic Substances

### 7.0 Marking, Labelling and Packaging

#### 7.1 Marking

7.1.1 The following information shall be marked legibly either on each container (bag / big bag):

- Chemical solution, trade name and grade
- Net Weight
- Name, address and telephone number of supplier and manufacturer
- Batch number

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- e) The date of manufacturing; and shall bear such other markings as required by applicable laws
- f) The statement 'Potable grade'
- g) Expiry date of the chemical

7.1.2 In the case of shipment in bulk, every consignment shall carry a certificate setting out the above-mentioned information.

## 7.2 Risk and Safety Labelling and Safety Data Sheet (SDS)

7.2.1 Labelling requirements (written in both Bahasa Malaysia and English) shall apply to Calcium Hypochlorite and shall comply with the requirements of the Regulations 6, 7, 8, 9, 10, 11 and 12 of the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013, Industry Code of Practice on Chemicals Classification and Hazard Communication 2014 (ICOP 2014), Occupational Safety and Health Act 1994 (Act 514) and Regulation and Orders.

7.2.2 Suppliers shall furnish dual languages (English and Bahasa Malaysia) of an up-to-date Safety Data Sheet (SDS) complying with Regulation 13 of the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 for each chemical before their first delivery to PBAPP Sdn. Bhd. and whenever there is any changes made to SDS.

## 7.3 Packaging, Chemical Handling during Transportation, Labelling and Certificate of Analysis

### 7.3.1 Packaging, Chemical Handling during Transportation and Labelling

7.3.1.1 All suppliers must prepare packaging according to the below Table 3: Requirement of Packaging.


Type of Packing of Calcium Hypochlorite	Packing Description
50 kg / Drum	Packed in metal / plastic airtight drums with plastic lining / LDPE Liner.

Table 3 : Requirement of Packaging

7.3.1.2 The packaging shall be securely sewn at both ends to provide sufficient sealing at ends to prevent leaking and also be with stand rough handling.

7.3.1.3 No contamination of Calcium Hypochlorite by toxic substances or other foreign substances shall occur during transportation or storage.

7.3.1.4 Broken bags, drums, containers, rebadged chemicals or other poor packing conditions shall be rejected and PBAPP reserves the right to reject any good that in their opinion is considered poorly packed.

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7.3.1.5 It is mandatory requirement to state the lot number, manufacturer date and expiry date at all packages of shipments.

7.3.1.7 The supplier shall provide recommendations for appropriate materials of constructions for the storage, handling and packaging of each specific product.

### 7.3.2 Certificate of Analysis (COA)

7.3.2.1 A certificate of analysis, with the indication of country of origin (where applicable) shall accompany all deliveries for the chemical and to be given to the end users.

7.3.2.2 The contents of the certificate of analysis shall include the following:

- a) Calcium hypochlorite, % (w/w),
- b) Moisture, % (w/w)

7.3.2.3 The COA shall contain the Batch No., parameter, PBAPP Specification, Actual Results and a column stating comparison of the result against PBAPP specification (Compliance to PBAPP specification). Supplier must provide the COA according to the Sample Format as tabulated in Table 4.

Customer / Location of Chemical Delivered to :			
Tanker / Lorry Number :			
Delivery Date :			
Delivery Order Number :			
Name of Chemical :			
Batch Number :			
Country of Origin :			
Manufacturing Date :			
Expiry Date :			
Parameter	PBAPP Specifications	Actual Result	Compliance
Calcium hypochlorite, % (w/w)	≥ 65%		
Moisture, % (w/w)	≤ 5%		

Table 4 : Sample Format of COA Report

7.3.2.4 A comprehensive certificate of analysis shall be provided to end users upon their request and the parameter as per 6.3 Table 1 and 6.4 Table 2.