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	Department : Material Evaluation Technical Committee (METC)		
	Document No: PBA/CHEM.SPEC/PD	Revision No : 00	
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1.0 General

All chemicals [Poly (Diallyldimethylammonium Chloride) @ Poly DADMAC] 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 Poly DADMAC shall be in accordance to MS 1930:2007; Poly DADMAC for use in potable water supply – specification.

2.0 Scope

The specification for Water Treatment Chemical – Poly DADMAC is a guideline for the Poly DADMAC suppliers to comply — in order to supply the Poly DADMAC 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:

- Occupational Safety and Health Act , 1994,
- 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),
- Any Regulations / Orders; and
- As well as other applicable laws

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5.0 Halal MS 1930:2007 and ANSI / NSF Standard 60 Certificates Requirements

All chemicals (Poly DADMAC) shall have valid HALAL certificate, certified to MS 1930:2007 and comply with ANSI / NSF Standard 60. The tenderer shall provide the valid certificates attached together with the tender submission.

6.0 Chemical Requirement

6.1 Identification

6.1.1 Relative Molecular Mass

Typically in the range of 20000 to 1 million

6.2 Physical Properties

6.2.1 Appearance

Poly DADMAC is a clear, colourless to amber-coloured liquid. There shall be no visible insoluble get or extraneous matter.

6.2.2 Solubility

Poly DADMAC is miscible with water at all concentration.


6.3 Chemical Properties

6.3.1 Poly DADMAC is a non-hazardous material and not intrinsically reactive. However, if it is brought into contact with strong acids or oxidising agents; a strong exothermic reaction will occur. In dilute solution, there can be a reaction with, or destruction by, some of the disinfection and oxidising agents used in water treatment.

6.4 Purity Criteria


6.4.1 Poly (Diallyldimethylammonium Chloride) @ Poly DADMAC 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 the product. Any quantity exceeding the impurity limit shall be notified to the user.

6.4.2 The Poly DADMAC must comply with the requirements as specified in **Table 1** which will be used by PBAPP for internal Quality Control (QC) Check purpose:

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Parameter	PBAPP Specifications	Test Method
<u>Physical properties</u>		
Appearance	Clear liquid, colourless to amber coloured liquid	
Active content, % (w/w)	Miscible with water at all concentration	
<u>Specific requirement</u>		
Active content, % (w/w)	20 - 40%	Annex A MS 1930:2007
<u>Impurities</u>		
DADMAC monomer, mg/kg of active product as derived from a reference dose of 10 mg active product per liter	5 000, max	Annex B MS 1930:2007
<u>Physical requirement</u>		
Product pH	4 - 7	Annex C MS 1930:2007
Bulk Brookfield viscosity, mPa.s	30 – 10 000	Annex D MS 1930:2007
Specific Gravity (S.G.)	1.02 – 1.09	
<u>Toxic Substances</u> (See Note 1)		
<u>NOTES:</u>		
1. For this product, toxic substances are not relevant at a reference dose of 10 mg active product per liter.		

Table 1: Requirements for Poly (Diallyldimethylammonium Chloride) @ Poly DADMAC

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7.0 Marking, Labelling and Packaging

7.1 Marking

7.1.1 The following information shall be marked legibly either on each container:

- Chemical solution, trade name and grade
- Net Weight
- Name, address and telephone number of supplier and manufacturer
- Batch number
- The date of manufacturing; and shall bear such other markings as required by applicable laws
- The statement 'Potable grade'
- 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 Poly DADMAC 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, Labeling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 for each chemical before their first delivery to PBAPP Sdn. Bhd.

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 2:** Requirement of Packaging.

Type of Packing of Poly DADMAC	Packing Description
210 kg / drum	– Pack in suitable containers, e.g. in bulk containers, drums, cans or bottles – in order to ensure the purity level of the product is not affected, the mean

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	of delivery shall not have been used previously for any different product or it shall have been specially cleaned and prepared before use.
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Table 2: Requirement of Packaging

- 7.3.1.2** The packaging shall be securely sewn / sealed 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 Poly (Diallyldimethylammonium Chloride) @ Poly DADMAC by toxic substances or other foreign substances shall occur during transportation.
- 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.
- 7.3.1.5** It is mandatory requirement to state the lot number, manufacturer date and expiry date at all packages of shipments.
- 7.3.1.6** 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:
- Product active content (active content), % (w/w)
 - DADMAC monomer content, mg/kg of active product
 - pH
- 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 3**.

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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
Product active content, % (w/w)	20 – 40		
DADMAC monomer content, mg/kg of active product	5 000, max		
pH	4 - 7		

Table 3 : Sample Format of COA Report

7.3.2.4 A comprehensive certificate of analysis shall be provided before the first delivery of a new contract and upon end users request. The COA shall include the parameters as per 7.1 **Table 1** and the following:

- Viscosity (Bulk Brookfield Viscosity), mPa.s
- Molecular mass
- Specific gravity


7.4 Storage Requirement

7.4.1 Storage

7.4.1.1 Poly DADMAC shall be:

- Stored in a cool dry place.
- Kept away from oxidants (e.g. chlorine, hydrogen peroxide, potassium permanganate, chlorates, nitrates) and strong acids.

7.4.2 Stability

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7.4.2.1 Product must be stable for at least 12 months.