

Approval & Reception Procedure

DEE – Departamento de Estruturas e Edifícios	
Building Water Distribution System – uPVC Pipes and Accessories	Document No.: ARP/DEE/013
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1 Reference standard

Regulations No. 46/96/M	Regulamento de Águas e de Drenagem de Águas Residuais de Macau (RADARM)
AS/NZS 4020:2005	Testing of products for use in contact with drinking water
BS 3505:1986	Specification for unplasticized polyvinyl chloride (PVC-U) pressure pipes for cold potable water
BS 6920-1:2014	Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water. Specification
BS EN ISO 1452-1:2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). General
BS EN ISO 1452-2:2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Pipes
BS EN ISO 1452-3:2010	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Fittings
BS EN ISO 1452-4:2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Valves
BS EN ISO 1452-5:2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Fitness for purpose of the system
GB 5749:2006	Standards for drinking water quality
GB/T 17219:1998	Standard for safety evaluation of equipment and protective materials in drinking water system
GB/T 10002.1:2006	Unplasticized poly (vinyl chloride) (PVC-U) pipes for water supply
GB/T 10002.2:2003	Fittings made of unplasticized poly (vinyl chloride) (PVC-U) for water supply

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2 Approval procedures

All materials (pipes, fittings/accessories, hose clam, adhesive, etc) are required to be approved in advance, and the following documents should be submitted for the approval:

- Products specification
- Test reports or relevant certification documents
- Method statements
- Depending on the actual situation, inspections on the factory will be required to verify the technical and quality competence for the project

2.1 Product specification

1. Product specification should include at least but not limited to the following content :

Items	Content
General Parameters	Reference standards for product manufacture, dimensions, diameter, wall thickness, etc
Mechanical Properties	Tensile strength, compressive strength, impact strength, etc
Water-tightness Properties	Maximum working pressure, etc
Heat Resistance Properties	Vicat softening temperature, etc
Construction Guidelines	Storage, transportation, installation method and equipment required for installation, etc

2. Unless otherwise specified in the project design, the submitted materials should comply with the requirements of the reference standard.

2.2 Test reports or related recognized documents

1. Test reports or certification documents should be valid. If the relevant documents have not specified the effective date, it is advisable to submit the documents issued in recent three years.

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2. The test content of the test reports should include but not limited to the following:

Items	Content
General Parameters	Marking, diameter, wall thickness, appearance, etc
Mechanical Properties	Tensile test, impact test, etc
Water-tightness Properties	Hydrostatic pressure test, etc
Heat resistance properties	Vicat softening temperature, etc

In general, the reference standards of the test reports should be consistent with the reference standards for product manufacture.

3. Test reports or certification documents should be issued by third-party organization.
4. If the installed pipelines are used for drinking water, valid certification documents that can be used for drinking water should be submitted for all materials of the pipelines (such as pipes, adhesives, etc.), to ensure that the materials comply with AS/NZS 4020, GB/T 17219, BS 6920 (only for non-metal) or other equivalent standards, in order to ensure that the materials comply with the requirement of relevant standards in parameters of bacteria, heavy metals, chemical and physical, etc. If the relevant documents have not specified the effective date, it is advisable to submit the documents issued in recent three years.

2.3 Method statements

The method statements should comply with the requirements of RADARM and the designer, and should follow the construction guidelines of the product manufacturers. The contents of the method statements should state the transportation, storage, installation and cleaning, etc, of the materials.

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3 Reception procedure

3.1 On-site acceptance

The contractor should submit mill certificates issued by the material manufacturers and the delivery note issued by the suppliers.

The materials delivered on-site should be good in appearance and clearly marked. The content should include: brand, reference standard, dimension, grade, etc.

3.2 Pipe tests

Test Items	Test Frequency	Acceptance Criteria
Dimensons	Each batch is 50 tons; Batch: pipes of the same size, same raw material, same process and same specification	According to product standard
Vicat softening temperature		
Longituinal reversion		
Tensile properties		
Impact resistance		
Hydrostatic pressure		
Dichloromethane impregnation test	If necessary	

3.3 Field tests

After installation, water-tightness tests should be performed in accordance with Article 191 of RADARM in all pipe sections.

3.4 Water quality testing

After flushing of the main water supply system, water quality testing should be performed in accordance with ARP/DEE/018.