

Approval & Reception Procedure

DEE – Departamento de Estruturas e Edifícios	
Building Drainage System – uPVC Pipes and Accessories	Document No.: ARP/DEE/015
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1 Reference standard

Regulations No. 46/96/M	Regulamento de Águas e de Drenagem de Águas Residuais de Macau (RADARM)
BS 4514:2001	Unplasticized PVC soil and ventilating pipes of 82.4mm minimum mean outside diameter, and fittings and accessories of 82.4mm and of other sizes - Specification
BS 5255:1989	British standard specification for thermoplastics waste pipe and fittings
BS 5481:1977	Specification for Unplasticized PVC pipe and fittings for gravity sewers
BS 4660:2000	Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage
ISO 3633:2002	Plastics piping systems for soil waste discharge (Low and high temperature) inside buildings. Unplasticized poly(vinylchloride) (PVC-U)
GB/T 5836.1:2006	Unplasticized PVC pipes for soil and waste discharge inside buildings
GB/T 5836.2:2006	Unplasticized PVC fittings for soil and waste inside buildings

2 Approval procedures

All materials (pipes, fittings/accessories, hose clamp, 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

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2.1 Product specification

- 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

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

2.2 Test reports or related recognized documents

- 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.
- 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.

- Test reports or certification documents should be issued by third-party organization.

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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.

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
Dimenson	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 270b of RADARM in all pipe sections.