

Approval & Reception Procedure

DEE – Departamento de Estruturas e Edifícios	
Building Water Distribution System – Ductile Iron Pipes and Accessories	Document no. : ARP/DEE/012
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1 Reference standards

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 EN 545:2010	Ductile iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods
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
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 13295-2013	Ductile iron pipes, fittings and accessories for water or gas applications

2 Approval procedures

All materials (pipes, fittings/accessories, exterior coatings, interior linings, couplings, sealing tapes, insulation material, 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

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, the composition and thickness of the exterior and interior coatings, etc
Mechanical Properties	Product grade, tensile strength, compressive strength, etc
Water-tightness Properties	Maximum working pressure, etc
Chemical Composition	the content of carbon, silicon, manganese, lead, sulphur, phosphorus, magnesium, cadmium, 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 issued by third-party organization.
2. The submitted test reports or certification documents should be valid. If the relevant documents have not specified the valid date, it is advisable to submit the documents issued in recent three years.

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

Items	Content
General Parameters	Marking, diameter, wall thickness, appearance, the thickness of the exterior and interior coatings, etc
Mechanical Properties	Tensile test, bending test, hardness test, etc
Water-tightness Properties	Water-tightness tests, etc
Chemical Composition	Chemical composition of material, etc

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

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, solder, 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. If welding is included in the method statements, the information of solders and the welding methods should be provided.

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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 Site tests after installation

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

3.3 Water Quality Testing

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