

Approval & Reception Procedure

DEE – Departamento de Estruturas e Edifícios	
Building Water Distribution System – Stainless Steel Pipes and Accessories	Document no. : ARP/DEE/011
	Rev. no. : B
	Date : 2021/03/31
	Page no. : 1 of 4

1 Reference standards

Regulations No. 46/96/M	Regulamento de Águas e de Drenagem de Águas Residuais de Macau (RADARM)
AS 3688:2016	Water supply and gas systems - Metallic fittings and end connectors
AS/NZS 4020:2005	Testing of products for use in contact with drinking water
BS EN 806-4:2010	Specifications for installations inside buildings conveying water for human consumption. Installation
BS 6362:1990 / ISO 7598:1988	Stainless steel tubes suitable for screwing in accordance with BS 21 'Pipe threads for tubes and fittings where pressure-tight joints are made on the threads'
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 10217-7:2014	Welded steel tubes for pressure purposes. Technical delivery conditions. Stainless steel tubes
BS EN 10312:2002	Welded stainless steel tubes for the conveyance of aqueous liquids including water for human consumption. Technical delivery conditions
BS 7786:2006	Specification for unsintered PTFE tapes for general use
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
ISO 4144:2003	Pipework -- Stainless steel fittings threaded in accordance with ISO 7-1
ISO 9453:2014	Soft solder alloys -- Chemical compositions and forms
BS EN ISO 17672:2016	Brazing -- Filler metals

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Building Water Distribution System – Stainless Steel Pipes and Accessories	Document no. : ARP/DEE/011
	Rev. no. : B
	Date : 2021/03/31
	Page no. : 2 of 4

2 Approval procedures

All materials (pipes, fittings/accessories, sealing rings, sealing tapes, etc) are required to be approved in advance (if pipe sections are connected by welding, rods and fluxes are also required to be approved), 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, diameter, wall thickness, 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, phosphorus, sulphur, nickel, chromium, etc
Construction Guidelines	Storage, transportation, installation method and equipment required for installation, etc

2. Solders should comply with the requirements of lead-free solder alloys in ISO 9453, and ISO 17672, as well as construction guidelines.
3. 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.

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	Rev. no. : B
	Date : 2021/03/31
	Page no. : 3 of 4

- 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.
- 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	Yield strength, tensile strength, elongation, 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.

- If the pipe sections are connected by welding, relevant test reports must be submitted, and the test reports must include chemical composition analysis.
- 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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	Rev. no. : B
	Date : 2021/03/31
	Page no. : 4 of 4

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 Stainless steel materials

ARP/DMC/12 should be followed for reception test of stainless steel materials.

3.3 Site tests

1. After installation, water-tightness tests should be performed in accordance with Article 191 of RADARM in all pipe sections.
2. If pipelines are connected by welding, the welded joints should be tested which can be followed ARP/DEE/010 item 3.2 point 1.

3.4 Water Quality Testing

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