



**Ranhill
SAJ**

**UnPLASTICISED POLYVINYL CHLORIDE (uPVC) PIPES For
COLD WATER SUPPLY SYSTEMS**

**SPECIFICATION SAJ PS / PV / 001
(Rev.4.0 / 12.2018)**

**Ranhill
SAJ**

QUALITY ASSURANCE DEPARTMENT
RANHILL SAJ SDN. BHD.

Ref. No. : PS/PV/001
Date : 24/12/2018
Total Pages : 10/10

Approve by:
Ass General Manager Quality Management

Specification for Unplasticised Polyvinyl Chloride (uPVC) Pipe For Cold Water Supply System

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1. REFERENCED DOCUMENTS

The following referenced documents contain provisions, which through reference in this text constitute provisions of this specification.

MS 628 Part1: 99 Specification for uPVC Pipes for Water Supply; Part 1:
Pipes
Part 2, Section 2.1: uPVC Joints and Fittings
Part 3: Guide for Installation

2. PIPES

- a. The uPVC pipes and fittings to be supplied shall be of PN12 (Class D) for sizes 80 mm and above, and PN15 (Class E) for sizes 10mm – 65mm.
- b. The color of pipes shall be blue.

3. MATERIALS USED IN MANUFACTURE

- a. The material used in the manufacture of pipes, joints and fittings shall consist substantially of polyvinyl chloride, to which may be added only those additives that are needed to facilitate the manufacture of the polymer and the production of sound and durable pipes of good surface, finish, mechanical strength and opacity.
- b. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic hazard, to impair the fabrication or welding properties of the pipes, or to impair the chemical and physical properties of the pipes (in particular long term mechanical and impact strength).
- c. PVC content of the pipe shall not be less than 85% and the content shall be achieved by the use of process control method.
- d. No rework material shall be used and the dispersion of all ingredients in the material composition shall be uniform.
- e. When tested by method 120B of BS 2782 (Methods of Testing Plastics), the deformation temperature of the material under load shall not be lower than 75°C.

4. CLASSIFICATION

- a. The pipes, joints and fittings shall be classified in accordance with the Maximum Permissible Working Pressure in table below:-

uPVC Classification of Pipes, Joints and Fittings

| Class of Pipe | Maximum Permissible Working Pressure | |
|----------------|--------------------------------------|----------------------|
| | at 20 ⁰ C | at 30 ⁰ C |
| PN12 (Class D) | 12 bar | 9.6 bar |
| PN15 (Class E) | 15 bar | 12.0 bar |

5. THICKNESS AND DIAMETER

- a. The pipes shall be designated by the nominal size and shall conform to the dimensions specified in Table E2.

6. RUBBER RING

All rubber ring joints :

- a. shall be manufactured for pipes sizes of 80 mm and above.
- b. Shall be of EPDM and have a hardness range of 66-75 IRHD and meet the requirements of MS 672:99 or AS 1646.
- c. Shall be factory fitted and positioned in the ring housing if required by SAJ.
- d. Supplied are designed to suit uPVC pipe and have the following marking:-
 - i. Manufacturer name
 - ii. Standards used to manufacture
 - iii. Date of manufacture
 - iv. Batch no.
 - v. Brand name of pipe to be used with
 - vi. Rubber type.
- e. For pipe sizes below 80 mm, the plain end or solvent weld joints shall be manufactured

7. LENGTHS

- a. The standard length of pipes shall be 6 meter.
- b. Other lengths may be supplied, if required by SAJ
- c. The Contractor shall supply free of charge the extra joints required due to the supply of non-standard pipe length.

8. TOLERANCE ON DIMENSIONS

- a. Mean tolerances on the outside diameters and ovality (out of roundness) shall conform to the requirements of Table A attached.
- b. A tolerance of +15mm/-0mm shall be allowed on the length of an individual pipe but the total length of pipe supplied shall not be less than the total of length ordered.

9. JOINTS AND FITTINGS

- a. uPVC pipe joints and fittings shall be manufactured according to clause 6 and 7 of MS 628: Part 2: Section 2.1 and shall meet the requirements of clause 8 of MS 628 Part 2 Section 2.1.

10. CUTTING AND CHAMFERING

- a. Smooth a chamfer at 15° is required at the outer edge of the plain-ended side for rubber ring joint.
- b. Pencil in a witness mark on the plain end to make sure the pipe goes far enough into the socket and to act as a guide for putting on the lubricant.

11. ROUTINE TESTS

a. uPVC Pipes

The routine tests on uPVC pipes shall be performed according to Table 3 and clauses 7.1, 7.2, 7.3 and 7.4 of MS 628: Part 1

b. uPVC Joints and Fittings

The routine test on uPVC joints and fittings shall be performed according to Table 5 and clauses 8.1, 8.4 and 8.6 of MS 628: Part 2: Section 2.1.

12. TEST CERTIFICATE

The Supplier shall submit the Test Certificate to the S.O., copies of all test results (Routine and Type), which have been performed on pipes to be supplied.

13. MARKING

- a. All pipe supplied shall have the following marking on the outside of pipe:
 - i. Manufacturer's identification
 - ii. Nominal size and Class
 - iii. Serial number of pipe
 - iv. Year of manufacture
 - vi. Standards reference
 - vii. Batch number
- b. The colour of the markings shall be black.
- c. Adhesive labels will not be accepted.

14. PRE DELIVERY INSPECTION

- a) It is the responsibility of the tenderer to inform SAJ for inspection purposes during manufacturing and before delivery.
- b) SAJ reserve the right to inspect and witness the testing of product offered.
- c) At any time, when requested, the supplier is to provide SAJ a sample of the product offered for evaluation purposes. All costs shall be borne by the supplier.
- d) If at any time the supplier fails to deliver the required sample, the product is deemed fail to meet the specifications.

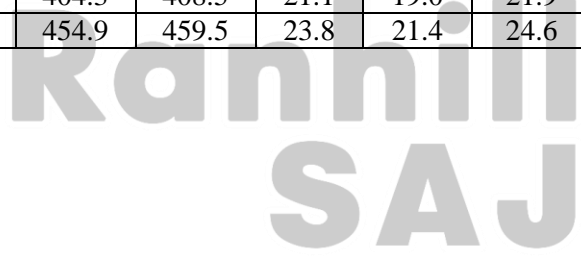
15. CERTIFICATION

- a) Manufacturer of supplier are required to provide a copy of the certificate and testing report from SIRIM, IKRAM or other recognized certification body.
- b) Tests report required should be those tests conducted within a year period.
- c) SAJ have the right to refuse offer or reject supply if the documents required are not enclosed.

Attachment

Table A

| Nom. Size (mm) | Mean Outside Diameter (mm) | | Out of Roundness (Ovality) (mm) | | Wall Thickness (mm) | | | | | |
|----------------|----------------------------|-------|---------------------------------|-------|---------------------|------------------|------|---------|------------------|-----|
| | | | | | PN 12 | | | PN 15 | | |
| | min | max | min | max | Ave. | Individual Value | | Average | Individual Value | |
| | | | | | Max | min | max | max | min | max |
| 10 | 17.0 | 17.3 | 17.0 | 17.3 | - | - | - | 1.9 | 1.5 | 1.9 |
| 15 | 21.2 | 21.5 | 21.2 | 21.5 | - | - | - | 2.1 | 1.7 | 2.1 |
| 20 | 26.6 | 26.9 | 26.6 | 26.9 | - | - | - | 2.5 | 1.9 | 2.5 |
| 25 | 33.4 | 33.7 | 33.3 | 33.8 | - | - | - | 2.7 | 2.2 | 2.7 |
| 32 | 42.1 | 42.4 | 42.0 | 42.5 | - | - | - | 3.2 | 2.7 | 3.2 |
| 40 | 48.1 | 48.4 | 48.0 | 48.5 | - | - | - | 3.7 | 3.1 | 3.7 |
| 50 | 60.2 | 60.5 | 60.0 | 60.7 | - | - | - | 4.5 | 3.9 | 4.5 |
| 65 | 75.0 | 75.3 | 74.8 | 75.5 | - | - | - | 5.5 | 4.8 | 5.5 |
| 80 | 88.7 | 89.1 | 88.4 | 89.4 | 5.3 | 4.6 | 5.3 | - | - | - |
| 100 | 114.1 | 114.5 | 113.7 | 114.9 | 6.8 | 6.0 | 6.9 | - | - | - |
| 125 | 140.0 | 140.4 | 139.4 | 141.0 | 8.3 | 7.3 | 8.4 | - | - | - |
| 155 | 168.0 | 168.5 | 167.4 | 169.1 | 9.9 | 8.8 | 10.2 | - | - | - |
| 175 | 193.5 | 194.0 | 192.8 | 194.7 | 11.4 | 10.1 | 11.7 | - | - | - |
| 200 | 218.8 | 219.4 | 218.0 | 220.2 | 11.6 | 10.3 | 11.9 | - | - | - |
| 225 | 244.1 | 244.8 | 243.2 | 245.7 | 12.9 | 11.5 | 13.3 | - | - | - |
| 250 | 272.6 | 273.4 | 271.6 | 247.4 | 14.3 | 12.8 | 14.8 | - | - | - |
| 300 | 323.4 | 324.3 | 322.2 | 325.5 | 17.0 | 15.2 | 17.5 | - | - | - |
| 350 | 355.0 | 356.0 | 353.7 | 357.3 | 18.6 | 16.7 | 19.2 | - | - | - |
| 375 | 405.9 | 406.9 | 404.3 | 408.5 | 21.1 | 19.0 | 21.9 | - | - | - |
| 400 | 456.7 | 457.7 | 454.9 | 459.5 | 23.8 | 21.4 | 24.6 | - | - | - |





SCHEDULE OF STORES

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Schedule Of Stores For Supply And Delivery Of uPVC Pipes
For Period of Year(s)

| No | Description | Provisional Quantity | Rate (RM) | Amount (RM) |
|----------|--|----------------------|-----------|-------------|
| A | UPVC Pipes Class PN 12 : Bell-mouth | | | |
| 1 | 80mm Diameter | | | |
| 2 | 100mm | | | |
| 3 | 155mm | | | |
| 4 | 200mm | | | |
| 5 | 250mm | | | |
| 6 | 300mm | | | |
| 7 | 350mm | | | |
| 8 | 400mm | | | |
| B | UPVC Class PN 12: Plain Ended | | | |
| 1 | 80mm diameter | | | |
| 2 | 100mm diameter | | | |
| 3 | 155mm diameter | | | |
| 4 | 200mm diameter | | | |
| 5 | 250mm diameter | | | |
| 6 | 300mm diameter | | | |
| 7 | 350mm diameter | | | |
| 8 | 400mm diameter | | | |
| | TOTAL TENDER SUM | | | |

(Ringgit:.....)

Signature of Tenderer :
 Name :
 In the capacity of :
 Tenderer's Seal or chop :
 Date :

Signature of Witness:.....
 Name :
 Address :
 Date :



