



**Ranhill
SAJ**

**SPECIFICATION FOR
MULTI-LAYER PVC PIPE (mPVC)
FOR WATER SUPPLY SYSTEMS**

**SPECIFICATION SAJ PS / mPV / 001
(Rev. 2.0 / 12.2018)**

QUALITY ASSURANCE DEPARTMENT
RANHILL SAJ SDN. BHD.

Ref. No. : PS/mPV/001

Date : 24/12/2018

Total Pages : 10/10

Approve by:
Ass General Manager Quality Management

SAJ SPECIFICATION FOR MULTI-LAYER PVC PIPE (mPVC)

CONTENT	Page
1.0 GENERAL	3
2.0 PIPES	3
3.0 MATERIAL USED IN MANUFACTURE	3
4.0 CLASSIFICATION	4
5.0 THICKNESS AND DIAMETER	4
6.0 RUBBER RING	4
7.0 LENGTHS	5
8.0 TOLERANCE ON DIMENSIONS	5
9.0 JOINTS AND FITTINGS	5
10.0 MARKING	5
11.0 PRE-DELIVERY INSPECTION	6
12.0 CERTIFICATION	6
SCHEDULE OF STORES	8

Ranhill
SAJ

SPECIFICATION FOR MULTI-LAYER PVC PIPE FOR COLD WATER SUPPLY SYSTEM

1. General

- 1.1 This specification is applicable to Multi-Layer PVC Pipe for water supply systems and shall conform to MS 628 : 1999 and BS 3505 : 1986.
- 1.2 These specifications will provide necessary information on the product dimension and requirements for the supply of pipes only.

2. PIPES

- a. The color of pipes shall be blue.

3. MATERIALS USED IN MANUFACTURE

- a. The material used in the manufacture of pipes, shall consist substantially of polyvinyl chloride, to which may be layered with only those additives which are needed to facilitate the manufacture of the polymers pipe with good finish, and mechanical strength, and any other properties improvement.
- 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). The No lead and no zinc additives shall be used for pipe dry compound.
- c. No rework material shall be used and the dispersion of all ingredients in the material composition shall be uniform.
- d. 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:-

Multi-Layer PVC Classification of Pipes, Joints and Fittings

Class of Pipe	Maximum Permissible Working Pressure	
	at 20 ^o C	at 30 ^o C
C	9 bar	8.1 bar
D	12 bar	10.8 bar
E	15 bar	13.5 bar

5. THICKNESS AND DIAMETER

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

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 Multi-Layer PVC 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.

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

Multi-Layer PVC pipe joints and fittings shall be of ductile iron fitting complying to BS EN545:1999.

10. 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
 - v. Standards reference
 - vi. Batch number
- b. The colour of the markings shall be black.
- c. Adhesive labels will not be accepted.

11. 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.

12. 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.

**Ranhill
SAJ**

Attachment

Table A

Nominal size (BS 3505) Inch	Nominal size (MS 628 & AS 1477) mm	Dimension of mPVC Pipe																		
		Outside Diameter		PN 9+ (Class C+)						PN 12+ (Class D+)						PN 15+ (Class E+)				
				MS 628 (BS 3505)			AS 1477			MS 628 (BS 3505)			AS 1477			MS 628 (BS 3505)			AS 1477	
		OD Min	OD Max	Wall-t	t min	t max	t min	t max	Wall-t	t min	t max	t min	t max	Wall-t	t min	t max	t min	t max		
1/2	15	21.2	21.5	-	-	-	-	-	-	-	-	-	-	2.1	1.7	2.1	1.4	1.7		
3/4	20	26.6	26.9	-	-	-	-	-	-	-	-	-	-	2.5	1.9	2.5	1.7	2.1		
1	25	33.4	33.7	-	-	-	-	-	-	-	-	-	-	2.7	2.2	2.7	2.1	2.5		
1 1/4	32	42.1	42.4	-	-	-	-	-	2.7	2.2	2.7	2.2	2.6	3.2	2.7	3.2	2.7	3.2		
1 1/2	40	48.1	48.4	-	-	-	-	-	3.0	2.5	3.0	2.5	3.0	3.7	3.1	3.7	3.1	3.6		
2	50	60.2	60.5	3.0	2.5	3.0	2.4	2.8	3.7	3.1	3.7	3.1	3.6	4.5	3.9	4.5	3.8	4.4		
2 1/2	65	75.0	75.3	3.5	3.0	3.5	3.0	3.5	4.5	3.9	4.5	3.9	4.5	5.5	4.8	5.5	4.8	5.5		
3	80	88.7	89.1	4.1	3.5	4.1	3.5	4.1	5.3	4.6	5.3	4.6	5.3	6.5	5.7	6.6	5.7	6.5		
4	100	114.1	114.5	5.2	4.5	5.2	4.5	5.2	6.8	6.0	6.9	5.9	6.7	8.3	7.3	8.4	7.3	8.2		
5	125	140.0	140.4	6.3	5.5	6.4	5.5	6.3	8.3	7.3	8.4	7.2	8.1	10.1	9.0	10.4	8.9	10.0		
6	155	168.0	168.5	7.5	6.6	7.6	6.3	7.1	9.9	8.8	10.2	8.3	9.3	12.1	10.8	12.5	10.2	11.4		
7	175	193.5	194.0	8.7	7.7	8.9	7.1	8.0	11.4	10.1	11.7	9.3	10.4	13.9	12.4	14.3	11.5	12.8		
8	200	218.8	219.4	8.8	7.8	9.0	7.9	8.9	11.6	10.3	11.9	10.5	11.7	14.1	12.6	14.5	12.9	14.4		
10	250	272.6	273.4	10.9	9.7	11.2	9.9	11.1	14.3	12.8	14.8	13.0	14.5	17.5	15.7	18.1	16.1	17.9		
12	300	323.4	324.3	12.9	11.5	13.3	11.1	12.4	17.0	15.2	17.5	14.7	16.3	20.8	18.7	21.6	18.1	20.1		
14	350	355.0	356.0	14.1	12.6	14.5	12.5	14	18.6	16.7	19.2	16.5	18.4	22.8	20.5	23.6	20.4	22.6		
16	400	405.9	406.9	16.2	14.5	16.7	15.9	17.7	21.1	19.0	21.9	20.9	23.2	26.0	23.4	27.0	25.9	28.6		



SCHEDULE OF STORES

**Ranhill
SAJ**

Ranhill SAJ Sdn. Bhd.
Schedule Of Stores For Supply And Delivery Of Multi-Layer PVC Pipes
For Period of Year(s)

No	Description	Provisional Quantity	Rate (RM)	Amount (RM)
A	Multi-Layer PVC Pipes Class PN 12 : Bell- Mouth			
1	80mm Diameter			
2	100mm			
3	155mm			
4	200mm			
5	250mm			
6	300mm			
7	350mm			
8	400mm			
B	Multi-Layer PVC 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 :



