

DELPHA PLASTICS CO., LTD.

Characteristics of DELPHA's ANSI standard CLEAR PVC Pipes

Clear PVC piping system → Quality is visible



The Clear PVC piping system offered by DELPHA is of superior quality. Non-clear pipes do not allow visual monitoring of fluids, flow direction, sediment buildups, clogs or other abnormalities in the pipe. As a result, users of non-clear pipes are unable to prevent mechanical problems, production termination or other serious losses caused by problems in the piping system. DELPHA CLEAR PVC piping system offers an effective solution.

DELPHA CLEAR PVC piping system has the following advantages:

- *All the pipes and accessories are clear, making easier the visual monitoring of the internal status of the pipes at any time.
- *Smooth interior walls ensure unimpeded flow and reduce sediment buildups.
- *Visual identification of the flow direction is easy. NO sign is needed to indicate the flow direction.
- *The piping system offers easy visual monitoring and high protection when used in dual-containment piping applications.
- *It is alkaline and acid resistant, as good as the PVC piping system.
- *Pipes can be easily joined by the solvent cementing process. This joining process is easy and quick and can ensure high joint strength.
- *It delivers durability of more than 10 years for indoor use at normal temperatures.
- *Its high relative transmittance (above 80%) ensures effective visual monitoring.
- *To meet the demand for high transparency, the pipes are designed to allow high transmittance of light through the pipe walls. Hence, adequate shading is needed for applications where the pipes may have direct exposure to sunlight.

Specifications:

● Specific gravity	1.329	ASTM D792-08
● Tensile strength	674kgf/cm ²	ASTM D638-08
● Flattening test	no crack/broken	ASTM D1785-06
● Hardness type D	80	CNS 12628
● Flame test	inflammable and non-oxidizing	CNS 1303

Installation and Storage of DELPHA CLEAR PVC Pipes

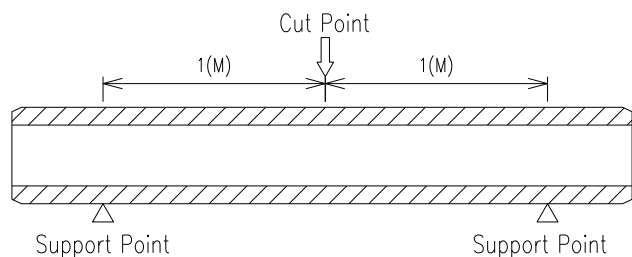
Cutting:

Clear PVC pipes should be cut using a specialized plastic cutting tool as shown below. With such tool, a saw, grater or sand paper is not necessarily needed. The cut should be straight and even with no burrs on edges, and the edges should be slightly beveled. The purposes of these are as follows:

1. Squared cutting ensures that the pipe can be inserted to the bottom of the fitting socket.
2. Burrs and sharp edges may scrape off the solvent cement when being inserted into the fittings, causing reduced the cementing strength.
3. Pipes with beveled edges are easier to fit. Beveled edges offer a larger space for more solvent cement to pile up, which is good for cementing strength.
4. For cutting straight pipes with a diameter less than 4 inches, a rotary plastic cutter (as shown in Figure A) is suggested. This kind of cutter progressively cuts the pipe as the user rotates the cutter around the pipe. The number of rotation of the cutter should be optimized first. Please try it on a short pipe first. Generally, the number ranges between 5-10, depending on pipe diameter and width. Another manual tool called deburrer is needed. Deburrer features a simple metal cone with a sharpened opening running from bottom to top of the cone. It can shave off burred end of the pipe and create a beveled edge. Users simply turn the tool placed around the pipe end for 1-3 minutes to get a well prepared pipe end. Larger PVC pipes with a diameter over 4 inches should be cut using a three-bladed cutting tool. The three-bladed cutting tool is installed clockwise on the pipe. Only the center blade is responsible for cutting. The other two blades run in the track created by the cutting blade to help it give a square and clean cut. Electric or manual hacksaw, circular saw or belt saw can be used to perform the cutting if the above mentioned PVC cutter is not available. Smaller saw teeth are more advisable (16-18 teeth per inch). The ideal speed is 6000 feet/min for circular saw and 3000 feet/min for belt saw. As suggested above, please optimize use of the cutting tool by trying shorter pipes first. The saw blade and teeth should better be carbide-tipped. To ensure a square cut, some auxiliary tools, including miter box, hold-down or jig, should be used. Check blade dullness and buildup of residues regularly. If the problem is serious, the blade should be replaced immediately.
5. If the distance from the cut point to both ends of the pipe is greater than 1 meter, the cut point should be maintained at the same level with both ends as shown below to avoid overloading on any single end of pipe, which may make the cut non-square or cause breakage due to uneven stress distribution.



Plastic pipe cutter (Figure A)

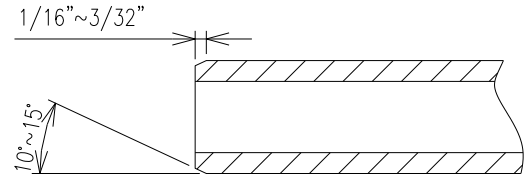


Cleaning:

Clear PVC pipes and fittings are homogeneous monolithic. In other words, they have the same physical and chemical properties, and no stratification. There should be no water, mold discharging agent, lubricant or any other extraneous substances on the joint surface. Use a sandpaper to prepare a clean joint surface if the surface cannot be fully cleaned with a wipe.

Tips on Joining Preparation

1. Check the pipe and fitting to join first.
2. Make all the cuts square.
3. Better use a specialized cutter to perform the cutting.
4. Deburr and bevel pipe edges after cutting (as shown on the right side).
5. Shears are not suggested, because uneven distribution of stress may cause breakage or other abnormalities easily.
6. Clean the surfaces of the pipe and fitting to join thoroughly
7. Check the joining depth. The pipe should easily go 1/3 to 3/4 of the way into the fitting hub.



Solvent Cementing

1. Wipe primer: Wipe primer around the joining surfaces on the pipe and the fitting to increase the cementing strength of solvent cement. Use a wiping tool or brush (rags are not recommended) that is about half of the pipe diameter wide to apply the primer around the external joint surface of the pipe and the internal joint surface of the fitting. When preparing larger pipes, be sure to increase the amount of primer used and the repetition of primer wiping operation to ensure softening of the joint surface.
2. Apply solvent: The solvent must be applied after the joint surfaces are primed. The joint surfaces must be soaked and softened. Spread a thick and even layer of solvent on the outside of the pipe and an intermediately thick and even layer of solvent on the inside of the tube. For pipes with a diameter larger than 2 inches, two or more layers of solvent are needed.
3. Joining: After applying the solvent, immediately insert the pipe into the fitting. Twist the fitting at least a quarter turn to make sure that the pipe end touches the bottom of the fitting socket. Hold the pipe and the fitting together for at least 15 seconds to ensure initial bonding (for joining pipes larger than 6 inches wide, at least two persons should work together to hold the joint for 1-3 minutes). Spill of the solvent around the joint area should be conspicuous and continuous. Noncontinuous spill of the solvent indicates that insufficient solvent is used. In this case, replace the fitting with a new one. Use a rag to wipe away the spill.

4. Ideal width of brushes for applying solvent:

Pipe diameter (inch)	Ideal width of the brush	
	Max. (inch)	Min. (inch)
1/2	1/2	1
3/4	1/2	1-1/2
1	1	1-1/2
1-1/4	1	1-1/2
1-1/2	1-1/2	1-3/4
2	1-1/2	2
2-1/2	2	2-1/2
3	2-1/2	3
4	3	3-1/2
5	4	4-1/2
6	5	5-1/2
8	6	6

Tips on Solvent Cementing

1. Damp surface is not applicable. (Do not perform solvent cementing in the rain.)
2. Expose pipes, fittings, and the solvent to the same temperature one hour before joining.
3. Use only natural brushes. Primer and solvent are erosive of artificial brushes.
4. Do not perform joining at temperature below 40°F.
5. The procedure of joining under direct sunlight with ambient temperature above 90°F is as follows:
 - (a) Shade all the joint surfaces one hour before the operation. Avoid exposure to sunlight during the operation.
 - (b) Use clean cotton cloth instead of a brush to wipe primer.
 - (c) Use a sealable bottle to contain primer.
 - (d) The solvent wiping operation and the joining operation should be finished as sooner as possible.
6. Check expiration date of the solvent and make sure it is effective before using it.
7. If the solvent has become solid, it should be discarded. Do not use any diluting agent or primer to dilute it. Use of such diluted solvent may cause serious fractures in the pipe.
8. Do not move or apply pressure on any area of the joint before solvent has completely set.

Storage and Handling of Plastic Pipes

1. Storage:

DELPHA's Clear PVC pipes have been processed to be ultraviolet-resistant. Due to their transparent nature, light can easily travel through the pipe walls. Therefore, outdoor storage of clear PVC pipes is not recommended. Clear PVC pipes should be stored indoors with good ventilation. To avoid damage, it is not advisable to store them in containers. Adequate shades are needed if they are stored in an outdoor environment.

To avoid deformation, pipes should not be stacked over one meter high. If pipes are stored on racks, be sure that there is no sharp edges on the racks. Avoid direct exposure to sunlight and heat sources. A continuous supporting material (e.g. a wooden plate of 1.5 cm thick) should be placed at the bottom of the racks to avoid load-induced deformation.

2. Handling:

Clear PVC pipes may easily damaged if they are not handled with care. For instance, scratches or fractures may occur if pipes are pulled out from a truck and directly fall on a hard ground. We suggest unloading of pipes from a truck be handled by at least three persons. Any reckless handling behavior is strictly prohibited.

Avoid contact of pipes or fittings with any sharp material, and be sure that there is no heavy object pressing upon them. In the event of an accident, check the pipes thoroughly, and replace the damaged section even if the possibility of its function failure is very small. If elevation or slinging of Clear PVC pipes is needed, use nylon ropes or ropes of 3-4 inches wide to hold the pipes. Chains of any type are not applicable.

Tests of DELPHA CLEAR PVC Pipes

SGS
Material & Engineering Laboratory-Taichung

Test Report

REPORT NO.: TV-11-02146XA
PAGE NO.: 1 OF 1
DATE: Aug. 25, 2011

Client: DELPHA PLASTICS CO., LTD.
Supplier: DELPHA PLASTICS CO., LTD.
Product Description: CLEAR PVC PIPE
Style/Item No.:
Color: LIMPID
Submitted By: DELPHA PLASTICS CO., LTD.
Received Date: Aug. 24, 2011
Tested Date: Aug. 24, 2011-Aug. 25, 2011
Remark: The information mentioned in the above section is provided by Client (Exclude Date of Sample Received and Date of Testing)

RESULT:

INSPECTION ITEM	TEST METHOD	RESULT
Flattening Test (Outside diameter for 40% strain)	ASTM D1785-06	No Crack and Broken

Note: This Test Report is an additional original report of TV-11-02146X. Issued date: Aug. 25, 2011.

Signed for and on behalf of
SGS Taiwan Ltd.

SGS
Material & Engineering Laboratory-Taichung

TEST REPORT

REPORT NO. TV-10-00794ZA-1
PAGE NO. 1 OF 1
DATE: May 18, 2010

Client: DELPHA PLASTICS CO., LTD.
Applicant: DELPHA PLASTICS CO., LTD.
Supplier: DELPHA PLASTICS CO., LTD.
Product Description: DELPHA CLEAR PVC PIPE
Style/Item No.:
Color: LIMPID
Submitted By: DELPHA PLASTICS CO., LTD.
Received Date: April 22, 2010
Tested Date: April 22, 2010-May 17, 2010
Remark: The information mentioned in the above section is provided by testing applicant (Exclude tested date)

Test Result:

Test Item	Test Method	Test Result
specific gravity	ASTM D792-08	1.329
Tensile strength (kgf/cm ²)	ASTM D638-08	674
Flame test	CNS 1303(1992)	The flame of test specimens were not extend and be self-extinguished

Test Result : Heavy metal analysis

Test Item	Unit	Test method	MDL	Result
Soluble Antimony(Sb)	mg/kg	With reference to ASTM P963. Analysis was performed by ICP-AES	5	<5
Soluble Arsenic(As)	mg/kg		5	<5
Soluble Barium(Ba)	mg/kg		10	<10
Soluble cadmium	mg/kg		5	<5
Soluble chromium	mg/kg		5	<5
Soluble Lead	mg/kg		5	<5
Soluble Mercury	mg/kg		5	<5
Soluble Selenium	mg/kg		5	<5

Note: 1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detection Limit
3. MDL = Method Detection Limit
4. Heavy metal Test is proceeded by SGS-TPE Lab.
5. Specific gravity and Tensile strength Test in this test report are TAF Registered items.
6. This test report is an extra issued one of TV-10-00794Z-1.
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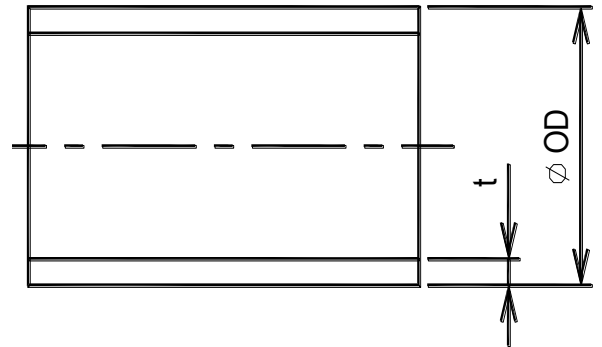
The required specification(s) offered in this test report is/are for reference only. The conformity judgment is at the Applicant's final verdict.

Signed for and on behalf of
SGS TAIWAN LTD.

ANSI PIPE

Unit:mm

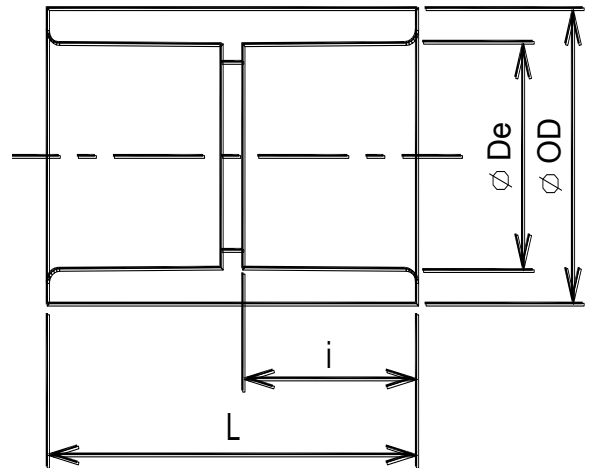
Size	OD	t	t Tolerance	23°C Water Pressure
1/2"	21.34	2.5	±0.30	31.05 kg
3/4"	26.67	2.5	±0.30	27.05 kg
1"	33.40	2.5	±0.30	22.03 kg
1-1/4"	42.16	3.0	±0.30	19.34 kg
1-1/2"	48.26	3.0	±0.30	16.73 kg
2"	60.32	3.5	±0.30	15.20 kg
2-1/2"	73.02	4.0	±0.35	14.42 kg
3"	88.90	4.5	±0.40	13.20 kg
4"	114.30	5.0	±0.45	11.36 kg
6"	168.28	7.2	±0.50	10.54 kg
8"	219.08	7.5	±0.55	9.08 kg



ANSI COUPLING (Socket*Socket)

Unit:mm

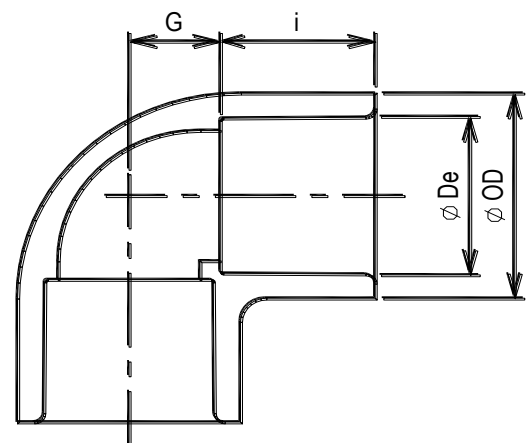
Size	De	i	OD	L
1/2"	21.34	20	27.1	42.2
3/4"	26.67	25.2	33.4	52.7
1"	33.40	28.8	41.4	60
1-1/4"	42.16	29.2	51	60.5
1-1/2"	48.26	32.3	58	68.5
2"	60.32	35	70	73
2-1/2"	73.02	49.8	84.4	103
3"	88.90	53.2	102.5	112.6
4"	114.30	59.7	128.5	125.7
6"	168.28	76.2	183.2	159.3

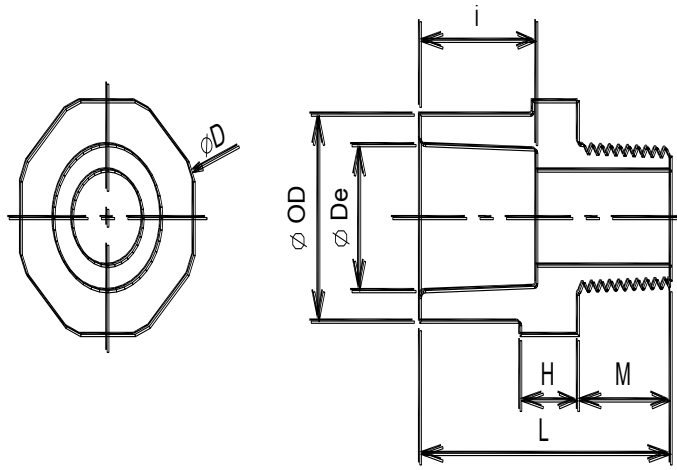


ANSI 90° Elbow (Socket*Socket)

Unit:mm

Size	De	i	OD	G
1/2"	21.34	20	27.2	13
3/4"	26.67	25.5	33.3	15.5
1"	33.40	28.5	41.3	18.5
1-1/2"	48.26	32	57.2	31
2"	60.32	31.5	70	35.5
2-1/2"	73.02	47.5	88.1	37.5
3"	88.90	48.5	100	45.5
4"	114.30	51	128	58
6"	168.28	55	180	88

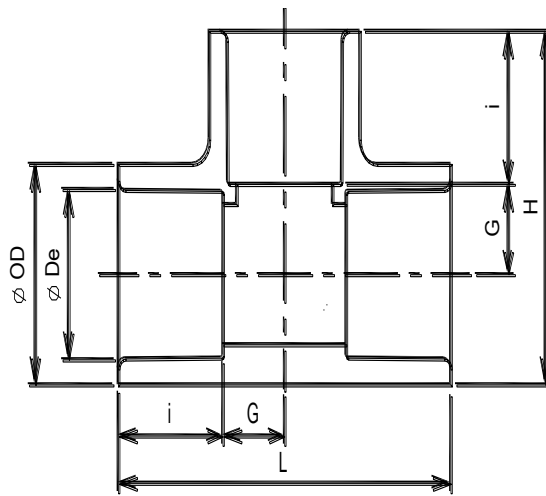




ANSI MALE ADAPTER(Socket*Mipt)

Unit:mm

Size	De	i	OD	L	M	H	D
1/2"	21.34	24.2	30	50	19	9.2	38.5
3/4"	26.67	27.2	35	49.5	14.5	9	43.3
1"	33.40	28.5	41.2	54	20.5	6.5	44.8
1-1/2"	48.26	32.8	57	61.4	22	9.7	61
2"	60.32	35.2	72.6	68.3	23.5	9.5	76



ANSI TEE (Socket*Socket*Socket)

Unit:mm

Size	De	i	OD	L	G	H
1/2"	21.34	24.3	29	74.4	12.9	51.7
3/4"	26.67	27.7	35.2	84.8	14.7	60
1"	33.40	31	44.2	97.2	17.6	70.7
1-1/2"	48.26	38.4	60.2	128.4	25.8	94.3
2"	60.32	41.3	73	146	31.7	109.5
2-1/2"	73.02	49	89	174	38	131.5
3"	88.90	51.2	102	200.4	49	151.2
4"	114.30	51.2	127	225	61.3	176