

Physical and Chemical Properties of PVC-U Pipes

Physical Properties

1. PVC-U Pipes for Drainage

Test Items	Standard Value	Test Standard
Density (kg/m ³)	1350~1550	GB/T5836.1-2006
Vicat Softening Temperature (°C)	> 79	
Longitudinal Reversion (%)	< 5	
Dichloromethane Immersion Test	Surface change not worse than 4L	
Tensile Yield Strength (Mpa)	> 40	
Drop Weight Impact Test (0°C) TIR(%)	< 10	

2. PVC-U Pipes for Water Supply

Test Items	Standard Value	Test Standard
Opacity Test	Opaque	GB/T10002.1-2006
Density (kg/m ³)	1350-1460	
Vicat Softening Temperature (°C)	> 80	
Longitudinal Reversion (%)	≤ 5	
Dichloromethane Immersion Test (15°C, 15min)	Surface change not worse than 4N	
Drop Weight Impact Test (0°C) TIR(%)	≤ 5	
Hydraulic Test	No rupture, no leakage	
Connection Sealing Test	No rupture, no leakage	
Sanitary Performance Test	Conforms to GB/T17219-1998	
VCM Content (mg/kg)	< 1.0	

Note: Water supply pipes are suitable for conveying general water and drinking water below 45°C, and can be used overhead or buried.

3. PVC-U Pipes for Chemical Industry

Test Items	Standard Value	Test Standard
Density (kg/m ³)	1330~1460	GB/T4219.1-2008
Vicat Softening Temperature (°C)	> 80	

Longitudinal Reversion (%)	< 5	
Dichloromethane Immersion Test (15°C, 30min)	No surface damage	
Drop Weight Impact Test (0°C) TIR(%)	< 10	
Hydraulic Test	No rupture, no leakage	
System Hydraulic Test	No rupture, no leakage	

4. Electrical Conduits for Buildings

Test Items	Standard Value	Test Standard
Compressive Performance	Loading 1min Df < 25% Unloading 1min Df < 10%	Q/HYW02-2015 IEC-614 JG/T3050-1998
Impact Performance	At least 10 out of 12 specimens do not break or crack	
Bending Performance	No visible cracks	
Flattening Performance	Gauge passes by its own weight	
Drop Performance	No shock cracking, no breakage	
Heat Resistance	Indentation diameter $D_i \leq 2\text{mm}$	
Flame Retardancy	Oxygen Index $OI \geq 32.0$ Self-extinguishing time $t \leq 30\text{S}$	
Electrical Performance	No breakdown within 15min, $R \geq 100\text{M}\Omega$	

5. Underground Sewage Pipes

Test Items	Standard Value	Test Standard
Density (g/cm^3)	< 1.55	GB/T20221-2006
Vicat Softening Temperature ($^{\circ}\text{C}$)	> 79	
Longitudinal Reversion (%)	≤ 5	
Drop Weight Impact TIR(%)	< 10	
Ring Stiffness (KN/m^2) SN2	≥ 2	
Ring Stiffness (KN/m^2) SN4	≥ 4	
Ring Stiffness (KN/m^2) SN8	≥ 8	
Dichloromethane Immersion	No surface change	
Connection Sealing Test	No leakage, no rupture	

6. Pipes for Water Delivery and Irrigation

Test Items	Standard Value	Test Standard
Density (kg/m^3)	1350~1550	GB/T13664-2006
Longitudinal Reversion (%)	< 5	

Tensile Yield Stress (MPa)	≥ 40	
Hydrostatic Test (20℃, 4 times working pressure, 1h)	No rupture, no leakage	
Drop Weight Impact (0℃)	9/10 pass	
Ring Stiffness (KN/m ²) Nominal pressure 0.2MPa pipe	≥ 0.5	
Ring Stiffness (KN/m ²) Nominal pressure 0.25MPa pipe	≥ 1.0	



Ring Stiffness (KN/m ²) Nominal pressure 0.32MPa pipe	≥ 2.0	
Flattening Test to 50%	No rupture	

PVC-U Fittings for Drainage and Water Supply

Test Items	Quality Standard	Test Principles
Internal Pressure Test	No leakage, no rupture	dn≤90: 4.2xPN dn>90: 3.36xPN Test temp 20±2℃, hold for 1 hour. Pressure according to GB/T10002.2-2003
Drop Test	Fall freely from standard height without rupture 1. Drainage: ≥74℃ 2. Water Supply: ≥74℃	Drop finished product freely from standard height without rupture. According to GB/T8801-88 Load 49.05N Heating rate 50±5℃/hr according to GB/T8802-2001
Heat Oven Test	Surface crack of finished product shall not exceed half of thickness	In 150℃ ventilated circulation oven, time controlled by thickness. According to GB/T8803-2001
VCM Content	≤ 1.0mg/kg	Analyzed by gas chromatograph. According to GB/T4615-84
Sanitary Performance	Qualified	According to GB/T17219-1998

Note: 1. Factory inspection items marked. 2. Type inspection items marked. 3. Items without marks mean that this type of product is exempt from this test.

(2) Chemical Properties

The followings are the marks for the Technical terms of Chemical Resistance.

O : Fine Resistance, no action, usable

Δ : Usable with care.

X : Unusable.

CHEMICAL	23°C	60°C	CHEMICAL	23°C	60°C
Acetaldehyde	X	X	Barium salts	O	
Acetaldehyde.aq 40%		X	Beer		O
Acetic acid, vapor			Beer sugar liquor		
Acetic acid glacial		X	Benzaldehyde, 10%		X
Acetic acid, 20%	O		Benzaldehyde.above 10%	X	X
Acetic acid.80%		O	Benzene (benzol)	X	X
Acetic anhydride			Benzene sulfonic acid, 10%		
Acctone	X		Benzene sulfonic acid		
Acetylene			Benzoic acid		
Adipic acid			Black liquor-paper		
Alcohol allyl			Bleach, 12.5% active chlorine	O	
Alcohol, butyl benzyl	X		Bleach, 5.5% active chlorine		
Alcohol,butyl (n- butanol)		O	Borax		
Alcohol, butyl (2- butanol)		X	Boric acid		O
Alcohol ethyl			Boron trifluoride		
Alcohol, hthyl			Bromic acid		
Alcohol, isopropyl (2- propanol)			Bormine, liquid	X	X
Alcohol, methyl		O	Bromine,gas.25%		
Alcohol, propyl(1- propanol)		O	Bromine,aq		
Allyl chloride			Butadine		
Alums	O	O	Butane		
Ammonia.gas			Butantetrol (crythritol)	O	X
Ammonia, liquid	X		Butanediol		
Ammonia.aq			Butyl acetate	X	X
Ammonium salts, except fluoride		O	Butyl phenol		X
Ammonium fluoride, 25%		O	Butylene		
Amyl acetate			Butyric acid	O	X
Aniline	X	X	Calcium salts.aq		
Aniline chlorohydrate	X	X	Calcium hypochlorite		
Aniline	X		Calcium hydroxide		

hydrochloride					
Aniline dyes	X		Cane sugar liquors		
Anthraquinone			Carbon bisulfide	X	X
Anthraquinone sulfonic acid			Carbon dioxide		O
Antimony trichloride			Carbon dioxide,aq		
Aqua regia		X	Carbon monoxide		
Arsenic acid,80%			Carbon tetrachloride		X
Aryl-sulfonic acid	O		Casein		
Castor oil			Caustic potash (potassium hydroxide)		
Dibutyl phthalate	X	X	Caustic soda (sodium hydroxide)	O	
Dibutyl sebacate	O	X	Cellosolve		
Dichlorobenzene		X	Cellosolve acetate		
Dichloroethylene	X	X	Chloral hydrate	O	
Ethers	X	X	Chloramine		
Ethyl esters			Chloric acid, 20%		
Ethyl halides	X		Chlorine gas,dry	X	
Ethylene halides	X		Chlorine gas,wet	X	
Ethylene glycol			Chlorine, liquid	X	
Ethylene oxide	X		Chlorine water	O	
Fatty acids			Chloracetic acid		
Ferric salts			Chlorobenzene	X	X
Fluorine dry gas		X	Chlorobenzyl chloride	X	
Fluorine,wet gas		X	Chloroform	X	X
Fluoboric acid,25%		O	Chlorosulfonic acid	X	
Fluosilicic acid			Chromic acid, 10%		O
Formaldehyde			Chromic acid.30%		O
Formic acid		X	Chromic acid.40%		
Freon-F11, F12, F113,F114			Chromic acid.50%	X	X
Freon-F21 F22	X	X	Citric acid		
Fuill oil	O	X	Coconut oil		
Furfural	X		Coke oven gas		
Gas.coal manufactured	X	X	Copper salts.aq		
Gas.natural, methane			Corn oil		
Gasolines			Corn syrup		
Gelatin			Cottonseed oil		
Glycerine (glycerol)		O	Cresol	X	X
Glycols	O		Cresylic acid.50%		
Glue,animal		O	Croton aldehyde	X	X
Glycolic acid	O		Crude oil	O	
Gallic acid			Cyclohexane	X	
Heptane			Cyclohexanol	X	X
Hexane			Cyclohexanone	X	

Hydrobromic acid, 20%			Diazo salts		
Hydrochloric acid			Diesel fuels	O	O
Hydrofluoric acid, 10%			Diethyl amine	X	X
Hydrofluoric acid, 60%			Dioctyl phthalate	X	
Hydrofluoric acid, 100%			Disodium phosphate		
Hydrocyanic acid			Diglycolic acid		
Hydrogen	O		Dioxane-1.4		
Hydrogen peroxide, 50%			Dimethylamine	O	
Hydrogen peroxide, 90%			Dimethyl formamide	X	X
Hydrogen sulfide, aq	O		Detergents.aq		
Methyl sulfonic acid		O	Hydrogen sulfide.dry		
Methylene bromide		X	Hydroquinone	O	O

3. PVC-U Pipe Specifications

(1) Pipes for Building Drainage (GB/T5836.1-2006)

Nominal Outer Diameter (mm)	Wall Thickness (mm)	Reference Weight (kg/m)	Total Length (m)
32	2.0+0.4	0.314	
40	2.0+0.4	0.398	
50	2.0+0.4	0.503	
75	2.3+0.4	0.867	4
90	3.0+0.5	1.348	
110	3.2+0.6	1.781	
160	4.0+0.6	3.199	
200	4.9+0.7	4.885	
250	6.2+0.8	7.674	6
315	7.8+0.8	12.017	

Note: 1. Pipe length can be determined according to order requirements, planned product color is white, other colors can also be determined by order.

2. Can provide $\Phi 50 \times 1.6\text{mm}$, $\Phi 75 \times 1.9\text{mm}$, $\Phi 110 \times 2.2\text{mm}$, $\Phi 110 \times 2.8\text{mm}$, $\Phi 160 \times 3.2\text{mm}$, $\Phi 200 \times 3.9\text{mm}$ customized drainage pipes.

(2) Pipes for Water Delivery and Irrigation (GB/T13664-2006)

Nominal Outer Diameter (mm)	Average Outer Diameter Limit Deviation	Wall Thickness Basic Size	Wall Thickness Limit Deviation	Nominal Pressure (Mpa)	Reference Weight (kg/m)	Total Length (m)
110	+0.4 / 0	2.2	+0.4 / 0	0.32	1.162	4

160	+0.5 / 0	3.2	+0.5 / 0	0.32	2.430	6
200	+0.6 / 0	3.9	+0.5 / 0	0.32	3.700	6

(3) Underground Sewage Pipes (GB/T20221-2006)

Nominal Outer Diameter (mm)	SN4 Wall Thickness	SN4 Ref. Weight (kg/m)	SN8 Wall Thickness	SN8 Ref. Weight (kg/m)	Total Length (m)
110	3.2	1.768	3.2	1.768	4
160	4.0	3.175	4.7	3.711	6
200	4.9	4.848	5.9	5.693	
250	6.2	7.674	7.3	8.959	
315	7.7	11.93	9.2	14.184	
400	9.8	19.212	11.7	22.790	

Note: Can provide $\Phi 250 \times 4.9\text{mm}$, $\Phi 315 \times 6.0\text{mm}$, $\Phi 315 \times 6.2\text{mm}$, $\Phi 400 \times 7.8\text{mm}$ wall thickness sewage pipes.

(4) Spiral Silencing Pipes for Building Drainage (Q/HYW04-2014)

Nominal Outer Diameter (mm)	Avg. Outer Dia. Limit Dev.	Wall Thickness Basic Size	Wall Thickness Limit Dev.	Reference Weight (kg/m)	Total Length (m)
75	+0.3 / 0	2.1	± 0.2	0.888	
110	+0.4 / 0	3.1	± 0.3	1.809	4
110 (Reinforced)	+0.3 / 0	3.2	+0.6 / 0	1.964	
160	+0.5 / 0	3.8	± 0.6	3.240	

(5) Double-wall Hollow Spiral Silencing Drainage Pipes (Q/HYW13-2014)

Nominal Outer Diameter (mm)	Wall Thickness (mm)	Reference Weight (kg/m)	Total Length (m)
75	5.0 +1.0/0	1.037	
110	6.0 +1.1/0	2.185	4
160	6.5 +1.2/0	3.423	

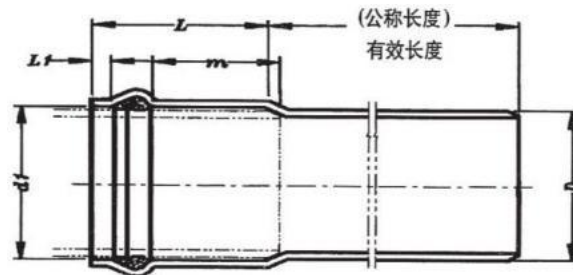
(6) Pipes for Water Supply (GB/T10002.1-2006)

Nominal Outer Diameter (mm)	Pressure 0.63MPa WT	Pressure 0.8MPa WT	Pressure 1.0MPa WT	Pressure 1.25MPa WT	Total Length (m)
20	-	-	-	2.0+0.4	4
25	-	-	2.0+0.4	2.3+0.5	
32	-	2.0+0.4	2.4+0.5	-	
40	2.0-0.4	2.4+0.5	3.0+0.5	-	
50	2.0-0.4	2.4-0.5	3.0-0.5	3.7+0.6	
63	2.0+0.4	2.5+0.5	3.0-0.5	3.8-0.6	

Note: 1. Can provide $20 \times 1.6\text{mm}$, $25 \times 1.6\text{mm}$, $32 \times 1.6\text{mm}$, $40 \times 1.6\text{mm}$, $50 \times 1.6\text{mm}$ water supply customized products.

2. Hard PVC-U water supply pipe sanitary license approval number: Wan Wei Shui Zi (2002) No. 0014

(7) Elastic Sealing Ring Connection Water Supply Pipes



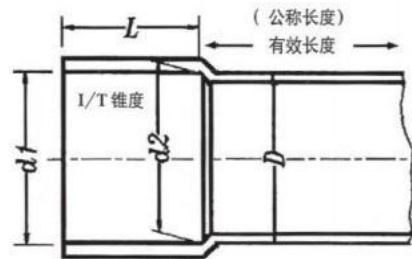
Nominal Outer Diameter	d1 (min)	L (min)	L1	m (min)	D Avg OD Limit	Total Length (m)
63	65±1.0	100	15±3.0	64	63	
75	77±1.0	110	20±3.0	67	75	
90	92±1.0	115	20±3.0	70	90	4
110	113±1.5	130	25±4.0	75	110	
160	165±2.5	175	30±4.0	86	160	

Note: 1. Pipe length can be determined according to order requirements, planned product color is gray.

2. "*" indicates product under development.



(8) TS Plain Bell End Pipes



Nominal Outer Diameter	d1	1/T	L	D
20	20.55±0.20	1/34	28	20
25	25.60±0.20	1/34	34	25
32	32.70±0.25	1/34	40	32
40	40.75±0.25	1/34	44	40
50	50.85±0.30	1/37	55	50
63	63.95±0.30	1/54	70	63
110	111.20±0.35	1/68	125	110

Note: 1. D is the average outer diameter of PVC-U.

2. Allowable variance of L is +4.0mm, -1.0mm.

3. $1/T = d1 - d2 / L$

(9) Pipes for Chemical Industry (GB/T4219.1-2008)

Nominal Outer Diameter dn	Tolerance	Nominal Wall Thickness en	Pressure PN (Mpa)	Total Length (m)
20	+0.2	2.3+0.5	1.6	4
25	+0.2	2.8+0.5		
32	+0.2	3.6+0.6		
40	+0.2	3.0+0.5		
50	+0.2	3.7+0.6		
110	+0.4	8.1+1.1		

Note: Chemical pipes are suitable for conveying certain corrosive chemical fluids with long-term temperature below 45°C.

(10) Electrical Conduits (JG/T 3050-1998)

Nominal Outer Diameter	Limit Deviation	Type	Min Inner Diameter	Min Thickness	Ref Weight (kg/m)	Total Length (m)
16	0 / -0.3	Light Medium Heavy	13.7 12.2 -	0.85 1.0 -	0.074 0.089 0.113	
20	0 / -0.3	Light Medium Heavy	17.4 15.8 -	1.0 1.1 -	0.102 0.117 0.159	3.2 or 4

Note: "*" indicates standard Q/HYW02-2015 is executed.