SCH40, SCH80, SCH120 UPVC PIPES & SCH40, SCH80 CPVC PIPES

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UPVC PIPES

ASTM UPVC PIPES

1 Preface

Nan Ya Plastics Corporation was established in 1958 and was at once engaged in the production of UPVC pipes and fittings, CPVC Pipes and fittings. On account of excellent quality, complete specifications and punctual delivery, the products have received good comment and reputation from the plastic circle. Our UPVC pipes and fittings fulfill the set standards specifications by either CNS or ASTM, ISO, JIS; the Pipes and fittings includes ASTM SCH40, SCH80, SCH120 and JIS VP, VU and CNS, also for thickness and thin wall pipes by JIS. At present, we have the largest and newest equipment for producing UPVC pipes and fittings CPVC Pipes and fittings in Taiwan. Our productivity is the strongest and our distributing network covers the whole world. We shall continue to develop new quality products to meet market demand, maintain punctual delivery and offer best services to our customers.

Products	Materials standard	Outlines dimensional spec. & physical properties	Sizes
SCH40, SCH80 UPVC Pipes	Cell classification 12454-B ASTM D-1784	ASTM D-1785	3/8" ~24"
SCH120 UPVC Pipes			1/2" ~12"
SCH40, SCH80 CPVC Pipes	Cell classification 23447 ASTM D-1784	ASTM F-441	3/8" ~16"

2 Physical Properties of SCH40、SCH80、SCH120 UPVC Pipes

◆Physical Properties of SCH40、SCH80、SCH120 UPVC Pipes

Pilot projects	Quality standard
Sustained Pressure	Meet ASTM D-1785, as shown in the following table
Burst Pressure	Meet ASTM D-1785, as shown in the following table
Flattening	Conforms to ASTM D-1785, does not break when the inner diameter is deformed to 40% of the original under pressure
Extrusion Ouality	Meet ASTM D-1785

◆Comparison table of various water-resistant pressure values of UPVC rigid pipes SCH40, SCH80, and SCH120 specifications:

Unit : PSI(MPa)

Size	SCH40			SCH80			SCH120		
	Sustained Pressure	Burst Pressure	Water Pressure Ratings	Sustained Pressure	Burst Pressure	Water Pressure Ratings	Sustained Pressure	Burst Pressure	Water Pressure Ratings
3/8"	1310(9.03)	1990(13.72)	620(4.27)	1930(13.31)	2940(20.27)	920(6.34)	–	–	–
1/2"	1250(8.62)	1910(13.17)	600(4.14)	1780(12.27)	2720(18.76)	850(5.86)	2130(14.69)	3250(22.41)	1010(6.96)
3/4"	1010(6.96)	1540(10.62)	480(3.31)	1440(9.93)	2200(15.17)	690(4.76)	1620(11.17)	2470(17.03)	770(5.31)
1"	950(6.55)	1440(9.93)	450(3.10)	1320(9.10)	2020(13.93)	630(4.34)	1510(10.41)	2300(15.86)	720(4.96)
1 1/4"	770(5.31)	1180(8.14)	370(2.55)	1090(7.52)	1660(11.45)	520(3.59)	1250(8.62)	1900(13.10)	600(4.14)
1 1/2"	690(4.76)	1060(7.31)	330(2.28)	990(6.83)	1510(10.41)	470(3.24)	1130(7.79)	1720(11.86)	540(3.72)
2"	580(4.00)	890(6.14)	280(1.93)	850(5.86)	1290(8.89)	400(2.76)	990(6.83)	1510(10.41)	470(3.24)
2 1/2"	640(4.41)	970(6.69)	300(2.07)	890(6.14)	1360(9.38)	420(2.90)	980(6.76)	1490(10.27)	470(3.24)
3"	590(4.07)	840(5.79)	260(1.79)	790(5.45)	1200(8.27)	370(2.55)	930(6.41)	1420(9.79)	440(3.03)
4"	470(3.24)	710(4.90)	220(1.52)	680(4.69)	1040(7.17)	320(2.21)	900(6.21)	1380(9.51)	430(2.96)
5"	410(2.83)	620(4.27)	190(1.31)	610(4.21)	930(6.41)	290(2.00)	830(5.72)	1260(8.69)	400(2.76)
6"	370(2.55)	560(3.86)	180(1.24)	590(4.07)	890(6.14)	280(1.93)	780(5.38)	1190(8.20)	370(2.55)
8"	330(2.28)	500(3.45)	160(1.10)	520(3.59)	790(5.45)	250(1.72)	760(5.24)	1160(8.00)	380(2.62)
10"	300(2.07)	450(3.10)	140(0.97)	490(3.38)	750(5.17)	230(1.59)	770(5.31)	1170(8.07)	370(2.55)
12"	280(1.93)	420(2.90)	130(0.90)	480(3.31)	730(5.03)	230(1.59)	710(4.90)	1090(7.52)	340(2.34)
14"	270(1.89)	410(2.87)	130(0.90)	470(3.29)	720(4.97)	220(1.54)	–	–	–
16"	270(1.89)	410(2.87)	130(0.90)	470(3.29)	710(4.90)	220(1.54)	–	–	–
18"	270(1.89)	410(2.87)	130(0.91)	460(3.22)	700(4.90)	220(1.54)	–	–	–
20"	260(1.82)	390(2.73)	120(0.84)	460(3.22)	700(4.90)	220(1.54)	–	–	–
24"	250(1.75)	380(2.66)	120(0.84)	450(3.15)	680(4.76)	210(1.47)	–	–	–

Remarks : (1) The above data comes from ASTM D-1785.
(2) Testing temperature is 73°F (23℃).
(3) SCH 80, SCH 120 Water Pressure rating means unthread piping.

◆Temperature Pressure De-rating For Thermoplastic Materials

Elevated temperature fluid mediums require a de-rating of thermoplastic pipe maximum internal pressure ratings at 73°F. To determine the maximum internal pressure rating at an elevated temperature, simply multiply the product pressure rating at 73°F by the percentage specified for the desired temperature.

This table is based on the normal temperature of 73°F (23°C), the operating pressure of UPVC pipeline/CPVC pipeline is 100%. As the operating temperature increases, the percentage of operating pressure remaining.

System Operating Temperature °F ℃	73 (23)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
UPVC	100%	90%	75%	62%	50%	40%	30%	22%	-0-	-0-	-0-	-0-	-0-	-0-	-0-
CPVC	100%	100%	91%	82%	73%	65%	57%	50%	45%	40%	32%	25%	22%	20%	-0-

NOTE: Threaded products should not be used at temperatures above 110°F (43℃) for UPVC, and 150°F (66℃) for CPVC.

3 Chemical Properties of UPVC Pipes

◆Chemical Properties

Followings are terms of chemical resistance:

⊙ : Superb resistance; usable without chemical reaction
◯ : Usable with care.
× : Unusable.

CHEMICAL	23℃	60℃	CHEMICAL	23℃	60℃
Acetaldehyde	×	×	Barium salts	⊙	⊙
Acetaldehyde, aq 40%	◯	×	Beer	⊙	⊙
Acetamide	—	—	Beet sugar liquor	⊙	⊙
Acetic acid, vapor	⊙	⊙	Benzaldehyde, 10%	⊙	×
Acetic acid, glacial	⊙	×	Benzaldehyde, above 10%	×	×
Acetic acid, 20%	⊙	⊙	Benzene(benzol)	×	×
Acetic acid, 80%	⊙	◯	Benzene sulfonic acid, 10%	⊙	⊙
Acetic anhydride	×	×	Benzene sulfonic acid	×	×
Acetone	×	×	Benzoic acid	⊙	⊙
Acetylene	◯	◯	Black liquor-paper	⊙	⊙
Adipic acid	⊙	⊙	Bleach, 12.5% active chlorine	⊙	⊙
Alcool,allyl	⊙	◯	Bleach, 5.5% active chloride	⊙	⊙
Alcohol, butyl benzyl	×	×	Borax	⊙	⊙
Alcohol, butyl (n-butanol)	⊙	⊙	Boric acid	⊙	⊙
Alcohol, butyl (2-butanol)	⊙	×	Boron trifluoride	⊙	⊙
Alcohol, ethyl	⊙	⊙	Bromic acid	⊙	⊙
Alcohol, hexyl	⊙	⊙	Bromine ,liquid	×	×
Alcohol, isopropyl (2-propanol)	⊙	⊙	Bromine, gas, 25%	⊙	⊙
Alcohol, methyl	⊙	⊙	Bromine, aq	⊙	⊙
Alcohol, propyl (1-propanol)	⊙	⊙	Butadine	⊙	⊙
Allyl chloride	×	×	Butane	⊙	⊙
Alums	⊙	⊙	Butantetrol(erythritol)	⊙	×
Ammonia, gas	⊙	⊙	Butanediol	⊙	⊙
Ammonia, liquid	×	×	Butyl acetate	×	×
Ammonia, aq	⊙	⊙	Butyl phenol	⊙	×
Ammonium salts, except fluoride	⊙	⊙	Butylene	⊙	⊙
Ammonium fluoride, 25%	⊙	◯	Butyric acid	⊙	×
Amylacetate	×	×	Calcium Salts aq	⊙	⊙
Aniline	×	×	Calcium hypochlorite	⊙	⊙
Aniline chlorohydrate	×	×	Calcium hydroxide	⊙	⊙
Aniline hydrochloride	×	×	Cane sugar liquors	⊙	⊙
Aniline dyes	×	×	Carbon bisulfide	×	×
Anthraquinone	⊙	⊙	Carbon dioxide	⊙	⊙
Anthraquinone sulfonic acid	⊙	⊙	Carbon dioxide, aq	⊙	⊙
Antimony trichloride	⊙	⊙	Carbon monoxide	⊙	⊙
Aqua regia	◯	×	Carbon terachloride	⊙	×
Arsenic acid, 80%	⊙	⊙	Casein	⊙	⊙
Aryl-sulfonic acid	⊙	⊙	Castor oil	⊙	⊙

3 Chemical Properties of UPVC Pipes

CHEMICAL	23℃	60℃	CHEMICAL	23℃	60℃
Caustic potash	⊙	⊙	Dibutyl phthalate	×	×
(potassium hydroxide)			Dibutyl sebacate	○	×
Caustic Soda	⊙	⊙	Dichlorobenzene	×	×
(sodium hydroxide)			Dichloroethylene	×	×
Cellosolve	⊙	○	Ethers	×	×
Cellosolve acetate	⊙	–	Ethyl esters	×	×
Chloral hydrate	⊙	⊙	Ethyl esters	×	×
Chloramine	⊙	–	Ethylene halides	×	×
Chloric acid, 20%	⊙	⊙	Ethylene glycol	⊙	⊙
Chlorine, gas ,dry	○	×	Ethylene oxide	×	×
Chlorine, gas ,wet	×	×	Fatty acids	⊙	⊙
Chlorine, liquid	×	×	Ferric salts	⊙	⊙
Chlorine water	⊙	⊙	Fluorine, dry gas	○	×
Chloracetic acid	⊙	⊙	Fluorine, wet gas	○	×
Chlorobenzene	×	×	Fluoboric acid, 25%	⊙	⊙
Chlorbenzyl chloride	×	×	Fluosilicic acid	⊙	⊙
Chloroform	×	×	Formaldehyde	⊙	⊙
Chlorosulfonic acid	⊙	×	Formic acid	⊙	×
Chromic acid, 10%	⊙	⊙	F11, F12, F113, F114 Freon-F11, F12, F113, F114	⊙	⊙
Chromic acid, 30%	⊙	○	F21, F22 Freon-F21, F22	×	×
Chromic acid, 40%	⊙	○	Fruit juices and pulps	⊙	⊙
Chromic acid, 50%	×	×	Fuil oil	○	×
Citric acid, 20%	⊙	⊙	Furfural	×	×
Coconut oil	⊙	⊙	Gas, coal, manufactured	×	×
Coke oven gas	⊙	⊙	Gas, natural, methane	⊙	⊙
Copper salts,aq	⊙	⊙	Gasolines	○	○
Corn oil	⊙	⊙	Gelatin	⊙	⊙
Corn syrup	⊙	⊙	Glycerine (Glycerol)	⊙	⊙
Cottonseed oil	⊙	⊙	Gglycols	⊙	⊙
Cresol	×	×	Glue, animal	⊙	⊙
Cresylic acid, 50%	⊙	⊙	HOCH2COOH Glycolic acid	⊙	⊙
Croton aldehyde	×	×	Green liquor, paper	⊙	⊙
Crude oil	⊙	⊙	Gallic acid	⊙	⊙
Cyclohexane	×	×	Heptane	⊙	⊙
Cyclohexanol	×	×	Hexane	⊙	○
Cycohexanone	×	×	Hydrobromic acid, 20%	⊙	⊙
Diazo salts	⊙	⊙	Hydrochloric acid	⊙	⊙
Diesel fuels	⊙	⊙	Hydrobromic acid, 10%	⊙	○
Diethyl amine	×	×	Hydrobromic acid, 60%	⊙	○
Dioctyl phthalate	×	×	Hydrobromic acid, 100%	⊙	○
Disodium phosphate	⊙	⊙	Hydrocyanic acid	⊙	⊙
Diglycolic acid	⊙	⊙	Hydrogen	⊙	⊙
Dioxane-1.4	×	×	Hydrogen peroxide, 50%	⊙	⊙
Dimethylamine	⊙	⊙	Hydrogen peroxide, 90%	⊙	⊙
Dimethyl formamide	×	×	Hydrogen sulfide, aq	⊙	⊙
Detergents, aq	⊙	⊙			

3 Chemical Properties of UPVC Pipes

CHEMICAL	23℃	60℃	CHEMICAL	23℃	60℃
Hydrogen sulfide, dry	⊙	⊙	Methyl sulfonic acid	⊙	⊙
Hydroquinone	⊙	⊙	Methylene bromide	×	×
Hydroxylamine sulfate	⊙	⊙	Methylene chloride	×	×
Hydrazine	×	×	Methylene iodine	×	×
Hypochlorous acid	⊙	⊙	Milk	⊙	⊙
Iodine, in KI, 3%,aq	○	×	Mineral oil	⊙	⊙
Iodine, alc	×	×	Mixed acids (sulfuric & nitric)	○	×
Iodine, aq, 10%	×	×	Mixed acids (sulfuric & phosphoric)	⊙	⊙
Jet fuels, JP-4 and JP-5	⊙	⊙	Malasses	×	×
Kerosene	⊙	⊙	Monochlorobenzene	×	×
Ketones	×	×	Monoethanolamine	×	×
Kraft paper liquor	⊙	⊙	Motor oil	⊙	⊙
Lacquer thinners	○	×	Nophtha	⊙	⊙
Lactic acid, 25%	⊙	⊙	Naphthalene	×	×
Lard oil	⊙	⊙	Nickel salts	⊙	⊙
Lauric acid	⊙	⊙	Nicotine	⊙	⊙
Lauryl chloride	⊙	⊙	Nicotinic acid	⊙	⊙
Lauryl sulfate	⊙	⊙	Nitric acid, 0 tp 50%	⊙	○
Lead salts	⊙	⊙	Nitric acid,60%	⊙	○
Lime sulfur	⊙	⊙	Nitric acid,70%	⊙	○
Linoleic acid	⊙	⊙	Nitric acid,80%	○	○
Linseed oil	⊙	⊙	Nitric acid,90%	○	×
Liqueurs	⊙	⊙	Nitric acid,100%	×	×
Liqueurs	⊙	⊙	Nitric acid , fuming	×	×
Llthium salts	⊙	⊙	Nitrobenzene	×	×
Lubricating oils	⊙	⊙	Nitroglycerine	×	×
Machine Oil	⊙	⊙	Nitrous acid	⊙	○
Magnesium salts	⊙	⊙	Nitrous oxide, gas	⊙	○
Maleic acid	⊙	⊙	Nitroglycol	×	×
Malic acid	⊙	⊙	Nitropropane	○	○
Manganese sulfate	⊙	⊙	Oils, vegetable	⊙	⊙
Mercuric salts	⊙	⊙	Oils abd fats	⊙	⊙
Mercury	⊙	⊙	Oleic acid	⊙	⊙
Mesityl oxide	×	×	Oleum	×	×
Metallic soaps, aq	⊙	⊙	Olive oil	○	–
Methane	⊙	⊙	Oxalic acid	⊙	⊙
Methyl acetate	×	×	Oxygen, gas	⊙	⊙
Methyl bromide	×	×	Ozone, gas	⊙	○
Methyl cellosolve	×	×	Palmitic acid, 10%	⊙	⊙
Methyl chloride	×	×	Palmitic acid, 70%	⊙	×
Methyl chloroform	×	×	Paraffin	⊙	⊙
Methyl cyclohexanone	×	×	Pentane	○	○
Methyl methacrylate	⊙	–	Peracetic acid, 40%	⊙	×
Methyl salicylate	⊙	⊙	Peracetic acid, 10%	⊙	○
Methyl sulfate	⊙	○	Peracetic acid, 70%	⊙	×

3 Chemical Properties of UPVC Pipes

CHEMICAL	23℃	60℃	CHEMICAL	23℃	60℃
Perchloroethlene	○	○	Sulfite liquor	⊙	⊙
Petroleum, sour	⊙	⊙	Sulfur	⊙	⊙
Phenol	○	×	Sugars, aq	⊙	⊙
Phenylcarbinol	×	×	Sulfur dioxide, aq	⊙	⊙
Phenylhydrazine	×	×	Sulfur dioxide, wet	⊙	○
HCI Phenylhydrazine HCI	○	×	Sulfur dioxide, aq	⊙	⊙
Phosgene, liquid, gas	⊙	○	Sulfur dioxide, wet	⊙	○
Phosgene, liquid	×	×	Sulfuric acid, up to 70%	⊙	⊙
Phosphorus,acid	⊙	⊙	Sulfuric acid, 70 to 90%	⊙	○
Phohosphorus, yellow	⊙	○	Sulfuric acid, 90 to 100%	○	×
Phosphorus, red	⊙	⊙	Sulfurous acid	○	×
Phosphorus pentoxide	⊙	○	Tall oil	⊙	⊙
Phosphorus trichloride	×	×	Tannic acid	⊙	⊙
Photographic chemicals ,aq	⊙	⊙	Tanning liquors	⊙	⊙
Phthalic acid	○	○	Tartaric acid	⊙	⊙
Picric acid	×	×	Tetrachloroethane	○	○
Plating solutions, metal	⊙	○	Tetraethyl lead	⊙	○
Potassium salts, aq	⊙	⊙	Tetrahydrofuran	×	×
Potassium permanganate, 25%	○	○	($SOCI_2$) Thionyl chloride	×	×
Potassium alkyl xanthates	⊙	×	Thread cutting oils	⊙	–
Propane	⊙	⊙	Terpineol	○	○
Propylene dichloride	×	×	Titanium tetrachioride	○	×
Propylene glycol	⊙	⊙	Toluene	×	×
Propylene oxide	×	×	Tributyl phosphate	×	×
Pyridine	×	×	Tributyl citrate	⊙	–
Pyrogallic acid	○	○	Tricresyl phosphate	×	×
Rayon coagulation bath	⊙	⊙	Trichloroacetic acid	⊙	⊙
Sea water	⊙	⊙	Trichloroethylene	×	×
Salicylic acid	⊙	⊙	Triethanolamine	⊙	○
Salicylaldehyde	○	○	Triethylamine	⊙	⊙
Selenic acid	⊙	⊙	Turpentine	⊙	⊙
Sewage, residential	⊙	⊙	Urea	⊙	⊙
Silicic acid	⊙	⊙	Urine	⊙	⊙
Silicone oil	⊙	×	Vaseline	×	×
Silver salts	⊙	⊙	Vegetable oils	⊙	⊙
Soaps	⊙	⊙	Vinegar	⊙	⊙
Sodium salts, aq, except	⊙	⊙	Vinyl acetate	×	×
Sodium chlorite	⊙	⊙	Water, distilled	⊙	⊙
Sodium chlorate	⊙	○	Water, fresh	⊙	⊙
Sodium dichromate, acid	⊙	⊙	Water, mine	⊙	⊙
Sodium perborate	⊙	⊙	Water, salt	⊙	⊙
Stannic chloride	⊙	⊙	Water, tap	⊙	⊙
Stannous chloride	⊙	⊙	Whiskey	⊙	⊙
Starch	⊙	⊙	Wines	⊙	⊙
Stearic acid	⊙	⊙	Xylene	×	×
Stoddard solvent	×	×	Zinc salts	⊙	⊙

Information about chemical resistance is for reference only

4 ASTM SCH40/SCH80/SCH120 UPVC Pipes Specification

Unit：Ginch(m/m)

ASTM D1785										
Size	Outer diameter and tolerance Inch (mm)	SCH 40			SCH 80			SCH 120		
		Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)	Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)	Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)
3/8"	0.675±0.004 (17.14±0.10)	0.091+0.020 (2.31+0.51)	620 (43.66)	0.167	0.126+0.020 (3.20+0.51)	920 (64.79)	0.211	—	—	—
1/2"	0.840±0.004 (21.34±0.10)	0.109+0.020 (2.77+0.51)	600 (42.25)	0.248	0.147+0.020 (3.73+0.51)	850 (59.86)	0.309	0.170+0.020 (4.32+0.51)	1,010 (71.13)	0.343
3/4"	1.050±0.004 (26.67±0.10)	0.113+0.020 (2.87+0.51)	480 (33.80)	0.329	0.154+0.020 (3.91+0.51)	690 (48.59)	0.419	0.170+0.020 (4.32+0.51)	770 (54.23)	0.452
1"	1.315±0.005 (33.40±0.13)	0.133+0.020 (3.38+0.51)	450 (31.69)	0.483	0.179+0.021 (4.55+0.53)	630 (44.37)	0.615	0.200+0.024 (5.08+0.61)	720 (50.70)	0.674
1 1/4"	1.660±0.005 (42.16±0.13)	0.140+0.020 (3.56+0.51)	370 (26.06)	0.653	0.191+0.023 (4.85+0.58)	520 (36.62)	0.850	0.215+0.026 (5.46+0.66)	600 (42.25)	0.941
1 1/2"	1.900±0.006 (48.26±0.15)	0.145+0.020 (3.68+0.51)	330 (23.24)	0.779	0.200+0.024 (5.08+0.61)	470 (33.10)	1.032	0.225+0.027 (5.72+0.68)	540 (38.03)	1.142
2"	2.375±0.006 (60.32±0.15)	0.154+0.020 (3.91+0.51)	280 (19.72)	1.045	0.218+0.026 (5.54+0.66)	400 (28.17)	1.428	0.250+0.030 (6.35+0.76)	470 (33.10)	1.611
2 1/2"	2.875±0.007 (73.02±0.18)	0.203+0.024 (5.16+0.61)	300 (21.13)	1.650	0.276+0.033 (7.01+0.84)	420 (29.58)	2.177	0.300+0.036 (7.62+0.91)	470 (33.10)	2.343
3"	3.500±0.008 (88.90±0.20)	0.216+0.026 (5.49+0.66)	260 (18.31)	2.160	0.300+0.036 (7.62+0.91)	370 (26.06)	2.916	0.350+0.042 (8.89+1.07)	440 (30.99)	3.346
4"	4.500±0.009 (114.30±0.23)	0.237+0.028 (6.02+0.71)	220 (15.49)	3.074	0.337+0.040 (8.56+1.02)	320 (22.54)	4.264	0.437+0.052 (11.10+1.32)	430 (30.28)	5.387
5"	5.563±0.010 (141.30±0.25)	0.258+0.031 (6.55+0.79)	190 (13.38)	4.169	0.375+0.045 (9.52+1.14)	290 (20.42)	5.915	0.500+0.060 (12.70+1.52)	400 (28.17)	7.687
6"	6.625±0.011 (168.28±0.28)	0.280+0.034 (7.11+0.86)	180 (12.68)	5.414	0.432+0.052 (10.97+1.32)	280 (19.72)	8.139	0.562+0.067 (14.27+1.70)	370 (26.06)	10.345
8"	8.625±0.015 (219.08±0.38)	0.322+0.039 (8.18+0.99)	160 (11.27)	8.154	0.500+0.060 (12.70+1.52)	250 (17.61)	12.364	0.718+0.086 (18.24+2.18)	380 (26.76)	17.249

4 ASTM SCH40/SCH80/SCH120 UPVC Pipes Specification

ASTM D1785										
Size	Outer diameter and tolerance Inch (mm)	SCH 40			SCH 80			SCH 120		
		Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)	Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)	Thickness and tolerance Inch (mm)	23℃ allowable operating pressure psi (kg/cm^2)	Reference weight (kg/M)
10"	10.750±0.015 (273.5±0.38)	0.365+0.044 (9.27+1.12)	140 (9.86)	11.579	0.593+0.071 (15.06+1.80)	230 (16.20)	18.362	0.843+0.101 (21.41+2.56)	370 (26.06)	25.423
12"	12.750±0.015 (323.85±0.38)	0.406+0.049 (10.31+1.24)	130 (9.15)	15.280	0.687+0.082 (17.45+2.08)	230 (16.20)	25.223	1.000+0.120 (25.40+3.05)	340 (23.94)	35.715
14"	14.000±0.015 (355.60±0.38)	0.437+0.053 (11.10+1.35)	130 (9.15)	18.086	0.750+0.090 (19.05+2.29)	220 (15.49)	30.260	—	—	—
16"	16.000±0.019 (406.40±0.48)	0.500+0.060 (12.70+1.52)	130 (9.15)	23.627	0.843+0.101 (21.41+2.57)	220 (15.49)	38.902	—	—	—
18"	18.000±0.019 (457.20±0.48)	0.562+0.067 (14.27+1.70)	130 (9.15)	29.861	0.937+0.112 (23.80+2.84)	220 (15.49)	48.670	—	—	—
20"	20.000±0.023 (508.00±0.58)	0.593+0.071 (15.06+1.80)	120 (8.45)	35.082	1.031+0.124 (26.19+3.15)	220 (15.49)	59.566	—	—	—
24"	24.000±0.031 (609.60±0.79)	0.687+0.082 (17.45+2.08)	120 (8.45)	48.826	1.218+0.146 (30.94+3.71)	210 (14.79)	84.506	—	—	—

Note:

1. The material used in the manufacture of the pipe shall be domestically produced rigid polyvinyl chloride (PVC) compound, with a Cell Classification of 12454 (PVC 1120) as defined in ASTM D1784.
2. PVC pipes shall be manufactured in accordance to the requirements of ASTM D1785 for physical dimensions and tolerances.
3. Application:
   (1) Pressure corrosion resistant pipes for use at temperatures up to and including 60℃ (140℉). Typical applications include: chemical processing, plating, high purity applications, potable water systems, water and wastewater treatment, and other industrial applications.
   (2) Schedule 120 pressure rating 340 psi (23.94kgf/cm^2) to 1,010 psi (71.13kgf/cm^2), heavy wall dimensions provide sufficient wall thickness suitable for many drilling, tapping, and other custom machining/fabrication operations.

5 NAN YA Vinyl Adhesive

NAN YA Vinyl Adhesive was reserved for the uses of rigid UPVC products, as UPVC pipe, PVC fitting etc. It suits the installation of UPVC pipe lines during different temperatures, by the way the product's qualities and physical properties are all apply to standard CNS 6224.

When the UPVC pipe lines were installed by NAN YA Vinyl Adhesive, the UPVC pipe lines will start to transfer water after wait for 24 hours. But if the temperature is under 5℃, the UPVC pipe lines need to keep 48 hours waiting affer installed, then start to transfer water.

＊No Eating

◆Packing Category :

180KG, 15KG, 1KG, 500G

VINYL ADHESIVE for RIGID VINYL PRODUCTS

◆Characteristics :

- Colorless and transparent
- Excellent adhesion for rigid PVC
- PVC serves as main material. After the applied adhesive is coagulated, it still maintains its characteristics
- May cause adhesive applied surface a swelling state to achieve adhesion effect
- Easy coating
- Quantity for coating : 0.02g/cm^2

◆Applications :

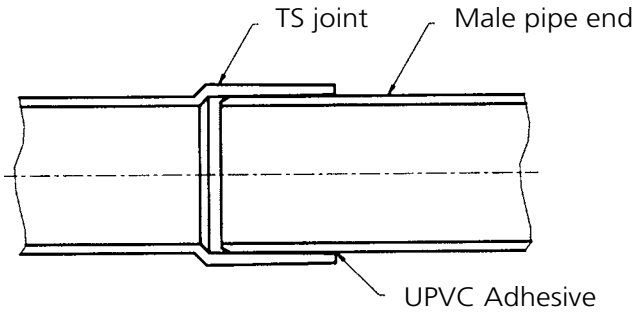
- On PVC pipes
- On PVC vent ducts
- On PVC pipes and their accessories
- On PVC plates
- Rigid or semi-rigid PVC products

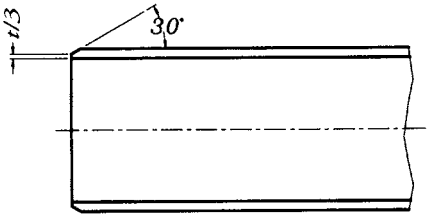
MATERIAL AND PHYSICAL TEST CORRESPONDS TO ASTM STANDARD

6 Installation of UPVC Pipes

TS unheating connection method :

1. On outside of pipe use a beveling tool to produce a t/3, 30° chamfer.
2. Each UPVC pipes mark line for the depth of the socket onto the pipe with reference.
3. Clean, wipe with a clean and dry rag.
4. Using applicator aggressively apply a full even layer of UPVC adhesive equal to the depth of the socket onto the pipe.Then aggressively apply a medium layer of UPVC adhesive into the fitting socket. Immediately while UPVC adbesive is still wet or tacky, assemble the piper into the fitting. Do not assemble if UPVC adhesive coatings are hardened.
5. Newly assembled joints must not be handled during set time and handled very carefully during cure time.





ASTM

CPVC PIPES

ASTM CPVC PIPES

1 Preface

- Featuring excellent acid, alkali and corrosion resistance, high rigidity, minimum fluid resistance and no influence on water quality, the heat-resistant CPVC is a lightweight material for easy handling and installation. It meets a wide range of applications that include household hot water, hot spring water, chemical engineering works, heated fluid supply in semi-conductor Fab. or chamical factories; industrial heated waste water drainage as well as fire fighting works.

- As best-selling products, the CPVC pipes and fittings produced by NAN YA feature a full range of both physical and chemical properties that meet CNS 14664, ASTM F441 for SCH40, SCH80 standards. CPVC material meet cell classification 23447 of ASTM D-1784.

- Currently, we have the largest and finest production equipment for CPVC pipes and fittings in Taiwan. The overall output, which is second to none in the local industry, is sold worldwide. At the same time, the intensive local marketing network is delivering satisfactory service as well.


經濟部標準檢驗局正字標記證書

廠商名稱 南亞塑膠工業股份有限公司

廠商地址 高雄市前鎮區中山三路35之1號

代表人姓名 吳嘉昭

生產製造工廠名稱 南亞塑膠工業股份有限公司嘉義廠

生產製造工廠地址 嘉義縣太保市南新里北港路2段201號

品管評鑑制度 CNS 12681/ISO 9001:2008

產品名稱 氯化聚氯乙烯（CPVC）塑膠接頭配件

適用國家標準 總號 14808 類號 K3123

證書號碼 台正字第 7222 號

上記產品依標準法第11條第1項規定審查合格，核准使用正字標記。

局長 陳介山

中華民國 94 年 2 月 17 日


經濟部標準檢驗局正字標記證書

廠商名稱 南亞塑膠工業股份有限公司

廠商地址 高雄市前鎮區中山三路35之1號

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生產製造工廠名稱 南亞塑膠工業股份有限公司嘉義廠

生產製造工廠地址 嘉義縣太保市南新里北港路2段201號

品管評鑑制度 CNS 12681/ISO 9001:2008

產品名稱 氯化聚氯乙烯（CPVC）塑膠管

適用國家標準 總號 14664 類號 K3121

證書號碼 台正字第 7078 號

上記產品依標準法第11條第1項規定審查合格，核准使用正字標記。

局長 陳介山

中華民國 92 年 5 月 29 日

2 Characteristies of HT-CPVC Pipe and Fitting

1. Optimal heat resistance:
   This makes the product apt for the supply of heated water or heated chemical fluids, which under 93℃.
2. Good pharmacopoeia and corrosion resistance:
   The optimal resistance to acids, alkalis and corrosion makes the product apt for piping works for hot water and heated chemical fluids.
3. Optimal heat insulation:
   At minimum heat transmittance: The minimum heat transmittance that is rated at approximately 1/360 that of steel pipes, delivers heat insulation to the fluid inside the pipe.
4. No incrustation:
   Thanks to the glossy wall that invites n incrustation, the pipe delivers larger flow when compared with metal pipes of identical diameters.
5. No impacts on water quality:
   When used for long period of time, the pipe does not produce impacts on the water quality and it meets all solution requirements.
6. Good electrical insulation:
   The god electrical insulation makes the pipe apt for high-voltage and heat-resistant applications.
7. Easy installation:
   As other UPVC pipes, this pipe is installable by using a simple method at minimum cost.

◆Temperature Pressure De-rating For Thermoplastic Materials

Elevated temperature fluid mediums require a de-rating of thermoplastic pipe maximum internal pressure ratings at 73˚F. To determine the maximum internal pressure rating at an elevated temperature, simply multiply the product pressure rating at 73˚F by the percentage specified for the desired temperature.

This table is based on the normal temperature of 73ºF (23ºC), the operating pressure of UPVC pipeline/CPVC pipeline is 100%. As the operating temperature increases, the percentage of operating pressure remaining.

System Operating Temperature ˚F ℃	73 (23)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
UPVC	100%	90%	75%	62%	50%	40%	30%	22%	-0-	-0-	-0-	-0-	-0-	-0-	-0-
CPVC	100%	100%	91%	82%	73%	65%	57%	50%	45%	40%	32%	25%	22%	20%	-0-

NOTE: Threaded products should not be used at temperatures above 110˚F (43℃) for UPVC, and 150˚F (66℃) for CPVC.

3 CPVC Chemical Properties

CPVC pipes shows an excellent chemical resistance to most acids, alkaline and salts.

But when it is used for organic solvents, it is remarkably swelled and physical properties fall down.

Chemicals	Concentration	20℃/68℉	60℃/140℉	80℃/176℉
Hydrochloric acid	20%	Excellent	Excellent	Good
Hydrochloric acid	35%	Excellent	Excellent	Good
Nitric acid	40%	Excellent	Fair	Fair
Nitric acid	60%	Good	Fair	Not good
Sulfuric acid	30%	Excellent	Good	Good
Sulfuric acid	50%	Excellent	Good	Not Good
Sulphurous acid	100%	Good	Not good	Not good
Acetic acid	60%	Excellent	Fair	Fair
Acetic acid	95%	Good	Not good	Not good
Cartonic acid	100%	Excellent	Fair	Fair
Caustic soda	40%	Excellent	Excellent	Good
Caustic soda	60%	Excellent	Excellent	Good
Sodium chloride	Saturate	Excellent	Excellent	Good
Sodium carbonate	Saturate	Excellent	Excellent	Good
Sodium sulfate	Saturate	Excellent	Excellent	Good
Hydrogen peroxide	Less than 30%	Excellent	Good	Not good
Ammonium carbonate	Saturate	Excellent	Excellent	Good
Methanol	100%	Excellent	Fair	Unavailable
Ethanol	100%	Excellent	Good	Unavailable
Isopropanol	100%	Excellent	Good	Good
Butanol	100%	Excellent	Good	Fair
Glycerine	100%	Excellent	Excellent	Excellent
Acetone	100%	Unavailable	Unavailable	Unavailable
Methyl othyl ketone	100%	Unavailable	Unavailable	Unavailable
Toluene	100%	Unavailable	Unavailable	Unavailable

4 Applications of CPVC Pipe and Fitting

1. Hot water piping for households, restaurants and hotels.
2. Hot water piping works for manufacturing plants.
3. Delivery pipe for heated chemical fluids and wastewater in chemical plants.
4. Hot spring piping
5. Fire fighting pipes
6. A/C systems, hot water circulation piping system
7. High-voltage cable and heat-resistant power pipes
8. Piping for transfer heated water or heated chemical fluids in semi-conducter Fab.
9. Piping for heated chemical fluids in electroplating plant.
10. Buried piping for high voltage power cable.
11. Other types of heated fluid delivery pipes.

Hot water piping

Petrochemical plant

Hot Spring piping

Semi-conductor Fab.

5 Specifications of CPVC Pipes

1. ASTM Specification for SCH40 CPVC Pipes :

Unit : Incs(mm)

Nominal Pipe Size	Outside Diameter and Toerance(1)	SCH 40 Wall Thickness		Approx. Weight (Kg/m)(2)
		Minimum	Tolerance	
3/8"	0.675±0.004 (17.1±0.10)	0.091 (2.31)	+0.020 (+0.51)	0.179
1/2"	0.840±0.004 (21.3±0.10)	0.109 (2.77)	+0.020 (+0.51)	0.265
3/4"	1.050±0.004 (26.7±0.10)	0.113 (2.87)	+0.020 (+0.51)	0.351
1"	1.315±0.005 (33.4±0.13)	0.133 (3.38)	+0.020 (+0.51)	0.517
1 1/4"	1.660±0.005 (42.2±0.13)	0.140 (3.56)	+0.020 (+0.51)	0.699
1 1/2"	1.900±0.006 (48.3±0.15)	0.145 (3.68)	+0.020 (+0.51)	0.833
2"	2.375±0.006 (60.3±0.15)	0.154 (3.91+)	+0.020 (+0.51)	1.117
2 1/2"	2.875±0.007 (73.0±0.18)	0.203 (5.16)	+0.024 (+0.61)	1.763
3"	3.500±0.007 (88.9±0.18)	0.216 (5.49)	+0.026 (+0.66)	2.309
4"	4.500±0.008 (114.3±0.20)	0.237 (6.02)	+0.028 (+0.71)	3.285
5"	5.563±0.010 (141.3±0.25)	0.258 (6.55)	+0.031 (+0.79)	4.456
6"	6.625±0.011 (168.3±0.28)	0.280 (7.11)	+0.034 (+0.86)	5.787
8"	8.625±0.015 (219.1±0.38)	0.322 (8.18)	+0.039 (+0.99)	8.716
10"	10.750±0.015 (273.1±0.38)	0.365 (9.27)	+0.044 (+1.12)	12.377
12"	12.750±0.015 (323.9±0.38)	0.406 (10.31)	+0.049 (+1.24)	16.332
14"	14.000±0.015 (355.6±0.38)	0.437 (11.10)	+0.053 (+1.35)	19.333
16"	16.000±0.019 (406.4±0.48)	0.500 (12.70)	+0.060 (+1.52)	25.256

Note :

1. Outer diameter shall refer to the arithmetic mean value of any 2 given O.D. at the right angle to each other.
2. Approximate weight shall be estimated by adding the minimum thickness to 1/2 of the allowable thickness tolerance at the specific gravity of 1.52.
3. Material meet the cell classification 23447 of ASTM D-1784.
4. The outlines dimensional specifications and physical properties meet the ASTM F-441.

5 Specifications of CPVC Pipes

2. ASTM Specification for SCH80 CPVC Pipes :

Unit : Incs(mm)

Nominal Pipe Size	Outside Diameter and Toerance[1]	SCH80 Wall Thickness		Approx. Weight (Kg/m)[2]
		Minimum	Tolerance	
3/8"	0.675±0.004 (17.1±0.10)	0.126 (3.20)	+0.020 (+0.51)	0.226
1/2"	0.840±0.004 (21.3±0.10)	0.147 (3.73)	+0.020 (+0.51)	0.330
3/4"	1.050±0.004 (26.7±0.10)	0.154 (3.91)	+0.020 (+0.51)	0.448
1"	1.315±0.005 (33.4±0.13)	0.179 (4.55)	+0.021 (+0.53)	0.657
1 1/4"	1.660±0.005 (42.2±0.13)	0.191 (4.85)	+0.023 (+0.58)	0.909
1 1/2"	1.900±0.006 (48.3±0.15)	0.200 (5.08)	+0.024 (+0.61)	1.103
2"	2.375±0.006 (60.3±0.15)	0.218 (5.54)	+0.026 (+0.66)	1.526
2 1/2"	2.875±0.007 (73.0±0.18)	0.276 (7.01)	+0.033 (+0.84)	2.327
3"	3.500±0.007 (88.9±0.18)	0.300 (7.62)	+0.036 (+0.91)	3.117
4"	4.500±0.008 (114.3±0.20)	0.337 (8.56)	+0.040 (+1.02)	4.558
5"	5.563±0.010 (141.3±0.25)	0.375 (9.52)	+0.045 (+1.14)	6.322
6"	6.625±0.011 (168.3±0.28)	0.432 (10.97)	+0.052 (+1.32)	8.700
8"	8.625±0.015 (219.1±0.38)	0.500 (12.70)	+0.060 (+1.52)	13.216
10"	10.750±0.015 (273.1±0.38)	0.593 (15.06)	+0.071 (+1.80)	19.628
12"	12.750±0.015 (323.9±0.38)	0.687 (17.45)	+0.082 (+2.08)	26.961
14"	14.000±0.015 (355.6±0.38)	0.750 (19.05)	+0.090 (+2.29)	32.345
16"	16.000±0.019 (406.4±0.48)	0.843 (21.41)	+0.101 (+2.57)	41.584

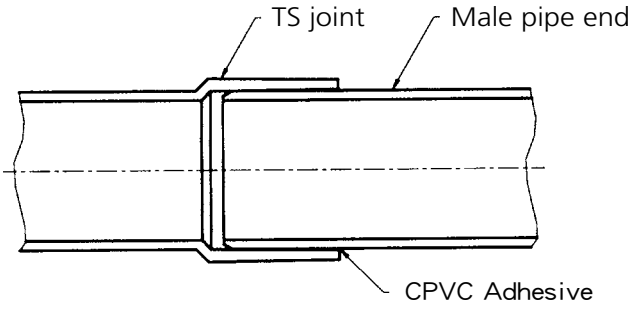
Note :

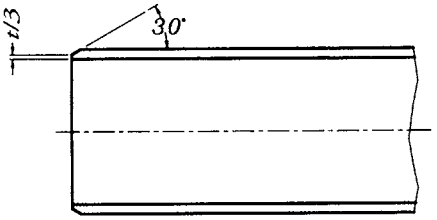
1. Outer diameter shall refer to the arithmetic mean value of any 2 given O.D. at the right angle to each other.
2. Approximate weight shall be estimated by adding the minimum thickness to 1/2 of the allowable thickness tolerance at the specific gravity of 1.52.
3. Material meet the cell classification 23447 of ASTM D-1784.
4. The outlines dimensional specifications and physical properties meet the ASTM F-441.

6 Installation of CPVC pipes (Unheating connection)

TS unheating connection method :

1. On outside of pipe use a beveling tool to produce a t/3, 30° chamfer.
2. Each CPVC pipes mark line for the depth of the socket onto the pipe with reference.
3. Clean, wipe with a clean and dry rag.
4. Using applicator aggressively apply a full even layer of CPVC adhesive equal to the depth of the socket onto the pipe.Then aggressively apply a medium layer of CPVC adhesive into the fitting socket. Immediately while CPVC adbesive is still wet or tacky, assemble the piper into the fitting. Do not assemble if CPVC adhesive coatings are hardened.
5. Newly assembled joints must not be handled during set time and handled very carefully during cure time.





7 Instructions for installation of CPVC pipes

1. Range of heat resistance of CPVC pipe: the CPVC pipe is usually used for heated fluids of up to 200℉(93℃). The relationship between temperature and the applicable pressure is given in page 34.
2. Embedding in RC: Embedding of CPVC pipes in RC shall be avoided. When necessary, be sure to leave a proper expansion margin. Before grouting RC, a 1-hour static hydraulic test of 10 kgf/cm^2 shall be conducted and the test shall show no fracture of leakage.
3. Selection of adhesives: Adhesion of the CPVC pipe shall be carried out with a heat-resistant type for CPVC and no ordinary vinyl adhesive shall be used.
4. Prevention of site heating: No CPVC or UPVC fittings shall be heated or welded with a rod in the work site.
5. Prevention of freezing: Just like an ordinary UPVC pipe, all adapters used in cold areas shall be provided with freezing measures and the insulation material shall be heat-resistant.
6. Prevention of ultraviolet rays: Direct sunshine on the surface of the pipe would make the pipe decolor. The protruding adapter shall be coated with insulation materials.
7. Decoloring CPVC: When used in environment of 80~90℃ for long periods of time, the surface of the pipe may turn whitish, though the quality remains the same.
8. Support of CPVC pipes: CPVC pipes shall be properly supported at the following pitch:

Unit : m

Nominal diameter	Longitudinal pitch	Horizontal pitch
35m/m(11/4")以下/and under	1.0	0.6
40m/m(11/2")~65m/m(21/2")	1.5	1.0
80m/m(3")~150m/m(6")	2.0	1.5
200m/m(8")以上/and up	2.5	2.0

7 Instructions for installation of CPVC pipes

9. Handling and unloading of CPVC pipe: When handling or installing CPVC pipes, keep them from falling. When unloading them, do not drop them.

10. Expansion of CPVC pipes:

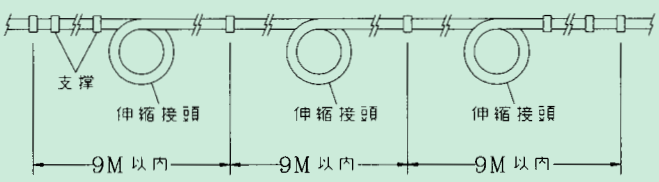
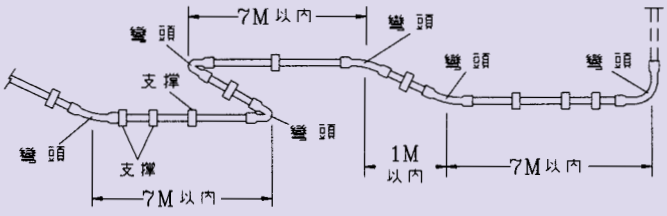
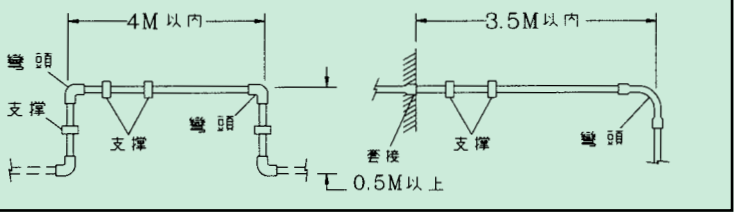
(1)As solution to the issue of expansion of CPVC pipes, use tubular adapters or adapters having a heat-resistance rubber ring.

(2)One expansion adapter shall be provided to the CPVC pipe in both horizontal and vertical direction at every 9 meters. If no expansion adapter is used, a flat bend of 90° shall be provided at every than 7 meters. The purpose of this adapter is to reduce the stretch of the linear piping and the bend would absorb the internal stress created by the expansion. For transverse piping works, the issue of expansion shall be dealt in the following manner.

Water temperature difference ℃	Expansion/Straight-line distance of HT-CPVC pipe
20 ℃	1.4cm/10M
40 ℃	2.8cm/10M

11.The tops of CPVC pipe line, which has to instal automatic discharge valve.

12.CPVC adhesive can not touch with water.

Long straight lines	
Straight lines of 4~7 meters	
Straight lines of 2~4 meters	

8 NAN YA CPVC Adhesive

Nan Ya CPVC Adhesive has excellence heat-resistance, and perform strongly strengh in connected CPVC pipe and CPVC fitting. Also easy and fast for installation.

- No Eating.
- Packing Category : 1KG、100g

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Test data, sizes, and pictures in the catalog are for reference only, and actual product information is based on the formal reports.

(2021.09)

NAN YA Plastics Corp.

NAN YA Plastics Pipe