

Model ASD CPVC Smoke Detector Sampling Tube

IMPORTANT

Refer to Technical Data Sheet IFP 2030 for warnings pertaining to regulatory and health information.

General Description

The IPEX Model ASD CPVC Smoke Detector Sampling Tube is a field assembled apparatus consisting of 3/4 in. (DN20) CPVC pipe and fittings.

The ASD CPVC tube offers an alternative advantage to typical point detectors, which are typically slower to recognize a fire condition as smoke often does not reach the ceiling quickly enough for timely detection. When installed in a detection system, air is continuously drawn through the ASD CPVC tube to detect smoke before it is visible to the naked eye.

Applications requiring the highly sensitive rapid smoke detection capability of the ASD CPVC tube include a broad range of clean or dirty confined and open space environments. For example: clean rooms, electronics rooms, control rooms, waste treatment, mining, and storage rooms containing materials easily damaged by or reactive to fire such as highly flammable liquid and gases.

As it can be easily hidden, the ASD CPVC tube is also suitable in applications where point detectors can be considered aesthetically displeasing, such as offices, apartments and hotel rooms. This factor also makes them suitable in applications where point detectors can be easily tampered with, such as in medical or correctional facilities.

NOTICE

The ASD CPVC components described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION

ASSOCIATION (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of this device.

The owner is responsible for maintaining their smoke detection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Technical Data

Approvals

UL Listed in accordance with UL 1887

Quality

- Tube in accordance with ASTM F442 to SDR13.5 dimensions, see Figure 1
- Fittings in accordance with ASTM F438, see Figure 1
- Solvent cement in accordance with ASTM F493
- Tube and fittings: NSF/ANSI 14 & NSF/ANSI 61

Design

Local codes and standards may apply

Handling

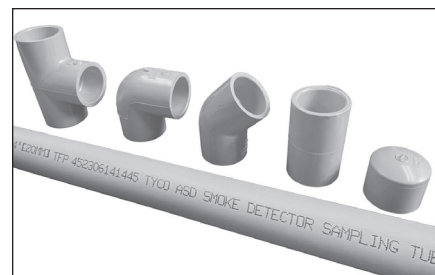
ASD CPVC components are to be handled in accordance with this section.

Handling ASD CPVC Tube and Fittings

ASD CPVC tube is protectively wrapped and fittings are packaged for ease of handling and storage, minimizing the potential damage of tube and fittings due to transit handling and storage.

NOTICE

ASD CPVC components have a lower impact strength as compared to metal piping products. Tubes and fittings, packaged or loose, should never be tossed or thrown to the ground.

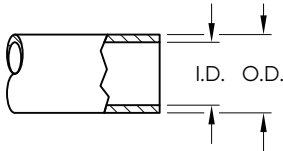


Property	Data
Flammability Rating	94V-0 / UL 94
Limited Oxygen Index	60% D2863
Flame Spread (ft)	≤ 5
Flame Travel	4 UL 1887
Optical Density	Peak: ≤ 0.50 Avg: ≤ 0.15
TABLE A ASD CPVC TUBE AND FITTING FIRE RESISTANCE	

Tubes should never be dropped or dragged on the ground, for example, when unloaded from a truck, and should remain boxed until ready for use. Impact cracks, splits or scratches can weaken or damage the tube and fittings. Heavy or sharp objects should not be thrown into or against tube and fittings. When handling ASD CPVC tube, ensure that it is well supported and sagging is minimized. Failure to comply could result in damage of the tube and in property damage due to leaks.

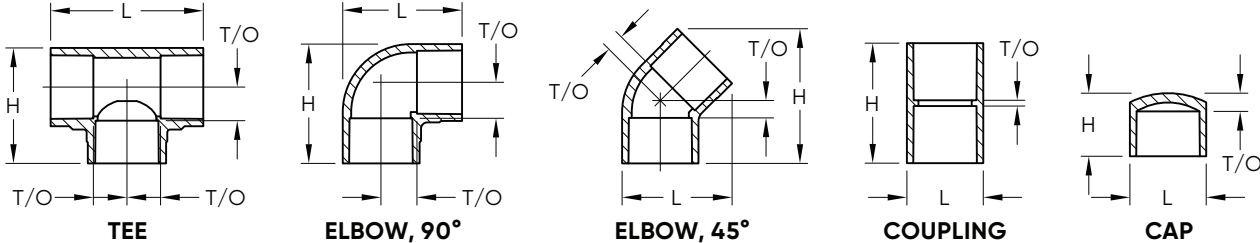
Very cold weather will make plastic tube and fittings brittle. Extra care during handling should be taken to prevent damage.

Nominal Pipe Size ANSI Inches DN	Nominal O.D. in. (mm)	Nominal I.D. in. (mm)	Empty Weight lbs/ft (kg/m)	Volume gal/ft (l/m)
3/4 DN20	1.050 (26.7)	0.874 (22.0)	0.168 (0.250)	0.031 (0.102)



TUBE

Fitting	Nominal Pipe Size ANSI in. DN	Nominal Take- Out in. (mm)	Nominal Outside in. (mm)		Pipe Sch.	Approx. Weight. Each lbs (kg)
			L	H		
Tee	3/4 DN20	0.625 (15.9)	2.820 (71.6)		40	0.11 (0.05)
Elbow. 90°		0.625 (15.9)	2.090 (53.1)			0.09 (0.04)
Elbow. 45°		0.375 (9.5)	1.926 (48.9)			0.08 (0.04)
Coupling		0.125 (3.2)	1.280 (32.5)			0.08 (0.04)
Cap		0.312 (7.9)	1.280 (32.5)			0.04 (0.02)



TEE **ELBOW, 90°** **ELBOW, 45°** **COUPLING** **CAP**

Property	Data	ASTM
Cell Classification	Pipe: 23547 Fittings: 24447	D1784 F438
Specific Gravity	3	D792
Tensile Strength	> 7000 psi	D638
Modulus of Elasticity	4.32 x 10.5	D638
Compressive Strength	9600 psi	D695
Izod Impact	3.0	D256A
Coefficient of Linear Expansion	3.4 x 10.5	D696
Upper Temperature Limit	200°F	-
Electrical Conductivity	Non-conductor	-

TABLE B
ASD CPVC TUBE AND FITTING
PHYSICAL CHARACTERISTICS

ASD CPVC components should always be inspected for damage before installation. Tube or fittings with cuts, gouges, scratches, splits or other signs of damage from improper handling or storage should not be used. Damaged sections on lengths of tube can easily be removed by using proper cutting techniques.

Storing ASD CPVC Components

ASD CPVC tube and fittings can be stored in their original packaging to keep them free from dirt and reduce the possibility of damage. Unpackaged tube and fittings must be covered with a non-transparent material when stored outdoors for extended periods of time. Brief exposure to direct sunlight on the job site may result in color fade, but will not affect physical properties. Long term exposure to direct sunlight will increase color fading and can make the tube and fittings more brittle. Avoid long term exposure to ultra-violet light and/or direct sun exposure.

When storing inside, ASD CPVC components should be kept in a well ventilated area, away from steam lines or other types of heat sources. Tube and fittings should always be stored in the original packaging until needed for use

to keep them free from dirt and other contaminants, eliminate color fading, and reduce the possibility of damage.

Tube should be stored on a clean, flat surface that provides an even support for the entire length of the tube. When palletized tube is stored, ensure that the wooden pallet bracings are in full contact with each other. Loose tube should be stored in original packaging. When storing tube on racks, the racks should have continuous or close support arms to prevent the tube from sagging. Storage racks should be free of oil/dirt and sharp edges that can damage the tube when stored and moved.

Plastic tube and fittings should be stored on pallets in their original cartons. The cartons should then be wrapped with thin plastic sheeting to prevent moisture from causing the packaging to collapse. To avoid hydrocarbon contamination and failure of the ASD CPVC fittings under pressure, CPVC fittings should never be stored with metal fittings.

Special care shall be taken to avoid contamination of ASD CPVC tube and fittings, see Chemical Compatibility section.

Handling Solvent Cements

CAUTION

Prior to using IPEX CPVC One Step Solvent Cements, review and follow all precautions found on the container labels, material safety data sheet, and Standard Practice for Safe Handling ASTM F 402. Failure to follow precautions may result in injury.

Cements contain volatile solvents that evaporate rapidly. Avoid breathing the vapors and provide ventilation. If necessary, use a fan to keep the work area clear of fumes. Avoid skin contact. Keep the cement can closed when not in use. If the cement thickens beyond its original consistency, discard it. Do not attempt to dilute it with primer or thinner, as this may change the character of the cement and make it ineffective. Primers and thinners may also not be compatible with ASD CPVC components and could cause failures, see Chemical Compatibility section.

Before applying solvent cement, appropriate safety precautions should be taken. Cement must be stored between 40°F (4.4°C) and 90°F (32.2°C) and should be kept in the shade. Eliminate all ignition sources and do not smoke when using. Explosion proof general mechanical ventilation or local exhaust is recommended to maintain vapor concentrations below recommended exposure limits. In confined or partially enclosed areas, a NIOSH approved organic vapor cartridge respirator with full face piece is recommended. Containers of solvent cement should be closed when not in use. Wearing PVA coated protection gloves and an impervious apron are recommended. Splash proof chemical goggles are recommended. For further information refer to Technical Data Sheet IFP-2010 SDS Safety Data Sheet for TFP-600 or BM-5 One Step Solvent Cement.

Note: IPEX CPVC solvent cement has a shelf life of approximately one to two years.

Storing Solvent Cements

Cement must be stored between 40°F (4.4°C) and 90°F (32.2°C) and should be kept in the shade. Eliminate all ignition sources.

Solvent Cement Spills

The best protection from accidental spills of cement is to protect the work area with drop cloths. If cement

comes in contact with fiberglass tub/shower enclosures, carpet or furniture, the excess cement must be wiped up immediately. Once the cement is dry, it is almost impossible to remove. The use of solvents such as alcohol, M.E.K. or acetone will usually work on tile sinks or floors but can do more damage than good on some synthetic materials. Care should be used when trying any solvent to remove cement from any surface. Always protect the work area before starting, both under and around where cement spills can cause irreparable damage.

Whatever method is used, it should first be tested on a small hidden area, if it removes the shine or color or softens the surface, do not use.

Joining ASD CPVC Tube and Fittings with One-Step Solvent Cement

NOTICE

Read and understand all instructions prior to assembly. Follow all instructions. Failure to follow instructions during joining and testing may result in tube failure, clogged waterways, or leakage. Solvent cementing is the only method of joining rigid ASD CPVC tube and fittings that provides a chemically fused joint.

Solvent cementing procedures must be carefully followed. Field experience has shown that problems can occur with improperly solvent cemented joints. Follow the instructions presented below carefully. Do not omit any steps and ensure that all facets of installation are fully understood prior to commencing work. Note the specific instructions and cure times for the TFP-600 One Step Solvent Cement provided in Table D. These instructions and cure times must be carefully followed.

NOTICE

Use of solvent cement products other than TFP-600 or BM-5 solvent cement will void the IPEX warranty on ASD CPVC tube and fittings.

Avoid applying too much cement. Do not allow the cement to drip beyond the bottom of fitting socket. Do not allow the cement to puddle in the tube and fitting assembly. Excessive cement on the tube and/or fitting can weaken the wall of the tube and/or fitting and may cause cracks when pressure is applied. Failure to comply could result in property damage due to leaks. Leaks

may not appear until after the tube and/or fitting is in service.

Estimating Cement Requirements

Guidelines to allow estimation of IPEX CPVC solvent cement quantities needed are provided in Table C.

Fitting Size ANSI Inch DN	One Step Solvent Cemented Joints per Quart
3/4 DN20	260
TABLE C ESTIMATED CEMENT REQUIREMENTS	

Cutting

ASD CPVC tube can easily be cut with a ratchet cutter, a wheel-type plastic tubing cutter, a power saw or a fine toothed saw. Tools used to cut ASD CPVC must be designed for plastic use and must be in good condition in accordance with the tool manufacturer's recommendations. It is important to cut the tube square. A square cut provides the surface of the tube with maximum bonding area. See Figure 2A.

NOTICE

Avoid splitting the tube when using ratchet cutters. Failure to do so may result in tube failure or leakage.

- Only use ratchet cutters that contain a sharp blade (blades dull quickly).
- Only use ratchet cutters at temperatures of 50°F (10°C) or warmer.
- Only use well-maintained, good quality ratchet cutters capable of consistently cutting the tube squarely. If any indication of damage or cracking is evident at the tube end, cut off at least 2 in. (50 mm) beyond any visible crack.

De-burring and Beveling

Burrs and filings can prevent proper contact between tube and fitting during assembly, and must be removed from the outside and the inside of the tube. A chamfering/reaming tool or a file is suitable for this purpose. A slight bevel (approximately 10° to 15° by 1/8 in. to 3/32 in.) shall be made at the end of the tube along the outer diameter to ease entry of the tube into the fitting socket. This will also minimize the

chance that the edges of the tube will wipe solvent cement from the fitting socket during the insertion of the tube. See Figure 2B.

Solvent Cement Application

See Figure 2.

CAUTION

Prior to using IPEX TFP-600 or BM-5 One Step Solvent Cement, review and follow all precautions found on the container labels, Safety Data Sheet, and Standard Practice for Safe Handling ASTM F 402. Failure to follow precautions may result in injury.

Chemical Compatibility

NOTICE

Products coming in contact with ASD CPVC assemblies must be chemically compatible.

Products commonly used in construction, including materials ancillary to the assembly of fire sprinkler systems, may contain chemicals that are incompatible with ASD CPVC components, including but not limited to: hydrocarbons (for example, non-CPVC compatible cutting oils), termiticides and insecticides, surfactants, cooking oils, plasticizers (for example, flexible wire or hose), building caulks, and certain paints.

This list is not meant to be exhaustive. Contact between ASD CPVC components and incompatible chemicals should be avoided; failure to avoid contact with incompatible chemicals may cause damage to/failure of the system. Consult The Lubrizol Corporation FBC SYSTEM COMPATIBLE PROGRAM at www.fbcssystemcompatible.com. If the product in question is not identified in the FBC SYSTEM COMPATIBLE PROGRAM, Lubrizol recommends, as does IPEX, that the chemical compatibility be confirmed with the manufacturer of the product in question.

As set forth in the IPEX Limited Warranty, IPEX does not provide a warranty for products or components which have been subject to deterioration from exposure to incompatible chemicals/materials.

Installation

Using a clean, dry rag, wipe loose dirt and moisture from the tube end fitting socket. Moisture can slow the cure time and at this stage of assembly, and excessive water can reduce joint strength.

The tube should easily enter the fitting socket one-third to two-thirds of the way. Contact between the tube and fitting is essential in making a good joint. This contact allows the solvent cement, applied in the next step, to effectively join the tube and fitting. See Figure 2C.

All ASD tube and fitting joints shall be made with IPEX TFP-600 or BM-5 One-Step Solvent Cement.

Quart (0.9 l) cans of solvent cement are furnished with 1-1/2 in. (38.1 mm) daubers attached to the caps.

Use either the dauber furnished with the can or a separately ordered 3/4 in. (19.1 mm) dauber when applying solvent cement.

Apply a heavy, even coat of cement to the outer wall of the tube end, see Figure 2D. Apply a medium coat to the inside of the fitting socket, see Figure 2E. **FIRST APPLY CEMENT ON THE TUBE END, THEN IN THE FITTING SOCKET, AND, FINALLY, ON THE TUBE END AGAIN.**

NOTICE

Too much solvent cement can cause clogged airways or weaken the wall of the tube or fitting and result in tube failure or leakage, which may not appear until after the tube and/or fitting is in service.

- Do not allow excess cement to puddle in the tube and fitting assembly. To prevent this puddling, apply a lighter coating of solvent cement to the inside of the fitting socket than the outside of the tube.
- Wipe off excess cement on the outside of the joint. The solvents will evaporate, but the solvent cement inside the fitting will remain in place.

Special care shall be exercised when assembling ASD CPVC components in temperatures below 40°F (4°C). In colder temperatures extra time must be allowed for the solvent cement to set and cure, see Table D. Extra care should be taken to prevent damaging the tube while handling. When solvent cementing tube and fittings in colder

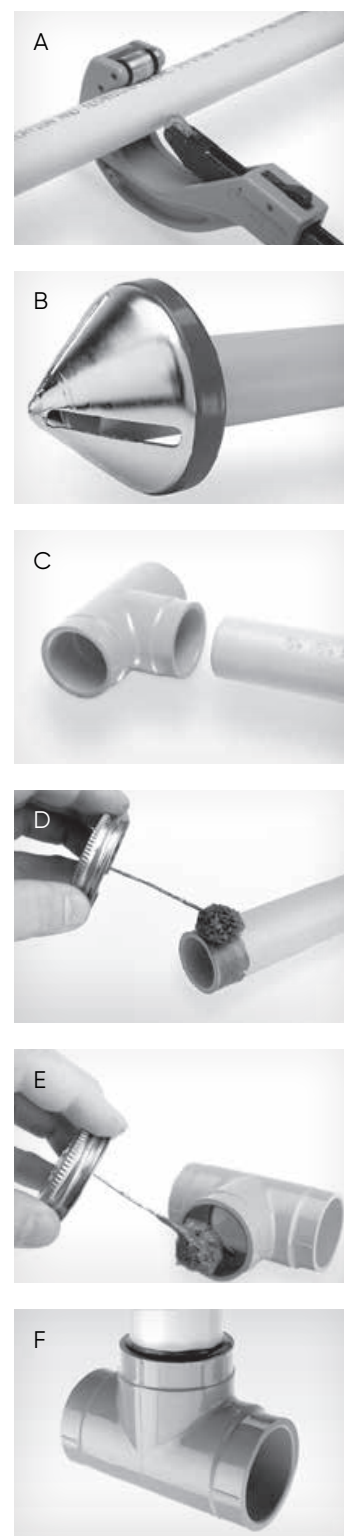


FIGURE 2
ASD CPVC TUBE AND FITTING
PREPARATION AND JOINING

temperatures, make certain that the cement has not become lumpy or has not gelled within the original container. Gelled cement must be discarded.

At temperatures above 80°F (27°C) make sure both surfaces to be joined are still wet with cement during assembly. Higher temperatures and/or wind accelerate the evaporation of the volatile solvents in the cement. Tube and fittings stored in direct sunlight may have surface temperatures 20°F to 30°F (-7°C to -1°C) above the air temperature. If possible, store the tube and fittings, or, at least the ends to be solvent welded, out of the direct sunlight prior to cementing. The solvents will penetrate hot surfaces more deeply. In such conditions, it is very important to avoid puddling the solvent cement inside the fitting socket.

Assembly

After applying cement, immediately insert the tube end into the fitting socket, while rotating the tube one quarter turn until the tube end bottoms out at the fitting stop. Rotate the tube as it is inserted into the fitting, not after it has bottomed out in the fitting. Properly align the fitting for the installation at this time. Tube must bottom to the stop. Hold the assembly for 30 seconds to ensure initial bonding. A bead of solvent cement should be evident around the tube and fitting juncture. If this bead is not continuous around the socket shoulder, it may indicate that insufficient cement was applied. If insufficient cement is applied, the fitting must be cut out and discarded. Cement in excess of the bead should be wiped off with a clean, dry rag.

NOTICE

Too much solvent cement can cause clogged airways.

- Visually inspect fittings to ensure that the airway is clear of any excess cement.
- Once the installation is complete and cured per Table D, hydrostatically test the system.

Set and Cure Times

NOTICE

Inadequate curing of solvent cement joints may cause tube failure or leakage. Solvent cement set and cure times are a function of tube size, temperature, relative humidity, and tightness of fit.

See Table D for cure times.

Cure times should be increased when moisture is present, such as during cut-ins to live sprinkler lines. The assembly must be allowed to set, without any stress on the joint, for 1 to 5 minutes, depending on temperature. Following the initial set period, the assembly can be handled carefully, avoiding significant stresses to the joint.

Ambient Temperature Ranges During Cure Period	Cure Period
60°F to 120°F (16°C to 49°C)	1 hour
40°F to 59°F (4°C to 15°C)	4 hours
0°F to 39°F (-18°C to 3°C)	72 hours

**TABLE D
SOLVENT CEMENT JOINT
CURE TIMES**

Joining ASD CPVC Tube and Fittings in Adverse Conditions

In Cold Weather

IPEX TFP-600 One Step Solvent Cements are suitable for joining ASD CPVC Tube and Fittings during cold weather temperatures as low as 0°F (-18°C) minimum (assembly in temperatures below 0°F (-18°C) are not permitted). The time period for bonding ASD CPVC tube and fittings is affected by temperature; therefore, very cold weather requires extra time to cure cemented joints.

When assembling a ASD CPVC tube and fitting system requiring pressure testing at 225 psi (15.5 bar), see Table D, and the Ambient Temperature is less than 0°F (-18°C), the ASD CPVC tube and fittings must be conditioned in a freezer at 0°F (-18°C) for 24 hours prior to assembly. Immediately after the 24 hour conditioning period, join the tube and fittings with TFP-600 One Step Solvent Cement in the 0°F (-18°C) environment and allow to cure per Table D before pressure testing.

Very cold weather will make ASD CPVC components brittle. Extra care should be taken during such conditions to prevent damage while handling, cutting, de-burring, beveling, and assembly.

NOTICE

Extra care must be exercised if using ratchet cutters as they may split the tube if not properly used and maintained. See Cutting sub-section.

When working in cold weather, be aware that solvents formulated into TFP-600 cements penetrate and soften the Model ASD CPVC surfaces more slowly than in warm weather. Colder temperatures require greater cure times due to the slower evaporation of primer in solvent cements. See Table D for cure times at various temperature ranges.

Other considerations are required when preparing for and joining ASD CPVC tube and fittings in cold weather conditions:

1. Carefully read and follow all instructions before installation.
2. Prefabricate as much of the system as possible in a heated working area.
3. Store cements in a warm area when not in use and make sure they remain fluid. Do not allow the cement to freeze or become "jelly-like." Gelled cement shall be discarded.
4. Take special care to remove moisture, including ice and snow.
5. When using TFP-600 One Step Solvent Cement, primer shall never be used.
6. Allow a longer cure period before the system is used.

In Hot Weather

Model ASD CPVC solvent cements contain volatile solvents. Tube stored in direct sunlight may have surface temperatures of 20°F to 30°F (-7°C to -1°C) above air temperatures. Solvents attack these hot surfaces deeper; therefore, it is very important to avoid puddling the cement inside the fitting socket. Always ensure that the excess cement is wiped from the outside of the joint.

Follow the standard installation instructions and take special note of the tips and cautions below:

1. See Tables E1 and E2 for the appropriate temperature related expansion and contraction information.
2. Store solvent/cements and primers in a cool or shaded area prior to use.

Length of Run m	Temperature Change. ΔT °C								
	10	15	20	25	30	35	40	50	55
	Thermal Expansion. ΔL Millimeters								
1	0.6	0.9	1.2	1.5	1.8	2.1	2.4	3.1	3.4
2	1.2	1.8	2.4	3.1	3.7	4.3	4.9	6.1	6.7
3	1.8	2.7	3.7	4.6	5.5	6.4	7.3	9.2	10.1
4	2.4	3.7	4.9	6.1	7.3	8.5	9.8	12.2	13.4
5	3.1	4.6	6.1	7.6	9.2	10.7	12.2	15.3	16.8
7	4.3	6.4	8.5	10.7	12.8	14.9	17.1	21.4	23.5
9	5.5	8.2	11.0	13.7	16.5	19.2	22.0	27.5	30.2
12	7.3	11.0	14.6	18.3	22.0	25.6	29.3	36.6	40.3
15	9.2	13.7	18.3	22.9	27.5	32.0	36.6	45.8	50.3
20	12.2	18.3	24.4	30.5	36.6	42.7	48.8	61.0	67.1
25	15.3	22.9	30.5	38.1	45.8	53.4	61.0	76.3	83.9
30	18.3	27.5	36.6	45.8	54.9	64.1	73.2	91.5	100.7
40	24.4	36.6	48.8	61.0	73.2	85.4	97.6	122.0	134.2
50	30.5	45.8	61.0	76.3	91.5	106.8	122.0	152.5	167.8
TABLE E2 THERMAL EXPANSION METRIC UNITS									

- 3. If possible, store the tube and fittings, or at least the ends to be solvent welded, in a shady area before cementing.
- 4. Make sure both surfaces to be joined are still wet with cement when putting them together.
- 5. Carefully read and follow all instructions before installation.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

ASD CPVC Smoke Detector Sampling Tube

ASD CPVC Smoke Detector Sampling Tube is fabricated from 3/4 in. (DN20) CPVC pipe and available in 10 ft (3.0 m) and 15 ft (4.6 m) lengths. Packaged in sleeves containing 25 lengths.

Specify: ASD CPVC Smoke Detector Sampling Tube, (specify) Length, P/N (specify):

- 10 ft (3.0 m)..... 013003
- 15 ft (4.6 m) 013004

ASD CPVC Fittings

Order ASD CPVC fittings separately to suit installation of ASD CPVC Smoke Detector Sampling Tube. Packaged in Bags or Boxes in quantities as shown in Table F.

Specify: ASD CPVC Fitting, 3/4 in. (DN20), (specify type), (specify Bag or Box), P/N (specify from Table F)

Fitting Type	Bag Qty.	Box Qty.	P/N
Tee	24	192	048080
90° Elbow	24	240	48094
45° Elbow	25	100	048102
Coupling	25	300	048107
Cap	25	225	048114
TABLE F ASD CPVC FITTING PART NUMBER SELECTION			

ASD CPVC Solvent Cement

ASD TFP-600 or BM-5 One-Step CPVC solvent cement packaged in 1 qt (0.9 l) can with dauber-attached cap.

Specify: TFP-600 One-Step CPVC Solvent Cement, 1 qt (0.9 l) Can, P/N 074293

Replacement CPVC Solvent Cement Dauber

Replacement 3/4 in. (19.1 mm) dauber. Packaged as individual item.

Specify: TFP-600 One-Step CPVC Solvent Cement Replacement Dauber, 3/4 in. (19.1 mm), P/N 074283