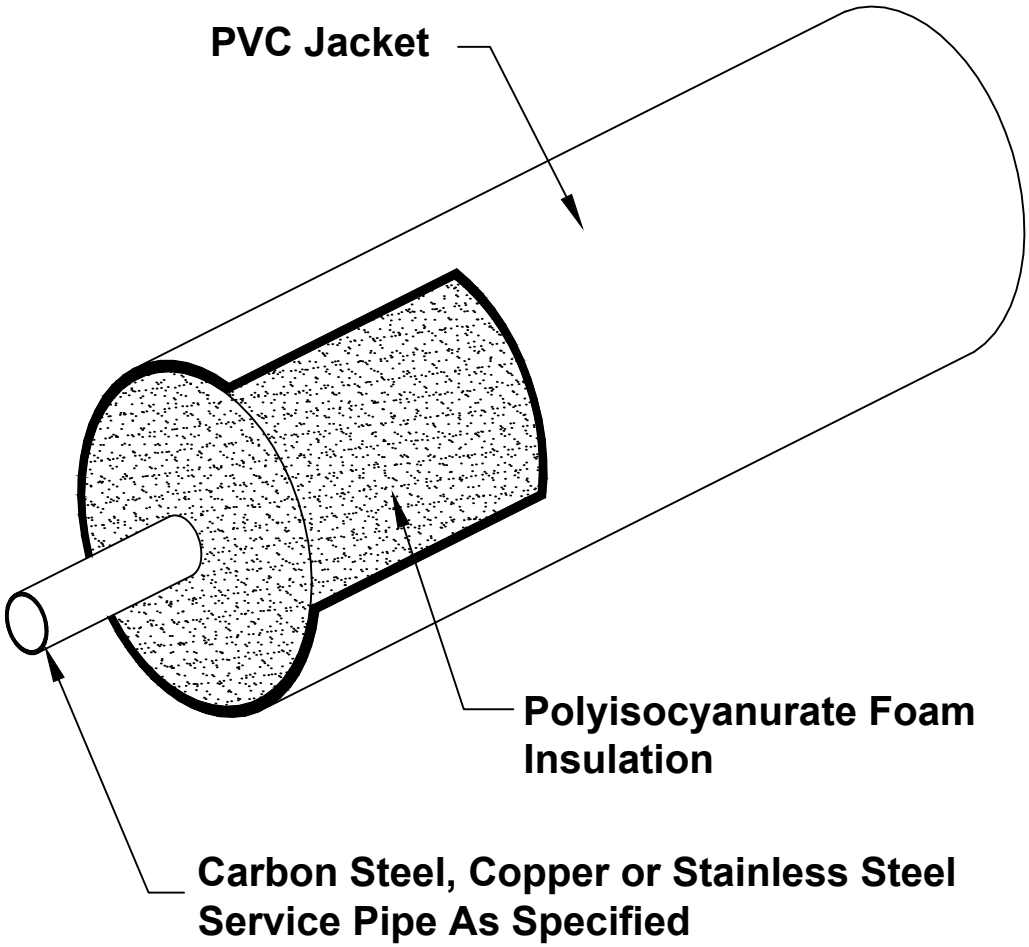
TRICON SUB-ZERO PIPE SYSTEM

For Applications down to -350°F for Above Ground

- ☐ Co2
- ☐ LN2
- ☐ Refrigeration



TRICON
Piping Systems, Inc. ®

P.O. Box 361, Canastota, New York 13032
Tel: 315.697.8787 Fax: 315.697.8788

TRICON SUB-ZERO System Specifications

TABLE 1

Copper Pipe Size	Minimum Insulation Thickness	PVC Jacket O.D.	PVC Jacket Wall
½"	2.68"	6.12"	.070"
¾"	2.56"	6.12"	.070"
1"	3.43"	8.16"	.080"
1¼"	3.31"	8.16"	.080"
1½"	3.19"	8.16"	.080"
2"	2.94"	8.16"	.080"
2½"	3.69"	10.20"	.100"
3"	3.44"	10.20"	.100"
4"	3.94"	12.24"	.120"
6"	3.96"	14.32"	.140"

TABLE 2

Copper Pipe Size	Minimum Insulation Thickness	PVC Jacket O.D.	PVC Jacket Wall
½" + ½"	2.25"	8.16"	.080"
¾" + ¾"	2.08"	8.16"	.080"
1" + 1"	2.58"	10.20"	.100"
1¼" +1¼"	2.42"	10.20"	.100"
1½" + ¾"	2.50"	10.20"	.100"
1½" + 1"	2.42"	10.20"	.100"
1½" + 1½"	2.92"	12.24"	.120"
2" + 1"	2.92"	12.24"	.120"
2" + 1½"	2.75"	12.24"	.120"
2" + 2"	3.25"	14.32"	.140"
2½" + 1½"	3.25"	14.32"	.140"

Service Pipe:

Copper service pipe shall be Type "K", hard drawn copper tubing to ASTM B-88 and WWT-799. Carbon steel service pipe shall be standard weight A333 welded or seamless beveled for welding. Straight lengths of piping will be supplied in 20 ft. lengths. Straight lengths of piping will be supplied with 6" of piping exposed at each end for field joint fabrication.

Insulation:

The insulation shall be a foamed in place closed cell polyurethane which completely fills the annular space between the carrier pipe and the exterior casing. The insulation shall have the following physical properties:

Minimum Density (lb./cu. ft.) 2.6	ASTM D-1622
90-95 % Closed Cell	ASTM D-6226
"K" Factor BTU/Hr. sq. ft. °F/in… 198	ASTM C-518

Exterior Casing:*

The exterior casing shall be seamless, extruded white PVC Type 1, Grade 1, Class 12454-B per ASTM D-1784

Sub-Assemblies:

All fittings, end seals, other sub-assemblies shall be prefabricated or field fabricated dependant upon engineer's option and/or site conditions. All Copper piping/fittings shall be purged with nitrogen while being brazed. All stainless piping/fittings shall be purged with nitrogen while being welded.

Insulated systems made near the insulation site or by the installer or other organization not regularly engaged in manufacturing cryogenic systems, will not be allowed.

Field Joints:

After silver brazing/welding and hydrostatic testing, PVC jacketed straight field joints shall be insulated with polyurethane foam to the thickness specified, PVC sleeve and pressure sensitive tape.

Installation:

The installing contractor shall handle the piping system in accordance with the directions furnished by the manufacturer and as approved by the architect and engineer. The carrier piping shall be hydrostatically tested to 1-1/2 times the operating pressure or as specified in the contract documents. The test shall be maintained for a minimum time of 1 hour.

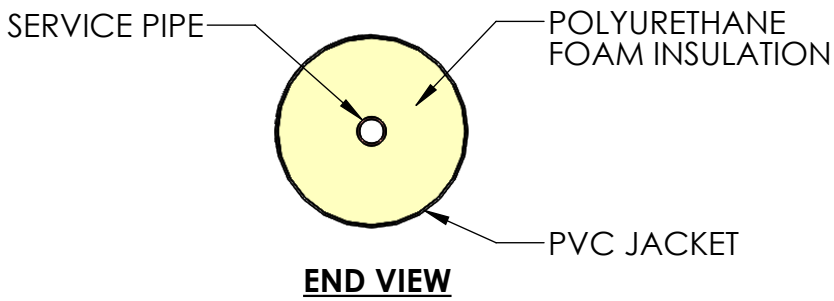
EXERCISE DUE CARE WHEN INSTALLING AND TESTING THE PIPING SYSTEM

System Options:

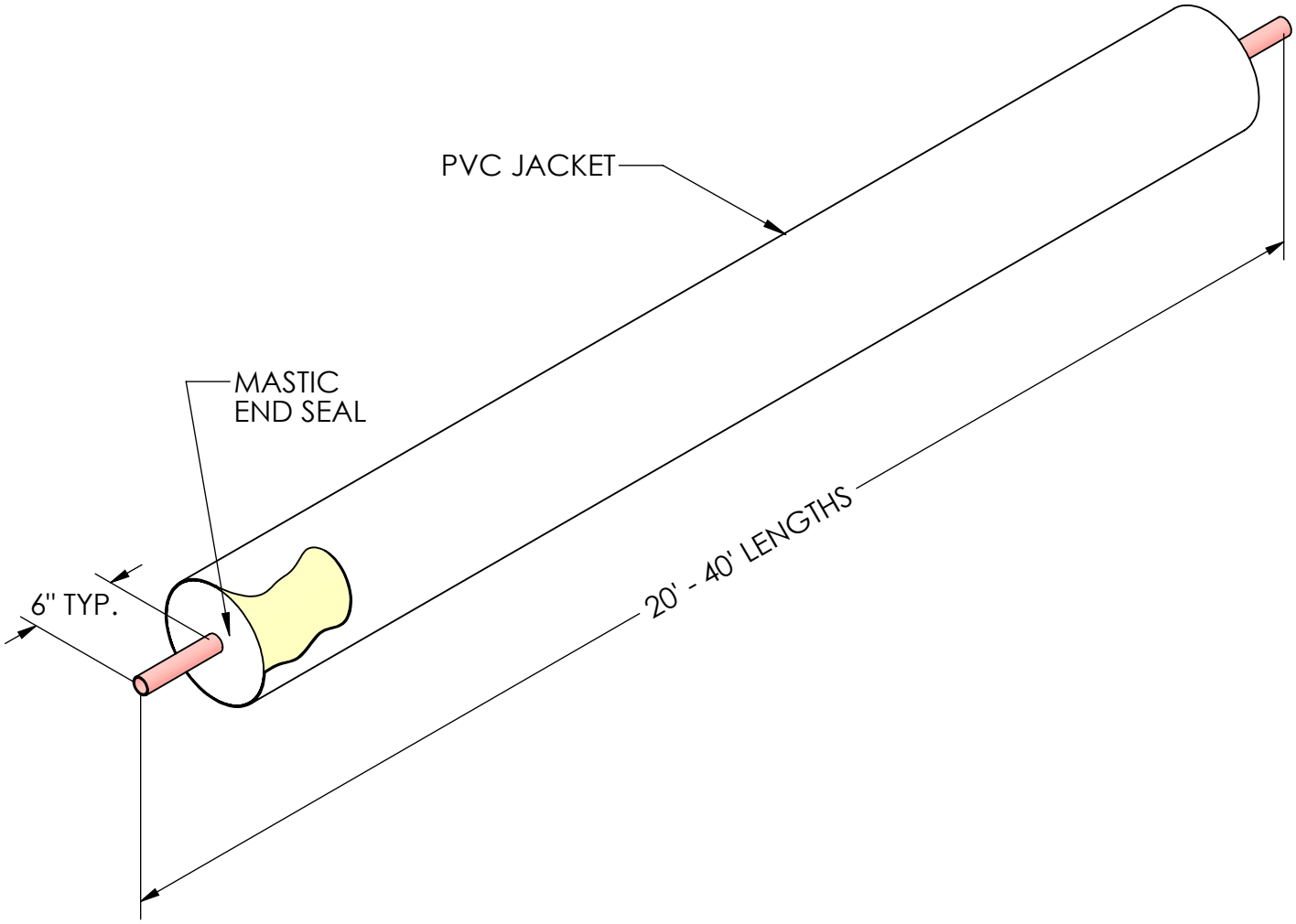
***** Optional metallic casings for above ground applications include, Spiral Lockseam in Galvanized, Aluminum or Stainless Steel.

- Contact your Tricon representative for available sizes, temperature range and system options.

Tricon Piping Systems, Inc. **Tel: 315-697-8787**
P.O. Box 361 **Fax: 315-697-8788**
Canastota, NY 13032 **www.triconpiping.com**



END VIEW



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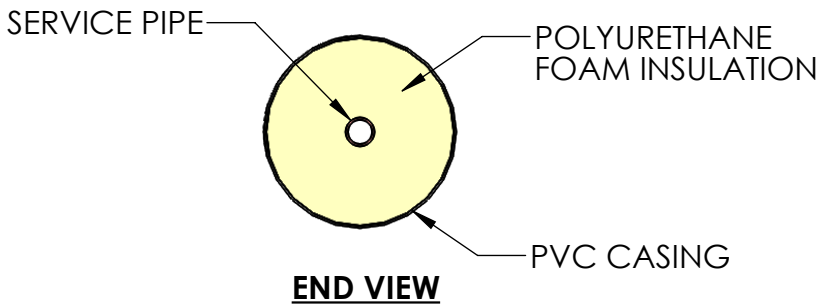
SHEET TITLE
STRAIGHT LENGTH DETAIL

PRODUCT
TRICON SUB-ZERO

SIZE	SCALE	DATE
A	NTS	12/01/16

DWG. NO.
SZ - 1



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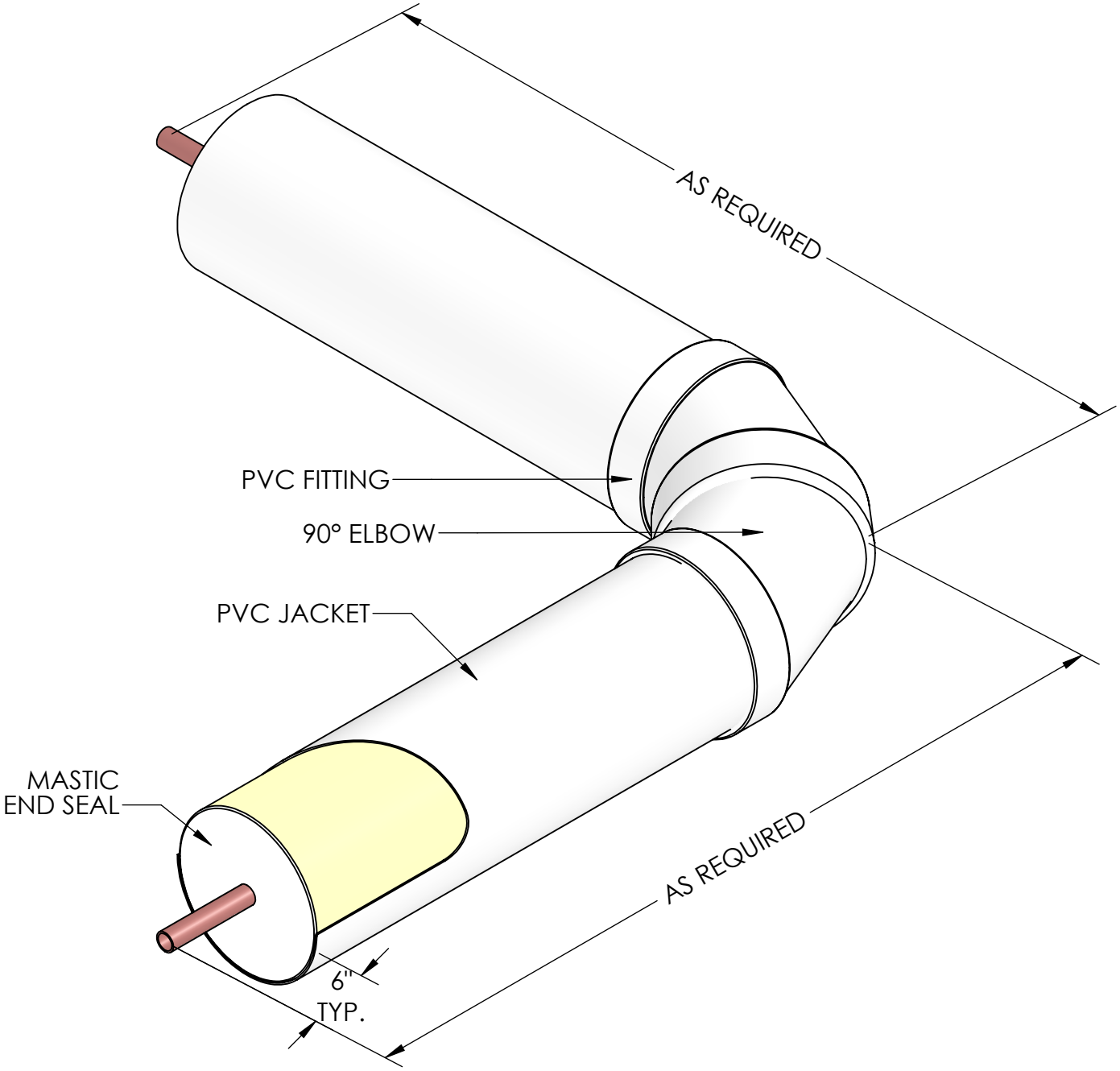

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P.O. BOX 361, Canastota, NY 13032
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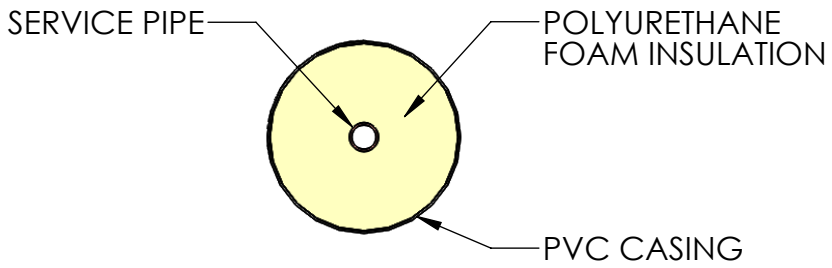
SHEET TITLE: PRE-FABRICATED 90° ELBOW

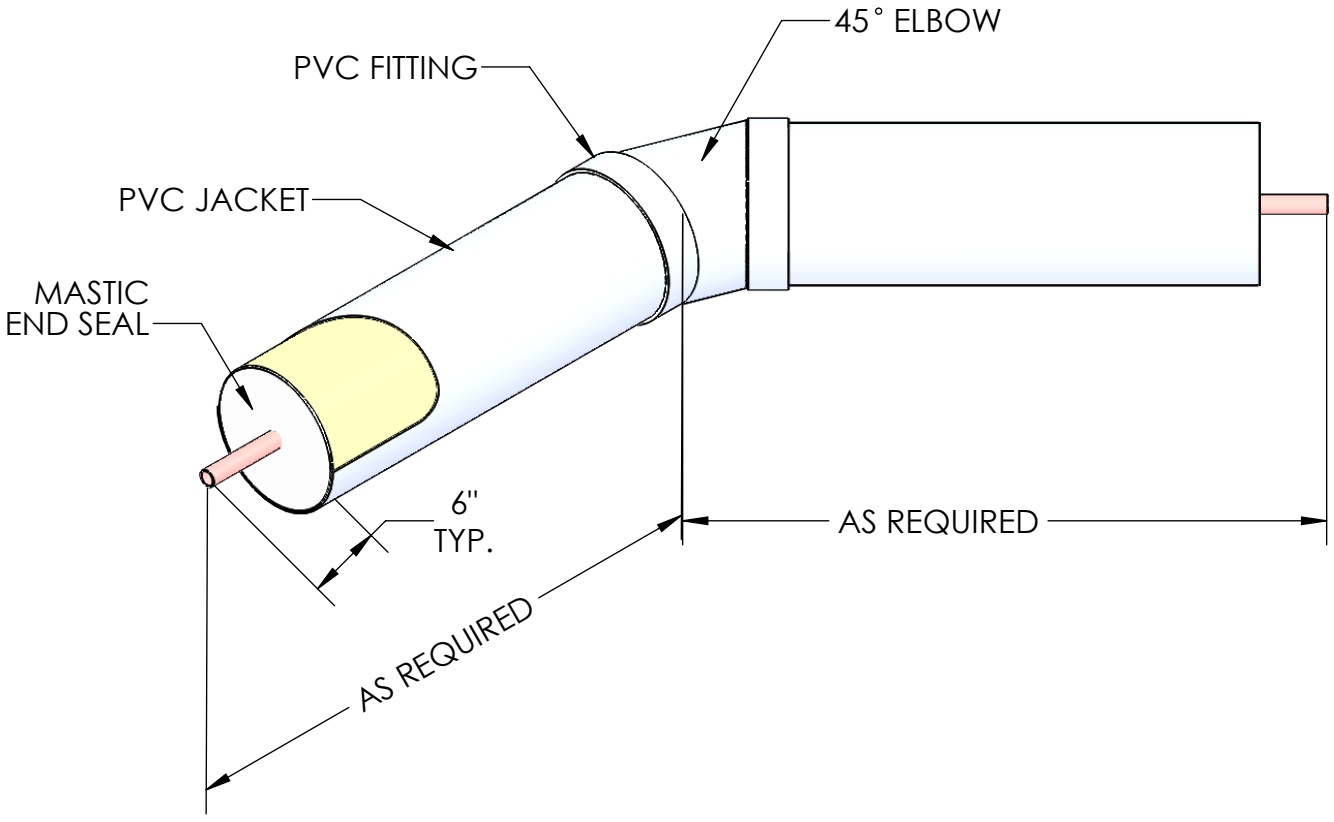
PRODUCT: TRICON SUB ZERO

SIZE	SCALE	DATE
A	NTS	12/01/16

DWG. NO. SZ - 2



END VIEW



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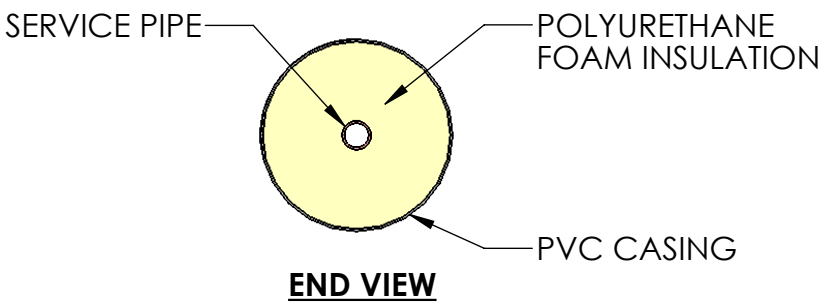
SHEET TITLE
PRE-FABRICATED 45° ELBOW

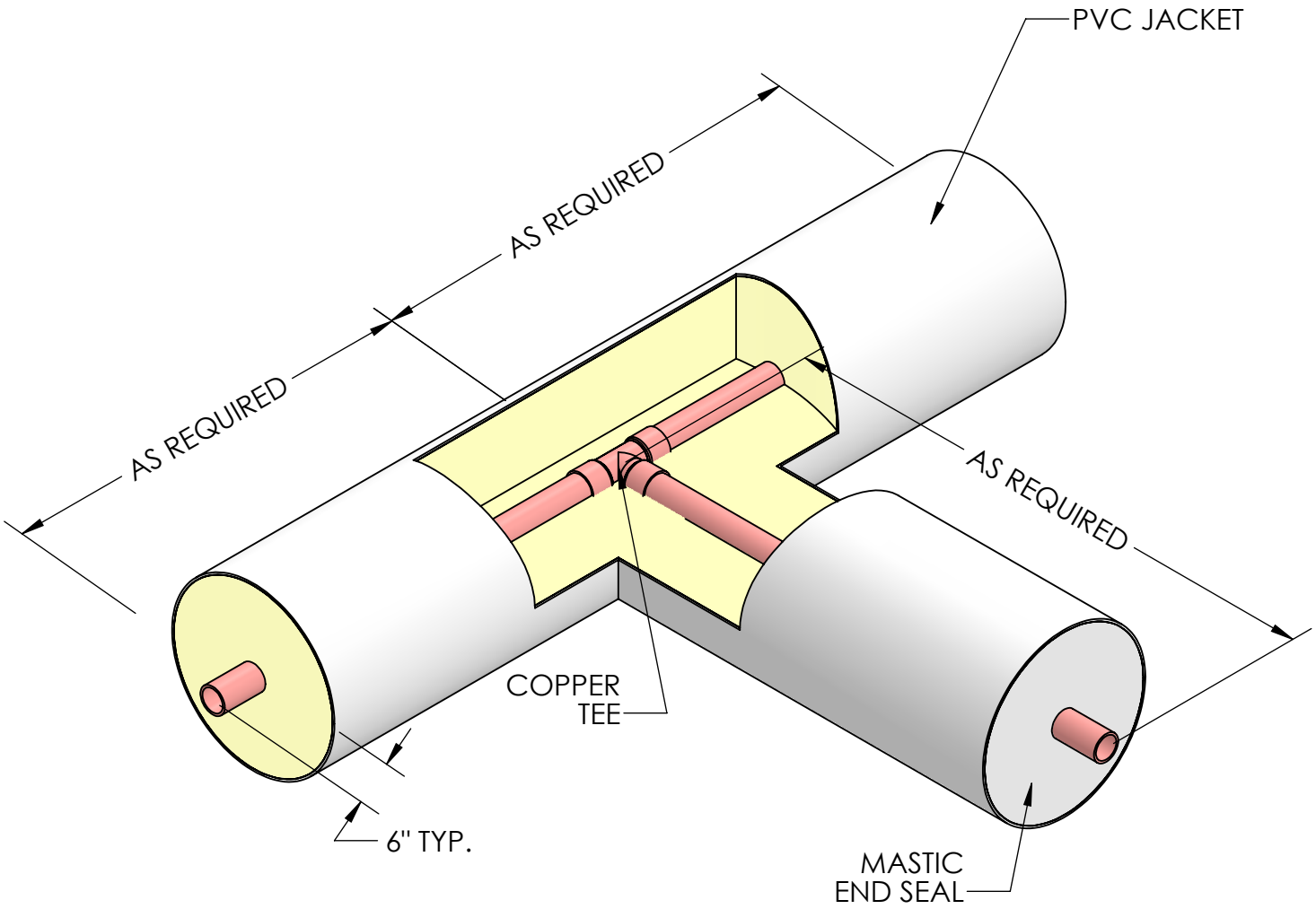
PRODUCT
TRICON SUB ZERO

SIZE	SCALE	DATE
A	NTS	12/01/16

DWG. NO.
SZ - 3



END VIEW



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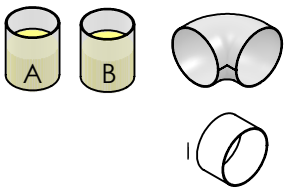
SHEET TITLE
PRE-FABRICATED TEE DETAIL

PRODUCT
TRICON SUB ZERO

SIZE	SCALE	DATE
A	NTS	12/01/16

DWG. NO.
SZ - 4

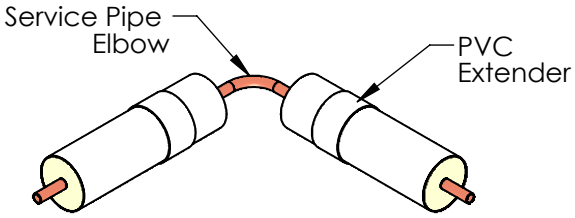
STEP #1: Gather Materials



The field joint kit includes:
1. Liquid Urethane Foam Materials
2. PVC Extenders
3. PVC Cover
4. Pressure-sensitive Tape

Equipment List:
Razor knife, drill, gloves, and safety glasses.

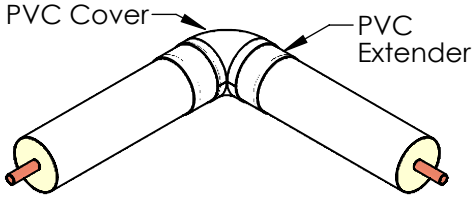
STEP #2: Place PVC Extenders and Join Service Pipe



Prior to welding service pipe, slide PVC extenders over casing and move away from weld point to prevent damage.

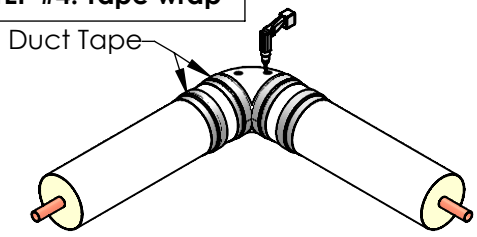
Weld fitting to service pipe and test/check all welds as required.

STEP #3: Fit PVC Cover & Extenders



Slide the PVC extenders in place and secure in place. Fit the PVC cover in place.

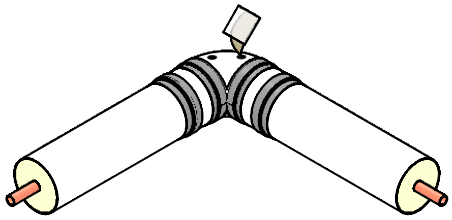
STEP #4: Tape wrap



Wrap seams tightly with duct tape.

Drill two (2) 1" holes into the top of the PVC cover for introduction of polyurethane foam mixture.

STEP #5: Insulate

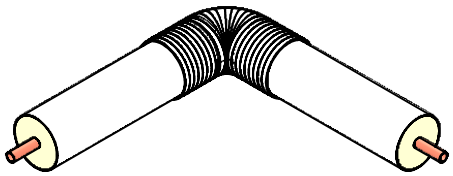


Refer to the chart for the foam amount based on the jacket size. Mix "A" and "B" in a bucket and pour foam into opening. When the foam reacts, temporarily seal the opening with duct tape. Allow 4-5 minutes for reaction to take place.

Note: Required proportions may vary based on weather conditions and foam thickness (chart based on 1½" nominal insulation thickness). Contact your Tricon representative for more information.

Jacket Size (In.)	"A" (Oz.)	"B" (Oz.)
3	3	1
4	6	2
5	6	2
6	6	2
8	12	4
10	18	6
12	24	8

STEP #5: Trim & Tape



Trim off excess material after curing is complete.

Spiral wrap fitting with pressure-sensitive tape as shown.

Note: In colder weather, tape must be kept warm until time of use.

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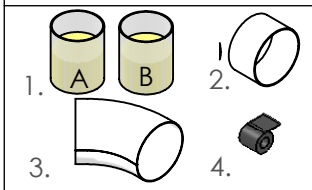
SHEET TITLE: 90 DEGREE ELBOW KIT (LIQUID FOAM) DETAIL

PRODUCT: TRICON SUB-ZERO

SIZE	SCALE	DATE
A	NTS	12/01/2016

DWG. NO. SZ-5

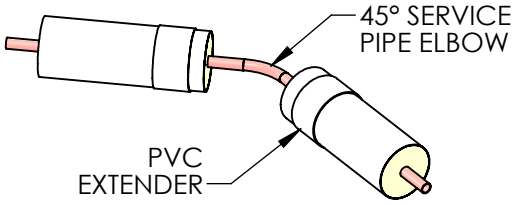
STEP #1: Gather Materials



The field joint kit includes:
1. Liquid Urethane Foam Materials
2. PVC Extenders
3. PVC Fitting Cover
4. Pressure-sensitive Tape

Equipment List:
Razor knife, drill, gloves, and safety glasses.

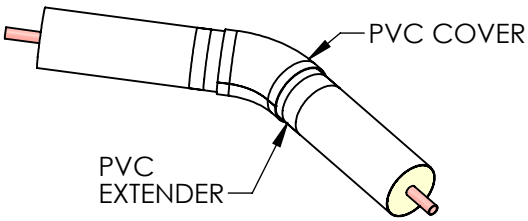
STEP #2: Place PVC Extenders and Join Service Pipe



Prior to welding service pipe, slide PVC extenders over casing and move away from weld point to prevent damage.

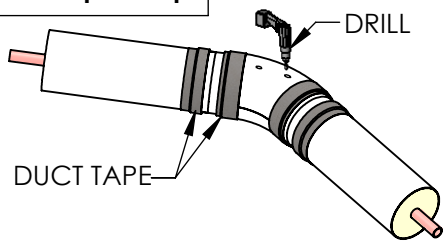
Weld/Braze fitting to service pipe and test/check all welds as required.

STEP #3: Fit PVC Cover & Extenders



Slide the PVC extenders in place and secure in place. Fit the PVC cover in place.

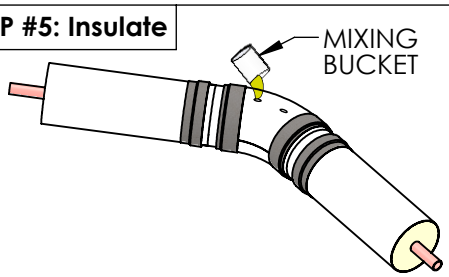
STEP #4: Tape wrap



Wrap seams tightly with duct tape.

Drill two (2) 1" holes into the top of the PVC cover for introduction of polyurethane foam mixture.

STEP #5: Insulate

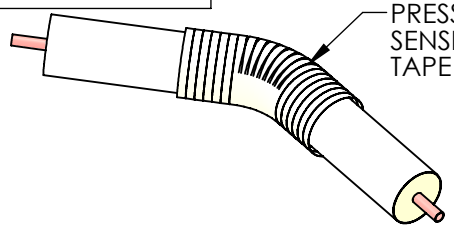


Refer to the chart for the foam amount based on the jacket size. Mix "A" and "B" in a bucket and pour foam into opening. When the foam reacts, temporarily seal the opening with duct tape. Allow 4-5 minutes for reaction to take place.

Note: Required proportions may vary based on weather conditions and foam thickness (chart based on 1½" nominal insulation thickness). Contact your Tricon representative for more information.

Jacket Size (In.)	"A" (Oz.)	"B" (Oz.)
3	6	2
4	6	2
5	9	3
6	9	3
8	12	4
10	15	5
12	21	7

STEP #5: Trim & Tape



Trim off excess material after curing is complete.

Spiral wrap fitting with pressure-sensitive tape as shown.

Note: In colder weather, tape must be kept warm until time of use.

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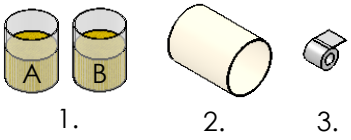
SHEET TITLE: ELBOW KIT (LIQUID FOAM) DETAIL

PRODUCT: TRICON SUB-ZERO

SIZE: A | SCALE: NTS | DATE: 12/01/2016

DWG. NO.: SZ-6

STEP #1: Gather Materials

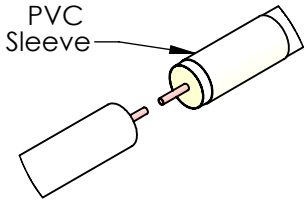


1. 2. 3.

The field joint kit includes:
1. Liquid Urethane Foam Materials
2. PVC Sleeve (18" long)
3. Pressure-Sensitive Tape

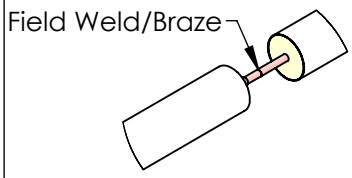
Equipment List:
Razor knife, drill, gloves, and safety glasses.

STEP #2: Prepare PVC Sleeve



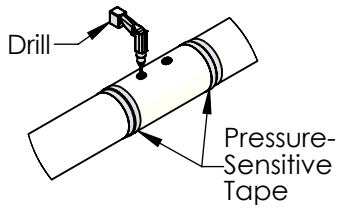
Prior to welding service pipe, slide PVC sleeve over casing and move away from weld point to prevent damage.

STEP #3: Join Service Pipe



Weld/Braze service pipe and test/check all welds as required.

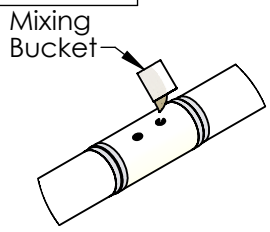
STEP #4: Apply Sleeve and Cut Hole



Slide PVC sleeve into the center of the joint and secure into place. Drill two (2) 1" holes into the top of the PVC sleeve for introduction of polyurethane foam mixture.

Apply a wrap of pressure-sensitive tape around both areas were casing and sleeve meet. Allow 2" overlap of tape onto both surfaces.

STEP #5: Insulate

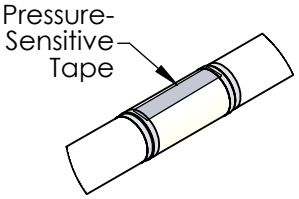


Refer to the chart for the foam amount based on the jacket size. Mix "A" and "B" in a bucket and pour foam into opening. When the foam reacts, temporarily seal the opening with duct tape. Allow 4-5 minutes for reaction to take place.

Note: Required proportions may vary based on weather conditions and foam thickness (chart based on 1½" nominal insulation thickness). Contact your Tricon representative for more information.

Jacket Size (In.)	"A" (Oz.)	"B" (Oz.)
3	3	1
4	6	2
5	6	2
6	6	2
8	9	3
10	12	4
12	12	4
14	18	6
16	21	7

STEP #6: Trim and Seal



Trim off excess material after curing is complete. Apply additional pressure sensitive tape over hole in PVC sleeve. Additional wraps may be required to ensure a water-tight seal.

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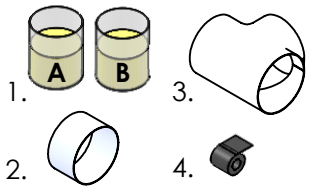
SHEET TITLE: Sub-Zero Field Joint Kit (Liquid Foam)

PRODUCT: Tricon Sub-Zero

SIZE: A | SCALE: NTS | DATE: 12/01/2016

DWG. NO.: SZ-7

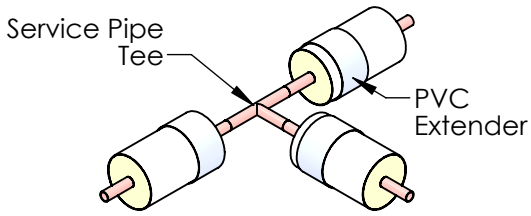
STEP #1: Gather Materials



The field joint kit includes:
1. Liquid Urethane Foam Materials
2. PVC Extenders
3. PVC Cover
4. Pressure-sensitive Tape

Equipment List:
Razor knife, drill, gloves, and safety glasses.

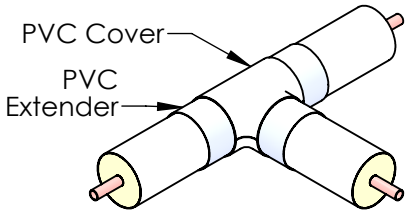
STEP #2: Place PVC Extenders and Join Service Pipe



Prior to welding tee to the service pipes, slide PVC extenders over casing and move away from weld point to prevent damage.

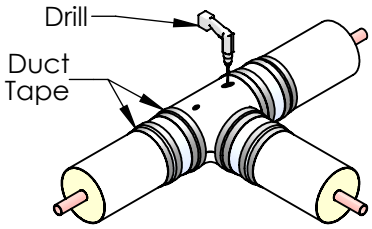
Weld fitting to service pipe and test/check all welds as required.

STEP #3: Apply Insulation



Slide the PVC extenders in place and secure in place.
Fit the PVC cover in place.

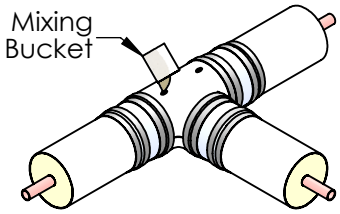
STEP #3: Apply Insulation



Wrap seams tightly with duct tape.

Drill two (2) 1" holes into the top of the PVC cover for introduction of polyurethane foam mixture.

STEP #4: Fit PVC over the insulation

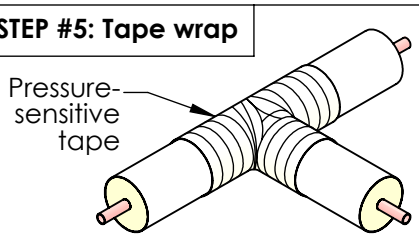


Refer to the chart for the foam amount based on the jacket size. Mix "A" and "B" in a bucket and pour foam into opening. When the foam reacts, temporarily seal the opening with duct tape. Allow 4-5 minutes for reaction to take place.

Note: Required proportions may vary based on weather conditions and foam thickness (chart based on 1½" nominal insulation thickness). Contact your Tricon representative for more information.

Jacket Size (In.)	"A" (Oz.)	"B" (Oz.)
3	6	2
4	6	2
5	9	3
6	9	3
8	12	4
10	15	5
12	21	7

STEP #5: Tape wrap



Trim off excess material after curing is complete.

Spiral wrap fitting with pressure-sensitive tape as shown.

Note: In colder weather, tape must be kept warm until time of use.

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SHEET TITLE: SUB-ZERO TEE KIT DETAIL

PRODUCT: TRICON SUB-ZERO

SIZE: A | SCALE: NTS | DATE: 12/01/2016

DWG. NO.: SZ-8