# Operator's Manual

McELROY

www.mcelroy.com

Fitting Fabrication Machine

## 250MM

McHiNT™

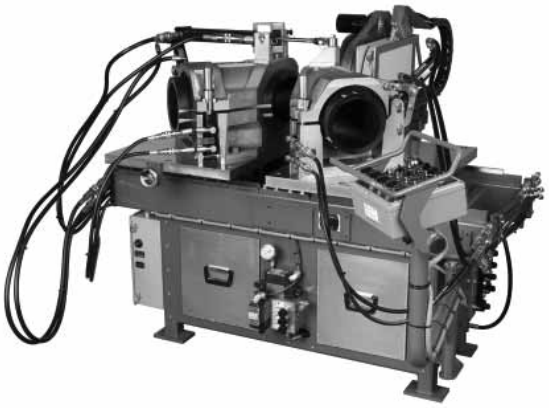
Manual: 877801 Revision: 4/06
Original Language: English

# Introduction

## Thank You for purchasing this McElroy product

The 250 McHiLYT™ fitting fabrication machine is designed to produce ells from polyethylene pipe in sizes from 12" IPS x SDR 9 down to 110 mm x SDR 32.5 and tees, wyes, and crosses 250 mm x SDR 7 to 110 mm x SDR 32.5.

The machine is compatible with the McElroy DataLogger®, which will record the fusion parameters that are used on each joint. This data can then be printed out or downloaded to a personal computer.



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## World Class Training

This manual is intended as a guide only and does not take the place of proper training by qualified instructors. The information in this manual is not all inclusive and can not encompass all possible situations that can be encountered during various operations.

McElroy Manufacturing, Inc., offers advanced training classes to enhance efficiency, productivity, safety and quality. Training is available at our facility or on-site at your location. Call (918) 836-8611.

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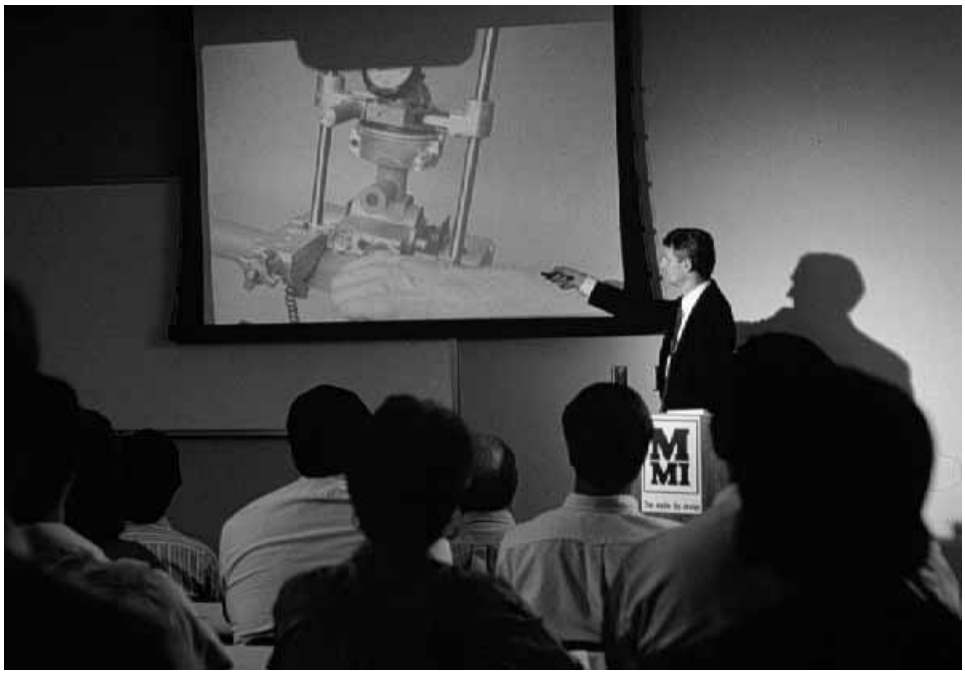

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# Warranty

## LIMITED WARRANTY

McElroy Manufacturing, Inc. (McElroy) warrants all products manufactured, sold and repaired by it to be free from defects in materials and workmanship, its obligation under this warranty being limited to repairing or replacing at its factory and new products, within **3 years** after shipment, with the exception of purchased items (such as electronic devices, pumps, switches, etc.), in which case that manufacturer's warranty applies. Warranty applies when returned freight is prepaid and which, upon examination, shall disclose to have been defective. This warranty does not apply to any product or component which has been repaired or altered by anyone other than McElroy or has become damaged due to misuse, negligence or casualty, or has not been operated or maintained according to McElroy's printed instructions and warnings. This warranty is expressly in lieu of all other warranties expressed or implied. The remedies of the Buyer are the exclusive and sole remedies available and Buyer shall not be entitled to receive any incidental or consequential damages. Buyer waives the benefit of any rule that disclaimer of warranty shall be construed against McElroy and agrees that such disclaimers herein shall be construed liberally in favor of McElroy.

## RETURN OF GOODS

Buyer agrees not to return goods for any reason except upon the written consent of McElroy obtained in advance of such return, which consent, if given, shall specify the terms and conditions and charges upon which any such return may be made. Materials returned to McElroy, for warranty work, repair, etc., **must have a Return Material Authorization (RMA) number**, and be so noted on the package at time of shipment. For assistance, inquiry shall be directed to:

McElroy Manufacturing, Inc.
P.O. Box 580550
833 North Fulton Street Tulsa, Oklahoma 74158-0550

PHONE: (918) 836–8611, FAX: (918) 831–9285.
EMAIL: fusion@McElroy.com

**Note:** Certain repairs, warranty work, and inquiries may be directed, at McElroy's discretion, to an authorized service center or distributor.

## DISCLAIMER OF LIABILITY

McElroy accepts no responsibility of liability for fusion joints. Operation and maintenance of the product is the responsibility of others. We recommend qualified joining procedures be followed when using McElroy fusion equipment.

McElroy makes no other warranty of any kind whatever, express or implied; and all implied warranties of merchantability and fitness for a particular purpose which exceed the aforestated obligation are hereby disclaimed by McElroy.

## PRODUCT IMPROVEMENT

McElroy reserves the right to make any changes in or improvements on its products without incurring any liability or obligation to update or change previously sold machines and/or the accessories thereto.

## INFORMATION DISCLOSED

No information of knowledge heretofore or hereafter disclosed to McElroy in the performance of or in connection with the terms hereof, shall be deemed to be confidential or proprietary, unless otherwise expressly agreed to in writing by McElroy and any such information or knowledge shall be free from restrictions, other than a claim for patent infringement, is part of the consideration hereof.

## PROPRIETARY RIGHTS

All proprietary rights pertaining to the equipment or the components of the equipment to be delivered by McElroy hereunder, and all patent rights therein, arising prior to, or in the course of, or as a result of the design or fabrication of the said product, are exclusively the property of McElroy.

## LAW APPLICABLE

All sales shall be governed by the Uniform Commercial Code of Oklahoma, U.S.A.

**Register your product online to activate your warranty: www.McElroy.com/fusion**

(Copy information listed on the machine nameplate here for your records).

Model No. _____

Serial No. _____

Date Received _____

Distributor _____

TX02486-04-06-05

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TX02628-4-17-06

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# Fusion Equipment Safety

## Safety Alerts

This hazard alert sign appears in this manual. When you see this sign, carefully read what it says. YOUR SAFETY IS AT STAKE.

You will see the hazard alert sign with these words: DANGER, WARNING, and CAUTION.

WR00051-11-30-92

**DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION** Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.




In this manual you should look for two other words: **NOTICE** and **IMPORTANT**.

**NOTICE:** can keep you from doing something that might damage the machine or someone's property. It may also be used to alert against unsafe practices.

**IMPORTANT**: can help you do a better job or make your job easier in some way.

TX00030-12-1-92

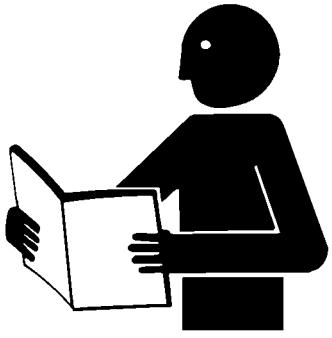
## Read and Understand

Do not operate this equipment until you have carefully read, and understand the "Safety" and "Operation" sections of this manual, and all other equipment manuals that will be used with it.

Your safety and the safety of others depends upon care and judgment in the operation of this equipment.

Follow all applicable federal, state, local, and industry specific regulations.

McElroy Manufacturing, Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine are therefore not all inclusive. You must satisfy yourself that a procedure, tool, work method, or operating technique is safe for you and others. You should also ensure that the machine will not be damaged or made unsafe by the method of operation or maintenance you choose.



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## General Safety

Safety is important. Report anything unusual that you notice during set up or operation.

**LISTEN** for thumps, bumps, rattles, squeals, air leaks, or unusual sounds.

**SMELL** odors like burning insulation, hot metal, burning rubber, hot oil, or natural gas.

**FEEL** any changes in the way the equipment operates.

**SEE** problems with wiring and cables, hydraulic connections, or other equipment.

**REPORT** anything you see, feel, smell, or hear that is different from what you expect, or that you think may be unsafe.

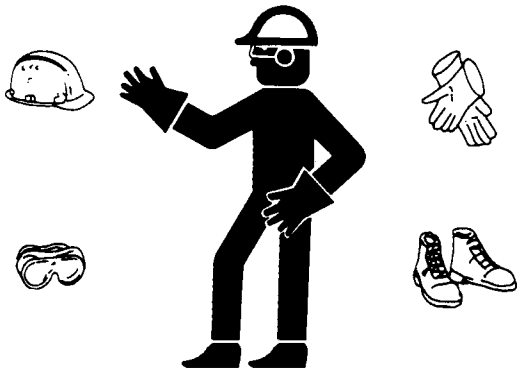

SAFE1ST-12-22-92

TX00114-4-22-93

## Wear Safety Equipment

Wear a hard hat, safety shoes, safety glasses, and other applicable personal protective equipment.

Remove jewelry and rings, and do not wear loose-fitting clothing or long hair that could catch on controls or moving machinery.



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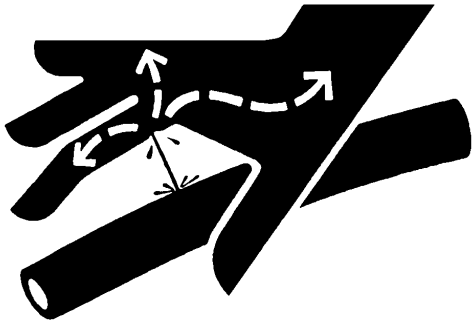
## Units With Hydraulics

Although the hydraulic pressures in this machine are low compared to some hydraulically operated equipment, it is important to remember that a sudden hydraulic oil leak can cause serious injury, or even be fatal if the pressure is high enough.

**⚠WARNING** Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes which eject fluid under pressure. Use a piece of cardboard or paper to search for leaks. If any fluid is injected into the skin, it must be immediately removed by a doctor familiar with this type of injury.

**NOTICE:** Wear safety glasses, and keep face clear of area when bleeding air from hydraulic system to avoid spraying oil into eyes.



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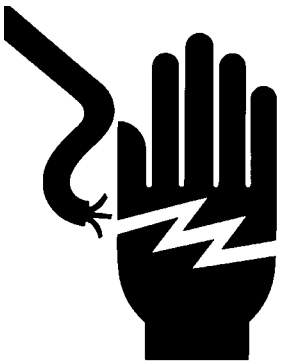
## Electrical Safety

**⚠WARNING** High voltage connections are present on this machine and can shock or kill. Do not disable safety interlocks. Refer all servicing to qualified personnel.



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Frequently inspect electrical cords and unit for damage. Have damaged components replaced and service performed by a qualified electrician.

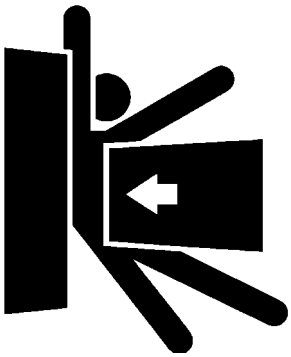
**NOTICE**: Always connect units to the proper power source as listed on the unit, or in the owner's manual.

**NOTICE**: Disconnect power source before attempting any maintenance or adjustment. Use proper lockout and tagout procedures on disconnect switch.

TX00662-9-29-95

## Crush Points

**⚠WARNING** Moving parts can crush. Keep fingers, feet, arms, legs, and head out of the jaw area and from between the moving tables. Always check pipe alignment with a pencil or similar object.



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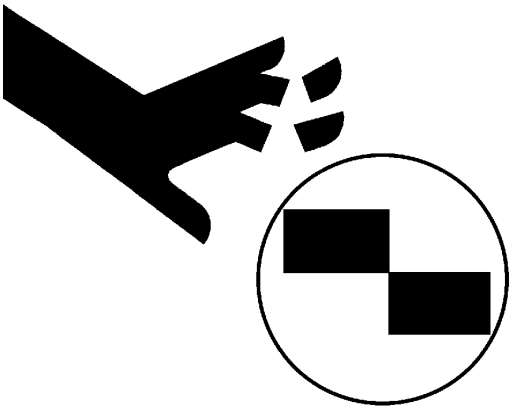
## Facer Blades Are Sharp

**⚠WARNING** Facer blades are sharp and can cut. Never attempt to remove shavings while the facer is running, or is in the facing position between the jaws. Use care when operating the facer, and when handling the unit.



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**NOTICE:** Disconnect power from the facer, and remove the facer blades before attempting any maintenance or adjustment.

**NOTICE:** Never extend the blade beyond the inner or outer circumference of the facer.

TX02378-1-24-05

## Heater Is Hot

**⚠CAUTION** The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand or blanket when not in use, and use care when heating the pipe.

**NOTICE**: Use only a clean non-synthetic cloth such as a cotton cloth to clean the heater plates.

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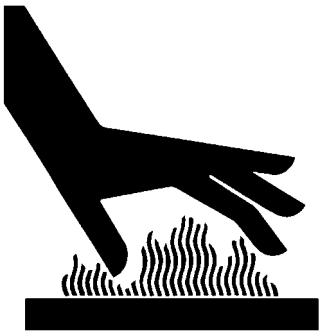

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## Fusion Procedures

Obtain a copy of the pipe manufacturer's procedures for the pipe being fused. Follow the procedure carefully, and adhere to all specified parameters.

**⚠CAUTION** Failure to follow pipe manufacturer's procedure could result in a bad joint. Always follow pipe manufacturer's procedures.

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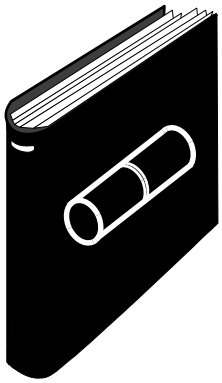

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## Theory of Heat Fusion

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The principle of heat fusion is to heat two surfaces to a designated temperature, and then fuse them together by application of force. This pressure causes flow of the melted materials, which causes mixing and thus fusion. When the polyethylene pipe is heated, the molecular structure is transformed from a crystalline state into an amorphous condition. When fusion pressure is applied, the molecules from each pipe end mix. As the joint cools, the molecules return to their crystalline form, the original interfaces are gone, and the two pipes have become one homogeneous pipe. The joint area becomes stronger than the pipe itself in both tensile and pressure conditions.

The principle operations include:

**Clamping** The pipe pieces held axially to allow all subsequent operations to take place.

**Facing** The pipe ends must be faced to establish clean, parallel mating surfaces perpendicular to the centerline of the pipes.

**Aligning** The pipe ends must be aligned with each other to minimize mismatch or high-low of the pipe walls.

**Heating** A melt pattern that penetrates into the pipe must be formed around both pipe ends.

**Joining** The melt patterns must be joined with a specified force. The force must be constant around the interface area.

**Holding** The molten joint must be held immobile with a specified force until adequately cooled.

**Inspecting** Visually examine the entire circumference of the joint for compliance with standards established by your company, customer, industry, federal, state, or local regulations.

Each pipe manufacturer has a slightly different approach for fulfilling the heating, joining, and holding phases, but the end result is the same – a fusion joint that is as strong or stronger than the pipe itself.

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## Tables

The fabrication machine has two tables. Both tables are movable and are driven by one or two hydraulic cylinders.

**⚠WARNING** Moving parts can crush. Stand clear of moving parts.

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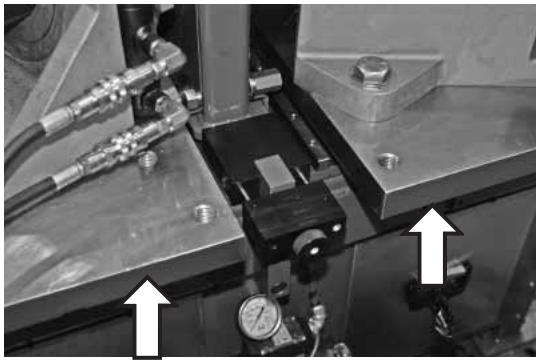

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## Miter Jaws

The standard jaws are designed to pivot on the table from zero to 22-1/2 degrees. The upper jaws are opened and closed manually and clamped hydraulically.

Inserts are required with the jaws for sizes below 12" IPS.

Other fixtures are required for fabricating tees and wyes.

Install fixture using (2) 1" hex head capscrews and (1) 1" stud with nut.

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PH03238-4-12-06

## Indexing Carriage

The heater and facer are mounted on hydraulic indexing carriages that position them at the pipe interface during the face and heat cycles. They are linearly driven in and out of the interface by hydraulic cylinders.

**⚠WARNING** Moving parts can crush. Stand clear of moving parts.

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## Controls

All controls are located on a pendant arm and are electrically operated.

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## Optional DataLogger®

The McElroy Datalogger can be used with this machine to record the fusion parameters that are used on each joint. This data can then be printed out, or downloaded to a personal computer. When setting up the Datalogger, be sure the effective piston area agrees with the lower and upper cylinder configuration.

The TEPA of the lower cylinder only is 2.75 $in^2$ and the upper and lower cylinders together are 4.21 $in^2$.

TX02588-4-17-06


PH03025-10-31-05

## Filter and Filler Cap

This machine is equipped with a 10 Micron filter (A) on the return side of the hydraulic system.

Change filter when the indicator gauge (B) reads between 20 psi and 25 psi (yellow range).

The reservoir is filled by removing the cap (A) and the filter.

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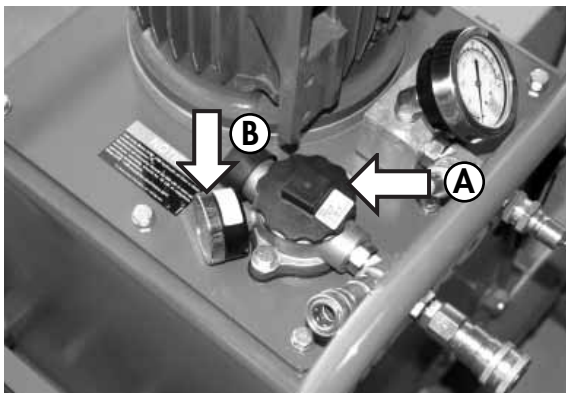


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## Motor and Pump

The pump is powered by a TEFC (Totally enclosed, fan cooled) motor. The pump is a pressure compensated piston pump and is set at 1500 psi.

**⚠CAUTION** Do not adjust the compensator on the pump higher. This will overload the motor and overheat the oil.

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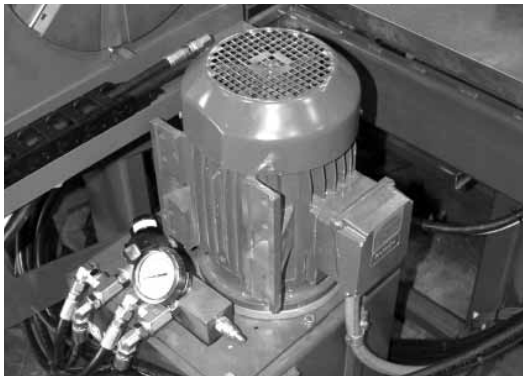

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## Oil Reservoir

The reservoir is incorporated in the hydraulic power unit.The oil level should remain visible in the sight gauge in the rear of the reservoir.

Never allow dirt or other foreign matter to enter the open tank.

See the "Hydraulic Fluids" section for hydraulic fluid recommendations.

TX02590-4-17-06

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## Facer

The facer is of the McElroy Rotating Planer-Block Design. The blade holders each contain one cutter blade. The block rotates on ball bearings and is chain driven. The facer is driven by a high torque hydraulic motor.

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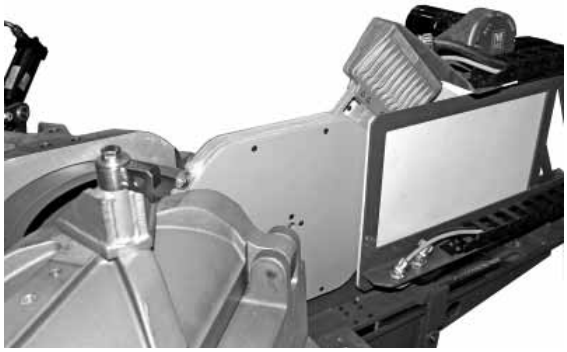
## Heater

The heater uses 6000 watts of 3-phase electric power.

The heater is equipped with replaceable butt plates, which allow for quick replacement or repair of a worn or damaged coating without disconnecting the heater.



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## Optional Jib Crane

A jib crane can be added to the unit as an option. It assists in loading pipe segments and handling completed fittings. It can also be used for maintenance work such as mounting fixtures.

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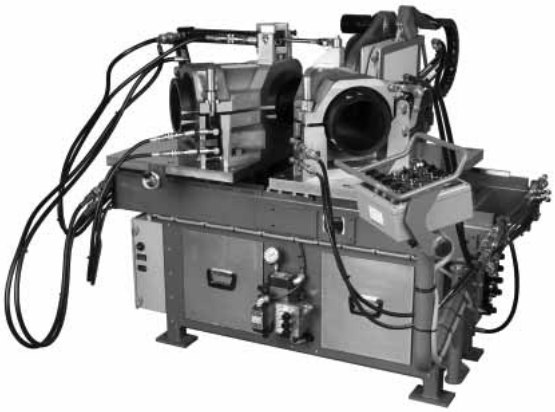
## Installation

The unit is approximately 6 ft. wide, 7 ft. deep and 4 1/2 ft. tall. It will be necessary, however to add at least 3 ft. in front of the machine for the operator. If the unit will be used for pupping, more room will be needed to handle the pupped fittings. Access around the machine should be provided for cleaning face-off waste.

The machine requires 10kW of 380VAC 3 phase electrical power.The customer needs to supply a fusible disconnect switch near the back of the machine.The electrical enclosure is attached to base of the unit on the left side. No compressed air is required.

An overhead hoist is optional to install jaws and fixtures. It can also be used to perform maintenance. It should be at least 1 ton capacity and have 8 ft. under the hook. A jib crane is available if the facility does not already have one or if it is not available.

The unit is shipped in 1 major piece. The base sub-assembly weighs approximately 3000 lbs. The site should be a level concrete slab. The heater and facer are positioned by two cylinders which must be restrained during handling to prevent them from shifting.



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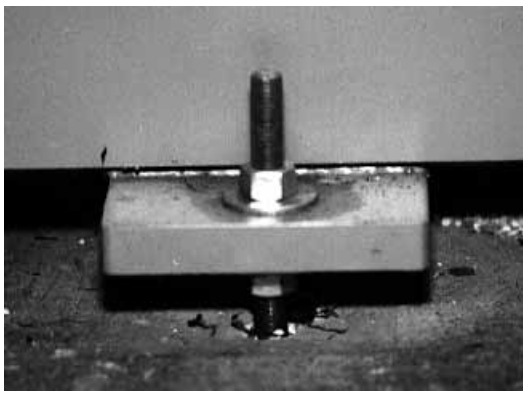
## Level the Unit

Position the base. Set 5/8" anchor studs in the floor to align with the holes in the base and the indexer. Use jack nuts on the studs under the unit to level the ways.



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## Hydraulic System

The hydraulic power unit is located at the back of the machine on the left side.

Once the power and hydraulic lines are connected it will be necessary to bleed air out of the lines. **Air trapped in the lines can cause erratic and sudden motion in the hydraulic system.**

Be especially carefull moving the heater and facer. Move them slowly until all air is worked out.

TX02595-4-17-06

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## Heater

A selector switch on the console turns the heater on. The heater temperature controller is mounted in the side of the main electrical box. The set point can be adjusted using the buttons on the front of the unit. Refer to temperature controller setup in the back of this manual for the proper procedure. Once the power is on to the heater and the set point is adjusted, it will take about 10 minutes for the heater to come up to temperature. The green light on the side of the main electrical box will come on when the heater has reached operating range.

While the heater is coming up to temperature the operator can clean the heater, turn on the hydraulic power unit, set the carriage force, load the pipe, face the pipe ends and perform the setup for the first fusion.

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PH03227-4-12-06

## Control Valves

There are three pressure control valves on the carriage manifold that need to be adjusted. These control the facing, heating and fusing pressures. Facing pressure is always set below 200 PSI. Heating and fusion pressures are specified by the pipe manufacturer. The charts in the back of this manual allows the operator to determine the fusion pressure based on the required interfacial pressure, pipe O.D., pipe DR, joint miter angle, and joint type.

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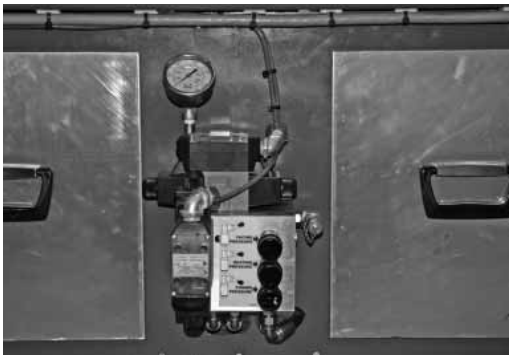

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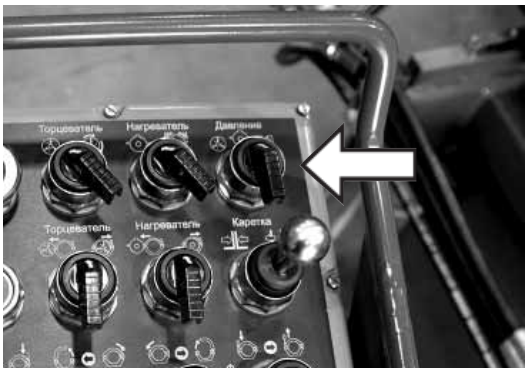
## Adjusting Valves

The operator has a selector switch on the right side of the console. It determines whether the top, middle or bottom reducing valve is controlling the pressure to the table. To set the facing force, put the selector switch in the left position. To set the heating force, put the selector switch in the middle position. To set the fusion force,put the selector switch in the right position.

**NOTICE:** Do not squeeze the facer between the ends of the pipe.

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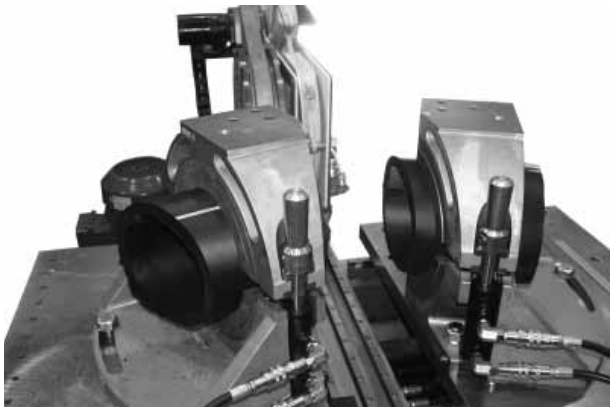
## Using the Miter Jaws to make Elbows and do Pupping

Refer to the pipe manufacturer's fusion parameters for all fusion settings.

The right and left miter jaws are located on the tables by the table dowel pin. Install fixtures using (4) 1" hex head capscrews and (2) 1" stud with nut. The jaws can be set to make joints from 0° to 45°. Set the miter angle to half of the desired joint angle. The jaws must always be set to the same angle, otherwise the pipe ends will not match. Once the angle is set, tighten all three bolts on each jaw.



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## Changing Sizes

Inserts are used to fuse all pipe smaller than 12"IPS. Install the inserts that are required in the upper and lower jaws. Use flat head capscrews in countersunk holes. Use socket head capscrews or lowhead socket capscrews. Be sure to seat the locating pin of each insert into the appropriate bushing.

PH03241-4-13-06

TX02599-4-17-06

## Pipe Segments

The pipe segments must be precut to the desired miter angle ( see the Dimensions section tables for the inside segment length for fabricating elbows).

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TX00639-9-7-95

## Placing Pipe in Jaws

Place the pipe in the jaws and close the jaws using the hydraulic valve on the front of the jaw. Swing the clamp cylinder into position and tighten it loosely. Switching the jaw valve to open will allow easier adjustment of the pipe in the jaws. Locate the pipe in the jaws and clamp loosely.

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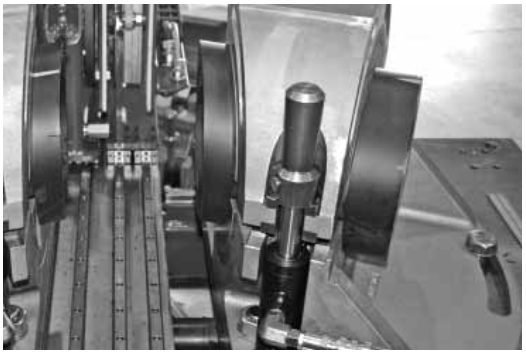

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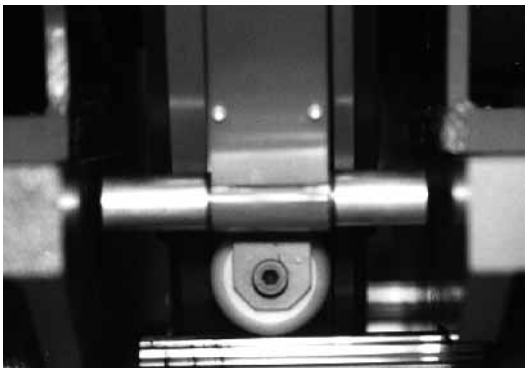
## Positioning Pipe Ends

Set the Carriage Pressure to fusing pressure. Bring the pipe ends together. Use the table to push the pipe back in the jaws until there is about 1/4" between the restbuttons and the table. Switch the jaw valve to close and tighten the clamps on the pipe.

TX00640-9-7-95



PH00531-9-20-95

## Facing

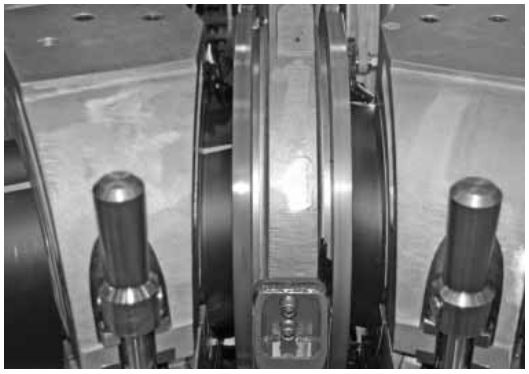
Open the tables fully. Turn off machine.

Install shorter facer stops marked with a "TΛ" graphic, on the right side of facer. Turn machine on.

Open the carriage and start the facer motor with the Pendant Switch. Set the carriage to facing pressure. Bring the pipe ends up against the facer. Maintain facing pressure until all restbuttons have bottomed out and facer is no longer cutting.Turn off the facer, then back the pipe off. Return the facer to the home position. Ensure that both sections of pipe have a complete face off.

**NOTICE:** Do not open miter jaws with facer in position.

TX02600-4-17-06



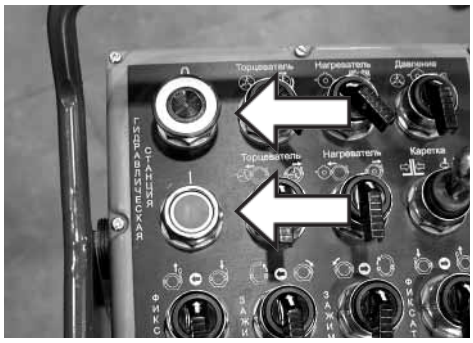
PH03244-4-11-06

## Remove Chips

Turn HPU off. Clean all chips out of the joint area. Do not touch faced pipe ends.

Turn HPU back on after cleaning out chips.

TX00756-11-7-95




PH03208-4-11-06

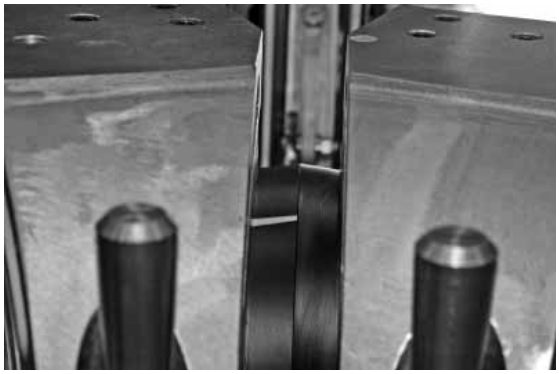
## Check Pipe Ends

Bring the pipe ends together to check for gaps, roundness of the pipe, and alignment of the pipe ends.

**⚠WARNING** Do not use hands to check pipe. The unit is under pressure and slippage could result in crushed hands. Always keep hands clear of the jaw area.

Adjust clamp knobs to align the pipe ends. If necessary, the ends will have to be moved up, reclamped and refaced until there is good alignment.

TX00642-9-7-95



PH03246-4-11-06

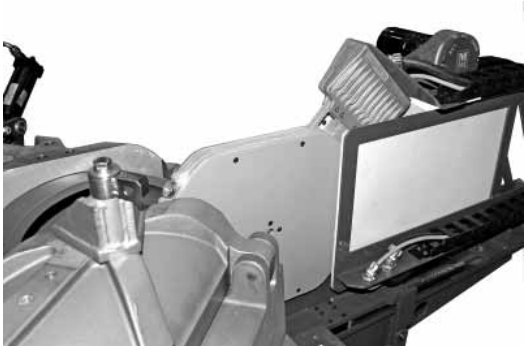
## Clean Heater Surfaces

The heater faces must be kept clean and free of any plastic build up or contamination.

On start up and after each fusion joint the heater surfaces must be wiped with a clean, non-synthetic cloth.

**NOTICE:** Do not use an abrasive pad or steel wool. Use a non-synthetic cloth that won't damage surfaces.

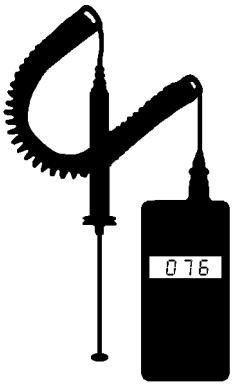
TX00758-11-9-95



PH03210-4-11-06

## Check Heater Temperature

**⚠CAUTION** Incorrect heating temperature can result in questionable fusion joints. Check heater plates periodically with a pyrometer and make necessary adjustments.




WR00077-4-16-93

Check heater surface temperature.

Refer to the pipe manufacturer's recommendations for proper heater temperature.

**IMPORTANT:** The heater temperature shown on the heater temperature controller display screen, indicates internal temperature, which varies from the actual surface temperature.

The indicated temperature can be used as reference once the surface temperature has been verified.

TX02548-10-31-05

## Heat Pipe

Check to be sure the heater is at the required temperature. Shift tables until the heater lines up with the gap, then move the heater into the interface.

Shift the selector valve to facing pressure. Close the tables, bringing the heater into contact with both pipe ends.

Move the selector valve to heating position.

If heating pressure is not required, allow the pressure to stabilize at the lowest setting and return carriage control valve to neutral position.

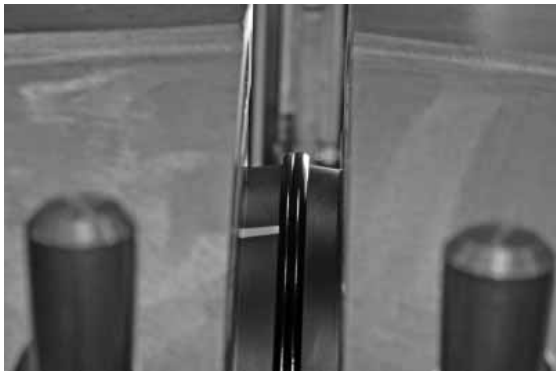
Follow the pipe manufacturers parameters for the heat and soak time. At the end of the heat time, shift the carriage valve to neutral to soak.

PH03247-4-11-06

TX02601-4-17-06

## Fusing the Pipe

At the end of the soak time shift the selector valve to the fusion position and open the tables fully. This will strip the pipe off the heater. Move the heater out, bring the pipe ends together to form the joint. Follow the pipe manufacturers parameters for cool time under pressure.



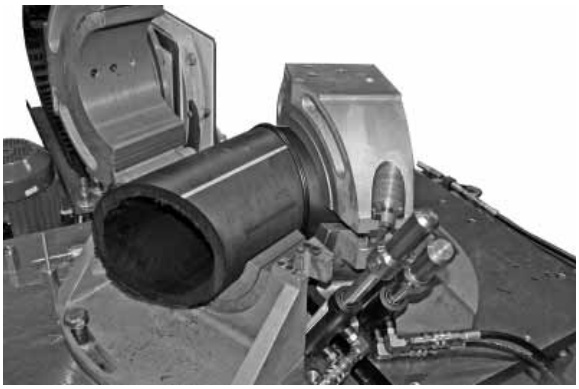
PH03248-4-11-06

TX02602-4-17-06

## Removing Fitting

After all joints have cooled down, shift the carriage to neutral,unclamp and open the jaws and remove the fitting from the unit.

**⚠WARNING** Moving parts can crush. Stand clear of moving parts.



PH03249-4-11-06

TX00645-9-7-95

# Dimensions

## Fabricated Elbow - Finished Imperial Dimensions made with the 250mm Fitting Machine (For IPS Pipe Sizes)

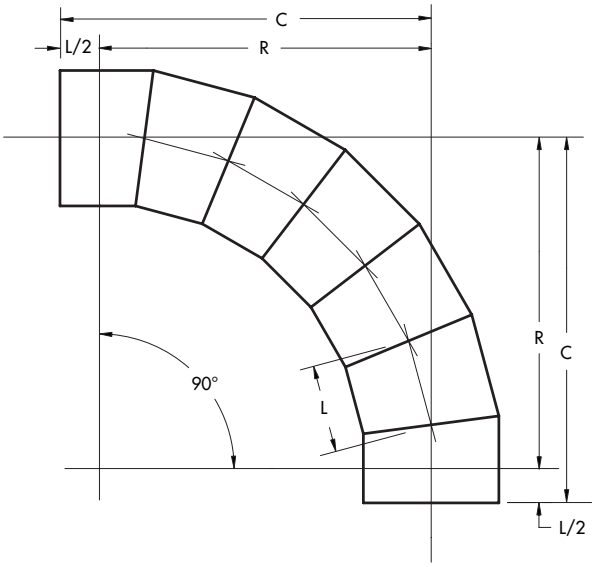
L = Center line cut length of pipe segment (allows for 1/2" of face-off per side, melt, and roll back)

C = Elbow length from cL to face

R = Elbow radius

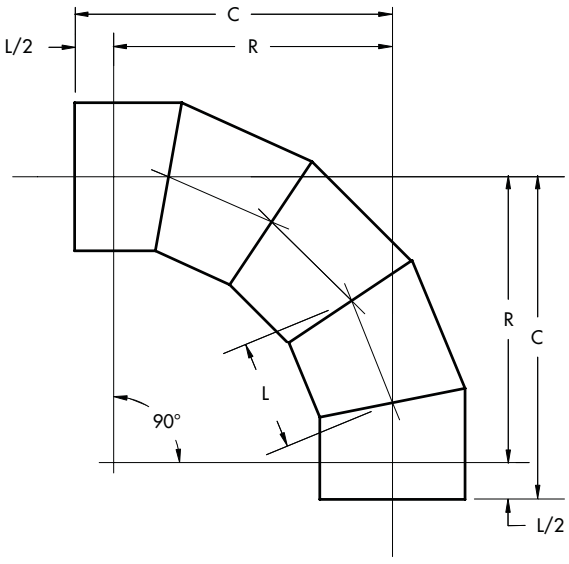
**All Lengths in inches**

| Dimensions for 7 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.80 | 34.25 | 29.83 |
| 5" IPS | 9.88 | 34.55 | 30.10 |
| 6" IPS | 9.94 | 34.85 | 30.36 |
| 8" IPS | 10.08 | 35.41 | 30.86 |
| 10" IPS | 10.22 | 36.02 | 31.39 |
| 12" IPS | 10.85 | 38.73 | 33.79 |




CD00699-3-01-06

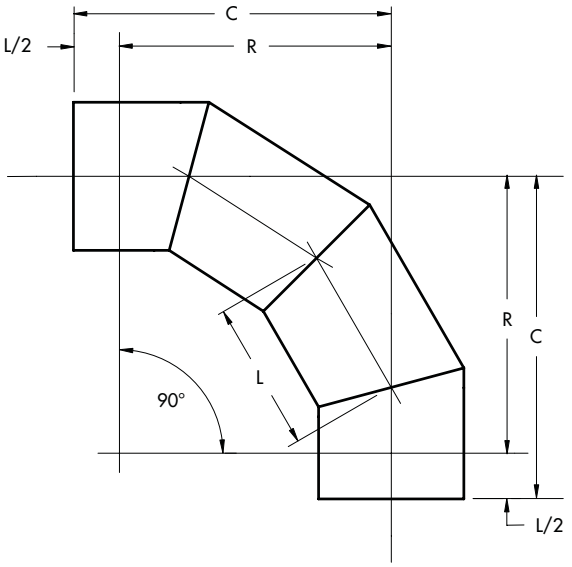
| Dimensions for 5 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.97 | 24.65 | 20.15 |
| 5" IPS | 10.07 | 24.97 | 20.42 |
| 6" IPS | 10.18 | 25.29 | 20.68 |
| 8" IPS | 10.38 | 25.88 | 21.18 |
| 10" IPS | 10.59 | 26.52 | 21.72 |
| 12" IPS | 11.29 | 28.63 | 23.47 |




CD00700-3-01-06

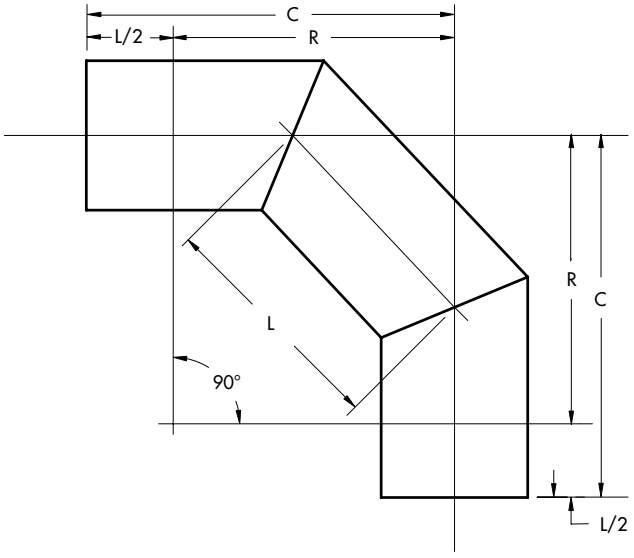
# Dimensions

| Dimensions for 4 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 10.14 | 19.86 | 15.28 |
| 5" IPS | 10.28 | 20.20 | 15.55 |
| 6" IPS | 10.42 | 20.53 | 15.81 |
| 8" IPS | 10.69 | 21.17 | 16.31 |
| 10" IPS | 10.98 | 21.84 | 16.84 |
| 12" IPS | 11.74 | 23.66 | 18.28 |



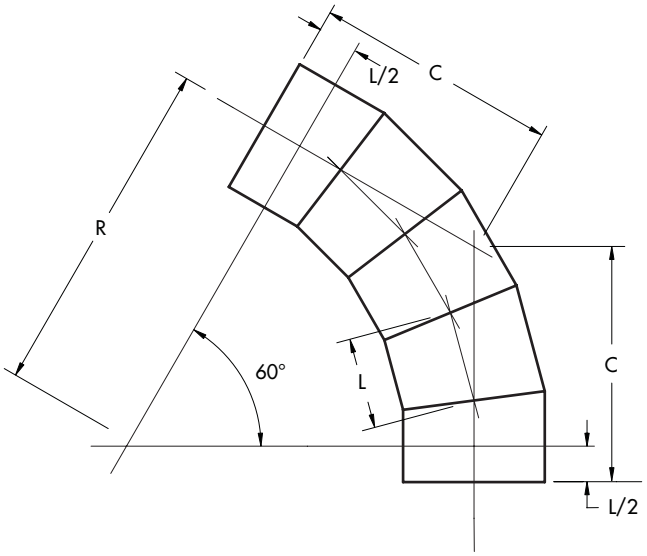
CD00701-3-01-06

| Dimensions for 3 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 22 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 10.51 | 15.11 | 10.34 |
| 5" IPS | 10.74 | 15.48 | 10.60 |
| 6" IPS | 10.95 | 15.86 | 10.87 |
| 8" IPS | 11.37 | 16.57 | 11.37 |
| 10" IPS | 11.81 | 17.32 | 11.90 |
| 12" IPS | 12.72 | 18.88 | 13.00 |



CD00702-3-01-06

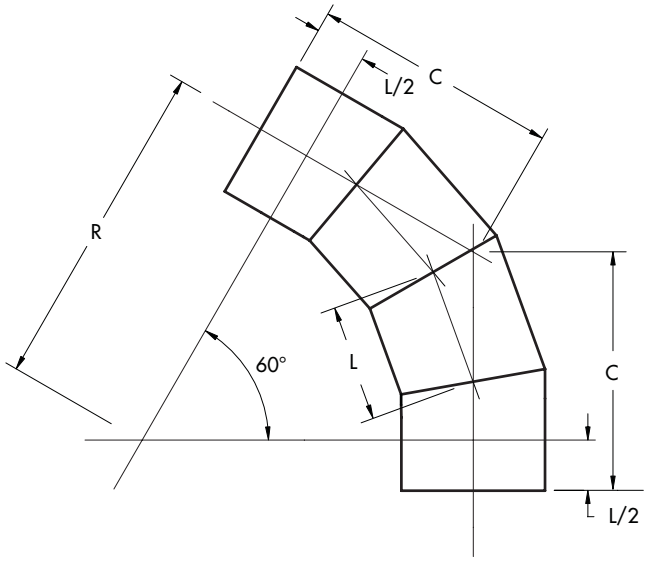
| Dimensions for 5 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.80 | 21.64 | 29.83 |
| 5" IPS | 9.88 | 21.83 | 30.10 |
| 6" IPS | 9.94 | 22.01 | 30.36 |
| 8" IPS | 10.08 | 22.37 | 30.86 |
| 10" IPS | 10.22 | 22.75 | 31.39 |
| 12" IPS | 10.85 | 24.45 | 33.79 |



CD00697-3-01-06

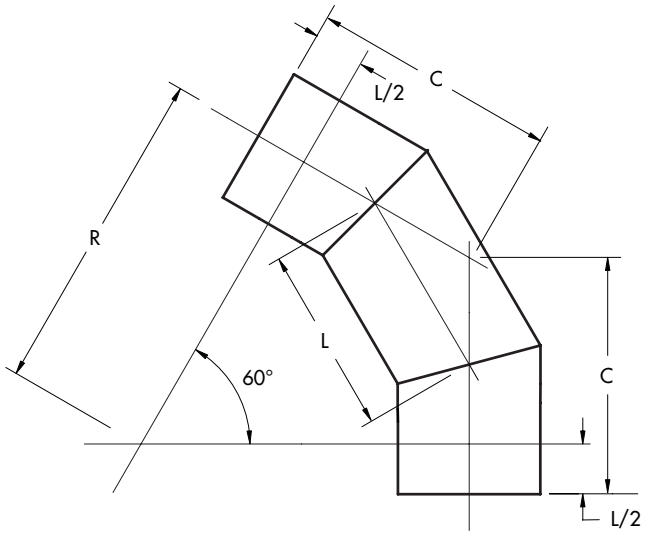
# Dimensions

| Dimensions for 4 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 10 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.91 | 17.50 | 22.58 |
| 5" IPS | 10.01 | 17.70 | 22.84 |
| 6" IPS | 10.10 | 17.90 | 23.11 |
| 8" IPS | 10.28 | 18.28 | 23.61 |
| 10" IPS | 10.46 | 18.68 | 24.14 |
| 12" IPS | 11.14 | 20.13 | 26.06 |



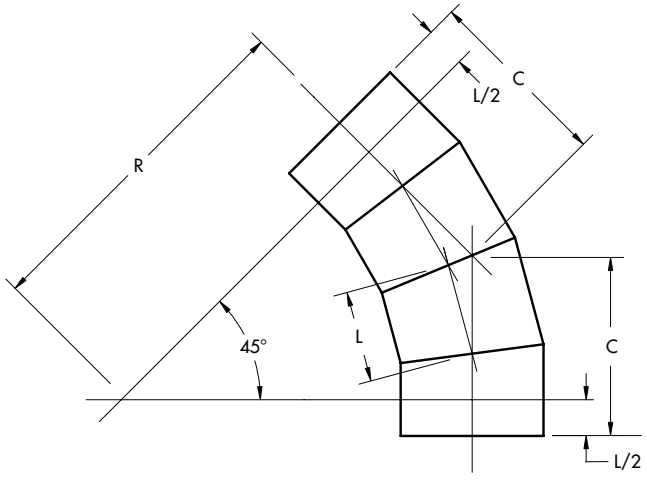
CD005696-10-12-05

| Dimensions for 3 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 10.14 | 13.40 | 15.28 |
| 5" IPS | 10.28 | 13.63 | 15.55 |
| 6" IPS | 10.42 | 13.85 | 15.81 |
| 8" IPS | 10.69 | 14.27 | 15.31 |
| 10" IPS | 10.98 | 14.72 | 16.84 |
| 12" IPS | 11.74 | 15.94 | 18.28 |



CD00698-10-12-05

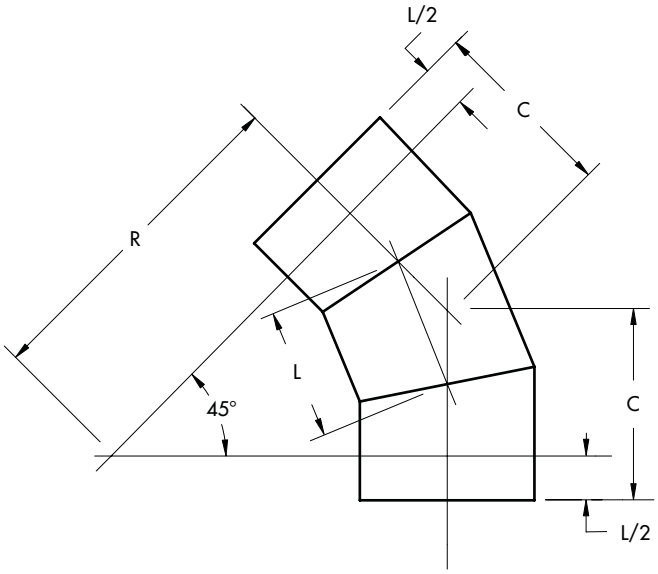
| Dimensions for 4 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.80 | 16.77 | 29.83 |
| 5" IPS | 9.88 | 16.92 | 30.10 |
| 6" IPS | 9.94 | 17.06 | 30.36 |
| 8" IPS | 10.08 | 17.33 | 30.86 |
| 10" IPS | 10.22 | 17.62 | 31.39 |
| 12" IPS | 10.85 | 18.93 | 33.79 |



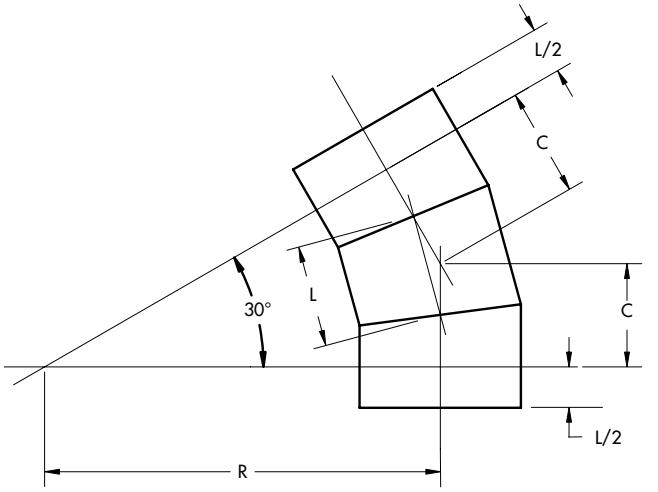
CD00693-10-12-05

# Dimensions

| Dimensions for 3 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.97 | 12.84 | 20.15 |
| 5" IPS | 10.07 | 13.01 | 20.42 |
| 6" IPS | 10.18 | 13.17 | 20.68 |
| 8" IPS | 10.38 | 13.48 | 21.18 |
| 10" IPS | 10.59 | 13.80 | 21.72 |
| 12" IPS | 11.29 | 14.88 | 23.47 |




| Dimensions for 3 segment 30 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" IPS | 9.80 | 12.41 | 29.83 |
| 5" IPS | 9.88 | 12.51 | 30.10 |
| 6" IPS | 9.94 | 12.62 | 30.36 |
| 8" IPS | 10.08 | 12.82 | 30.86 |
| 10" IPS | 10.22 | 13.03 | 31.39 |
| 12" IPS | 10.85 | 13.99 | 33.79 |



## Fabricated Elbow - Finished Imperial Dimensions made with the 250mm Fitting Machine (For DIPS Pipe Sizes)

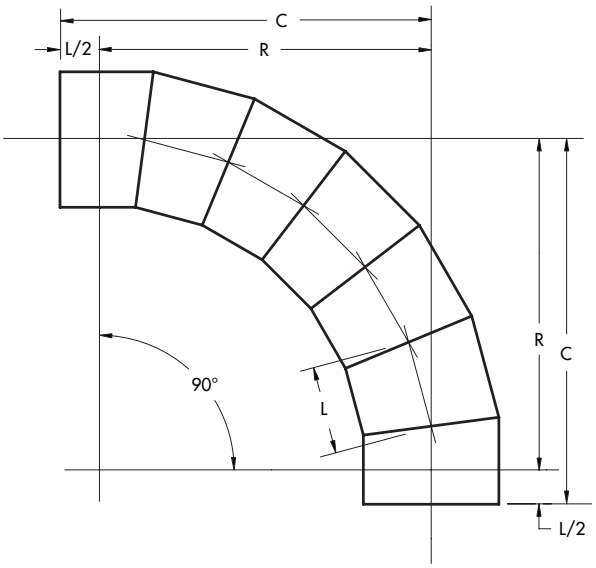
L = Center line cut length of pipe segment (allows for 1/2" of face-off per side, melt, and roll back)

C = Elbow length from cL to face

R = Elbow radius

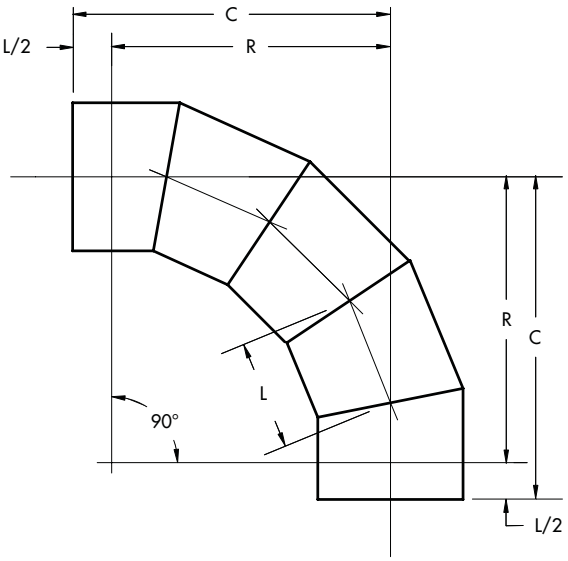
**All Lengths in inches**

| Dimensions for 7 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 9.82 | 34.33 | 29.91 |
| 6" DIPS | 9.96 | 34.93 | 30.43 |
| 8" DIPS | 10.10 | 35.54 | 30.97 |
| 10" DIPS | 10.24 | 36.11 | 31.48 |



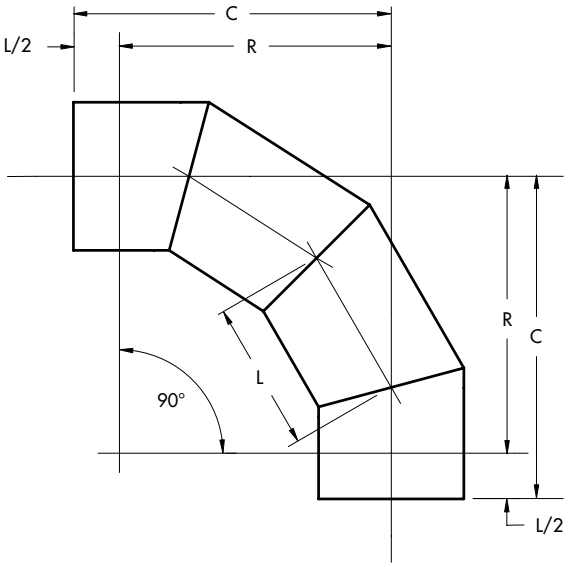

CD00699-3-01-06

| Dimensions for 5 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 10.00 | 24.74 | 20.23 |
| 6" DIPS | 10.21 | 25.37 | 20.75 |
| 8" DIPS | 10.42 | 26.01 | 21.29 |
| 10" DIPS | 10.62 | 26.63 | 21.80 |



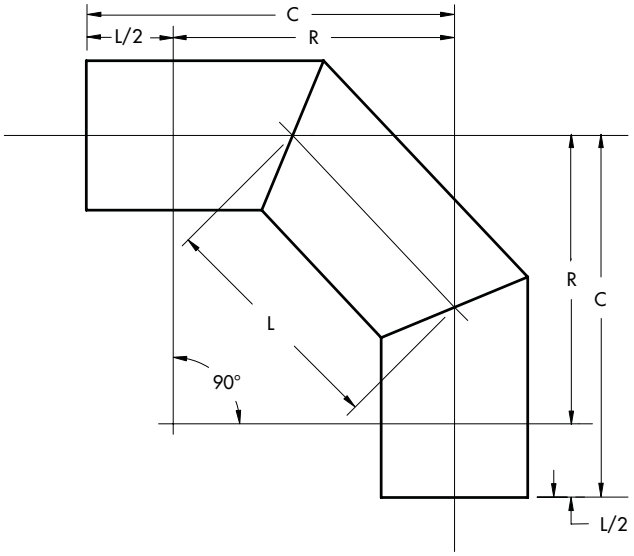

CD00700-3-01-06

| Dimensions for 4 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 10.18 | 19.96 | 15.36 |
| 6" DIPS | 10.46 | 20.62 | 15.88 |
| 8" DIPS | 10.75 | 21.31 | 16.42 |
| 10" DIPS | 11.02 | 21.95 | 16.93 |



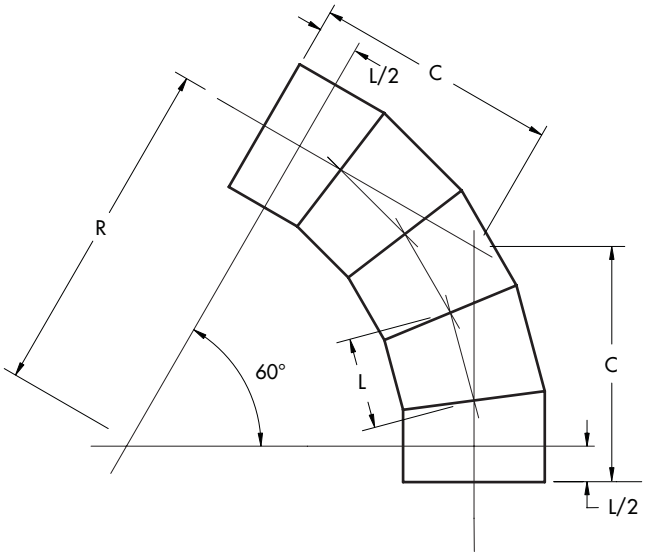

CD00701-3-01-06

| Dimensions for 3 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 22 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 10.58 | 15.22 | 10.41 |
| 6" DIPS | 11.01 | 15.96 | 10.94 |
| 8" DIPS | 11.46 | 16.72 | 11.48 |
| 10" DIPS | 11.88 | 17.44 | 11.99 |




CD00702-3-01-06

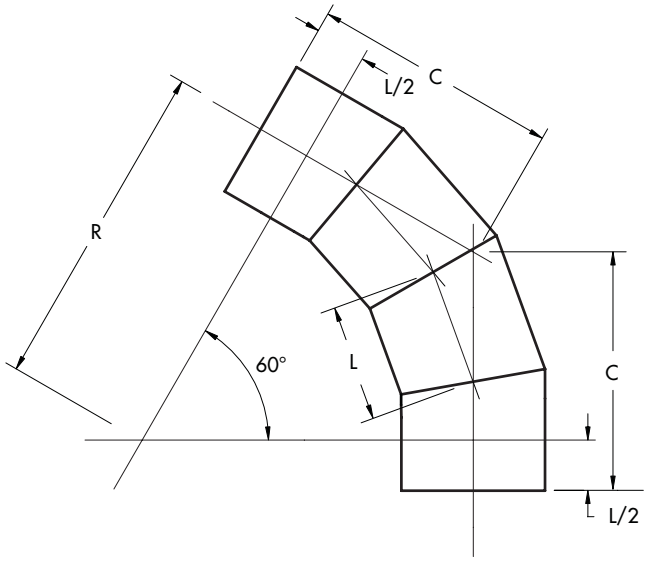
| Dimensions for 5 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 9.82 | 21.69 | 29.91 |
| 6" DIPS | 9.96 | 22.06 | 30.43 |
| 8" DIPS | 10.10 | 22.45 | 30.97 |
| 10" DIPS | 10.24 | 22.81 | 31.48 |




CD00697-3-01-06

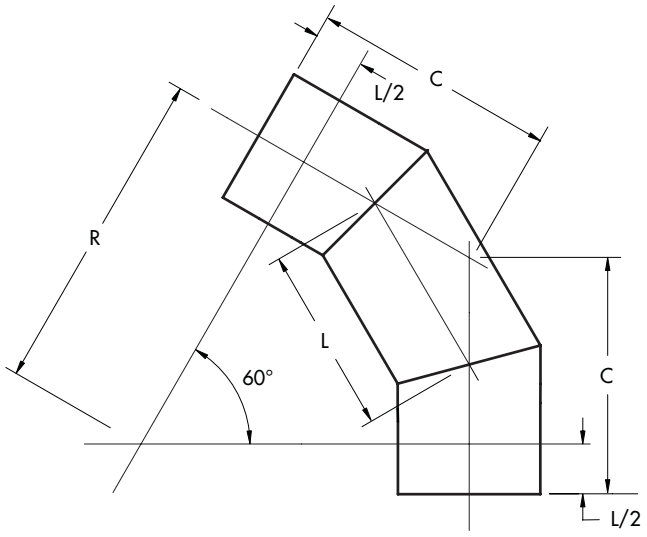
# Dimensions

| Dimensions for 4 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 10 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 9.94 | 17.56 | 22.65 |
| 6" DIPS | 10.12 | 17.96 | 23.18 |
| 8" DIPS | 10.31 | 18.36 | 23.72 |
| 10" DIPS | 10.49 | 18.75 | 24.23 |



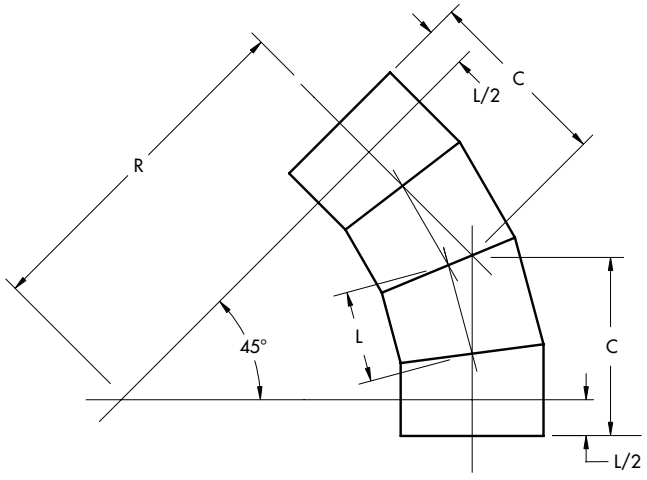
CD005696-10-12-05

| Dimensions for 3 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 10.18 | 13.47 | 15.36 |
| 6" DIPS | 10.46 | 13.91 | 15.88 |
| 8" DIPS | 10.75 | 14.37 | 16.42 |
| 10" DIPS | 11.02 | 14.80 | 16.93 |



CD00698-10-12-05

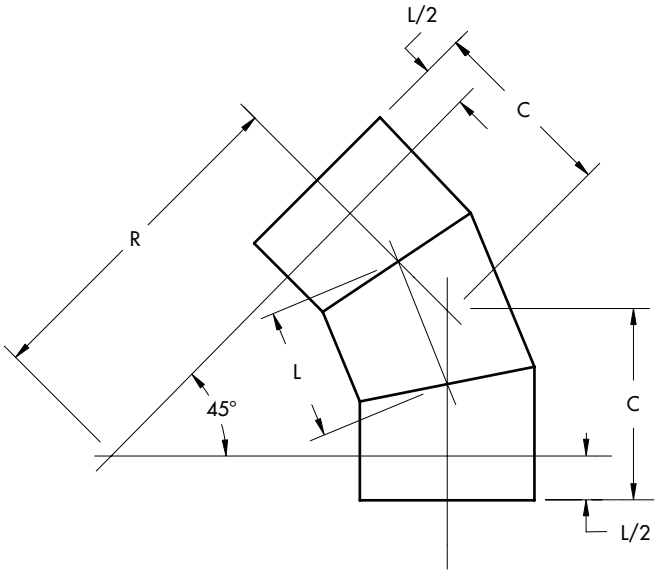
| Dimensions for 4 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 9.82 | 16.81 | 29.91 |
| 6" DIPS | 9.96 | 17.10 | 30.43 |
| 8" DIPS | 10.10 | 17.39 | 30.97 |
| 10" DIPS | 10.24 | 17.67 | 31.48 |



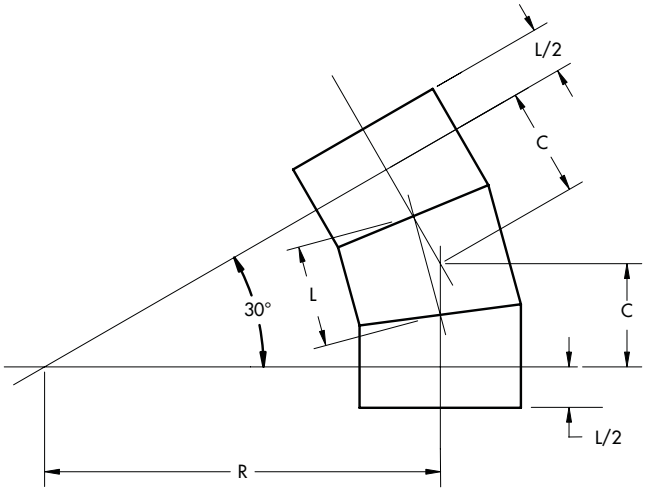
CD00693-10-12-05

# Dimensions

| Dimensions for 3 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 10.00 | 12.89 | 20.23 |
| 6" DIPS | 10.21 | 13.21 | 20.75 |
| 8" DIPS | 10.42 | 13.54 | 21.29 |
| 10" DIPS | 10.62 | 13.86 | 21.80 |




| Dimensions for 3 segment 30 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 4" DIPS | 9.82 | 12.44 | 29.91 |
| 6" DIPS | 9.96 | 12.65 | 30.43 |
| 8" DIPS | 10.10 | 12.86 | 30.97 |
| 10" DIPS | 10.24 | 13.07 | 31.48 |



## Fabricated Elbow - Finished Metric Dimensions made with the 250mm Fitting Machine (Pipe Sizes in mm)

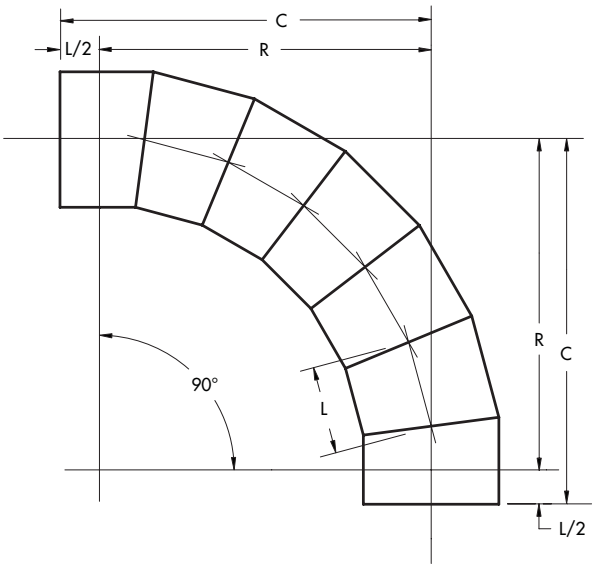
L = Center line cut length of pipe segment (allows for 1/2" of face-off per side, melt, and roll back)

C = Elbow length from cL to face

R = Elbow radius

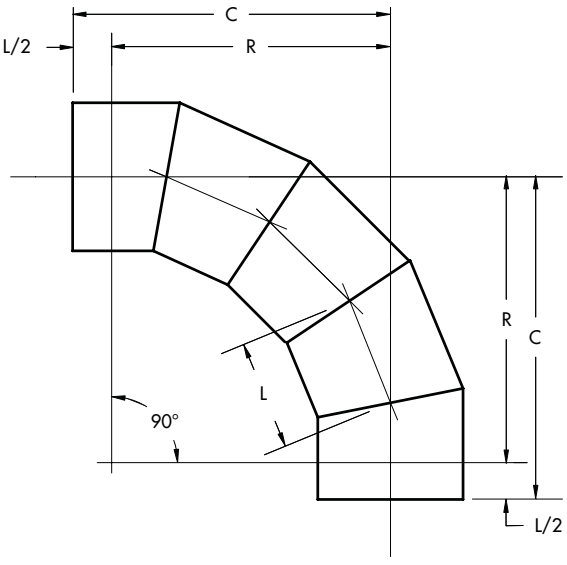
**All Lengths in cm**

| Dimensions for 7 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 24.9 | 86.9 | 75.7 |
| 125 mm | 25.0 | 87.3 | 76.0 |
| 140 mm | 25.1 | 87.7 | 76.4 |
| 160 mm | 25.2 | 88.3 | 76.9 |
| 180 mm | 25.3 | 88.8 | 77.4 |
| 200 mm | 25.5 | 89.4 | 77.9 |
| 225 mm | 25.6 | 90.1 | 78.5 |
| 250 mm | 25.8 | 90.8 | 79.2 |
| 280 mm | 26.0 | 91.7 | 79.9 |
| 315 mm | 26.2 | 92.7 | 80.8 |
| 12" IPS | 27.6 | 98.4 | 85.8 |




CD00699-3-01-06

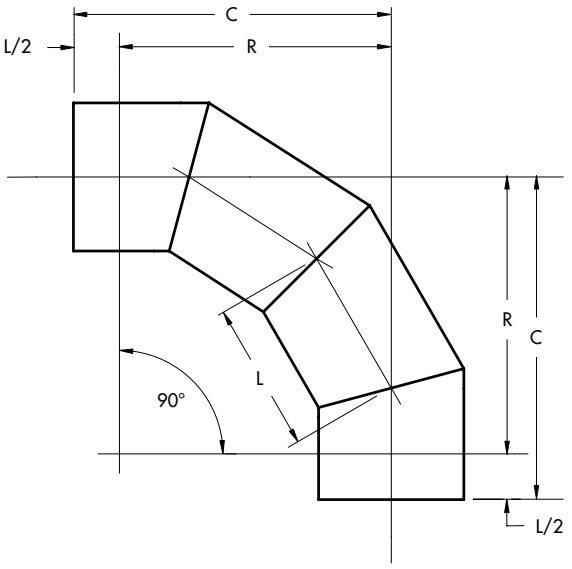
| Dimensions for 5 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 25.3 | 62.5 | 51.1 |
| 125 mm | 25.4 | 62.9 | 51.5 |
| 140 mm | 25.6 | 63.4 | 51.8 |
| 160 mm | 25.8 | 64.0 | 52.3 |
| 180 mm | 26.0 | 64.6 | 52.8 |
| 200 mm | 26.2 | 65.2 | 53.3 |
| 225 mm | 26.4 | 65.9 | 54.0 |
| 250 mm | 26.7 | 66.7 | 54.6 |
| 280 mm | 27.0 | 67.6 | 55.3 |
| 315 mm | 27.3 | 68.6 | 56.2 |
| 12" IPS | 28.7 | 72.7 | 59.6 |




CD00700-3-01-06

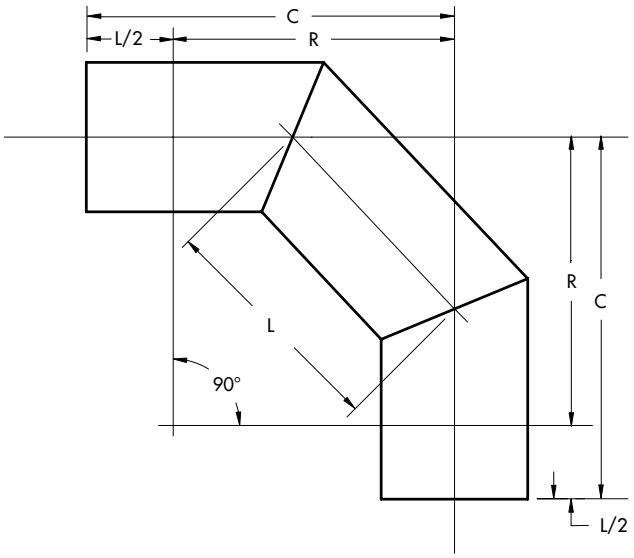
# Dimensions

| Dimensions for 4 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 25.7 | 50.3 | 38.7 |
| 125 mm | 25.9 | 50.8 | 39.1 |
| 140 mm | 26.1 | 51.3 | 39.5 |
| 160 mm | 26.4 | 51.9 | 40.0 |
| 180 mm | 26.6 | 52.5 | 40.5 |
| 200 mm | 26.9 | 53.2 | 41.0 |
| 225 mm | 27.2 | 54.0 | 41.6 |
| 250 mm | 27.6 | 54.7 | 42.2 |
| 280 mm | 28.0 | 55.7 | 43.0 |
| 315 mm | 28.4 | 56.8 | 43.8 |
| 12" IPS | 29.8 | 60.1 | 46.4 |




CD00701-3-01-06

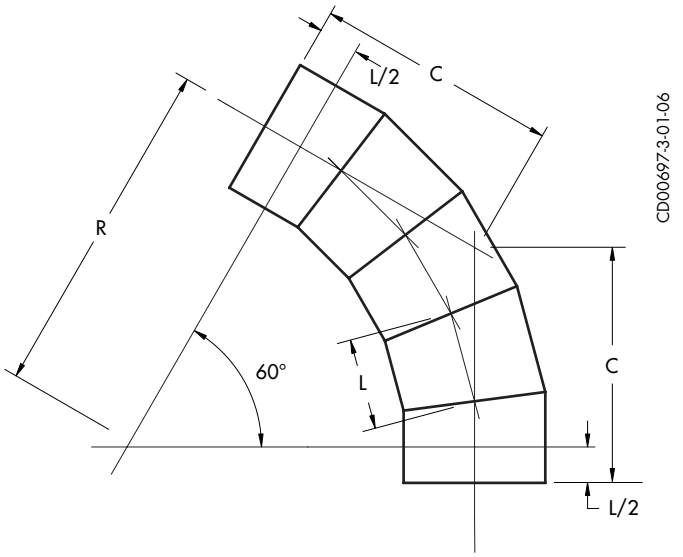
| Dimensions for 3 segment 90 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 22 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 26.6 | 38.2 | 26.2 |
| 125 mm | 26.9 | 38.8 | 26.5 |
| 140 mm | 27.2 | 39.3 | 26.9 |
| 160 mm | 27.7 | 40.0 | 27.4 |
| 180 mm | 28.1 | 40.7 | 27.9 |
| 200 mm | 28.5 | 41.4 | 28.4 |
| 225 mm | 29.0 | 42.3 | 29.0 |
| 250 mm | 29.5 | 43.2 | 29.7 |
| 280 mm | 30.1 | 44.2 | 30.4 |
| 315 mm | 30.9 | 45.5 | 31.3 |
| 12" IPS | 32.3 | 48.0 | 33.0 |



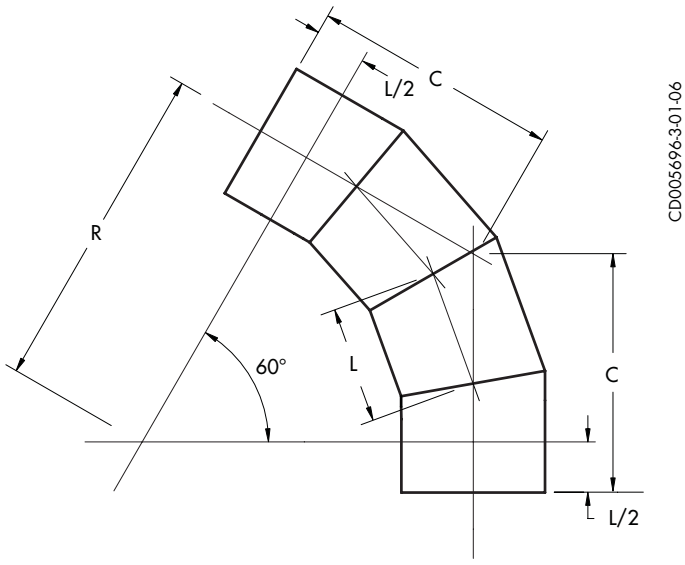

CD00702-3-01-06

# Dimensions

| Dimensions for 5 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 24.9 | 54.9 | 75.7 |
| 125 mm | 25.0 | 55.2 | 76.0 |
| 140 mm | 25.1 | 55.4 | 76.4 |
| 160 mm | 25.2 | 55.8 | 76.9 |
| 180 mm | 25.3 | 56.1 | 77.4 |
| 200 mm | 25.5 | 56.5 | 77.9 |
| 225 mm | 25.6 | 56.9 | 78.5 |
| 250 mm | 25.8 | 57.4 | 79.2 |
| 280 mm | 26.0 | 57.9 | 79.9 |
| 315 mm | 26.2 | 58.5 | 80.8 |
| 12" IPS | 27.6 | 62.1 | 85.8 |

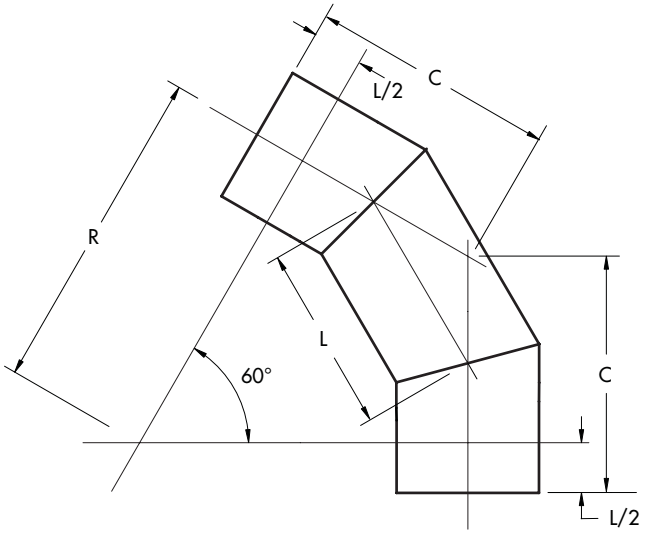



| Dimensions for 4 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 10 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 25.1 | 44.4 | 57.2 |
| 125 mm | 25.3 | 44.7 | 57.6 |
| 140 mm | 25.4 | 44.9 | 58.0 |
| 160 mm | 25.6 | 45.3 | 58.5 |
| 180 mm | 25.8 | 45.7 | 59.0 |
| 200 mm | 25.9 | 46.1 | 59.5 |
| 225 mm | 26.2 | 46.5 | 60.1 |
| 250 mm | 26.4 | 47.0 | 60.7 |
| 280 mm | 26.6 | 47.6 | 61.5 |
| 315 mm | 26.9 | 48.2 | 62.4 |
| 12" IPS | 28.3 | 51.1 | 66.2 |



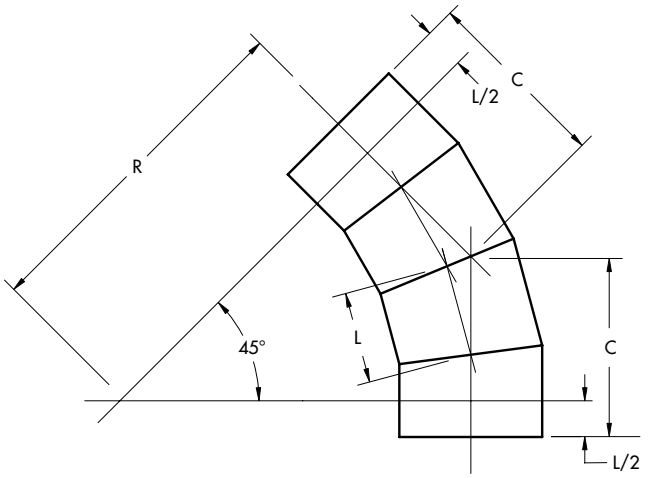
# Dimensions

| Dimensions for 3 segment 60 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 15 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 25.7 | 34.0 | 38.7 |
| 125 mm | 25.9 | 34.3 | 39.1 |
| 140 mm | 26.1 | 34.6 | 39.5 |
| 160 mm | 26.4 | 35.0 | 40.0 |
| 180 mm | 26.6 | 35.4 | 40.5 |
| 200 mm | 26.9 | 35.9 | 41.0 |
| 225 mm | 27.2 | 36.4 | 41.6 |
| 250 mm | 27.6 | 36.9 | 42.2 |
| 280 mm | 28.0 | 37.5 | 43.0 |
| 315 mm | 28.4 | 38.3 | 43.8 |
| 12" IPS | 29.8 | 40.5 | 46.4 |



CD00698-3-01-06

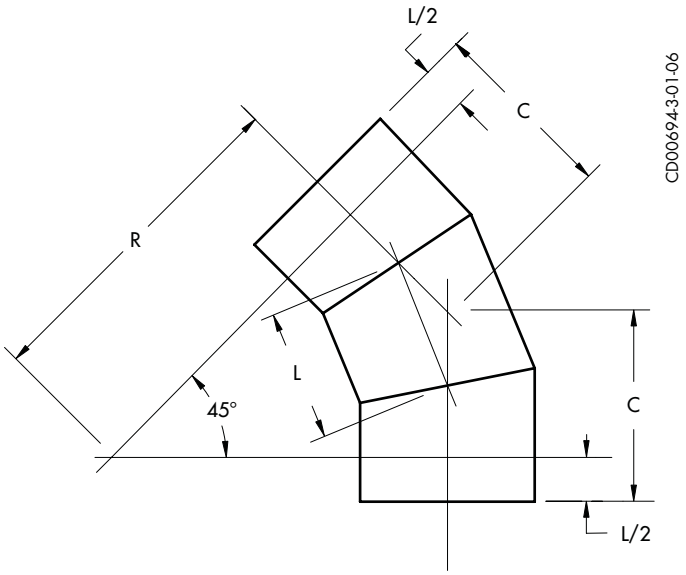
| Dimensions for 4 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 24.9 | 42.5 | 75.7 |
| 125 mm | 25.0 | 42.7 | 76.0 |
| 140 mm | 25.1 | 43.0 | 76.4 |
| 160 mm | 25.2 | 43.2 | 76.9 |
| 180 mm | 25.3 | 43.5 | 77.4 |
| 200 mm | 25.5 | 43.8 | 77.9 |
| 225 mm | 25.6 | 44.1 | 78.5 |
| 250 mm | 25.8 | 44.5 | 79.2 |
| 280 mm | 26.0 | 44.9 | 79.9 |
| 315 mm | 26.2 | 45.3 | 80.8 |
| 12" IPS | 27.6 | 48.1 | 85.8 |



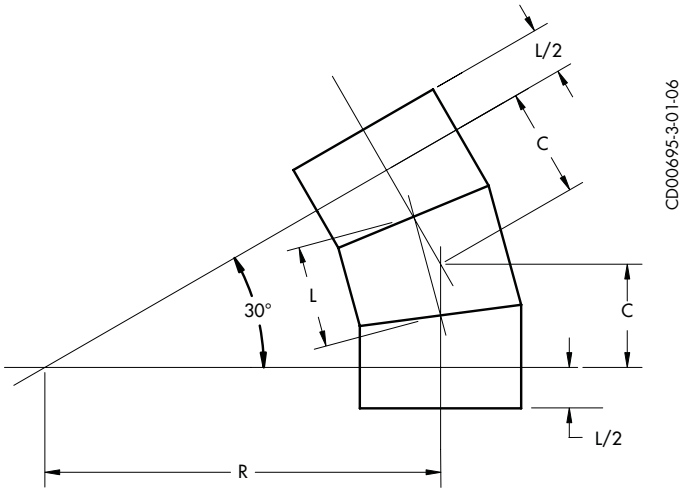
CD00693-3-01-06

# Dimensions

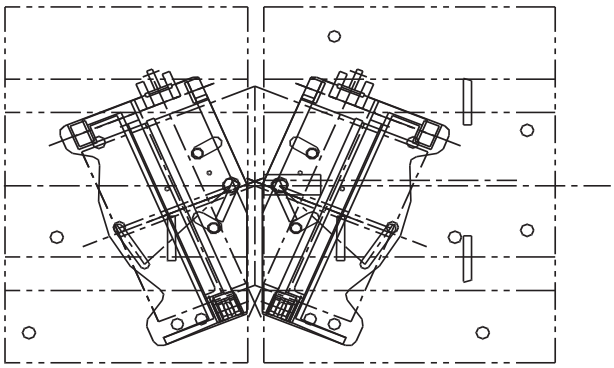
| Dimensions for 3 segment 45 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 11 1/4 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 25.3 | 32.6 | 51.1 |
| 125 mm | 25.4 | 32.8 | 51.5 |
| 140 mm | 25.6 | 33.0 | 51.8 |
| 160 mm | 25.8 | 33.3 | 52.3 |
| 180 mm | 26.0 | 33.6 | 52.8 |
| 200 mm | 26.2 | 33.9 | 53.3 |
| 225 mm | 26.4 | 34.3 | 54.0 |
| 250 mm | 26.7 | 34.7 | 54.6 |
| 280 mm | 27.0 | 35.2 | 55.3 |
| 315 mm | 27.3 | 35.7 | 56.2 |
| 12" IPS | 28.7 | 37.8 | 59.6 |



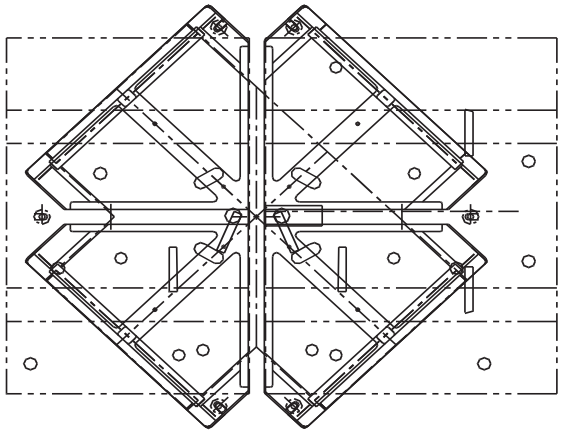

| Dimensions for 3 segment 30 degree elbows fabricated with the 250mm Fabricated fitting unit | | | |
|---|---|---|---|
| Miter angle = 7 1/2 degrees | | | |
| Pipe Size | L | C | R |
| 110 mm | 24.9 | 31.5 | 75.7 |
| 125 mm | 25.0 | 31.6 | 76.0 |
| 140 mm | 25.1 | 31.8 | 76.4 |
| 160 mm | 25.2 | 32.0 | 76.9 |
| 180 mm | 25.3 | 32.2 | 77.4 |
| 200 mm | 25.5 | 32.4 | 77.9 |
| 225 mm | 25.6 | 32.6 | 78.5 |
| 250 mm | 25.8 | 32.9 | 79.2 |
| 280 mm | 26.0 | 33.2 | 79.9 |
| 315 mm | 26.2 | 33.5 | 80.8 |
| 12" IPS | 27.6 | 35.5 | 85.8 |



# Fitting Fabrication Procedure

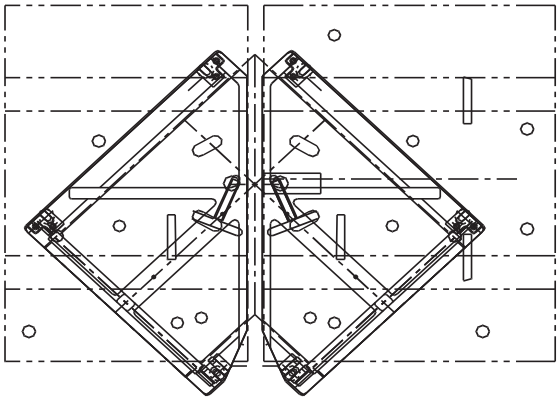


MITER JAWS

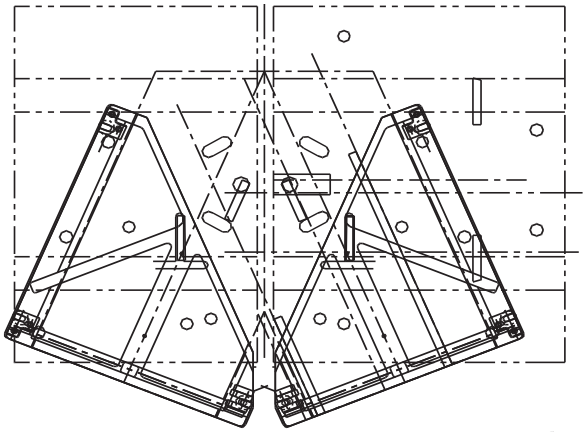


CROSS – THIRD JOINT

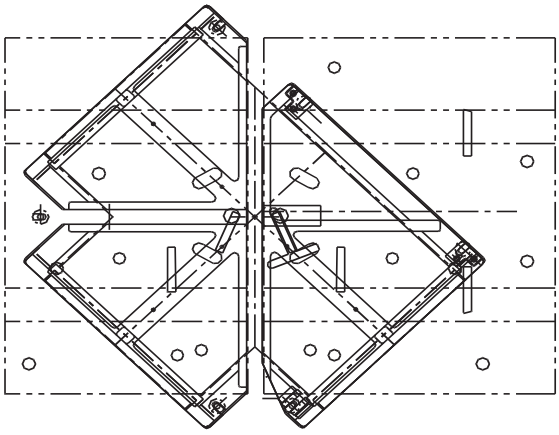
CD00317-8-2-96



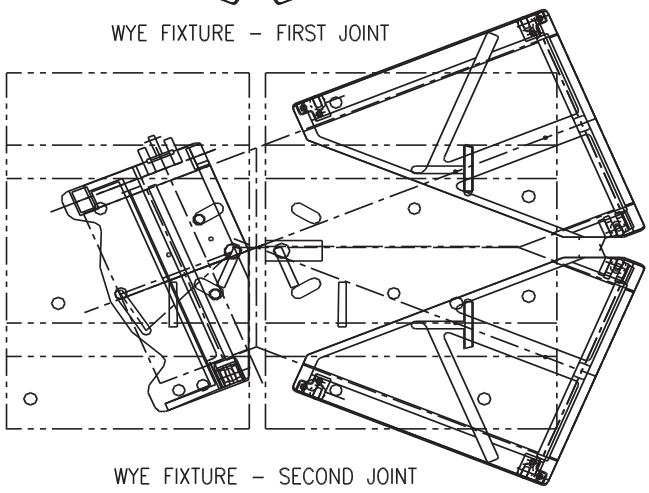
TEE FIXTURE – FIRST JOINT



WYE FIXTURE – FIRST JOINT



TEE FIXTURE – SECOND JOINT



WYE FIXTURE – SECOND JOINT

# Carriage Pressure Formula

## Presetting the Carriage Pressure Using the Pressure Reducing Valves on the Console

To obtain the required carriage pressure setting for heating or fusing, use the formula below.

$$\frac{\text{Interfacial area X Recommended interfacial pressure}}{\text{TEPA}} \textbf{ + Carriage drag pressure (30 psi/2.1 BAR) = Gauge pressure}$$

Use the attached table to find the interfacial area for common pipe sizes.

**You must select the correct TEPA based on the cylinder arrangement you decide to use.**

For lower cylinder only: 2.75 $in^2$ or 1774 $mm^2$

For upper and lower cylinder: 4.21 $in^2$ or 2716 $mm^2$

Always use the pipe manufacturer's recommended interfacial pressure.

### For Example:

For 225 DR 11 pipe to be fused on a 15 degree miter angle at 1.5 BAR (using the lower cylinder only)

$$\frac{13607\ mm^2 \times 1.5\ BAR}{1774\ mm^2} + 2.1\ BAR = \textbf{13.6 BAR}$$

Therefore, in the fusion mode, you would set the carriage to **13.6 BAR**.

For 12" SDR 11 pipe to be fused on a 15 degree miter angle at 75 psi (using upper and lower cylinders)

$$\frac{43.7\ in^2 \times 75\ psi}{4.21\ in^2} + 30\ psi = \textbf{808 psi}$$

Therefore, in the fusion mode, you would set the carriage to **808 psi**.

### Calculating Interfacial Areas not Given in the Tables

**For first wye joint:**

If the pipe you are using is not in the table, use the formula below to find the interfacial area:

Interfacial area = $[(OD^2\text{-}ID^2) \times .785] / [2 \times \cos(\text{Miter angle})]$

Where:

OD = outside diameter of the pipe

ID = inside diameter of the pipe

Miter Angle = Miter angle as set on the table (half the joint angle)

**For second wye joint:**

Calculate using the formula for Ells and Tees, but use a miter angle of 22.5°

# Carriage Pressure Formula

## For Example:

If your pipe has an OD of **225** mm and an ID of **184** mm and you want to make the first wye at 67.5 degrees

$$\frac{0.785[(225\text{ mm})^2 - (184\text{ mm})^2]}{2 \times \cos(67.5°)} = 17{,}199\text{ mm}^2$$

You would then enter **17,199** square millimeters and the recommended interfacial pressure in the equation above to find the required carriage force.

If your pipe has an OD of **12.75** inches and an ID of **10.43** inches and you want to make the first wye at 67.5 degrees

$$\frac{0.785[(12.75\text{ in})^2 - (10.43\text{ in})^2]}{2 \times \cos(67.5°)} = 55.16\text{ in}^2$$

You would then enter **55.16** square inches and the recommended interfacial pressure in the equation above to find the required carriage force.

**2nd Wye:**

If your pipe has an OD of **225** mm and an ID of **184** mm and you want to make the second wye at 22.5 degrees

$$\frac{0.785[(225\text{ mm})^2 - (184\text{ mm})^2]}{\cos(22.5°)} = 14{,}248\text{ mm}^2$$

You would then enter **14,248** square millimeters and the recommended interfacial pressure in the equation above to find the required carriage force.

If your pipe has an OD of **12.75** inches and an ID of **10.43** inches and you want to make the second wye at 22.5 degrees

$$\frac{0.785[(12.75\text{ in})^2 - (10.43\text{ in})^2]}{\cos(22.5°)} = 45.69\text{ in}^2$$

You would then enter **45.69** square inches and the recommended interfacial pressure in the equation above to find the required carriage force.

## For Ells and Tees

If the pipe you are using is not in the table, use the formula below to find the interfacial area:

Interfacial area = $[(OD^2\text{-}ID^2) \times .785] / \cos$ (miter angle)

Where:

OD = outside diameter of the pipe

ID = inside diameter of the pipe

Miter Angle = Miter angle as set on the table (half of the joint angle)

## For Example:

If your pipe has an OD of **225** mm and an ID of **184** mm and you want to make a tee at 45 degrees

$$\frac{0.785[(225\text{ mm})^2 - (184\text{ mm})^2]}{\cos(45°)} = 18{,}587\text{ mm}^2$$

You would then enter **18.587** square millimeters and the recommended interfacial pressure in the equation above to find the required carriage force.

If your pipe has an OD of **12.75** inches and an ID of **10.43** inches and you want to make a tee at 45 degrees

$$\frac{0.785[(12.75\text{ in})^2 - (10.43\text{ in})^2]}{\cos(45°)} = 59.69\text{ in}^2$$

You would then enter **59.69** square inches and the recommended interfacial pressure in the equation above to find the required carriage force. TX02603-4-17-06

# Pipe Interfacial Area in $in^2$

## Pipe Interface Area in $in^2$ for IPS Pipe Sizes- 250mm FAB. Fitting Unit

4 in IPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 0.64 | 7.79 | 7.86 | 7.91 | 7.94 | 8.06 | 8.43 | 11.02 | 10.18 |
| 9 | 0.50 | 6.28 | 6.34 | 6.38 | 6.41 | 6.50 | 6.80 | 8.89 | 8.21 |
| 11 | 0.41 | 5.26 | 5.30 | 5.34 | 5.36 | 5.44 | 5.69 | 7.44 | 6.87 |
| 17 | 0.26 | 3.52 | 3.55 | 3.58 | 3.59 | 3.65 | 3.81 | 4.98 | 4.60 |
| 19 | 0.24 | 3.17 | 3.20 | 3.22 | 3.23 | 3.28 | 3.43 | 4.49 | 4.14 |
| 21 | 0.21 | 2.89 | 2.91 | 2.93 | 2.94 | 2.99 | 3.12 | 4.08 | 3.77 |
| 26 | 0.17 | 2.35 | 2.37 | 2.39 | 2.40 | 2.44 | 2.55 | 3.33 | 3.07 |
| 32.5 | 0.14 | 1.90 | 1.91 | 1.93 | 1.93 | 1.96 | 2.05 | 2.68 | 2.48 |

5 in IPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 0.80 | 11.92 | 12.02 | 12.10 | 12.15 | 12.34 | 12.90 | 16.85 | 15.57 |
| 9 | 0.62 | 9.61 | 9.70 | 9.76 | 9.80 | 9.95 | 10.40 | 13.59 | 12.56 |
| 11 | 0.51 | 8.04 | 8.11 | 8.17 | 8.20 | 8.33 | 8.71 | 11.38 | 10.51 |
| 17 | 0.33 | 5.39 | 5.43 | 5.47 | 5.49 | 5.58 | 5.83 | 7.62 | 7.04 |
| 19 | 0.29 | 4.85 | 4.89 | 4.93 | 4.95 | 5.02 | 5.25 | 6.86 | 6.34 |
| 21 | 0.27 | 4.41 | 4.45 | 4.48 | 4.50 | 4.57 | 4.78 | 6.24 | 5.77 |
| 26 | 0.21 | 3.60 | 3.63 | 3.65 | 3.67 | 3.73 | 3.90 | 5.09 | 4.70 |
| 32.5 | 0.17 | 2.90 | 2.93 | 2.95 | 2.96 | 3.00 | 3.14 | 4.10 | 3.79 |

6 in IPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 0.95 | 16.88 | 17.02 | 17.14 | 17.21 | 17.47 | 18.27 | 23.87 | 22.05 |
| 9 | 0.74 | 13.61 | 13.73 | 13.82 | 13.88 | 14.09 | 14.74 | 19.25 | 17.79 |
| 11 | 0.60 | 11.39 | 11.49 | 11.57 | 11.62 | 11.79 | 12.33 | 16.11 | 14.88 |
| 17 | 0.39 | 7.63 | 7.70 | 7.75 | 7.78 | 7.90 | 8.26 | 10.79 | 9.97 |
| 19 | 0.35 | 6.87 | 6.93 | 6.98 | 7.01 | 7.12 | 7.44 | 9.72 | 8.98 |
| 21 | 0.32 | 6.25 | 6.31 | 6.35 | 6.37 | 6.47 | 6.77 | 8.84 | 8.17 |
| 26 | 0.25 | 5.10 | 5.14 | 5.18 | 5.20 | 5.28 | 5.52 | 7.21 | 6.66 |
| 32.5 | 0.20 | 4.11 | 4.15 | 4.17 | 4.19 | 4.26 | 4.45 | 5.81 | 5.37 |

8 in IPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 1.23 | 28.62 | 28.86 | 29.06 | 29.18 | 29.63 | 30.97 | 40.47 | 37.39 |
| 9 | 0.96 | 23.08 | 23.28 | 23.44 | 23.53 | 23.90 | 24.98 | 32.64 | 30.16 |
| 11 | 0.78 | 19.31 | 19.48 | 19.61 | 19.69 | 20.00 | 20.91 | 27.31 | 25.24 |
| 17 | 0.51 | 12.94 | 13.05 | 13.14 | 13.19 | 13.40 | 14.00 | 18.30 | 16.91 |
| 19 | 0.45 | 11.65 | 11.75 | 11.83 | 11.88 | 12.06 | 12.61 | 16.48 | 15.23 |
| 21 | 0.41 | 10.60 | 10.69 | 10.76 | 10.81 | 10.97 | 11.47 | 14.99 | 13.85 |
| 26 | 0.33 | 8.64 | 8.72 | 8.78 | 8.81 | 8.95 | 9.36 | 12.22 | 11.29 |
| 32.5 | 0.27 | 6.97 | 7.03 | 7.08 | 7.11 | 7.22 | 7.54 | 9.86 | 9.11 |

# Pipe Interfacial Area in $in^2$

10 in IPS PIPE

| | | MITER ANGLE | | | | | |
|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° |
| 7 | 1.54 | 44.47 | 44.86 | 45.16 | 45.34 | 46.04 | 48.14 |
| 9 | 1.19 | 35.87 | 36.18 | 36.42 | 36.57 | 37.14 | 38.83 |
| 11 | 0.98 | 30.02 | 30.27 | 30.48 | 30.60 | 31.07 | 32.49 |
| 17 | 0.63 | 20.11 | 20.28 | 20.42 | 20.50 | 20.82 | 21.76 |
| 19 | 0.57 | 18.11 | 18.27 | 18.39 | 18.46 | 18.75 | 19.60 |
| 21 | 0.51 | 16.47 | 16.61 | 16.73 | 16.79 | 17.05 | 17.83 |
| 26 | 0.41 | 13.43 | 13.55 | 13.64 | 13.69 | 13.91 | 14.54 |
| 32.5 | 0.33 | 10.83 | 10.92 | 11.00 | 11.04 | 11.21 | 11.72 |

12 in IPS PIPE

| | | MITER ANGLE | | | | | |
|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° |
| 7 | 1.82 | 62.54 | 63.07 | 63.50 | 63.76 | 64.74 | 67.69 |
| 9 | 1.42 | 50.44 | 50.88 | 51.22 | 51.43 | 52.22 | 54.60 |
| 11 | 1.16 | 42.21 | 42.57 | 42.86 | 43.03 | 43.70 | 45.68 |
| 17 | 0.75 | 28.27 | 28.52 | 28.71 | 28.83 | 29.27 | 30.60 |
| 19 | 0.67 | 25.46 | 25.68 | 25.86 | 25.96 | 26.36 | 27.56 |
| 21 | 0.61 | 23.16 | 23.36 | 23.52 | 23.61 | 23.98 | 25.07 |
| 26 | 0.49 | 18.89 | 19.05 | 19.18 | 19.26 | 19.55 | 20.44 |
| 32.5 | 0.39 | 15.23 | 15.36 | 15.47 | 15.53 | 15.77 | 16.49 |

## Pipe Interface Area in $in^2$ for DIPS Pipe Sizes- 250mm FAB. Fitting Unit

4 in DIPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 0.69 | 8.89 | 8.96 | 9.02 | 9.06 | 9.20 | 9.62 | 12.57 | 11.61 |
| 9 | 0.53 | 7.17 | 7.23 | 7.28 | 7.31 | 7.42 | 7.76 | 10.14 | 9.36 |
| 11 | 0.44 | 6.00 | 6.05 | 6.09 | 6.11 | 6.21 | 6.49 | 8.48 | 7.84 |
| 17 | 0.28 | 4.02 | 4.05 | 4.08 | 4.10 | 4.16 | 4.35 | 5.68 | 5.25 |
| 19 | 0.25 | 3.62 | 3.65 | 3.67 | 3.69 | 3.75 | 3.92 | 5.12 | 4.73 |
| 21 | 0.23 | 3.29 | 3.32 | 3.34 | 3.36 | 3.41 | 3.56 | 4.65 | 4.30 |
| 26 | 0.18 | 2.68 | 2.71 | 2.72 | 2.74 | 2.78 | 2.90 | 3.80 | 3.51 |
| 32.5 | 0.15 | 2.16 | 2.18 | 2.20 | 2.21 | 2.24 | 2.34 | 3.06 | 2.83 |

6 in DIPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 0.99 | 18.34 | 18.50 | 18.62 | 18.70 | 18.99 | 19.85 | 25.94 | 23.96 |
| 9 | 0.77 | 14.79 | 14.92 | 15.02 | 15.08 | 15.32 | 16.01 | 20.92 | 19.33 |
| 11 | 0.63 | 12.38 | 12.49 | 12.57 | 12.62 | 12.82 | 13.40 | 17.51 | 16.17 |
| 17 | 0.41 | 8.29 | 8.36 | 8.42 | 8.46 | 8.59 | 8.98 | 11.73 | 10.84 |
| 19 | 0.36 | 7.47 | 7.53 | 7.58 | 7.61 | 7.73 | 8.08 | 10.56 | 9.76 |
| 21 | 0.33 | 6.79 | 6.85 | 6.90 | 6.93 | 7.03 | 7.35 | 9.61 | 8.88 |
| 26 | 0.27 | 5.54 | 5.59 | 5.62 | 5.65 | 5.73 | 6.00 | 7.83 | 7.24 |
| 32.5 | 0.21 | 4.47 | 4.51 | 4.54 | 4.55 | 4.62 | 4.84 | 6.32 | 5.84 |

8 in DIPS PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 1.29 | 31.56 | 31.83 | 32.05 | 32.18 | 32.68 | 34.16 | 44.64 | 41.24 |
| 9 | 1.01 | 25.46 | 25.68 | 25.85 | 25.96 | 26.36 | 27.56 | 36.00 | 33.26 |
| 11 | 0.82 | 21.30 | 21.49 | 21.63 | 21.72 | 22.05 | 23.06 | 30.13 | 27.83 |
| 17 | 0.53 | 14.27 | 14.39 | 14.49 | 14.55 | 14.77 | 15.45 | 20.18 | 18.65 |
| 19 | 0.48 | 12.85 | 12.96 | 13.05 | 13.10 | 13.31 | 13.91 | 18.18 | 16.79 |
| 21 | 0.43 | 11.69 | 11.79 | 11.87 | 11.92 | 12.10 | 12.65 | 16.53 | 15.27 |
| 26 | 0.35 | 9.53 | 9.61 | 9.68 | 9.72 | 9.87 | 10.32 | 13.48 | 12.45 |
| 32.5 | 0.28 | 7.69 | 7.75 | 7.81 | 7.84 | 7.96 | 8.32 | 10.87 | 10.04 |

10 in DIPS PIPE

| | | MITER ANGLE | | | | | |
|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° |
| 7 | 1.59 | 47.41 | 47.82 | 48.15 | 48.34 | 49.09 | 51.32 |
| 9 | 1.23 | 38.24 | 38.57 | 38.83 | 38.99 | 39.59 | 41.39 |
| 11 | 1.01 | 32.00 | 32.28 | 32.49 | 32.63 | 33.13 | 34.64 |
| 17 | 0.65 | 21.44 | 21.62 | 21.77 | 21.86 | 22.19 | 23.20 |
| 19 | 0.58 | 19.31 | 19.47 | 19.60 | 19.69 | 19.99 | 20.90 |
| 21 | 0.53 | 17.56 | 17.71 | 17.83 | 17.90 | 18.18 | 19.01 |
| 26 | 0.43 | 14.32 | 14.44 | 14.54 | 14.60 | 14.83 | 15.50 |
| 32.5 | 0.34 | 11.55 | 11.65 | 11.73 | 11.77 | 11.96 | 12.50 |

## Pipe Interface Area in mm² - 250mm FAB. Fitting Unit

110 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 15.7 | 4653 | 4693 | 4725 | 4744 | 4817 | 5037 | 6581 | 6080 |
| 9 | 12.2 | 3753 | 3786 | 3811 | 3827 | 3886 | 4062 | 5308 | 4904 |
| 11 | 10.0 | 3141 | 3168 | 3189 | 3202 | 3251 | 3399 | 4441 | 4103 |
| 17 | 6.5 | 2104 | 2122 | 2136 | 2145 | 2178 | 2277 | 2975 | 2749 |
| 19 | 5.8 | 1895 | 1911 | 1924 | 1932 | 1962 | 2051 | 2680 | 2476 |
| 21 | 5.2 | 1723 | 1738 | 1750 | 1757 | 1784 | 1865 | 2437 | 2252 |
| 26 | 4.2 | 1405 | 1417 | 1427 | 1433 | 1455 | 1521 | 1987 | 1836 |
| 32.5 | 3.4 | 1133 | 1143 | 1151 | 1155 | 1173 | 1227 | 1603 | 1481 |

125 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 17.9 | 6013 | 6064 | 6105 | 6130 | 6225 | 6508 | 8503 | 7856 |
| 9 | 13.9 | 4850 | 4891 | 4924 | 4945 | 5021 | 5249 | 6858 | 6336 |
| 11 | 11.4 | 4058 | 4093 | 4121 | 4138 | 4201 | 4392 | 5739 | 5302 |
| 17 | 7.4 | 2718 | 2742 | 2760 | 2772 | 2814 | 2942 | 3844 | 3552 |
| 19 | 6.6 | 2448 | 2469 | 2486 | 2496 | 2535 | 2650 | 3462 | 3199 |
| 21 | 6.0 | 2227 | 2246 | 2261 | 2270 | 2305 | 2410 | 3149 | 2910 |
| 26 | 4.8 | 1816 | 1832 | 1844 | 1851 | 1880 | 1966 | 2568 | 2373 |
| 32.5 | 3.8 | 1464 | 1477 | 1487 | 1493 | 1516 | 1585 | 2071 | 1913 |

140 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 20.0 | 7540 | 7605 | 7657 | 7688 | 7806 | 8162 | 10664 | 9852 |
| 9 | 15.6 | 6082 | 6134 | 6176 | 6201 | 6296 | 6583 | 8601 | 7946 |
| 11 | 12.7 | 5089 | 5133 | 5168 | 5189 | 5269 | 5509 | 7197 | 6649 |
| 17 | 8.2 | 3409 | 3439 | 3462 | 3476 | 3530 | 3690 | 4821 | 4454 |
| 19 | 7.4 | 3070 | 3097 | 3118 | 3131 | 3179 | 3323 | 4342 | 4012 |
| 21 | 6.7 | 2793 | 2817 | 2836 | 2847 | 2891 | 3023 | 3950 | 3649 |
| 26 | 5.4 | 2277 | 2297 | 2312 | 2322 | 2358 | 2465 | 3221 | 2975 |
| 32.5 | 4.3 | 1836 | 1852 | 1865 | 1872 | 1901 | 1988 | 2597 | 2399 |

160 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 22.9 | 9850 | 9935 | 10002 | 10043 | 10198 | 10662 | 13931 | 12870 |
| 9 | 17.8 | 7945 | 8014 | 8068 | 8101 | 8225 | 8600 | 11236 | 10381 |
| 11 | 14.5 | 6648 | 6706 | 6751 | 6779 | 6883 | 7196 | 9402 | 8686 |
| 17 | 9.4 | 4454 | 4492 | 4522 | 4541 | 4611 | 4821 | 6298 | 5819 |
| 19 | 8.4 | 4011 | 4046 | 4073 | 4090 | 4153 | 4342 | 5673 | 5241 |
| 21 | 7.6 | 3648 | 3680 | 3705 | 3720 | 3777 | 3949 | 5159 | 4767 |
| 26 | 6.2 | 2975 | 3001 | 3021 | 3033 | 3080 | 3220 | 4207 | 3887 |
| 32.5 | 4.9 | 2399 | 2420 | 2436 | 2446 | 2484 | 2597 | 3393 | 3135 |

# Pipe Interfacial Area in $mm^2$

180 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 25.7 | 12462 | 12569 | 12654 | 12706 | 12901 | 13488 | 17623 | 16282 |
| 9 | 20.0 | 10051 | 10138 | 10206 | 10248 | 10406 | 10880 | 14215 | 13133 |
| 11 | 16.4 | 8411 | 8483 | 8540 | 8576 | 8707 | 9104 | 11895 | 10989 |
| 17 | 10.6 | 5634 | 5683 | 5721 | 5745 | 5833 | 6099 | 7968 | 7362 |
| 19 | 9.5 | 5074 | 5118 | 5153 | 5174 | 5253 | 5492 | 7176 | 6630 |
| 21 | 8.6 | 4615 | 4655 | 4687 | 4706 | 4778 | 4996 | 6527 | 6030 |
| 26 | 6.9 | 3764 | 3796 | 3822 | 3837 | 3896 | 4074 | 5323 | 4917 |
| 32.5 | 5.5 | 3035 | 3061 | 3082 | 3094 | 3142 | 3285 | 4292 | 3965 |

200 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 28.6 | 15387 | 15520 | 15625 | 15689 | 15930 | 16655 | 21761 | 20105 |
| 9 | 22.2 | 12411 | 12518 | 12603 | 12654 | 12849 | 13434 | 17552 | 16216 |
| 11 | 18.2 | 10385 | 10475 | 10546 | 10589 | 10752 | 11241 | 14687 | 13569 |
| 17 | 11.8 | 6957 | 7017 | 7064 | 7093 | 7203 | 7530 | 9839 | 9090 |
| 19 | 10.5 | 6266 | 6320 | 6362 | 6389 | 6487 | 6782 | 8861 | 8187 |
| 21 | 9.5 | 5699 | 5748 | 5787 | 5811 | 5900 | 6169 | 8060 | 7446 |
| 26 | 7.7 | 4647 | 4687 | 4719 | 4738 | 4811 | 5030 | 6572 | 6072 |
| 32.5 | 6.2 | 3748 | 3780 | 3805 | 3821 | 3880 | 4056 | 5300 | 4896 |

225 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 32.1 | 19473 | 19642 | 19774 | 19855 | 20160 | 21078 | 27540 | 25443 |
| 9 | 25.0 | 15707 | 15843 | 15949 | 16015 | 16261 | 17001 | 22213 | 20522 |
| 11 | 20.5 | 13143 | 13257 | 13346 | 13401 | 13607 | 14226 | 18587 | 17173 |
| 17 | 13.2 | 8805 | 8881 | 8940 | 8977 | 9115 | 9530 | 12452 | 11504 |
| 19 | 11.8 | 7930 | 7998 | 8052 | 8085 | 8209 | 8583 | 11214 | 10361 |
| 21 | 10.7 | 7212 | 7275 | 7324 | 7354 | 7467 | 7807 | 10200 | 9423 |
| 26 | 8.7 | 5881 | 5932 | 5972 | 5997 | 6089 | 6366 | 8318 | 7684 |
| 32.5 | 6.9 | 4743 | 4784 | 4816 | 4836 | 4910 | 5134 | 6707 | 6197 |

250 mm O.D. PIPE

| | | MITER ANGLE | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° | TEE | 1st WYE |
| 7 | 35.7 | 24040 | 24248 | 24411 | 24511 | 24888 | 26021 | 33998 | 31410 |
| 9 | 27.8 | 19390 | 19558 | 19690 | 19770 | 20075 | 20988 | 27422 | 25335 |
| 11 | 22.7 | 16226 | 16366 | 16476 | 16543 | 16798 | 17562 | 22946 | 21200 |
| 17 | 14.7 | 10869 | 10963 | 11037 | 11082 | 11253 | 11765 | 15372 | 14202 |
| 19 | 13.2 | 9789 | 9874 | 9940 | 9981 | 10135 | 10596 | 13844 | 12790 |
| 21 | 11.9 | 8904 | 8981 | 9041 | 9078 | 9218 | 9637 | 12592 | 11633 |
| 26 | 9.6 | 7261 | 7323 | 7373 | 7403 | 7517 | 7859 | 10268 | 9487 |
| 32.5 | 7.7 | 5855 | 5906 | 5945 | 5970 | 6062 | 6337 | 8280 | 7650 |

# Pipe Interfacial Area in $mm^2$

280 mm O.D. PIPE

| | | MITER ANGLE | | | | | |
|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° |
| 7 | 40.0 | 30161 | 30422 | 30627 | 30752 | 31225 | 32646 |
| 9 | 31.1 | 24328 | 24538 | 24703 | 24804 | 25186 | 26332 |
| 11 | 25.5 | 20357 | 20532 | 20671 | 20756 | 21075 | 22034 |
| 17 | 16.5 | 13637 | 13755 | 13847 | 13904 | 14118 | 14761 |
| 19 | 14.7 | 12282 | 12388 | 12471 | 12522 | 12715 | 13294 |
| 21 | 13.3 | 11171 | 11267 | 11343 | 11390 | 11565 | 12091 |
| 26 | 10.8 | 9109 | 9188 | 9250 | 9288 | 9431 | 9860 |
| 32.5 | 8.6 | 7346 | 7409 | 7459 | 7490 | 7605 | 7951 |

315 mm O.D. PIPE

| | | MITER ANGLE | | | | | |
|---|---|---|---|---|---|---|---|
| SDR | WALL | 0° | 7.5° | 10° | 11.25° | 15° | 22.5° |
| 7 | 45.0 | 38161 | 38490 | 38749 | 38908 | 39507 | 41305 |
| 9 | 35.0 | 30780 | 31045 | 31255 | 31383 | 31866 | 33316 |
| 11 | 28.6 | 25756 | 25978 | 26153 | 26260 | 26664 | 27878 |
| 17 | 18.5 | 17254 | 17403 | 17520 | 17592 | 17862 | 18675 |
| 19 | 16.6 | 15539 | 15673 | 15779 | 15844 | 16087 | 16819 |
| 21 | 15.0 | 14134 | 14256 | 14352 | 14410 | 14632 | 15298 |
| 26 | 12.1 | 11525 | 11625 | 11703 | 11751 | 11932 | 12475 |
| 32.5 | 9.7 | 9294 | 9374 | 9437 | 9476 | 9622 | 10060 |

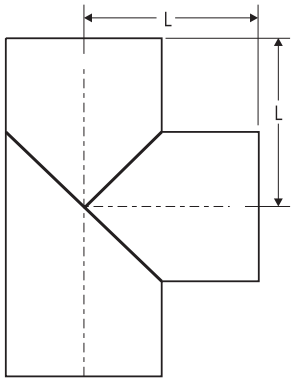
# Fabricating a Tee

## Fabricating a Tee

The fixtures used to fabricate tees consist of two long tee fixtures and one short tee fixture. Two fusion joints are required to make a tee. The first joint welds two pipe segments cut at 45° to each other, forming a 90° ell. The point of the ell is marked and sawn off.

The second joint is made by fusing another 45° pipe segment to the sawn face of the 90° ell.

TX01055-8-2-96



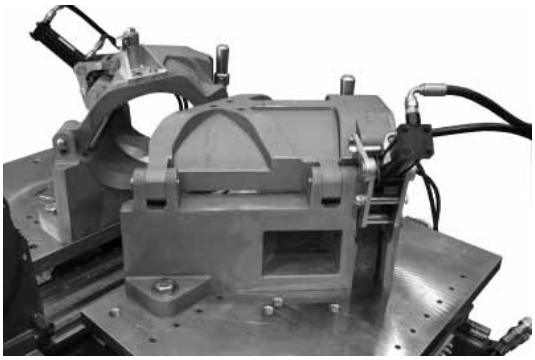

CD00577-4-4-00

## Install Tee Fixtures

Mount the long tee fixtures on each table so that the keys on the fixture drop into the keyslots on the table. The face of the fixture should be flush with the front of the table. Bolt the fixtures to the table.

With the proper inserts mounted in the jaws, load the pipe with enough pipe protruding to complete a face-off.

TX02604-4-17-06

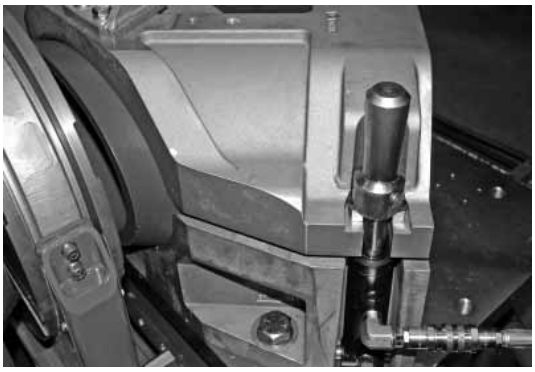


PH03217-4-12-06

## Clamp Pipe in Place

Clamp the pipe securely to prevent slipping. There are two hydraulic clamps on the short side of the fixtures. Pivot the upper jaw closed then clamp it firmly.

TX02605-4-17-06



PH03200-3-10-06

## Select Cylinder Configuration

If the upper cylinder is required, mount it into the mounting bracket and pin in place.

Connect to the hoses on the left side of the machine.

TX02606-4-17-06

PH03240-4-12-06

# Fabricating a Tee

## Face the Pipe

Open the tables fully. Turn off machine.

Install shorter facer stops marked with a "TΛ" graphic, on the right side of facer. Turn machine on.

Bring the facer in and face the pipe ends to get a clean, square surface.

**NOTICE:** Do not exceed 200 psi of carriage force during facing. Excessive force can cause a bad face-off or facer damage.

If more pressure is required to cut the pipe, sharpen or replace the facer blades. Once all restbuttons are bottomed out, stop the facer and open the jaws to remove the facer.

Remove any waste from facing around the fusion area.

TX02607-4-17-06

PH03201-3-10-06

## Check Alignment of Pipe

Bring the pipe ends together at facing pressure to check for gaps and alignment.

If the joint has an unacceptable gap or if the walls are not aligned within 10% of the wall thickness, bump the pipe in, align and repeat the face-off.

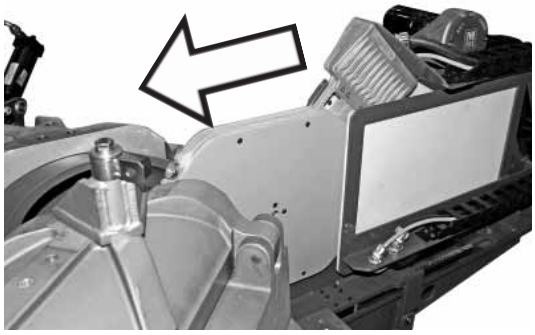
TX01059-8-2-96

PH03202-3-10-06

## Move Heater In

Move the heater into position. The green light on the electrical box indicates when the heater is in range. When the heater in on, the temperature controller on the side of the electrical box indicates both the current temperature (on top) and the set point.

TX02608-4-17-06

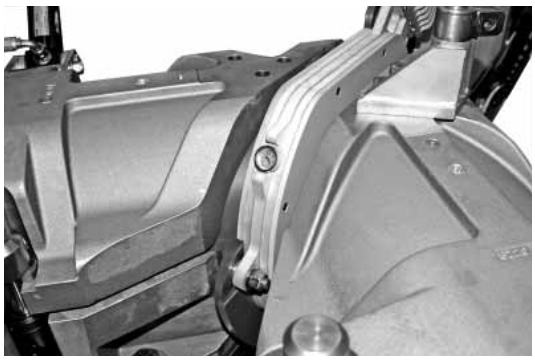


PH03203-3-10-06

## Heat Pipe

Select facing pressure and bring the pipe ends up against the heater. When a bead has formed around the entire perimeter select soak pressure, wait for the pressure to change to soak pressure, then shift the carriage selector to the center position. Follow the pipe manufacturers recommended procedure for heating and soaking times and pressures.

TX02609-4-17-06

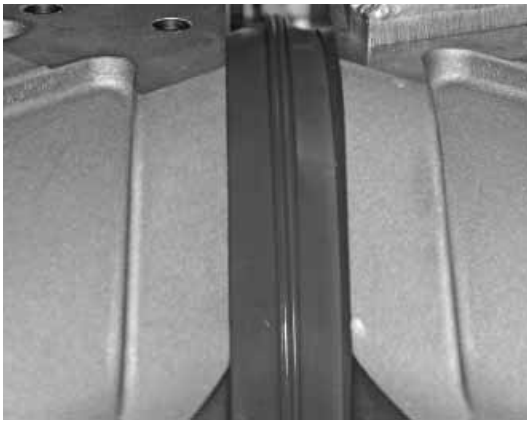


PH03204-3-10-06

## Fuse the Joints

When the heat cycle is complete, open the carriage fully to allow the stripping mechanism to strip the pipe off of the heater. Move the heater out, then close the carriage, making the fusion. Hold pressure against the joint during the required cool time.

TX02610-4-17-06



PH03205-3-10-06

## Remove Ell

When the joint has cooled shift the carriage valve to the center position. Remove the upper cylinder, if necessary. Unclamp the fixtures and pivot out the upper jaws then remove the completed ell. Set the ell in the short tee fixture and use a marker pen with a 2" standoff block to mark a saw line on the point. Once the point is removed you are ready to fuse another 45° segment onto the sawn opening.

TX02611-4-17-06

PH03206-3-10-06

## Change Fixtures

Remove the left long tee fixture and mount the short tee fixture on the fixed table with its edge flush with the edge of the table. Clamp the ell in the short tee fixture and the 45° segment in the right long tee fixture. Face the ends off as before. Exercise care to get a good face off on the ell as there is only one position that will match the cross section of the other segment.

TX01065-8-5-96

PH03218-4-12-06

## Heat and Fuse Joints

Check the ends for alignment, heat and fuse using the same procedure as the first joint. After the required cooling time, shift the carriage control to center and remove the completed tee.

TX01066-8-5-96

PH03219-4-12-06

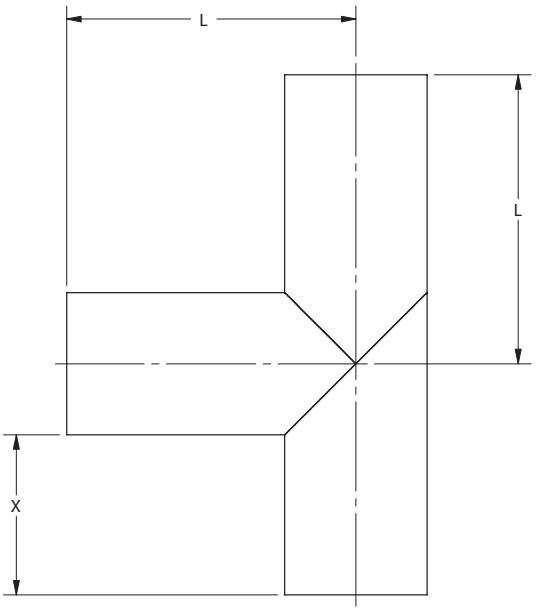
## Tee Part Preparation

The table below gives the leg lengths required to fuse a fabricated tee in the McElroy fusion machines noted.

Refer to the sketch for the preparation drawings for the tee segments. All segments are the same.

**NOTE:** These are minimum dimensions, allow extra for face-off. Installation face-off allowance of 1/4" is included and finished dimensions are measured to square, faced ends.

TX02612-4-17-06



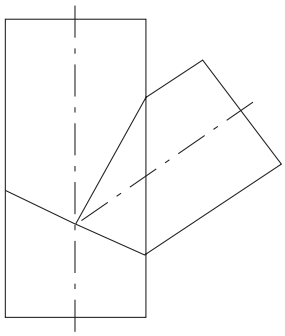

| Tee Lengths | | |
|---|---|---|
| **Dimensions in inches** | | |
| Pipe OD | X | L |
| 250mm | 8.45 | 13.37 |
| 225 | 8.62 | 13.05 |
| 200 | 9.11 | 13.05 |
| 180 | 8.51 | 12.05 |
| 160 | 8.90 | 12.05 |
| 140 | 8.29 | 11.05 |
| 125 | 8.59 | 11.05 |
| 110 | 7.88 | 10.05 |

| Tee Lengths | | |
|---|---|---|
| **Dimensions in centimeters** | | |
| Pipe OD | X | L |
| 250mm | 21.5 | 34.0 |
| 225 | 21.9 | 33.1 |
| 200 | 23.1 | 33.1 |
| 180 | 21.6 | 30.6 |
| 160 | 22.6 | 30.6 |
| 140 | 21.1 | 28.1 |
| 125 | 21.8 | 28.1 |
| 110 | 20.0 | 25.5 |

## Fabricating a Wye

The fixtures used to fabricate wyes consist of two long tee fixtures and the left miter jaw. Two fusion joints are required to make a wye. The first joint welds to pipe segments cut at 22-1/2° to each other forming a 45° vee. The second joint is made by fusing a 22-1/2° pipe segment to the point of the vee.

TX01069-8-5-96



CD00631-4-14-00

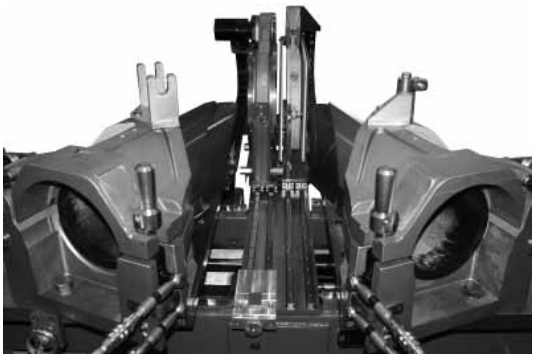
## Install Fixtures

Mount the long tee fixtures on each table at a 22-1/2° angle.

With the proper inserts mounted in the jaws, load the pipe with enough pipe protruding to complete a face-off.

Connect left fixture to hoses on the left side of machine and right fixture to hoses on the right side of machine.

TX02613-4-17-06

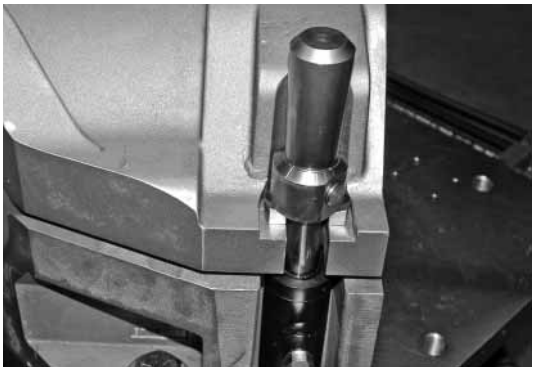


PH03239-4-12-06

## Clamp Pipe in Place

Clamp the pipe securely to prevent slipping. There are two hydraulic clamps on the short side of the fixtures. Pivot the upper jaw closed then clamp it firmly.

TX02614-4-17-06



PH03200-4-12-06

## Select Cylinder Configuration

If the upper cylinder is required, mount it into the mounting bracket and pin in place.

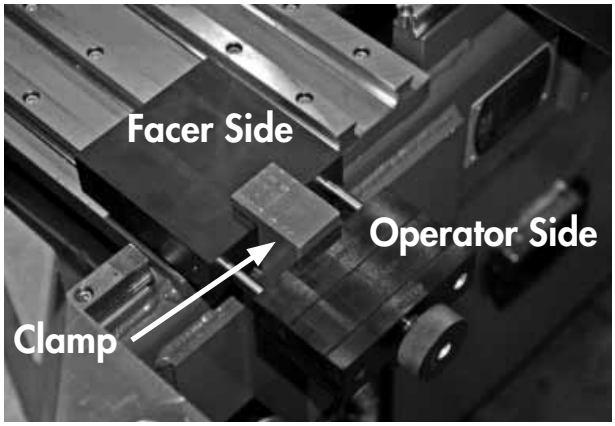
Connect to the hoses on the left side of the machine.

TX02615-4-17-06

PH03240-4-12-06

# Fabricating a Wye

## Face the Pipe



PH03250-4-12-06

Open the tables fully. Turn off machine.

Install shorter facer stops marked with a "TΛ" graphic on the right side of facer.

For the first wye joint, you will need to use the correct facer stop blocks so you can have the facer positioned correctly in relation to the position of the pipe for facing. There are four blocks:

A base block (108mm)

Two 25mm blocks

One 12mm block

Install any blocks needed on the facer side of the clamp and any unused blocks are attached and kept on the operator side of the clamp. All blocks are held in place by guide rods and tightened together with a knob.

Use the table in this section to determine which blocks are needed for the size pipe to be fused.

| Pipe Size | Facer Blocks used |
|---|---|
| 250mm | None |
| 225mm | Base |
| 200mm | Base + 25mm |
| 180mm | Base + 25mm |
| 160mm | Base + 25mm + 25mm |
| 140mm | Base + 25mm + 25mm |
| 125mm | Base + 25mm + 25mm + 12mm |
| 110mm | Base + 25mm + 25mm + 12mm |

Turn machine on.

Bring the facer in and face the pipe ends to get a clean, square surface.

**NOTICE:** Do not exceed 200 psi of carriage force during facing. Excessive force can cause a bad face-off or facer damage.

If more pressure is required to cut the pipe, sharpen or replace the facer blades. Once all restbuttons are bottomed out, stop the facer and open the jaws to remove the facer.

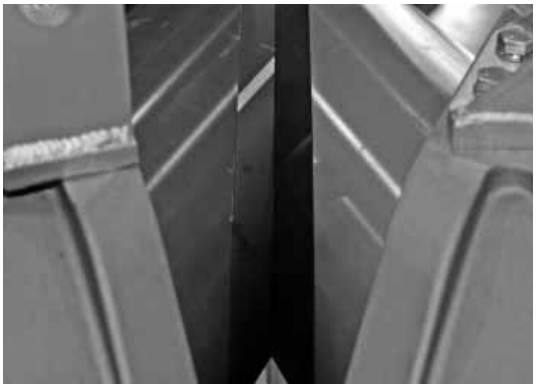

PH03220-4-12-06

Remove any waste from facing around the fusion area.

Uninstall any facer stop blocks and install them back on the operator side of the clamp.

TX02616-4-17-06

## Check Alignment of Pipe


PH03221-4-12-06

Bring the pipe ends together at facing pressure to check for gaps and alignment. If the joint has an unacceptable gap or if the walls are not aligned within 10% of the wall thickness, bump the pipe in, align and repeat the face-off.

Cross slide adjustment may be used to correct misalignment.

TX02617-4-17-06

# Fabricating a Wye

## Move Heater In

Open the tables fully.

Move the heater into position. The green light on the electrical box indicates when the heater is in range. When the heater in on, the temperature controller on the side of the electrical box indicates both the current temperature (on top) and the set point.

TX02618-4-17-06

PH03222-4-12-06

## Heat Pipe

Set the selector control to facing pressure and bring the pipe ends up against the heater. When a bead has formed around the entire perimeter select soak pressure, wait for the pressure to change to soak pressure, then shift the carriage valve to the center position. Follow the pipe manufacturer's recommended procedure for heating and soaking times and pressures.

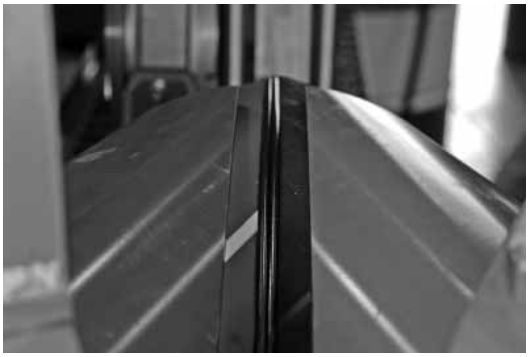
TX01076-8-5-96

PH03223-4-12-06

## Fuse the Joints

When the soak cycle is complete shift the selector to the fusion position. Fully open the carriage, move the heater out, then close the carriage, making the fusion. Hold pressure against the joint during the required cooling time. When the joint has cooled, shift the selector valve to the center position.

TX02619-4-17-06



PH03224-4-12-06

## Unclamp Joint

To remove the first wye joint:

Unclamp the right jaw and open the jaw.

Holding the right clamp against the jaw, unclamp the left jaw and open the left jaw.

Remove the first wye joint.

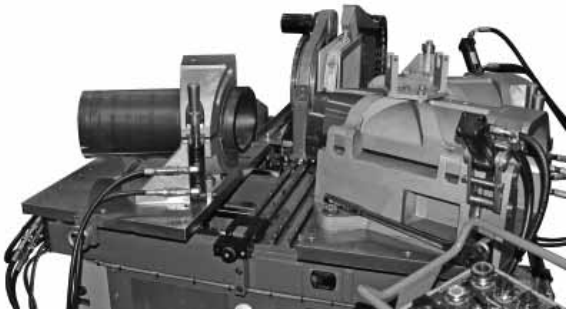
PH03225-4-12-06

PH03226-4-12-06

TX02620-4-17-06

## Second Joint

To make the second joint mount both long tee fixtures on the right table at 22-1/2° from center line. Mount the left miter jaw on the left table. Use the scale on the back of the jaw to set it to 22-1/2°. Connect the hoses from the rear fixture to the right rear quick disconnects. Connect the pivot hoses from the front fixture to the left front quick disconnects. Connect the clamp hoses to the right front quick disconnects. Clamp the vee formed by the first joint in the long tee fixtures and the 22-1/2° pipe segment in the left miter jaw.



PH03233-4-12-06

TX02621-4-17-06

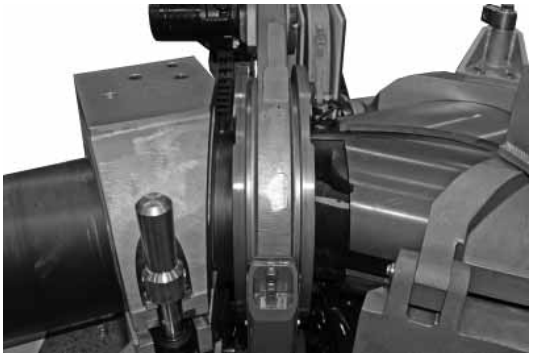
## Face the Pipe

Turn off machine.

Install longer facer stops marked with a " Y " graphic, on the right side of facer. Turn machine on.

Face the ends off as before. Exercise care to get a good face off on the vee as there is only one position that will match the cross section of the other segment.

TX02622-4-17-06

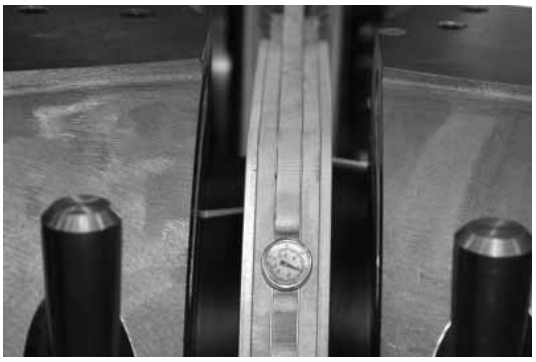


PH03234-4-12-06

## Heat and Fuse Joints

Check the ends for alignment, heat and fuse using the same procedure as the first joint. After the required cooling time shift the carriage to neutral and remove the completed wye.

TX01080-8-5-96



PH03235-4-12-06

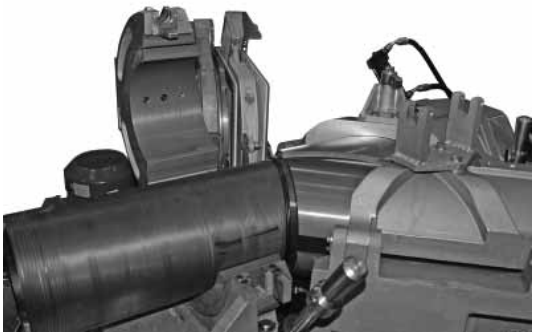
## Remove Finished Wye

Unclamp and open the miter jaw first.

Open the wye jaws using the sequence in "Unclamp Joint" section of "Fabricating a Wye."

**NOTICE:** Be careful not to open the jaws too far. You may contact or damage the heater frame.

TX02623-4-17-06



PH03242-4-12-06

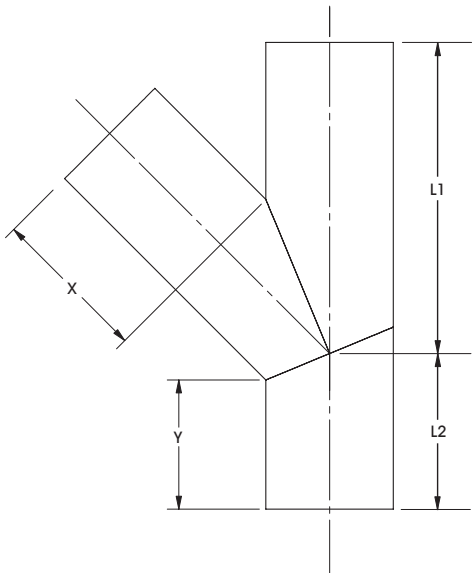
PH03243-4-12-06

## Wye Part Preparation

Refer to the sketch for the preparation drawings for the wye segments. Two of the segments are the same. The third is simply a segment cut at 22.5° on one end.

**NOTE:** These are minimum dimensions, allow extra for face-off. Installation face-off allowance of 1/4" is included and finished dimensions are measured to square, faced ends.

TX02624-4-17-06




CD00711-3-24-06

| This table gives the leg lengths (in inches) required to fuse a fabricated wye | | | | |
|---|---|---|---|---|
| Pipe OD | X | Y | L1 | L2 |
| 250mm | 15.41 | 6.04 | 27.29 | 8.08 |
| 225 | 15.91 | 6.24 | 26.60 | 8.07 |
| 200 | 16.40 | 6.45 | 25.90 | 8.08 |
| 180 | 13.43 | 6.61 | 21.98 | 8.08 |
| 160 | 13.82 | 6.77 | 21.43 | 8.07 |
| 140 | 14.22 | 6.94 | 20.87 | 8.08 |
| 125 | 14.51 | 7.06 | 20.45 | 8.08 |
| 110 | 14.81 | 7.18 | 20.03 | 8.08 |

| This table gives the leg lengths (in centimeters) required to fuse a fabricated wye | | | | |
|---|---|---|---|---|
| Pipe OD | X | Y | L1 | L2 |
| 250mm | 39.1 | 15.3 | 69.3 | 20.5 |
| 225 | 40.4 | 15.8 | 67.6 | 20.5 |
| 200 | 41.7 | 16.4 | 65.8 | 20.5 |
| 180 | 34.1 | 16.8 | 55.8 | 20.5 |
| 160 | 35.1 | 17.2 | 54.4 | 20.5 |
| 140 | 36.1 | 17.6 | 53.0 | 20.5 |
| 125 | 36.9 | 17.9 | 51.9 | 20.5 |
| 110 | 37.6 | 18.2 | 50.9 | 20.5 |

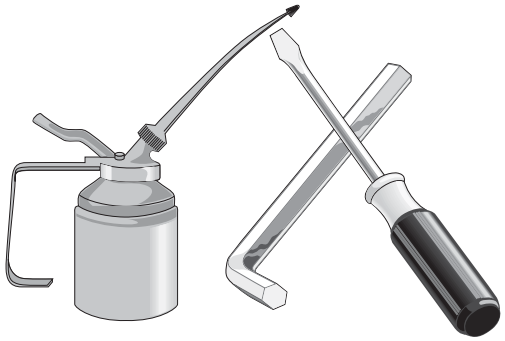
## Preventative Maintenance

To insure optimum performance, the machine must be kept clean and well maintained.

With reasonable care, this machine will give years of service. Therefore, it is important that a regular schedule of preventative maintenance be kept.

Store machine inside, out of the weather, whenever possible.

TX00428-8-10-95

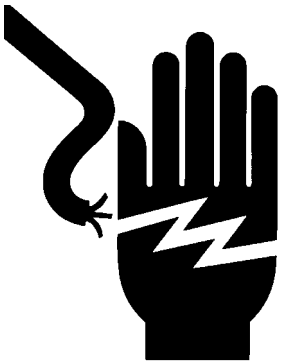


CD00142-11-2-94

## Electrical Lock-Out

**⚠CAUTION** Follow all applicable electrical lock-out and tag-out procedures before maintenance is performed.

TX00651-9-20-95



WR00025-11-30-92

## Hydraulic Power Unit

Check the oil level in the hydraulic reservoir and the filter condition indicator weekly.

During normal operation the oil temperature, indicated on the oil level gauge in the tank, should not exceed 160°F. High temperatures indicate worn components or an improperly adjusted relief valve.

The filter on the HPU is equipped with a back pressure indicator which indicates when the element needs to be replaced. With the system running and the facer on, check the service indicators on the filter to determine if they should be replaced.

Replace all oil if there is any sign of contamination or foaming in the reservoir.

See the "Hydraulic Fluids" section for hydraulic fluid recommendations.

TX00652-9-20-95

PH03209-4-12-06

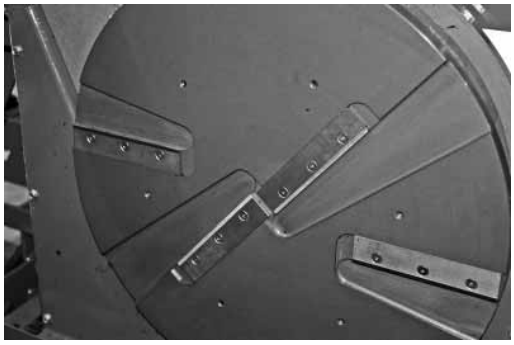
## Facer Blades

Blades bolt directly to the blade holder and should be inspected for damage and sharpness.

Chipped blades must be replaced.

Dull blades can be returned to McElroy Manufacturing for sharpening.

TX00653-9-20-95



PH03237-4-12-06

## Clean Heater Surfaces

The heater faces must be kept clean and free of any plastic build up or contamination.

On start up and after each fusion joint the heater surfaces must be wiped with a clean, non-synthetic cloth.

**NOTICE:** Do not use an abrasive pad or steel wool. Use a non-synthetic cloth that won't damage surfaces.

TX00758-11-9-95

PH03236-4-12-06

## Hydraulic System

Repair any leaks on the unit, console or HPU as soon as they are noticed.

Inspect all hoses and replace those that show wear or leakage.

TX00654-9-20-95

PH03209-4-12-06

## Heater Controller Offset Adjustment

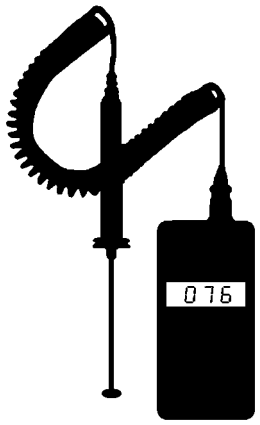
The temperature controller has a programmable temperature offset. This allows the display to indicate approximate surface temperature while the actual temperature sensor is in the center of the body. If your pyrometer readings are consistently different from the temperature controller readout, you should adjust the offset so that the readout is correct. Refer to the temperature controller setup on next page.

TX00655-9-20-95

PH03227-4-12-06

## Check Heater

Check the surface of the heater daily with a pyrometer to ensure that the controller is working correctly and that all the heating elements are working.

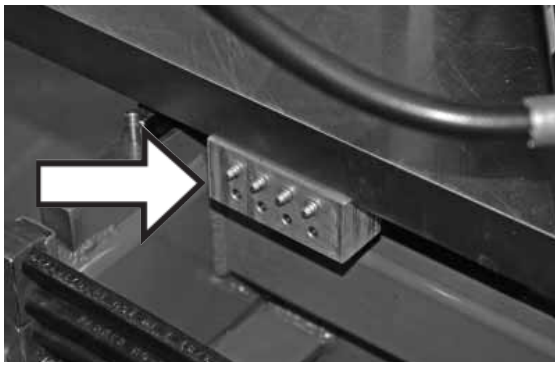



WR00077-4-16-93

TX00664-9-29-95

## Lubricate Bearings

Lubricate the linear bearings on the tables every 150 hrs with EP grease.



PH03230-4-12-06

TX02625-4-17-06

## Check Fasteners

Check the unit weekly for loose or missing fasteners. Tighten or replace as required.

TX00666-9-29-95

# Fuji Model PXR3 Temperature Controller Setup

## Setting the heater temperature

To change the heater set point, turn the heater on and press the SEL key to display the SV (Setting Value). The PV indicator lamp will turn off and the SV indicator lamp will be lit. Press the /\ (UP) or \/ (DOWN) arrow keys until the desired setting is displayed. The new value will be registered in the SV after three seconds. Thereafter, the controller will operate using the new SV value.

PH03227-4-12-06

## Checking the heater with a pyrometer

Each day the operator should check the surface of the heater to see that the PV (Process Value) reading on the controller agrees with the actual surface temperature. When the heater has come up to operating temperature, use a hand-held pyrometer or DataLogger® to read the actual surface temperature. Be sure to allow enough time after the heater is turned on for the surface to stabilize. Adjusting the SV will correct any discrepancy. If the difference is consistent, the operator can modify the controller bias setting PVOF as described below.

## Adjusting the Controller Bias Setting

To enter the second block parameter set mode, press and hold the SEL key for approximately 6 seconds until the first parameter (P) of the second block is displayed. Press the \/ (DOWN) key and scroll down until the PVOF parameter is displayed. Using the /\ (UP) and \/ (DOWN) arrow keys adjust the setting for the desired offset value. Press the SEL key once and PVOF will be displayed and the new offset value will be added or subtracted from the SV setting. By pressing the SEL key for two seconds, the display will return to the SV setting. If unaltered, after approximately thirty seconds the display will return to the PV reading.

### Initial Setup of unit

**Parameters of the First Block**

| Display | Parameter Name | Value as Shipped |
|---|---|---|
| StbY | Stby | OFF |
| ProG | ProG | OFF |
| LACH | LACH | 0 |
| AT | AT | 0 |
| TM-1 | TM-1 | 0 |
| TM-2 | TM-2 | 0 |
| AL 1 | AL1 | 415 |
| AL2 | AL2 | 415 |
| LoC | LoC | 0 |

## Parameters of the Second Block

| Display | Parameter Name | Value as Shipped |
|---|---|---|
| P | p | 5.3 |
| I | I | 62 |
| d | d | 12 |
| HYS | HYS | 2 |
| CooL | CooL | N/A |
| db | db | N/A |
| bAL | bAL | N/A |
| Ar | Ar | N/A |
| CTrL | CTrL | PID |
| SLFb | SLFb | N/A |
| onoF | onoF | N/A |
| TC | TC | 30 |
| TC2 | TC2 | N/A |
| P-n2 | P-n2 | 1 |
| P-SL | P-SL | 0 |
| P-SU | P-SU | 550 |
| P-dP | P-dP | 0 |
| P-F | P-F | N/A |
| PVOF | PVOF | -25 |
| SVOF | SVOF | N/A |
| P-dF | P-dF | 5 |
| ALM1 | ALM1 | 1 |
| ALM2 | ALM2 | 1 |
| STAT | STAT | OFF |
| PTn | PTn | 1 |
| SV-1 | SV-1 | 0.00 |
| RM1r | RM1r | 0.00 |
| RM1S | RM1S | 0 |
| SV-2 | SV-2 | 0.00 |
| RM2r | RM2r | 0.00 |
| RM2S | RM2S | 0 |
| Sv-3 | Sv-3 | 0.00 |
| RM3r | RM3r | 0.00 |
| RM3S | RM3S | 0 |
| SV-4 | SV-4 | 0.00 |
| RM4r | RM4r | 0.00 |
| RM4S | RM4S | 0 |

## Parameters of the Second Block

| Display | Parameter Name | Value as Shipped |
|---|---|---|
| SV-5 | SV-5 | 0.00 |
| RM5r | RM5r | 0.00 |
| RM5S | RM5S | 0 |
| SV-6 | SV-6 | 0.00 |
| RM6r | RM6r | 0.00 |
| RM6S | RM6S | 0 |
| SV-7 | SV-7 | 0.00 |
| RM7r | RM7r | 0.00 |
| RM7S | RM7S | 0 |
| SV-8 | SV-8 | 0.00 |
| RM8r | RM8r | 0.00 |
| RM8S | RM8S | 0 |
| Nod | Nod | 0 |

## Parameters of the Third Block

| Display | Parameter Name | Value as Shipped |
|---|---|---|
| P-n1 | P-n1 | 1 |
| SV-L | SV-L | 0 |
| SV-H | SV-H | 550 |
| dLY1 | dLY1 | 0 |
| dLY2 | dLY2 | 0 |
| A1hY | A1hY | 2 |
| A2hY | A2hY | 2 |
| A1oP | A1oP | 000 |
| A2oP | A2oP | 000 |
| dSP1 | dSP1 | 64 |
| dSP2 | dSP2 | 224 |
| dSP3 | dSP3 | 224 |
| dSP4 | dSP4 | 45 |
| dSP5 | dSP5 | 20 |
| dSP6 | dSP6 | 1 |
| dSP7 | dSP7 | 0 |
| dSP8 | dSP8 | 0 |
| dSP9 | dSP9 | 0 |
| dP10 | dP10 | 78 |
| dP11 | dP11 | 254 |
| dP12 | dP12 | 255 |
| dP13 | dP13 | 127 |

Parameters of the first block may be accessed by pressing and holding the SEL key for approximately three seconds (stby). If the SEL key is held an additional three seconds, the second block parameters will display (p). If held for roughly nine seconds, the third block parameters menu will display (P-n1). Use the /\ (UP) and \/ (DOWN) arrow keys to display the desired parameter and press the SEL to edit the value.

A complete operations manual for the Fuji PXR3 controller may be downloaded in .pdf form from the following website:

**http://www.ttiglobal.com/productfiles/4712/PXR3_Manual.pdf**

TX02626-4-17-06

## Hydraulic Fluids

The use of proper hydraulic oil is mandatory to achieve maximum performance and machine life. Use a clean, high quality, anti-wear hydraulic oil with a viscosity index (VI) of 135 minimum. It should have a maximum viscosity of 500 cSt (2000 SSU) at startup (ambient temperature) and a minimum viscosity of 13 cSt (65 SSU) at the maximum oil temperature (generally 80°F above ambient). Using hydraulic oils that do not meet these criteria may cause poor operation and/or damage to the hydraulic components.

The following table specifies the oil temperature at various viscosities. Temperature rise of the hydraulic oil can vary from 30° F to about 80° F over the ambient temperature depending on the pressure setting, age of the pump, wind, etc. Exxon Univis N46 hydraulic oil is installed at our factory. The advantage of this oil is a wider temperature range, however, this oil should not be used for continuous operation below 20° F. For use in extremely cold ambient temperatures, we suggest Mobil DTE 11M, which can be used to –16° F. This oil should not be used for continuous operation above 100° F (oil temperature).

TX02244-2-2-04

**Hydraulic Fluids Characteristics**

| Manufacturer | Fluid Name | SSU 100F | SSU 210F | V.I. | -20F | -10F | 0F | 10F | 30F | 50F | 70F | 90F | 110F | 130F | 150F | Range °F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobil | DTE 11M | 87 | 40 | 145 | ****** | ****** | ****** | ****** | ****** | ****** | ****** | | | | | -27-87 |
| | DTE 13M | 165 | 48 | 140 | | | | ****** | ****** | ****** | ****** | ****** | ****** | | | 5-130 |
| | DTE 15M | 225 | 53 | 140 | | | | ****** | ****** | ****** | ****** | ****** | ****** | ****** | | 5-140 |
| Exxon | Univis N-32 | 177 | 49 | 164 | | | | ****** | ****** | ****** | ****** | ****** | ****** | ****** | | 5-140 |
| | Univis N-46 | 233 | 55 | 163 | | | | | ****** | ****** | ****** | ****** | ****** | ****** | | 25-142 |
| | Univis N-68 | 376 | 68 | 160 | | | | | | ****** | ****** | ****** | ****** | ****** | ****** | 34-155 |

NOTE: This chart is based on pump manufacturer recommendations of 65 to 2000 SSU limits.

NOTE: Temperatures shown are fluid temperatures. – NOT ambient temperatures.

# Specifications

## Fusion Machine Specifications

| | |
|---|---|
| Maximum force at jaws | 6315 lbs (2,864 kg) |
| Carriage travel | 12 in (30.5 cm) with lower cylinder |
| | 11 1/8" (28.25 cm) with upper cylinder |
| Hydraulic system pressure | 1500 psi (172 bar) |
| Hydraulic power unit motor | 5 hp (3.7 kW) |
| Total power required | 10 kW 380V, 3-phase, 50Hz |
| Overall dimensions | 6 ft wide X 7 ft deep X 4.5 ft high |
| Weight of base sub-assembly | 3,000 lbs (975 kg) |
| Hydraulic fluid | Exxon Univis N-46 |
| Hydraulic reservoir capacity | 10 gallons (38 L) |

TX02627-4-17-06

# About this manual . . .

McElroy Manufacturing continually strives to give customers the best quality products available. This manual is printed with materials made for durable applications and harsh environments.

This manual is waterproof, tear resistant, grease resistant, abrasion resistant and the bonding quality of the printing ensures a readable, durable product.

The material does not contain any cellulose based materials and does not contribute to the harvesting of our forests, or ozone-depleting constituents. This manual can be safely disposed of in a landfill and will not leach into ground water.

TX001660-8-19-99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