

# Operator's Manual



# McELROY

[www.mcelroy.com](http://www.mcelroy.com)



Fitting Fabrication Machine







# Introduction



## Thank You for purchasing this McElroy product

The McHiLYT™ fitting fabrication machine is designed to produce ells and tees from polyethylene pipe in sizes from 630 mm x SDR 7 down to 8" IPS/280mm x SDR 26. This machine can also fabricate wyes from 630 mm x SDR 7 to 8"/280mm x SDR 11.

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.



PH03118-10-31-05

TX02578-10-10-05

## 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.

TX01083-12-10-96



PH00917-8-15-96



# 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 aforesaid 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](http://www.McElroy.com/fusion)**

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

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Date Received \_\_\_\_\_

Distributor \_\_\_\_\_



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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



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



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



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.



WR00052-12-1-92

TX00031-12-8-92



# Fusion Equipment Safety



## 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.



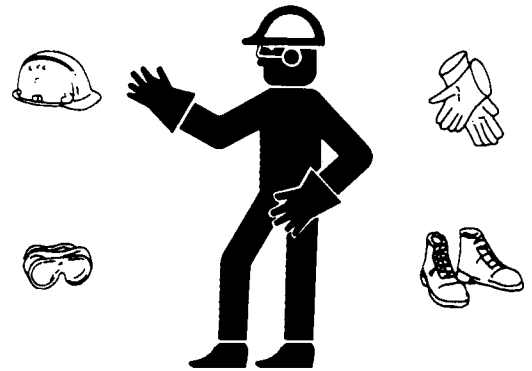
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TX00114-4-22-93

## 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.



WRO0053-12-2-92

TX00032-4-7-93

## 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.



WRO0078-4-8-93

TX00110-8-23-95



# Fusion Equipment Safety



## 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.

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.

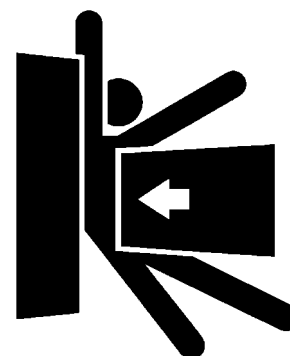


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## Crush Points

**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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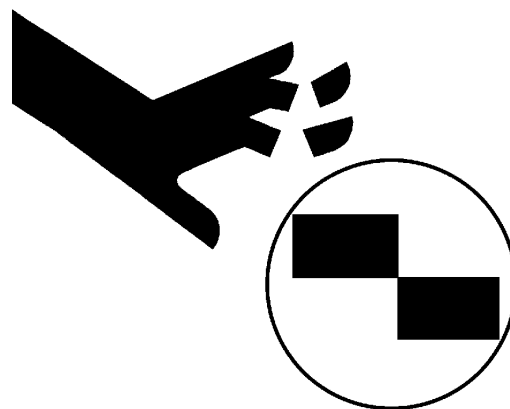
TX00103-4-6-93

## 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.

**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.



WR00073-4-6-93

TX02378-1-24-05



# Fusion Equipment Safety



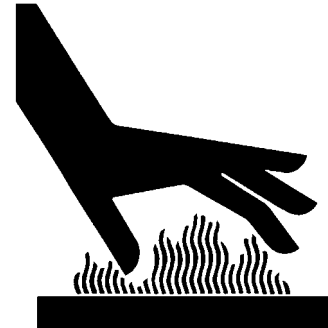
## Heater Is Hot

**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.

TX00104-8-12-94



WR00030-2-10-93

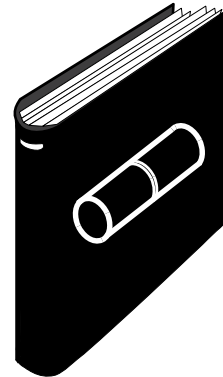
## Fusion Procedures

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.

TX00113-4-12-93



WR00079-4-12-93

## Theory of Heat Fusion

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.



PH005249-18-95



# Overview



## Tables

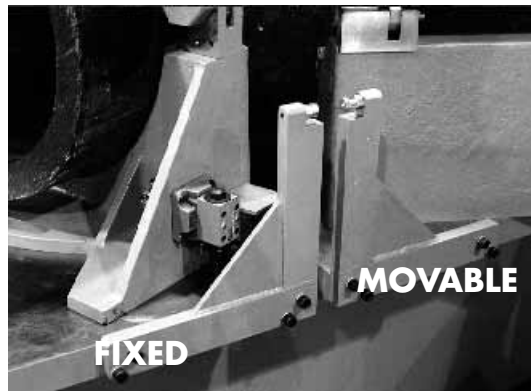
The fabrication machine has two tables. One table is in a fixed position, mounted to a rigid machine base.

The other table is movable and is driven by a hydraulic cylinder.



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

TX00625-9-6-95



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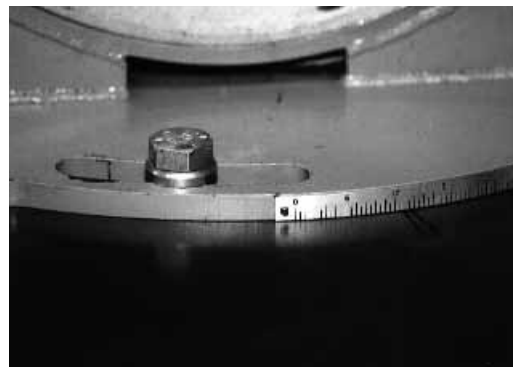
## Miter Jaws

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

Inserts are required with the jaws for sizes below 630mm.

Other fixtures are required for fabricating tees and wyes.

TX00626-9-6-95



PH00522-9-18-95

## Indexing Carriage

The heater and facer are mounted on a hydraulic indexing carriage that positions them at the pipe interface and allows for free-float during the face and heat cycles. They are pivoted in and out of the interface by hydraulic cylinders.



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

TX00627-9-6-95



PH00898-7-29-96

## Controls

All controls are located on a free standing console and are manually operated.

The control console is connected to the machine by a flexible cord so it can be moved to the most convenient location.

TX00629-9-6-95



PH03117-10-31-05



# Overview



## 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 Hi-Lo mode force selector on the panel.

Hi-Lo mode is 19.83 in<sup>2</sup> and Lo-mode is 3.14 in<sup>2</sup>.

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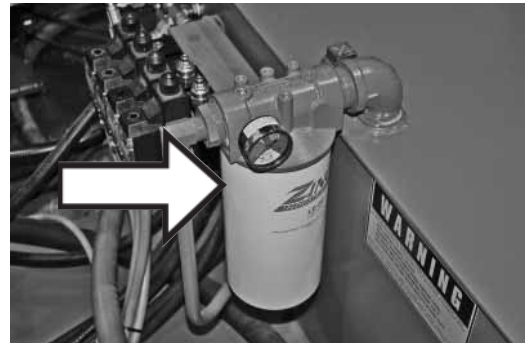
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## Filter

This machine is equipped with a 10 Micron absolute filter on the return side of the pump.

Change filter every 400 hours.

TX00545-7-12-95



PH03111-10-31-05

## Motor and Pump

The pump is powered by a TEFC motor. The pump is a pressure compensated piston pump and is set at 2500 psi.

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

TX00656-9-20-95



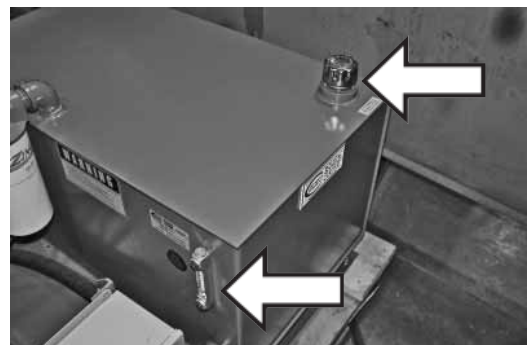
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## Oil Reservoir

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

Never allow dirt or other foreign matter to enter the open tank. Fill with Sunvis 2105 or equivalent hydraulic fluid.

TX00679-10-16-95



PH03110-10-31-05



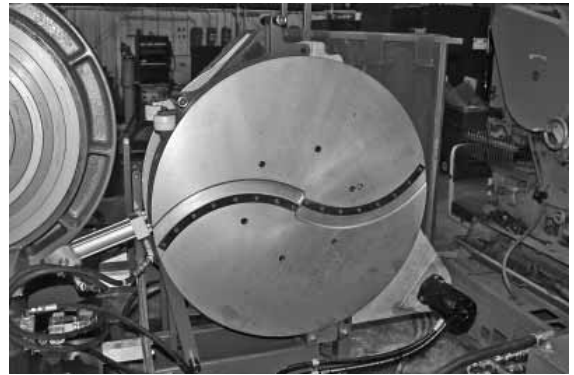
# Overview



## Facer

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

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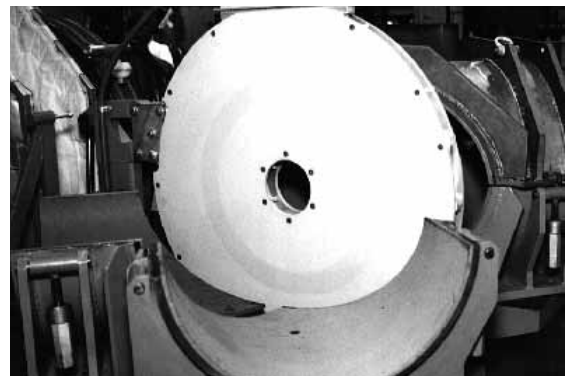


PH03106-10-31-05

## Heater

The heater uses 20,400 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.

TX00628-9-6-95



PH00506-9-6-95

## 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 installing inserts, mounting fixtures, or changing the heater's butt plates.

TX00646-9-11-95



# Installation



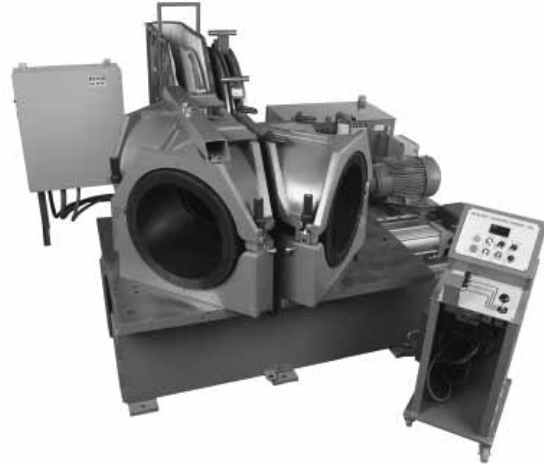
## Installation

The unit is approximately 9 ft. wide, 10 ft. deep and 6 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. The base is constructed as an open channel, allowing face-off waste to fall to the floor in-between the beams. This waste can be removed from the fixed jaw end of the unit. Access to this end will be needed.

The machine requires 50kW of 480VAC 3 phase electrical power. The customer needs to supply a fusible disconnect switch near the back of the machine. The electrical enclosure is to be anchored on the left end of the unit. No compressed air is required.

An overhead hoist will be needed to install jaws and fixtures. It can also be used to perform maintenance, such as replacing heater butt plates. 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 2 major pieces. The base sub-assembly weighs approximately 5500 lbs. The indexer sub-assembly weighs approximately 2200 lbs. The site should be a level concrete slab at least 6" thick. The heater and facer are positioned by three cylinders which must be restrained during handling to prevent them from shifting.

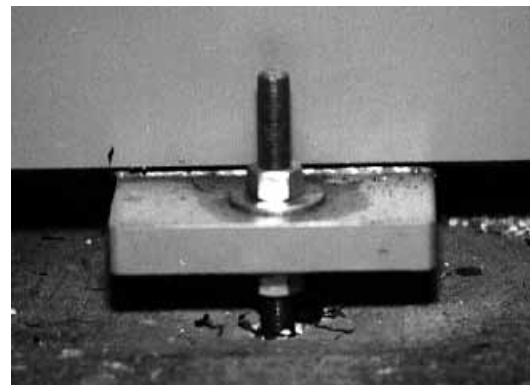


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## Level the Unit

Position the base and indexer and bolt them together. 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. Align the ways of the indexer parallel with the base ways and tighten everything down.



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TX00682-10-23-95



# Installation



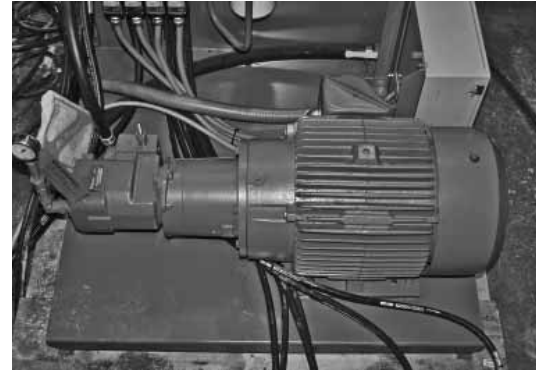
## Hydraulic System

The hydraulic power unit is located at the back of the machine on the right 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 careful pivoting the heater and facer. Raise them less than 12" until all air is worked out.

TX00683-10-23-95

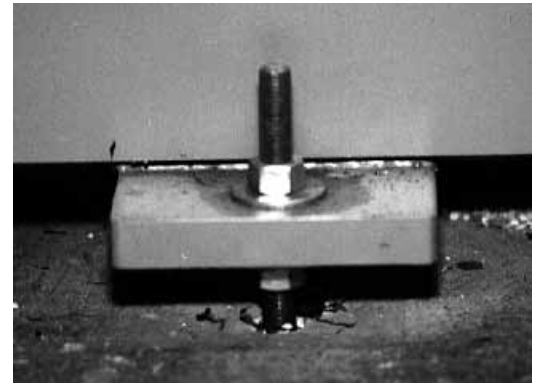


PH03112-10-31-05

## Square the Unit

Once the system is operational, rotate the facer into position between the tables and check it for squareness with the table. Check both vertically and horizontally. Use the jack bolts under the indexer to get the heater perfectly square with the tables. Tighten down all the anchor nuts, check again for squareness and grout the machine.

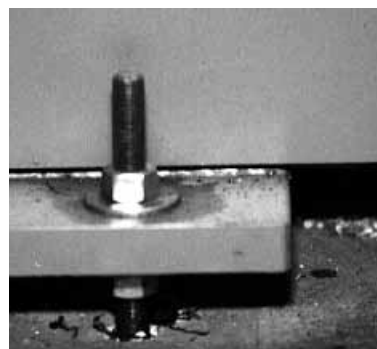
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PH00558-10-23-95

## Spreader Bar

TX00684-10-23-95



PH00558-10-23-95



# Operation



## 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 30 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.

TX00633-9-29-95



PH00510-9-7-95

## Control Valves

There are three pressure control valves on the operator's console that need to be adjusted. These control the facing, heating and fusing forces. Facing force is always set below 1,000 pounds. Heating and fusion forces are specified by the pipe manufacturer. The chart in the back of this manual allows the operator to determine the fusion force based on the required interfacial pressure, pipe O.D., pipe SDR, and joint miter angle.

TX00634-9-7-95



PH03107-10-31-05

## Adjusting Valves

The moveable table is equipped with an electronic load cell which indicates the actual force between the tables/jaws on a digital readout on the operator's console. The table has two force ranges. When the required force is less than 8,500 psi, put the "Carriage Force" selector in the low position. To set the force, rotate the facer into the area between the tables before the pipe is loaded. Bring the tables up against the facer rest buttons. If the pipe is already loaded, place a 4"x 4" wooden block between the tables to set the force. Holding the carriage control valve in the closed direction, adjust the appropriate control valve until the carriage force read-out indicates the required load. The operator has a selector valve 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 valve in the top position. To set the heating force, put the selector valve in the middle position. To set the fusion force, put the selector valve in the bottom position.

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

TX00635-9-7-95



PH03103-10-31-05



# Operation

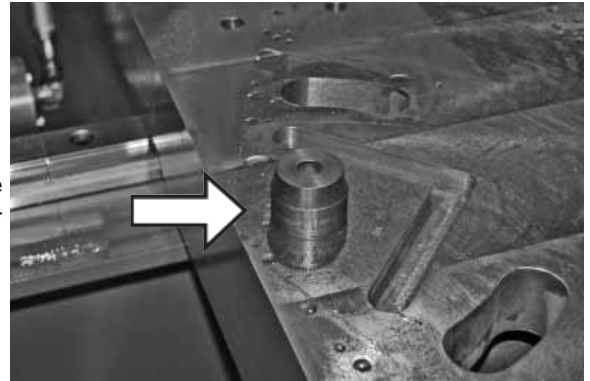


## Using the Miter Jaws to make Elbows and do Popping

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. Two 1-1/2" bolts and flat washers hold down the front of the table and are installed from under the table. One 1-1/8" bolt and flat washer locks the back of the jaw in place. The jaws can be set to make joints from 0° to 45°. Use the scale on the back of the jaw to 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.

Hydraulic hoses on the jaws connect to the power unit by means of quick disconnect fittings. These provide the hydraulic opening and closing.



PH03115-10-31-05

TX00636-9-7-95

## Changing Sizes

Inserts are used to fuse all pipe smaller than 630mm. Install the inserts that are required using the 1/2" capscrews in the upper and lower jaws. Use flat head capscrews in countersunk holes. Use socket head capscrews in counterbored holes.



PH03109-10-31-05

TX00637-9-7-95

## 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).



PH00529-9-20-95

TX00639-9-7-95



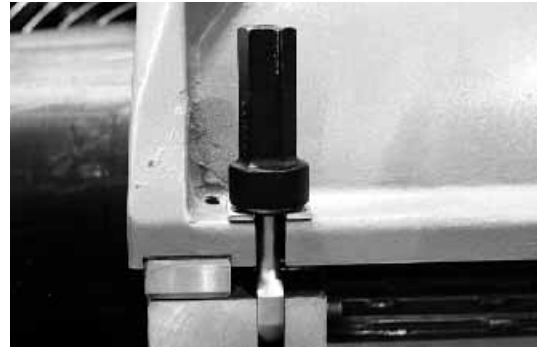
# Operation



## 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 bolt 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.

TX00663-9-29-95



PH00901-8-2-96

## 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

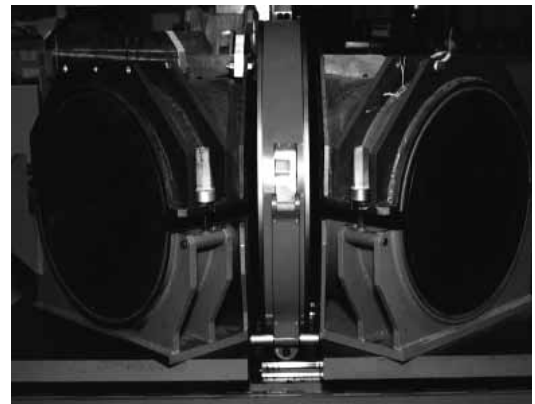


PH00531-9-20-95

## Facing

Open the carriage and start the facer motor with the Pendant Switch. Set the carriage to facing pressure. With the indexer in the neutral position bring the pipe ends up against the facer. Maintain facing pressure until all three pairs of restbuttons have bottomed out and facer is no longer cutting. Turn off the facer, then back the pipe off. Shift the indexer slightly so that the restbuttons can clear the pipe and rotate the facer to the home position. Ensure that both sections of pipe have a complete face off.

TX00641-9-7-95



PH00532-9-20-95



# Operation



## 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



PH03108-10-31-05

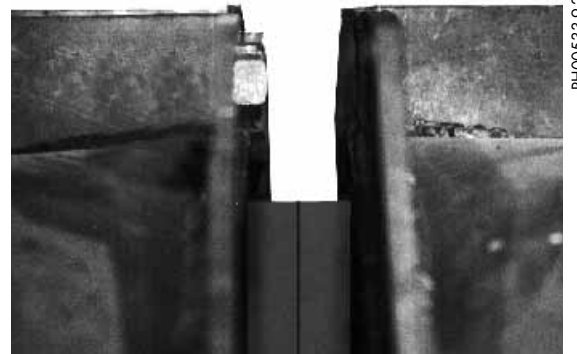
## Check Pipe Ends

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



PH00533-9-20-95

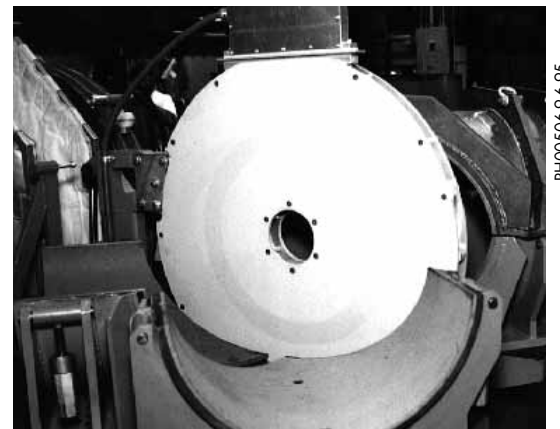
## Clean Heater Surfaces

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



PH00506-9-6-95



# Operation



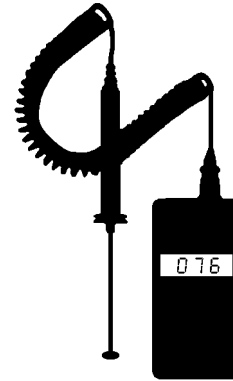
## Check Heater Temperature



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

Check heater surface temperature.

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



WR000774-16-93

**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 the indexer over until the heater lines up with the gap, then rotate the heater into the interface.

Shift the selector valve to facing pressure. Move the table to the left, 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.



PH017724-13-00

TX00643-9-7-95



# Operation



## Fusing the Pipe

At the end of the soak time shift the selector valve to the fusion position and back the pipe off the heater. Strip the heater using the indexing cylinder, rotate the heater using the indexing cylinder, rotate the heater to the home position and bring the pipe ends together to form the joint. Follow the pipe manufacturers parameters for cool time under pressure.

TX00644-9-7-95



PH00554-9-20-95

## 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.

TX00645-9-7-95



PH00902-8-2-96



# Dimensions



## Fabricated Elbow - Finished Imperial Dimensions made with the 630mm 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

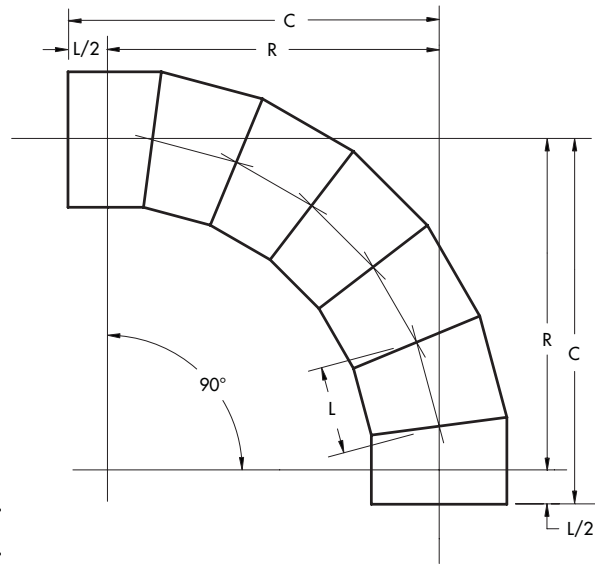
R = Elbow radius

All Lengths in inches

Dimensions for 7 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
8" IPS	13.42	49.78	43.56
10" IPS	13.56	50.38	44.09
12" IPS	13.69	50.95	44.59
14" IPS	13.77	51.30	44.90
16" IPS	13.90	51.87	45.40
18" IPS	14.04	52.43	45.90
20" IPS	14.17	53.00	46.40
22" IPS	14.30	53.56	46.90
24" IPS	14.43	54.13	47.40
630mm	14.48	54.36	47.60

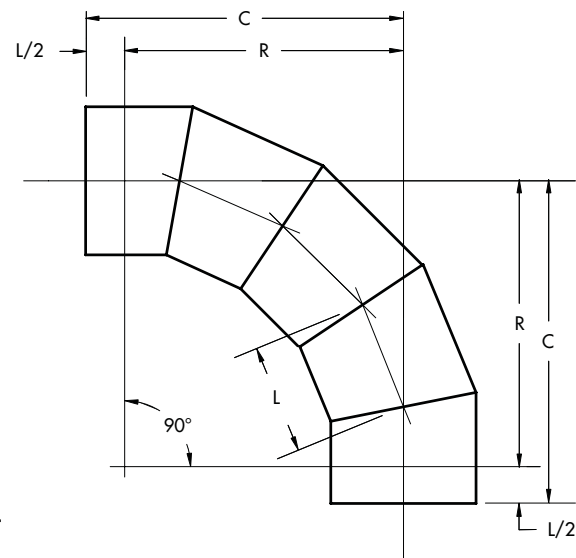


CD00699-3-01-06

Dimensions for 5 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 11 1/4 degrees

Pipe Size	L	C	R
8" IPS	13.72	35.96	29.59
10" IPS	13.97	36.60	30.12
12" IPS	14.13	37.20	30.62
14" IPS	14.26	37.57	30.93
16" IPS	14.45	38.17	31.43
18" IPS	14.65	38.77	31.93
20" IPS	14.85	39.37	32.43
22" IPS	15.05	39.97	32.93
24" IPS	15.25	40.57	33.43
630mm	15.33	40.81	33.63



CD00700-3-01-06



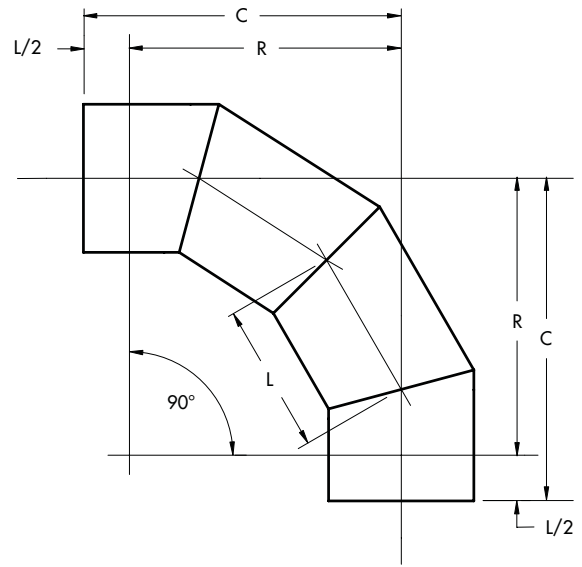
# Dimensions



Dimensions for 4 segment 90 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 15 degrees

Pipe Size	L	C	R
8" IPS	14.04	29.08	22.55
10" IPS	14.32	29.76	23.08
12" IPS	14.59	30.39	23.58
14" IPS	14.76	30.79	23.90
16" IPS	15.02	31.42	24.40
18" IPS	15.29	32.06	24.90
20" IPS	15.56	32.69	25.40
22" IPS	15.83	33.32	25.90
24" IPS	16.10	33.96	26.40
630mm	16.20	34.21	26.60

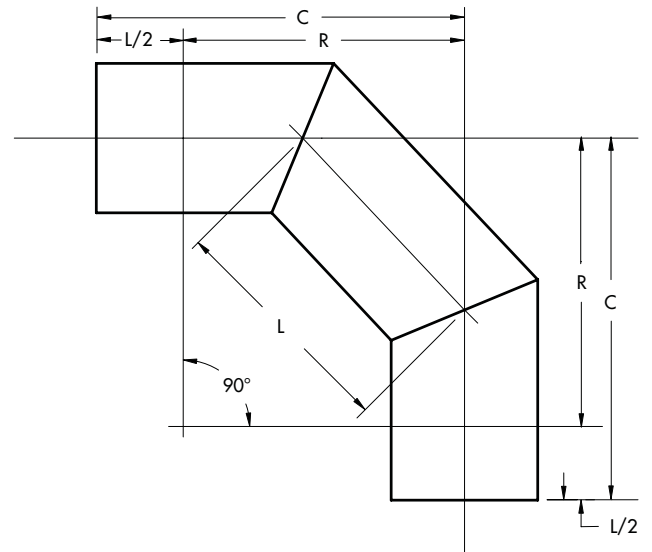


CD00701.3.01.06

Dimensions for 3 segment 90 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 22 1/2 degrees

Pipe Size	L	C	R
8" IPS	14.72	22.28	15.41
10" IPS	15.16	23.04	15.94
12" IPS	15.57	23.74	16.44
14" IPS	15.83	24.18	16.76
16" IPS	16.25	24.89	17.26
18" IPS	16.66	25.60	17.76
20" IPS	17.07	26.31	18.26
22" IPS	17.49	27.01	18.76
24" IPS	17.90	27.72	19.26
630mm	18.07	28.00	19.46

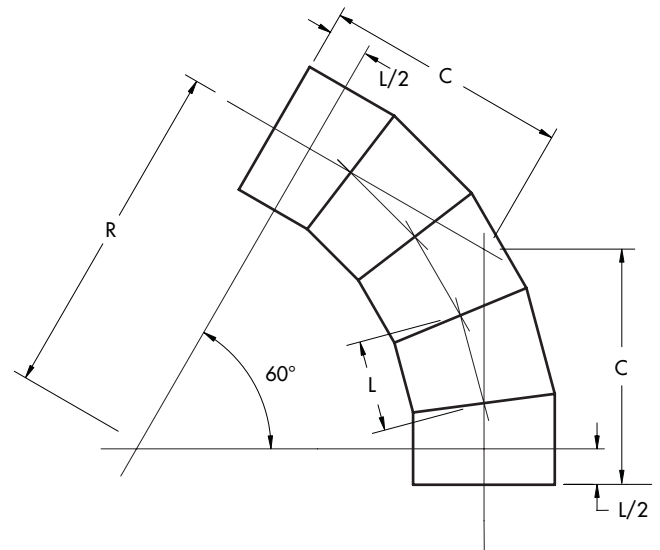


CD00702.3.01.06

Dimensions for 5 segment 60 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
8" IPS	13.42	31.37	43.56
10" IPS	13.56	31.75	44.09
12" IPS	13.69	32.10	44.59
14" IPS	13.77	32.32	44.90
16" IPS	13.90	32.68	45.40
18" IPS	14.04	33.03	45.90
20" IPS	14.17	33.39	46.40
22" IPS	14.30	33.74	46.90
24" IPS	14.43	34.10	47.40
630mm	14.48	34.24	47.60



CD00697.3.01.06



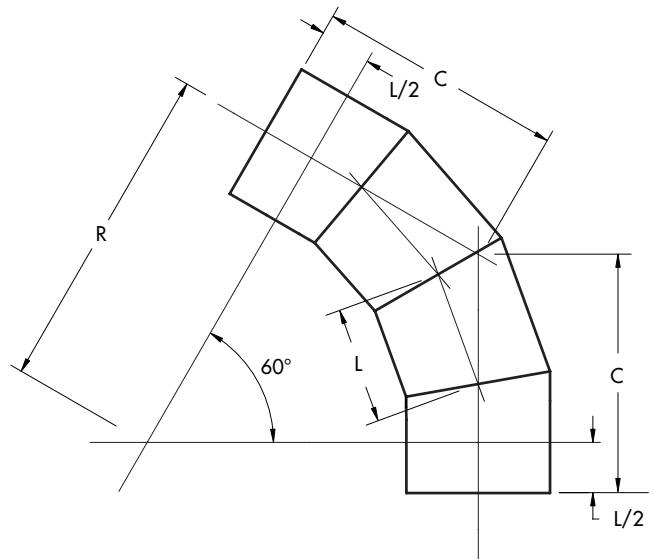
# Dimensions



Dimensions for 4 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 10 degrees

Pipe Size	L	C	R
8" IPS	13.62	25.43	33.09
10" IPS	13.81	25.83	33.62
12" IPS	13.98	26.20	34.12
14" IPS	14.09	26.44	34.43
16" IPS	14.27	26.82	34.93
18" IPS	14.45	27.19	35.43
20" IPS	14.62	27.57	35.93
22" IPS	14.80	27.95	36.43
24" IPS	14.97	28.32	36.93
630mm	15.05	28.47	37.13

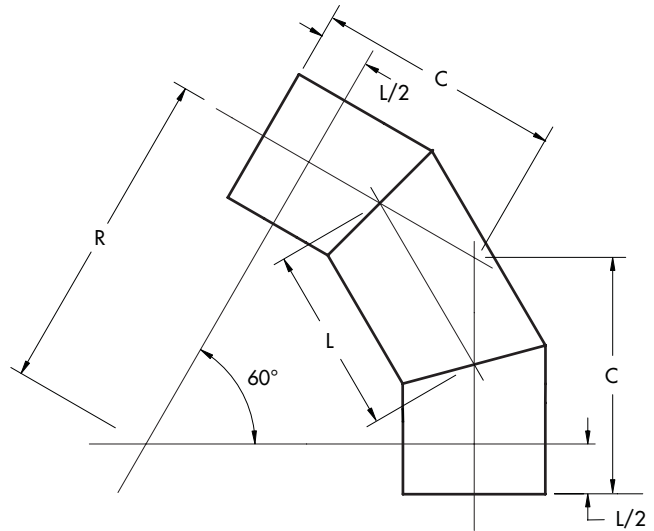


CD005696-3-01-06

Dimensions for 3 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 15 degrees

Pipe Size	L	C	R
8" IPS	14.04	19.55	22.55
10" IPS	14.32	20.00	23.08
12" IPS	14.59	20.42	23.58
14" IPS	14.76	20.69	23.90
16" IPS	15.02	21.11	24.40
18" IPS	15.29	21.53	24.90
20" IPS	15.56	21.96	25.40
22" IPS	15.83	22.38	25.90
24" IPS	16.10	22.80	26.40
630mm	16.20	22.97	26.60

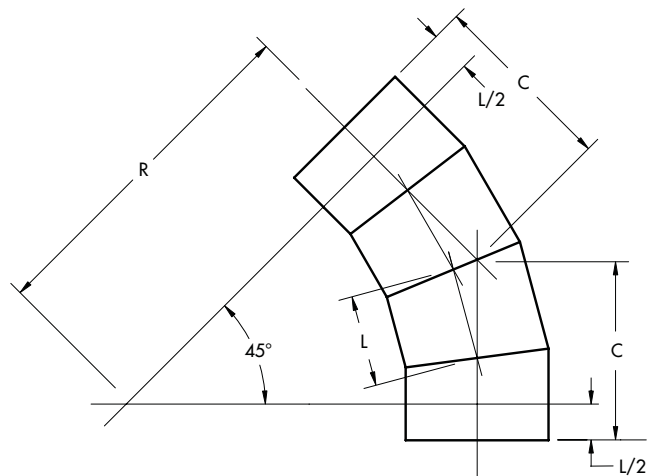


CD00698-3-01-06

Dimensions for 4 segment 45 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
8" IPS	13.42	24.26	43.56
10" IPS	13.56	24.55	44.09
12" IPS	13.69	24.83	44.59
14" IPS	13.77	25.00	44.90
16" IPS	13.90	25.27	45.40
18" IPS	14.04	25.54	45.90
20" IPS	14.17	25.82	46.40
22" IPS	14.30	26.09	46.90
24" IPS	14.43	26.36	47.40
630mm	14.48	26.47	47.60



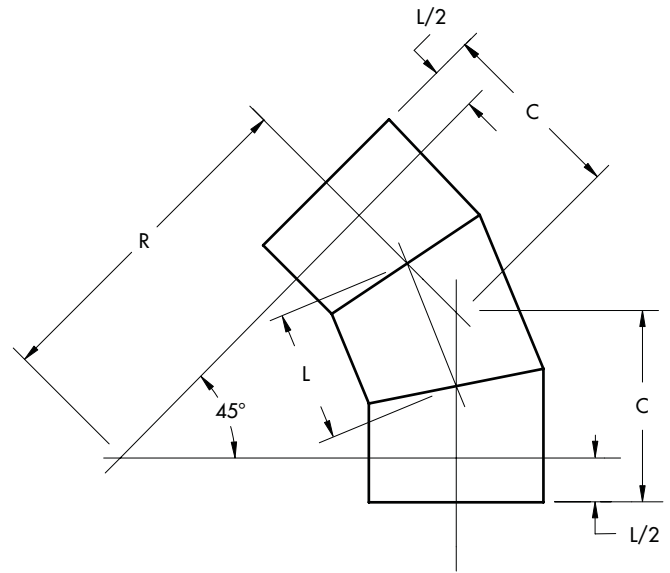
CD00693-3-01-06



# Dimensions

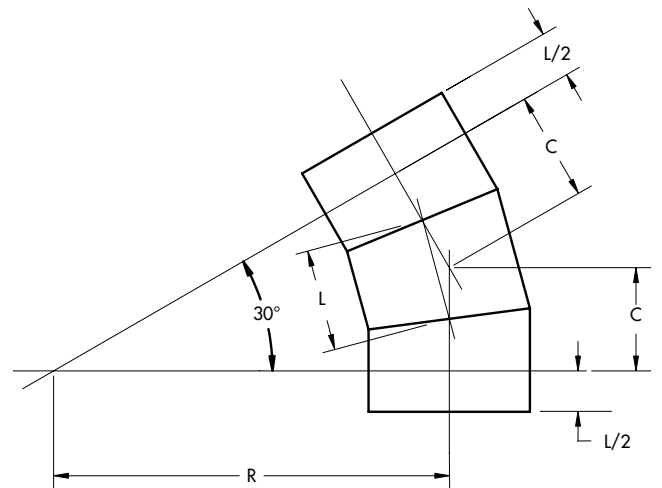


Dimensions for 3 segment 45 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 11 1/4 degrees			
Pipe Size	L	C	R
8" IPS	13.72	18.63	29.59
10" IPS	13.93	18.96	30.12
12" IPS	14.13	19.26	30.62
14" IPS	14.26	19.45	30.93
16" IPS	14.45	19.76	31.43
18" IPS	14.65	20.07	31.93
20" IPS	14.85	20.37	32.43
22" IPS	15.05	20.68	32.93
24" IPS	15.25	20.99	33.43
630mm	15.33	21.11	33.63



CD00694-3-01-06

Dimensions for 3 segment 30 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
8" IPS	13.42	17.89	43.56
10" IPS	13.56	18.11	44.09
12" IPS	13.69	18.31	44.59
14" IPS	13.77	18.43	44.90
16" IPS	13.90	18.63	45.40
18" IPS	14.04	18.83	45.90
20" IPS	14.17	19.03	46.40
22" IPS	14.30	19.23	46.90
24" IPS	14.43	19.43	47.40
630mm	14.48	19.51	47.60



CD00695-3-01-06



# Dimensions



## Fabricated Elbow - Finished Imperial Dimensions made with the 630mm 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

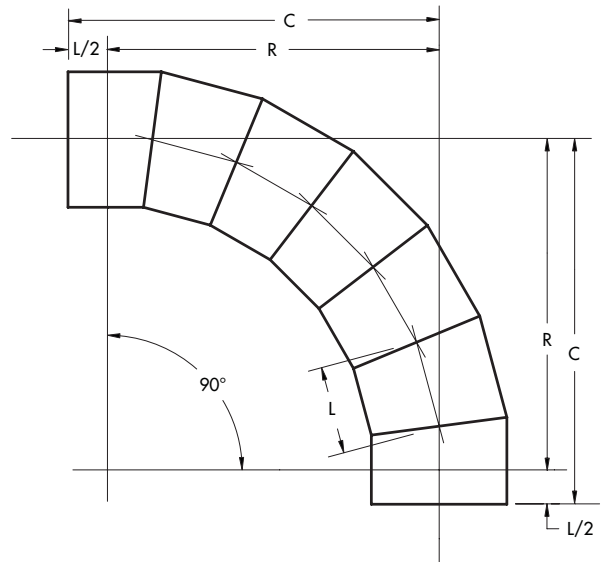
R = Elbow radius

All Lengths in inches

Dimensions for 7 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
8" DIPS	13.45	49.90	43.67
10" DIPS	13.58	50.48	44.18
12" DIPS	13.72	51.07	44.70
14" DIPS	13.86	51.67	45.23
16" DIPS	14.00	52.26	45.75
18" DIPS	14.14	52.86	46.28
20" DIPS	14.27	53.45	46.80
630mm	14.48	54.36	47.60

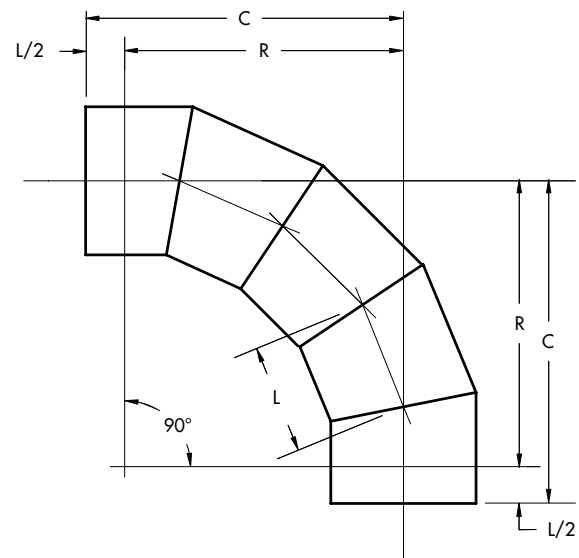


CD00699-3-01-06

Dimensions for 5 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 11 1/4 degrees

Pipe Size	L	C	R
8" DIPS	13.76	36.09	29.70
10" DIPS	13.97	36.70	30.21
12" DIPS	14.18	37.33	30.73
14" DIPS	14.39	37.96	31.26
16" DIPS	14.59	38.59	31.78
18" DIPS	14.80	39.22	32.31
20" DIPS	15.01	39.85	32.83
630mm	15.33	40.81	33.63



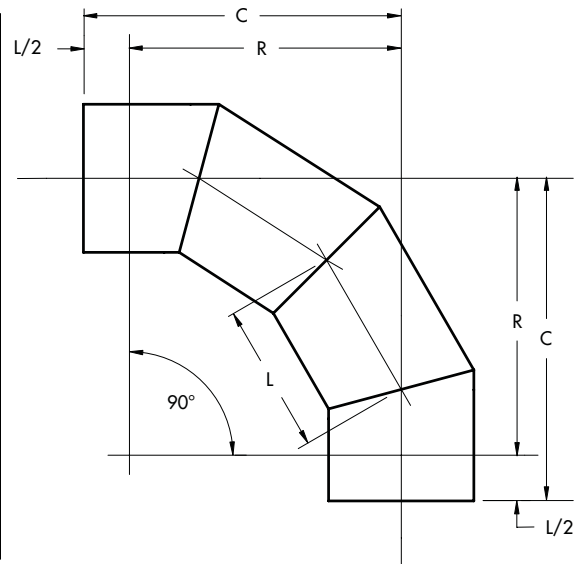
CD00700-3-01-06



# Dimensions

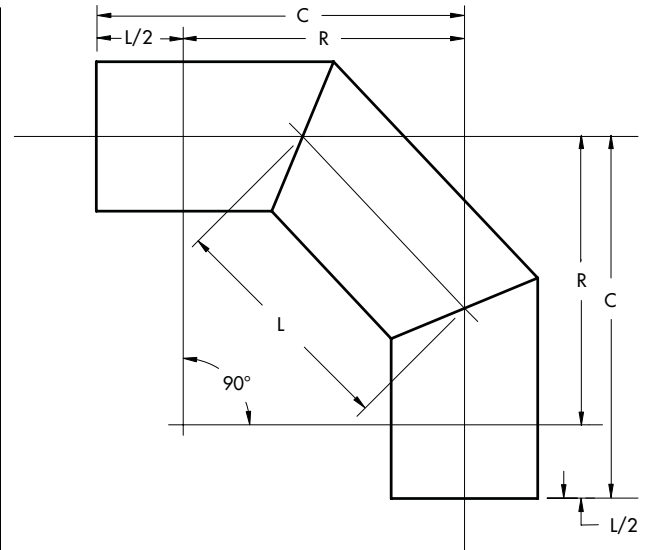


Dimensions for 4 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 15 degrees			
Pipe Size	L	C	R
8" DIPS	14.09	29.22	22.66
10" DIPS	14.37	29.87	23.17
12" DIPS	14.65	30.53	23.70
14" DIPS	14.93	31.20	24.22
16" DIPS	15.21	31.86	24.75
18" DIPS	15.49	32.53	25.27
20" DIPS	15.77	33.20	25.80
630mm	16.20	34.21	26.60



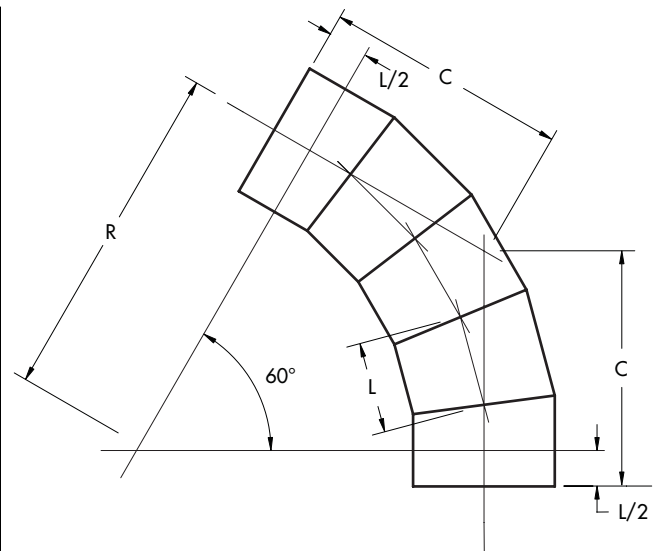
CD00701-3-01-06

Dimensions for 3 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 22 1/2 degrees			
Pipe Size	L	C	R
8" DIPS	14.81	22.44	15.52
10" DIPS	15.23	23.16	16.03
12" DIPS	15.67	23.90	16.56
14" DIPS	16.10	24.64	17.08
16" DIPS	16.54	25.39	17.61
18" DIPS	16.97	26.13	18.13
20" DIPS	17.41	26.87	18.66
630mm	18.07	28.00	19.46



CD00702-3-01-06

Dimensions for 5 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
8" DIPS	13.45	31.45	43.67
10" DIPS	13.58	31.81	44.18
12" DIPS	13.72	32.18	44.70
14" DIPS	13.86	32.55	45.23
16" DIPS	14.00	32.93	45.75
18" DIPS	14.14	33.30	46.28
20" DIPS	14.27	33.67	46.80
630mm	14.48	34.24	47.60



CD00697-3-01-06



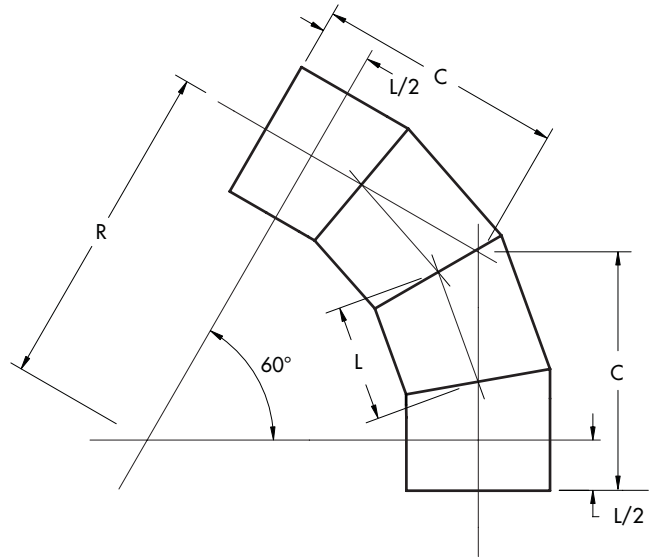
# Dimensions



Dimensions for 4 segment 60 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 10 degrees

Pipe Size	L	C	R
8" DIPS	13.66	25.51	33.20
10" DIPS	13.84	25.89	33.71
12" DIPS	14.02	26.29	34.23
14" DIPS	14.21	26.68	34.76
16" DIPS	14.39	27.08	35.28
18" DIPS	14.58	27.48	35.81
20" DIPS	14.76	27.87	36.33
630mm	15.05	28.47	37.13

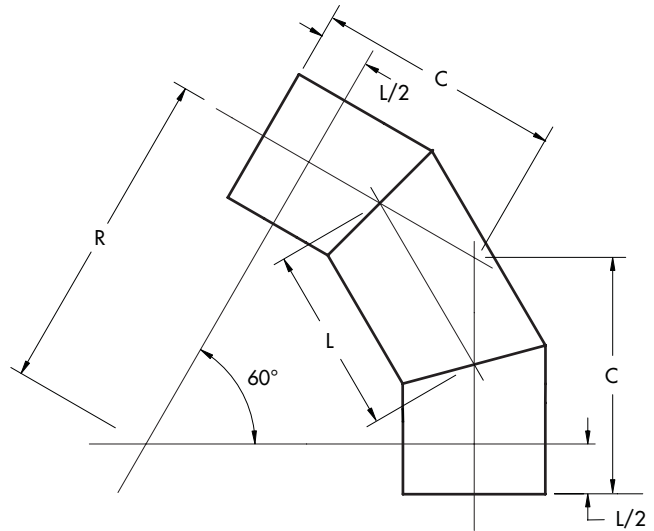


CD005696-3-01-06

Dimensions for 3 segment 60 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 15 degrees

Pipe Size	L	C	R
8" DIPS	14.09	19.64	22.66
10" DIPS	14.37	20.07	23.17
12" DIPS	14.65	20.52	23.70
14" DIPS	14.93	20.96	24.22
16" DIPS	15.21	21.41	24.75
18" DIPS	15.49	21.85	25.27
20" DIPS	15.77	22.29	25.80
630mm	16.20	22.97	26.60

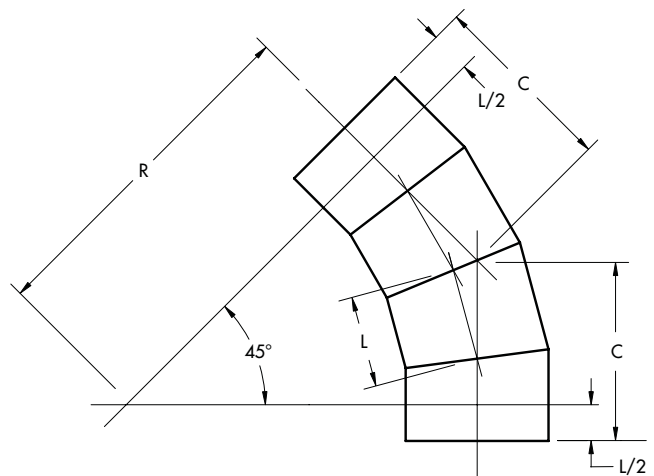


CD00698-3-01-06

Dimensions for 4 segment 45 degree elbows  
fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
8" DIPS	13.45	24.32	43.67
10" DIPS	13.58	24.60	44.18
12" DIPS	13.72	24.89	44.70
14" DIPS	13.86	25.18	45.23
16" DIPS	14.00	25.46	45.75
18" DIPS	14.14	25.75	46.28
20" DIPS	14.27	26.04	46.80
630mm	14.48	26.47	47.60



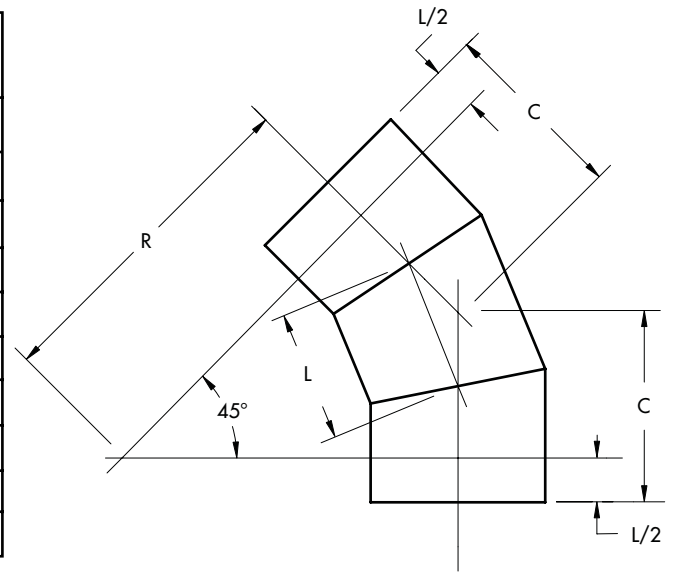
CD00693-3-01-06



# Dimensions

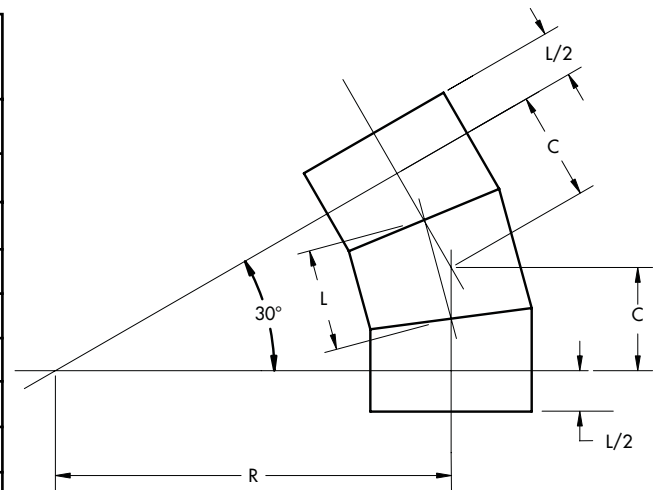


Dimensions for 3 segment 45 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 11 1/4 degrees			
Pipe Size	L	C	R
8" DIPS	13.76	18.70	29.70
10" DIPS	13.97	19.01	30.21
12" DIPS	14.18	19.33	30.73
14" DIPS	14.39	19.65	31.26
16" DIPS	14.59	19.97	31.78
18" DIPS	14.80	20.30	32.31
20" DIPS	15.01	20.62	32.83
630mm	15.33	21.11	33.63



CD006943-01-06

Dimensions for 3 segment 30 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
8" DIPS	13.45	17.94	43.67
10" DIPS	13.58	18.14	44.18
12" DIPS	13.72	18.35	44.70
14" DIPS	13.86	18.56	45.23
16" DIPS	14.00	18.77	45.75
18" DIPS	14.14	18.98	46.28
20" DIPS	14.27	19.19	46.80
630mm	14.48	19.51	47.60



CD00695-3-01-06



# Dimensions



## Fabricated Elbow - Finished Metric Dimensions made with the 630mm 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

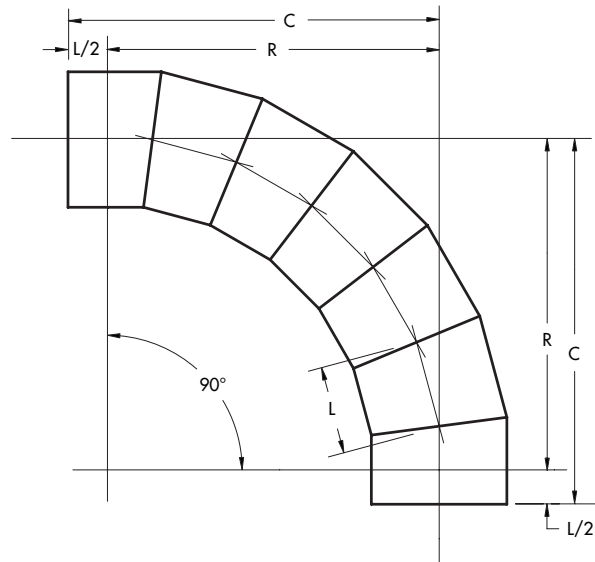
R = Elbow radius

All Lengths in mm

Dimensions for 7 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 7 1/2 degrees

Pipe Size	L	C	R
280 mm	345	1282	1122
315 mm	347	1292	1130
355 mm	350	1303	1140
400 mm	353	1316	1152
450 mm	356	1330	1164
500 mm	359	1344	1177
560 mm	363	1361	1192
630 mm	368	1381	1209

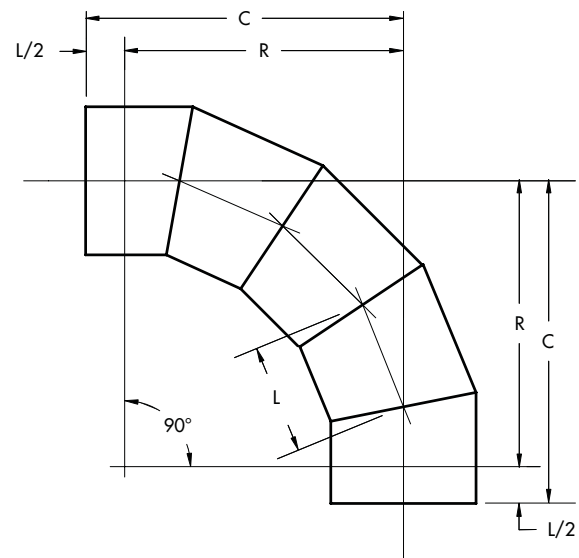


CD00699-3-01-06

Dimensions for 5 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit

Miter angle = 11 1/4 degrees

Pipe Size	L	C	R
280 mm	355	932	767
315 mm	358	942	776
355 mm	362	954	786
400 mm	367	968	797
450 mm	371	983	809
500 mm	376	998	822
560 mm	382	1016	837
630 mm	389	1037	854



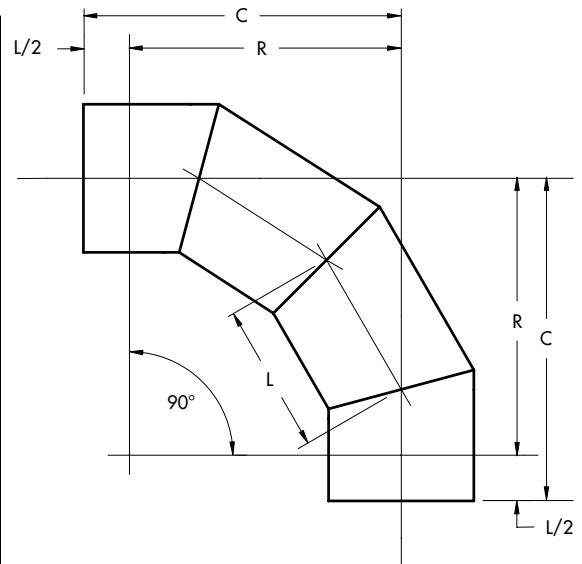
CD00700-3-01-06



# Dimensions

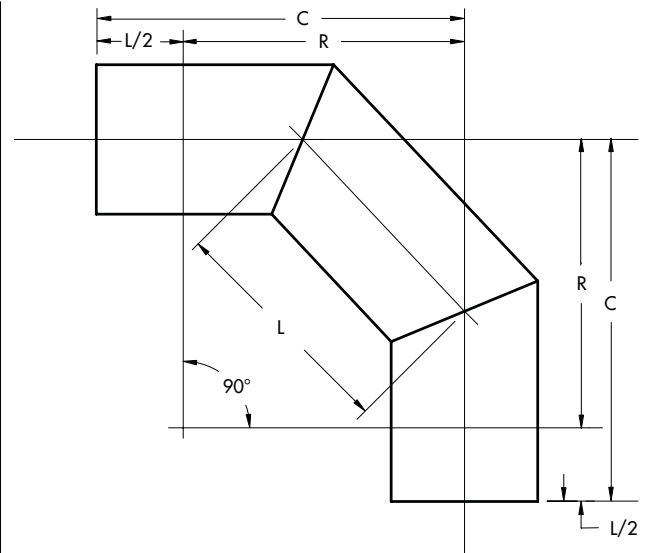


Dimensions for 4 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 15 degrees			
Pipe Size	L	C	R
280 mm	365	758	588
315 mm	369	769	597
355 mm	375	782	607
400 mm	381	796	618
450 mm	387	812	631
500 mm	394	828	643
560 mm	402	847	658
630 mm	412	869	676



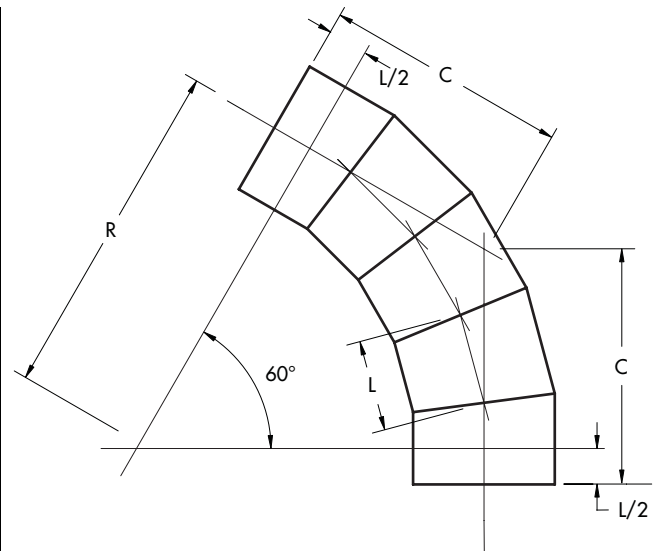
CD00701-3-01-06

Dimensions for 3 segment 90 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 22 1/2 degrees			
Pipe Size	L	C	R
280 mm	386	588	407
315 mm	394	600	415
355 mm	402	614	425
400 mm	411	630	437
450 mm	422	648	449
500 mm	432	665	462
560 mm	444	687	477
630 mm	459	711	494



CD00702-3-01-06

Dimensions for 5 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
280 mm	345	808	1122
315 mm	347	814	1130
355 mm	350	821	1140
400 mm	353	829	1152
450 mm	356	838	1164
500 mm	359	847	1177
560 mm	363	857	1192
630 mm	368	870	1209



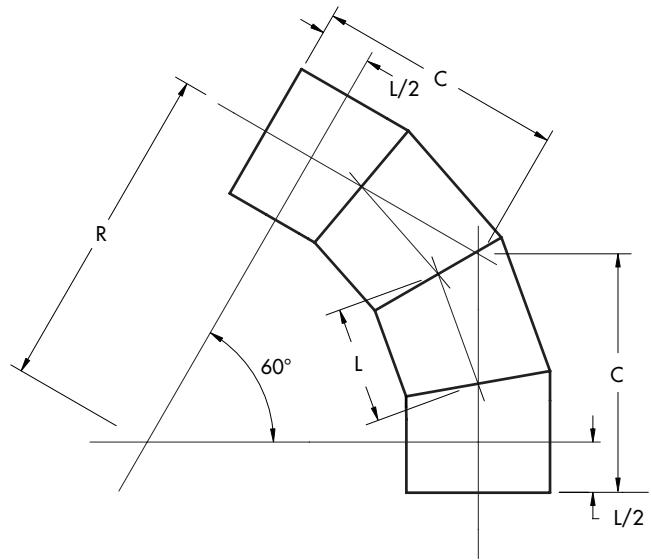
CD00697-3-01-06



# Dimensions

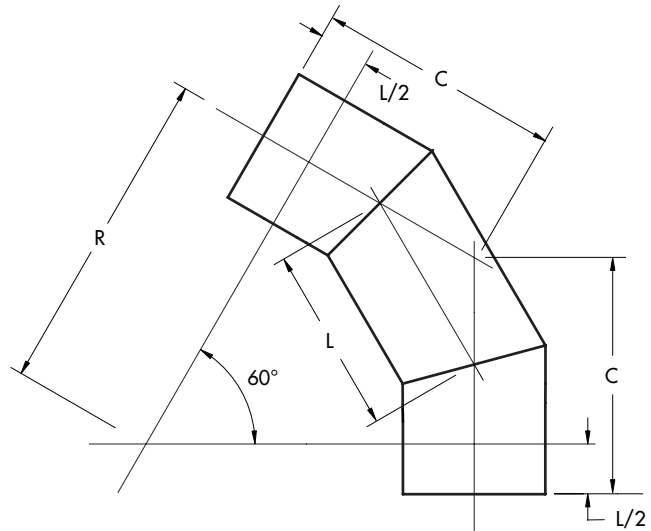


Dimensions for 4 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 10 degrees			
Pipe Size	L	C	R
280 mm	351	657	856
315 mm	354	664	864
355 mm	358	671	874
400 mm	362	680	886
450 mm	366	689	898
500 mm	371	699	911
560 mm	376	710	926
630 mm	382	723	943



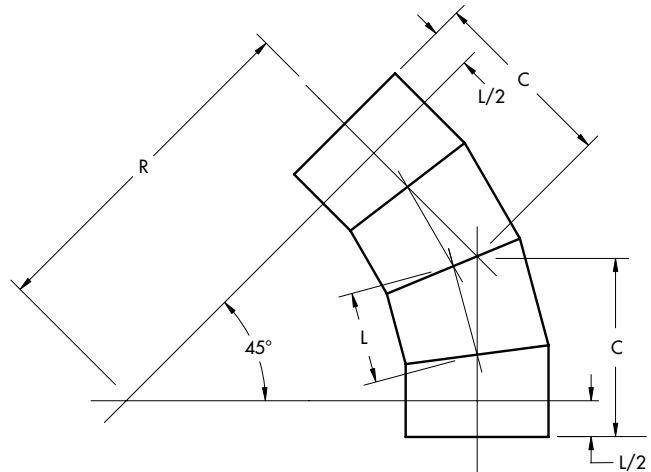
CD005696-3-01-06

Dimensions for 3 segment 60 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 15 degrees			
Pipe Size	L	C	R
280 mm	365	509	588
315 mm	369	517	597
355 mm	375	525	607
400 mm	381	535	618
450 mm	387	545	631
500 mm	394	556	643
560 mm	402	569	658
630 mm	412	583	676



CD00698-3-01-06

Dimensions for 4 segment 45 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
280 mm	345	625	1122
315 mm	347	629	1130
355 mm	350	635	1140
400 mm	353	641	1152
450 mm	356	648	1164
500 mm	359	655	1177
560 mm	363	663	1192
630 mm	368	672	1209



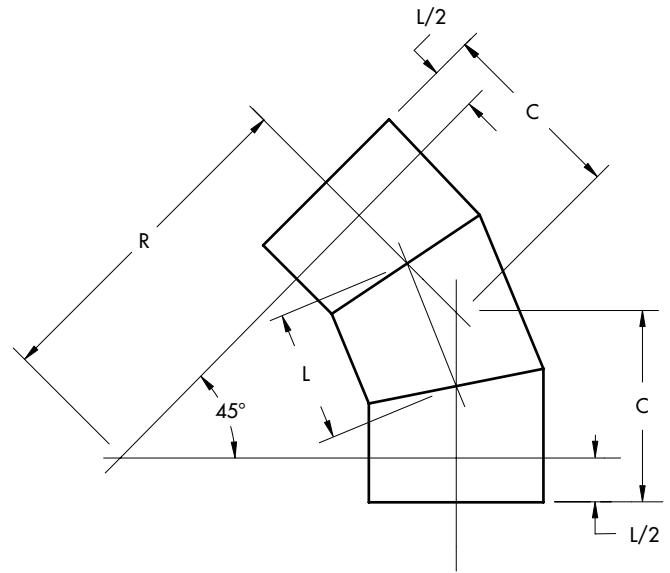
CD00693-3-01-06



# Dimensions

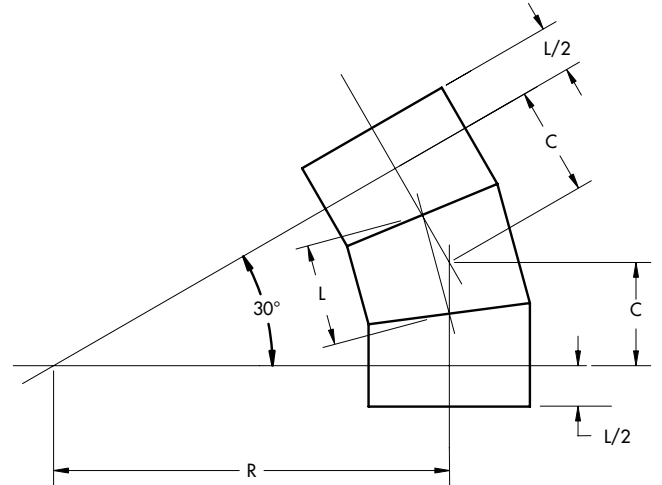


Dimensions for 3 segment 45 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 11 1/4 degrees			
Pipe Size	L	C	R
280 mm	355	483	767
315 mm	358	488	776
355 mm	362	494	786
400 mm	367	501	797
450 mm	371	509	809
500 mm	376	516	822
560 mm	382	525	837
630 mm	389	536	854

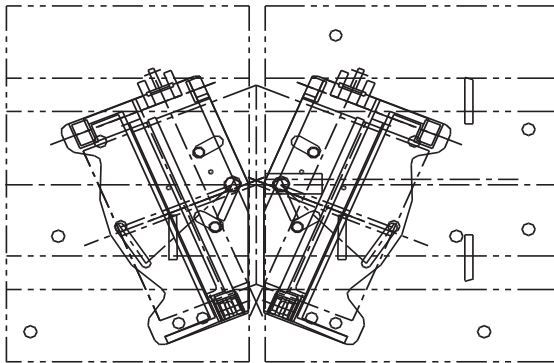


CD00694-3-01-06

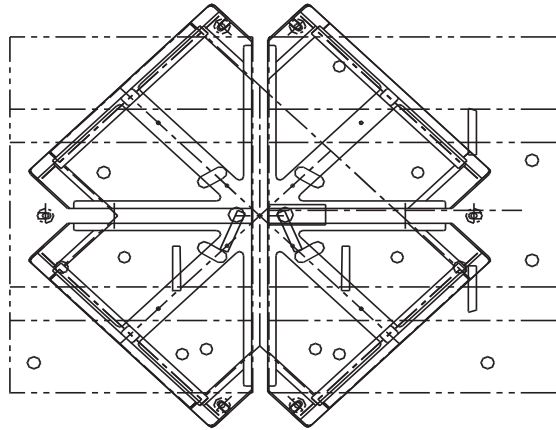
Dimensions for 3 segment 30 degree elbows fabricated with the 630mm Fabricated fitting unit			
Miter angle = 7 1/2 degrees			
Pipe Size	L	C	R
280 mm	345	461	1122
315 mm	347	464	1130
355 mm	350	468	1140
400 mm	353	473	1152
450 mm	356	478	1164
500 mm	359	483	1177
560 mm	363	489	1192
630 mm	368	496	1209



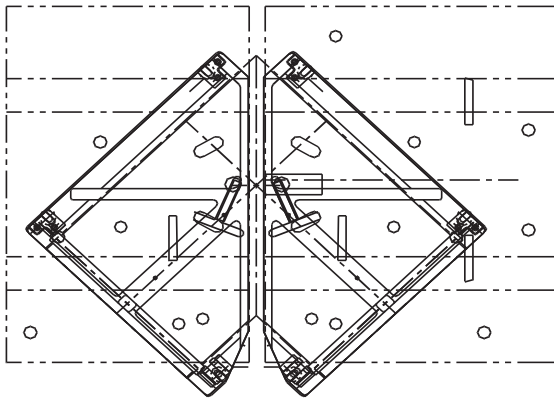
CD00695-3-01-06



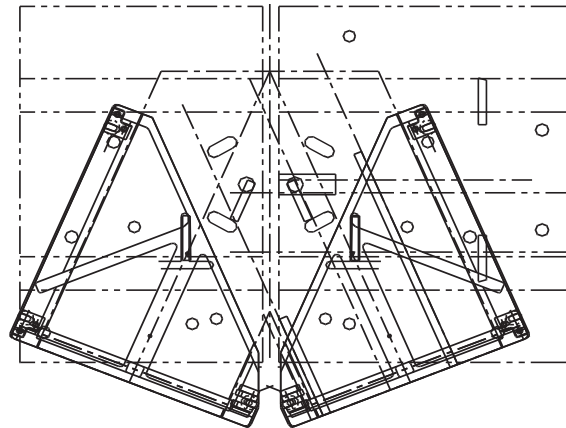
MITER JAWS



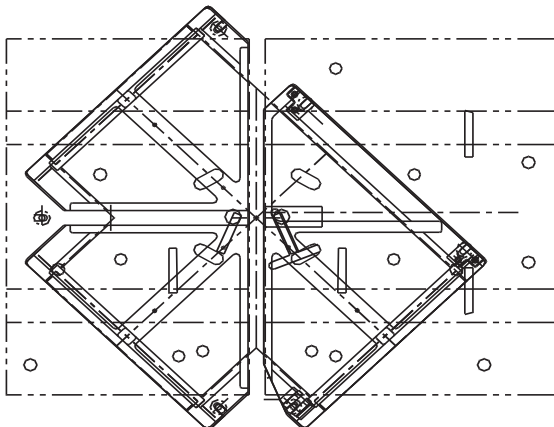
CROSS - THIRD JOINT



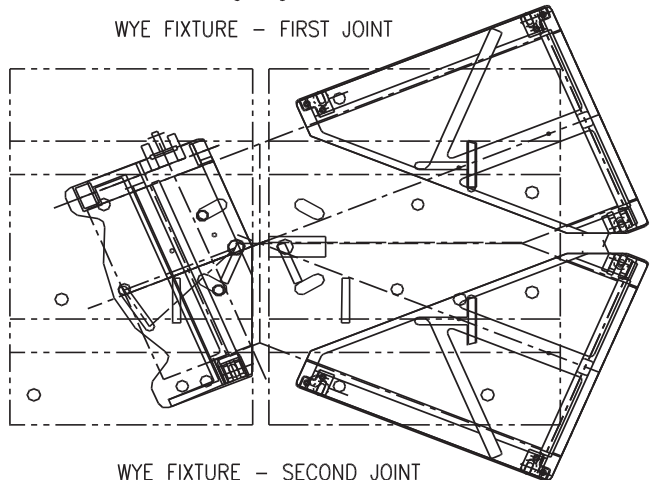
TEE FIXTURE - FIRST JOINT



WYE FIXTURE - FIRST JOINT



TEE FIXTURE - SECOND JOINT



WYE FIXTURE - SECOND JOINT

CD00317-8-2-96



# Carriage Force Formula



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

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

**Interfacial area X Recommended interfacial pressure + Carriage drag force (175lbs/80kg) = Carriage force setting**

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

Always use the pipe manufacturer's recommended interfacial pressure.

### For Example:

For 355 DR 11 pipe to be fused on a 15 degree miter angle at 5.28 kg/cm<sup>2</sup>

$$339\text{cm}^2 \times 5.28 = \mathbf{1789 \text{ kg}}$$

Therefore, in the fusion mode, you would set the carriage to **1789** kg on the digital display.

For 14" SDR 11 pipe to be fused on a 15 degree miter angle at 75 psi

$$53 \text{ in}^2 \times 75 \text{ psi} = \mathbf{3975 \text{ psi}}$$

Therefore, in the fusion mode, you would set the carriage to **3975** lbs on the digital display.

### For Ells and Tees

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

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

Where:

OD = outside diameter of the pipe

ID = inside diameter of the pipe

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

### For Wyes

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

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

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 Example:

If your pipe has an OD of **40** centimeters and an ID of **32.7** centimeters and you want to make a tee at 45 degrees

$$\frac{[(40\text{cm})^2 - (32.7\text{cm})^2] \times .785}{\cos(45^\circ)} = 589 \text{ cm}^2$$

You would then enter 589 square centimeters and the recommended interfacial pressure in the equation above to find the required carriage force.

If your pipe has an OD of **16** inches and an ID of **13.1** inches and you want to make a tee at 45 degrees

$$\frac{[(16\text{in})^2 - (13.1\text{in})^2] \times .785}{\cos(45^\circ)} = 93.7 \text{ in}^2$$

You would then enter 93.7 square inches and the recommended interfacial pressure in the equation above to find the required carriage force. TX02547-10-31-05



# Pipe Interfacial Area in in<sup>2</sup>



## Pipe Interface Area in in<sup>2</sup> for IPS Pipe Sizes- 630mm FAB. Fitting Unit

### 8 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.23	29	29	29	29	30	31	40	37
9	0.96	23	23	23	24	24	25	33	30
11	0.78	19	19	19	20	20	21	27	25
17	0.51	13	13	13	13	13	14	18	17
19	0.45	12	12	12	12	12	13	16	15
21	0.41	11	11	11	11	11	11	15	14
26	0.33	9	9	9	9	9	9	12	11

### 10 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.54	44	45	45	45	46	48	63	58
9	1.19	36	36	36	37	37	39	51	47
11	0.98	30	30	30	31	31	32	42	39
17	0.63	20	20	20	21	21	22	28	26
19	0.57	18	18	18	18	19	20	26	24
21	0.51	16	17	17	17	17	18	23	22
26	0.41	13	14	14	14	14	15	19	18

### 12 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.82	63	63	63	64	65	68	88	82
9	1.42	50	51	51	51	52	55	71	66
11	1.16	42	43	43	43	44	46	60	55
17	0.75	28	29	29	29	29	31	40	37
19	0.67	25	26	26	26	26	28	36	33
21	0.61	23	23	23	24	24	25	33	30
26	0.49	19	19	19	19	20	20	27	25

### 14 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.00	75	76	76	77	78	82	107	99
9	1.56	61	61	61	62	63	66	86	79
11	1.27	51	51	51	52	53	55	72	66
17	0.82	34	34	34	35	35	37	48	45
19	0.74	31	31	31	31	32	33	43	40
21	0.67	28	28	28	28	29	30	39	36
26	0.54	23	23	23	23	24	25	32	30



# Pipe Interfacial Area in in<sup>2</sup>



## 16 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.29	98	99	99	100	102	107	139	129
9	1.78	79	80	80	81	82	86	112	104
11	1.45	66	67	67	68	69	72	94	87
17	0.94	45	45	45	45	46	48	63	58
19	0.84	40	40	40	41	42	43	57	52
21	0.76	36	37	37	37	38	39	52	48
26	0.62	30	30	30	30	31	32	42	39

## 18 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.57	125	126	126	127	129	135	176	163
9	2.00	101	101	101	103	104	109	142	131
11	1.64	84	85	85	86	87	91	119	110
17	1.06	56	57	57	57	58	61	80	74
19	0.95	51	51	51	52	53	55	72	66
21	0.86	46	47	47	47	48	50	65	60
26	0.69	38	38	38	38	39	41	53	49

## 20 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.86	154	155	155	157	159	167	218	201
9	2.22	124	125	125	127	128	134	176	162
11	1.82	104	105	105	106	108	112	147	136
17	1.18	70	70	70	71	72	75	98	91
19	1.05	63	63	63	64	65	68	89	82
21	0.95	57	57	57	58	59	62	81	74
26	0.77	46	47	47	47	48	50	66	61

## 22 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	3.14	186	188	188	190	193	202	263	243
9	2.44	150	151	151	153	155	163	212	196
11	2.00	126	127	127	128	130	136	178	164
17	1.29	84	85	85	86	87	91	119	110
19	1.16	76	76	76	77	78	82	107	99
21	1.05	69	70	70	70	71	75	98	90
26	0.85	56	57	57	57	58	61	80	73



# Pipe Interfacial Area in in<sup>2</sup>



## 24 in IPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	3.43	222	223	223	226	229	240	313	290
9	2.67	179	180	180	182	185	193	253	234
11	2.18	150	151	151	152	155	162	211	195
17	1.41	100	101	101	102	104	108	142	131
19	1.26	90	91	91	92	93	98	128	118
21	1.14	82	83	83	84	85	89	116	107
26	0.92	67	67	67	68	69	72	95	87



# Pipe Interfacial Area in in<sup>2</sup>



## Pipe Interface Area in in<sup>2</sup> for DIPS Pipe Sizes- 630mm FAB. Fitting Unit

### 8 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.29	32	32	32	32	33	34	45	41
9	1.01	25	26	26	26	26	28	36	33
11	0.82	21	21	21	22	22	23	30	28
17	0.53	14	14	14	15	15	15	20	19
19	0.48	13	13	13	13	13	14	18	17
21	0.43	12	12	12	12	12	13	17	15
26	0.35	10	10	10	10	10	10	13	12

### 10 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.59	47	48	48	48	49	51	67	62
9	1.23	38	39	39	39	40	41	54	50
11	1.01	32	32	32	33	33	35	45	42
17	0.65	21	22	22	22	22	23	30	28
19	0.58	19	19	19	20	20	21	27	25
21	0.53	18	18	18	18	18	19	25	23
26	0.43	14	14	14	15	15	15	20	19

### 12 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	1.89	67	68	68	68	69	73	95	88
9	1.47	54	55	55	55	56	59	76	71
11	1.20	45	46	46	46	47	49	64	59
17	0.78	30	31	31	31	31	33	43	40
19	0.69	27	28	28	28	28	30	39	36
21	0.63	25	25	25	25	26	27	35	32
26	0.51	20	20	20	21	21	22	29	26

### 14 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.19	90	91	91	92	93	97	127	118
9	1.70	73	73	73	74	75	79	103	95
11	1.39	61	61	61	62	63	66	86	79
17	0.90	41	41	41	42	42	44	58	53
19	0.81	37	37	37	37	38	40	52	48
21	0.73	33	34	34	34	35	36	47	44
26	0.59	27	27	27	28	28	29	38	36



# Pipe Interfacial Area in in<sup>2</sup>



## 16 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.49	116	117	117	119	121	126	165	152
9	1.93	94	95	95	96	97	102	133	123
11	1.58	79	79	79	80	81	85	111	103
17	1.02	53	53	53	54	55	57	74	69
19	0.92	47	48	48	48	49	51	67	62
21	0.83	43	44	44	44	45	47	61	56
26	0.67	35	35	35	36	36	38	50	46

## 18 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	2.79	146	148	148	149	151	158	207	191
9	2.17	118	119	119	120	122	128	167	154
11	1.77	99	100	100	101	102	107	140	129
17	1.15	66	67	67	67	68	72	94	86
19	1.03	60	60	60	61	62	64	84	78
21	0.93	54	55	55	55	56	59	77	71
26	0.75	44	45	45	45	46	48	62	58

## 20 in DIPS PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	3.09	179	181	181	183	186	194	254	234
9	2.40	145	146	146	148	150	157	205	189
11	1.96	121	122	122	123	125	131	171	158
17	1.27	81	82	82	83	84	88	115	106
19	1.14	73	74	74	75	76	79	103	95
21	1.03	66	67	67	68	69	72	94	87
26	0.83	54	55	55	55	56	59	77	71



# Pipe Interfacial Area in cm<sup>2</sup>



## Pipe Interface Area in cm<sup>2</sup> - 630mm FAB. Fitting Unit

### 280 mm O.D. PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	40.00	302	304	304	308	312	326	427	394
9	31.11	243	245	245	248	252	263	344	318
11	25.46	204	205	205	208	211	220	288	266
17	16.47	136	138	138	139	141	148	193	178
19	14.74	123	124	124	125	127	133	174	160
21	13.33	112	113	113	114	116	121	158	146
26	10.77	91	92	92	93	94	99	129	119

### 315 mm O.D. PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	45.00	382	385	385	389	395	413	540	499
9	35.00	308	311	311	314	319	333	435	402
11	28.64	258	260	260	263	267	279	364	337
17	18.53	173	174	174	176	179	187	244	226
19	16.58	155	157	157	158	161	168	220	203
21	15.00	141	143	143	144	146	153	200	185
26	12.12	115	116	116	118	119	125	163	151

### 355 mm O.D. PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	50.71	485	489	489	494	502	525	686	633
9	39.44	391	394	394	399	405	423	553	511
11	32.27	327	330	330	334	339	354	463	427
17	20.88	219	221	221	223	227	237	310	286
19	18.68	197	199	199	201	204	214	279	258
21	16.90	180	181	181	183	186	194	254	235
26	13.65	146	148	148	149	152	158	207	191

### 400 mm O.D. PIPE

SDR	WALL	MITER ANGLE						TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°		
7	57.14	615	621	621	628	637	666	870	804
9	44.44	496	501	501	506	514	537	702	649
11	36.36	415	419	419	424	430	450	587	543
17	23.53	278	281	281	284	288	301	394	364
19	21.05	251	253	253	256	259	271	354	327
21	19.05	228	230	230	232	236	247	322	298
26	15.38	186	187	187	190	192	201	263	243



# Pipe Interfacial Area in cm<sup>2</sup>



## 450 mm O.D. PIPE

SDR	WALL	MITER ANGLE							TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°			
7	64.29	779	786	786	794	807	843	1102	1018	
9	50.00	628	634	634	641	651	680	889	821	
11	40.91	526	530	530	536	544	569	744	687	
17	26.47	352	355	355	359	365	381	498	460	
19	23.68	317	320	320	323	328	343	449	414	
21	21.43	289	291	291	294	299	312	408	377	
26	17.31	235	237	237	240	244	255	333	307	

## 500 mm O.D. PIPE

SDR	WALL	MITER ANGLE							TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°			
7	71.43	962	970	970	981	996	1041	1360	1257	
9	55.56	776	782	782	791	803	840	1097	1013	
11	45.45	649	655	655	662	672	703	918	848	
17	29.41	435	439	439	443	450	471	615	568	
19	26.32	392	395	395	399	405	424	554	512	
21	23.81	356	359	359	363	369	386	504	465	
26	19.23	290	293	293	296	301	314	411	380	

## 560 mm O.D. PIPE

SDR	WALL	MITER ANGLE							TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°			
7	80.00	1206	1217	1217	1230	1249	1306	1706	1576	
9	62.22	973	981	981	992	1007	1053	1376	1271	
11	50.91	814	821	821	830	843	881	1151	1064	
17	32.94	545	550	550	556	565	590	771	713	
19	29.47	491	495	495	501	509	532	695	642	
21	26.67	447	451	451	456	463	484	632	584	
26	21.54	364	367	367	371	377	394	515	476	

## 630 mm O.D. PIPE

SDR	WALL	MITER ANGLE							TEE	WYE
		0°	7.5°	10°	11.25°	15°	22.5°			
7	89.99	1526	1540	1540	1556	1580	1652	2159	1994	
9	69.99	1231	1242	1242	1255	1275	1333	1741	1609	
11	57.27	1030	1039	1039	1050	1067	1115	1457	1346	
17	37.05	690	696	696	704	714	747	976	902	
19	33.15	622	627	627	634	643	673	879	812	
21	30.00	565	570	570	576	585	612	800	739	
26	24.23	461	465	465	470	477	499	652	602	



# Fabricating a Tee

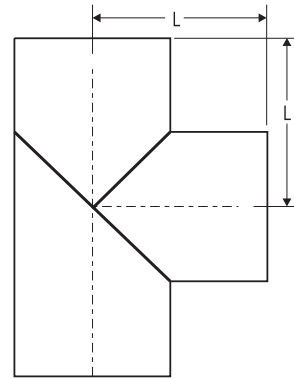


## Fabricating a Tee

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



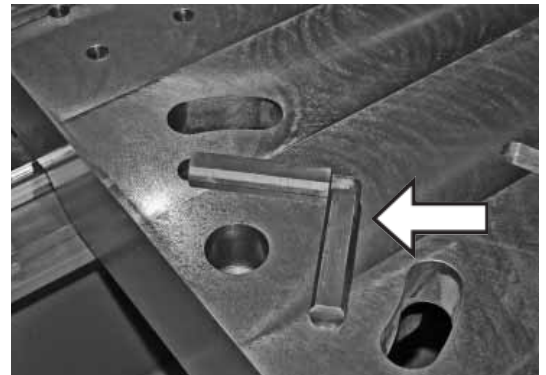
CD00577-4-4-00

## Install Tee Fixtures

Mount the long tee fixtures on each table so that the beveled edge is exactly flush with the front of the table.

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

TX01056-8-2-96

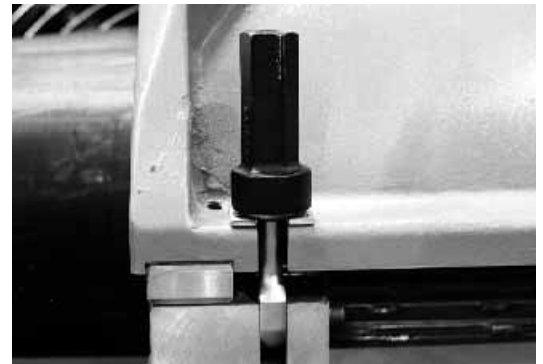


PH03116-10-31-05

## Clamp Pipe in Place

Clamp the pipe securely to prevent slipping. There are two clamp knobs on the long side of the fixtures. They are adjacent to alignment blocks which serve as a pivot for the upper fixture. Tighten the long side of the fixture down to the alignment blocks first, then tighten the single clamp knob to hold the pipe

TX01057-8-2-96



PH00901-9-11-95

## Face the Pipe

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

**NOTICE:** Do not exceed 500 lbs/230 kg of carriage force during facing. Excessive force can cause a bad face-off.

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.

TX02546-10-31-05



PH01764-4-13-00



# Fabricating a Tee



## 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



PH00533-9-29-95

## Select Force Range

When a good face-off is completed, place a 4x4 between the tables to set the carriage force. Select fusion pressure and bring the tables in against the wood. If the required force is less than 9000 lbs/4100 kg, select the low force range with the selector switch on the control panel. Adjust the fusion pressure reducing valve until the force is correct for the pipe diameter and DR to be fused at a 45° miter. This adjustment will only need to be made for the first joint. The second joint as well as additional tees will use the same settings.

TX2545-10-31-05

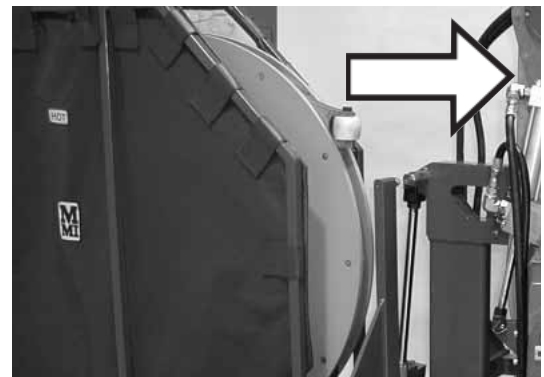


PH03103-10-31-05

## Rotate Heater In

Remove the 4x4 and rotate the heater into position. If the heater will not rotate in, it is not in the acceptable temperature range. The green light on the electrical box indicates when the heater is in range. When the heater is on, the temperature controller on the side of the electrical box indicates both the current temperature (on top) and the set point.

TX01061-8-5-96



PH01770-4-13-00

## 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.

TX01062-8-5-96

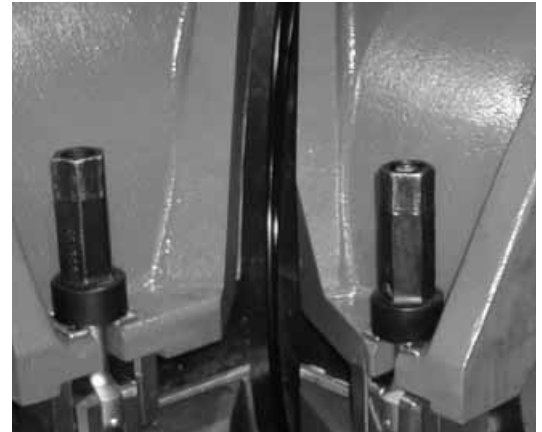


# Fabricating a Tee



## Fuse the Joints

When the heat cycle is complete, shift the selector valve to the fusion position. Quickly back off the carriage, index the heater and rotate it out, then close the carriage, making the fusion. Hold pressure against the joint during the required cool time.



PH01768-4-13-00

TX01063-8-5-96

## Remove Ell

When the joint has cooled shift the carriage valve to the center position. Unclamp the fixtures and lift off the uppers then remove the completed ell. Set the ell in the short tee fixture and use a marker pen with the 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.

TX01064-8-5-96

## 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

## 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



# Fabricating a Tee



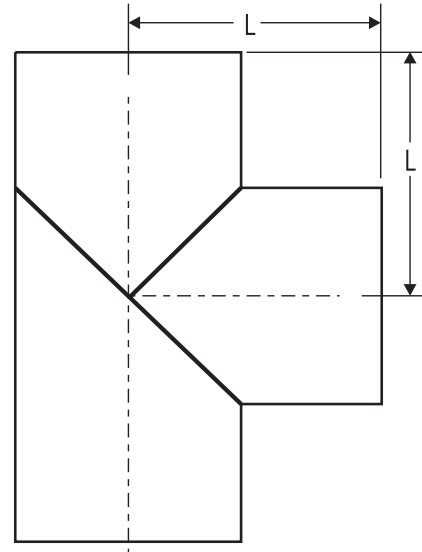
## Tee Part Preparation

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.

**IMPORTANT:** When sawing the ell, be sure to allow enough length to assure a good face-off.

TX00648-9-11-95



CD00575-4-4.00

McElroy Fusion Models				
Dimensions in inches				
Pipe Dia.	McHiLYT 630mm	No.824	No.1236	No.1648
630mm	26	26	26	32.9
24	26	26	26	32.5
22	26	26	26	31.5
20	26	26	26	30.5
18	26	26	26	29.5
16	26	26	26	28.5
14	26	26	26	27.5
12	26	26	26	26.5

McElroy Fusion Models				
Dimensions in centimeters				
Pipe Dia.	McHiLYT 630mm	No.824	No.1236	No.1648
630mm	66	66	66	84
560	66	66	66	83
500	66	66	66	80
450	66	66	66	78
400	66	66	66	75
355	66	66	66	73
315	66	66	66	70
280	66	66	66	68

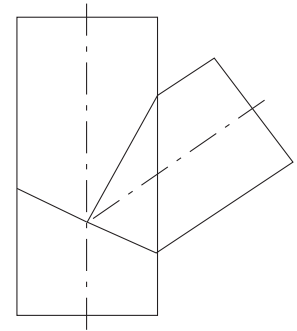


# Fabricating a Wye



## 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  $22\text{-}1/2^\circ$  to each other forming a  $45^\circ$  vee. The second joint is made by fusing a  $22\text{-}1/2^\circ$  pipe segment to the point of the vee.

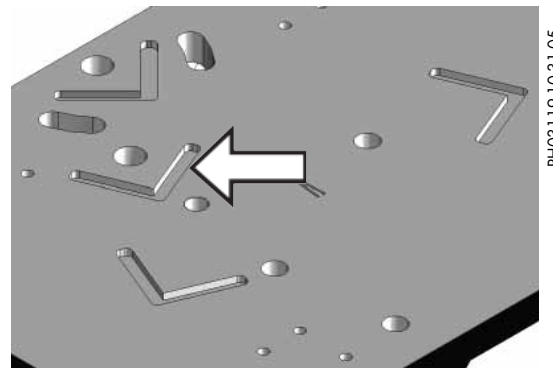


TX01069-8-5-96

CD00631-4-1400

## Install Fixtures

Mount the long tee fixtures on each table at a  $22\text{-}1/2^\circ$  angle. With the proper inserts mounted in the jaws, load the pipe with enough pipe protruding to complete a face-off. Use the offset inserts for 18" IPS and smaller pipe. Install them in the jaws so the pipe is closer to the facer.

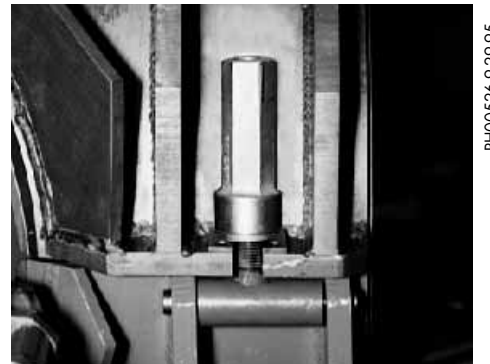


TX01070-8-5-96

PH03119-10-31-05

## Clamp Pipe in Place

Clamp the pipe securely to prevent slipping. There are two clamp knobs on the long side of the fixtures. They are adjacent to alignment blocks which serve as a pivot for the upper fixture. Tighten the long side of the fixture down to the alignment blocks first, then tighten the single clamp knob to hold the pipe.



TX01071-8-5-96

PH00526-9-29-95

## Face the Pipe

Bring the facer in and face the pipe ends to get a clean, square surface. Do not exceed 500 lbs/230 kg of carriage force during facing. Excessive force can cause a bad face-off. If more pressure is required to cut the pipe, sharpen or replace the facer blades. Once all restbuttons are bottomed out, stop the facer, open the jaws and remove the facer.



TX02546-10-31-05

PH01764-4-13-00



# Fabricating a Wye



## 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.

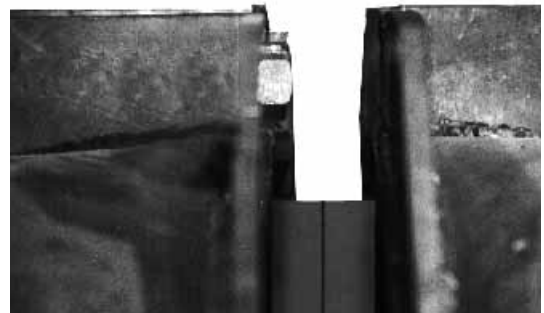


PH00533-9-29-95

TX01073-8-5-96

## Select Force Range

When a good face-off is completed, place a 4x4 between the tables to set the carriage force. Select fusion pressure and bring the tables in against the wood. If the required force is less than 9000 lbs/4100 kg select the low force range with the selector switch on the control panel. Adjust the fusion pressure reducing valve until the force is correct for the area given in the wye column in the table on page 7-1 & 2.



PH00533-9-29-95

TX2545-10-31-05

## Rotate Heater In

Remove the 4x4 and rotate the heater into position. If the heater will not rotate in, it is not in the acceptable temperature range. The green light on the electrical box indicates when the heater is in range. When the heater is on, the temperature controller on the side of the electrical box indicates both the current temperature (on top) and the set point.



PH01770-4-13-00

TX01061-8-5-96

## 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



# Fabricating a Wye

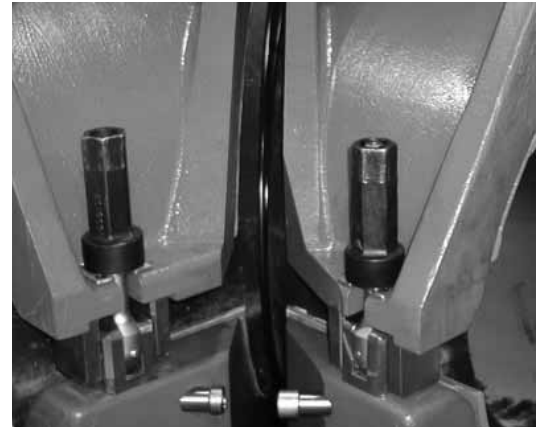


## Fuse the Joints

When the soak cycle is complete shift the selector to the fusion position. Quickly open the carriage, index the heater and rotate it 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.

Unclamp the fixtures and lift off the uppers, then remove the completed vee.

TX01077-8-5-96

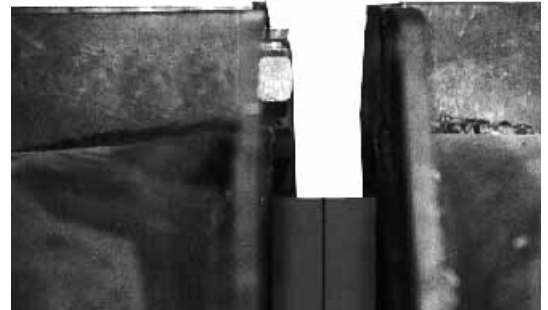


PH01768-4-13-00

## Second Joint

To make the second joint mount both long tee fixtures on the moveable table at 22-1/2° from center line. Mount the left miter jaw on the fixed table. Use the scale on the back of the jaw to set it to 22-1/2°. Connect the hydraulic lines to the quick disconnects on the hydraulic power unit. 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. The offset inserts are **not** used on the second joint.

TX01078-8-5-96

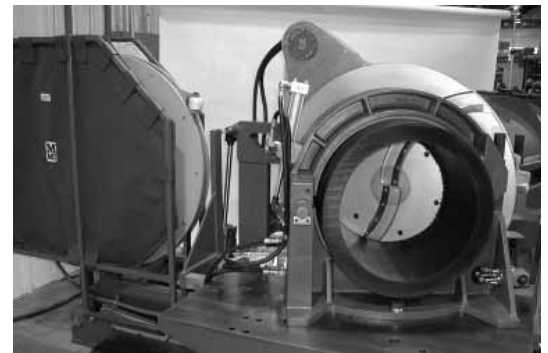


PH00533-9-29-95

## Face the Pipe

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.

TX01079-8-5-96



PH01770-4-13-00

## 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



PH00915-8-14-96

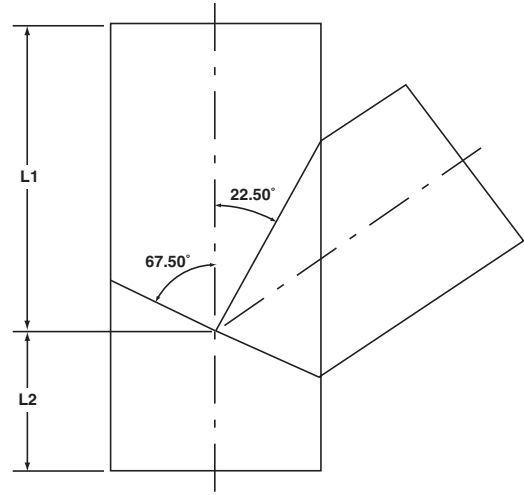


# Fabricating a Wye



## 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° on one end. Be sure to allow enough material for face-off.



CD00630-4-14-00

TX00647-9-11-95

This table gives the leg lengths (in inches) required to fuse a fabricated wye in the current McElroy fusion machine

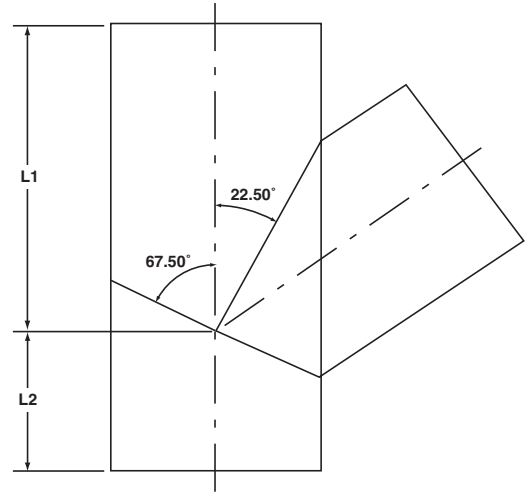
Pipe Dia.	630 McHiLYT		No.824		No.1236		No.1648	
	L1	L2	L1	L2	L1	L2	L1	L2
630mm	47	18	77	20	68	18	84	18
24	47	18	76	21	67	18	83	18
22	47	18	73.5	18	64.5	18	80.5	18
20	41	18	74.5	18	63.5	18	78.5	18
18	41	18	58	18	63	18	78	18
16	41	18	55.5	18	61.5	18	76.5	18
14	41	18	53.5	18	58.5	18		
12	41	18	55	18	60	18		

For older McElroy machines with vertical parking brakes use these values

Pipe Dia.	630 McHiLYT		No.824		No.1236		No.1648	
	L1	L2	L1	L2	L1	L2	L1	L2
630mm			84	30	78	26	84	18
24			83	30	67	25	83	18
22			80.5	29	73.5	23	80.5	18
20			78.5	28	67.5	18	78.5	18
18	41	18	78	25	63	18	78	18
16	41	18	76.5	24	61.5	18	76.5	18
14	41	18	74	22	60	18		
12	41	18	72.5	21	58.5	18		



# Fabricating a Wye



CD00630-4-1400

This table gives the leg lengths (in centimeters) required to fuse a fabricated wye in the current McElroy fusion machine

Pipe Dia.	630 McHiLYT		No.824		No.1236		No.1648	
	L1	L2	L1	L2	L1	L2	L1	L2
630mm	119.38	45.72	195.58	50.8	172.72	45.72	213.36	45.72
560	119.38	45.72	193.04	53.34	170.18	45.72	210.82	45.72
500	119.38	45.72	186.69	45.72	163.83	45.72	204.47	45.72
450	104.14	45.72	189.23	45.72	161.29	45.72	199.39	45.72
400	104.14	45.72	147.32	45.72	160.02	45.72	198.12	45.72
355	104.14	45.72	140.97	45.72	156.21	45.72	194.31	45.72
315	104.14	45.72	135.89	45.72	148.59	45.72		
280	104.14	45.72	139.7	45.72	152.4	45.72		

For older McElroy machines with vertical parking brakes use these values

Pipe Dia.	630 McHiLYT		No.824		No.1236		No.1648	
	L1	L2	L1	L2	L1	L2	L1	L2
630mm			213.36	76.2	198.12	66.04	213.36	45.72
560			210.82	76.2	170.18	63.5	210.82	45.72
500			204.47	73.66	186.69	58.42	204.47	45.72
450			199.39	71.12	171.45	45.72	199.39	45.72
400	104.14	45.72	198.12	63.5	160.02	45.72	198.12	45.72
355	104.14	45.72	194.31	60.96	156.21	45.72	194.31	45.72
315	104.14	45.72	187.96	55.88	152.4	45.72		
280	104.14	45.72	184.15	53.34	148.59	45.72		



# Maintenance

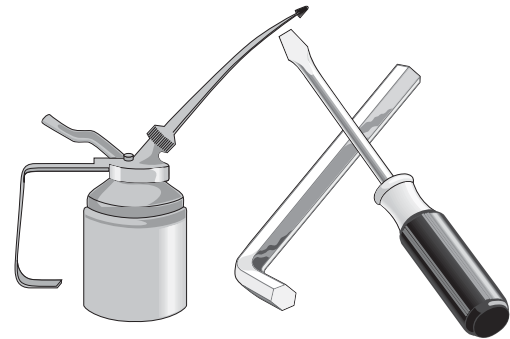


## Preventative Maintenance

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.



CD00142-11-2-94

TX00428-8-10-95

## Electrical Lock-Out



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



WR00025-11-30-92

TX00651-9-20-95

## 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.

Use Sunvis 2105 or equivalent hydraulic oil.



PH03112-10-31-05

TX00652-9-20-95



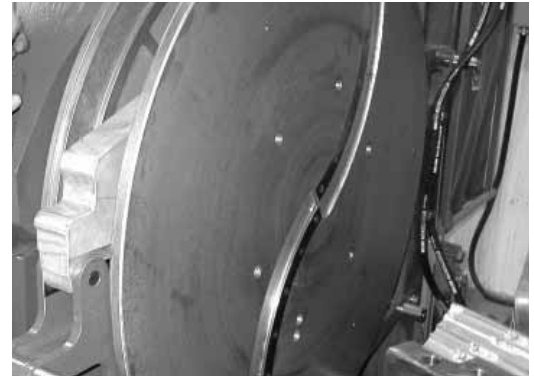
## Facer Blades

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



PH01762-4-13-00

## 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



PH01767-4-13-00

## 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



PH03112-10-31-05

## 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



PH00510-10-31-05

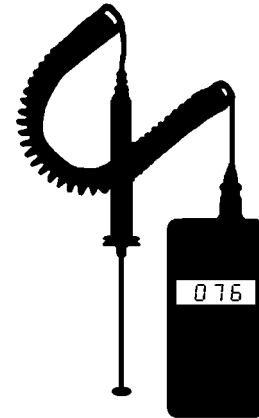


# Maintenance



## 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.

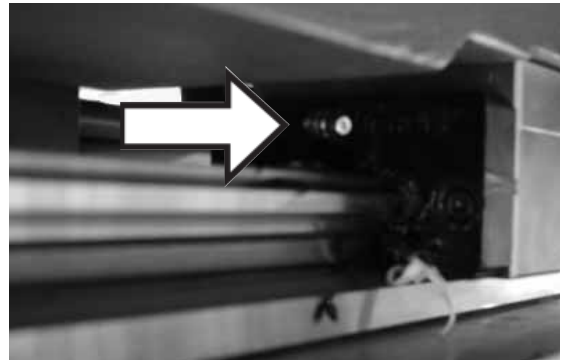


WR00077-4-16-93

TX00664-9-29-95

## Lubricate Bearings

Lubricate the linear bearings on the table and indexing carriage every 6 months with #2 lithium grease.



PH01774-4-13-00

TX00665-9-29-95

## Check Fasteners

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



PH00592-1-1-10-95

TX00666-9-29-95



## Fenwal Model 923 Temperature Controller Setup

### Setting the heater temperature

To change the heater set point, turn the heater on and press the SET/ENT button on the face of the controller. The right most character will be bright. Press the up or down arrow until the setting is right, then press the left arrow to adjust the next character. Continue across until all characters are correct. Press the SET/ENT button to return to normal operation.

### Checking the heater with a pyrometer

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

### Adjusting the controller bias setting

To unlock the parameter set up mode, press and hold the SET/ENT key for 6 seconds. Press the SET/ENT key until LCK is displayed. Change the set value to 0000 to unlock the parameters. Press SET/ENT then press SET/ENT and the left arrow key for 6 seconds to modify the set up parameters. Press SET/ENT until the display shows Pb and change it's value as required. Press SET/ENT until LCK is displayed and change the value back to 0110.



PH00510-1031-05

### Initial Setup of unit

Operating parameters		Setup parameters	
AL1	20	SL1	1100
LbA	8.0	SL2	0001
Lbd	0	SL3	1010
ATU	0	SL4	0110
P	0	SL5	0000
I	0	SL6	0001
d	0	SL7	0010
Ar	0100	SL8	NOT USED
T	0020	Pb	-0040
LCK	0110	oH	002.0
		AH1	002.0
		SLH	0600
		SLL	0300T

TX00614-8-18-95



# Hydraulic Fluids



## 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).

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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	50,200 lbs (22.820 kg)
Carriage travel	18 in (45.7 cm)
Hydraulic system pressure	2800 psi (172 bar)
Hydraulic power unit motor	25 hp (18.6 kW)
Total power required	50 kW 230V or 460V, 3-phase, 60hz (50 kW, 380V, 3-phase, 60hz)
Overall dimensions	9 ft wide X 10 ft deep X 6 ft high
Weight of base sub-assembly	5,500 lbs (2500 kg)
Weight of indexer sub-assembly	2,200 (1000 kg)
Hydraulic fluid	Sunvis 2105
Hydraulic reservoir capacity	50 gallons (189 L)

## **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.

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