HDSS QUIKLOK™
Field Restraint







PIPE

FABRICATION

RESTRAINED JOINTS

FITTINGS

GASKETS

COATINGS & LININGS

U.S. PIPE

A QUIKRETE® COMPANY

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REQUIRED TOOLS

Supply Kit (Included)

- Two Exact Pro Series Saws
- Cutting/Beveling Saw
- Grooving saw
- Snap ring expander
- Groove location jig
- Groove depth gauge
- Pipe rollers
- Saw instructions

Additional Tools (Not Provided):

- HDSS QUIKLOK snap rings sold separately
- A 220 volt power source with a minimum 15 amp capacity
- Pi tape
- Measuring tape
- Marking device
- Wire brush or grinder with 120 grit flap disc
- Touch-up paint
- Personal protection equipment

A minimum Class 54 wall thickness is required for HDSS QUIKLOK.

HDSS QUIKLOK™ OVERVIEW

Many owners and installers prefer the strength and simplicity of HDSS Pipe and Fittings. The joint is integrally restrained which gives it four advantages:

1. Boltless Assembly
2. The gasket is contained and protected within the bell
3. Greatest axial strength
4. Greatest deflection capacity

Integral restraint is provided via a weld bead on the pipe spigot which makes contact with a series of locking segments that are contained within the bell. Each restraint connection requires a spigot weld bead. Historically, this has meant that the installer could not field cut on a HDSS system without welding a new weld bead or installing an "as-manufactured" spool. This limits field adaptability which is an important element of many installations. The HDSS QUIKLOK solves this problem.

TELL ME MORE ABOUT GROOVING DUCTILE IRON PIPE

Grooving ductile iron pipe is not a new concept, however field grooving ductile iron pipe has its challenges. The outside diameter of ductile iron pipe can vary and using grooving machines that can clamp, track, and accurately cut a groove into ductile iron pipe have been historically challenging for field crews to operate and maintain. The HDSS QUIKLOK system solves those concerns by using a specialized circular saw by Exact Saw. The Exact Saw will change your opinion on field cutting, beveling, and grooving ductile iron pipe. It is accurate, safe, and repeatable.

AVAILABILITY AND REQUIREMENTS

Currently, HDSS QUIKLOK is only available for 4"–12" diameters. It requires a minimum wall thickness of Class 54 to ensure that sufficient wall thickness remains under the groove to maintain a full factor of safety per ANSI/AWWA C150/A21.50.



CUTTING & BEVELING
SUGGESTED STEP-BY-STEP

INITIAL SETUP

These guidelines are intended to be a general overview for cutting, beveling, and grooving ductile iron pipe using an Exact Saw as manufactured by Exact Tools, Inc. For detailed information regarding the operation, maintenance, and safety procedures of the Exact Saw, please see the manufacturer specific instructions included in the saw kit, or visit the Exact Tools website at www.exacttools.com.

U.S. Pipe does not assume any liability in regards to the operation, maintenance, and/or safety of the saw provided in the kit. Safety requirements and PPE must be followed.

STEP 1: PLACE PIPE ON ROLLER SUPPORTS



Find a flat surface to layout equipment and place the roller supports provided in your QUIKLOK kit. Ensure all support wheels are in contact with the pipe and adjust as necessary. Verify that there are no items located on the inside of the pipe.

STEP 2: MEASURE AND MARK PIPE TO DESIRED LENGTH



Once the pipe is securely on the rollers, use a measuring tape to measure the desired length and mark the point where you will cut.

STEP 3: MEASURE OUTSIDE DIAMETER OF PIPE



Using a Pi tape, measure and verify that the outside diameter of the pipe is within gauged tolerance for assembly *(See Table 1)*. If pipe is not within the tolerance range, set pipe aside to be used for installation as a full-length piece and restart at Step 1 with a new piece.

Table 1: Gauged tolerance for joint assembly.

INCH		
SIZE	PIPE DIAMETER	
	Minimum	Maximum
4	4.74	4.86
6	6.84	6.96
8	8.99	9.11
10	11.04	11.16
12	13.14	13.26

STEP 4: CALIBRATE SAW TRACKING



Prior to the initial cut for project installation, it is recommended to check if the saw is cutting square around the circumference. This can be checked using the laser or a test cut. This only needs to be performed once per diameter.

Detailed instructions can be found in the Exact Saw manufacturer's instructions included in the kit and as found on the website.

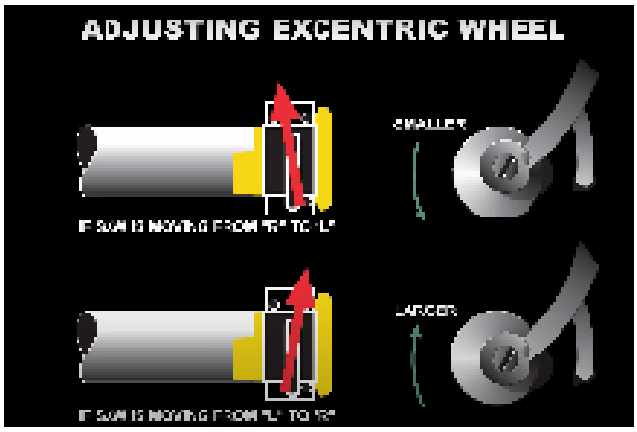
STEP 5: SET BEVEL DEPTH



Bevel depth and width is adjusted with the depth adjustment wheel. Turning the wheel clockwise will make a deeper and wider bevel, and turning the wheel counterclockwise will make a smaller and thinner bevel.

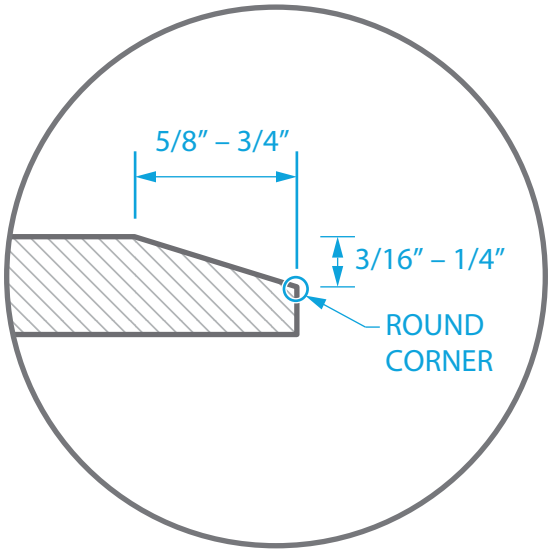
Start by rotating the depth adjustment wheel clockwise to the highest position. Make the initial plunge into the pipe until the motor is locked into place. Next, while the saw is still powered, rotate the depth adjustment wheel clockwise to lower the saw and deepen the bevel until the correct depth is achieved.

Figure 1: Adjusting excentric wheel



Small adjustments are made by changing the eccentric wheel position *(see Figure 1)* and larger adjustments are made by modifying the motor adjustment plate. Detailed instructions can be found in the Exact Saw instructions included in the kit and as found on the website.

Figure 2: Recommended bevel profile 4”–12”



Correct bevel depth setting is confirmed with visual evaluation of the cutting result. Once the bevel is set, no further adjustment is needed for cuts on the same diameter. If the diameter is changed, the bevel depth will need to be reset.

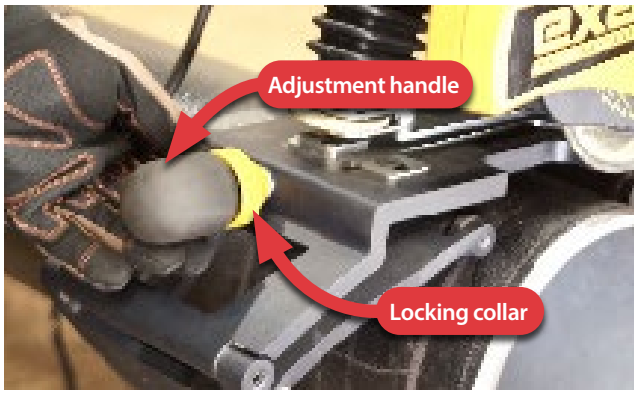
CUTTING & BEVELING
SUGGESTED STEP-BY-STEP

STEP 6: OPEN SAW AND SET ON PIPE



To attach the saw to the pipe, open the gripper unit by rotating the adjustment handle located at the rear of the saw. Position the saw on top of the pipe and lightly fasten the saw by turning the gripper adjustment handle. Verify that the blade is located at the desired cut location. Once verified, finish tightening the saw by firmly turning the gripper adjustment handle.

STEP 7: ATTACH SAW TO PIPE



Remember to lock the mechanism by turning the gripper locking collar. Ensure that the saw moves freely in the direction the pipe is fed. Connect the saw to the power source and hold the saw handle firmly with your right hand and place your left foot on top of the pipe approximately 20 inches from the pipe saw.



NOTE: As you cut and bevel the pipe, pay attention to the traffic lights on the saw display.

STEP 8: PLUNGE SAW THROUGH PIPE AND LOCK SAW



Start the motor and wait until the blade reaches full speed. Pierce the pipe wall by pushing down slow and evenly until the blade has cut through the pipe wall. At this stage the pipe must not rotate and the motor unit has to be locked down in the cutting position. When the saw is locked in the cutting position, the yellow tab on the unlock switch is not visible.

STEP 9: CUT AROUND PIPE



Once the saw is locked into place, you can safely continue with the cutting. Begin cutting around pipe by feeding the saw forward. Prevent the pipe from turning by keeping your left foot firmly on the pipe. Release the pipe by removing your left foot and rotate the saw backwards for about 1/6th of a turn, the pipe will rotate backwards with the saw. Start new feeding movement by putting your foot firmly back on the pipe barrel and feeding the saw forward. Repeat process until the pipe has been cut through.

STEP 10: UNLOCK SAW



When finished cutting, push the unlock switch forward until the yellow mark is visible and the locking is released. Lift the motor unit to the starting position and release the power switch.

STEP 11: REMOVE SAW FROM PIPE



After the blade has stopped rotating, open the locking collar and loosen the gripping unit by turning the adjustment handle.

STEP 12: INSPECT CUT AND BEVEL



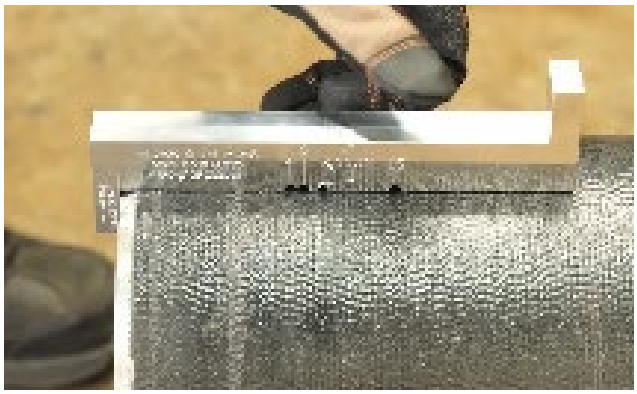
Inspect the cut and bevel carefully. Remove any sharp edges or burrs with a file or grinder with flap disc.

GROOVING
SUGGESTED STEP-BY-STEP

INTRODUCTION
When grooving ductile iron pipe, additional care must be taken to ensure that the groove depth and width meets the required specifications.

The procedure for attaching and removing the saw are identical to the cutting and beveling procedure and they have been omitted from the following grooving procedure.

STEP 13: MARK FRONT OF GROOVE LOCATION



Locate and place the groove location jig onto the pipe spigot. The jig has two sides, one side has location markings for HDSS pipe and the other side has location markings for TR-XTREME. Verify the type of pipe connection being used and place the jig over the spigot of the pipe. Place a mark at the appropriate diameter. This marking will locate the front of the groove.

STEP 14: ATTACH SAW TO PIPE



Next, locate the grooving saw which has a wider diamond blade than the cut and bevel blade. The procedure for placing and tightening the saw onto the pipe is the same as the cut and bevel procedure. Once the saw is attached to the pipe. Lift the blade guard and **line up the groove location mark on the pipe with the front edge of the groove blade**.

STEP 15A: SET INITIAL GROOVE DEPTH



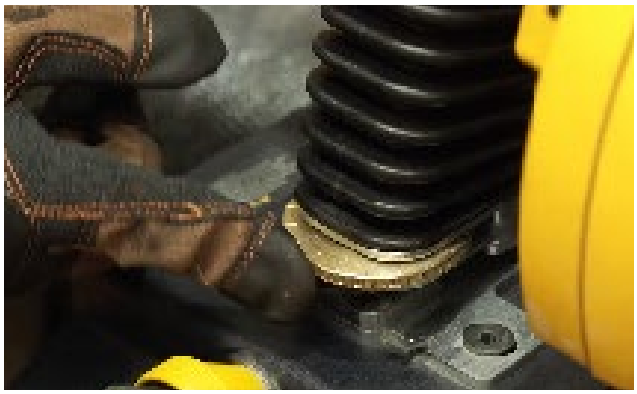
Prior to grooving the pipe, the grooving depth should be set. Groove depth only needs to be set one time for each diameter of pipe being cut. **ENSURE THERE IS NO POWER TO THE SAW**. Rotate the depth adjustment wheel counterclockwise so that the saw blade is at the maximum height.

STEP 15B: ZERO-OUT BLADE DEPTH



Push down on the saw handle until the saw motor locks into place. Pull up on the blade guard and spin the depth adjustment wheel clockwise until the blade makes initial contact with the surface of the pipe. Do not over-rotate. Unlock the motor and lift it up so that the blade is no longer touching the pipe.

STEP 15C: SET GROOVE DEPTH



The recommended initial groove depth is 0.11 inches. This is set by rotating the depth adjustment wheel clockwise approximately TWO full rotations.

NOTE: Each stop on the depth adjustment wheel raises or lowers the blade approximately 0.003 inches. **One rotation of the depth adjustment wheel has 19 stops**.

STEP 16: INITIAL PLUNGE AND GROOVE



Begin by gently plunging the saw into the pipe until the lock switch clicks into place and the yellow tab is no longer visible. **Care must be taken NOT to push down too hard on the saw motor as it can create a divot in the pipe wall**.

Continue grooving around pipe until a full rotation has been completed. Verify that the gripper adjustment remains tight during the grooving process.

Once a full rotation has been completed, it is recommended to rotate the grooving saw around the pipe circumference at least 2 more times to eliminate any high spots in the groove.

STEP 17: INSPECT GROOVE



Once grooving has been completed, unlock the saw, lift the blade, loosen the adjustment dial and remove the saw.

Inspect the surface of the groove and remove any burrs using a le or a grinder with a flap disc.

STEP 18: CHECK GROOVE DEPTH



Locate the groove depth gauge. The groove depth gauge is used to verify the minimum and maximum depth specification. Check the entire circumference of the pipe. **The required groove depth is 0.11–0.14 inches**. If the groove is too shallow, adjust the blade depth by rotating the adjustment dial clockwise. If the entirety of groove is too deep, a new groove will need to be cut.

GROOVING
SUGGESTED STEP-BY-STEP

STEP 19: TOUCH UP-GROOVE



Apply a light coat of touch-up paint to the exposed metal of the groove. Coating shall be a Zinc Cold Galvanizing spray with an asphaltic topcoat. **Maximum coating thickness is 10 mils or less**.

STEP 20: INSERT SPREADER PLIERS INTO RING HOLES



Now you are ready to install the HDSS QUIKLOK ring. Locate the appropriately sized HDSS QuikLok ring and the snap ring spreader pliers. Place the pins of the snap ring spreader pliers into the holes of the HDSS QUIKLOK ring.

STEP 21: INSTALL QUIKLOK RING INTO SPIGOT GROOVE



Expand the HDSS QuikLok ring using the pliers and place it over the spigot of the pipe. **Be sure to place the gap in the snap ring at the 12 o'clock position on the pipe.** You may need to roll the pipe to ensure the bell end is oriented with any locking segment insertion points at the 12 o'clock position. Release the snap ring spreader pliers such that the HDSS QUIKLOK ring snaps into the groove. If necessary a mallet may be used to move the ring along the spigot.

STEP 22: INSPECT QUIKLOK RING ASSEMBLY



Inspect the HDSS QUIKLOK ring and make sure that it is completely seated within the groove. Once inspection is complete, the spigot is now ready for assembly.

NOTES

U.S. Pipe, A Quikrete® Company, is the leading manufacturer and a principal supplier of highly engineered ductile iron pipe and fabrication in the United States and Canada. Providing custom solutions to owners, engineers and contractors for even the most demanding applications, including water transmission and distribution lines, plant piping, intake and outfall lines, and other diverse applications.

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