Full Circle® Repair Clamps
General Information

Full Circle® Repair Clamps are flexible repair clamps consisting of one or more stainless steel band sections to which cast lugs are securely attached to accommodate bolts and nuts for the purpose of mounting the clamp on pipe. It has a full encirclement tapered, overlapping, gridded gasket with a flush mounted, bonded-in stainless steel bridge plate to span the band opening between the lugs, to provide a full circumferential seal on the pipe.

A Full Circle® Repair Clamp is fast and simple to install, and requires no special tools. The clamp is wrapped around the pipe, properly positioned over the area to be repaired or connected, and the bolts tightened. This compacts the rubber gasket tightly against the full circumference of the pipe wall forming a leak resistant seal.

The Smith-Blair Full Circle® method of pipe repair is a quick, long lasting, economical solution to pipe repair problems.

You will soon discover the Full Circle® method means:
• Minimal pipeline downtime--one man with a simple wrench can quickly install any Full Circle® Repair Clamp.
• Lower material and labor costs--each size fits a range of pipe types within its range, and can be used for repair, joining or tapping.
• Less crew, equipment, excavation and scheduling complications--once the damaged pipe is exposed, one man with a single wrench can easily make the repair.
• No need for extra pipe fittings--flexible Full Circle® Repair Clamps are able to conform to pipe irregularities and provide an efficient leak resistant seal.
• No need for complete line shutdown and possible contamination--Full Circle® Repair Clamps can be installed quickly and easily either out of water or underwater; tightening the centermost bolts will usually stop the flow of water and then the other bolts can be equally tightened.
• No special tools or skills required for installation--one man with a simple wrench and minimal pipeline repair experience can accomplish the repair of a pipe with Full Circle® Repair Clamps.

Compare the ease of the Full Circle® method to that of split mechanical sleeves or replacing a section of pipe and you will be convinced it is the best method!

Not Just a Repair Clamp!
Full Circle® Repair Clamps are often used as a coupling to join plain end pipe for new installations and pipe replacement programs. WARNING: Full Circle® Clamps do not restrain axial pipe movement. Use of axial restraint device will be required.
### Smith-Blair, Inc. Full Circle® Repair Clamps solve these piping problems:

*Full breaks*
- New construction or repairs.

**Holes**
- Slightly misaligned pipe ends.

***Pin Holes***
- Band: Stainless Steel
- Lugs: Ductile Iron
- Gasket: Grade 60
- Bolts: Low Alloy

**Cracks or splits**
- Band: Stainless Steel
- Lugs: Ductile Iron
- Gasket: Grade 60
- Bolts: Low Alloy

#### CC200 Selection Guide & Index | NSF 61 Listed

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<td>32 Thru 390</td>
<td>1 1/4&quot; Thru 14&quot;</td>
<td>Up to 50 PSI</td>
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<td>Lugs: Ductile Iron</td>
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<td>226</td>
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<td>Lugs: Ductile Iron or</td>
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<td>3&quot; Thru 12&quot;</td>
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*When a gap between the ends of the pipe is 1 inch or greater a short section of pipe should be put in the opening or a thin strip of sheet metal wrapped around the opening to provide support to the gasket.

**Holes should not exceed 1/3 the clamp width. When a section of pipe wall equal to 40% or more of the pipe circumference is broken away, a section of sheet metal should be placed over the opening to provide a sealing surface for the gasket.

****Cracks and splits require a small hole be drilled at each end to prevent spreading. 1 inch of clamp width on both sides of the damaged area is required.

Warning: Full Circle® Repair Clamps do not restrain axial pipe movement. Use of axial restraint device will be required.

Note: Spring washers are required when these products are used on high density polyethylene pipe. Please refer to the HDPE application for details.
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<td>300 And Larger</td>
<td>14&quot; And Larger</td>
<td>Up to 100 PSI</td>
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<td>3&quot; Thru 8&quot;</td>
<td>Up to 300 PSI</td>
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<td>239</td>
<td>Double Band</td>
<td>Band: Stainless Steel</td>
<td>100 Thru 300</td>
<td>4&quot; Thru 12&quot;</td>
<td>Up to 300 PSI</td>
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<td>256</td>
<td>Single Band</td>
<td>Band: Stainless Steel</td>
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*The amount of pressure that a Full Circle® repair clamp will contain is proportionate to the diameter of the clamp, and the amount of torque applied to the bolts. Small diameter clamps will have a higher pressure rating than their larger counterparts (regardless of manufacturer). On any given installation, the pressure capability of a clamp is influenced by the type and extent of the damage, service conditions, environmental conditions and installation workmanship. Suitable anchorage must be provided when excessive pipe movement could cause the pipe to move out of the clamp.
A Full circumference single or multiple section stainless steel bands are available in 5” thru 30” widths to fit virtually all types and sizes of pipe.

B All weldments including bolts, sidebars and fingers are constructed of premium grade stainless steel to minimize the possibility of corrosion.

C Smith-Blair®’s exclusive “C” shaped keeper bar permits fast run-down of nuts against the clamps weldments while equalizing tension along the full length of the clamp.

D Bridge plate flush mounted and bonded to the gasket assures even distribution of gasket pressure and prevents crimping.

E Gridded, tapered, overlapping gasket design offers excellent full circumferential sealing and full adjustment to rough pipe surfaces.

F A special high-strength ductile iron alloy lug utilizes a strength efficient computer-aided design that’s not only stronger, but lighter and easier to install.

G Drop-in, self-securing bolts eliminate loose parts, save time and make installation possible with only one wrench.

H Lugs with mutually supporting sliding fingers to assure proper bolt alignment while tightening. Permits maximum torque without bending of bolts.

J The band locking system uses a unique lug core design and a band hemming process that resists pull-out and provides maximum band retention.

K Full circumference, single or multiple section stainless steel bands available in 7 1/2”, 10”, 12 1/2”, 15”, 20” and 30” widths.

Electrical Conductivity Buttons

Copper electrical conductor buttons are available for most 200 series Full Circle® Repair Clamps. Factory installed conductor buttons are glued between the gasket and the stainless steel band with contact buttons protruding through specially prepared gaskets to accommodate electric thawing of frozen pipelines.

When ordering clamps with factory installed conductor buttons, change the first digit of the last three digits in the catalog number to a 7.

EXAMPLE: XXX-XXXXXX-700-Conductor buttons and low alloy bolts.

XXX-XXXXXX-701-Conductor buttons and stainless steel bolts.
Why the Smith-Blair® Full Circle® Repair Clamp seals . . . positively and effectively . . .

**Tapered and Lapped Gaskets . . .**
Smith-Blair® tapered, lapped gaskets provide a continuous and uniform seal over the full O.D. range of the clamp.

**Smith-Blair® Recessed Bridge Plate**
Bonded-In Recessed Bridge Plate

Smith-Blair® bridge plates are precision set, flush mounted and securely bonded into the gasket during the molding operation. This provides a smooth surface, which insures a 100% encirclement of uniform gasket pressure. A dependable method of sealing.

**Finely Gidded Gasket . . .**
Smith-Blair® finely gridded gaskets; 16 grids to the square inch; form a series of dams to conform to irregularities on the pipe surface, and seal effectively against rough or pitted surfaces to prevent development of a leak path.

**Uniform Distribution of Gasket Pressure Over Entire Circumference of Pipe.**

**Other Methods of Bridge Plate Attachments**

**Bridge Plate Glued on Top of Gasket**

Bridge plates attached to the clamp band or glued to the outside of the gasket have exposed metal edges that hold the band away from the gasket, setting up low pressure points as in "A" and "B" above, which are potential leak paths. The exposed metal edge can also hang up on the clamp band and impede tightening of the clamp.

**Bridge Plate Glued in Molded Recess**

Bridge plates that are glued into recesses formed in the gasket during molding, may not fit the recess properly. There may be void spaces that create low pressure points, as at "A" and "B" above which are potential leak points.
Full Circle®
Repair Clamps
All Stainless Steel
Nominal Sizes 2” through 12”

Smith-Blair® engineers, with more than 100 years of combined leadership in the design and development of pipeline products, have produced the ideal solution for soil conditions requiring a stainless steel clamp.

The efficient design of “the cool clamp for hot soil” combines superior strength and corrosion resistance with all of the time-proven Full Circle® Repair Clamp features and benefits, to provide leak-resistant seals on all types of pipe.

1. **Cast Stainless Steel Lugs**
   Constructed with CF8M cast stainless steel lugs (type 316 equivalent). Mutually supporting stabilizing fingers permit maximum torquing of the bolts. There is no welding in the lug area. The anti-corrosion properties of the stainless steel band are fully preserved.

2. **Stainless Steel Recessed Armor Plate**
   Type 304 or better recessed flush and bonded to the gasket. This feature insures even gasket pressure at all points around the circumference of the pipe.

3. **Tapered, gridded gasket**
   Molded tapered ends provide full, uniform sealing at the lap joint through the full O.D. range of the clamp. The finely gridded surface provides a network of seals around the damaged area and superior sealing on rough or pitted pipe.

4. **Stainless Steel Bands**
   Bands are type 304 stainless steel or better, selected to meet the exacting requirements of corrosion resistance, flexibility and strength.

5. **Stainless Steel Bolts and Nuts**
   Type 304 or better. Double radius head and square neck design facilitate easy installation and maximum tightening. Course series rolled threads are supplied. The stainless steel nuts and bolts are coated to prevent galling.
Selecting the Proper Full Circle® Repair Clamp:

Determine the exact outside diameter (OD) of pipe to be repaired. Select the type of clamp--(single band, super range, etc.) Select the clamp that has an OD range that includes the OD size of the pipe to be repaired.

The width of the clamp should be sufficient to provide at least 3" of clamp on solid pipe on each side of the break or damaged area on pipes 12" or smaller. On pipes larger than 12" the clamp should provide at least 4" of clamp on solid pipe on each side of the break or damaged area.

Useful Installation Tips:

- Always clean the pipe as thoroughly as possible.
- Lubricating the pipe with water, soap solution or other suitable lubricant helps to overcome friction and allows proper seating of the gasket.
- Cleaning and lubricating the bolt threads will reduce friction and permit greater torque transfer to the lugs.
- Leaving sufficient pressure on the line to keep water flowing will assist in preventing foreign matter or contaminants from entering the pipeline.

A Full Circle® Repair Clamp can be assembled loosely alongside the break and slid over the break if the pipe is well lubricated.

Allowing the water level to rise above the pipe will minimize spraying water. Full Circle® Repair Clamps can be installed quickly and easily under water.

Completely tightening the centermost bolt(s) first will usually stop spraying water.

Drilling a small hole at each end of a crack in the pipe will usually relieve stresses and prevent the crack from spreading.

Special Instructions:

Breaks with a minor amount of deflection can be repaired with a Full Circle® Repair Clamp. The best method is to use a 10" or longer clamp with multiple section lug. Align the joint in the lug sections with the break. The clamp will articulate to conform to the deflection. Breaks with a major amount of deflection should be repaired with a Smith-Blair® 437 Cut-In Coupling.

Breaks with a minor amount of pipe misalignment can be repaired using a Full Circle® Repair Clamp. Breaks with greater misalignment should be repaired by using a Smith-Blair® 437 Cut-In Coupling, using two Smith-Blair® Flexible Couplings and a short section of pipe or by realigning the pipe and using a Full Circle® Repair Clamp.

When a gap between the ends of the pipe is 1 inch or greater a short section of pipe should be put in the opening or a thin strip of sheet metal wrapped around pipe opening to provide support to the gasket.

When a section of pipe wall equal to 40% or more of the pipe circumference is broken away, a section of sheet metal should be Full Circle® wrapped around pipe opening to provide support to the gasket.

Improving Larger O.D. Clamps:

To fill an emergency need to repair a split or crack, wider than the clamps available, narrower clamps can be joined together to make a wider clamp.

1. Measure the length of the crack or damaged area. The ends of cracks and splits should be drilled so that it does not propagate down the pipe.
2. Select two or more clamps whose total width is at least 3" wider than the damaged area.
3. Carefully remove the gaskets and reposition them so that they are offset by 1". The armor should go on the closed lug side and the edge of the armor should be about 3/4" from the end of the clamp on 3.50" and larger clamps and about 3/8" for smaller than 3.50". It is very important to position the gasket in straight and all gaskets are offset by the same amount to ensure that the edges of the gaskets will seal against each other. If the gaskets do not stay in the clamp, they can be held in place with contact cement or tape.
4. If gaskets have been spliced, be sure that the spliced areas are held tightly together. The spliced areas should have less than a 1/16" gap between them. If possible, it is good practice to position the clamp so that the splice on the gasket is not over the damaged area.
5. Loosely install the clamps on the pipe. Push the clamps together so that they fit together snugly, making sure that the damaged area is covered by both the gasket and the band. The lugs can be staggered so that adjacent lugs do not align.
6. Rotate the clamp to insure proper seating of the gaskets. Slowly and evenly tighten all of the bolts to the recommended torque. Uneven tightening may cause the gasket to extrude and push the clamps apart.

WARNING!

This product does not restrain axial pipe movement.

Note: HDPE Applications will require clamps with spring washers.

Warranty. Smith-Blair® warrants its products only against defects in materials and workmanship. Smith-Blair®'s liability and customer’s exclusive remedy under this warranty or any warranty extends for a period of one (1) year from the date of Smith-Blair®'s shipment and is expressly limited to repayment of the purchase price, repair, or replacement, at Smith-Blair®'s option, during said period, upon proof satisfactory to Smith-Blair® and upon customer’s returning and prepaying all charges on such products to factory or warehouse designated by Smith-Blair®. THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.