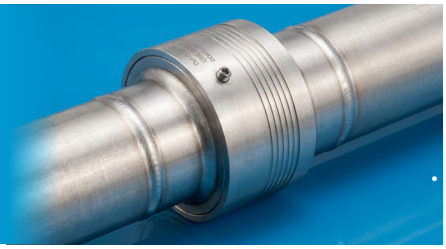
BETE
PERFORMANCE SPRAY ENGINEERING
DIVISION OF EXAIR



DUR O LOK® COUPLINGS INSTALLATION PROCEDURE

DUR O LOK couplings are all-purpose, lightweight connectors that replace standard ANSI flanges. The design of these pipe couplings ensures reliable operation over a wide range of temperatures. The heart of the design is a system of wedge-shaped, circumferential teeth on the outside diameter of the hubs and the inside diameter of the mating split coupler. When assembled, the teeth generate a wedging action that compresses the gasket and brings the hub ends together. The split coupler's tapered outside diameter accepts a matching tapered retaining ring that slides over the split coupler ring segments, forcing them together and holding them securely in place with a set screw. The entire connection process can be completed in under a minute, without wrenches.

GENERAL INSTALLATION INFORMATION

For the installation of DUR O LOK couplings in catalyst lift lines or similar services involving long piping runs, tack weld the assembled coupling to both pieces of pipe, positioned horizontally along a flat surface. Care must be taken to ensure that the two pieces of pipe are straight and properly aligned before welding. 80 feet of (shop floor) space is required to position and weld two 40-foot sections of pipe to a DUR O LOK coupling. The tacked coupling may be disassembled prior to completing the circumferential weld.

For pipes employing precision bends (e.g., CCR catalyst transfer lines and related applications), trial installation in the shop is highly recommended, as it allows for final adjustments to be made. DUR O LOK couplings have higher installation tolerances than standard flanges, and extra care must be taken during final alignment. Pipe sections must be match-marked after the trial fit-up is complete and on-spec. This will facilitate trouble-free installation of the pipe assemblies in the field.

DUR O LOK couplings are available in both standard and high-temperature designs. Standard design couplings employ an elastomeric type O-ring seal and are used for applications typically below 450 °F (232 °C). The O-ring material determines the temperature limit. Materials of construction for O-rings include Viton®, silicone, Kalrez®, and many others, depending on the application requirements. Although O-rings are typically reusable if not damaged, it is strongly recommended that a used O-ring be replaced with a new one.

The high-temperature design utilizes a graphite-type flat gasket for nominal service temperatures exceeding 450 °F (232 °C). A DUR O LOK installation clamp may be required to compress the installed gasket and properly assemble the high-temperature DUR O LOK coupling. These custom-sized gaskets are not reusable and only available through BETE. Please specify DUR O LOK coupling pipe size and pipe schedule when ordering.

Warning: Low-temperature (OR70) and high-temperature (GRF100) design DUR O LOK couplings and their gaskets are not interchangeable.

BETE offers an assembly clamp (purchased separately) for fast and easy installation, ensuring proper alignment of the coupling hubs. If this clamp is to be used, refer to the attached DOL Clamp Instructions for more details.

STEP-BY-STEP INSTALLATION PROCEDURE

STEP 1. PREPARE DUR O LOK® COUPLING FOR WELDING

- The welding surfaces of the coupling and the mating pipe must be cleaned and prepared for welding. Be sure to remove any dirt, grease, or other surface contaminants prior to welding. Also, be sure to remove plastic protective caps, as they will melt. If the coupling has a black oxide finish, lightly grind or sand off the black oxide coating from the welding surfaces of the coupling. Removal of the black oxide coating from the coupling's welding end may have already been done at the factory for your convenience.
- For applications involving catalyst transfer (e.g., CCR Platforming), it is recommended that the black oxide coating be removed from the entire inner surface of the coupling.
- Remove the gasket or O-ring.

STEP 2. WELD DUR O LOK COUPLING TO MATING PIPE

- It is highly recommended that the DUR O LOK coupling be welded to the mating pipes as an assembled unit whenever possible, as this ensures proper alignment and protects machined surfaces. Be sure to take extra care during welding alignment as DUR O LOK couplings have higher installation tolerances than standard flanges.

Warning: Do not have a gasket or O-ring in place while welding, as damage will occur.

- For pipes involved in catalyst transfer, a smooth transition at the inside surface for all circumferential welds is mandatory. The inside diameters of the pipes and welded DUR O LOK coupling may require grinding to remove all ledges in order to produce a flush transition in the area of the circumferential welds. The final wall thickness of the pipes and the coupling must not be less than the minimum required wall thickness.
- For non-horizontal coupling installations, ensure that the female hub (the hub with a gasket cavity) is positioned as the lower half of the coupling, so that the gasket cannot fall out of place during assembly.

Warning: Protect the machined surfaces of the coupling from weld splatter.

STEP 3. POSITION TAPERED RETAINING RING

- Place the tapered retaining ring over the male hub end and slide it past the grooves on the hub for the split coupler. The end with the larger inside diameter must be oriented toward the mating (gasket) surface of the coupling. The two set screw holes should be located in the half of the tapered retaining ring closest to the mating surface of the coupling.
- Bring the two hub ends welded to the pipe segments into an approximate assembled position.

STEP 4. INSTALL GASKET

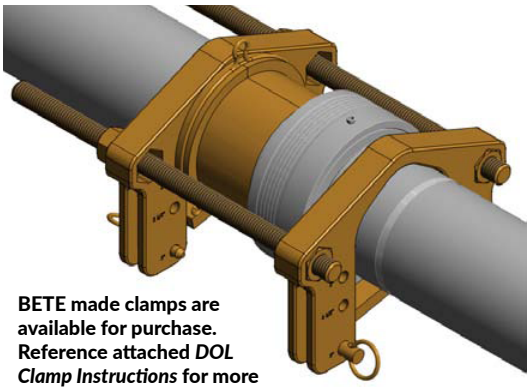
- Closely examine the gasket cavity of the female hub. Ensure the cavity is free from oil, debris, scratches, or any other contaminants that may compromise the seal's quality.

- Place the gasket in the cavity of the female hub.
- Handle gaskets with care in order to avoid damage.

Warning: Damaged gaskets must not be used, as they will not seal properly. Always replace used gaskets to ensure a proper seal. High-temperature (GRF100) gaskets are for one-time use only.

STEP 5. ASSEMBLE COUPLING

- With the gasket in place, draw the hub ends together. If the welded pipes are not aligned properly, a clamp will be required to draw the two halves of the DUR O LOK coupling together. BETE offers a special clamp to simplify this process, but, if desired, a clamp can be constructed in your shop using standard riser clamps.
- Couplings that are excessively out of alignment will require removal, repositioning, and re-welding. It is best to take care to align the piping and couplings prior to welding.
- Place the two split couplers in position. Ensure that the set screw grooves in the split couplers are aligned over the female hub (the hub with the gasket).
- Slide the end with the larger inside diameter over the split couplers until the tapered retaining ring aligns with the set screw holes directly over the set screw grooves in the split couplers. Use a soft-faced hammer (e.g., nylon or rubber) to drive the tapered retaining ring into a fully engaged position.



BETE made clamps are available for purchase. Reference attached *DOL Clamp Instructions* for more information.

Warning: The tapered retaining ring must be fully engaged to attain the design compression and pressure rating for the desired service. The tips of the set screws must fit completely inside the split coupler's set screw grooves. The coupling could become inadvertently disassembled due to vibration during use if not assembled properly. This may result in process material leakage.

STEP 6. SECURE COUPLING

- Install and hand-tighten the set screws with the supplied 3/16" hex key (Allen wrench). The function of the set screws is to prevent the tapered collar from disengaging. The set screws do not function to pull the tapered retaining ring into position. Do not overtighten, as this may cause damage to the threads.
- Install the safety wire through the holes in both set screws and wrap the wire once around the coupling.
- Twist the safety wire a minimum of five times, ensuring the set screws cannot work loose during operation. Safety wire twisting and cutting pliers are available for this purpose.
- The presence of the safety wire is generally indicative that a gasket is in place. DUR O LOK couplings can also be tagged or marked to indicate "gasket installed."