



Weld Procedures for Combining And Terminating Thermoflex[®] Tubing

Requirements:

1. Polyflow's weld style couplings (Part number should end in a W)
2. Welding equipment and weld rod compatible with the coupling material (Carbon Steel or Duplex Stainless Steel)
3. Grinder
4. Wire Brush
5. Alignment Clamps
6. Welding and Grinding face masks
7. Heat Sink (Wet towel or other method to reduce the temperature in adjacent to the weld)

Overview:

The purpose of this procedure is to set forth the proper procedures for welding Polyflow's Thermoflex[®] couplings to join to steel pipe or for joining two Thermoflex[®] lengths of tubing together by welding two couplings together. It is not intended to train welders on proper weld techniques, heat inputs, weld rod selection, etc and welders should refer to API, ANSI 31.3 and Minimum Federal Safety Standards 49 CFR Part 191 and 192 for proper welding procedures and certification of welders.

Weld techniques are similar to those employed to weld steel pipe joints together but extra care must be taken to prevent damage to the polymers and braid swaged to the couplings.

Procedures:

The first step is to swage the termination couplings to the Thermoflex[®] tubing. Please refer to the coupling manual for the step by step proper procedures to install a weld style coupling to the Thermoflex[®] tubing. The coupling style must have a part number with a W at the end to designate a weld style. A CA2375W part number designates a coupling to mate with 2.375" Thermoflex[®] tubing with a weld style end. There are two types of coupling materials available from Polyflow. The first is made of zinc chromate plated AISI 1026 carbon steel and the second is a Duplex 2205 Stainless steel. Welders should refer to welding guides for proper weld rod selection. Polyflow does provide couplings that are Fortron polymer lined for corrosion and flow properties. Couplings with this

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liner cannot be provided in a weld style because molten weld metal will destroy the properties of the coupling's Fortron liner.



Figure 1: Properly Swaged Coupling Pushing Through the Die

The coupling do have a bevel on the weld end of the coupling but the zinc chromate plated carbon steel couplings need to have the plating ground off any area that will be in contact with the weld metal. Otherwise there is a potential to contaminate the weld with zinc chromate and potentially weaken the joint. Use of a portable grinder is suitable for removal of the zinc chromate plating.

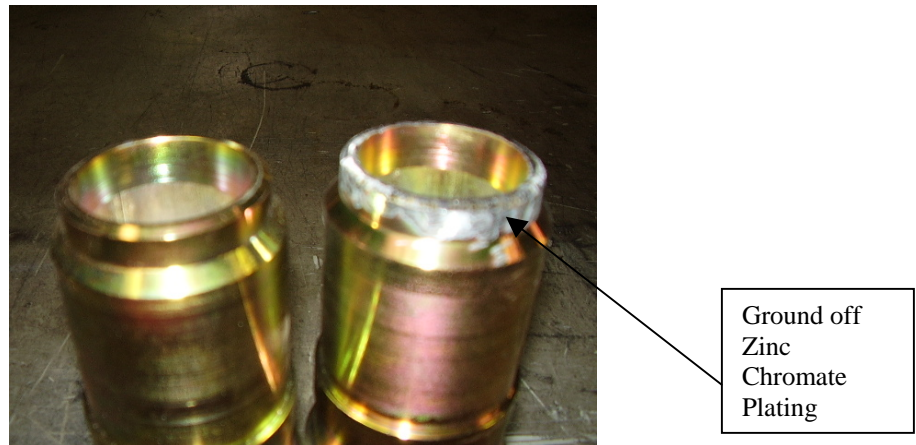


Figure 2: Ground Beveled End

The coupling should then be aligned with the mating steel component (steel riser, flange, another coupling etc.) Alignment clamps such as the on pictured in figure 3 helps to properly align the tow components square and concentric to one another. There should be a slight gap of 1/16th between the components.

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Figure 3: Aligning the Components to be Welded

Once aligned, wet towels can be wrapped around the ferrule of the coupling (s) to act as a heat sink to minimize the heat adjacent to the Thermoflex[®] tubing. Weld rod (sticks) that is 3/16" or less in diameter should be used and three passes made to complete the welding of the joint. This minimizes heat into the weld area. Again, the welder should refer to the proper welding guides for proper weld rod selection, power settings, etc.



Figure 4: Proper Setup with Heat Sink

The welder is not ready to tack weld three locations along the weld to hold the components in place. Once tacked together the weld metal should be ground to remove slag and to ready the part for the first pass. Welding the first pass should take place with a steady constant travel across the joint to prevent excessive heat input. After the first pass is completed, make sure the heat at the ferrule is cool to the touch, if not, rewet the heat sink towels and cool the weld area before grinding the first pass to remove slag and rough areas. Repeat this process until three passes have been completed. Note: If plastic begins to bubble out from under the ferrule, the heat input into the coupling was

excessive and the compressive load on the braid from the swaging process is damaged and a new coupling must be installed.

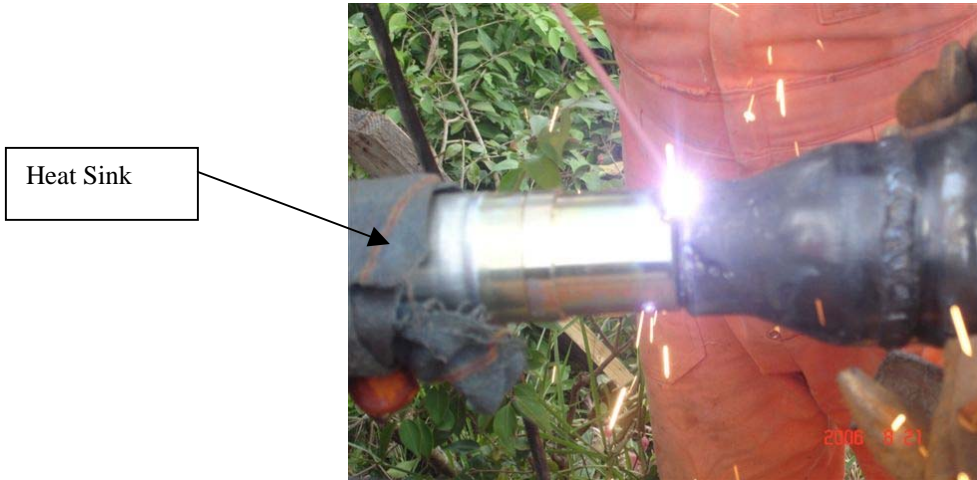


Figure 5: Welding of the Joint

After the third pass the weld can be wire brushed to remove the slag and clean up the weld. For stainless couplings the process is complete but for zinc chromate plated carbon steel couplings the “naked” weld must be protected. Wax tape, or any taping/coating method preferred by the operator of the tubing is acceptable. The installation procedures of the tape manufacturer should be followed. Taping or coating can cover the entire coupling assemble to assure a corrosion barrier to any area where the zinc chromate coating may have ground off.

The procedure is complete.

Related References:

API

ANSI 31.4 and 31.4

Minimum Federal Safety Standards 49 CFR Part 192