

THE SCIENCE OF HDPE FUSION WELDING.

The fundamental of heat fusion welding is to heat two HDPE surfaces to an appropriate temperature, changing the resin's molecular structure to an amorphous (pliable) state, and then fuse them together by application of prescribed force until cooling occurs, returning the material to a crystalline state and creating one homogeneous pipe. When fusion pressure is applied at the designated temperature and prescribed force, the molecules from each pipe surface end mix. As the joint cools, the molecules return to their crystalline form, the original interfaces have been removed, and the two pipes have become one continuous length. The end result is a fusion joint that is as strong or stronger than the pipe itself, and this creates the leak-free joint that is one of the amazing strengths of HDPE pipe.

THE METHOD OF HDPE FUSION WELDING.

Generally speaking, HDPE pipe is Butt fused together using a "fusion welder". Welding machines vary depending on the Outside Diameter (OD) of the pipe to be welded. The pipe pieces are held axially by a Clamping device to allow subsequent operations to take place. Large diameter pipes may require hoisting assistance such as an excavator or crane. Once the pipe is clamped, the pipe ends are "faced" with a machining tool to establish clean, parallel mating surfaces, perpendicular to the centerline of each pipe. A heating element or heating plate is inserted in between the faced ends, and the pipe is drawn together against the heating plate. A melt pattern, that penetrates into the pipe ends is formed around both pipe ends. Once the correct melt temperature is reached, the heating plate is quickly removed, and the melt ends are drawn together with a specified force. The specified force on the joint must be continuous, and held until the joint cools. A small melt bead forms at the joint. At completion, the fused pipe is removed from the welding machine.

AVAILABILITY OF FUSION WELDING EQUIPMENT.

There are several makes of fusion welding equipment on the market. Proper fusion equipment must be used to make good fusion welds. Equipment can be purchased, or rented from various suppliers. Training is strongly recommended to ensure safety and quality. Doing the job right the first time is the most efficient, safest and quickest way to profitability.