HDPE Pipe Welding Meeting kit

HDPE WELDING

HDPE pipe is a high-density polyethylene thermoplastic pipe. The process of joining or welding sections of HDPE together is often referred to as fusion. There are specific machines available for three basic kinds of fusion:

- Butt
- Saddle
- Socket

BUTT FUSION/WELDING

The process of butt fusing HDPE is melting two sections into one under pressure. After placing sections of HDPE pipe to be fused into the welding machine, a cutting head is used to prepare the face of both sections. The cutting or shaving of the joint surfaces ensures that they are both square and level to allow maximum surface area to contact between them. Next, the joint faces of the pipe are pressed against a heating element or plate to heat them up to 400˚F (204˚C) depending on the size of the pipe. Once the joint faces are heated correctly, the heating element is removed, and the joint sections are pressed together forcefully according to a prescribed pressure and period of time for fusing. Once the material cools, the pipe sections are now bonded together, and the joint has sealed itself inside and out.

DANGERS OF HDPE WELDING

HDPE Welding uses extremely high temperatures to bond pieces of metal together. They become fused together when the pieces have cooled down. This is often done to fuse the framework of buildings, for example. The heat alone is enough to cause severe injuries, especially if there are equipment malfunctions.

HAZARDS OF HDPE WELDING

There are many hazards associated with this process of butt fusing HDPE pipe. Some of the major hazards include:

- **Struck-by and caught-between incidents.** Often, hundreds of feet of pipe are being fused together. Equipment such as front loaders or excavators need to be used to lift and pull the pipe into place to be fused or to be installed in the final resting place. This creates many different opportunities for struck-by and caught-in or between incidents to occur.
- **Stored energy.** When moving the pipe, be aware of stored energy in the pipe. Stored energy can be hazardous to personnel in the area if it released creating a struck-by hazard. If too much pressure is applied the pipe can snap resulting in a violent whiplash effect.
- **Pinch points.** There are many pinch point hazards associated with this task between lifting and rigging the pipe to the actual welding.
- **Other hand injuries.** Burns and lacerations can occur due to the heat plate and cutting face.
- **Strains and sprains.** Lifting heavy lengths of pipe or heavy parts from the welding machine can cause sprains and strain injuries. Smaller machines require manual pulling of levers which can create repetitive stress injuries.

WHAT ARE THE MOST COMMON WELDING INJURIES?

- Burns from fire, sparks, or flammable material.
- Eye injuries due to excessive heat or the arc eye.
- Infrared radiation exposure.
- Electrocution.
- Skin injuries other than burns.
- UV exposure.
- Toxic fume inhalation, especially due to working in confined spaces with little ventilation.

- Invisible light exposure.
- Hearing loss due to excessively loud noises.
- Vision loss due to excessive lighting or injuries to the eyes.

REDUCE WORKPLACE WELDING INJURIES

For welding operations, access to personal protective equipment, or PPE, is critical in reducing common injuries like burns and exposure to gases. PPE includes protective face masks and eye shields to eliminate welder's flash injuries to the eyes and face. This protective equipment typically includes heavy gloves and fire-resistant aprons or coats to prevent welding spatter from causing burns. In areas where exposure to metal fumes or toxic gases may be at elevated levels, welders often use helmets with breathing apparatus to avoid inhalation of dangerous substances.

Regular training and recertification of welding professionals is a critical part of the risk management process.

EMPLOYEE BEST PRACTICES

- Always have the proper training and knowledge to run the specific welder you are using.
- Never stick your hands or body in the line of fire in the machine. Even if the machine is "off" crawling into it to retrieve the shavings from the cut pipe can be a fatal mistake. Use an object or tool to clear the shavings or follow the manufacturer's recommendations to safely be able to clear the shavings.
- Make sure all people and equipment are out of the line of fire when lifting and moving pipe. Always be mindful of where a pipe will go if it is dropped or stored energy releases; if you are in these areas then move.
- Never try to lift heavy or awkward objects alone. Use heavy equipment to eliminate this hazard completely or involve a coworker to help move a manageable object.
- Keep your hands and body clear of the pipe when the

equipment is moving it. Pinch points are abundant between the pipe and the machine anytime it is being moved into place.

FINAL WORD

There are many other hazards and safeguards to consider when completing this task. There are many moving parts going on to successfully weld long lengths of this pipe and move it into place. When evaluating and planning out this work task consider not only the immediate dangers of the welding process, but also lifting and moving the pipe.