

# SHEFFIELD™ STEELS WELDING DATA

**Note:** This data is for information purposes only and is not intended to be instructional. It is not to be used as a substitute for the AWS welding procedures appropriate for the welding of medium alloy Quench & Tempered Materials. In all cases the employment of trained/qualified welders, the observance of sound welding practice, and adherence to AWS procedures is strongly urged.

Our Proprietary Chemistry, Q & T, through hardened **Sheffield #10** and **Sheffield #20 TG&P** are readily welded utilizing the “**Standard Low-Hydrogen Method**”. Use of Low Hydrogen rods, such as E7018 and E8018, provides greater ductility. Those rods have been used with a high degree of success. In instances where pre-heat is not possible, use of a 309 Stainless Rod should be considered. Where higher tensile is required, a 10018 rod may be used with attention to the pre and post thermal treatment.

Preheat the weld area. A preheat and interpass temperature of 500°F to 700°F is generally sufficient. Exact furnace controlled temperature is not required, a heat crayon will provide adequate guidance. When using a torch, move rapidly and evenly to provide a general increase in temperature. Maintain preheat temperature during weld. Post-heat following the same procedure allowing the assembly to slow-cool, thus minimizing shrinkage of the weld.

Use the smallest diameter electrode that will do the job. Travel rapidly and use several small stringer beads. To help minimize welding stresses, peen the beads, after each pass, while they are still hot. Note that stick welding is preferred simply because of the tendency of the semi-automatic process to apply too great of a deposit, which translates into higher heat.

Make every attempt to remove material stresses prior to welding. Insure that the weld surfaces are clean and free of contaminants, such as grease, dust, oil, etc.

After welding, stress relieve at 1000°F to 1250°F, holding at that temperature one hour per inch of greatest cross section. Insure that the welded unit is transferred to the furnace quickly. Do not allow the temperature to drop below the pre-heat and interpass temperature when transferring to the furnace.

Adherence to sound welding practice, the elimination of moisture, the minimization of dramatic temperature change, and use of the **Standard Low-Hydrogen Method**, will greatly improve your chances for exceptional welds.

## **Helpful tip: Storing and re-drying electrodes**

All electrodes must be completely dry or they may cause major problems when welding alloy steels. Purchase only electrodes that are in hermetically sealed containers. Store the rods in those containers. Open containers should be stored at 250°F to 300°F. Typical re-drying temperatures are 650°F to 700°F for one hour. (Longer at lower temperatures is not the same). Discard any electrodes that look noticeably different after the re-drying process. When re-drying electrodes, remove them from the container and spread them out in a furnace. Do not exceed the 700°F temperature.

*Information above is specific to our **Sheffield #10** and **Sheffield #20 TG&P** shaft materials. This information does not apply to “**Free Machining**” grades. For welding data pertaining to other products offered, please contact our technical support staff for more details.*