

## Prebond Operations

1. Plain materials (metal) may come from ICEM Engineering Co. Ltd. inventory or most often from a vendor, mill or stockiest.
2. Incoming inspection is performed in both situations controlled by the Workstation

Instructions identified by the ICEM Engineering Co. Ltd. Job number. Bar code stickers are attached to those metals

So time and material can be tracked. Metal components are also steel stamped with the job Number for traceability to the original vendor documents.

3. Metals are physically inspected for dimensions, surface condition, flatness and any other noted properties.
4. The documents from this inspection go to the Quality Department to be matched with the mill test reports and vendor certification documents. The certification documents are compared and checked for compliance to ICEM Engineering Co. Ltd. purchase order and standard material specifications. Once these chemical and physical properties are verified the material is released into production. **HOLD POINT.** Satisfactory completion of all tasks is recorded by the technician, trained in the operation, by scanning the workstation instruction document with the bar code wand.
5. Metal may have to be trimmed, cut or parted.
6. Carbon and low alloy steels require removal of mill scale.
7. Both faying surfaces of the backer and cladder metals are ground on an automatic, gantry, abrasive belt, surface grinder. A specific grind profile is required and is verified by inspection. **HOLD POINT**
8. Frequently, due to standard, available mill sizes for the alloy cladder, fusion seam welding is required to match the cladder to the backer plate size. The backers are never seamed. The seam welding occurs in a “clean room” on an automatic seam welder to ICEM Engineering Co. Ltd. Procedures qualified to ASME Sect. IX standards. Reference to the appropriate Weld Procedure Specification (WPS) is in the Workstation Instructions for the technician to follow.
9. The welds are all radio graphed, interpreted to ASME standards or customer specifications and the weld surface liquid penetrant inspected.

### **HOLD POINT.**

10. When required by the customer, the cladder plates are heat treated in the thermocouple controlled furnace to stabilize the carbon after the welding operation. This operation may be required by the specifications to maintain the corrosion properties of the alloy. After heat treatment the plate is moved to the grinding operation.
11. The backer and cladder are united at the assembly workstation according to the Workstation Instructions. This is a major operation involving significant, varied detail steps of construction. These steps are key to the explosion bonding process. Technicians build the assembly with close attention to standoff, one of the two main Essential Variables. Standoff is the spacing distance between the two component metals. It is verified with Go/No Gogauge rods.

## **HOLD POINT**

12. Markings needed by the Explosive Chamber crew are added. The “Assembly” is prepared for a 5-km truck ride to the explosive chamber.