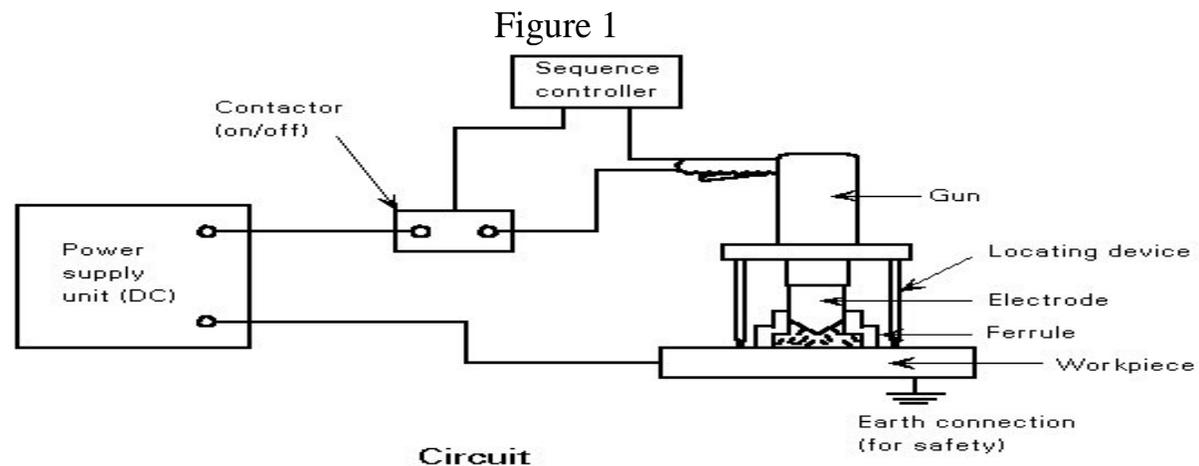


Stalwart Technosource Welding Process

Shear Stud Welding Process:

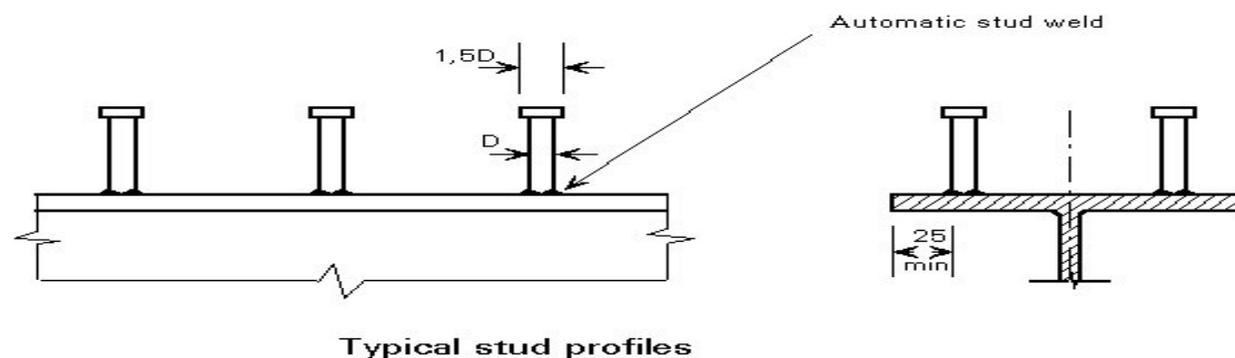
- Drawn-arc stud welding is an extremely efficient method of attaching fasteners primarily to mild steel and stainless steel by utilizing a constant-current DC power supply, typically a 3-phase transformer-rectifier, equipped with integral controls to operate a special drawn-arc stud welding gun(refer fig.1).
- When a weld is initiated, current begins to flow through the stud while the weld gun simultaneously lifts the stud to "draw an arc", which melts the base of the stud and adjoining surface on the work piece.



Electrode : Studs with ends prepared for welding by manufacturer

Ceramic ferrules : shaped to suit stud profile

Controls :
 Current - preset at power supply unit
 Voltage - vary during welding in a sequence
 Electrode feed - determined by the control unit
 Location - controlled by operator



- Upon completion of the weld time, the gun plunges the stud back to the work piece, resulting in a permanent bond as the molten material solidifies all in less than one second refer fig.2



Figure: 2

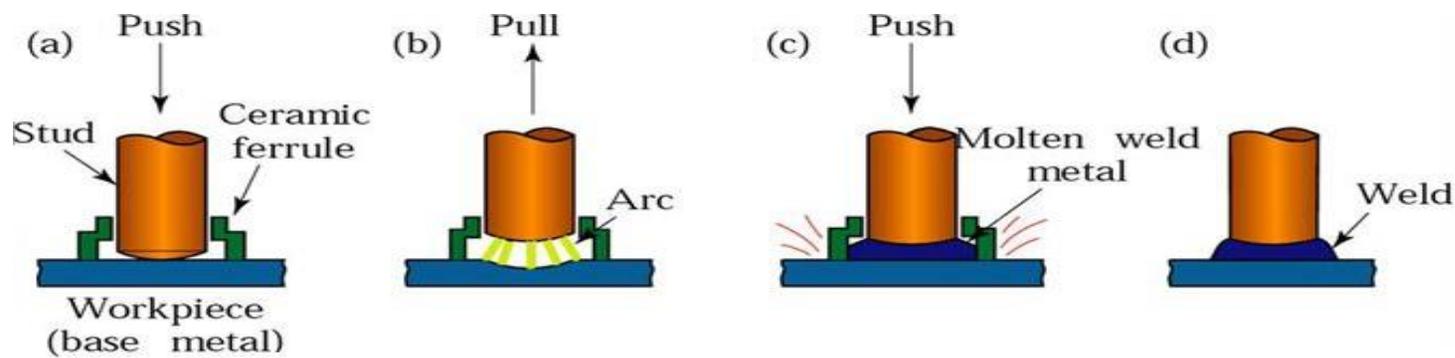


Figure 3

- Fig 3 Shows Process of shear stud welding Holding Shear connectors in welding Gun.

Measure to be taken for Shear Stud Welding:

- A) Keep ferrules dry; wet ferruled cannot be used.
- B) Keep stud dry; rusty studs cause welding problems and premature chuck failure.
- C) Do not weld when the temperature of the bas material is below 0 degrees F per AWS D1.1, Section 7.5.4
- D) Do not attempt to weld through more than 2 thickness of galvanized decking
- E) Do not weld where water is present on the weld surface.
- F) Do not weld through dirt, sand or other foreign material.
- G) Beam flanges should be free of paint, rust and any other foreign material.
- H) If welding thru deck, deck must be tight against beam flange.
- I) Weld studs in the center of beam flange whenever possible to eliminate arc blow.
- J) Hold gun perpendicular to base material.
- K) Test weld set-up at the start of each day and every half hour

Shear Stud welding Testing:

- Testing of Welded Studs At least two studs should be bent in any direction to a 30 degree angle from weld position striking with a hammer or bending with a pipe(refer fig 4) . For deformed bar anchors, bend around a pin the diameter that is equal to twice the diameter of the specimen. If a failure occurs, re-adjust settings and repeat test. Once the setup has been approved, production may be started.

- It is a good idea to test two or three studs every half hours to assure that the set-up has not changed. This can be accomplished by bending several studs to a 15 degree angle from weld position. If a failure does not occur, the weld should be considered good.

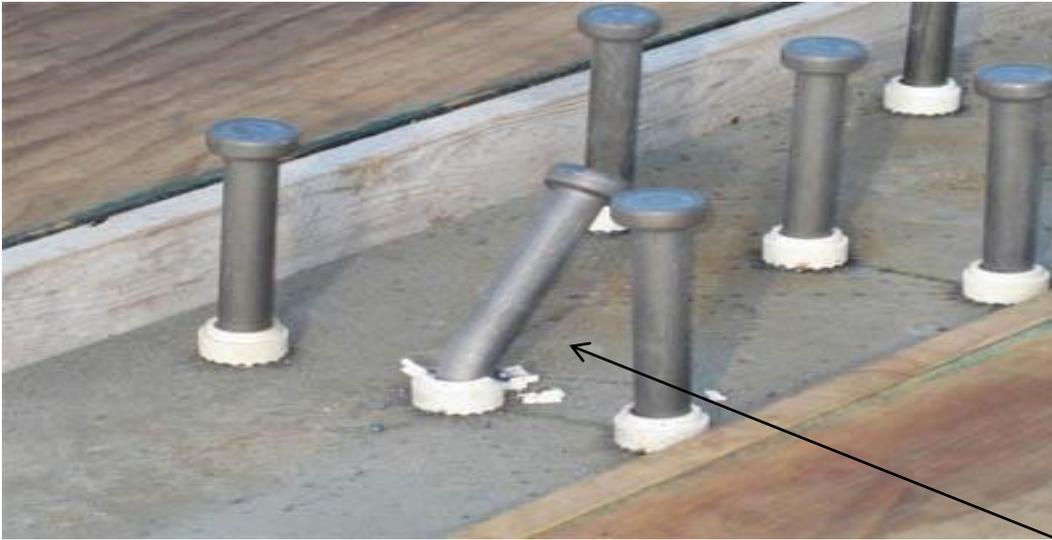


Figure 4

30 Degrees Bend Test

- It is not necessary to straighten a stud that is bent.
- Testing should be carried out at the beginning of each day, after any change in operator, or if the set-up is changed in any way.
- Visual inspection should show a full 360 degree weld fillet, although not necessarily the same fillet height around the circumference of the stud. An under cut at the weld interface will be cause for rejection. If the fillet is something less than 360 degrees complete the fillet by hand welding.
- The studs should then be tested by bending 15 degrees from their original axis either by striking with a hammer or placing a pipe over the stud and manually or mechanically bending the stud. If a failure does not occur, the weld should be considered good. If the weld fails, the studs should be replaced. (See AWS D1.1, Section 7.8.1)
- Fig 5 Shows Visual Testing of stud welding process.

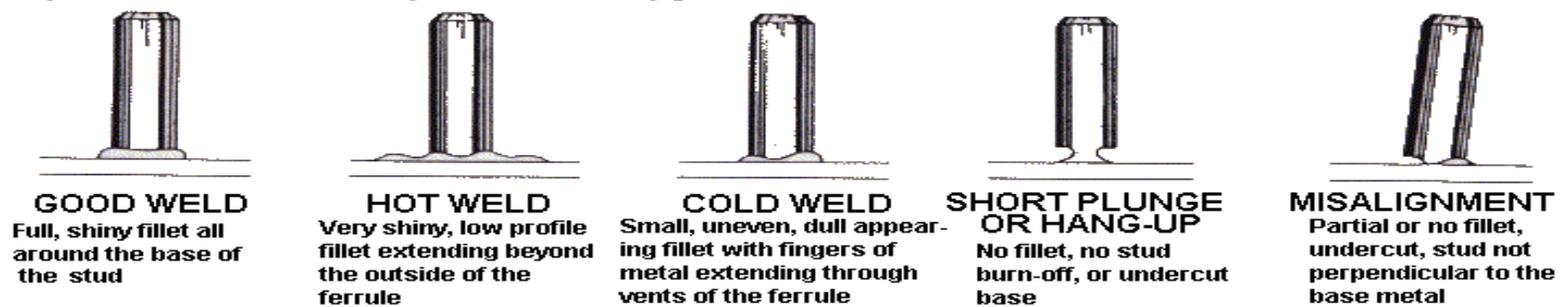


Figure 5