



## SECTION 9

# SHORT CYCLE STUD WELDING GENERAL INFORMATION & TECHNICAL DETAILS

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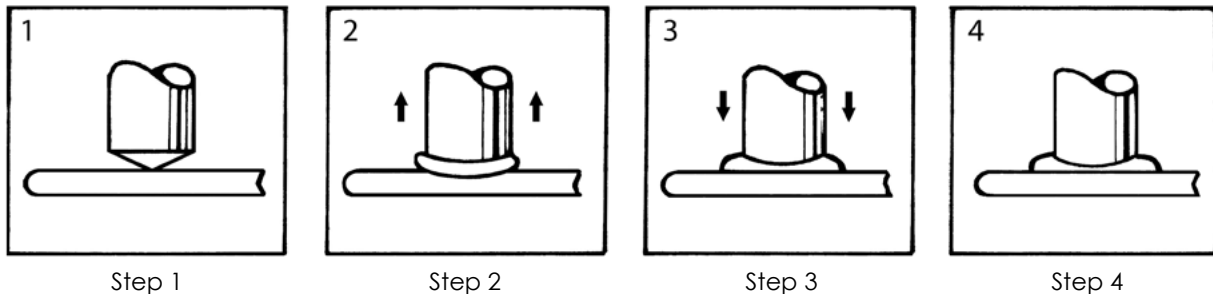
# Short Cycle Stud Welding

## SHORT CYCLE STUD WELDING PROCESS DESCRIPTION

Short Cycle Drawn Arc Stud Welding is commonly referred to as "Short Cycle Stud Welding" or "SC."

The SC welding sequence is the same as the sequence of Arc Stud Welding, however, with relatively higher currents and shorter welding times (100 milliseconds).

The SC welding process is very suitable for stud diameters up to 1/2" (12mm) on thin sheets. To achieve a high welding quality, use of a shielding gas is recommended.



- 1) The welding gun is positioned over the base material and the main gun spring is partially compressed.
- 2) The trigger is pressed and the stud lifts off the base material, drawing an arc. The arc melts the end of the weld stud and the base material below. The process times out and the main current is shut off.
- 3) The main spring plunges the weld stud down into the molten pool of metal in the base material. The cycle is complete and the resulting weld bond develops full strength of the fastener in the weld zone.
- 4) The weld gun is withdrawn from the weld stud.



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## SHORT CYCLE WELD STUDS – TECHNICAL DETAILS

**Threaded & No Thread Short Cycle (SC) Weld Studs:** Sunbelt Stud Welding has various sizes of externally and internally threaded weld studs and various sizes of no thread weld studs. These weld studs are used in various automotive and industrial applications.

**Threads:** The chart below depicts the thread standards for imperial and metric external and internal threads. Unless requested or quoted otherwise, threads will be quoted based on these common thread standards.

Unless indicated or quoted otherwise, external threads will be a rolled type thread. The strength and surface finish of rolled threads are considered to be superior to cut type threads.

Thread Type	External Threads	Internal Threads
Imperial Threads - Coarse	UNC-2A	UNC-2B
Imperial Threads - Fine	UNF-2A	UNF-2B
Metric Threads	Class 6g	Class 6H

**Auto Feed Quality:** All SC weld studs are available in auto feed quality. This allows for usage in auto feed stud welding systems. Auto feed hand guns and weld heads are available with the power source(s) and feeding equipment for incorporation into automated CNC and robotic systems. Auto feed quality should be requested at the time of quotation.

**Material:** The chart below depicts the common material types with corresponding typical tensile strengths used to produce SC Weld Studs.

Note, all externally threaded mild steel SC studs are copper flashed / plated.

Material Type(s)	Typical Tensile Strength	
	Ultimate (psi)	Yield (psi)
Mild Steel C1006 -C1018 range	55,000	35,000
Stainless Steel 18-8 (302HQ & 304)	75,000	30,000
Aluminum Alloy 5356 & 5154	40,000	29,000
Aluminum Alloy 1100	21,000	20,000



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## SHORT CYCLE WELD STUDS - TECHNICAL DETAILS

**Plating:** For mild steel studs, copper plating is standard for externally threaded studs. Upon request Nickel, Zinc and other plating's are available.

**Annealing:** All low carbon steel and stainless steel studs are annealed where required.

**Weld Base:** Studs are available in the Flanged condition. Other flange diameters and weld base dimensions are quoted upon request.

**Length Reduction:** SC Studs have an approximate length reduction from welding of 0.030 inches.

**Flux:** SC Studs are not flux loaded.

**Shielding:** The SC Process does not require shielding gas up through 1/4" diameter studs, however, in most cases it is recommended to use a shielding gas.

**Welding Position:** SC Studs can be welded in the down hand, side hand and overhead positions. In the side hand and overhead positions this becomes increasingly more difficult as the stud diameter increases.

**Available Sizes:** SC studs are available in diameters up through 1/2" (M12) and length is not a limitation. SC studs over 3/8" Diameter typically do not have a flange and are made to order.

**Visual Inspection:** The weld is acceptable if a 360 degree weld flash is present.

**Mechanical Testing:** Testing can be done by bend testing or torque testing. The bend test should be done by bending the stud 30 degrees by striking with a hammer or bending with a pipe.

For torque testing, please refer to the CD Stud Weld Inspection - Mechanical (torque values). These values are the same for SC type studs.

**Weight Charts:** Please see the CD Weld Stud Weight Charts for these values.

