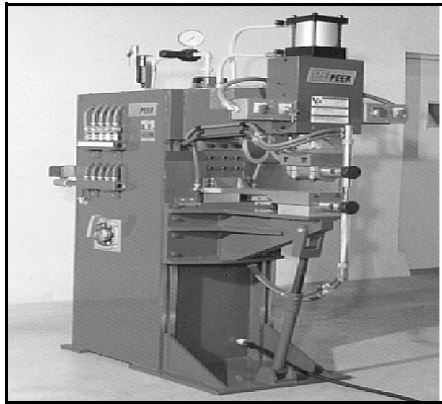


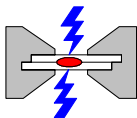
# ALUMINUM SPOT WELDING

As time goes on more and more parts are made out of aluminum and other special alloys, rather than cold rolled steel. This is certainly true for the automotive parts suppliers whose customers are required to reduce the overall weight of the automobile. For those users who are facing aluminum welding for the first time as in automobile, truck, and bus parts and other high quality products we provide this basic review of aluminum spot welding and suggestions of machines.

## 1. THREE PHASE WELDING



The highest quality military spot welding of aluminum and high quality commercial products should be done on 3 phase frequency converter or similar type welding machines. These large high power machines have deluxe welding controls and have the advantage of high output current with medium power demand like middle size single phase welders. Typical outputs of welders would be 90,000 amps secondary current for welding with approximately 150 amps per phase draw on a 440 volt 3 phase power system.



These 3 phase welders are practical welders that result in high quality welding and can meet all automotive and military specifications.

These machines are available new in the price range of \$60 to \$85,000 or in rebuilt from \$25 to \$35,000. Rebuilt machines with new solid state controls are available in a variety of sizes and types.

## 2. CAPACITOR DISCHARGE WELDING



Welding aluminum requires high current and another way to obtain this is with "Capacitor Discharge" Type welders.

The capacitor discharge welder stores energy in a capacitor bank of a new special type and delivers extremely high power currents with minimal draw from your AC power lines. The advantage of this type of equipment for aluminum welding is with small plants that are able to do aluminum spot welding in thicker gauges without flickering their lights or putting in newer power systems. This is an extreme advantage for this type of user and this type of equipment should definitely be considered for aluminum spot welding.

### Resistance Welding Equipment & Supply Co.

2045 East 46th Street Indianapolis, IN 46205  
 Phone: (317) 251-9406 Fax: (317) 251-9407 e-mail: wesco@iquest.net  
 Visit us on the World Wide Web at : [www.spotweldequip.com](http://www.spotweldequip.com)

As an example, in welding normal gauges of aluminum material these welders would draw 35 to 50 amps from a 440 volt single phase line and yet be able to deliver up to 60,000 secondary amps to make a weld. A slight recycle charge time in the order of approximately two seconds is required, however, usually your part movement and other things will not slow production from this quick recharging of this new type capacitor.

If you are considering aluminum spot welding a capacitor discharge machine may be your answer. A model SC-40 10 KVA capacitor discharge welder will be able to weld up to two pieces of 1/16" material. This is a considerable difference from three phase or single phase welders and should open up aluminum welding to a wider range of metal fabricators.

Note: Capacitor discharge machines are not recommended for welding coated metals.

### 3. SINGLE PHASE ALUMINUM SPOT WELDING

The spot welding of aluminum materials on single phase welders is extremely difficult. Due to the high current required for making aluminum spot weld due to its high conductivity, single phase welders from a minimum of 75 KVA or higher are required. Thus, if you are using a 150 KVA single phase welder to weld two pieces of 1/16" aluminum the power draw could be in the range of 200 to 250 AMPS off your main power system. This can cause light blinking and other problems with computers and associated NC controlled equipment. Many single phase welders do weld aluminum. However, this high power demand is their main drawback. Also, excessive electrode sticking and other problems are inherent in single phase machines which are not in the three phase or capacitor discharge type.

We distribute a job shop machine which is the equivalent of a 100 KVA Rocker Arm type welder which was specially modified for aluminum spot welding. For job shop use, up to two pieces of 060 material, this machine will do an industrial quality spot weld in aluminum, however the cosmetic appearance is less than in the higher quality welders mentioned above.



Therefore, if you are considering welding aluminum, here are three possible answers for you. Depending on your plant situation, the quantity of production and the quality of welded products required. We can help you select the proper type aluminum spot welder for your needs.

Remember that typically aluminum's high electrical and thermal conductivity requires about two to three times the amount of current and about one quarter of the "weld time" compared to spot welding steel. Electrodes must be water cooled to keep them in good condition, increase their useful life, and insure consistent weld quality.

Let us know your requirements for aluminum spot welding so we can help you select the machine of your choice. The price range Capacitor Discharge welders is from \$27,000 to \$50,000 and the price range of single phase aluminum welders of the rocker arm type would be from \$13,000 to \$16,000.

Contact us for further information on aluminum and other type spot welding equipment.