

HELPFUL SUGGESTIONS

Many factors affecting electrode cost and useful electrode life are briefly outlined below.

PART TO BE WELDED

Lay out the part for resistance welding. Designing engineer, welding engineer and production man in charge of welding should cooperate in securing a better product at lowest cost.

Correct design permits the use of standard straight electrodes: or standard offset or standard angular holders if the straight approach is not possible. Special shaped electrodes cost more, and the difficulty of cooling the electrode is amplified. Single spot, multiple spot, projection, or other method may be accurately chosen to achieve lowest cost. Contact us for more information.

MATERIAL TO BE WELDED

The weldability of the materials can be determined by consulting your material supplier, feel free to contact us.

Surface conditions, rust, oil, dirt, and, on many articles, oxide film and even handling marks have a decided effect on weld quality. Cleaning may have to be a part of the welding job in some cases.

WELDING EQUIPMENT AND CONTROL

A welding machine of reputable quality purchased for a particular application will be correctly designed both electrically and mechanically, and will be supplied the correct control equipment and electrodes for the work.

On machine change-overs make sure of adequate electrical and mechanical capacity, and see that the necessary controls are provided. Consult us when redesigning or revising your choice of electrodes.

ELECTRODE LIFE SAVERS

Use standard electrodes with ejector type, self-adjusting tube, water-cooled electrode holders wherever possible. Avoid special or irregular shapes for lowest cost.

Use ample cold cooling water as close as practical to the welding contact surface, properly circulated at a minimum of 30-psi pressure, and supplied at a rate of at least 1-1/2 gallons per minute.

Be sure to select the proper type and size of electrode, taking into consideration electrode pressure, contact area of electrode, gauge, and nature of material to be welded. Contact us for help, if needed. Overloading as well as overheating shortens electrode life.

Good welds depend upon properly maintained electrodes which assure an accurate surface contact. Keep tapers clean and dress electrode faces with lathe, emery paddle or fine line. Use our copper paste (PC968) to facilitate tip removal, and avoid application of insulators such as Teflon tape and other materials.

RESISTANCE WELDING MACHINE SETUP							
TO DETERMINE SPOT WELDING SCHEDULE				APPROX. PRESSURE EXERTED BY AIR CYLINDER SIZE			
				DIAMETER	CYLINDER AREA SQ. INCHES		
CURRENT	=	$2T \times 100,000$	=	AMPERES	4"	=	12.5 x =
TIME	=	$2T \times 100$	=	CYCLES	5"	=	19.5 x WELDER GAUGE PRESSURE = ELECTRODE FORCE PRESSURE
PRESSURE	=	$2T \times 6000$ (LB)	=	FORCE REQUIRED (LB)	6"	=	28.0 x =
		T = THICKNESS OF THE THINNEST PIECE			8"	=	50.0 x =

PROBLEM SOLVING

PROBLEM	SOLUTION
Expulsion at weld interface	<ul style="list-style-type: none"> • Short squeeze time • Low welding force • Dirty – Scaly material • Poor fit up • Insufficient Edge Distance
Surface expulsion/electrode sticking	<ul style="list-style-type: none"> • Short squeeze time • Long weld time • Short hold time • Low weld force • High weld current • Dirty – Scaly material
Electrode mushrooming	<ul style="list-style-type: none"> • Insufficient cooling • Low weld force • High weld current • Small electrode face area • Long weld time • Welder head impacts work
Low weld strength	<ul style="list-style-type: none"> • Short weld time • Low weld time • Low weld current • Small electrode face area • Poor heat balance • Welds too close together

Excessive weld indentation	<ul style="list-style-type: none"> • Long weld time • High weld force • High weld current • Poor fit up • Welder head impacts work
Internal cracks in weld nugget	<ul style="list-style-type: none"> • Short hold time • Low weld force • Dirty – Scaly material • Metallurgy of material welded • Poor head follow up
Displaced weld nugget	<ul style="list-style-type: none"> • Electrode Misalignment • Poor heat balance • Poor fit up
Cracks in parent material	<ul style="list-style-type: none"> • High weld force • Insufficient cooling • Metallurgy of material welded

HELPFUL HINTS

- Use standard RWMA design electrodes whenever possible. Use the RWMA recommended electrode material for the part being welded. Keep the electrodes aligned normal to the working face. Only use offset electrodes or weld at an angle when nothing else will work.
- Check the water deflector tubes each time you install electrodes. They should be within one quarter inch of the bottom of the water hole of the electrode.
- Confirm there is water flow from the electrodes, transformer, control and other cooled components before welding.
- Always use the proper size water hose, if removed check for obstructions that might impede flow.
- When a set up will not be used for a period of time remove the electrodes from the holders to avoid freezing into the holder due to corrosion.
- Use fine emery cloth to dress electrode faces. If wear is excessive remove from the machine and dress in lathe or other controlled machine. Dressing electrodes with files is not recommended because alignment and consistency are not possible with this manual method.
- If the use of a hammer is necessary on resistance welding machine or its components, use rubber, plastic, brass, raw-hide or other soft material. Never use a steel hammer.
- If a water leak is found, repair as soon as possible, or report it to the appropriate maintenance personnel.
- Check all mechanical connections in the secondary connections. Check all shunts and cables for damage, replace as needed.
- Perform maintenance to Resistance Welding equipment as outlined in RWMA Bulletin 14.

- Keep in mind that sparks/expulsion are an indication that something is not right at the weld. It could be current, force, time, alignment and many other factors. Take time, check your set up for variance from the desired settings. Expulsion can be dangerous and could also result in questionable product.

Always feel free to contact us for advices, service call or configuration matters, our team will be please to help you.