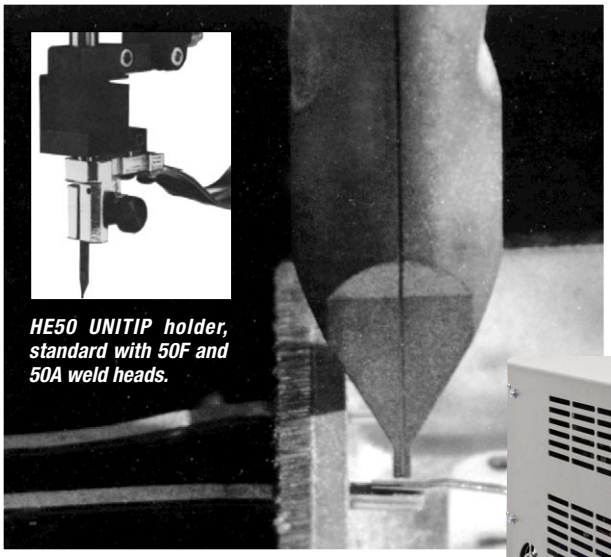
UNITIP®/UNIBOND®

Parallel Gap Bonding Electrodes

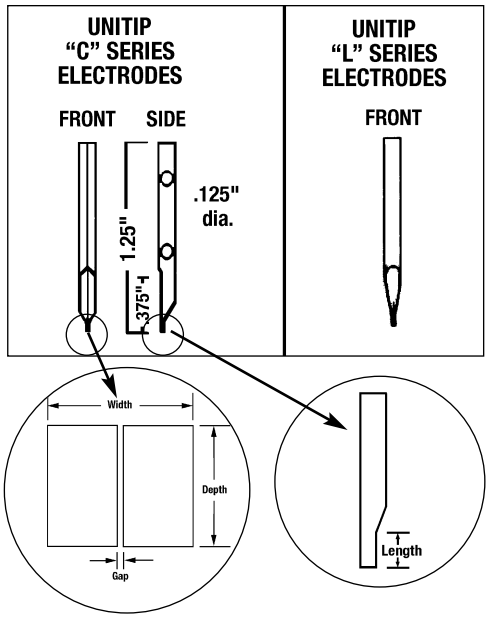


HE50 UNITIP holder, standard with 50F and 50A weld heads.

UNITIP electrode bonding gold ribbon to hybrid interconnect pin.

UB-500A linear DC welder

UNITIPS are electrodes for parallel gap bonding of gold plated kovar, copper, or gold ribbons (wires) which are smaller than 0.010 inches (0.25 mm). They are made from two pieces of molybdenum or tungsten, which are permanently bonded to an insulating spacer. This fixed gap and bonded construction results in a tip which wears uniformly when properly dressed. The length of the UNITIP and the flat area on the front allows it to bond ribbons extremely close to the walls of packages as deep as 0.450 inches (11.5 mm). The narrower THIN-LINE "L" series UNITIPS have a tapered profile, enabling them to be used closer to the corners of packages.

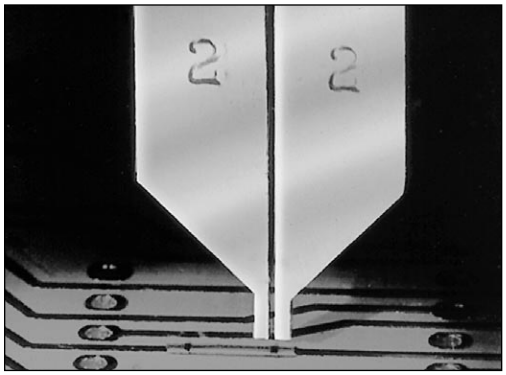


	FACE				Max. force	Max. force
Model	Width	Depth	Gap	Length	oz	Kgf
UTM111L	.010	.009	.001	.025	33	.94
UTM112L	.010	.010	.002	.025	33	.94
UTM152L	.010	.005	.002	.025	17	.47
UTM222L	.018	.020	.002	.050	132	3.75
UTM237L	.030	.020	.007	.050	161	4.57
UTM111C	.009	.010	.001	.025	33	.94
UTM112C	.010	.010	.002	.025	33	.94
UTM222C	.018	.020	.002	.050	132	3.75
UTM224C	.020	.020	.004	.050	132	3.75
UTM224L	.020	.020	.004	.050	132	3.75
UTM112CS	.010	.010	.002	.015	33	.94
UTM112LS	.010	.010	.002	.015	33	.94
UTT111C*	.009	.010	.001	.025	33	.94
UTT112C*	.010	.010	.002	.025	33	.94

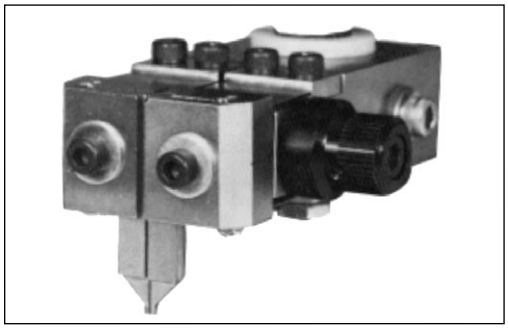
All dimensions in inches unless noted. NOTE: Model UTA UNITIP adapter required for use with models 50F/UB, 50A/UB, 86F and 86A weld heads. See Accessories for more information. ** Tungsten electrodes*

TYPICAL APPLICATIONS

- Hybrid or microwave circuitry
- Thin or thick film substrate
- Potentiometers and other miniature components
- Medical devices
- Semi-rigid substrates
- Fine line printed circuit trace repair



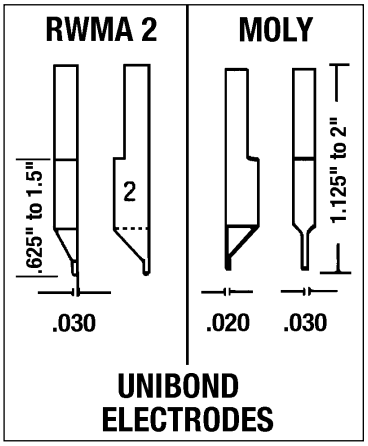
UNIBOND electrodes perform welded circuit board repair.



HE50UB UNIBOND electrode holder, standard with 50F/UB and 50A/UB weld heads. 86F & 86A weld heads are equipped with a similar HE86UB UNIBOND electrode holder.

UNIBOND ELECTRODES

UNIBOND electrodes are used for parallel gap bonding and reflow soldering. Generally, RWMA2 copper UNIBOND electrodes are used with resistive and/or hard materials such as gold plated kovar and nickel. Molybdenum UNIBOND electrodes are used for bonding conductive or soft materials such as copper or gold. The face of a UNIBOND electrode is 0.020 inches (0.5 mm) wide by 0.030 inches (0.75 mm) deep. In unfixtured applications, this limits their use to bonding ribbons (wire) which are at least 0.010 inches (0.25 mm) wide because of the limited visibility.



Model	Material	FACE			
		Length	Width	Depth	Length
EU1000	RWMA2	1.125 in	.020	.030	.080
EU1002	RWMA2	2 in	.020	.030	.080
EU2030M	Copper Clad Moly	1.125 in	.020	.030	.080
EU2030ML	Moly	2 in	.020	.030	.080
EU2537M	Moly	1.125 in	.025	.037	.100
EU2030MR	Moly	1.125 in	.020	.030	.080

THREE RULES FOR SUCCESSFUL SUBMINIATURE PARALLEL GAP WELDING

General

Subminiature parallel gap welding is extremely sensitive to the proper placement of the electrode tip on the parts to be welded. Inconsistent or blow-out welds between the electrode tip and the part being welded can usually be traced to poor electrode tip placement, incorrect electrode tip size, improper weld schedule selection, or poor electrode maintenance.

RULE 1: MAKE CONSISTENT TIP CONTACT

UNITIP or UNIBOND parallel gap electrode tips must make consistent contact with the part to be welded. If the contact area between the tip and part is reduced because of operator tip misplacement, the electrode tip will become very hot, causing sparking, material expulsion, and sticking of the electrode tip to the parts. The electrode tip becomes hot because the entire weld current is forced through the reduced contact area instead of the full contact area.

Figure 1 shows a UNITIP electrode tip, as viewed from above, correctly centered on a printed circuit trace. For ease of visual alignment, the electrode gap is best positioned perpendicular to, and centered on the trace.

Figure 2 shows expulsion occurring when both sides of the UNITIP electrode do not make full contact with the trace. The cross-hatch area indicates a 70% contact area.

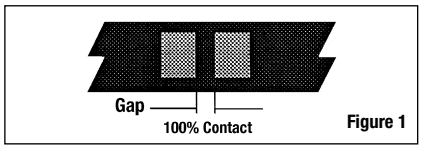


Figure 1

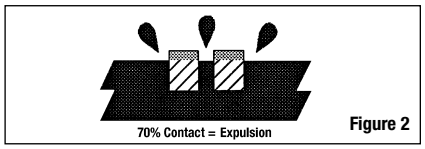


Figure 2

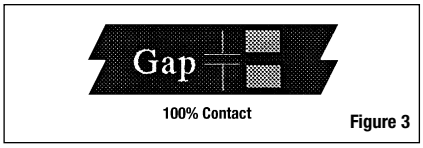


Figure 3

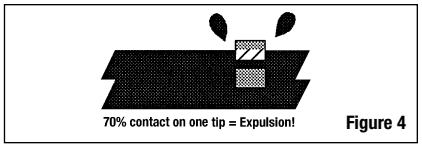


Figure 4

Figure 3 shows a UNITIP electrode tip face correctly centered on a printed circuit trace with electrode gap parallel to the trace.

Figure 4 shows expulsion occurring when one side of the UNITIP electrode does not make full contact with the trace.

RULE 2: USE THE LARGEST ELECTRODE FACE

To minimize operator positioning errors, use an electrode tip that has a larger face area than the part being welded. Small variations in electrode position have no effect on the weld quality because the electrode tip contact area stays constant. Longer electrode tip life, less electrode sticking, and reduced frequency of electrode cleaning are added benefits of using the largest possible electrode tip face. When using a parallel gap electrode that is larger than the part being welded, the electrode gap must be perpendicular to the part.

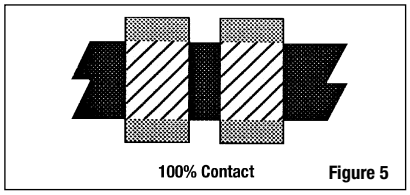


Figure 5

Figure 5 shows a large UNITIP electrode tip centered over and completely covering 100% of the part width.

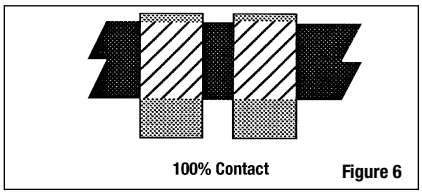


Figure 6

Figure 6 shows the same electrode tip offset slightly on the part, but still contacting 100% of the part width. Both figures 5 and 6 produce equal quality welds.

RULE 3: OPTIMIZE THE WELD SCHEDULE

Many users of subminiature parallel gap welding systems assume that one weld energy schedule will work on all applications regardless of changes in part dimensions or thickness. A weld schedule includes the following variables: weld energy, current, or voltage amplitude, the weld duration, weld force, electrode materials and their dimensions, and electrode gap. Invariably, a weld schedule setting optimized for a small thermal mass application produces a weak weld when applied to a larger thermal mass application. If the parts to be welded only change width, not thickness, the weld force and electrode gap can remain constant but the weld energy, current or voltage, and the weld duration must be readjusted to produce a quality weld.

While matching weld schedules to each welding application may use slightly more production time, the cost savings in reduced product scrap will produce significant dividends.

Figures 7 and 8 show examples of a typical printed circuit board trace repair operation. The trace width is identical in both figures, but Figure 8 has a circuit board pad and extra traces on each end which act as heat sinks. Since figure 7 has no circuit board pads or extra traces present to heat sink the weld energy, less energy is required to make a good weld. Attempting to weld Figure 8 using the same energy as Figure 7 will result in a weak weld. Conversely, using the Figure 8 weld schedule on the Figure 7 weld will result in trace blow-out because the smaller thermal load cannot absorb the higher energy level. Each weld depicted requires a different weld schedule.

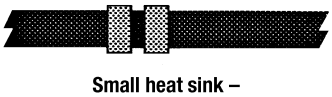


Figure 7

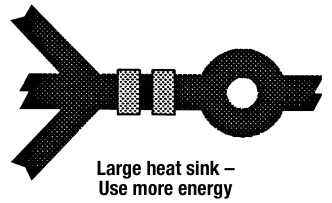
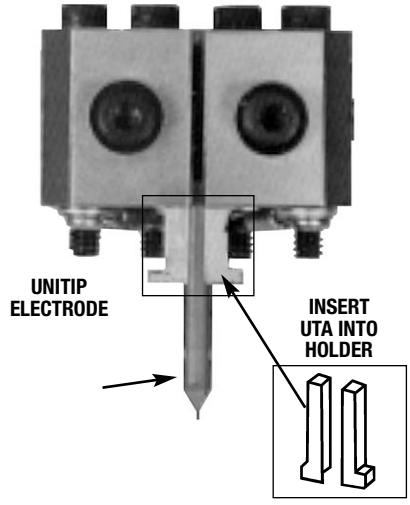


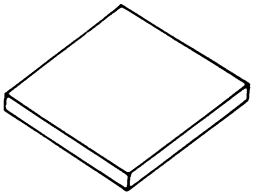
Figure 8

ACCESSORIES



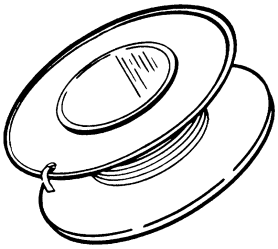
Model UTA UNITIP adapter.
Use with 50F/UB, 50A/UB, 86F and 86A weld heads.

Polishing Disks



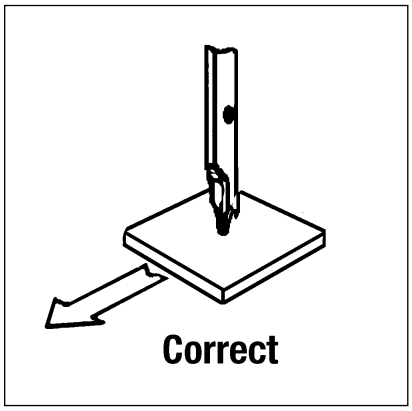
Model	Description
CPD	Ceramic polishing disks, 1 in square x .025 thick. Package of 20.

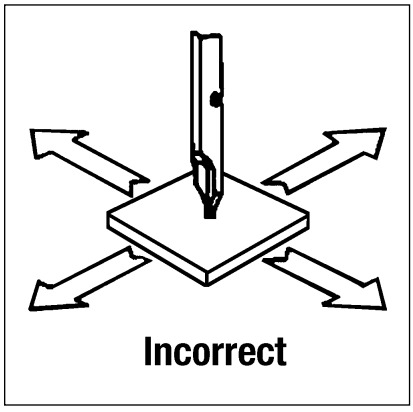
Gold Plated Kovar Ribbon



Model	Size
KR207	.002 in x .0065 in x 10 ft
KR306	.002 in x .010 in x 20 ft
KR307	.002 in x .005 in x 20 ft
KR310	.003 in x .010 in x 20 ft
KR315	.003 in x .015 in x 20 ft
KR320	.003 in x .020 in x 20 ft

ELECTRODE DRESSING AND CLEANING





Dressing procedure

UNITIP AND UNIBOND ELECTRODE DRESSING

UNITIP and UNIBOND electrodes must be properly dressed to ensure that the electrode face is parallel to the workpiece surface. The small UNITIP and UNIBOND tip geometries make the electrode faces extremely susceptible to damage during dressing or cleaning. Dress UNITIP and UNIBOND electrodes with Model CPD ceramic polishing square.

UNITIP and UNIBOND electrodes should be resurfaced periodically using the techniques described to remove the oxides and welding debris from the electrodes which are naturally resultant of the bonding process. When welding with UNITIP electrodes, a small puff of smoke appears as each bond is made. The absence of this puff of smoke is a clear signal to the operator that it is time to clean the electrode face. Use organic solvents to clean flux and other buildup from thermode tips.

Steps:

1. Install UNITIP or UNIBOND electrode.
2. Adjust the Work Holder surface height so that it is at the same level as the workpiece surface.
3. Place a Model CPD ceramic polishing disk on the work holder surface, directly beneath the electrode face.
4. Bring the electrode face into contact with the polishing disk. Avoid applying a force of more than 150 grams to smallest UNITIP electrode tips.
5. Gently pull the polishing disk forward, keeping the direction of pull parallel to the electrode gap. Note: Do not rock the polishing disk from side to side or front to back. The drawing, below, shows a UNITIP electrode being correctly and incorrectly dressed.
6. Clean the electrode face with a small lint free swab saturated in alcohol to remove any residue created by the dressing procedure. Low pressure compressed air can also be used to remove any residues.
7. Examine the electrode face with a small mirror for flatness and direction of surface scratches. A properly dressed electrode will have small scratch marks that are parallel to the electrode gap.

CE

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