



## CircuitWorks® — Benchtop Solutions for Your Electronic Needs

### CircuitWorks® Repair and Prototype Tools

Comprehensive line of conveniently packaged and precision dispensing rework and repair products makes circuit board repair and prototyping faster, easier and more accurate. Advanced-formula materials packaged in unique delivery systems ensure superior performance and pinpoint accuracy. The full range of products meets all of the technicians needs for electronics rework and prototyping — repairing, cleaning, protecting, lubricating, bonding, and restoring electrical conductivity to circuit boards and components.

CircuitWorks® products are compliant with IPC-7711 Rework of Electronic Assemblies, and ANSI/J-STD-001.

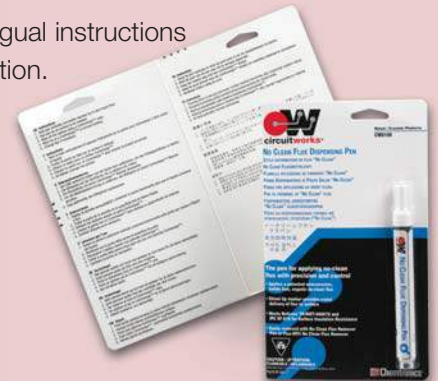


### Wide Variety of Benchtop Solutions

CircuitWorks® repair and prototype tools are grouped in the following product areas: Conductive Inks, Conductive Greases, Thermal Compounds, Conductive Epoxies, Protective Overcoats, and Flux, Solder, Cleaning, and Lubricating Pens.

### Convenient Packaging

All CircuitWorks® products are available on folded blister cards complete with multi-lingual instructions and regulatory information.



## Conductive Ink



### CircuitWorks® Conductive Pen

Pen dispenser for drawing highly conductive silver traces, jumpers and shielding with precision and control

- Quickly creates highly conductive silver traces
- Valved pen tip for easy applications
- Solderable at low temperatures
- Dries in minutes at room temperature
- Choice of Micro Tip for fine lines or Standard Tip for wider lines

**Applications:**

- Repairs traces
- Links components
- Makes smooth jumpers
- Shields electronics



<b>CW2200STP</b>	Standard Tip	8.5 g / 0.3 oz
<b>CW2200MTP</b>	Micro Tip	8.5 g / 0.3 oz

### CircuitWorks® Copper Conductive Pen

Pen dispenser for drawing highly conductive copper traces, jumpers and shielding with precision and control

- Quickly creates conductive copper traces
- Valved pen tip for easy applications
- Operating temperature to 212°F (100°C)
- Dries in minutes at room temperature
- Standard Tip for wider lines

**Applications:**

- Repairs traces
- Links components
- Makes smooth jumpers
- Shields electronics

<b>CW2300STP</b>	Standard Tip	8.5 g / 0.3 oz
------------------	--------------	----------------



### CircuitWorks® Nickel Conductive Pen

Pen dispenser for economically drawing conductive traces, jumpers and shielding

- Quickly creates conductive nickel traces on most surfaces
- Easy and economical to use
- Valved pen tip for easy applications
- Dries in minutes at room temperature

**Applications:**

- Economically repairs traces, links components, and shields electronics

<b>CW2000</b>	Standard Tip	9 g / 0.32 oz
---------------	--------------	---------------



### CircuitWorks® Flex Conductive Pen

Micro-tip pen for drawing conductive traces on flexible and ITO surfaces

- Quickly creates flexible conductive silver traces on flex circuitry
- Micro tip for precise applications
- Dries in minutes at room temperature
- Highly adherent silver-based polymer system

**Applications:**

- Repairs conductive traces on flexible circuits and indium tin oxide components

<b>CW2900</b>	8.5 g / 0.3 oz
---------------	----------------



### CircuitWorks® Rubber Keypad Repair Kit

Conveniently-sized kit for permanent repair of rubber keypads

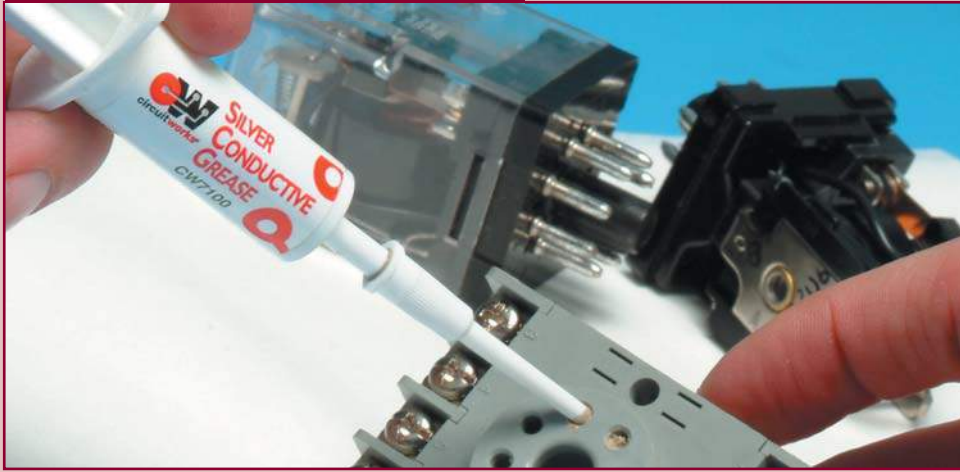
- Restores electrical conductivity to worn carbon contacts
- Forms a tough, flexible, wear-resistant surface
- Repairs over 50 rubber button contacts

**Applications:**

- Restores rubber and telephone keypads
- Restores flexible carbon contacts

<b>CW2605</b>	Adhesive	3 g / 0.1 oz
	Curing Agent	0.3 g / 0.01 oz

## Conductive Greases



### CircuitWorks® Silver Conductive Grease

Grease for superior electrical and thermal conductivity, lubrication and protection

- Maximum electrical and thermal conductivity
- Protects against moisture and corrosion
- Thermally stable over a wide temperature range
- Conductive lubricant containing pure silver

**CW7100** 6.5 g / 0.23 oz

#### Applications:

- Fills connector gaps to maximize electrical and thermal conductivity
- Controls static discharge
- Grounds circuits



### CircuitWorks® Carbon Conductive Grease

Carbon conductive grease for superior electrical/thermal conductivity, lubrication and protection

- Excellent lubrication properties
- Resistance to moisture, radiation, oxidation and corrosive chemicals
- Protects active metal surfaces from corrosion and oxidation
- Good electrical conductivity for medium or low power applications
- Very wide operating temperature range from -70° to 485°F (-56° to 252°C)

#### Applications:

- Protects against wear on low or medium speed sliding contacts
- Forms conductive contacts for static drains or grounding
- Prevents corrosion on knife switches
- Extends the life of rotating switches
- Lubricant for ball and roller bearings
- Grounds ball and socket connections on power insulators

**CW7200** 3.5 g / 0.12 oz Syringe

## Thermal Compounds

### CircuitWorks® Boron Nitride Heat Sink Grease

Ultra-high efficiency, thermally conductive grease

- Provides maximum thermal conductivity with superior dielectric properties
- Silicone free compound will not harden or dry out
- Electrically insulative; noncorrosive and nonflammable
- Thermally stable from -99.4°F/-73°C to 392°F/200°C
- Exceeds MIL-C-47113 for Thermal Conductivity

#### Applications:

- Formulated for maximum heat transfer between circuit components and heat sinks without electrical conductivity

**CW7250** 3.4 g / 0.12 oz



### CircuitWorks® Silicone Free Heat Sink Grease

Non-contaminating silicone free heat-sink grease

- Silicone free compound will not harden or dry out
- Excellent thermal conductivity and dielectric properties
- Non-corrosive
- Thermally stable from -5°F/-15°C to 392°F/200°C
- Exceeds MIL-C-47113 for thermal conductivity

#### Applications:

- Excellent heat transfer between circuit components and heat sinks, without any silicone migration

**CW7270** 8 g / 0.28 oz



### CircuitWorks® Heat Sink Grease

Silicone compound for heat transfer away from electronics and electrical components

- Excellent thermal and dielectric properties
- Will not dry out, harden, or melt
- Noncorrosive and nonflammable
- Thermally stable from -40°F/-40°C to 342°F/172°C
- Meets MIL-DTL-47113D Type I

#### Applications:

- Facilitates heat transfer between circuit components and heat sinks

**CT40-5** 142 g / 5 oz

**CT40-1** 454 g / 1 lb



## Conductive Epoxies



### CircuitWorks® 5 Minute Conductive Epoxy

Epoxy for precision repair and high strength conductive bonding

- Conductive silver epoxy provides excellent electrical conductivity
- High strength conductive bond with a five minute work time
- Repairs defective traces and creates jumpers on boards
- Quick solderless electronic connections

#### Applications:

- Repairs traces and temperature sensitive circuits
- Makes high-strength solderless conductive connections

<b>CW2400J</b>	Adhesive	10 g / 0.35 oz
	Hardener	10 g / 0.35 oz in jars

### CircuitWorks® Conductive Epoxy

Epoxy for precision repairs and high-strength conductive bonding

- Conductive silver epoxy provides excellent electrical conductivity
- High strength conductive bond with a five minute work time
- Repairs defective traces and creates jumpers on boards
- Quick solderless electronic connections

#### Applications:

- Repairs traces and temperature sensitive circuits
- Makes high-strength solderless conductive connections

<b>CW2400</b>	Adhesive	7 g / 0.25 oz
	Hardener	7 g / 0.25 oz



### CircuitWorks® 60 Minute Conductive Epoxy

Epoxy system with extended pot life for high strength conductive bonds

- Conductive silver epoxy provides excellent electrical conductivity
- Sixty minute work time provides a high strength conductive bond
- Extended pot life provides increased work time
- Repairs defective traces and creates jumpers on boards
- Quick solderless electronic connections

#### Applications:

- Longer pot life provides extended work time
- Makes high-strength solderless conductive connections

<b>CW2460</b>	Adhesive	10 g / 0.35 oz
	Hardener	10 g / 0.35 oz in jars

## Protective Overcoats



### CircuitWorks® Epoxy Overcoat

Tough, thermally stable, epoxy protective conformal coating

- Provides a hard, durable, protective green coating
- Excellent dielectric properties; help prevent electrical discharge
- Protects against moisture and abrasion
- Ideal for pre-reflow solder resist repair
- Service temperature from -55°F/-48°C to 600°F/315°C
- Meets the requirements of IPC-7721, 2.4.1

#### Applications:

- Ideal for repairing permanent solder mask before reflow applications
- Protects circuits and prevents shorting and arcing

<b>CW2500</b>	Adhesive Syringe	4 g / 0.14 oz
	Hardener Syringe	3.4 g / 0.12 oz

### CircuitWorks® Overcoat Pen

The pen dispenser for precise application of a tough protective acrylic conformal coating

- Simple to use, single component system
- Hard, durable coating
- High dielectric strength helps prevent electrical discharge
- Dries quickly at room temperature
- Protects against moisture and abrasion damage
- Meets requirements of MIL-I-46058C and IPC-CC-830A
- Choice of clear, green, blue, black or white coating

#### Applications:

- Insulates and protects conductive pen traces
- Repairs permanent solder mask
- Prevents shorting and arcing

<b>CW3300C</b>	Clear	4.9 g / 0.16 oz
<b>CW3300G</b>	Green	4.9 g / 0.16 oz
<b>CW3300B</b>	Blue	4.9 g / 0.16 oz
<b>CW3300BLACK</b>	Black	4.9 g / 0.16 oz
<b>CW3300WHITE</b>	White	4.9 g / 0.16 oz

## Flux and Solder



### CircuitWorks® Flux Dispensing Pens

Pen for applying flux with precision and control

- Chisel tip marker provides exact delivery of flux to surface
- Easily removed with appropriate CircuitWorks® Flux Remover Pen

### No Clean Flux Dispensing Pen

- Applies a patented noncorrosive, halide free, no clean flux
- Flux meets Bellcore TR-N-NWT-000078 and IPC SF-818 for Surface Insulation Resistance
- Flux meets ANSI/IPC J-STD-004, Type ROLO

**CW8100** 9 g / 0.32 oz

### Lead-Free Flux Dispensing Pen

- Applies a noncorrosive, halide free, no clean flux for high temperature, lead-free application
- Can also be used for tin/lead solders
- Flux meets Bellcore TR-N-NWT-000078 and IPC SF-818 for Surface Insulation Resistance
- Flux meets ANSI / IPC J-STD-004, Type ROLO
- Easily removed with Lead-Free Flux Remover Pen, or Flux-Off® Lead-Free Flux Remover

**CW8400** 9 g / 0.32 oz

### Rosin Flux Dispensing Pen

- Applies a noncorrosive, nonconductive Type R flux
- Flux meets MIL-F-14256 F Type R and ANSI/IPC J-STD-004, Type ROLO

**CW8200** 9 g / 0.32 oz

### Water Soluble Flux Dispensing Pen

- Applies a neutral pH organic water soluble flux for rapid soldering
- Flux meets ANSI/IPC J-STD-004, ORH1 Classification
- Easily removed with water or Flux-Off® Water Soluble

**CW8300** 9 g / 0.32 oz



### CircuitWorks® Lead-Free Pocket Solder

Lead free, high purity pocket sized solder dispenser for convenient rework and repair

- Precision manufactured lead-free solder alloy
- 96.5% Tin (Sn), 3.0% Silver (Ag), 0.5% Copper (Cu)
- Type ROLO flux per IPC J-STD-004
- Ensures even, reliable solder connections
- Cleans and wets heavily tarnished copper surfaces

#### Applications:

- SAC 305 for soldering lead-free applications

**S200** 1.0 mm / 0.04" Diameter,  
3.18 m / 125" Length

### CircuitWorks® Lead-Free Tacky Flux

Conveniently packaged flux gel formulated for easy lead-free BGA rework

- Specifically formulated for the higher temperature requirements of lead free applications
- Syringe applicator provides exact delivery of flux
- Long tack time, extended shelf life
- No refrigeration required
- Noncorrosive, halide and halogen free
- Meets IPC requirements for ROLO, No Clean
- Conforms to ISO 9454
- Meets Bellcore TR-NWT-000078 requirements
- Meets DIN EN 29454-1 1.1.3.C classification

**CW8700** 3.5 g / 0.12 oz Syringe

**CW8710** 12 g / 0.42 oz EFD Dispenser

**CW8710BLK** 12 g / 0.42 oz EFD Dispenser



### CircuitWorks® No-Clean Tacky Flux

Conveniently packaged no-clean flux gel formulated for easy BGA rework

- Formulated for No-Clean applications
- Syringe applicator provides exact delivery of flux
- Long tack time, extended shelf life
- No refrigeration required
- Noncorrosive, halide and halogen free
- Meets IPC requirements for ROLO, No Clean
- Conforms to ISO 9454
- Meets Bellcore TR-NWT-000078 requirements
- Meets DIN EN 29454-1 1.1.3.C classification
- RoHS Compliant

**CW8500** 3.5 g / 0.12 oz Syringe

**CW8510** 12 g / 0.42 oz EFD Dispenser

**CW8510BLK** 12 g / 0.42 oz EFD Dispenser

### CircuitWorks® Water Soluble Tacky Flux

Conveniently packaged water soluble flux gel formulated for easy BGA rework

- Specifically formulated for water soluble and water removable applications
- Syringe applicator provides exact delivery of flux
- Long tack time, extended shelf life
- No refrigeration required
- Halide and halogen free
- Meets IPC ANSI-J-STD-006 requirements for ORLO, Water Soluble
- Conforms to ISO 9454
- Meets Bellcore TR-NWT-000078 requirements

**CW8600** 3.5 g / 0.12 oz Syringe

## CircuitWorks® Lead-Free Flux

Convenient, easy-to-use flux for lead-free applications

- High thermal stability
- Excellent material compatibility
- No-clean flux is noncorrosive and halide-free
- Fast drying
- RoHS compliant
- Can be used for soldering with lead-free or tin/lead solders
- Flux passes J-STD-004 Surface Insulation Resistance Testing IPC-TM 650 Test Method 2.6.3.3

### Applications:

- Printed circuit boards
- Chip carriers
- Surface mount device pads
- Switches and sockets

**CW3220** 32 oz / 1 qt



## CircuitWorks® BA Dispensing Pen

Empty pen for easy filling, dispensing, and applying all types of liquids

- Fill with your choice of liquids; fluxes, cleaning solvents, oils, etc.
- Wide opening allows easy filling
- Wide base permits the pen to stand upright on your work bench, minimizing footprint
- Tough and durable body, valve and nib
- Anti-roll cap prevents pen from rolling off bench top

### Applications:

- Portable and convenient way to apply the specific flux for your process
- Dispensing lubricants, contact preservatives or coatings
- Can be used with inks or marking materials

**CW7000** 2 Empty Pens per Package

## Cleaning and Lubricating Pens



## CircuitWorks® Conformal Coating Remover Pen

Pen for precise removal of silicone, acrylic and urethane coatings from PCBs

- Spot cleans tight tolerance areas on circuit boards
- Marker dispenser provides controlled and exact application
- Evaporates quickly
- Provides low surface tension for superior wetting
- Low VOC content

### Applications:

- Removes most types of conformal coatings

**CW3500** 9 g / 0.32 oz

## CircuitWorks® Flux Remover Pen

Pen for precise removal of flux from printed circuit boards

- Completely removes flux in seconds
- Spot cleans tight tolerance areas on circuit boards
- Marker dispenser provides controlled spot cleaning
- Dries fast

### Applications:

- All cleaning applications where rosin or no clean flux must be removed

**No Clean Flux Remover Pen**  
**CW9100** 9 g / 0.32 oz

**Rosin Flux Remover Pen**  
**CW9200** 8 g / 0.28 oz



## CircuitWorks® Lead-Free Flux Remover Pen

Pen for removing lead-free flux with precision and control

- Completely removes lead free flux residues in seconds
- Can also be used to remove tin/lead fluxes
- Marker dispenser provides controlled and exact application
- Dries fast

**CW9400** 9 g / 0.32 oz

## CircuitWorks® Gold Guard™ Pen

Pen for cleaning and lubricating gold and other noble metal contacts and connectors

- Cleans and leaves protective polyphenyl ether lubricant in one step
- Chisel tip marker for exact delivery to the contact
- Safe on plastics

### Applications:

- Cleans and lubricates gold contacts
- Extends life of noble metal contacts

**CW7400** 8.5 g / 0.3 oz



## CircuitWorks® The Mighty Pen®

Powerful universal cleaning pen

- Outstanding cleaning ability
- Marker dispenser provides controlled and exact application
- Mild citrus aroma
- U.S. Patent 6,677,291 and 6,677,292, and foreign patents

### Applications:

- General purpose cleaning and refurbishing of equipment
- Removes ink stains, label adhesives, and difficult to remove soils

**CW3700** 11 g / 0.39 oz