

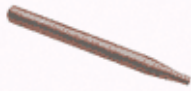
RESISTANCE WELDING ELECTRODES



Process Overview

Opposed Welding Electrodes

ER Series: Ideal for opposed welding of small components with limited access. Available in RWMA-02, RWMA-03 and Glidcop®



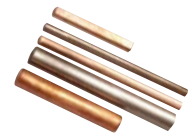
EH Series with Insert: Ideal for opposed welding of small components. Available in all materials with tip inserts of Molybdenum and Tungsten for conductive material welding



EW Series: Ideal for opposed welding of component leads and stranded wires. Available in all materials

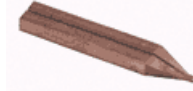


EM Series: Non-profiled electrode material for in house machining. Available in all materials



Parallel Gap Welding Electrodes

EPG Series: Ideal for parallel gap welding applications. Available in RWMA-02, Molybdenum and Glidcop®



EB-1S Series: Ideal for parallel gap welding of precise components or ribbon materials. Material: Molybdenum



EB-2S Series: Ideal for parallel gap welding of precise components or ribbon materials. 2-sided design increases electrode life. Material: Molybdenum



ESQ Series: Replacement Electrodes for Hughes VTA-90 Welding Heads. Available in RWMA-13 and Molybdenum



UniTip Series: Replacement electrodes for parallel gap welding systems with Unitip electrode holders



Battery Tab Welding Electrodes

ER-CM Series: Ideal for series welding of battery tabs and similar materials. Available in RWMA-02, RWMA-03, and Glidcop®



Feasibility studies Process Development
Prototype Contract Manufacturing

Replacement Resistance Welding Electrodes

Comprehensive Selection at Competitive Prices

MacGregor offers a complete line of standard and custom electrodes for most micro-welding applications. A wide variety of welding electrode shapes and materials are available that are suitable for use in all standard equipment models and brands.

Ordering can be done using existing supplier part numbers from **MacGregor™**, **Unitek™**, **Hughes™** / **MicroJoin™**, **Miyachi™**, and **Seiwa™** catalogs.

Custom electrode design and manufacture is available for applications that require non-standard electrode designs and profiles.

Available Materials

A full range of conventional welding materials are available from MacGregor for most application needs. The primary material types are listed below.

RWMA-02 Copper-Chromium
Conductivity: 85% / Rockwell hardness: 83B

RWMA-03 Copper-Cobalt-Beryllium
Conductivity: 48% / Rockwell hardness: 100B

RWMA-11 Copper-Tungsten
Conductivity: 46% / Rockwell hardness: 90B

RWMA-13 Tungsten
Conductivity: 32% / Rockwell hardness: 70A

Molybdenum
Conductivity: 31% / Rockwell hardness: 90B

Glidcop® AlO² Dispersion Strengthened Cu
Conductivity: 92% / Rockwell hardness: 65B

How to Maintain a Stable and Reliable Welding Process...

Electrode Maintenance

It is imperative to perform regular maintenance of the electrodes to ensure that the quality and characteristics of the connection remains stable and constant. Failure to maintain the welding electrodes can result in variable weld results, process instability and damage to parts due to weld splash.

In order to ensure a stable welding process, the electrode shape must be maintained as well as the cleanliness of its contact surface. MacGregor provides several easy to use Electrode Maintenance Tools that ensure the electrode cleaning is quickly and effectively accomplished with the minimum down-time.

Electrode Maintenance Tools

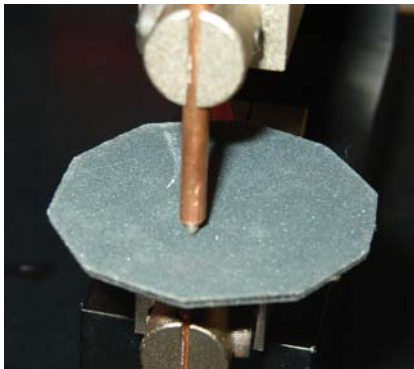
EMT-D-100

Electrode Burnishing Discs – Box of 100



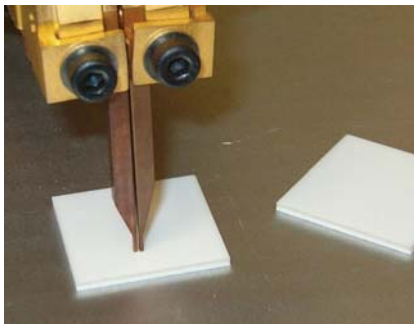
600 grit double sided burnishing discs for quick and easy electrode cleaning.

Representative / Distributor



EMT-S-05

Electrode Burnishing Stones – Box of 5



Alumina Burnishing Stone for use with precision electrodes. Ideal for parallel gap welding systems.

Digital Welding Force Gauges

WFG Series

The digital welding force gauges from MacGregor provide a precise measurement of the welding force applied by the electrodes in a compact hand held package. The unit provides the

force readout in Grams, Pounds and Newtons. The unit can be supplied with an RS-232 option allowing the force readings to be stored in a PC program.

WFG-07: 1-7000 G
.25-15.0 lbs
1-70 N

WFG-15: 200 -15000 G
0. 5-33.0 lbs
2-147 N



Weld Head Adjustments

Over time, it is possible for the integrity of connections within a welding head to deteriorate or loosen. At regular intervals it is recommended that the welding head connections be checked and the alignment of the electrodes be verified. It is also critical in many applications that the welding force be set accurately.

To allow the welding force to be quickly measured and verified, MacGregor has designed the Digital Welding Force Gauges. These products allow for a quick and simple measurement of the welding force using a convenient hand held device. The digital welding force gauge can be configured with an RS-232 link that allows the measured force to be recorded by a PC if a log of measured force is required.



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Design and manufacture
of precision welding
equipment and sub-contract
micro-welding services

UK OFFICE

MACGREGOR WELDING SYSTEMS LTD

69 Fred Dannatt Rd, Mildenhall, Suffolk, IP28 7RD, U.K.

Tel: +44 (0)1638 510011 Fax: +44 (0)1638 510329

E-mail: sales@macgregorsystems.co.uk Web: www.macgregorsystems.com

BENELUX OFFICE

MACGREGOR WELDING SYSTEMS LTD

Vivaldilaan 5, 5707 RA Helmond, The Netherlands

Tel: +31 492 538 597 Fax: +31 492 538 597

E-mail: sales@macgregorbenelux.com Web: www.macgregorsystems.com