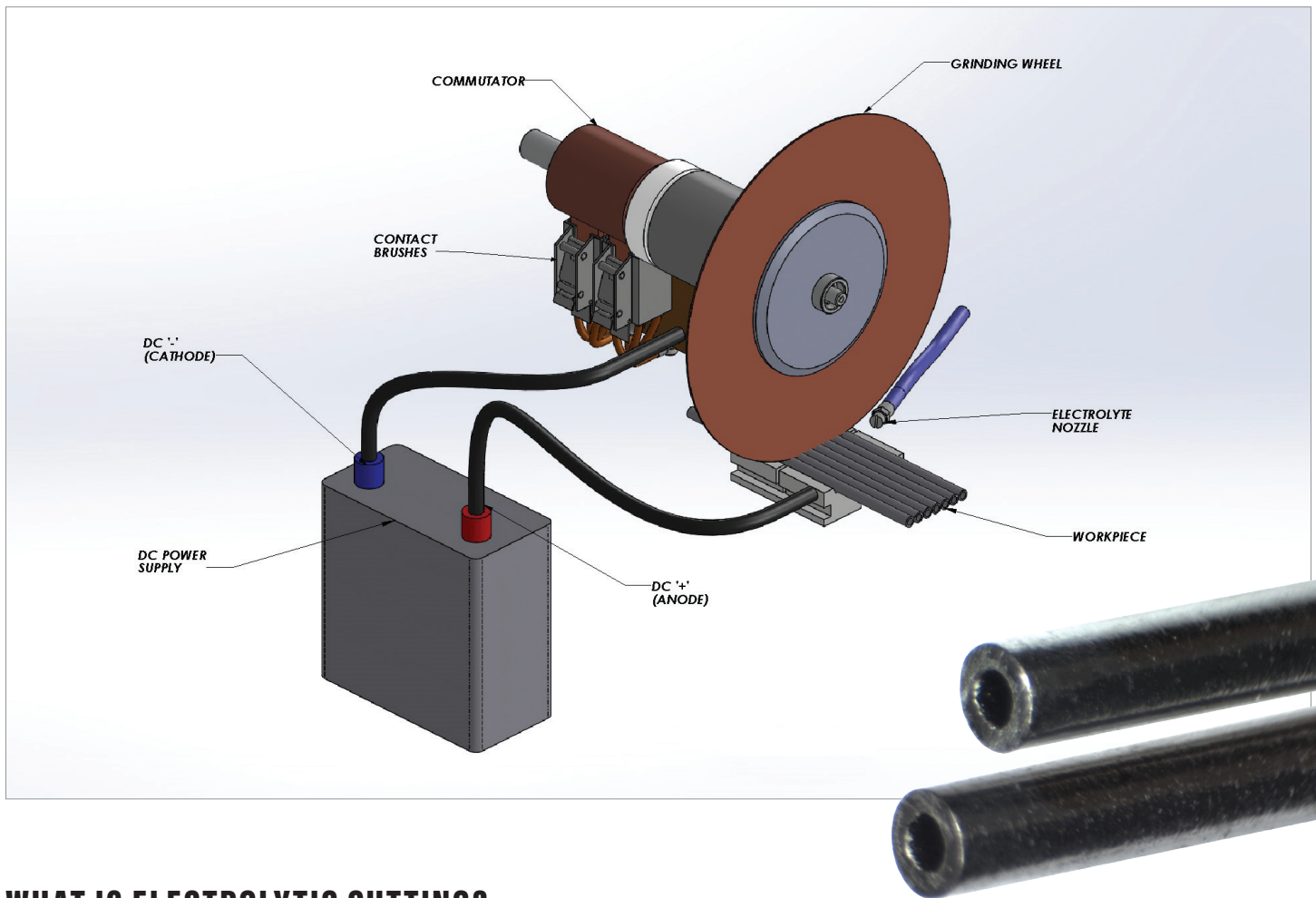


ECM TUBING

A CUT ABOVE THE REST

When evaluating a tube's quality, the untrained eye often focuses too much on the amount of material along the tube's length with little regard for the end face. The end face, however, is the key interface that allows the tube to interact with a variety of complex assemblies—making the end geometry critical for a number of industries, including chromatography, semiconductor, aerospace and medical devices. With little room for error, abrasive saw-cut tube ends do not provide the consistency or quality these applications need. Where traditional methods fail, HandyTube's Electrolytic Cutoff Machine (ECM) provides a fast, high-quality alternative to abrasive cuts without the need for additional end work.



WHAT IS ELECTROLYTIC CUTTING?

ECM cutting—also known as Electrochemical Grinding (ECG)—utilizes a mixture of chemical and abrasive material removal processes to achieve a square, burr-free and precise cut free of residual stresses. The electrochemical part of the process softens the cut material by partially dissolving it using a DC current and electrolyte solution, which means less cut force is required when mechanically removing the material via abrasion. The low amount of cut force prevents residual stresses and burrs from forming, while the residual current field erodes any small burrs that might be created. Any material that is conductive and electrochemically reactive can reap the benefits of ECM cutting.

HOW DOES IT WORK?

To chemically remove material from a part, an ECM creates an oxidation-reduction chemical reaction between the cutting wheel and the part. A direct current runs through the machine. Continuously spraying an electrolyte solution on the part as it is being cut initiates a chemical reaction with the copper-coated cutting wheel. The electrolyte acts like a wire, completing the electric circuit and allowing the current to flow through the anodic part to the cathodic cut wheel. Electrolysis occurs as the cut surface reacts with the oxygen in the electrolytes oxidizing the material. This reaction dissolves some of the material into the solution and creates a soft oxide layer that is easily removed by the abrasive wheel.



ACHIEVING THE PERFECT CUT

Setting up an ECM is both an art and a science. Experienced operators understand how a wide variety of settings can impact the end condition. Voltage, cut rate and electrolyte flow, composition and concentration all need to be adjusted according to each unique application. If there is not enough chemical removal, abrasive cutting takes over—causing burrs, residual stresses and heavily stained end faces. On the other hand, too much chemical removal creates a sloppy, uneven end face with overly rounded edges that are not clearly defined.

HandyTube's personnel have been trained by industry experts at Tridex—a company that has continued to push the cutting edge of ECM technology since its inception—enabling HandyTube to create the perfect end cut while accounting for various tube sizes and alloys. With experienced operators, top-notch equipment and customer satisfaction as our top priority, HandyTube's ECM provides solutions for a variety of critical applications where a typical saw just doesn't cut it.

