

## Capacitor Products Division

### Facilities

Reynolds Capacitor Products Division, located in Santa Maria, California, produces high voltage mica capacitors, voltage multipliers with output voltages ranging from 3 KVDC to 160 KVDC and high alumina ceramic brazed gas discharge tubes.

The Division also excels in packaging hybrid systems using mica capacitors and various electronic components. The depth necessary for the design, development, manufacture and testing of these products is typified by the following on-site equipment and staff.

- Administrative personnel
- Mechanical and electrical engineering staff
- Full Computer Aided Design (CAD) facilities for all products
- Quality Control facilities and staff
- Model Shop for prototype development
- Brazing furnaces for ceramic to metal sealing with associated capability to braze and fill devices with a variety of gases including radioactive isotopes.
- Precision multi-spindle capacitor winding machines
- Environmentally controlled areas for capacitor manufacturing processes
- Automatic environmental control chambers for development testing and component "burn-in" prior to shipment
- Equipment supporting high voltage and high energy transient surge testing, fast impulse break-down testing, and analog or digital test equipment development.

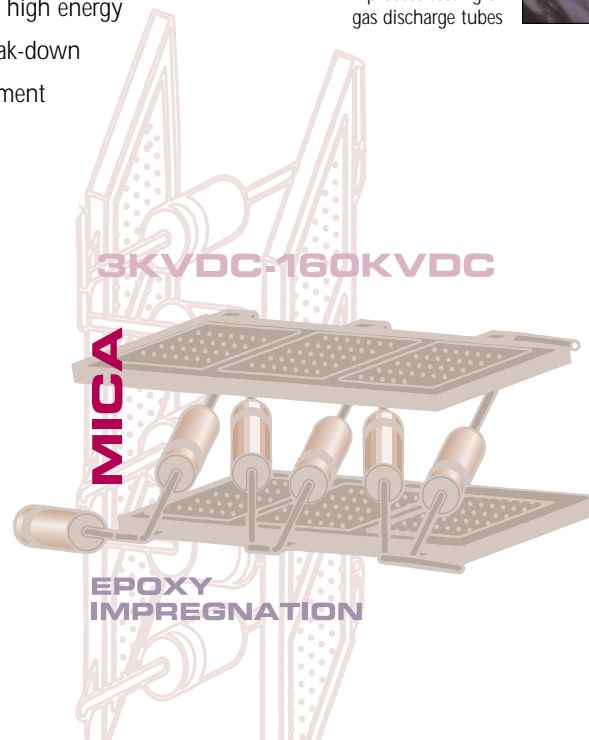
This multi-spindle capacitor roll winding machine was custom fabricated to meet the rigid tension, alignment and cleanliness requirements for high reliability reconstituted mica paper capacitors using ultra low caliper materials



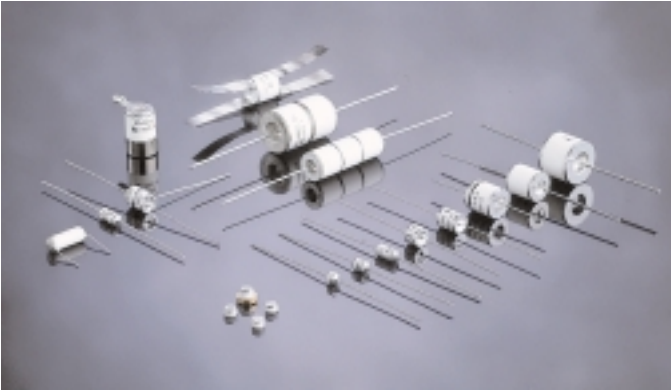
This press, used for the final forming and curing of impregnated capacitors, is computer controlled to completely automate platen temperature, closure rate, ultimate pressure and cure time of capacitors. Each new design has its own individual cure cycle program.



In-process testing of gas discharge tubes



Overvoltage gas discharge tubes (spark gaps) in a variety of sizes and end terminations.



Rolls of reconstituted mica paper and a capacitor winding with tabs in place and ready for epoxy resin impregnation



A selection of completed **Micapacitor** filter capacitors with a wide variety of packaging and termination methods.

## Technology and products

### High Voltage Capacitors

The Capacitor Products Division manufactures high voltage capacitors using only the finest reconstituted mica paper as the dielectric material. Mica paper comes in a roll of a specified width and thickness and undergoes a thorough incoming inspection before use.

Precision winding machines are used to wind the mica paper and capacitor grade aluminum material into a custom, computer generated configuration.

After winding, the parts are epoxy resin filled and gas pressure cycled for maximum epoxy impregnation. Pressing, an oven cure and testing complete the manufacturing cycle of what is known as a raw capacitor section. These raw sections are then assembled into a final capacitor configuration.

### Micapacitors

Micapacitors are in military and commercial high voltage power supplies where a reliable filter capacitor is required. Micapacitors are configured as epoxy molded, fiberglass encased with epoxy filling or wrapped with end cap potting. Micapacitors use only reconstituted mica as the dielectric.

### Electrical Transient Protection Products

Reynolds' transient protection product line is based on a wide variety of gas discharge tubes (spark gaps) which are available in many voltage and energy ranges, and as hybrid combinations with other transient protection components. These discharge tubes are unique in their ability to rapidly and repeatedly switch currents of thousands of amperes. Because of this characteristic they are ideally suited for diverting large electrical surges caused by lightning, EMP and other sources of high voltage, high current transients.

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A 160 KVDC **Micaplier** voltage multiplier used in powerful industrial X-Ray equipment for non-destructive examination of aircraft assemblies such as critical airframe structures and landing gear. The unit shown is 5.5 inches in diameter and 9 inches tall.

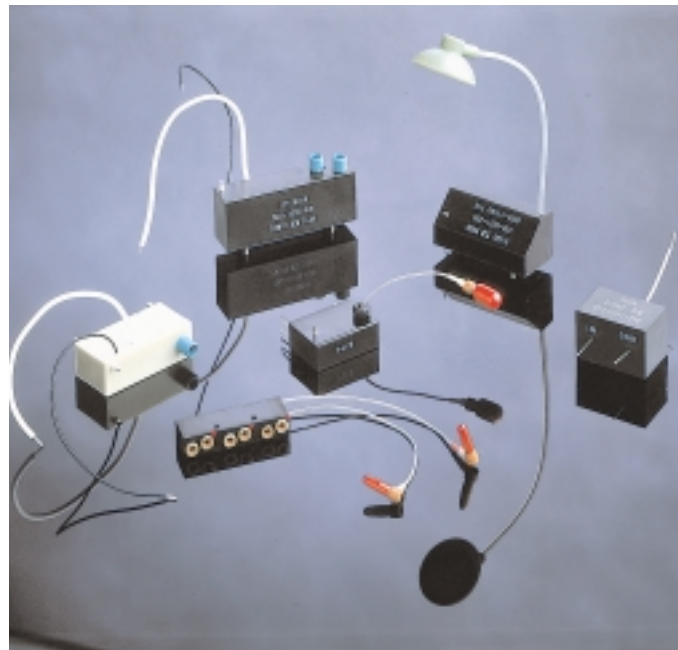
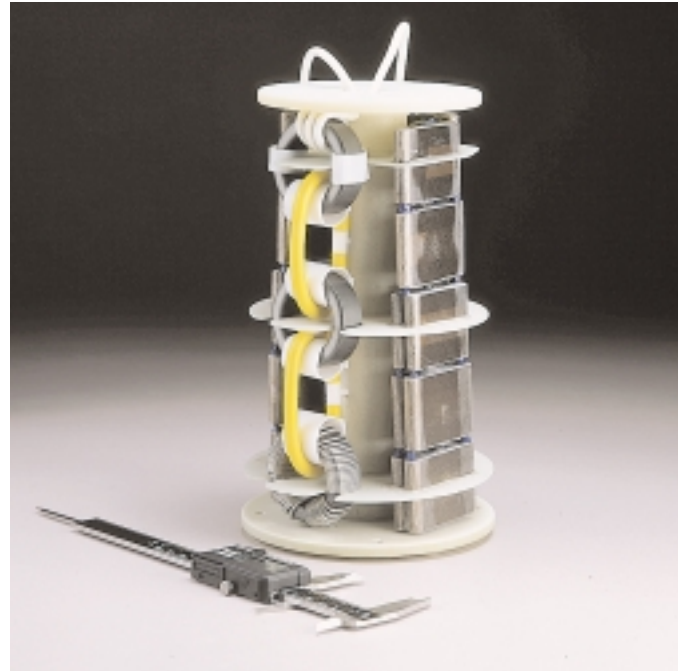
### Micaplier High Voltage Multipliers

In many situations, the use of voltage multipliers becomes the only realistic way to produce high voltages. Transformers producing 25 KV directly, have to be physically large in order to handle the voltage stresses, especially when required to operate at altitude.

Using a Micaplier voltage multiplier, the transformer needs only to produce voltages up to 3 KV peak to produce the same results. Thus it is possible to reduce size and weight dramatically. Further, the high speed diodes within Micapliers permit a higher operating frequency to be used than in the direct transformer design, leading to even more space and weight reduction.

Micapliers use reconstituted mica as the dielectric. Mica, with a temperature capability of  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  with no derating, surpasses all competing technologies. Mica capacitors also perform superbly when exposed to physical shock and vibration.

Micapliers are used in a wide range of military and commercial applications. Typical applications are: CRT anode and focus supplies for airborne Electronic Flight Instrumentation Systems (EFIS), X-Ray equipment and low power (mini) TWT's. Practically all airborne CRT displays and most stroke written CRT's use voltage multipliers as the high voltage source.



A variety of **Micaplier** assemblies with output voltages ranging to 80 KVDC