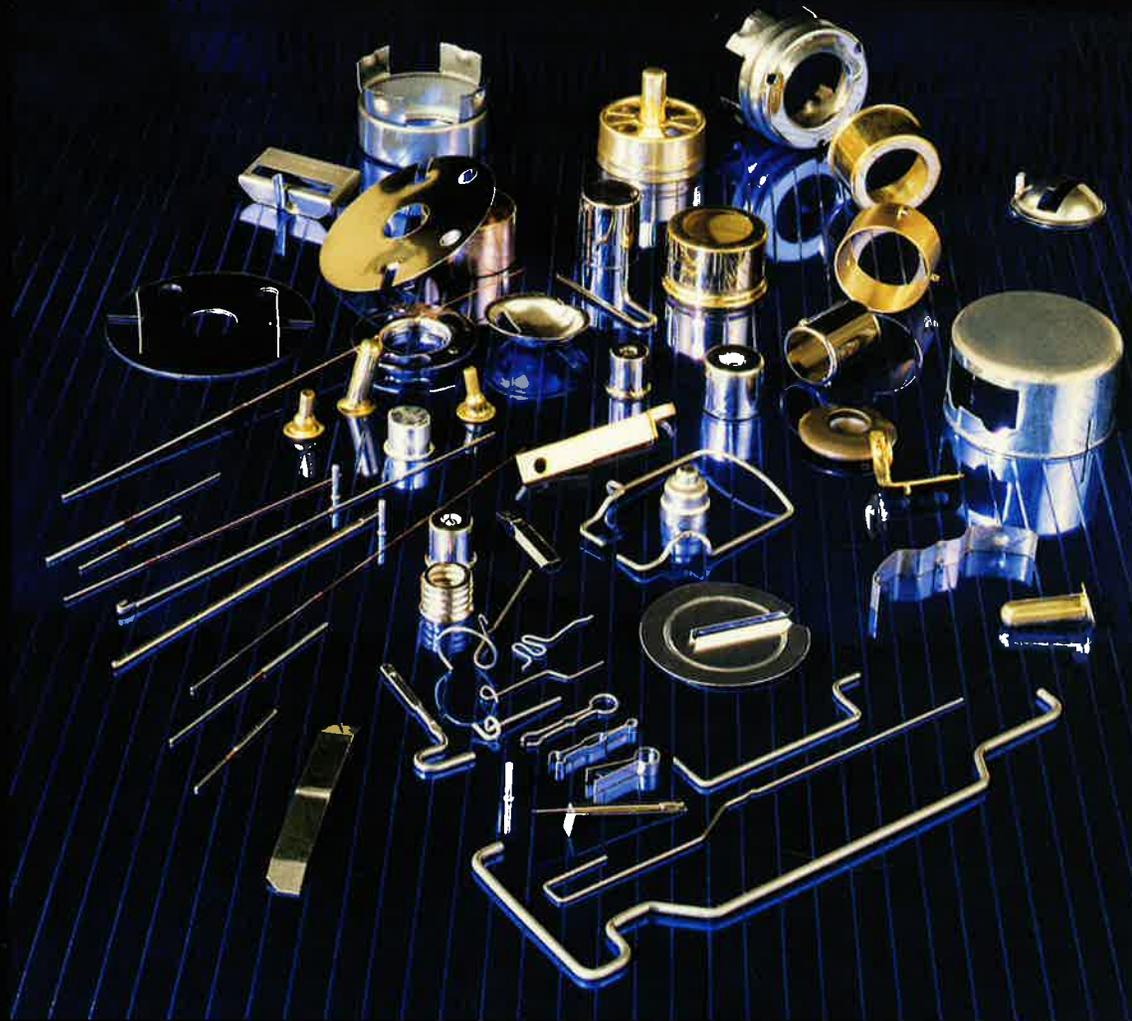




*Components/Quartz
Marketing & Sales Operation*



**Precision Formed
& Fabricated Parts**

Stamped & Deep Drawn Parts

Forming gossamer thin shapes in aluminum or deep drawing tiny sleeves of brass takes a particular type of metal forming facility. At GE's stamping plants, parts like these are made to accurate and repeatable dimensions, and in the millions. Even in the thinner gauges and smaller sizes, you'll find we keep our quality levels exceptionally high.

GE utilizes a full complement of presses. Included are multi-slide, verti-slide, rotary verti-slide, horizontal four slide and transfer presses, as well as progressive die presses for multiple part forming on continuous strip.

This equipment handles a variety of input materials...from foil gauges to thicknesses of $\frac{1}{16}$ of an inch...full hard to soft...and a range of metals and alloys, both bare and plated.



Forming thin gauge metals takes a light touch. Many of these parts require plating or blanking before press operations.



Deep drawing thin gauge metals is one of our specialties. Parts shown at left are life size; those pictured above are quite small and are enlarged here to show specific detail. Many of these parts are threaded, dimpled, plated, or otherwise enhanced to meet user requirements.

Formed Wire Parts

Close tolerance wire and ribbon products are formed at high production rates in our facilities. We are almost unlimited on the materials we form, from common grades of steel, aluminum and copper, to more challenging materials, such as tungsten, molybdenum, and the high performance copper based alloys. Wire diameters are from .001" to .250". Ribbon sizes start at .002" thickness by .125" wide and range up to .010" thick and 1.000" wide.

One part that illustrates GE's versatility is the contact clip shown below. It is made of beryllium copper wire and several of them are assembled



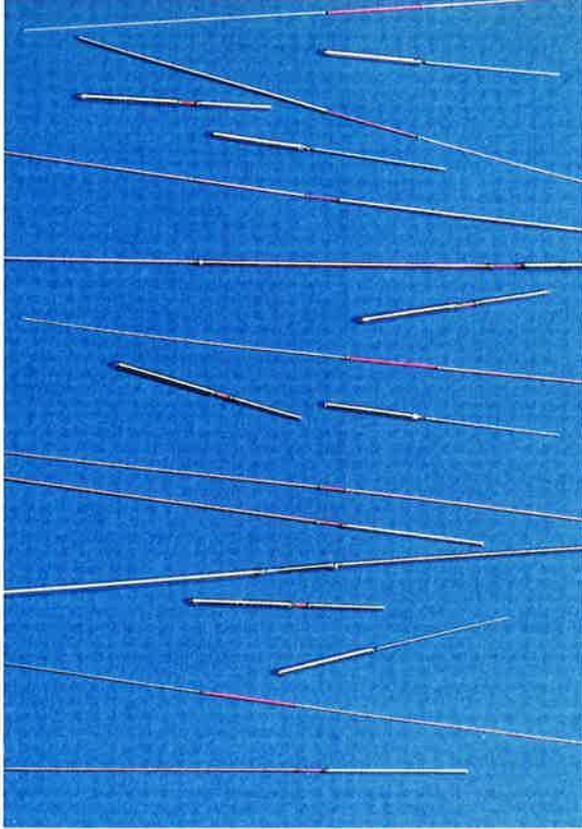
side-by-side in a plastic connector used in a wiring harness. The double looped end of the wire serves as a contact into which a ceramic printed circuit card is inserted. The wire is produced to a spring temper in this area to maintain uniform normal force throughout the life of the connection. The tail end of the wire is kept soft by segment annealing so it can be imbedded into the terminal body when the final connection is made. Quantities of parts like these are in the millions.



On the comparator, intricate formed wire parts are visually inspected at several times actual size to detect any dimensional variations that may be occurring because of tool wear or other small changes in the processing equipment.



The complex workings of this high speed multi-slide press turn out between 300 and 600 multiple bend parts every minute. Starting materials cover a range from very thin wire gauges to one inch wide ribbon.



Welded Wire Parts & Subassemblies

End-to-end welding of dissimilar wires is a technology that General Electric Company has carefully evolved over many years of producing high performance lead wires for lamps. These wire assemblies successfully join a variety of materials, combining such properties as electrical conductivity, glass sealing characteristics, and high strength in a continuous wire length.

When it comes to fabricating small wire parts, there are very few things we can't do in terms of shapes, material combinations, and fabrication of subassemblies.

Almost any number of different wires can be joined end-to-end... we even weld wires to molybdenum foil and thin gauge sheet.

Another of our specialties are products for the metallizing industry. We provide finished coils as well as stranded tungsten wire.



We produce a wide variety of subassemblies in our wire plants.



Wire-to-wire and wire-to-foil weldments, as well as over-wrapped and stranded wire, are just some of the specialties offered.



Typical of the many special parts we produce is this formed wire part onto which a short spur of hooked ribbon is welded just below the loop. The equipment that produced this part, specially built by GE, can be adapted for other wire and thin gauge ribbon fabrications.

Close Tolerance Wire & Thin Gauge Metal Parts... A Special Capability From GE

Small to medium sized light-weight metal parts...some formed to intricate shapes at production rates of 800 to 1200 strokes per minute...others that use our special skills for combining various dissimilar metals or welding wires end to end.

Those are just a few of the thousands of precision sheet metal and wire parts produced by GE's Components/Quartz Marketing and Sales Operation.

Working with sheet gauges and wire diameters that are sometimes considered too delicate for high speed production, GE produces a wide variety of blanked, formed and deep drawn sheet metal parts as well as formed and welded wire components. For designers who need small, delicate parts, intricate shapes, tiny subassemblies or unusual combinations of materials, our manufacturing facilities represent a valued source.

At GE, users benefit from the economies of mass production as

well as the high quality standards which govern every part we make. Production can be a few hundred thousand parts, or as many as millions per week if your demand warrants.

We are accustomed to working with a wide range of materials...from the familiar low carbon and stainless steels, aluminum, nickel and copper based alloys...to such specialized metals as niobium, zirconium, platinum clad molybdenum and rhenium alloyed tungsten. Our processes can accommodate products that require welding, brazing, plating, cladding, coating, segment annealing and other special treatments.

Because we must maintain consistent quality in very high volumes, most of our production equipment utilizes the latest solid state controls. Statistical process controls (SPC) and other state-of-the-art quality control methods are employed in many of our processes to assure that your parts are made to exacting specifications.

This 30 ton cold forming press, representing the latest in die press technology, operates at speeds of up to 1200 strokes per minute.



Fast...and accurate. Brass lugs with the complex bends like those shown here are produced on our 60-ton Bruderer press at high production rates. The carbon steel shield, with a number of intricate cuts and stamped features, is also run at high speeds.

Our Production Is High Speed... But It Never Gets Ahead Of Quality

GE offers in-house design capabilities and a proven ability to solve complex engineering problems for customers. We produce and test prototypes, perform materials analyses, design and build tooling, produce the part, and perform secondary operations such as heat treating or subassembly when required.

But each plant has its own special niche too.

At Conneaut, Ohio, metal stamping receives the major emphasis with presses of various capacities turning out parts by the millions. Here you'll see state-of-the-art Bruderer presses utilizing the latest in progressive die technology. Parts are blanked, formed, and deep drawn in a variety of materials.

Providence, Rhode Island, is another GE stamping operation, specializing in heavier, shorter run parts. Together, our two stamping plants operate over 45 presses.

Goldsboro, North Carolina, is where we manufacture our clad Dumet and Cumet wires and produce wire-to-wire welded parts.

And at Dover, Ohio, there's a little bit of everything—the production of molybdenum and clad molybdenum wire, the drawing, forming, wrapping, stranding and subassembly of wire, and the stamping and forming of metal ribbon and strip.

Although production is geared to high speed and massive volumes, we never sacrifice quality for efficiency. QC is evident throughout the manufacturing stream...from inspection of raw materials to our final quality audit.



High quality parts featuring multiple bends and intricate cuts are processed at high speeds on this verti-slide forming press. It handles a full range of materials, from soft brass to molybdenum ribbon.

Engineering Assistance Ordering

Many of the parts featured in this bulletin reflect a blending of material and machinery orchestrated by our various design departments.

Unless you are already using our facilities, you'll probably need some assistance, at least initially, to take full advantage of our capabilities. This help is readily available whether it is needed in part design, tool engineering, or assembly operations. Our staff has the experience and special training to accommodate your requirements.

To initiate an inquiry or order, contact your Regional GE Components/Quartz Marketing & Sales Operation sales representative, the Marketing and Sales Operation in Cleveland, or any of the plants listed below.

- Providence Base Plant
586 Atwells Avenue
Providence, Rhode Island 02909
(401) 456-6140
- Carolina Welds Plant
900 N. George Street
Goldsboro, North Carolina 27530
(919) 731-5118

General Electric Company
Components/Quartz Marketing
& Sales Operation
24400 Highland Road
Richmond Heights, Ohio 44143
(216) 266-2451

- Conneaut Base Plant
Rieg & Maple Aves.
Conneaut, Ohio 44030
(216) 593-1156 Ext. 228
- Dover Wire Plant
200 West Broadway
Dover, Ohio 44622
(216) 343-8841

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