

Omega Engineering: A Force in Domestic Manufacturing



Custom Designed Temperature Products.

Because Omega Engineering offers over 100,000 products, many customers have the erroneous impression that the company is simply a catalog house, distributing products made by others. Actually, Omega is a major manufacturer in its own right, making over 80% of the products it offers, with this percentage continuously increasing. At a time when “outsourcing “ seems to be the theme of many US manufacturers, Omega Engineering, headquartered in Stamford, Connecticut, remains a notable exception. The company has nearly 400,000 square feet of manufacturing space spread among 4 locations in nearly a dozen facilities located coast to coast, and, as new products are introduced, this domestic production space is increased. Here are some specific examples of current manufacturing operations at various Omega facilities.

Wire Production

Manufacturing at Omega starts near the bottom of the supply chain. The company actually produces its own thermocouple wire at a manufacturing operation that turns out tens of millions of

feet per year. Starting with bare wire stock in a wide range of compositions and diameters, finished cable is made for a myriad of Omega products. Specialized machines turn out braided, extruded, glass-wrapped, shielded, single conductor, multi-conductor, twisted shielded pairs, Kapton coated, and Teflon coated cable in both solid and stranded styles. The smallest size used is 40 gauge, which is much finer than a human hair. Such small gauge sizes are used in many temperature and pressure sensors, and Omega production personnel have become experts in handling these super fine wires. If you can think of a wire type, it is probably made in the Omega facility.



Wire: Thermocouple, RTD, Thermistor, Heater Hook-up

Metalworking

Because it requires a large investment to have extensive in-house machining capability, many manufacturers farm out this work to machine shops. Not so at Omega. The company has been willing to invest both for better control of product quality and to facilitate the introduction of new products.

The result is a sophisticated CNC machining operation that produces many of the parts used in their measurement, process control, and automation products. Parts manufactured range from the simple, such as thermocouple connector pins, to the extraordinary, such as ultra-precise and ultra-intricate military and aerospace components. For extreme precision, the facility boasts electrical discharge machining (EDM) capability. The Omega products that incorporate these machined parts end up in an amazing diversity of applications, examples of which include mammography testing machines, submarines, aircraft, food and beverage processing equipment, and factory automation systems.



In-House Machining Capability

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Thermocouple Connectors

Omega is the world's largest manufacturer of thermocouple connectors both in volume and selection. These connectors are used directly on Omega products and are available separately to end users. The company has an in-house molding operation for the plastic shells, and also makes the other components, such as plugs and jacks, strain relief parts, cable clamps, and mounting accessories. A review of Omega's Handbooks and Encyclopedias or web site shows an astonishing range of styles and options to fill any need imaginable and they are all manufactured by Omega. Such an extensive product offering could be an overwhelming logistical challenge if dozens of vendors were used or the parts were manufactured overseas. By manufacturing these parts, Omega can maintain complete control over quality, inventory, and delivery.



Thermocouple Connectors and Panel Systems

Temperature Probes

Omega boasts an automated probe manufacturing facility that is unequalled. Starting with coils of flat metal stock and a wide range of wire types, a highly automated production line fabricates probe sheath, with wiring enclosed, in coils which can be hundreds of feet in length. Sheath sizes range from an incredibly thin .010 inches up to a robust .375 inches. While other manufacturers make the probes individually to a specific length, Omega can make any desired length by simply cutting it from the probe coil. The temperature sensor (thermocouple or RTD) is then added to one end, leads added to the other and the unit is sealed, tested, calibrated, and ready to go.



Thermocouple Probes and Assemblies



Class 10 Clean Room

Thin Film Fabrication

RTD elements used in temperature sensors and probes are made in Omega's own thin film fabrication facility located in a class 10 clean room. Here the RTD elements are created on substrates, 2000 at a time, using the latest vacuum deposition and photolithography equipment and processes. After leaving the clean room, the elements are laser trimmed to the correct resistance, assembled into completed sensors with leads attached, tested, and sorted. While many of these processes are automated, a highly skilled production team carries out those steps that are best done manually. From here the completed RTD sensors are routed to other manufacturing locations for incorporation into a wide variety of end products.

Automation

Omega is a strong advocate of process automation for both its productivity and quality benefits. It is used extensively throughout the various manufacturing locations. Where commercial equipment is used, the input and output processes are often objects of in-house automation. Omega has some of the most talented automation engineers around and has invested in the model shops and labs needed to support them. Working with a talented staff of software engineers, they produce a wide range of custom automation equipment. Interestingly, Omega makes extensive use of its own components and instrumentation products in these automation projects; products that are also purchased and used by other manufacturers worldwide. This includes temperature and pressure sensors, load cells, actuators, heaters, and instrumentation.

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Benefits of In-House Manufacturing

Omega products are used in many critical applications in manufacturing, food processing, medicine, aerospace, and science, to name a few. By making the individual components within the company, Omega can achieve a measure of control not possible when critical parts are supplied by a variety of vendors with a variety of reliabilities. Through extensive use of automation and in-process quality testing, the uncertainties that can be associated with outside vendors have been eliminated. This is key to the high esteem Omega enjoys among its customers and its reputation for highly consistent, top quality products. And, in the event of a problem, you are dealing directly with the manufacturer who has the knowhow to help resolve it. No pointing fingers at this supplier or that, leaving the customer scratching his head with nowhere to turn. It is also notable that Omega's main manufacturing location in Swedesboro, New Jersey is a zero waste facility. Materials that cannot be reclaimed and reused are sent to recyclers to keep them out of the landfills. The philosophy that permeates all of Omega's operations, from design and development, to manufacturing, to sales, and to customer service is quite simple: "Do it right."

Conclusion

Although far from comprehensive, the capabilities discussed above give a flavor of the extensive manufacturing operations that are part of Omega Engineering. Although a customer using standard products may typically only require sales or application assistance, in the background is a huge pool of talented production line workers, product designers, software engineers, and automation experts. They are all ready and able to create and implement innovative custom solutions for difficult and unusual applications. During a period when American manufacturing continues to move offshore, Omega bucks this trend by continuously expanding domestic manufacturing space as new products are added. Make no mistake about it, Omega Engineering is a major manufacturer, and a good one. When you deal with them, you can be sure that you are dealing with a company that has their act together and has complete control over the quality, consistency, and reliability of their products.



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