

## **Job Shops Answer Calls for Emergency Medical Parts**

*By Mark Langlois – Design2Part Magazine*



*Bob Powner, sales engineer at Ace Wire Spring & Form Co., holds a large diameter torsion spring.  
Photo courtesy of Ace Wire Spring & Form Co.*

*Urgent needs for ventilators and respirators during the COVID-19 pandemic have sparked demands for fast deliveries of springs, stampings, wire forms, and machined parts.*

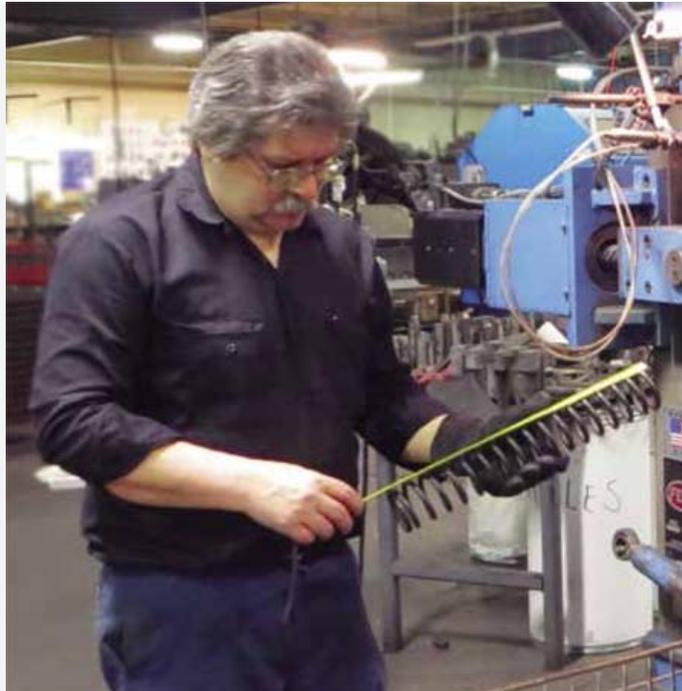
The COVID-19 pandemic has brought with it emergency purchases of American-made springs, stampings, wire forms, and machined parts for medical uses, including parts for ventilators, masks, and emergency room equipment, among others.

When President Trump declared a national emergency on March 13 and invoked the Stafford Act, manufacturers started receiving emergency orders for supplies. The law ordered manufacturers to fill medical emergency orders first. The emergency declaration kept many factories open to make medical parts at a time when other orders dried up.

At **Ace Wire Spring & Form Co., Inc.**, in McKees Rocks, Pennsylvania, a customer “called in” its existing order for 1,500 conical compression springs for ventilators. Ace filled the order from stock. The company had already manufactured the entire order of 0.024-inch by 1.125-inch 302 stainless steel springs, so it shipped them immediately.

“They’d set it up as a yearly blanket order, and they’ll take 500 pieces three times a year,” said Robert Powner, a sales engineer at Ace Wire Spring & Form. “We’re like a stock house for them. They’re on the shelf when they call for them.”

Powner and Ace’s marketing manager, John Higgins, said that in that case, Ace manufactured all the parts when the order was placed, thereby making it easier for Ace to manufacture them all to the same specifications. Plus, it helped Ace immediately ship the order when it turned into a medical emergency.



*A craftsman at Ace Wire Spring & Form performs continuous inspection on parts as they are manufactured.  
Photo courtesy of Ace Wire Spring & Form Co.*

“We often start from the beginning when working with a customer,” Higgins wrote in response to a D2P survey. “We can adapt our processes in order to meet our customer’s unique requirements. We offer exceptional engineering assistance when needed and work very closely with our customers.”

Ace shipped the balance of the original 1,500 pieces immediately. Then the customer doubled the order.

“What the medical customer wants is consistency of quality,” Powner said. “The parts they’re going to get from us are within their tolerance every time we go around. We make sure to deliver the same quality at the same price. We will have customers come back to us and ask if we can hold plus or minus five thousandths ( $\pm 0.005$ ). I’d say nine times out of 10, we accomplish that.

“It worked out very well for the customer. When this [COVID-19] hit, a couple of our customers had blanket orders with us and they called them in right away. Then they put in new blanket orders. If they did this with the rest of their vendors and the rest of the parts, it worked out well for them.”

## U.S. Suppliers Ready with Parts

It worked out well for the OEMs, Powner explained, because the OEM could turn out ventilators as fast as they could assemble them. Their supply chain was ready with the parts immediately.



*One of Ace's coilers measures a spring to verify that its height matches the specifications. Photo courtesy of Ace Wire Spring & Form Co.*

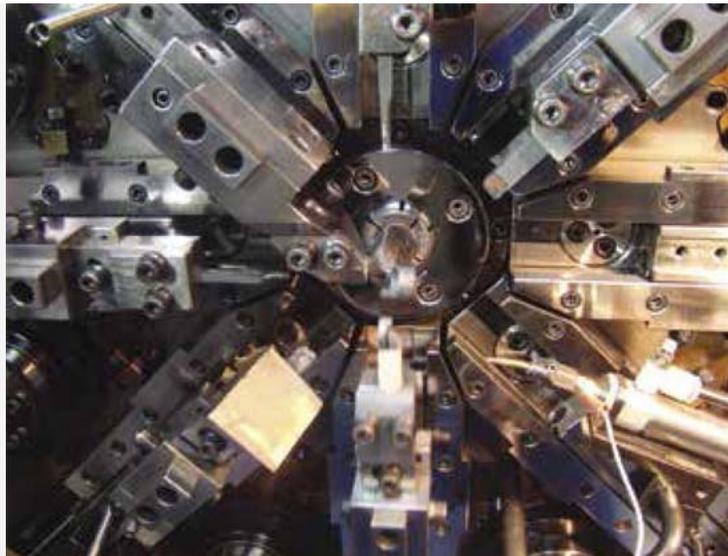
Powner said the customer never revealed the spring's job inside the ventilator. A conical spring sits in a bore, and it has a pin running up the center. It is narrower at the top than at the bottom. It can be designed to flatten out to one or two wire thicknesses when compressed, because the smaller rings at the tip fit inside the wider rings underneath. In a confined space, it's the spring of choice.

The conical shape, combined with the bore and pin, makes the spring more stable with less vibration. Ace manufactures, upon request, a spring that is within 0.0005-inch tolerance. The part is stress relieved and passivated when completed.

"Every day in manufacturing, you must prioritize production. With the current pandemic situation, we are seeing more of a need for quick turnarounds with our medical customers," Powner said. "Coincidentally, some customers we have in other industries have seen a slowdown in production or have closed their doors for the time being. Ace can modify production and delivery schedules to meet these customers' needs for when they get back up and running."

Powner added that Ace Wire Spring & Form makes communication the priority. “With it, we can fill our customers’ needs effectively. Medical makes up between 2 and 5 percent of Ace’s business, and this year, it is on track to double that,” he said.

Before the COVID-19 crisis arrived, **Crawford Manufacturing Co.**, in Baltic, Ohio, saw a slight increase in demand for parts in January and February. Once the economy stalled, parts demand decreased from March through June. Crawford is a manufacturer of wire forms, stampings, springs, and assemblies, and was founded in 1965. At its 16,000-square foot factory with about 15 employees, the company’s bread and butter are orders of 50,000 parts or more.



*A close-up view of Southern Spring and Stamping’s high-speed multi-axis coiler, which helps the firm run emergency orders quickly and efficiently. Photo courtesy of Southern Spring and Stamping.*

Shortly after the onset of COVID-19, a potential customer approached Crawford for a bid on nose clips for face masks. The initial request was for 2.5 million aluminum nose clips, which, in subsequent communications, dwindled down to 15,000. That bid hasn’t worked out, said Mary Miller, customer service manager with Crawford, in an interview with *D2P*.

But Crawford has produced wire forms for an Ohio customer that needs to improve its own factory workstations for making essential hospital masks. This is a small order by company standards, about 500. “It’s to create a more efficient workstation,” Miller said. “We like to help people when we can.”

Another part that Crawford made for a medical customer was a metal rod that was part of a larger assembly used in hospitals and nursing homes to help turn or otherwise move patients.

Crawford remains open and is manufacturing for more than seven customers who provided it with letters from their state governments stating their parts were essential for fighting Covid-19. Crawford has excess capacity for producing more parts and is ready and willing to make other parts. The essential parts it now makes include

wire hangers used for cable and oxygen lines, as well as parts for the funeral home industry, appliances, and construction.

**Southern Spring and Stamping, Inc.**, in Venice, Florida, and Stokesdale, North Carolina, relies on technology to ensure tight tolerances and on-time delivery for its customers. Fewer hands touch each part because Southern Spring relies on new technology, including a Simplex spring machine described not as a “Cadillac,” but as a “Ferrari,” plus a Mazak 6kW fiber optic laser.



“The frames are blanked out there [on the laser],” said Brad Moore, sales manager at Southern Spring and Stamping, in an interview with D2P. “The machine parts are blanked out there, roughing them out. So, what that means is, instead of taking a whole block and machining it, we’re cutting out the outline and then putting it on our machining centers, which makes us faster and more efficient.” Moore added that for some parts, 50 percent of the machining is eliminated by the high-speed laser that can cut steel up to an inch thick.

The Simplex machine is self-correcting: Numerous times per second, it inspects the last three, five, or 10 parts it made. It takes photographs and measurements, and decides on machine adjustments, if required.

“It does that in a split second; it’s doing that several times a second,” Moore said. “It averages—you won’t have big swings one way or another. The fastest part runs 16.4 parts a second. These coilers allow us to run emergency orders very quickly and efficiently.”

One Covid-19 inspired part is a stainless steel clip that attaches a face shield to a surgeon’s head light. Parts for ventilators include flat springs, compression springs, sheet metal enclosures, and brackets. They’re mostly in stainless steel or beryllium copper, Moore said.

“Many of our abilities — springs, stampings, sheet metal, and machining — go into the production of these parts. We make multiple components for respirators, goggles, and other medical devices needed right now,”



Moore said in response to a D2P survey. “Springs, stampings, sheet metal, and machining are all abilities used to support ventilators and critical medical equipment.”

Among the medical parts Southern Spring and Stamping makes today are welded frames and machined parts used by the pharmaceutical industry for inspection in quality control scanners that check the size, shape, and quality of medications, including searching for contaminants. Increased orders and faster delivery were demanded for these parts since the COVID-19 outbreak.

### **Emergency Orders Head the List**

The emergency orders resulting from the COVID-19 crisis forced Southern to change how it tracks its work, Moore said.

“Emergency orders go from manager to manager, so it can be tracked in an instant,” said Richard Mulvihill, general manager at Southern Spring and Stamping. “Managers can fast-track orders and prepare for future steps, and bypass the stack of other jobs.”

“Initially, we saw a ramp-up in mid-March. By the beginning of April, we started to see National Emergency Orders,” he continued. “It was the first Defense Production Act by order of the President I have ever seen. We shipped parts within days.”