

Defying the Oil Ripple

Heat treaters are staying afloat in spite of a troubled oil industry.

Alex Cannella, News Editor

The oil industry is (pardon the pun) tanking. That may conjure up horrific images of other industries following suit in a domino effect of collective collapse into the overabundant oil slick the industry is currently drowning in, but not everyone is getting knocked down alongside the oil sector. The heat treatment industry is, in fact, staying afloat. Automotive sales are up, some believe as a direct result of dropping oil prices, and companies that work alongside the industry, such as EMAG Eldec and Applied Process, are benefiting. For those without a stake in the light vehicle industry, business has taken a bruising, but most companies are still afloat. Of the companies we interviewed, the situation has at worst given people pause, but has yet to stop them in their tracks.

Outside of the oil industry's ripple effect, there are two new forces in the heat treatment industry. One is MedAccred, a new and growing accreditation targeted towards the medical industry from the same group that oversees Nadcap. The group has ironed out the details of its prerequisites and started awarding certifications to those early adopters jumping on board, including Solar Atmospheres.

The second force is the Industrial Internet of Things, which you may have heard about as it has gained prevalence in other industries. Up until now, it hasn't really been a factor in gear hardening. The Industrial Internet, however, is starting to break into the heat treatment industry, and it's something to keep an eye on.

For the most part, however, the industry continues its course. The ripples from the oil market are rocking the boat, but they aren't destabilizing it yet, and so the hatches remain unbattered for now.

Oil is Down, but Automotive is Up

The oil industry's ripple effect through related industries is palpable. Many manufacturers are reporting flat sales at best, and there's always the possibility things get worse in the future. In the midst of the oil ripple, however, there's actually one industry that is currently on the upswing: automotives. And as the auto industry rises, so do the heat treaters that support it.

"Low fuel prices have empowered the American consumer, and this has driven light vehicle sales," said Vasko Popovski, director of sales and marketing at Applied Process. "We think this will continue at a high level for another year or two."

As the rest of manufacturing is taking a hit from the oil ripple and stumbling, the auto industry is up, and in a stroke of irony, its rise could at least in part be attributed to the decreased price on oil.

"We haven't really seen a downturn overall," said Dennis Beauchesne, general manager of ECM USA. "So our business is better than flat."

According to Beauchesne, automotive sales make up somewhere between 40–60 percent of ECM's sales worldwide, but in the U.S., that number is closer to 80 percent. That, combined with the market's increasing interest in ECM's equipment to heat treat up-and-coming nine- and 10-speed transmissions, has kept the company profitable despite the rest of the industry's woes.

EMAG Eldec is another company riding auto market growth. They produce equipment to heat treat and harden various parts with induction, from fuel reduction system parts to chain wheels and steering and drive pinions for the auto industry. Their success is compounded by the Simultaneous Dual Frequency (SDF) generator, a generator that can heat components at both medium and high frequency at the same time.

The generator's unique feature has proven popular with auto manufacturers, especially for gears.

Outside of those supplying the auto industry, the picture isn't as clear. Amongst the companies feeling a pinch is Solar Atmospheres, which has customers that directly supply the oil industry, but according to Solar Atmospheres' Principal Engineer, Trevor Jones, the downswing isn't "significant enough" to alter the company's business strategy.

"We do not believe the downswing will be nearly as bad as the most recent recession in the late 2000's," Jones said.



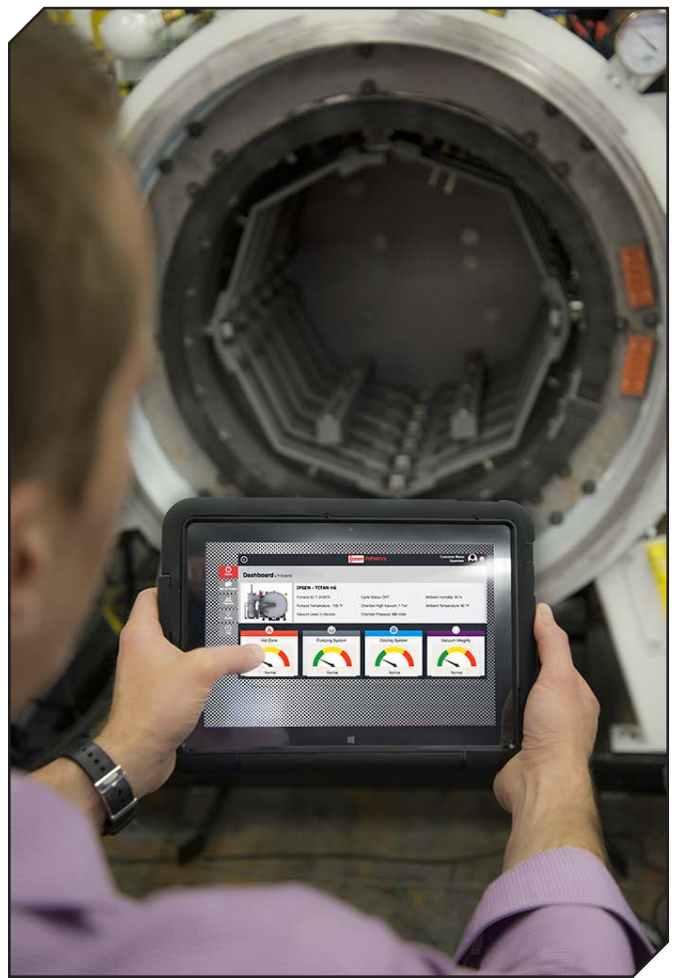
PdMetrics: The Industrial Internet Breaks In

Across every industry, the Industrial Internet of Things (IIoT) is becoming an increasingly recognizable term. Every year, the latest in the ongoing dialogue about Industry 4.0 filters out of Germany, either from headlines on the country's industrial policy or from trade shows like Hannover Messe, and every year, more American manufacturers jump on the bandwagon and start adopting the Industrial Internet.

For the uninitiated, the IIoT is an umbrella term encompassing numerous new technologies, from new applications for sensors and RFID tags to new analytics and predictive maintenance technology. The core theme that connects all of these different technologies together is increasing and improving communication in the machinery we use. For example, a machine could monitor itself and warn a technician when a part is in critical condition and in danger of failing without the technician ever having to crack open the machine and halt production. But it's also about making machines communicate with each other — transmitting orders, enabling one machine to carry out multiple tasks or make modifications to a product as specified by a customer, automatically recording and adjusting for abnormalities or mistakes in the manufacturing process, and so on — and through doing so, decreasing turnaround time and cost.

Ipsen is incorporating many of these concepts with its PdMetrics, a software platform that takes some of the cornerstones of the Industrial Internet — predictive maintenance and data analytics — and brings it to the heat treatment industry.

PdMetrics integrates with critical systems (e.g. hot zone,



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pumping system, cooling system and vacuum integrity) and provides real-time monitoring and diagnostics that help ensure the furnace runs smoothly. As soon as maintenance or further action is required, the software can notify a technician before that problem causes the furnace to break down or become faulty. The program also has some other bells and whistles, such as the ability to integrate with multiple furnaces across multiple facilities, but the main draw is the proactive, predictive maintenance it brings to the table. PdMetrics is also backwards compatible. The software is an add-on that isn't integrated with the furnace PLC, so it can be installed not just on new furnaces, but also retrofitted onto older equipment and installed on non-Ipsen brands.

"Ipsen's PdMetrics software platform is the first of its kind for the Thermal Processing industry," Janusz Kowalewski, director of business development at Ipsen, said. "With that in mind, we have seen a large outpouring of interest for several reasons. One, being that it provides insights about heat treatment equipment and processes that customers have not been able to obtain before. Two, being that none of our competitors have a product like this on the market."

But even if Ipsen is the first to start tapping into this new tech, it's unlikely that they'll be the only ones, or that they'll just stop there. Kowalewski sees the IIoT as holding vast potential.

"When we think of the Internet of Things (IoT), whether it's for consumer or industrial applications, we believe it has the ability to transform the ways companies operate," Kowalewski said. "...However, it also opens the door to a multitude of possibilities and new opportunities for growth. As more companies begin to realize the possibilities of the IoT, I believe we will continue to see it emerge in ways that positively impact the productivity, efficiency and operations of industries around the world."

Big and Little: ECM's Nano and Jumbo Gas Quench Furnaces Push Boundaries of Maintenance

Another interesting product in the realm of maintenance is ECM's newest gas quench furnace, the Nano system. The furnace has two features that ECM is pushing: smaller cavities for small batches and a dual-tower system that allows for more flexible and less costly maintenance.

According to Beauchesne, the smaller load allows for faster turnaround. The obvious benefit is, of course, sidestepping the bottleneck of waiting for enough parts to do a single large load, and since the furnace features six separate cavities, multiple small batches can be run at any given time.

"Instead of being a 2,000-piece load, maybe you're only talking about 20 pieces in a load, so that we would run the load at a higher temperature and we could quench them out faster," Beauchesne said. "And then this 10- or 20-piece load can be robotically loaded and unloaded faster and simulate a single-piece flow arrangement rather than waiting for 2,000 pieces to

be in a load."

The other feature, the furnace's dual-tower system, also focuses on decreasing downtime. Instead of having to shut down your entire production line to perform maintenance on a furnace, the Nano allows mechanics to shut down one tower to work on it while the other continues working as normal, only halving productivity instead of shutting it down entirely.

"You can shut off half of your capacity, do maintenance on it while you're running the other half and then, of course, vice versa," Beauchesne said.

The Nano system is literally just breaking into the industry, with the first furnace being shipped at the end of April. In the meantime, however, ECM's other furnace, the Jumbo, is already on sale.

The Jumbo is a modular system that can accommodate up to 12 cells and is capable of both gas and oil quenching. The furnace system's biggest feature marks a shift in how ECM's prod-



ucts work. Up until now, most of ECM's products used a tunnel system with a robotic loader, but the Jumbo moves the loader to a shuttle car, which means individual cells can be loaded or unloaded separately, instead of having to shut down the entire system for one cell. Much like the Nano, the Jumbo allows for partial maintenance while the system is still running.

"The new Jumbo system and Nano systems will change the way low pressure carburizing equipment is implemented and maintained," Beauchesne said. "The larger 250 KW motors on the new gas quench cell have improved quenching capability and will bring gas quenching into more scenarios than in the past."

A Rising Accreditation

Solar Atmospheres holds accreditations like a field marshal bears medals: in copious amounts and with great pride. Many (Nadcap, ISO and AS, to name a few) are common within the field, but they recently picked up a first: Their Souderton plant became MedAccred certified last April, making them the first business to successfully achieve certification.

“MedAccred is to the medical industry as Nadcap is to the aerospace industry,” Trevor Jones, principal engineer for Solar Atmospheres, said.

And when Jones says MedAccred is the medical industry’s Nadcap, he means that in more ways than just function. It’s run by the same organization, the Performance Review Institute, as Nadcap is, and uses the same accreditation-via-audit system. It also covers more than just heat treating. It also has standards for sterilization, wiring, etc. It’s been a steadily growing force in the medical industry, with over 30 companies now listed as actively participating in the program, and Solar Atmospheres is spearheading the effort, which they believe will pay dividends in the future.

“At this time it is a ‘lead the pack’ or ‘first adopter’ approach on the part of Solar management,” Ed Engelhard, vice president of corporate quality at Solar Atmospheres, said. “The true value of accreditation will expand rapidly as OEM’s flow down the requirement to become accredited. We think 2016 will be a watershed year for the program.”

MedAccred certification is a big step for Solar Atmospheres, and not just because of the parallels it draws with Nadcap as a gold standard. Even without the accreditation, Solar Atmospheres had already built up a customer base within the medical industry, but MedAccred brings an extra level of legitimacy that execs believe will put them head and shoulders above the competition going forward.

All of these certifications don’t come cheap, however. According to Jones, “maintaining accreditations such as

Nadcap, ISO and AS is very time consuming and expensive to preserve... To maintain these accreditations and deal with other business related items requires comprehensive employees that are dedicated to their jobs and experienced in these fields constantly looking for methods to reduce costs and/or keep costs associated with these difficulties at a minimum.”

The question then becomes: If the cost is so high, is it worth it? While MedAccred is gaining traction, it’s still a young program, only a few years old. Some of its more specific certifications (such as, for example, one for sterilization) were only just finalized in the past year. While it may aim to become the same universally recognizable standard that Nadcap is, it has yet to reach that industry-wide level of recognition. In the short term, becoming MedAccred approved is voluntary. Even though it’s been a year, Engelhard noted that it’s still too early to tell if Solar Atmospheres is seeing any returns on their efforts.

Solar Atmospheres’ view has, however, been on the long term, and in the long term, MedAccred approval looks viable. The program’s gaining steam and it’s entirely possible it will indeed become the medical industry’s equivalent of Nadcap.

“Every company has to make that business decision for themselves,” Engelhard said. “But I would point out the following; look at what has happened to the value of Nadcap accreditation over the years.”

The Neverending Hunt for Talent

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constant woe across time and industry that affects everyone, regardless of how well the company's doing.

Unfortunately, the problem isn't going away. In fact, according to Beauchesne, it's been getting worse. So bad, in fact, that ECM has opted to start training employees from its own ranks to fill more specialized positions, teaching them everything they need to know starting with the very basics.

"We've taken more of an attitude of training somebody from scratch," Beauchesne said. "So hiring somebody in the warehouse, getting them familiar with the parts and the drawings and how the equipment works, and then training them into service people from there."

Training began less than a year ago, and according to Beauchesne, it's still too early to tell how well the training program is working. ECM has considered expanding the program, but has opted to maintain the program at its current level for now.


"We're satisfied with the number of people we have onboard," Beauchesne said.

Applied Process has also felt the talent shortage, particularly with metallurgical engineers, and they've been taking more traditional measures to try and bring fresh faces into the industry.

"Applied Process has consistently hosted interns from a variety of backgrounds, including metallurgical engineers," Popovski said. "Beyond this, we feel a responsibility to work with colleges to support their programs via groups like ASM and AFS."

Sailing Ahead

The oil industry may be haunting the minds of some people, but the ripple effect hasn't been enough to sink the heat treating industry. Even if sailing isn't smooth for everyone in the industry, it *is* steady. Companies are still investing in innovation, the conversation is still on increased productivity and reduced turnaround times and the talent pool is still too small.

Blips such as the advent of MedAccred show up here and there in the industry, and the Industrial Internet of Things will almost definitely continue to grow in relevance, but overall, the industry continues business as usual. 

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