hottopics

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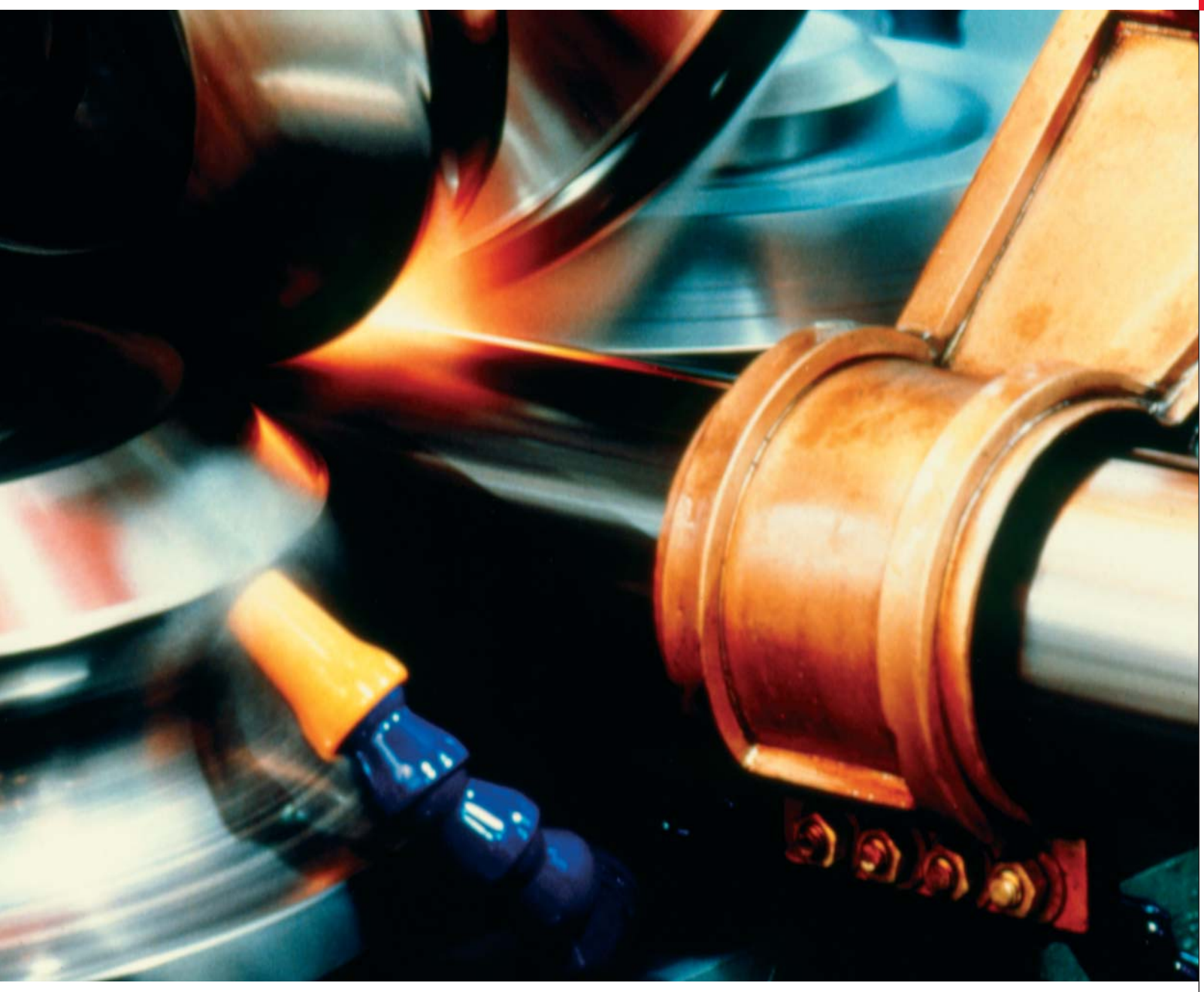

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Weldac impresses at Chinese event

Dozens of high-level representatives from China's tube and pipe industry recently attended a special technical seminar hosted by EFD Induction in Shanghai. Qin Song, managing director of EFD Induction China, reports on the day's activities.

It's not every day that senior executives from tube and pipe giants such as Baosteel, TPCO, Shandong Taifeng and Qianjin Steel gather in one room. It's even rarer to find them seated next to representatives from line makers such as Japan's Kusakabe, as well as reporters from China's leading tube and pipe trade publications. But on January 22 this year, more than 60 senior decision-makers and influencers from China's tube and pipe industry came together in Shanghai for a seminar organized and hosted by EFD Induction. The seminar began with opening remarks from Ding Guoliang, President of the China Cold Roll-Forming Steel Association. Inggard Torvik, CEO of EFD Induction Norway was also present, and provided a brief history of the company and how it continues to be at the forefront of finding new industrial uses for induction heating.

When the speeches were concluded, participants began a tour of our new manufacturing facility for solid-state Weldac welding systems. Indeed, one of the highpoints of the day was the product demonstrations where participants could examine our very latest Weldac. EFD Induction technicians were on hand to demonstrate and explain Weldac's benefits, especially the high uptime achieved by using rugged IGBT transistors and our patented switching technology.

After viewing the facility and seeing the Weldac in action, Lai Xingtao, manager of Baosteel's HFW welding plant, said: "After five years' successful use of an EFD induction 1.8MW tube welder, I don't see any reason to turn to any other supplier than EFD Induction for large-sized tube welding. I say this not only because of the quality and efficiency of EFD Induction's highly ranked technology, but also because of their excellent after-sales service." Off course, it's always encouraging to hear such comments. But it's extra encouraging when they come from a senior executive at the world's third largest steel maker.

The seminar illustrated just how successful EFD Induction has been in winning trust and confidence in China. We began in 2001 with a major manufacturing plant in Shanghai, and last year opened the new custom-built Weldac factory in the same city. We have also opened a sales office in Beijing, and a year ago we unveiled our new center in Guangzhou in the south of the country. The new facility in Guangzhou includes sales and service offices, as well as a state-of-the-art 1,000 sq. meter induction coil factory. This new base will let us expand our cooperation with existing customers in south China—and of course, let us offer our expertise to new partners in the region.

Attendees listen to a presentation at the technical seminar hosted by EFD Induction in Shanghai.

The Italian job

Venice, home to Piazza San Marco, the Rialto Bridge... and a rather interesting bolt expansion job on a steam turbine.

The canals and architectural splendour of Venice make it easy to forget it is also a large modern city, a place that around a quarter of a million people call home. And that's not counting the tourists, 50,000 of whom clog the waterways and piazzas every day. Then there are the city's surrounding industrial areas. Nearby Porto Marghera, for example, is one of Italy's most important chemical processing centers.

Read more on next page ►

Getting the job done—an EFD Induction Minac heats a bolt prior to turbine cover disassembly.

Talkline

Sharing our expertise

Dear Reader

Welcome to this first issue of Hottopics for 2010. As you can see, our main story on page one covers a highly successful seminar and 'open house' hosted by EFD Induction in Shanghai. The event focused on induction tube and pipe welding, and gave participants the chance to inspect our latest generation of IGBT transistor-equipped Weldac welding systems. Just as important, visitors to the event got a chance to tour our new state-of-the-art Weldac manufacturing center. The event, and the high turnout and positive feedback it generated, underlines just how successful EFD Induction continues to be in this key market.

You may already have noticed a new feature in this issue: 'Induction Instruction'. From now on each issue of Hottopics will feature an article written by an EFD Induction expert. Each article will focus on a technical aspect of induction heating in industrial applications. To launch the series, none other than Leif Markegård, senior R&D engineer at EFD Induction Norway, has written a piece about induction coils. Nobody is better qualified than Leif to tackle such a crucial—yet often overlooked—subject. A co-founder of ELVA, the company that in 1996 merged with Germany's Fritz Düsseldorf to create EFD Induction, Leif is a recognized authority on induction technology.

This issue also has a short note about the new video library that we've uploaded on YouTube. The library contains a wide selection of films showing our equipment in action in various applications. The number of films available is as yet rather limited, but we will definitely be adding more during the year. After all, as one of the world's largest induction companies, we certainly have no shortage of material to share with YouTube viewers.

Finally, as the geographical spread of the stories in this issue shows, EFD Induction is a truly worldwide company. But one of our strengths is that we back up our global operations with extensive local presences. This can be seen in EFD Induction's network of factories, workshops, service centers, sales offices and agents in Europe, Asia and North America. Such a network means you are never far away from induction solutions that can improve your company's productivity. To find the EFD Induction office closest to you, just visit our website at www.efd-induction.com

Eivin Jørgensen, Chief Executive Officer

EFD® INDUCTION

ArcelorMittal Fontaine chooses EFD Induction

Belgium-based steel wire specialists ArcelorMittal Fontaine has bought an EFD Induction Sinac induction generator for pre-heating steel strands. The Sinac is a low-frequency 200 kW model.

Delivered at the end of 2009, the EFD Induction Sinac is being used to produce pre-stressed steel. This material, consisting of metal wires and strands made of wire rod, is mainly used in the construction industry. Together with various forms of concrete it can be used for balconies, foundation piles, underground engineering and bridge building.

Sales executive Rémus Carlier of EFD Induction in France said: "ArcelorMittal Fontaine took delivery of a Sinac system in 2007, and based on their positive experience decided to add this latest order. We're also looking at the possibility of replacing more of their existing rotation generators with induction heating alternatives."

According to Carlier, the pre-stressed steel wire sector is one of the few industrial sectors to remain unaffected by the global economic crisis. "Governments worldwide have invested heavily in infrastructure projects—something that has helped keep the demand for steel wire buoyant."

The EFD Induction Sinac system will pre-heat steel strands destined for use in demanding construction and engineering projects.

► *The Italian job, continued from page 1*

All the above means a reliable power generation and distribution system is essential. And with any critical system, it is vital to keep scheduled downtime to a minimum. This is particularly true for turbines, as even a few hours of unplanned outage can result in major revenue losses.

The time pressure facing service engineers is made even worse by the technology traditionally used to expand and remove the large bolts that secure turbine covers. Alessandro Mariani of EFD Induction Italy explains: "Open flames and resistance heaters have serious drawbacks. The former method is slow, uncomfortable and inaccurate—and there's a risk of excessive heat input damaging the threads. The latter has reliability issues, with a risk of rods melting inside the bolts. So when Alstom Power in Italy was performing planned maintenance on a turbine in Marghera just outside Venice, they asked us if induction heating was a viable alternative."

Mariani continues: "We held a demo in Milan for Alstom where we showed how our mobile Minac systems, complete with special elongated coils, are perfect for bolt expansion. We covered a lot of ground; even explaining the benefits of a Minac 'Twin'. This is a single converter connected to two independent handheld transformers. One operator can work on two bolts at the same time—in effect doubling his productivity. Or two operators can work simultaneously, each with their own transformer."

Alstom were sufficiently impressed that they ordered two Minac 25/40 systems. Although the outer dimensions of each Minac is only 345 x 708 x 453mm, the system's handheld transformer delivers a maximum output power of 40kW. When using a Minac, the heating process is so quick there simply isn't time for heat to travel into the thread area. And thanks to electronic controls, key process parameters such as temperatures, ramp-up and dwell times can be set in advance and repeated with amazing accuracy.

According to Mariani, Alstom were delighted with Minac's performance in Venice. "Sure, the job was completed much faster than it would have taken had traditional methods been used. No damage was caused to nuts or bolts. And the operators really appreciated Minac's comfort and safety. In short, nothing unexpected happened. Minac did what it does best—it got the job done."

Mission accomplished! The turbine minus its cover. The triangular-shaped EFD Induction Minac units can be seen in the top left corner.

State-of-the-art Sinac for state-of-the-art Eibach

The next time you watch a Formula One race on TV, you can be sure that most of the cars on the track are equipped with suspension springs from Eibach. In fact, wherever high-performance vehicles have to endure extreme conditions, chances are many of them will be fitted with Eibach suspension solutions.

It was a particularly proud day when EFD Induction heard they had been selected to provide a Sinac induction heater and coils for renowned suspension makers Eibach. The Sinac has been bought by Schneider Maschinenbau of Lennestadt, Germany, who will incorporate it into an automated, high volume system for pre-heating stabilizer bar ends prior to forging.

Commenting on the project, Jürgen Schulte, Managing Director of Engineering and Operations at Eibach Germany, said: "I'm proud to work with EFD Induction on this important project. After all, state-of-the-art manufacturing technology is a cornerstone of our global reputation for quality. So we are extremely selectively about who we work with, but both Schneider and EFD Induction were able to meet our tough demands."

The solution developed by Schneider and EFD Induction features a Sinac 50/80 capable of pre-heating Eibach's extensive range of solid and tubular stabilizer bars. Only two induction coils are needed to cover the entire range.

Eibach, which is headquartered in Finnentrop in the German state of North Rhine-Westphalia, is a world-renowned designer and manufacturer of suspension springs, valve springs, stabilizer bars and suspension systems. Although famous for its involvement in motorsports, the company is also a major supplier for mass produced car models.

Eibach suspension systems are widely used in the toughest competitive environments. An EFD Induction Sinac heater and coils are being used to pre-heat stabilizer bar ends prior to forging.

Induction Instruction

'Induction Instruction' is a new series of short articles where EFD Induction experts write about various aspects of induction heating. For this first article, Leif Markegård, senior R&D engineer at EFD Induction Norway, describes what's important when designing induction coils.

Correctly designed and built induction coils are absolutely critical for successful, cost-effective induction heating. In fact, designing and testing coils is often the process with the longest lead time when devising an induction heating solution. A key reason for this is the fact that coils are task specific. They must be designed to achieve specific results on specific materials under specific conditions. There are no—or at least there shouldn't be—'off-the-shelf' coil designs.

Rigorous testing of a coil's design and construction is essential. Too few people realize that coils are often the part most exposed to harsh operating conditions. Testing and computer-aided simulation is therefore sometimes needed to arrive at a design that is both safe and fatigue resistant. And of course, it takes repeated testing to achieve optimal part-heating patterns.

Nothing can be taken for granted when designing induction coils. With very high power density coils, for example, one even needs to determine the correct speed at which cooling water should flow through the coil. Too low a speed will result in insufficient thermal transference. But even when the correct speed has been found, the coil designer must decide whether a booster pump is necessary in order to achieve and maintain the desired water through-flow rate. The competent coil designer will also specify a purity level for the cooling water, in order to minimize corrosion on the inside of the coil. So something as apparently straightforward as the coil's water, is in fact a complex matter demanding technical competence and specialist equipment.

Leif Markegård, senior R&D engineer EFD Induction Norway.

Induction coils come in a wide variety of shapes and sizes, depending on their specific task and the materials involved in the heating process.

Magnetic flux concentrators are another area of an overall induction solution that at first glance seems relatively straightforward. As the name suggests, the main function of such concentrators is to concentrate the coil's current in the area of the coil facing the workpiece. Without a concentrator, much of the magnetic flux is free to propagate around the coil. This uncontrolled flux will then 'engulf' adjacent conductive components. But when channeled by a concentrator, the magnetic flux can be restricted to precisely defined areas of the workpiece, resulting in the localized heating zones characteristic of induction heating.

Many variables must be considered when making flux concentrators. The workpiece's material, the coil's shape, the application—each influences the concentrator's final design. Even deciding what material to use for the concentrator can be a complicated task. Basically, concentrators are made from laminations, or from pure ferrites and ferrite- or iron-based powders.

Each concentrator material has its own drawbacks and advantages. Laminations have the highest flux densities and magnetic permeability; they are also less expensive as parts than iron- and ferrite-based powders. Laminations must however be stamped to a few standardized sizes and are therefore less flexible. They are also labor intensive to mount. Pure ferrites can also offer outstanding magnetic permeability. However, they suffer from low saturation flux density, and their brittleness makes them difficult to machine (diamond-tipped cutters must be used). Iron powders are easy to shape, offer high flux densities, and are easy to shape. But great care must be taken to provide against over-heating, as internal losses or heat transfer from the heated part means such powders have a relatively low working temperature.

A specially designed EFD Induction coil being prepared for installation at a customer in Norway.

Of course, many other factors need to be considered when designing induction coils. Correct impedance matching between the coil and the power source, for instance, is crucial in order to use the full power from the power source. Plus the fact that coils need five to ten times as much reactive as active power. Then there is the science of choosing the appropriate electrical insulation: should the coil be dipped in an epoxy coating, or should it be molded with high-temperature concrete? Again, these are complicated decisions influenced by several variables.

As we have seen, a professionally designed and fabricated induction coil is an advanced, complex component. Unfortunately, too many induction users persist in viewing coils as low-tech copper tubes. The results of this misconception are incorrect and even dangerous coil designs, amateurish repairs, insufficient or incorrect maintenance, and ultimately, process and equipment failures.

EFD Induction to braze Danfoss Compressors

EFD Induction has delivered two induction brazing systems to Danfoss Compressors d.o.o in Slovenia. The systems, one single and one twin EFD Induction Sinac, are being used to braze capillary tubes in air and gas compressors for refrigeration equipment.

Located in Crnomelj in southern Slovenia, Danfoss Compressors d.o.o boasts one of Europe's most modern and highly automated compressor production facilities. Established in 1993, the factory serves markets in Southern Europe and the Middle East.

EFD Induction in Austria was responsible for the sale of the two Sinac systems. For company general manager Matthias Gruber the sale confirms EFD Induction's reputation for high-uptime solutions: "Danfoss is an undisputed leader in its field, so of course it's encouraging to know we can satisfy their stringent quality standards. And it's particularly encouraging that the Sinacs are being used in the state-of-the art Crnomelj factory."

One of the systems delivered to Danfoss Compressors is a Sinac 18/25 Twin, pictured above. 'Twin' means that a single converter features two independent power outputs that can operate simultaneously under identical or different parameters.

US breakthrough for new Terac

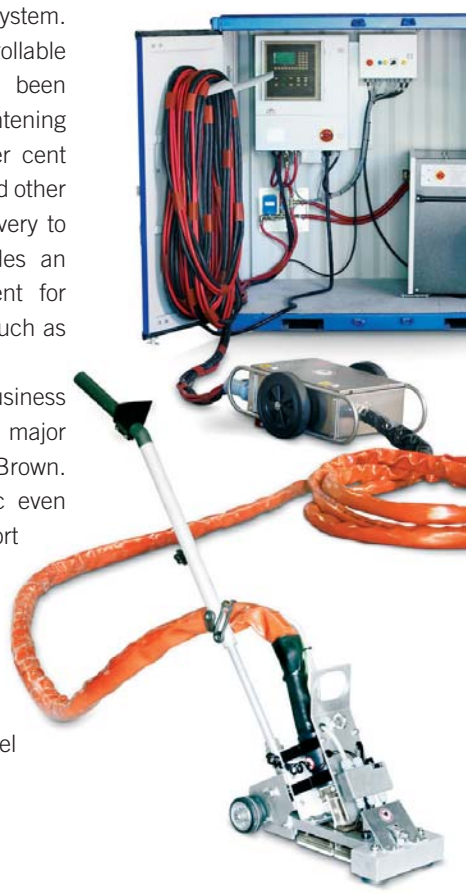
EFD Induction recently delivered one of its new generation Terac 25 induction straightening systems to Keppel AmFELS in Brownsville, Texas. The delivery makes Keppel AmFELS the first purchaser in the Americas of the new Terac 25 system.

Keppel AmFELS will use the EFD Induction Terac to straighten main decks and living quarters on their large offshore drilling units. The company is part of Keppel Offshore and Marine, the world's leading designer, builder and repairer of mobile offshore rigs, particularly jackups and semisubmersibles.

Commenting on the delivery, Tom Brown of EFD Induction in the US said: "That a customer of the caliber of Keppel AmFELS chooses a Terac underlines the commercial, safety and environmental benefits of our system. It also proves that the Terac is the proven and established induction-based straightening solution. After all, Keppel AmFELS are famous rig builders—so we succeeded in satisfying their stringent performance demands."

The EFD Induction Terac 25 is a complete, turnkey deck, bulkhead and side shell straightening system. Its rapid, repeatable, controllable and localized heat has been documented to cut straightening times by as much as 80 per cent compared to flame heating and other traditional methods. The delivery to Keppel AmFELS also includes an optional handheld attachment for straightening vertical plates such as bulkheads.

"A Terac is a powerful business tool that gives shipyards a major competitive advantage," says Brown. "And what makes the Terac even more attractive is the support offered by EFD Induction's worldwide network of factories and service centers. I'm sure the coming months will see more yards follow the example set by Keppel AmFELS."



A complete EFD Induction Terac system. The system is housed in a small container for easy mobility around shipyards and other worksites.

New agent in Canada

EFD Induction has appointed Synergetic Technologies Inc. its agent in Canada. Based in Oakville, just outside Toronto, Synergetic Technologies has been supplying Canada's manufacturers and researchers with process and furnace heating solutions for more than a quarter of a century. Synergetic Technologies will act as agent for all EFD Induction equipment, with the exception of its Weldac induction welding systems.

"Canada is an increasingly important market for us," says EFD Induction marketing head Johan Larsen. "There is a strong existing manufacturing base, but the country is also home to a vibrant R&D sector—ideal customers for our proven, technically advanced heating solutions. So we're extremely pleased to have such a well respected and established company as Synergetic Technologies for our agent. They know their market, and they're specialists in industrial heating."

Synergetic was founded and continues to be run by Gunnar Poschmann. Commenting on the appointment, Poschmann says: "I'm of course really looking forward to working with EFD Induction, and to finding new projects and applications for their expertise and equipment in Canada."

EFD Induction is no stranger to the Canadian market. At the beginning of 2008 EFD Induction acquired a 49 per cent stake in Tekna Plasma Systems Inc. Based in Montreal, the company specializes in developing plasma systems and solutions for nanopowder synthesis, plasma spray coating and powder spheroidization.

Gunnar Poschmann of Synergetic Technologies Inc.

Induction film library on YouTube

One of the world's largest video collections of induction heating videos is beginning to appear on YouTube. The collection, gathered over recent years by EFD Induction, covers everything from novelty items to instructional 'how-to' films in applications as diverse as aluminum brazing, gear hardening, shrink fitting and bolt forging.

For EFD Induction marketing executive Johan Larsen the appearance of the videos is the result of EFD Induction's experience in many applications and industries worldwide: "That's why we have so many films—and why they feature every conceivable heating task."

According to Larsen, the videos will eventually form a unique online resource for anyone interested in industrial heating. "The films show the speed, accuracy and flexibility of induction heating in real life settings. More important, the videos demonstrate how EFD Induction has succeeded in coming up with solutions for companies committed to innovation and productivity."

A first batch of videos is already uploaded on YouTube, with EFD Induction planning to upload more over the coming months. Visitors to YouTube can see the initial selection of films by entering EFD Induction in the site's search field. Alternatively, viewers can go directly to the EFD Induction channel at: www.youtube.com/user/efdinduction

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