

# Liebherr

## TOUTS TECHNOLOGY AT LATEST GEAR SEMINAR

For two days in Saline, Michigan, Liebherr's clients, customers and friends came together to discuss the latest gear products and technology. Peter Wiedemann, president of Liebherr Gear Technology Inc., along with Dr.-Ing. Alois Mundt, managing director, Dr.-Ing. Oliver Winkel, head of application technology, and Dr.-Ing. Andreas Mehr, technology development shaping and grinding, hosted a variety of informative presentations.

Topics included techniques in dry hobbing, gear coating, gear cutting, gear shaping, gear inspection, automation solutions, hobbing tools, CVD-reinforced dressing tools and precision-shaped grains for gear grinding. In addition to Liebherr's own presentations, experts from LMT-Fette, Ingersoll, Oerlikon Balzers, Dr. Kaiser, 3M-Winterthur, Wenzel and WZL RWTH-Aachen shared insights and technologies that are changing the gear industry now and in the future. Here are a few highlights from the event:

### Gear Inspection

Wenzel, who became a partner with Liebherr earlier this year, discussed its latest gear measuring machine, the WGT 280, during the gear seminar. The WGT 280 is the first model of a new generation of gear measuring machines that made its debut at Control 2013 in Stuttgart.

It will also be exhibited in the Liebherr booth during Gear Expo 2013 in Indianapolis. "The WGT 280 can inspect gears starting with a module of 0.5 as standard and gives us greater flexibility for small gears and rotationally symmetrical parts," said Heinrich Bruderle from Wenzel. "With this machine and the rest of the gear measuring technology provided by Wenzel, we'll be able to provide gear inspection for almost all automotive applications."

### Hobbing Solutions

Since its introduction in 2011, SpeedCore by LMT Fette has provided cutting speed increases and significantly more parts in less time. Together,

Thomas Falk from LMT Tool Systems and Winkel from Liebherr shared insights into the user benefits of SpeedCore including regrinding and recoating without any process change, higher cutting speeds and significant cost reduction. "SpeedCore closes the gap between carbide and PM-HSS and offers benefits with high performance coating," explained Falk. In a comparison study between a PM-HSS hob and SpeedCore, Liebherr found that SpeedCore provided increased productivity, performance benefits and a time savings of more than 46 percent.

### Gear Grinding

In a presentation from Chad Wesner of 3M-Winterthur, the Cubitron II bonded abrasives were examined on applications for an automotive gear as well as a heavy industrial gear. The economic and quality benefits of the Cubitron II provide a more uniform surface finish and no grinding burn if used properly. In addition, it can cut the standard production time, dressing amounts and number of dressing cycles in half.

By reducing the number of passes and increasing the axial feed rates, Liebherr was able to lower the cost per part for the automotive gear and the heavy industrial gear. All LCS machines from Liebherr have enough spindle power and dynamic stiffness to utilize the Cubitron II.

During the seminar, the Cubitron II was demonstrated on an LCS machine that displayed its extremely fast cutting speeds. It also provided attendees a firsthand account of the many tool life advantages versus a standard ceramic abrasive.

Many grinding innovations and technologies (including a significant reduction in grinding time) have been developed for both the machine and the tools in recent years. Oliver Schramm, division manager at Dr. Kaiser, discussed these technologies regarding CVD-Reinforced Dressing Tools. Schramm—with assistance from Liebherr's Dr.-Ing. Mehr—discussed how CBN (in combination with vitrified bonding) offers the highest metal removal rate and shows




economical potential for mass production. In order to achieve full potential, the machine, CBN worms and dressers must fulfill the highest process requirements. In the future, investigations will be made in grinding tests with worms which allow a cutting speed up to 120 m/s and the influence on the residual stress and the life time of a gear ground with vitrified CBN worms.

### Feedback:

The two-day event gave engineers an opportunity to get a comprehensive understanding of the new technologies and solutions that Liebherr can provide in gear manufacturing.

"80 percent of all gears are used in the automotive industry," said Mundt. "Today, automotive companies are going outside more and more to buy gears instead of making their own. Our goal is to develop more relationships with job shops and suppliers in the United States and let them know exactly what Liebherr can provide to them. I think with the attendees of this gear seminar, you see that we're starting to get more and more of these people as our customers."

"We're continuing our diversification approach," adds Wiedemann. "Broaden our customer base, help the suppliers benefit from the processes we offer. We don't like to supply just a machine tool. We want to offer solutions. This can be automation; it can be process developments, whatever the customer needs. We'd like to supply a solutions package. This approach is what we're showing at the gear seminar. We work with partners and industry leaders within the gear industry to make that happen." 

**For more information:**  
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