Gear Hobbing Technology Update

Q&A WITH LIEBHERR'S DR. ALOIS MUNDT

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Dr. Alois Mundt

Recently our editors had the opportunity to interview Dr. Alois Mundt, general manager of Liebherr-Verzahntechnik GmbH, regarding the state of the art in gear hobbing technology. We talked about the latest advances in machine tools and cutting tools, as well as how Liebherr is keeping up with the changes in technology.

What are the most significant recent advances in gear machine tool technology related to gear hobbing?

Dr. Alois Mundt: Right now, the technology is facing various trends: Other than the further development of direct drives and modern controls we see significant progress in automation, process integration and process development.

What Liebherr machine models feature these advances?

Dr. Alois Mundt: As for the drive technology, all of our machines offer various options. Regarding table drives for example, we are offering both worm gear drives and direct torque drives. The customers can choose the best fitting solution for their requirements, based on our advice. This benefit also applies to a number of other components.

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Automation is vital to increase efficiency of the production process. For our machines, we realize automation concepts up to a part size of 2,000 millimeters. In addition, we provide the integration of our technology into the customer‘s processes on individual demand.

When were these machines introduced?

Dr. Alois Mundt: Liebherr introduced these machines on the market in the late 1990s—starting with the models for smaller parts. Over the years we have been constantly improving the technology of every model and expanding the range of sizes that we offer.

How will gear hobbing machines continue to improve over the next 5–10 years?

Dr. Alois Mundt: The basic prospects in this area are somewhat similar to those in other industries. Gear hobbing machines will focus on even more functionality, higher complexity, user-friendly operation, energy savings and low maintenance.

What are the most significant recent advances in gear cutting tool technology (i.e., hob coatings and substrate materials)?

Dr. Alois Mundt: Recently developed coatings play a major role in the progress of gear cutting tool technology. By providing longer tool life, for example, they make for more efficient processes altogether. Also, the breakthrough of ICI technology has been a crucial advance, i.e. for coarse pitch and large gears.

How will gear cutting tools continue to improve over the next 5–10 years?

Dr. Alois Mundt: The processes will be even more specific. Due to this development the design of the cutting tools, among other things, will be more detailed and dedicated.

What are the current trends in gear hobbing technology?

Dr. Alois Mundt: Chamfering and deburring has become more important in the context of small gears. Also, manufacturers focus more on the pre

grinding quality and higher process stability. Other trends for large gears include the growing significance of ICI hobs; increasing component sizes applicable for automation; and high performance gears. The design features in the gear geometry are getting more sophisticated. For example, smaller pressure angles, higher helix and higher cutting depths. This takes away some manufacturing improvement back to lower chip removal rate.

What methods are your customers using to increase gear hobbing throughput?
Dr. Alois Mundt: Generally speaking, there is no silver bullet. We jointly develop the most efficient solution for the needs of each individual situation in discussion with our experts.

What methods SHOULD they be using but aren't yet using?
Dr. Alois Mundt: There are a number of untapped or underutilized potentials in the industry. This is particularly true for the training of employees—an area that has been broadly neglected by many customers in the past. Additional fields in this context are: the application of modern tools, cutting-edge technology, modern powerful machines, fast automation and a modern and rigid fixture design.

How are gear hobbing operations being combined with other operations to reduce overall cycle time?
Dr. Alois Mundt: A key point in this context are add-on processes that run simultaneously to maintenance.

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