

2015 State of the Gear Industry

From the Economics to 4.0 – Industry Leaders Have Their Say

John Perrotti, CEO, Gleason Corporation

The global market for manufacturing, on balance, is fairly weak. Slowing growth in China and other emerging markets, weak sectors such as oil/gas, mining and agriculture create some headwinds in the market.

The general trend for quieter and stronger gears continues. Hence, hard finishing processes are in high demand. Power skiving, as a process technology, continues to grow in its use – not just with dedicated machines, but also on machining centers of various types. Nevertheless, the technology requires very stable machines, simulation tools, precise cutting tools and process knowhow to become successful.

Another trend that continues to gain momentum is the digital factory, as manufacturers explore how they can use data in a real-time environment to optimize their designs and manufacturing processes. Also, factory automation of all types continues to grow in popularity to reduce idle times and combine operations.

In 2015, Gleason Corporation celebrated an important milestone in its history: We have now been serving the gear manufacturing industry for 150 years. We have had the opportunity to celebrate this great achievement with our customers and employees at special events as well as major trade shows throughout the world.

We also took this opportunity to further invest in technology to extend our leadership in a highly competitive global marketplace. New products including our 200GX threaded wheel grinding machine, 300GMS-P shop hardened gear inspection machine, our 500CB automated cutter build machine and genesis 400H gear hobbing machine, along with significant process advances in power skiving, bevel gear grinding and lapping offer exciting potential for the future. As the “total gear solutions provider,” we also expanded our line of cutting tools and workholding, our services business, including remanufacturing and re-control of machines, our plastic gears division, and automation solutions. All of these solutions ultimately fit into our Gleason 4.0 vision of the future where we link from design to the factory floor with closed-loop systems able to control and optimize gear production.



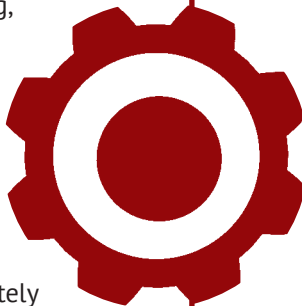
Bryan Barlow, Vice President Sales and Marketing, Delta Gear

What we're seeing is decisions being delayed by customers, and the demand for capacity – at least on the aerospace side – didn't come, at least not to the degree they forecasted back a few years ago with the new engine programs and the new aircraft programs. We're busy, but all this demand didn't come to everybody like the customers forecasted. We're in a price driven market because there's a lot of capacity, but it is available capacity. Our Delta Research division, which is a gear

manufacturing facility, is the opposite. They're not in a price market – they're in a “give me the parts tomorrow” market. [Delta Research is] booming; things are great. There

are a lot of new programs on the Delta Research side for us. Automotive seems to be on fire with all these new transmissions programs and new vehicle programs on the electric side.

The aerospace side, in my opinion, I think is soft. It's a little bit slow, and I think budgets are tight on the OEM side. You can see that their travel budgets are tight, so things are happening at a slower pace. For us, even though things are a little bit slower on the customer side, we're gaining market share because we're bringing on new OEM customers. We're either getting in on new programs or gaining market share. So for us, we're actually growing even though it's a little bit soft.



David Goodfellow, President, Star SU

I think that there have been some updates of products that have been out there for a year or two but have now manifested themselves into the reality of capable, production-ready processes.

One is scudding. Scudding, when tooled properly, is an extremely efficient process that often replaces traditional shaping and broaching and, in some cases, hobbing. Scudding is Proficator's registered, trademarked term. Some people call it hard skiving, which has been around a long, long time. It started actually in the '60s. But coming back to this process, with modern tool technology, we've been able to advance that Scudding process to become an extremely efficient, production-ready capability between the machine, the cutting tool and, of course, how you refurbish that tool after it's serviced. So that's one thing: You're seeing a trend now in eliminating broaching and shaping applications with extremely efficient machines.

The other breakthrough is that we've been working for about a year or two to be competitive in the gear grinding business. The old traditional hob and shave processes in automobile transmissions were hobbled and heat treated, and then they lived with whatever variations came after heat treat. But as of late, there's been a tendency to go to grinding after a heat treat to remove errors and distortion coming out of the heat treat process. So that grinding process is used for purposes like improving surface finish, which reduces noise and improves the efficiency of the transmission so it can take more power and torque, run more smoothly, and have better performance and longer life.

We introduced at the EMO Milan tool show a new grinder called SkyGrind – not because of the sky itself, but because it's skive hobbing to rough out the material, and then finishing grinding to

remove the minimal amount of stock. The unique opportunity that we saw there was to do it without coolant. We thought if we could remove that from the



process – it's pretty much the only process in the gear manufacturing process that isn't dry – it would be important to remove it and all the ancillary problems of coolant like smoke and drips. So we introduced this process and it's kind of unique.

Kerry Klein, Vice President Sales and Marketing, Arrow Gear

The biggest issue is that the economic portion of the business is not very strong right now. [Arrow Gear is] a mix of aerospace and industrial. Aerospace is doing OK, and industrial is pretty much down across the board. That's the toughest part: just trying to keep your head above water right now.

Arrow Gear is going through a little bit of a transition right now. It's been a family-owned company since it was born. It still is a family-owned company, but there's new management coming in and they're making some changes. We just completely redid our front offices – so we have a new look, a lot of new personnel in the company and we're really trying to bring the company forward with modern manufacturing, modern manufacturing tools and a new way of thinking. So that is all new stuff for the company.

We actually just purchased two new Mori Seiki NT machines; we purchased a new Gleason 600 cutting machine; we purchased some new inspection equipment. We actually have a lot of new equipment. We also have some new partnerships with European companies (Pritzwalk and Samputensili) – either they're selling our product overseas or we're selling their product here in North America. So there actually was a lot going on for us this year.

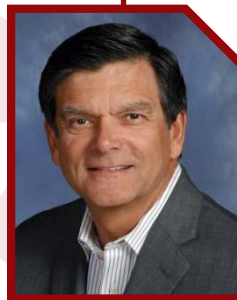


Bill Miller, Vice President Sales, Kapp Technologies

Basically, the automotive industry and the aerospace industry continued to boom. The mining and large commercial gearboxes and energy continued declining. Our product line is the most diverse in the industry and we produce gear grinding machines for every aspect of the market, so our reaction is simply to redeploy our resources as needed to apply to these growth areas. There haven't been any major shifts this year – it's just a continuation of the same trend.

We have two manufacturing facilities, and we utilize both of those now for the growth areas. We typically build smaller machines in Coburg and larger machines in Berlin. But those facilities have a dual purpose and we switch between the two; they're managed by the same production manager and planning people. So we have redundant capabilities. We're utilizing both of those facilities right now.

The other aspect of this is the continuing shift towards Mexico. We actually have more deliveries to Mexico than to the United States and Canada combined. During this period of recession for the large gear makers, we've taken this opportunity to develop a new basis for productivity and machine types, which is in the 1.2 meter range. We made an installation at True Gear & Spline in Cambridge, Ontario, and that was a very big success. We've also delivered our latest technology to the aerospace industry – and I hate to be cliché, but that's about all I can say about that.

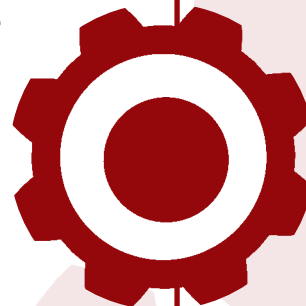
**Nicholas Bergmann, General Manager, Exsys Tool**

What we're seeing now is we're trying to convert a lot of people from older technology that uses worm gears into hypoid gearsets. They're trying to make the equipment that it goes into more efficient – I think that has been a big buzzword in 2015, because everyone wants to go smaller and faster. Those are the other two buzzwords.

Some of the major companies we've dealt with are Mercedes and Bugatti – we're mostly automotive right now. We're trying to branch out and we have some robotics customers. I would say that within those sectors, those are the big things right now.

Honestly, our market share (in the gear industry) is very small right now. We're trying to gain market shares and really feel the market out in all of North America. We also sell live tooling and rotary gearboxes, and those things have taken off – but strictly speaking to gears, we haven't made significant progress

yet. We really only started six years ago, so compared to some [other companies] who have been making gears for 100 years and have huge accounts and are well-established in the industry, a newcomer like us is really trying find our footing and have some of the big questions on what is new and trendy answered for us.



Hastings Wyman, CEO, Klingelberg America

In my opinion, the defining trends of 2015 for the Gear Industry have been market based. Here I'm speaking primarily for what we see in North America. The potential everyone hoped for in 2014 for the U.S. auto industry has been fulfilled and then some, with all-time or near all-time SAAR levels. This obviously benefits anyone in the gear industry with any auto industry exposure. The industry switch to high multi-speed transmissions, with eight, nine, and 10 forward ratios, has meant a lot of big new programs, very high volumes and very short cycle times. It is typical now for automotive planet gears to be finish ground in less than 10 seconds, floor-to-floor. The auto industry, of course, places the highest demands on statistical quality, which means these super-fast cycle times are also happening at 1.67 Cpk, fully automated, three shifts, 24/7. And those gears need to be inspected on the shop-floor, in minutes, not in a gear lab, in hours. There was really impressive stuff happening in U.S. auto industry in 2015.

The heavy truck and aerospace industries are also doing quite well with very strong volumes, which is also very good for the gear industry. The new jet engines coming online in the next few years are very exciting. Decoupling the hot section from the cold section with a gearbox allows both parts of the turbine to run in more efficient regimes, for lower fuel consumption. On the downside in 2015, the big commodity boom is over. Everyone knows oil and gas are down, but so is coal, iron ore, copper, tin, nickel, you name it. So the big demand everyone saw for new big gear installations over the past 5 to 10 years has really taken a hit. The repair and maintenance market for these gears will weather a bit better, and in some cases may improve, so there are bright spots—but overall it definitely hurts the “big and heavy” end of the gear industry.

At Klingelberg America, 2015 has been a big year. At the EMO show, Klingelberg showed our Viper 500 parallel-axis gear grinder and our new C30 bevel gear cutting machine. At Gear Expo we unveiled our new G30 bevel gear grinder and P40 gear measuring machine. The Viper can form grind both external and internal gears with the day-in and day-out precision the Höfler brand is renowned for, and be configured for generating grinding, as well. But high technology doesn't add value unless you can make it work on the shop-floor, so Klingelberg designed the C30 and G30 with a new common user interface around an industrial touch screen. We've had a terrific response from our customers on this development, because it answers a need they all face every day: training new employees, especially Millennials, many of whom don't have experience in machining or gear manufacturing. Our new machine interface is as intuitive for them as using their smartphone.

Outside of selling and delivering new machines, at Klingelberg America we place a big focus on supporting our North American customers after the sale, through applications support, service, and parts and tooling. We're doing a lot of machine refurbishment work in Saline (MI), taking old lappers, cutting machines and grinders, doing complete mechanical overhauls, PPAP and putting them back into production. We added a lot of headcount in this area in 2015, and we will continue to in 2016. ⚙️



For more information:

Gleason Corporation
Phone: (585) 473-1000
www.gleason.com

Delta Gear
Phone: (734) 525-8000
www.delta-gear.com

Star SU LLC
Phone: (847) 649-1450
www.star-su.com

Arrow Gear Co.
Phone: (630) 969-7640
www.arrowgear.com

Kapp Niles
Phone: (303) 447-1130
www.kapp-usa.com

Exsys Tool USA
Phone: (352) 588-4345
www.exsys-tool.com

Klingelberg America
Phone: (734) 470-6278
www.klingelberg.com

For Related Articles Search

state of the gear industry

at www.geartechnology.com