Gleason

ANNOUNCES HOBBING MACHINE WITH INTEGRATED CHAMFER HOBBING

The new Genesis 160HCD Hobbing Machine for cylindrical gears integrates a newly developed process for chamfer cutting. Chamfer Hobbing ensures precise chamfers according to customer specification — with minimal tool cost.

The new Gear Hobbing Machine with Integrated Chamfer Hobbing is based on the extremely successful Genesis Machine Series with hundreds of installed machines globally. With the new Genesis 160HCD, Gleason integrates a newly developed chamfer cutting process which is executed in parallel to gear hobbing. Chamfer Hobbing provides very short cycle times and minimal tool cost per workpiece. This new chamfering process ensures burr-free gear faces without the requirement of additional, subsequent deburring steps. Likewise, no measurable burrs are created on tooth flanks. The workpiece is ideally prepared for the subsequent hard finishing process.

Chamfer Hobbing is a very efficient process due to the ability to shift the chamfer hobs for maximum tool life. Compared to special deburring tools, chamfer hobs can be easily reconditioned, keeping tool cost under control and cost-per-piece at a minimum.

Ideally suited for the highly economical manufacture of cylindrical gears up to a module of 4 mm and an outside diameter of 160 mm, the 160HCD can be optionally extended to a workpiece diameter of 210 mm. Its updated part loading concept with a fast gantry system minimizes part handling and setup times, thanks to its complete integration into the machine's control software.

The new 160HCD is the latest addition to the Genesis Series of Hobbing Machines offering another method to chamfered gears precisely and economically: Whether as a dedicated hobbing machine or integrated with different chamfering solutions available through Gleason — a Genesis Gear Hobbing Machine can satisfy a wide range of customer requirements.

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

Liebherr

INTRODUCES NEW GEAR GRINDING MACHINE

Based on its LGG 280 generating grinding machine, Liebherr recently presented the larger LGG 400 M model at IMTS in Chicago.

The new Liebherr LGG 400 M was developed with an eye towards aerospace and job shop customers. It fits into the same footprint as the smaller LGG 280, but is well-suited to machining long shafts because the travel of the main and counter column has been extended.

"Our users can utilize a variety of grinding heads for internal and external gears," says Oliver Kraft, manager development and design of gear cutting machines at Liebherr-Verzahntechnik GmbH. "They can perform generating grinding with high productivity on workpieces up to 280 millimeter in diameter or profile grinding on even larger components up to 400 millimeters. This means even greater flexibility than its sister machine."

Ideal for long shafts

The machine concept came about from the requirements of the market. Long shafts with small diameters have come into demand, required by customers in the aerospace and job shop industries—often for short runs. Liebherr offers an optional crane for optimal handling of large parts."We have ergonomically adapted the machines overall," Kraft explains. "Due to the height, we have incorporated fold-out stair steps so

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workers are better able to reach the working area. Large viewing windows provide the operator with the best possible overview of the working area and the process."

For more information:
Liebherr Gear Technology
Phone: (734) 429-7225
www.liebherr.com

Forest City Gear

ADDS METAL ALLOY ANALYSIS TO GEAR INSPECTION CAPABILITIES

Forest City Gear can now perform fast, comprehensive analysis and verification of metal alloys for quality assurance and control using its new Thermo Scientific Niton XRF Analyzer.

The Niton XRF Analyzer enables Forest City Gear to quickly and easily verify that the metal alloys used in barstock and/or near net shape blanks received from outside suppliers meet specifications before gears are produced. It can also be used to confirm that the chemical composition of metal alloys after heat treat meets requirements. The Analyzer can even be used to verify the plating thickness over metal to ensure that plating performed by outside vendors conforms to specification.

The lightweight, handheld and purpose-built construction of the Niton Analyzer makes it ideal for application in a wide range of environments, from shop floor to even outdoors.

For more information:
Forest City Gear
Phone: (815) 623-2168
www.forestcitygear.com

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DVS TECHNOLOGY GROUP

GMTA

EXAMINES MICRO-FINISHING TECHNOLOGY ON PROFILATOR MACHINES

Recently at IMTS in Chicago, GMTA introduced a new technology (patent-pending since May, 2018) by Profilator called micro-finishing via scudding. Micro-finishing takes place *after* the hard-scudding process has been completed. The process will take an already high quality, hard-scudded part and make it better in terms of surface finish. While the overall AGMA, JIS or DIN quality may not change, the surface roughness of the gear teeth will be dramatically improved. It should also be noted that superfinishing gear processes such as this have been shown to reduce friction, increase pitting resistance and increase the life of gears. Additionally, this technology from Profilator GmbH & Co. KG. is a completely dry machining process and requires no cutting fluids or MQL technology.

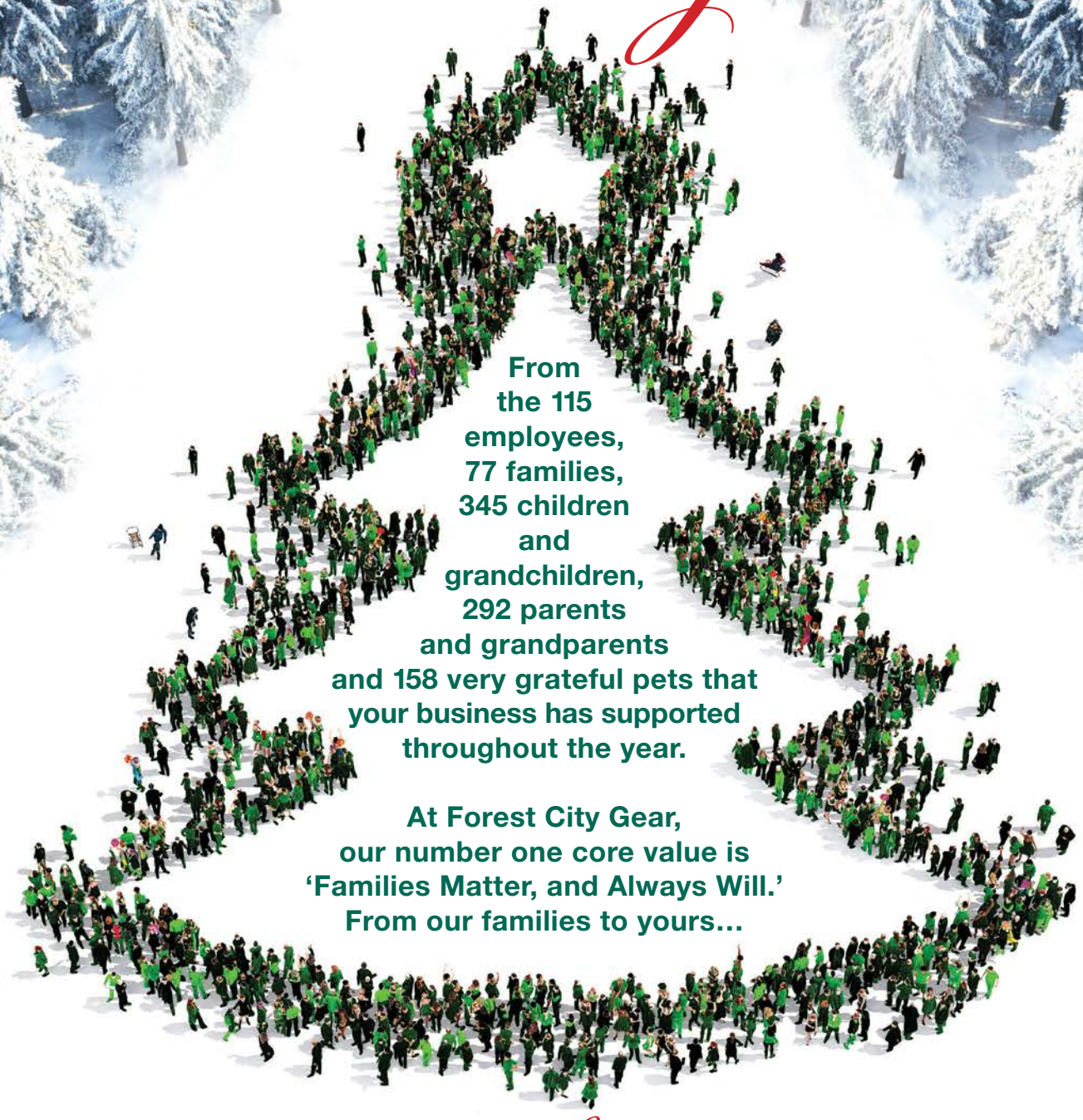
The hard-scudding time for a standard automotive ring gear (approx. 125–140 mm ID) is 37–52 seconds (25–40 seconds cutting/12 seconds load-unload-stock division time). In the company's testing, they are seeing that the micro-finishing process takes approximately 20 seconds on a standard automotive size ring gear. That being said, they estimate that the total cycle time for finishing a ring gear via hard- scudding and micro-finishing would be approximately 64 seconds, if completed sequentially. As they continue to test and develop the micro-finishing process, GMTA feels that the time estimate noted above could be optimized to decrease the hard-scudding and micro-finishing cycle by 10%, thus keeping the total cycle time under one minute for all automotive ring gears.

The market is turning toward hybrid and e-Drive technology at a rapid pace. In these applications, noise (or lack of noise) is a very important consideration. The gears in these transmissions rotate at extremely high velocities and that increases the possibility of gear noises being perceptible to the human ear. As previously stated, the micro-finishing technology addresses noise sensitive applications and is aimed at making a quieter gear. The gear *may* also be a slightly higher overall quality, but the goal is to increase the quality of the surface roughness of the gear tooth flanks.

The Rz measurements do not exceed 0.8 µm in either lead or profile direction. This is in line with much more expensive abrasive gear finishing processes which require expensive machining fluids and filtration systems. So, in short, gear makers can achieve this high quality using a dry process from Profilator GmbH & Co. KG.

The micro-finishing process utilizes a high quality diamond plated tool. This tool concept was designed and developed by Profilator GmbH & Co., located in Wuppertal, Germany. This unique process is designed to remove only a small amount of part material where the

Thank You



From
the 115
employees,
77 families,
345 children
and
grandchildren,
292 parents
and grandparents
and 158 very grateful pets that
your business has supported
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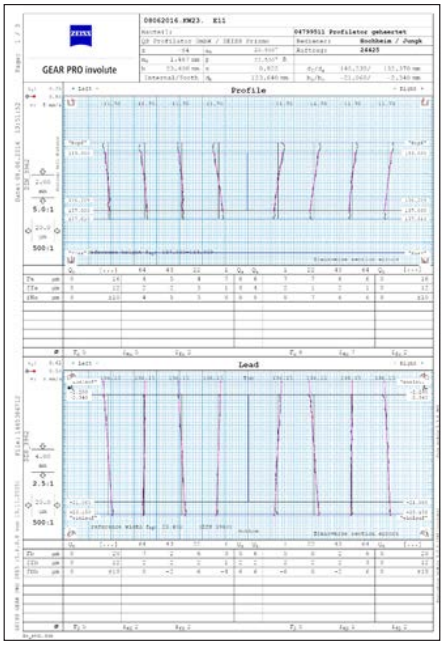

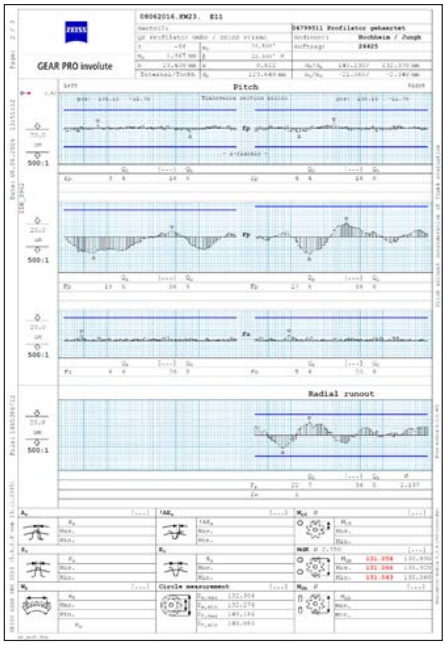

Surface Roughness "Hard-Scudding®" and "Micro-Finishing"

R-PROFIL (Profile Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.14 µm
Rz	**0.8 µm**
Rms	0.18 µm

L-PROFIL (Profile Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.15 µm
Rz	**0.8 µm**
Rms	0.19 µm

R-PROFIL (Lead Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.12 µm
Rz	**0.7 µm**
Rms	0.13 µm

L-PROFIL (Lead Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.11 µm
Rz	**.6 µm**
Rms	0.12 µm

Surface Roughness "Hard Scudding®" Only

R-PROFIL (Profile Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.38 µm
Rz	**2.0 µm**
Rms	0.42 µm

L-PROFIL (Profile Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.33 µm
Rz	**1.7 µm**
Rms	0.36 µm

R-PROFIL (Lead Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.28 µm
Rz	**1.6 µm**
Rms	0.29 µm

L-PROFIL (Lead Measurement)	
Ausw. – L	4.0
λc	0.8mmX5
Ra	0.25 µm
Rz	**1.3 µm**
Rms	0.28 µm

resulting part provides the user a great benefit, in terms of surface quality on the gear teeth as well as noise reduction. This fine finishing process is completed using the high quality industrial diamond tool (noted above) with an average particle size of 45 µm. During the process, the tool will remove approximately 20 µm of stock per flank which will not largely alter the gear geometry but drastically improve the surface finish on the gear teeth. Due to the relatively small amount of stock removal, it is believed that the tool life will be very good (testing continues to confirm this fact).

The micro-finishing technology can be applied in several ways on Profilator equipment. It can be a stand-alone process on a scudding machine, it can be a sequential process where hard-scudding and micro-finishing are completed utilizing a tandem tool set-up or it can be applied on a double spindle Profilator scudding machine, where the processes of the hard-scudding and micro-finishing can be completed simultaneously. In many cases, the part geometry will define the optimal process for the user.

Micro-Finishing tool.

For more information:
GMTA
Phone: (734) 973-7800
www.gmtamerica.com

Starrett Digital Gages

OFFER DIVERSE FORCE MEASUREMENTS

The L.S. Starrett Co. has introduced its DFC and DFG Series of Digital Handheld Force Gages. Depending on the series, advanced automatic testing can be attained with the DFC Force Gage controlling a Starrett FMM Digital Force Tester, or basic testing can be performed using the DFG gage.

The Starrett DFC and DFG Digital Force Gages are part of the new Starrett L1 line of entry level digital force measurement solutions. Optimized for production and quality control testing, the versatile, innovative architecture of the Starrett L1 system is designed for fast, easy-to-use, reliable and repeatable operation.

Starrett DFC and DFG Digital Force Gages feature an easy-to-view high-resolution OLED color backlit display and auto-off function. A primary and secondary window shows test results, and out-of-tolerance results display in red. A simple multi-function keypad has softkeys that are programmable to the users' most repetitive functions.

Adjustable sampling rates help capture peak loads, and filters can be applied to peak and display values. The Starrett L1 Digital Force Gages' battery life provides over 30 hours of continuous operation and have a USB port for transmitting data to a computer. The gages have a cast aluminum housing with a comfortable grip design for handheld testing, and a metric threaded top post enables screw-on attachments and clevis adapters that fit hundreds of Starrett test fixtures.

"Whether for simple, basic economical testing via handheld gaging, or more advanced testing when mounted on our L1 stands, our innovative Digital Gages provide the ultimate solution in force measurement versatility," said Emerson Leme, head of metrology division at Starrett.

Swiss Precision Gear Grinding

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- fine or polished ground gears
- twist-free gears or gears with controlled twist
- non-involute gears (cycloid gears)
- tapered gears

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DFC Digital Force Gages

The DFC Series is a revolutionary concept for force measurement via a handheld force gage. The DFC may be used as an advanced digital force gage and controller with Starrett FMM Force Testers, or as an advanced digital force gage with Starrett MTL and MTH Manual Force Testers. The DFC Gage can serve as a universal interface where the user tests and can configure load limits, distance limits, break limits, crosshead travel direction, crosshead speed and more. The DFC features a precise measurement accuracy of 0.1% full scale with internal data sampling at 25KHz. Display resolution is 10,000:1 and the DFC features Bluetooth, USB and RS-232 communications plus digital I/O.

DFG Digital Force Gages

The DFG Series is a basic force gage that measures force at an accuracy of better than 0.2% full scale. It is ideal for basic handheld tensile and compression testing. Test setup and operation is fast, efficient and easy. The DFG display shows the test direction and dynamic load during testing. Results are displayed at the completion of testing, including "Pass-Fail" when tolerance is applied. The gage will display statistics when results are saved to the gage's internal memory and it can store up to 50 test results in local memory.

Both the DFC and DFG Digital Force Gages are supplied with a complete accessory kit and carrying case that includes hook, notch, chisel and flat attachments, a chisel and point adapter, a 6" extension rod and a NIST-traceable certificate of calibration.

When more sophisticated and complex testing is required, Starrett also offers a range of force solutions via its L2, S2, L2 Plus and L3 Systems. Starrett force measuring equipment is manufactured in the U.S.A. and is available to order now in several configurations including Handheld Force Gages and Digital and Manual Force Testing stands.

For more information:
L.S. Starrett Company
Phone: (978) 249-3551
www.starrett.com/force

Kennametal

RELEASES LATEST HELICAL MILLING CUTTER

Kennametal recently released its newest helical milling cutter, the Harvi Ultra 8×.

Using a 95 mm (3.74 in.) axial depth of cut, 20 mm (0.78 in.) radially, and a feedrate of 423 mm/min (16.65 ipm), the 80 mm (3.15 in.) diameter Harvi Ultra 8× helical milling cutter from Kennametal recently worked through a difficult aerospace superalloy. Tim Marshall, senior global product manager for indexable milling, has tested the Harvi Ultra 8× with a variety of customers, pushing the limits of the new cutter on everything from 15-5 PH to cast iron to Aermet 100 (high strength steel) and seeing outstanding results with each.

"Kennametal developed the Harvi Ultra 8× to meet two distinct needs," Marshall says. "The first came from the aerospace industry, which thanks to the large numbers of aircraft being built today requires the highest metal removal rates possible but still achieving excellent tool life. At the same time, machine tool builders and users alike are asking for tools able to withstand higher cutting speeds but generate lower machining forces, so as to reduce wear and tear on machine components during extreme cutting conditions. The new HARVI Ultra 8× does all that, and a lot more besides."

Marshall said the Harvi Ultra 8× was designed to predictably remove 20 cubic inches (328 cm^3) of Ti-6Al-4V each minute while attaining 60 minutes of tool life per cutting edge. To do this, Kennametal combined a number of innovative technologies into this cutting tool solution including a double-sided yet positive rake insert, a unique AlTiN+TiN PVD coating that provides robust resistance to thermal fatigue, a higher quality steel for improved stiffness and rigidity under high cutting forces, a unique BTF46 (bolt taper flange) connection

that provides deflection resistance and a variable helix design that breaks up the harmonics that lead to chatter, further improving tool life, part quality, and throughput.

"We've optimized everything about the Harvi Ultra 8×," said Marshall. "The flutes and the coolant nozzles assure maximum chip flow, something that's very important when you're removing this much material—without it, the chips get jammed up and you're facing catastrophic failure. Our KCSM40 grade has proven to be a top performer in high-temp alloys, but we also offer several equally excellent grades for other workpiece materials."

For more information:
Kennametal
Phone: (724) 539-8033
www.kennametal.com