

ADVANCED GEARING CAPABILITIES

KEY CAPABILITIES

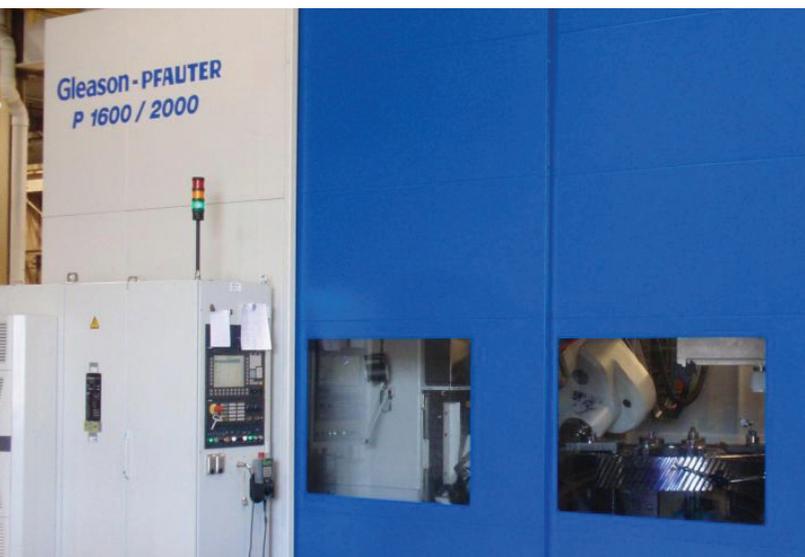
- 237,000 sq. ft. of manufacturing
- 35,000 sq. ft. of heat treating
- 6,500 sq. ft. – H&S Canada (Lively, ON)

ENGINEERING EXPERTISE

- Over 25,000 hours/year
- Drawings for over 90 different gearbox brands and spare parts

INNOVATIVE EQUIPMENT

- Fellows 65-16 Shaper with full CNC controls
- Giddings & Lewis VTC 2000 vertical turning
- Gleason-Pfauter P1600/2000 hobber/gasher
- Gleason-Pfauter P2000G form grinder
- Gleason-Pfauter P2006 form grinder
- Gleason-Pfauter P2400/3000 hobber/gasher
- Hofler R1600/2000 form grinder
- Hofler R6000 form grinder
- Hofler 1600 form grinder
- Schiess horizontal boring mill
- G&L 3500 vertical turning center
- Farrel 50 ft. vertical turning center
- Aichlin pit furnace (2)



The **Gleason-Pfauter HOBBER/GASHER** improves productivity with a **7x REDUCTION IN HOBGING TIME.**



THE COMPANY MOST QUALIFIED TO HANDLE ALL YOUR GEARING NEEDS.

TURNKEY GEARING SOLUTIONS

- Design to Manufacturing
- Repair & Rebuild
- Field Service
- Reverse Engineering and Performance Upgrades
- Gears up to 24 ft. (7.3m) in diameter and 287 in.
- Gearbox Types: Planetary, Parallel Shaft, Split Shaft, Right Angle, Multi-Speed
- In-house Heat Treating and Carburizing up to 50,000 lbs. (22,000 kg)
- Induction Hardening to 5m in diameter or 30,000 lbs. (13,000 kg)
- Inspection and Testing

GEAR & SHAFT GRINDING SPECIFICATIONS

- External: outside diameter to 6.0m (237 in.)
- Internal: outside diameter to 3.5m (138 in.)
- Face width: up to 2.0m (79 in.)
- Module: up to 40 (0.63 DP)
- ISO grade: up to 4 (AGMA quality 14)

GEAR TOOTH CUTTING SPECIFICATIONS

- Spur, helical, double helical, herringbone, internal and worm gears
- External: outside diameter to 7.3m (287 in.)
- Internal: outside diameter to 4.8m (189 in.)
- Face width: up to 1.3m (50 in.)
- Module: up to 70 (.375 DP)
- ISO grade: up to 8 (AGMA quality 10)

MOST TRUSTED NAME IN METAL INDUSTRY GEARING FOR OVER 130 YEARS

WE'VE REBUILT THOUSANDS OF GEARBOXES, MORE THAN 120 DIFFERENT BRANDS



ADVANCED GEARING CAPABILITIES

IN-HOUSE HARDENING FOR IMPROVED DURABILITY AND RELIABILITY

- **THROUGH HARDENING** - Medium to high carbon steel parts (1045, 1137, 1141 1144, 4130, 4140, 4330v, 4340, 8640, etc.) have enough carbon content to harden without addition of carbon to the surface (case hardening). Hardness is usually specified on Rockwell "C" scale with a minimum spread of 5 points.
- **INDUCTION HARDENING** - A form of heat treatment in which a metal part is heated by induction heating and then quenched. The quenched metal undergoes a martensitic transformation.
- **CARBURIZING** - A heat treatment process in which iron or steel absorbs carbon liberated when the metal is heated in the presence of a carbon bearing material, such as charcoal or carbon monoxide, with the intent of making the metal harder. Capability up to 90 in. OD, and 16 ft. L.

REBUILD, REPAIR, FIELD SERVICE & PREVENTATIVE MAINTENANCE

Rebuilt & Repaired thousands of **gearboxes**, and have a library of drawings across **120 BRANDS**.

- Detailed inspections and evaluations
- Dynamic modeling and optimization recommendations
- Emergency breakdown service and repairs
- Spin and load testing
- Equipment evaluation/analysis
- Gear alignment
- Installation and startup supervision
- Lubrication system evaluation
- Nondestructive testing (NDT)
- On-site machining
- Preservation and long-term storage
- FARO Arm
- Rebuilds of all manufacturers
- Re-ratios and engineered upgrades to gears and housings
- Reverse engineering
- Spare OEM parts



HORSBURGH & SCOTT
DELIVERING THE DIFFERENCE



GEAR TEETH PROFILING EXPERTISE

- **CROWNING** - Helps center the tooth contact in the middle of the facewidth, and helps prevent catastrophic tooth breakage.
- **END RELIEF** - Helps prevent end loading in cases of heavy shock or momentary overloading, and helps to prevent heavy loading at the ends of the teeth which could lead to tooth breakage.
- **TIP RELIEF** - Helps promote smooth engagement and disengagement of the meshing gears, and helps prevent tooth breakage.
- **LEAD AND PROFILE MODIFICATIONS** - Helps to promote contact across the entire tooth facewidth when the gear is under load, and provides major improvements in the life of gearing operating under heavy loads.
- **SHOT PEENING**

QUALITY ASSURANCE

Quality-centric individuals and teams have positioned Horsburgh & Scott as one of the **HIGHEST-QUALITY DESIGNERS AND MANUFACTURERS OF INDUSTRIAL GEARING**.

- Engineering analysis and upgrades
- Reverse engineering
- Sophisticated tools and practices to follow rigorous standards, including AGMA, ISO 9001:2008, AASHTO and API
- Gear cutting (AGMA class 10)
- Gear grinding (AGMA class 14)
- Zeiss Coordinate Measuring Machine (4 x 4 x 2m) within 2 micron accuracy
- On-board lead & involute checking
- Specialized metallurgical testing for heat treat
- Nondestructive testing (NDT)



216.431.3900

inquiry@horsburgh-scott.com

horsburgh-scott.com

5114 Hamilton Avenue
Cleveland, Ohio 44114
USA

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