

**INSPECTION EQUIPMENT**

- Gleason / M&M Sigma 5 gear analyzer, 475mm maximum outside diameter, 650mm between centers (2006)
- Gleason CAGE/GAGE and QUINDOS gear software tools for spur, helical, straight bevel, spiral bevel, and hypoid gear inspection and analysis options
- Brown & Sharpe Chameleon 7-6-5 coordinate measuring machine, 27.5" x 23.5" x 20" capacity with scanning capabilities (2007)
- Brown & Sharpe Chameleon 7107C coordinate measuring machine, 31.5" x 63" x 27" capacity with auto probe changing and scanning capabilities (2000)
- Brown & Sharpe Chameleon 9159 coordinate measuring machine, 41" x 82" x 35" capacity with scanning capabilities (1997)
- Brown & Sharpe Reflex coordinate measuring machine, 16" x 20" x 16" capacity (1998)
- (1) Illitron 2276 gear charter, with recorder, composite checking, 24 inch maximum diameter, 28 inch length
- (4) Illitron 2280 gear charter, composite checking, 12 inch maximum diameter, 18 inch length
- Fellows 4 fine pitch redliner, with recorder, composite checking, re-manufactured with up-grades (1994)
- (3) Fellows 12M involute checker, with recorder, measuring and recording involute profile, internal and external gears to 12 inch diameter
- Illinois 3924-2C lead checker, with recorder, measuring and recording lead error, spur and helical gears to 24 inch diameter, 36 inches between centers
- (6) Fellows 12C cone checker, inspecting gear concentricity and tooth-to-tooth spacing
- Johnson DF-2 thread gages with internal and external masters, 1.5 to 12 inch capacity
- Optical flats, VanKeuren light sources
- Mitutoyo SV-3100 profilometer
- Mitutoyo SJ-201P surface roughness tester
- (4) Pratt & Whitney supermicrometer

**GEAR SHAPING**

- Fellows 20-8 shaper, 20" maximum pitch diameter, 23" vertical clearance, 8" stroke, with tailstock and 6-axis CNC (2003)
- Fellows 20-4 shaper, 20" maximum pitch diameter, 23" vertical clearance, 4" stroke
- (2) Fellows 10-4 CNC shaper, 10" maximum pitch diameter, 10" vertical clearance, 4" stroke, elevating attachment (2006)
- Fellows 10-4 shaper, 10" maximum pitch diameter, 10" vertical clearance, 4" stroke, with tailstock
- (3) Fellows 10-2 shaper, 10" maximum pitch diameter, 10" vertical clearance, 2" stroke, with tailstock
- Fellows 7125A shaper, 7" maximum pitch diameter, 5" vertical clearance, 2" stroke

**GEAR GRINDING**

- Niles ZE 400S CNC gear grinder (2008)
- Kapp VUG 432 CNC gear grinder, 8" maximum pitch diameter, work length to 20", equipped for both internal and external grinding, and cluster gear grinding, uses CBN grinding wheels, automatic synchronization (2003)
- Kapp VAS 432 CNC gear grinder, 12" maximum pitch diameter, work length 25", uses CBN grinding wheels, automatic synchronization (1996)
- Samputensili RI-370 CNC gear grinder, 15" maximum pitch diameter, 20" length, spur and helical grinding, with automatic synchronization, and in-process lead and profile inspection, uses either aluminum oxide or CBN grinding wheels (1998)
- Höfler Promat 200 CNC spur gear grinder, 7.5" maximum pitch diameter, 6" grinding length, automatic stock dividing (1996)
- (3) Gear and spline lappers

**GEAR HOBBING**

- Pfauter P320 CNC hobber, 12" maximum pitch diameter, 18" length, 3 DP maximum, for spur and helical gears and splines, with crowning and taper hobbing (1997)
- Jeil JDP-2 hobber, 20" maximum pitch diameter
- Barber-Colman 14-15 hobber, 14" maximum pitch diameter, 15" length
- Barber-Colman 16-36 multi-cycle hobber, 16" maximum pitch diameter, 36" length, with differential
- (2) Barber-Colman 6-10 hobber, 6" maximum pitch diameter, 10" length
- Mikron 102 fine pitch hobber, 2" maximum diameter, 3" length

## BEVEL GEAR EQUIPMENT

- Gleason Phoenix 400G CNC hypoid gear grinder, work diameter to 16", for grinding hypoid or spiral bevel gears (1997)
- (2) Gleason Phoenix 200HG CNC hypoid gear grinder, work diameter to 12", for grinding hypoid or spiral bevel gears (1995, 1996)
- Gleason Phoenix 250HC hypoid cutting machine, work diameter up to 18", for grinding hypoid or spiral bevel gears (1996)
- (2) Gleason Phoenix 175HC hypoid cutting machine, work diameter up to 12", for generating hypoid or spiral bevel gears (1995)
- Gleason #439 (#104) straight bevel generator (1990)
- (2) Gleason #429 (#14) straight bevel generator
- (2) Gleason #12 straight bevel generator
- Gleason #523 bevel gear tester
- Gleason #14 bevel gear tester (reconditioned 2006)
- (7) Gleason #13 bevel gear tester
- (5) Gleason #6 bevel gear tester
- (3) Gleason #15 blank checker, with digital readouts
- Gleason #572 creep feed cutter sharpener
- (2) Gleason #12 cutter blade sharpener
- Gleason #528 cutter truing device

## BROACHING

- Lapointe V1 vertical broach, 5 ton, 42" stroke
- Colonial HAS 15-60 horizontal broach, 15 ton, 60" stroke

## GRINDING

- (2) Studer S33 CNC ID/OD grinder, 13.5" maximum diameter, 40" length (2008)
- (3) Okuma GA-34N CNC OD grinder, 15" maximum diameter, (2) 22" and (1) 34" length, equipped with Marposs gaging
- Okuma GU-34S CNC grinder, OD and ID spindles, 12" maximum diameter, 18" length, with in-process gaging (1992)
- (3) Okuma GI-20N CNC ID grinder, 10" ID, 18" swing (1990, 1995, 1997)
- Landis 1R Microtronic OD grinder, 10" maximum diameter, 20" length, equipped with Marposs gaging
- Reid surface grinder, 6" x 12" magnetic chuck
- (2) Brown & Sharpe 618 MM Micromaster surface grinder, 6" x 18" magnetic chuck
- Brown & Sharpe 1224 MM surface grinder, 12" x 24" magnetic chuck
- Covell surface grinder, 6" x 12" magnetic chuck
- Heald 273A ID grinder, 20" maximum diameter
- Arter D16 rotary surface grinder, 17" maximum diameter
- Heald #22 rotary surface grinder, 15" maximum diameter
- (3) Taft-Pierce rotary surface grinder, 6" maximum diameter
- Moore G18 jig grinder, various grinding spindles, additional 6" rise
- Norton CTU OD grinder, 6" x 18" capacity
- Technica center grinder
- (2) Excello 74 center lapper
- Sunnen MBB1650 hone
- (5) Crane Lapmaster 15" lapping machine
- Brown & Sharpe #1 universal ID/OD grinder

## MILLING

- (2) Haas VF-3B 5-axis vertical mill (2007)
- Hass VF-2 4-axis vertical mill (2007)
- (2) Okuma MX-60HB 4-axis CNC horizontal machining center, OSP 7000M control, 40" x 32" x 32" capacity, machine is equipped to operate from a pool of six 24" pallets and has a 150 tool capacity tool changer making it particularly suited for the production of complex gear cases (1998, 2000)
- Okuma MC-V3016 CNC 4-axis vertical machining center, OSP7000 control, 36" x 18" x 18" capacity (2003)
- (2) Okuma MX-45VAE CNC 4-axis vertical machining center, OSP7000 control, 30" x 18" x 18" capacity (1998)
- Okuma/Howa Millac 5VA CNC 4-axis vertical machining center, 19" x 40" x 19" capacity
- (12) Bridgeport vertical mill, with digital read-out

## TURNING

- Haas SL-20TB lathe (2007)
- Haas SL-30 lathe (2007)
- Hardinge Quest 10/65 SP hard turning lathe, super-precision, with hydrostatic guideways, tailstock (2005)
- (3) Hitachi Seiki HT 23SIII Hitec-turn lathe, with quick change tooling, 2.5" bar feed (1996, 1997)
- (2) Hitachi Seiki HT 25G Hitec-turn lathe, with quick change tooling (1998)
- (5) Okuma LC-30 4 axis (dual turret) CNC lathe
- Okuma L470BB/650 turning center (2008)
- Okuma LU400SB-25C/650 4-axis turning center (2008)
- Monarch 612 engine lathe, 16" x 30"
- (2) Webb engine lathe, 17/25" x 40"
- Pratt & Whitney engine lathe, 16 x 42"
- Monarch 10EE engine lathe, 12" x 20"
- (2) Takisawa engine lathe, 12" x 36"

## HEAT TREATING

- Dow internal quench carburizing furnace, 24" x 22" x 36", with recorder
- (2) Lindberg box furnace, 24" x 24" x 36", controlled atmosphere, with recorder
- Pacific Scientific box furnace, controlled atmosphere, with recorder
- (2) Despatch oven, with recorder, 500°
- Lindberg endothermic gas generator, 1000 cubic feet per hour
- (2) Harris freezer, 20 cubic feet, with recorder, to -80°C (1998, 2001)
- Fully equipped metallurgical lab

## FULLY EQUIPPED GEARBOX ASSEMBLY FACILITY

### OTHER EQUIPMENT

- Shot Peening Equipment (2006)
- SWECO FMD-1LR finishing mill, 1 ft<sup>3</sup> capacity (2007)
- Rosler R 320 rotary vibrator, 10 ft<sup>3</sup> capacity (2006)
- Roto-Finish vibratory finisher, 10 ft<sup>3</sup> capacity
- Schenck AB10/CAB70H dynamic balancer, horizontal, .16 to 16 gram inches, part weight from 2 to 130 pounds (2004)
- Schenck VE3L/CAB700V dynamic balancer, vertical, .0008 to .8 gram inches, maximum 5.5 pounds per plane (2005)
- Magna-flux magnetic particle inspection machine and Magna-flux demagnetizer
- Ingersoll EDM, 23" x 42" tank, equipped with ERM 120 amp power supply
- Fellows 6S helical cutter sharpener
- SIP Hydroptic jig bore, type HY-B; 29" x 40" working area
- Black Diamond drill grinder
- Pressure Blast vapor blast unit (1996)
- CMV abrasive blast unit (1997)
- Marvel Series 9 power hacksaw, 10" x 10" capacity
- DoAll 16-3 vertical bandsaw, 16" throat
- Mark V dot peen marking machine (1994)
- (7) Aqueous part cleaning systems, various manufacturers (1997, 1998, 2004, 2005, 2007)
- Greive oven, 36" x 36" x 36", 350°
- Blue M oven, 25" x 38" x 20", 650°
- (2) Fork trucks, 5,000 pound capacity