

**INSPECTION EQUIPMENT**

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

**GEAR SHAPING**

- (1) Fellows 20-8 6-axis CNC shaper, 20" maximum pitch diameter, 23" vertical clearance, 8" stroke, with tailstock
- (1) Fellows 20-4 shaper, 20" maximum pitch diameter, 23" vertical clearance, 4" stroke
- (2) Fellows 10-4 4-axis CNC shaper, 10" maximum pitch diameter, 10" vertical clearance, 4" stroke
- (1) 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
- (3) Fellows FS180 5-axis CNC shaper, 7" maximum pitch diameter, 10" vertical clearance, 1.25" stroke
- (1) Fellows 7125A shaper, 7" maximum pitch diameter, 5" vertical clearance, 2" stroke

**GEAR GRINDING**

- (1) 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
- (2) Kapp VAS 432 CNC gear grinder, 12" maximum pitch diameter, work length 25", uses CBN grinding wheels, automatic synchronization
- (1) Niles ZE 400S CNC gear grinder
- (1) 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 aluminum oxide and CBN grinding wheels
- (3) Gear and spline lappers

**GEAR HOBBING**

- (2) Barber-Colman 6-10 hobber, 6" maximum pitch diameter, 10" length
- (1) Barber-Colman 14-15 hobber, 14" maximum pitch diameter, 15" length
- (1) Barber-Colman 16-36 multi-cycle hobber, 16" maximum pitch diameter, 36" length, with differential
- (1) Jeil JDP-2 hobber, 20" maximum pitch diameter
- (1) Mikron 102 fine pitch hobber, 2" maximum diameter, 3" length
- (1) Mitsubishi GE15A CNC hobber, 7" maximum pitch diameter
- (1) Pfafter P320 CNC hobber, 12" maximum pitch diameter, 18" length, 3 DP maximum, for spur and helical gears and splines, with crowning and taper hobbing

**BEVEL GEAR EQUIPMENT**

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

**BROACHING**

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

**GRINDING**

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

**MILLING**

- (2) Haas VF-3B 5-axis vertical mill
- (1) Haas VF-3YT 5-axis vertical mill
- (1) Haas VF-2 4-axis vertical mill
- (1) Haas VF-2YT 4-axis vertical mill
- (2) Okuma MX-60HB 4-axis CNC horizontal machining center, OSP7000M control, 40" x 32" x 32" capacity, equipped with six 24" pallets and has a 150 tool capacity changer making it particularly suited for the production of complex gear cases
- (1) Okuma MC-V3016 CNC 4-axis vertical machining center, OSP7000 control, 36" x 18" x 18" capacity
- (2) Okuma MX-45VAE CNC 4-axis vertical machining center, OSP7000 control, 30" x 18" x 18" capacity
- (1) Okuma/Howa Millac 5VA CNC 4-axis vertical machining center, 19" x 40" x 19" capacity
- (12) Bridgeport vertical mill, digital read out

**TURNING**

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

**HEAT TREATING**

- (1) 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
- (1) Pacific Scientific box furnace, controlled atmosphere, with recorder
- (2) Despatch oven, with recorder, to 500°F
- (2) Harris freezer, 20 ft<sup>3</sup> with recorder, to -80°
- (1) Lindberg endothermic gas generator, 1000 cubic feet per hour

**FULLY EQUIPPED METALLURGICAL LAB**
**FULLY EQUIPPED GEARBOX ASSEMBLY FACILITY**
**FULLY EQUIPPED GEARBOX TEST FACILITY**
**OTHER EQUIPMENT**

- (1) Almco 2SF-48BRA spindle finishing machine
- (7) Aqueous part cleaning systems
- (1) Black Diamond drill grinder
- (1) Blue M oven, 25" x 38" x 20", 650°
- (1) Caterpillar F35 fork truck
- (1) Clark ECS 25 fork truck
- (1) CMV abrasive blast unit
- (1) DoAll 16-3 vertical bandsaw, 16" throat
- (1) Fellows 6S helical cutter sharpener
- (1) Greive oven, 36" x 36" x 36", 350°
- (1) Grove SM2633BE man lift
- (1) Ingersoll EDM, 23" x 42" tank, equipped with ERM 120 amp power supply
- (1) JLG 20DVL man lift
- (1) Magna-flux magnetic particle inspection machine and Magna-flux demagnetizer
- (1) Mark V dot peen marking machine
- (1) Marvel Series 9 power hacksaw, 10" x 10" capacity
- (1) Pressure Blast vapor blast unit
- (1) Rosler R 320 rotary vibrator, 10 ft<sup>3</sup> capacity
- (1) Roto-Finish vibratory finisher, 10 ft<sup>3</sup> capacity
- (1) Schenck AB10/CAB70H dynamic balancer, horizontal, .16 to 16 gram inches, 2 to 130 lb part weight
- (1) Schenck VE3L/CAB700V dynamic balancer, vertical, .0008 to .8 gram inches, maximum 5.5 lb per plane
- (2) Shot Peening Equipment
- (1) SIP Hydroptic jig bore, type HY-B; 29" x 40" working area
- (1) Sweco FMD-1LR finishing mill, 1 ft<sup>3</sup> capacity