

# HEAT TREAT



**Carburizing and Hardening** with surface combustion pit furnaces for **Large Gear Treatment**.

Horsburgh & Scott has in-house gas carburizing, induction hardening, stress relieving and through-hardening to meet all of your gearing heat treat requirements. We also have resident metallurgical expertise for process design and process control.

## IN-HOUSE HARDENING FOR HIGH QUALITY AND RELIABILITY

### **Carburizing**

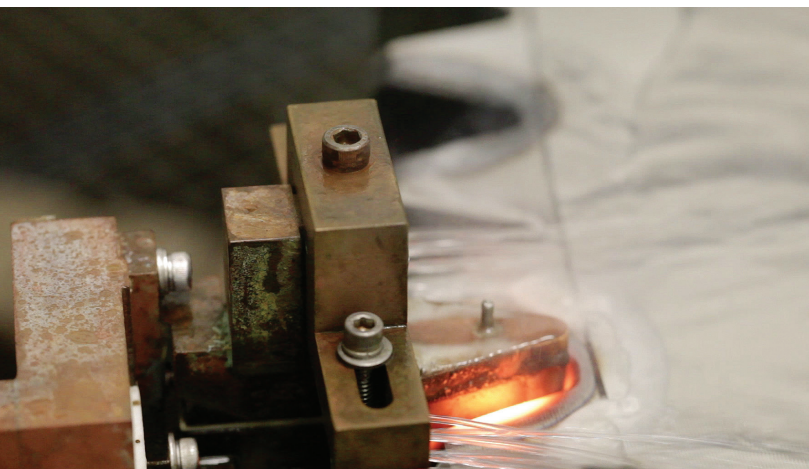
A surface heat treatment process in which iron or steel absorbs carbon when the metal is heated, with the intent of making the metal harder and stronger (3310, 4320, 4820, 8620, 18CrNiMo7, and more)

### **Induction Hardening**

A form of surface heat treatment in which a metal part is heated by induction heating and then quenched.

### **Through Hardening**

Carbon and alloy steels (1045, 4130, 4140, 4330v, 4340, and more) that are hardened to ranges between 200-400 BHN



**Induction Hardening** for stronger gears that stand up to high stress usage, increasing **Gear Life and Productivity**.



## INDUCTION HARDENING

- CNC gear induction hardening machine
- Gears to 5.0m diameter x 0.75m face
- Shafts to 3.0m length x 1.25m face
- Optimized for gear pitches of 3.0DP to 0.75DP
- Nondestructive ultrasonic case depth testing

## CARBURIZING AND HARDENING

- Newly installed pit carburizing furnaces
  - 1 pit 2.0m diameter x 2.5m depth
  - 1 pit 2.5m diameter x 2.0m depth
- Other pit carburizing furnaces
  - 2 pits 1.0m diameter x 1.5m depth
  - 2 pits 2.0m diameter x 4.5m depth



## DEDICATED HEAT TREAT FACILITY

- Stand-alone 35,000 sq. ft. facility
- Captive and commercial carburizing and hardening
- Captive induction and commercial hardening
- Experienced metallurgical engineering staff
- Gears and shafts processed from 100 to 50,000 lbs.

## OTHER HEAT TREAT EQUIPMENT

- Stress relieving (up to 100,000 lbs.)
  - 6.0m x 6.0m x 4.0m
  - 5.0m x 5.0m x 4.0m
  - 2.0m x 4.0m x 2.0m
- EquoTip, Knoop, King, Rockwell, Micro and BHN hardness testers
- Complete metallurgical laboratory

# 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 Hobbing Time.**



**HORSBURGH & SCOTT**  
DELIVERING THE DIFFERENCE

**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 GEARING FOR OVER 130 YEARS**

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



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