



UniCase Master®

Precision Case Hardening for High-Volume Manufacturers
4D Quenching®

■ **Designated for automotive, transmission and bearing industry**

■ **Case hardening by low pressure carburizing and high pressure gas quenching**

■ **High Production Efficiency**

- Lean Manufacturing Compatible
- Throughput up to 1 million gears per year
- Footprint 5 M x 5 M (16.5 FT x 16.5 FT)

■ **Outstanding Quality**

- Ideal repeatability of case hardening results for every single piece
- 4D Quenching® for minimal distortion
- Single-piece monitoring and reporting

■ **Benefits and Savings**

- Minimize final machining costs
- Eliminate batch material handling logistics
- Eliminate fixturing costs and energy consumption
- Eliminate oils, chemicals and washer systems
- Eliminate fire and explosion hazards
- Flexible production, on demand start-up and shut down
- Fully automated, continuous operation
- Clean, environmentally friendly technology
- Apply cutting edge LPC and HPGQ technologies

Precision Case Hardening for High-Volume Manufacturers

Technical Data

General:

- Working zone (Φ x H) 200 x 50 mm / 8" x 2"
- Max load weight 3,0 kg / 6.6 lbs
- Number of positions (per process chamber) 15 for gear dia. 200 mm / 8"
30 for gear dia. 100 mm / 4"
- Tact time 30 s

Heating:

- Operating temperature 1100°C/2012°F
- Temperature uniformity ±1°C/2°F
- Heating power 96 kW
- Heating zones 9

Quenching:

- 4D Quenching® pressure 20 bar Nitrogen
- Nitrogen recycling system 360 m³/h / 212 cfm

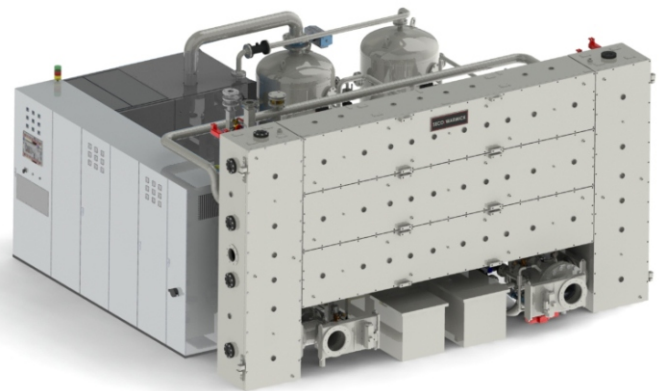
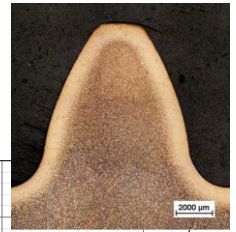
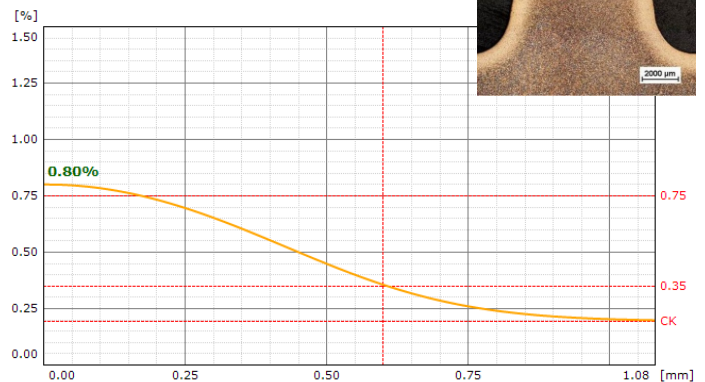
Vacuum:

- Operational vacuum 10·10⁻² mbar
- Leakage 10⁻³ mbar·l/s
- Mechanical pump 2x 300 m³/h / 180 cfm
- Root pump 2x 1000 m³/h / 600 cfm

Utility:

- Electrical power 150 kW
- Cooling water 12 m³/h, 7 cfm, 2 bar
- Acetylene 15 l/min / 4 gpm
- Nitrogen 30 l/min / 8 gpm
- Footprint 5 x 5 M / 16.5 x 16.5 FT
- High 3 M / 10 FT

Case carbon profile

**SECO/WARWICK Group**

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