



SECO/WARWICK GROUP
a leading global manufacturer
of heat treatment furnaces and equipment

SECO/WARWICK is a technological leader in innovative heat treatment furnaces. Expertise includes end-to-end solutions in 5 categories: vacuum heat treatment, atmosphere, and aluminum thermal processing, controlled atmosphere brazing of aluminum heat exchangers and vacuum metallurgy. SECO/WARWICK Group with 9 companies located on three continents with customers in nearly 70 countries, has its production facilities in Poland and China. In addition, the Group includes a number of service and sales offices in such countries as Germany or Russia. The company provides standard or customized state-of-the-art heat processing equipment and technologies to leading companies involved in the following industries: automotive, aerospace, electronics, tooling, medical, recycling, energy including nuclear, wind, oil, gas, and solar and production of steel, titanium, and aluminum.

UNICASE MASTER®

Single - Piece Flow Case Hardening

SECO/WARWICK

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distortion under control
safe and clean
environmentally friendly
industry 4.0
automation & integration
in-line manufacturing
single-piece flow
single part traceability, monitoring, inspection



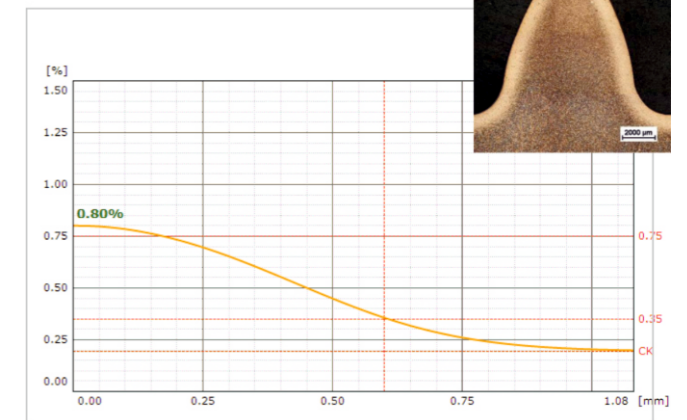
**UNICASE
MASTER®**



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CASE CARBON PROFILE



UNICASE MASTER®

Destinated for aerospace, automotive, transmission and bearing industry

Case hardening by low pressure carburizing (LPC) and high pressure gas quenching (HPGQ)

HIGH PRODUCTION EFFICIENCY

- Lean Manufacturing Compatible
- Compact and economical solution
- Throughput up to 1 million gears per year

OUTSTANDING QUALITY

- Precision and ideal repeatability of case hardening results for every single piece
- 4D Quenching for minimal distortion
- Single-piece monitoring reporting and inspection

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, ondemand start-up and shutdown
- Fully automated, continuous operation
- Clean, environmentally friendly technology
- Apply cutting edge LPCand HPGQ technologies
- System flexibility and adaptability

GENERAL:

- Working zone (OxH) 200x50mm/8"x2"
- Max load weight 4.0kg/9.0lbs
- Number of positions 15 (per process chamber)
- Tact time 30s

HEATING:

- Operating temperature 1100°C/2012°F
- Heating power 96kW
- Heating zones 9

4D QUENCHING:

- Pressure 10 bar Nitrogen
- Gas flow pattern 3D+rotation

VACUUM:

- Operational vacuum 10-10⁻² mbar
- Leakage 10⁻³ mbar*/l/s
- Mechanical pump 2x200m³/h/118cfm
- Root pump 2x1000m³/h/600cfm

UTILITY:

- Electrical power 150kW
- Cooling water 6m³/h, 26gpm, 2bar
- Acetylene 151/min/9cfm
- Nitrogen 10 bar
- Footprint 5,5x5,5m/18x18ft
- High 3,2m/10,5ft

