ACCELERATING THE ENERGY TRANSITION

ALD Heat Treatment Services (HTS): - Automotive • Powertrain • Systems

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CORPORATE STRUCTURE - AMG BUSINESS SEGMENTS

AMG is a global critical materials company that produces highly engineered specialty materials and provides vacuum furnace systems and services to the transportation, infrastructure, energy and specialty metals & chemicals end markets.

AMG LITHIUM

- AMG's Lithium segment spans the lithium value chain, reducing the CO_2 footprint of both suppliers and customers.
- Composition:
  - AMG Brazil
  - AMG Lithium GmbH
  - AMG Lithium Portugal
  - Zinnwald Lithium PLC

AMG VANADIUM

- AMG Vanadium is the world's market leader in recycling vanadium from oil refining residues.
- Composition:
  - AMG Vanadium AMG
  - Titanium
  - AMG Chrome
  - Shell AMG BV

AMG TECHNOLOGIES

- AMG Technologies is the established world market leader in advanced metallurgy and provides equipment, engineering and services globally.
- Composition:
  - ALD
  - LIVA
  - AMG Silicon
  - AMG Graphite
  - AMG Antimony

- Approx. 3,600 employees
- Founded 2006, IPO July 2007
- Euronext listed

FY 2025	
Revenue	$ 1.77 Billion

CORPORATE STRUCTURE - AMG ENGINEERING - HEAT TREATMENT SERVICES

Key Facts

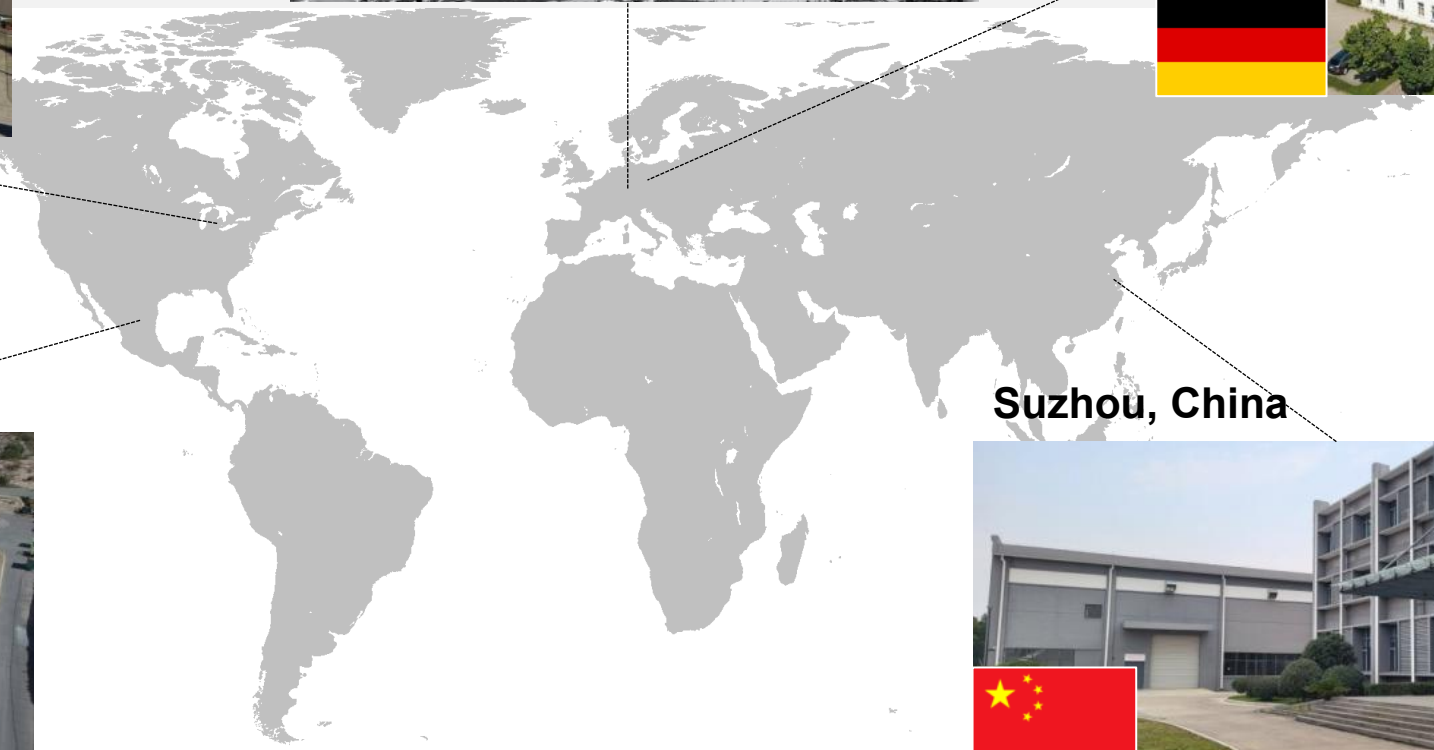
- Over 100 years of experience in vacuum metallurgy and heat treatment
- Engineering facilities in Germany, France, USA, China and India
- Four Heat Treatment Service (HTS) centers in Germany, the U.S., Mexico and China
- Approximately 950 employees

GLOBAL HTS FOOTPRINT

Port Huron MI, US

ALD Headquarters
Hanau, Germany

Limbach-Oberfrohna, Germany



Ramos Arizpe, Mexico

Suzhou, China

ALD VACUHEAT GmbH
LIMBACH-OBERFROHNA, GERMANY

Established 1999/2000

Technologies/Services:

- LPC & HPGQ (ModulTherm®, VZKQ)
- Tempering
- Brazing
- Annealing
- De-Oiling

Capacity:

- 3 ModulTherm® systems with 14 treatment chambers
- 3 Dual chamber furnaces
- Various other pre & post processing facilities

Production Record:

>250 Million Injection Components

- (approx. 60 Million Cars)
- 0 Field ppm since 2000 SOP

Equipment

ModulTherm-4 System with individual Vacuum pump sets

De-Oiling Furnace (for PM Parts)

ALD THERMAL TREATMENT, INC.
PORT HURON, MI USA

Established 2006

Technologies/Services:

- LPC & HPGQ (ModulTherm®)
- Washing / Pre-Oxidation / Tempering
- Gas Nitriding / Ferritic Nitro Carburizing (FNC),
- Abrasive After Treatment (Shot Peen/Blast)
- In line Cryogenics

Capacity:

- **4** ModulTherm® Systems with **24** treatment chambers
- **2** VZKQ Dual chamber furnaces & **2** Nitriding furnaces
- Various other pre & post processing capabilities
- **2** digital gear dimensional checkers

Production Record:

>12 Million Automatic Transmissions

- Components for up to ~5,500 Transmissions/Day (60-70 Tons/Day)
- Zero Field ppm since 2006 SOP

Equipment

ModulTherm-4 Furnace System

Metallurgical Lab

Hardness testers and M&M Machine | Spectrometer and microhardness testers

ALD TRATAMIENTOS TERMICOS S.A. DE C.V.
RAMOS ARIZPE, MEXICO

Established 2008

Technologies/Services:

- Low Pressure Carburized & HPGQ (ModulTherm®)
- Washing / Pre-Oxidation / Tempering
- Gas Nitriding / Ferritic Nitro Carburizing (FNC), Post Oxidation
- Abrasive After Treatment (Shot Peen/Blast)
- Annealing
- T5 for Aluminum

Capacity:

- **3** ModulTherm® Systems with **17** Treatment Chambers
- **1** VZKQ Dual Chamber & **2** Nitriding furnaces
- Various other Pre & Post Processing Facilities
- **1** digital gear dimensional checkers
- Extensive Equipment Service Capabilities

Production Record:

>9 Million Automatic Transmissions

- Components for up to ~3,500 Transmissions/Day (45-55 Tons/Day)
- Zero Field ppm since 2008 SOP

Process Equipment

ModulTherm-17 Furnace System

2 Nitriding Furnaces
(Payload 2.5 tons)

Abrasive Post Process

ALD TRATAMIENTOS TERMICOS S.A. DE C.V.
RAMOS ARIZPE, MEXICO

Metallurgical Lab Equipment

Established 2008

Services:

- Full Metallurgical Sample Preparation (Cutting, Grinding, Polishing, Etching)
- Surface/Core Hardness Testing (HRC, HRA, HR45N, HR30N, HR15N)
- Micro Hardness Vickers (100 gr up to 30Kg Load)
- Microstructural Evaluation
- Chemical Analysis
- Dimensional Analysis Pre/Post Heat Treat

Capacity:

- 3 cutting machine
- 3 mounting metallographic samples
- 4 Polishing/Griding machines
- 3 Hardness Testers
- 1 MicroHardness Tester
- 1 Microscope
- 1 Spectrometer for chemical analysis
- 1 Dimensional Gear Analyzer








ALD THERMAL TREATMENT (SUZHOU) CO., LTD SUZHOU CHINA

Equipment available in phase 1 :

- **1 ModulTherm®** system with **6** treatment chambers
- 7 Temper furnaces
- 2 Industrial washer
- 3 Pre-oxidation furnaces
- Cryogenic units (upon request)
- Metallography and related equipment

As expert in vacuum heat treatment, we offer:

- Low Pressure Carburizing (LPC)
- High Pressure Gas Quenching (HPGQ) with N_2 / He
- Vacuum Processing
  - Neutral hardening, brazing, annealing
- Pre-cleaning
- Tempering
- Cryogenics (upon request)
- Rust protection after treatment
- Metallurigical analysis
- Heat treatment consultancy
- Certified quality management

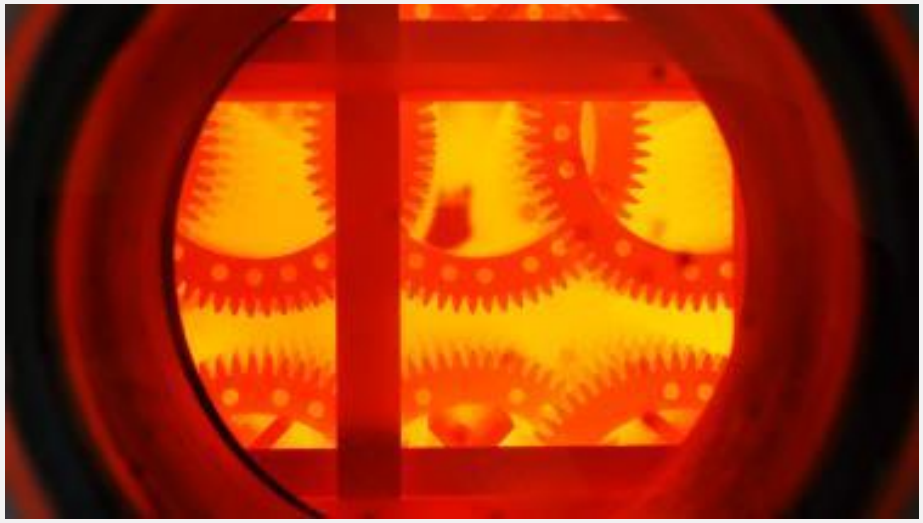
Equipment

ModulTherm-6 Furnace System

Wujiang Economic and Technological Development Zone

WHY CHOOSE ALD?

- World Leader in LPC/HPGQ with over 50 Years of Operational Experience
  >1 Billion parts processed with 0 field ppm's
- Delivering Minimal and Predictable Distortion Control
- Quality Control: (GM Supplier Quality Excellence Award in many consecutive years)
- Traceability; Individual part traceability is possible (2D matrix pre-heat treat)
- On-time delivery with quick turnaround times
- Root cause analysis expertise
- Fast response for development
- Unique R&D capabilities



WHERE IS ALD'S EXPERTISE?

- Any parts requiring low & predictable distortion with superior quality control
  - Gears for automotive, aerospace, industrial, commercial vehicles and all other applications
  - Driveline systems (Joints, Cages, Tripods, Spiders)
  - Cam shafts and sliding cams
- Powder metal parts (e.g. Gears for automotive powertrain systems)
- Shafts and crankshafts
- Thin-walled parts (synchronizer rings, actuator components, bearing races, etc.)
- Parts with blind holes
- Fuel injection parts
- Anything hard to clean / parts with higher cleanliness requirements

SYSTEMS WE SUPPORT

BEV Drive Units

- Drive Gears, Ring Gears, Motor Rotor Shafts, Drive Pinions
- Production since 2022
- Launches in 2023 & 2024
- More than 600 trial loads since 2020

Hybrid Transmissions

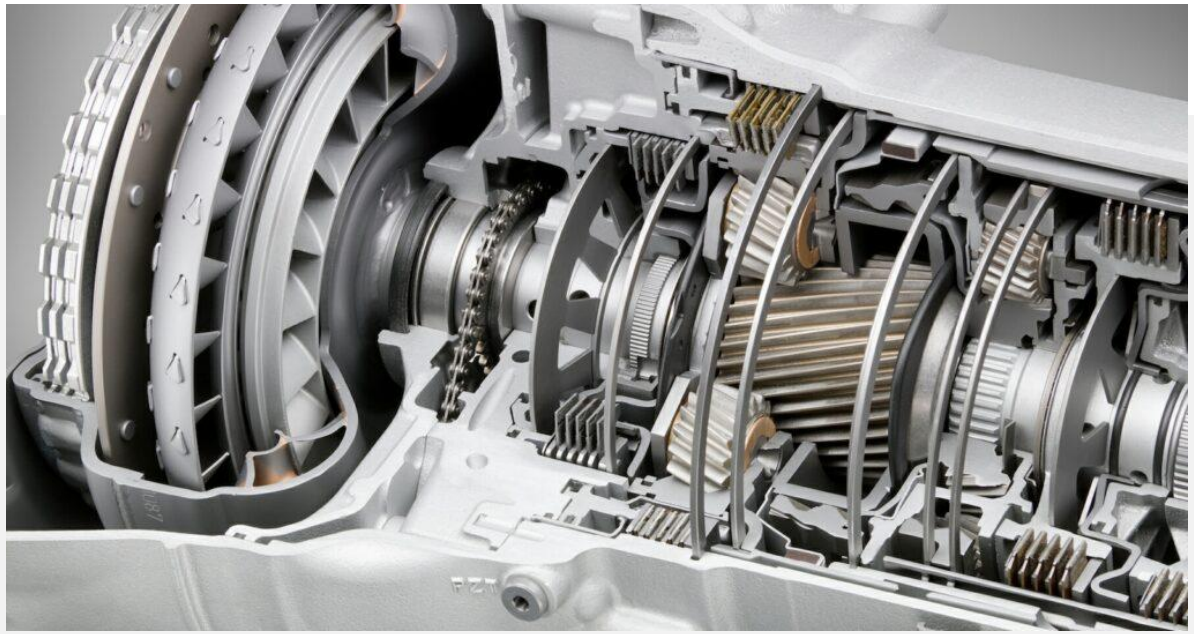
- Ring Gears
- Production since 2018

IC Engines

- Injection Components, Cam Shafts, Sliding Cams
- Production since 1999

IC Transmissions

- Internal Drive Gears, Ring Gears, Pinion Gears (All GM FWD, All components)
- Production since 2006



IC Driveline Components

- Transfer Case Shafts, Transfer Case Cam Levers
- Production since 2009

Aerospace

- Bearing races for 737 – Max wing flap systems

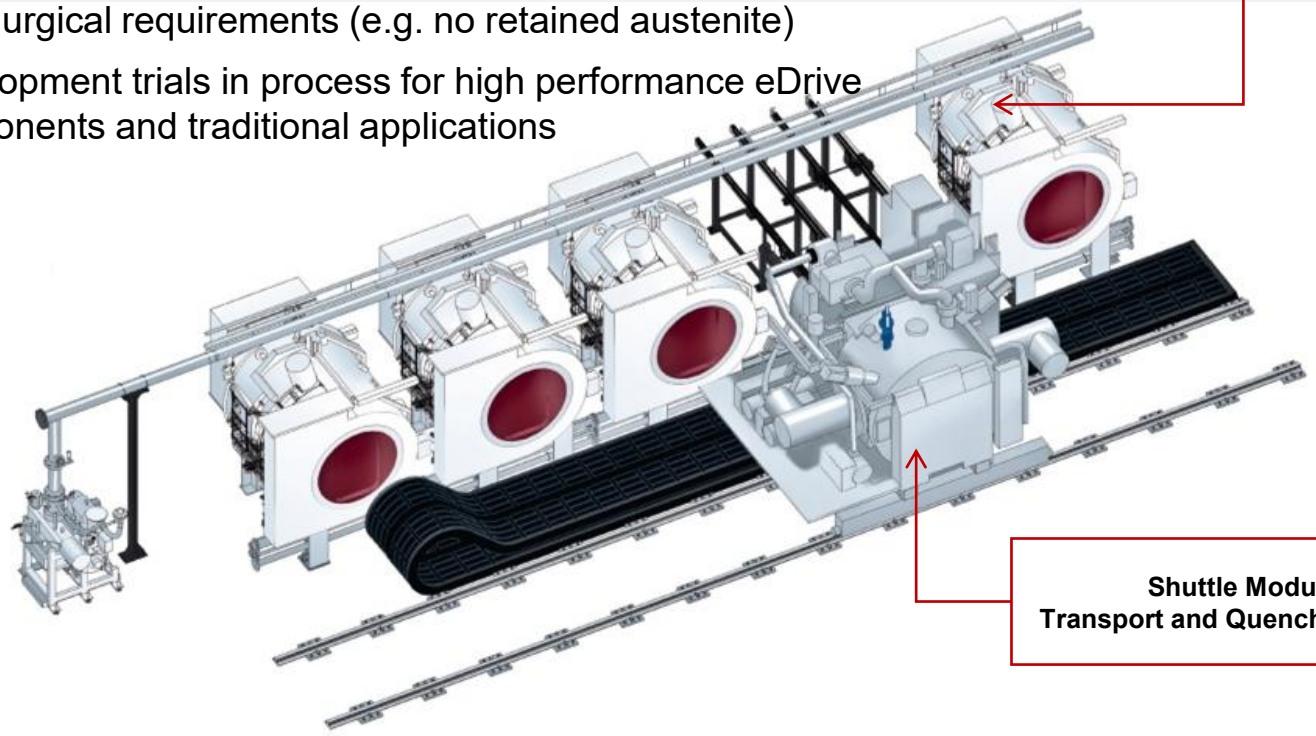
Passive Energy Creation

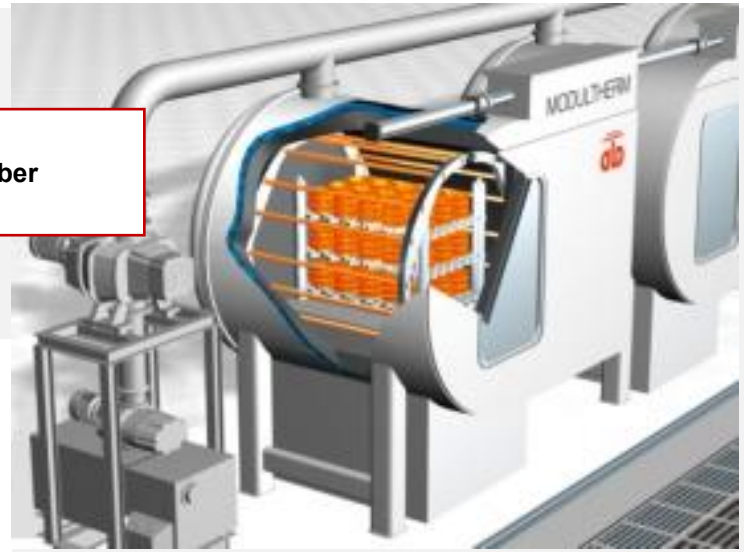
- Worm gear drives for solar panel rotation motors

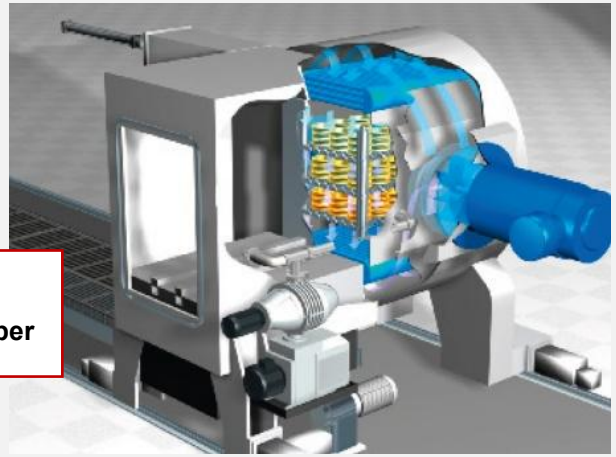
WHAT WE DO AND HOW WE DO IT

ModulTherm® (LPC & HPGQ)

- Best-in-class for superior distortion control
- Elimination / minimization of hard finishing of processed parts
- Capability for Helium or Nitrogen quench
- Cryogenic processing in place for specific metallurgical requirements (e.g. no retained austenite)
- Development trials in process for high performance eDrive components and traditional applications





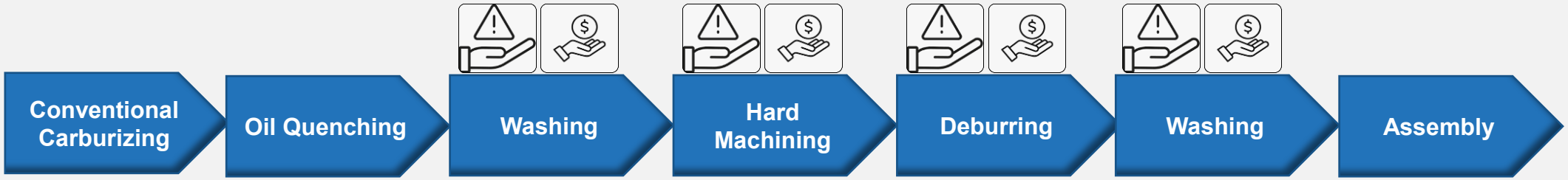


ALD MODULTHERM BIC FEATURES

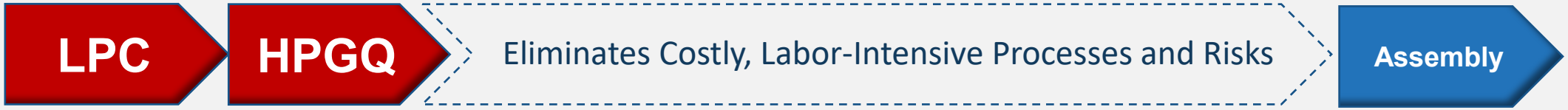
- Doors and sealing systems optimized: maximize up time, minimized maintenance downtime.
- Redundant pumps: maximize up time.
- Best-in-Class temperature homogeneity: consistent metallurgy throughout the load.
- Carburizing optimization:
  - Reduced carbon build up: less and easier maintenance.
  - Convection heating: fast heat up, less time in the chamber.
- Quenching technology:
  - Turbine blades designed for long life, high loads.
  - Simple robust gas reversing possibilities for distortion optimization.
- Simple controls, intuitive HMI.
- Simple optimized transfer mechanisms and logic: minimal temperature loss from treatment chamber to quench, minimal wait time.

ALD'S TOTAL COST ADVANTAGE

Conventional Process Chain



ALD Streamlined Process Chain



Benefits of HPGQ vs. Liquid Quench

- Reduced Distortion
- Clean Surfaces
- Better Fatigue Resistance
- Minimal Variation (load to load)
- Fewer Steps > Less Cost
- Clean Shiny Parts
- Environmentally Friendly
- Flatness & Additional Distortion Control

CERTIFICATES, AWARDS & HIGHLIGHTS

Certified to:

- IATF 16949 : 2016
- AS9100D*
- ISO 9001 : 2015
- Nadcap

Compliant to:

- CQI-9
- OHSA 18001
- ISO 27001
- ISO 14001

*Recommended for Continued Certification

GM Supplier Quality Excellence 10 years running in Port Huron, 8 years in Ramos

- Safety: On Average <1 LTA/year (>1500 days in PH, >700 days in Ramos)
- Low employee turnover in all facilities
- International Engineering Network (DE, US, MX, CN) including unique expertise in the world

CERTIFICATES, AWARDS & HIGHLIGHTS

Nadcap
Administered by PRI
ACCREDITED

ALD is capable of adhering to aerospace material specifications for multiple alloy families related to:

- Stress Relieving
- Low-Pressure Carburizing (LPC)
- Gas and Solution Nitriding
- Neutral Hardening
- Vacuum Heat Treating.

Nadcap
Administered by PRI

This certificate is granted and awarded by the authority of the Nadcap Management Council to:

ALD Thermal Treatment Inc

2656 24th Street
F rt Huron, MI 48060
United States

This certificate demonstrates conformance and recognition of accreditation for specific services, as listed in www.eAuditNet.com on the Qualified Manufacturer's List (QML), to the revision in effect at the time of the audit for:

Heat Treating

Certificate Number: 8629219606
Expiration Date: 29 February 2024
Accreditation Length: 12 Months

Jay Solomond
Executive Vice President & Chief Operating Officer

Performance Review Institute (PRI) | 161 Thorn Hill Road | Warrendale, PA 15086-7527

ENVIRONMENTAL EFFICIENCIES

The Dry Gas-Quenching Process:

- **No CO_2 emissions**
- >98 % of Helium gas used in quenching is recycled for reuse
- No disposal of waste washing water or polymer oil quench baths
- High energy efficiency due to low thermal loss
- Low noise emission

The Facility:

- Reduced electricity consumption since 2016 through equipment upgrades and Lean manufacturing
- **DTE Electric plans to reduce CO_2 emissions by 90% by 2040**
- 67% of all wastes generated or received during processing is recycled by mass
- Actively prevent stormwater pollution through run-off filtration

PROVEN PRODUCTION QUALITY

ALD VACUHEAT Limbach-Oberfrohna:

Processed > 250M high pressure fuel injection nozzles

- 0 field ppm since 2000

ALD Port Huron:

Processed > 235M parts for GM in PH @ 0 field ppm since 2006

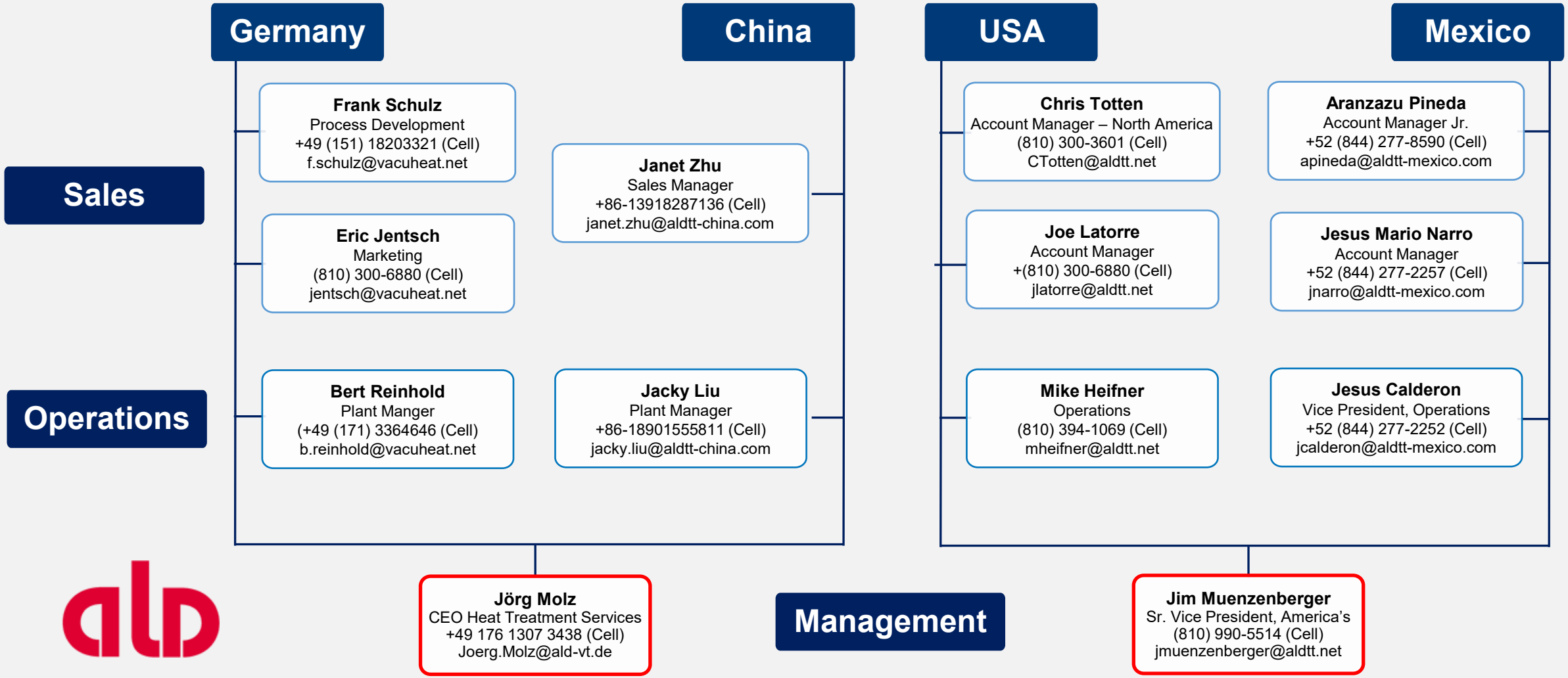
- Supported > 12M transmissions
- Processed > 180M parts for other customers in PH @ 0 field ppm since 2006

ALD Ramos:

Processed > 120M parts in Ramos @ 0 field ppm since 2008

- Supported > 8M transmissions

ALD SUPPORT TEAM CONTACTS



SAMPLE OF HEAT TREATMENT PARTS (I)

Gears

Shafts

Driveline Systems Joints

SAMPLE OF HEAT TREATMENT PARTS (II)

Driveline Systems Cages

Crankshafts

Spiders

Tripods

Sprockets

Pistons

SAMPLE OF HEAT TREATMENT PARTS (III)

Races

Couplings

Drill bits

Steering Nuts

Dies

Bearings

SAMPLE OF HEAT TREATMENT PARTS (IV)

Drive Transfer

Internal Gears

Arrow Heads

Injector bodies

Studs for Aircraft

Engine Lobes

THANK YOU


Future Mobility & Energy Transition
RELIABILITY
Proven Systems for Continuous Operation
SUSTAINABILITY
Setting Pace with global trends
AUTOMATION
System Integration & Process Monitoring
INNOVATION
New Technologies, Materials & Processes