

E-MOBILITY

THE SCHERDELGROUP

NORTH AMERICA REGION



DEUTSCHLAND:

Berlin
Chemnitz
Coburg
Erlangen
Marienberg
Marktredwitz
Plauen
Röslau
Seiffenhennersdorf
Treuen
Waldershof
Wiesau
Zwickau

weltweit in **80%** aller
PKWs und Nutzfahrzeuge vertreten



EUROPA:

Frankreich: l'Arbresle, Beauvais
Portugal: S.J. da Madeira
Russland: Kaluga
Slowakei: Myjava
Tschechien: Bor



ca. **90.000**
Tonnen Stahl werden
pro Jahr verarbeitet

AMERIKA:

Brasilien: Sorocaba
Mexiko: Silao, **San José Iturbide**
USA: Muskegon

ca. **700 Mio. €**
(Umsatz vollkonsolidiert, Stand 2021)

ASIEN:

China: Anqing, Huzhou
Japan: Nagoya
Indien: Jaipur

ca. **6.4%** vom Umsatz
wurden investiert

über **130** Jahre
SCHERDEL-Geschichte



jährlich werden ca.
6 Milliarden
Federn und Stanz-Biegeteile
produziert



12 
Länder

34 
Standorte

45 
produzierende Werke

ca. **6.500** 
Mitarbeiter weltweit

PISTON RING SPRINGS



VALVE SPRINGS



COMPRESSION, TENSION AND TORSION SPRINGS



SEAL RING SPRINGS



STAMPING AND BENDING PARTS



FINE BLANKING PARTS



WIRE AND TUBE BENDING PARTS



TORSION BARS



CONSTANT FORCE AND POWER SPRINGS



SPIRAL SPRINGS



WAVE SPRINGS



DISK SPRINGS



OUR PRODUCT RANGE

ASSEMBLY AND JOINING TECHNOLOGIES



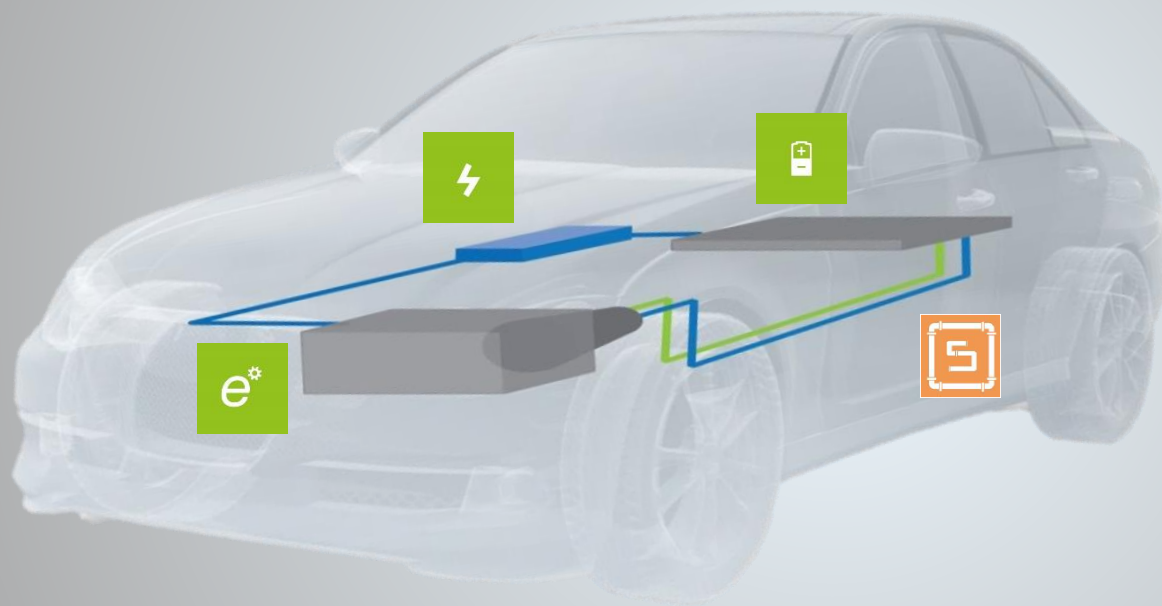
Product:

- Delta-Protekt® KL 100/120, Delta Seal Silver GZ, etc.
- Flocking
- VT600
- Technical Cleanliness

Application: Various shapes, sizes, and coating thicknesses available for protection against chemicals, oils, and corrosion.

Quality Examinations: Salt Spray Test NSS, Condensed Air Test AHT, Coating Thickness.





POWER
ELECTRONICS



ELECTRIC
DRIVES

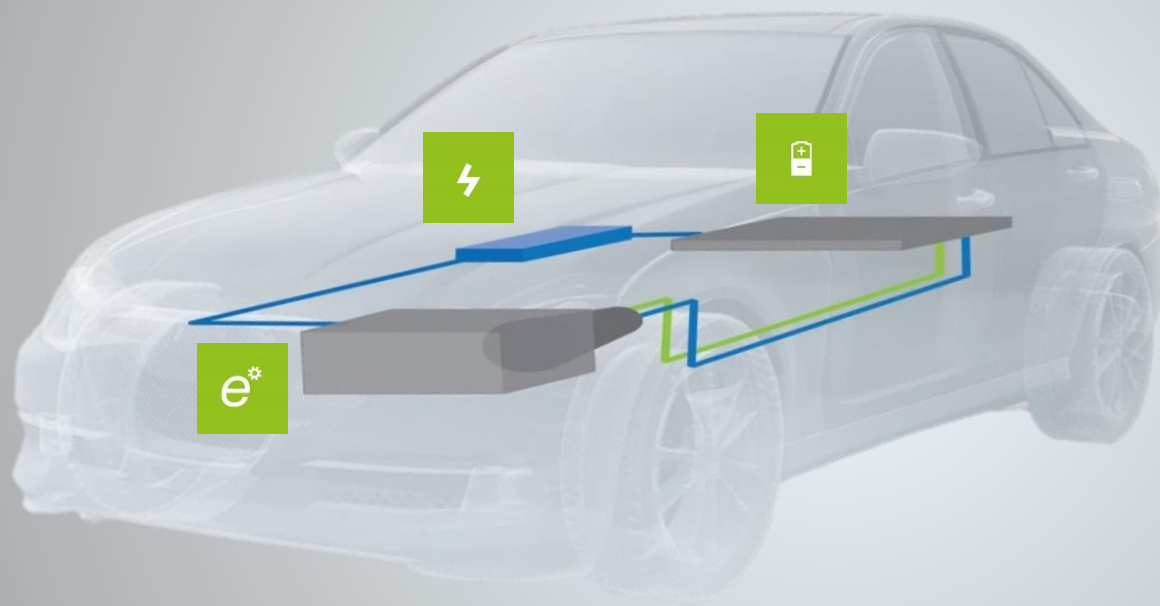


BATTERY
SYSTEMS



THERMAL
MANAGEMENT

APPLICATIONS



POWER
ELECTRONICS

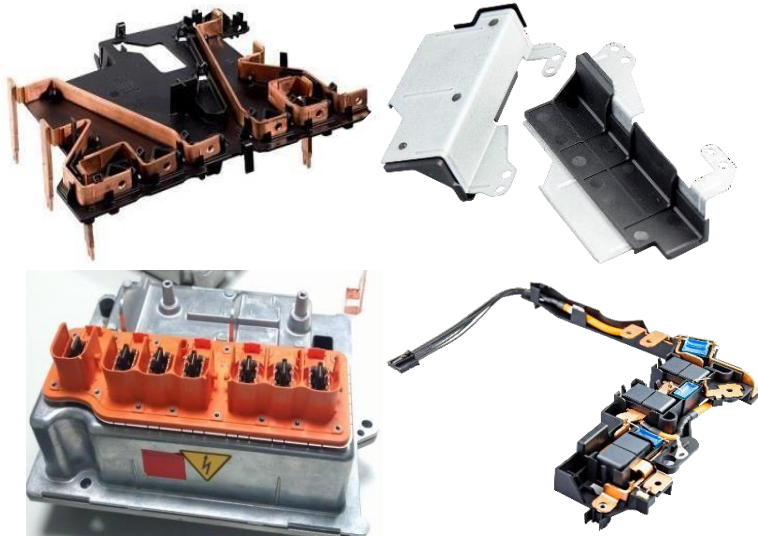


ELECTRIC
DRIVES



BATTERY
SYSTEMS

⚡ POWER ELECTRONICS



Technologies: Stamping, Bending, Coating, Cleaning, Adhesive Technology, Assemblies, Laser Welding

Material: Copper, Aluminum, Plastic, etc.

Applications: EMC filters, Intermediate circuit capacitor busbars, inverters, converters, power connectors, guided frames, overmoulded busbars

e⁺ ELECTRIC DRIVES



Technologies: Stamping, Bending, Forming, Joining, Laser Welding, Overmoulding, Glueing

Material: Copper, Aluminum, Plastic, etc.

Applications: Busbars, Connection rings for E-motors, Power Connectors, Copper Wire Forms for E – motors, Formed insulation wires with plastic overmoulding

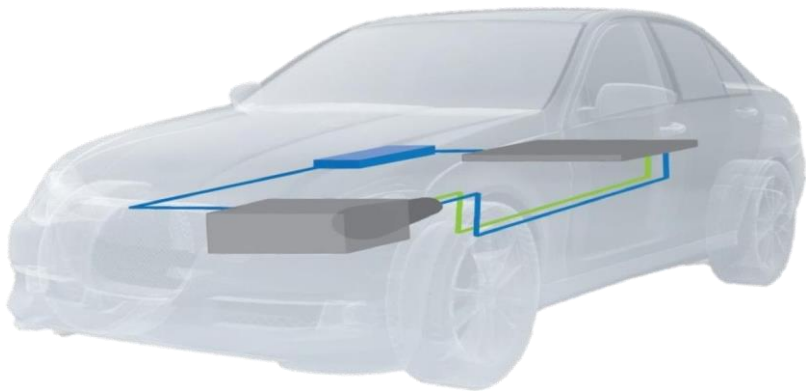
BATTERY SYSTEMS



Technologies: Stamping, Bending, Forming, Milling, Welding, Mounting, Injection Molding

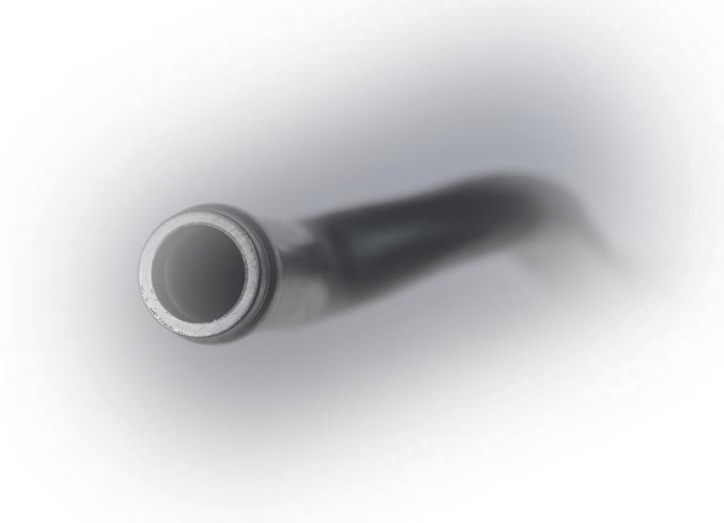
Material: Copper, Aluminum, Nickel, Plastic, Insulation, Pre-coated Busbars

Applications: Cell Connectors, Connection Units, Pack Connectors



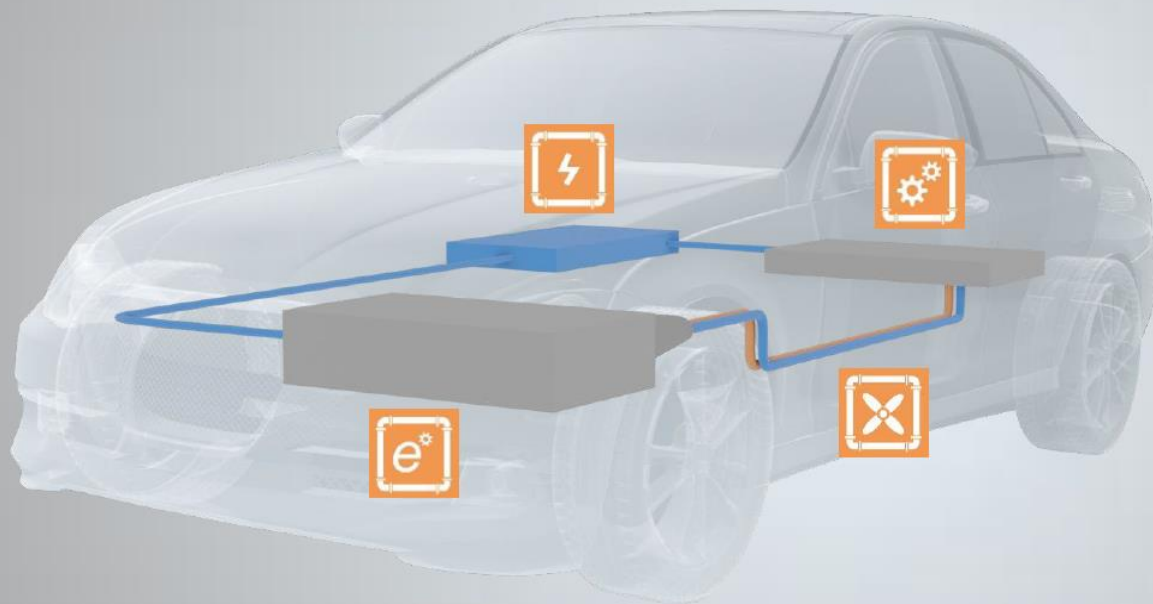
THERMAL MANAGEMENT

THE SCHERDEL GROUP





THERMOMANAGEMENT



**POWER
ELECTRONICS**



**ELECTRIC
DRIVES**



**POWER
GENERATORS
& STORAGE**



**CLIMATE- &
HEAT-PUMP-
SYSTEMS**

 THERMOMANAGEMENT

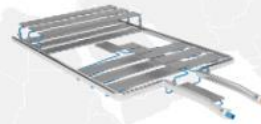
 POWER
ELECTRONICS



 ELECTRIC
DRIVES



 POWER GENERATORS/STORAGE



 CLIMATE- &
HEAT-PUMP-SYSTEMS

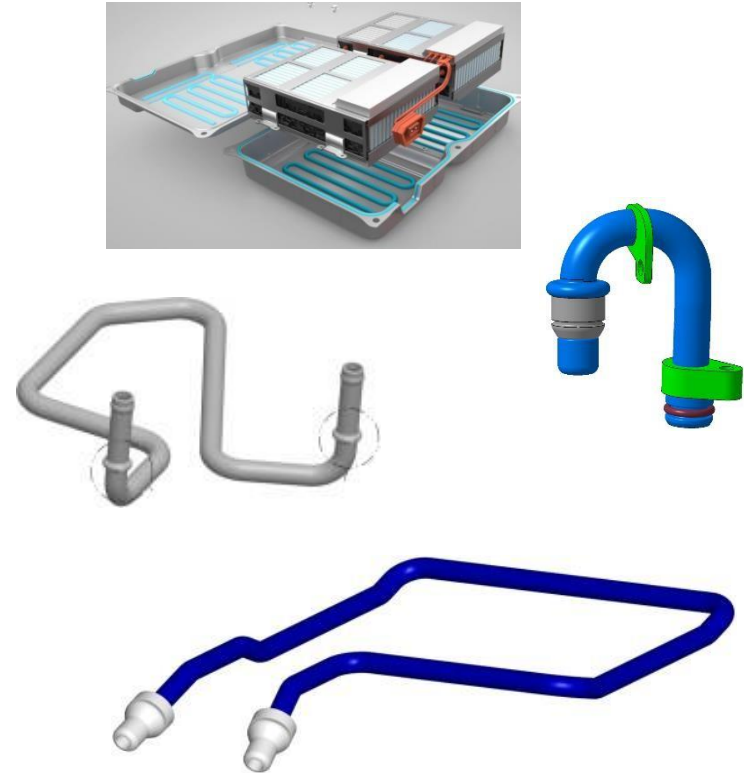


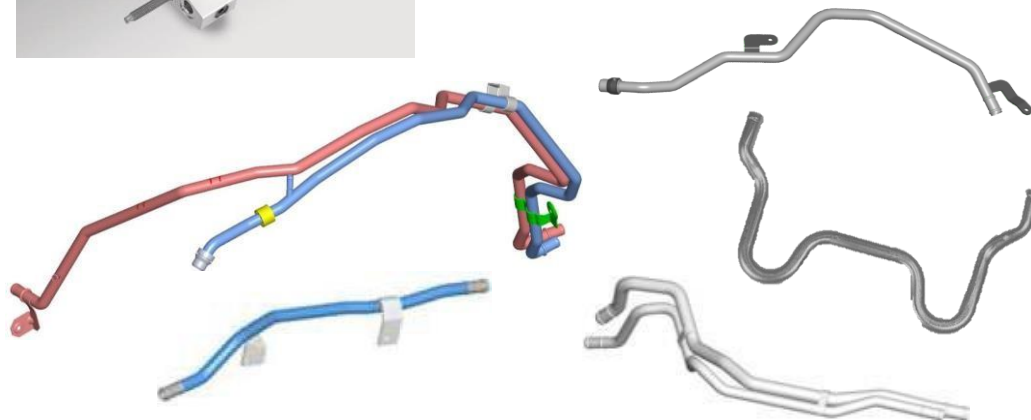
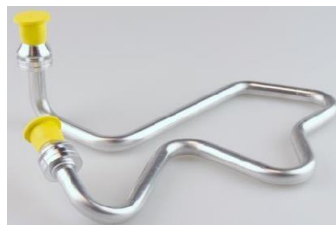
ADVANTAGES:

- ✓ Cost Reduction
- ✓ Material Saving
- ✓ Process Development Including Simulation and Calculation

THERMAL MANAGEMENT BEV, PHEV POSSIBLE APPLICATIONS

- Power electronics
- Assemblies in conventional drives
- Cooling systems in e-vehicles
- Cooling management system
- Battery cooling system
- Fuel cell





PRODUCT

Forming/Bending/Welding

Process :

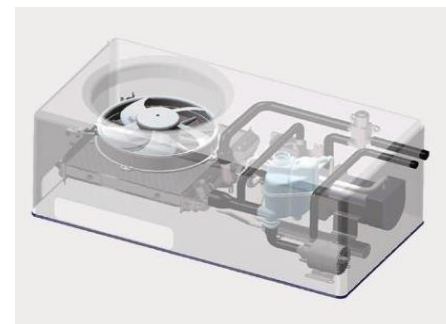
Bending technology
Forming
Clean

Material:

Aluminum
Stainless steels

Dimension:

9 mm to 25 mm



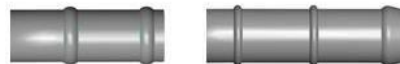


PRODUCT
Forming/Bending

Process :
Bending
Forming
Clean

Material:
Aluminum
Stainless steel
Plastic

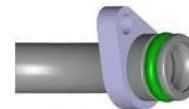
Dimension:
9 mm to 25 mm



DIN 3021- Form B&C



VDA-NW6 -16



O-Ringträger



SAE-J2044

TECHNOLOGY

DESIGN-SUPPORTING SIMULATIONS

THERMAL

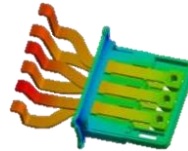
- Electrical heat generation
- Temperature distribution
- Extension

ELECTRICAL

- Inductivities of components
- Electrical fields
- Power loss
- Circuit simulation
- Simulation of damping curves

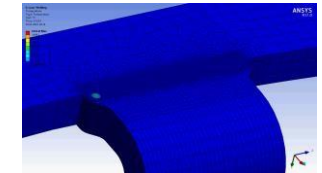
MECHANICAL

- Mechanical loads
- Mechanical oscillation
- Comprehensive material data for steel, non-ferrous-metals and plastics
- Determining of material properties
- Operational stability properties

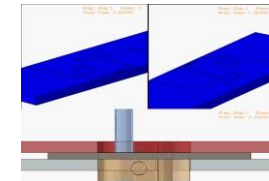


WELDING SIMULATION

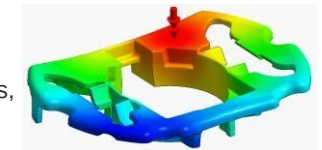
- Temperature distribution
- Welding parameters
- Warping

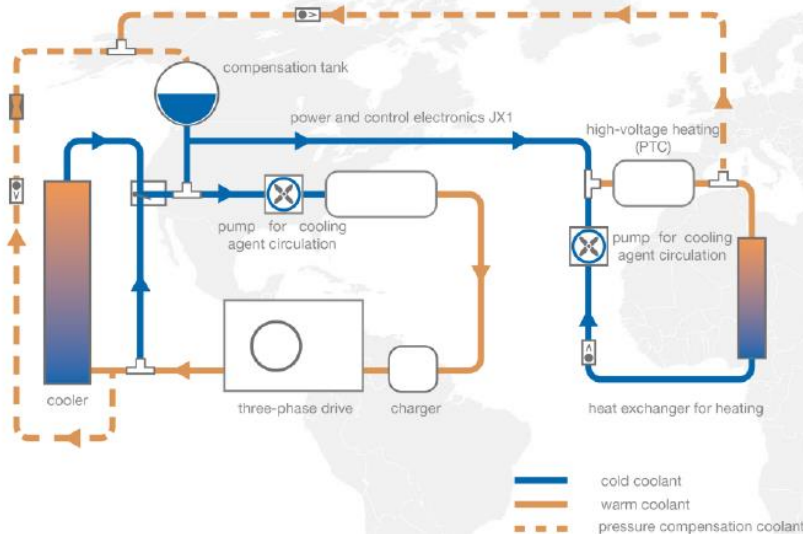


- Bending
- Deep drawing
- Stamping
- Joining



- Duroplasts and Thermoplastics
- Short- and Long-fiber reinforced materials
- Inserts
- Filling development, warping and temperatures,

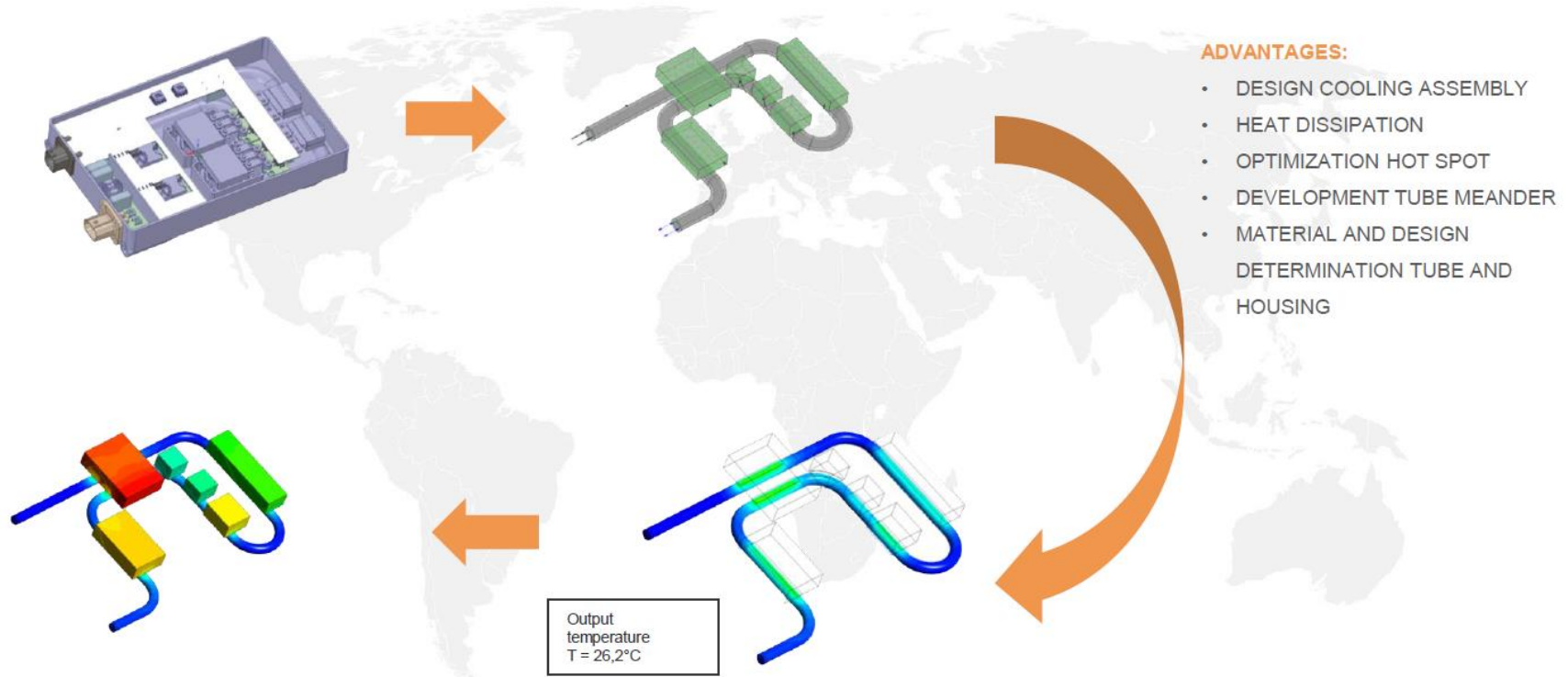


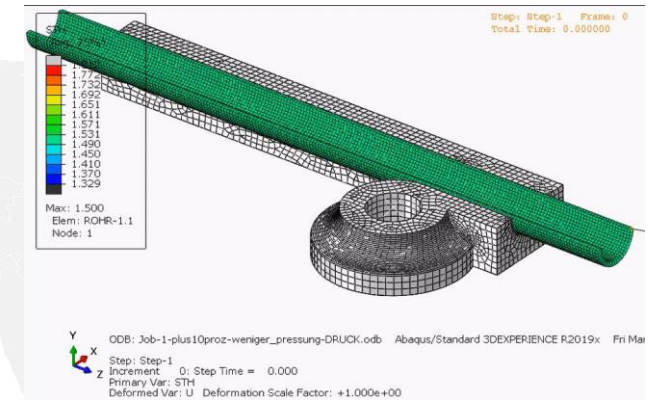
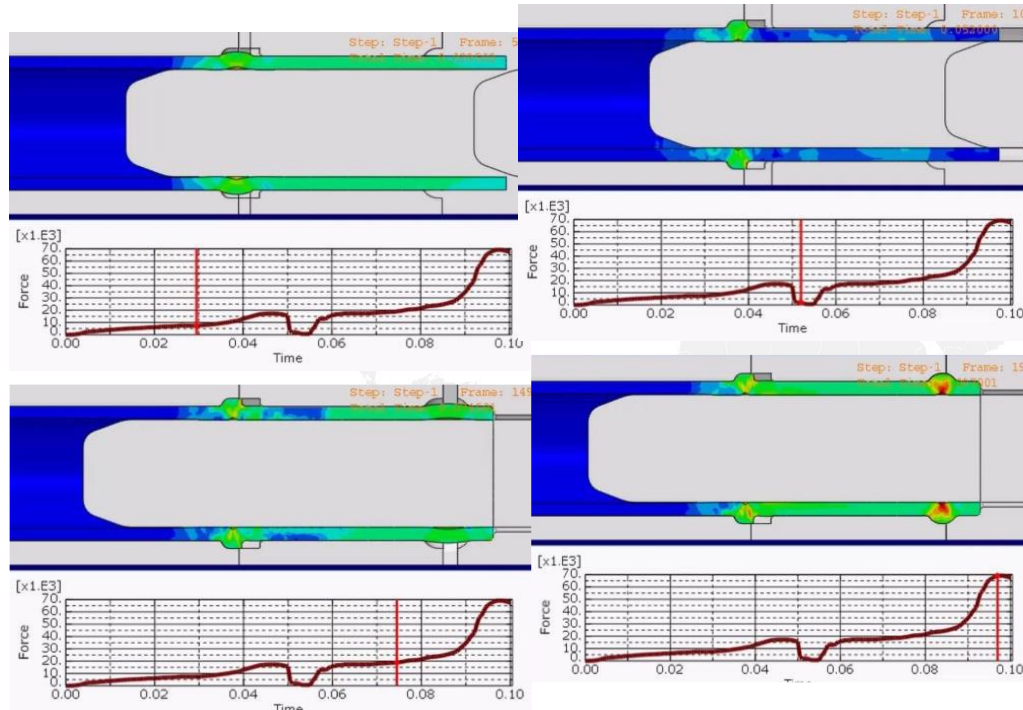


ADVANTAGES:

- DESIGN COOLING CIRCUIT
- SUPPORT IN THE FIELD OF THERMO MANAGEMENT
- VOLUME FLOW ASSESSMENT
- PRESSURE LOSS CALCULATION

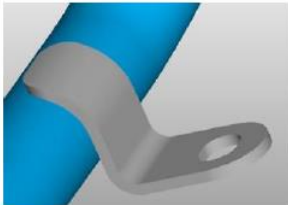
- Which power loss must be dissipated?
- How high may the pressure loss be in this subsystem?
- In which temperature range the subsystem is operated?
- How high is the volume flow in the system?





ADVANTAGES:

- ✓ Development Forming/Bending Tool
- ✓ Determination/Development material
- ✓ Development nozzle/tube design.



Solder connection



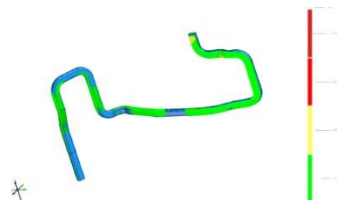
Laser welding



ADVANTAGES:

- LOW HEAT INPUT
- LOW WARPAGE CAUSED BY WELDING PROCESS
- HIGH ACCURACY (TOLERANCE SPECIFICATION)
- NO STRAIGHTENING PROCESS
- STRENGTH INCREASE AT THE CONNECTION POINT
- NO SOLDERING PROCESS REQUIRED
- NO FLOW SUBSTANCE
- NO CLEANING OF FLOW SUBSTANCES
- REDUCTION OF CORROSION DANGER
- AVOIDANCE OF LEAKAGES
- SHORTER PROCESS TIMES COMPARED WITH SOLDERING METHOD
- OPTIMIZATION OF HOLDER
- MORE SIMPLE GEOMETRY
- WEIGHT REDUCTION





MEASUREMENT TECHNOLOGY

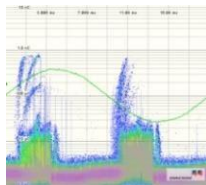
Optical

- 3D-Scan technology
- Digital measuring projectors

Tactile

- Coordinate measuring technology

Tightness



ELECTRICAL TESTING

High voltage

- AC up to 5000 VAC
- DC up to 7000 VDC
- Iso up to 1000 VDC

Resistance

- Test current up to 200 A
- Resolution up to 1 $\mu\Omega$

Partial discharge



MATERIALS TECHNOLOGY

Tests

- Tensile
- Fatigue strength
- Hardness and roughness
- Material analysis
- Coating thickness
- Surface Tension
- Tensile test Acc. To EN 6892-1 / specification OEM.
- Hot tensile test (up to 400°C) as per EN 6892-2/Specification OEM



TECHNICAL CLEANLINESS

Fluid extraction

- Injections
- Ultrasound

Standard analysis

- Photo-optical analysis
- Gravimetry

Further analysis

- Analysis size and Composition with LM, REM, EDX, Digital Microscope

SCHERDEL + SCHERDEL *WIESAUPLAST*



SCHERDEL E-MOBILITY
FOR A GREEN FUTURE.



- HQ in Germany (Markredwitz), a production site in Mexico (Silao, Guanajuato), a production site and sales office in USA, and additional round about 30 own plants worldwide.
- World leader in the area of processing of metallic wire and strip.
- Certified in accordance with ISO 9001, IATF 16494, and ISO 14001.
- Innovation and Technical Development orientated profile.
- Production technology for:
- Stamping and Bending, Technical Springs, and plastic-metal (joining technologies) components.
- Assembly and secondary operations.
- In-house Prototype and Tool Shop.

- HQ in Germany (Wiesau), a production site in Mexico (San Jose Iturbide, Guanajuato), and a sales office in USA.
- World leader in the area of sensitive PET safety parts for braking systems.
- Certified in accordance with ISO 9001, IATF 16494, and ISO 14001.
- Hi-Tech, Multi component and Insert Injection Molding.
- **Latest automation technology.**
- Assembly and secondary operations.
- In-house Tool Shop.
- **Mexico plant capabilities.**

High-quality injection molding (66 machines in the range of 25-750 tons), 5 welding devices (Bielomatik) and, 10 testing devices (Innomatec).

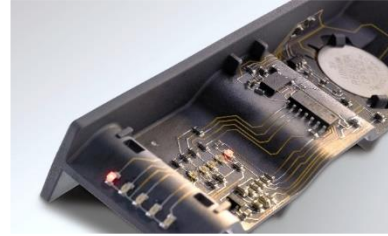
- 29 machines in the range of 40 – 400 tons
- Mold making know-how, maintenance and repair.
- CNC Machine (3 & 5 axis), wire cutting EDM machine, laser welding machine, grinding machine, lathe machine.
- Injection and Insert Molding.
- Automated production.



Das Ziel von MID-TRONIC ist es, funktionsfähige Elektronikanwendung auf dreidimensionaler Basis, typischerweise basierend auf Kunststoffträgern mit zu entwickeln und zu produzieren.

Wir schlagen die Brücke zwischen den Technologien getreu dem Motto:

„Plastic meets Electronics“



- DEVELOPMENT OF MECHATRONIC SYSTEM (MECHANIK & ELEKTRONIK)
- PROTOTYPING BASED ON PLASTIC, FLEXIBLE CIRCUIT BOARDS & OTHER SUBSTRATES
- IN-HOUSE TOOLING MAKING AND INJECTION MOLDING
- MID LDS STRUCTURING AND COATING
- 2D AND 3D SMD- ELECTRONICS PRODUCTION ON DIFFERENT SUBSTRATES
- INTEGRATED AOI AND ICT INSPECTION
- PRODUCT SPECIFIC TRACEABILITY





- High Performance Plastic
- PPS, PEEK, PPA, PET, PA, POM..
- Glass fiber content up to 50%

Plastic / Plastic-Metal combinations at SCHERDEL



Plastic components at SCHERDEL Wiesauplast



SCHERDEL

+

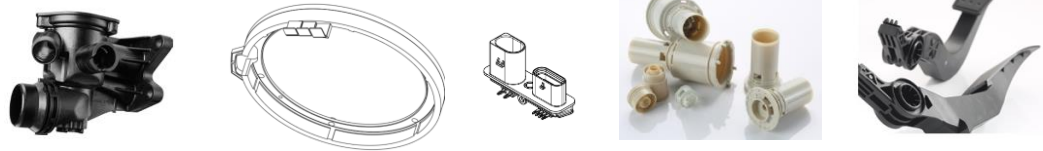
SCHERDEL
WIESAUPLAST



USA – Muskegon, Michigan



MEX – San Jose Iturbide, Guanajuato



MEX – Silao, Guanajuato



SCHERDEL
THERMOMANAGEMENT



THERMOMANAGEMENT

SCHERDEL
THERMOMANAGEMENT

**ELECTRIC
DRIVES**



**POWER
ELECTRONICS**



**ELECTRIC
DRIVES**



**POWER
GENERATORS &
STORAGE**



**CLIMATE- &
HEAT-PUMP-SYSTEMS**

CONTACTS

NORTH AMERICA REGION (USA + MEXICO)



E-Mobility Contacts:

Martin Mendez
Application Engineer
martin.mendez@scherdel.com
Mobile: +1 231 215-1281



Chen Ding
Application Engineer
chen.ding@scherdel.com
Mobile: +1 231 777-6108



Ana Valdez
Business Development
ana.valdez@scherdel.com
Mobile: +52 477 449-7093



Contact USA

Phone: +1 231 777-6144
Email: Sales.Mus@scherdel.com

Contact México

Phone: +52 472 500-3439
Email: Sales.Sil@scherdel.com

THANK YOU FOR YOUR ATTENTION!

Thank you! obrigado! 谢谢! *Děkuji!* **Merci!** ありがとう! **Gracias!** спасибо! *d'akujem!* *dankjewel!* teşekkür ederim! **köszönjük!** **tack!** *dziękuję!* धन्यवाद!