

COMPETENCE CENTER FOR HOT STAMPING TECHNOLOGY

– 7th PHS Suppliers Forum –

Complexity of parts & functional integration in the PHS process



Presented by: TELOS Global, Caryville, TN, USA

Scientific Management: Dipl.-Ing. Frank Schieck ,
Division Director Sheet Metal Forming
Fraunhofer Institute for Machine Tools and Forming Technology, IWU



TELOS Global specializes in the conception, design, training and production associated with high-quality press hardened and aluminum stampings, tooling and the required thermal and production equipment. Our state-of-the-art facility line, manufactures customized presshardened parts developed by our engineers in close collaboration with our customers. Our in-house toolmaking workshop supplies the tooling required – from prototypes through serial products.

Besides these core competencies, we process products and train on state of the art equipment using the talent and support of our entire workforce and partners.

Pictures: Volkswagen AG, NMB, Fraunhofer IWU, T&F, Private

INTRODUCTION

Specific requirements for car body design are presently becoming more and more inconsistent. OEMs provide an expansive range of car body and drive train variants in various local markets, however, the development and production cost, per car, needs to be significantly reduced. This currently leads to intentions of thinning out the model ranges at large volume car manufactures such as Volkswagen, PSA/Opel and Ford. Because of the changes in customer priorities for newer functionalities in cars, such as assistant devices to complete autonomous driving cars, the production of further car components will become less of a priority within OEM.

Today, OEMs earn more money by providing mobility concepts rather than manufacturing cars. This leads to a tendency of producing car bodies with lower effort and costs. An appropriate method of reducing the production effort is to decrease the number of parts. In the past, ideas to overcome this led to complete automated tailored welded banks. This is why we have chosen the focus of this year's forum **"Complexity of Parts & Functional Integration in the PHS Process"**. This forum encompasses the presentations as well as the hands-on trainings. These trainings offer many exciting options and will focus on industry-oriented applications, and take place at, TELOS Global, TN, USA as real-life work simulations.

KEY PLAYERS

- Luke Reini (GM, Global Vehicle Engineering, Detroit, MI, USA)
- Frank Schieck (Fraunhofer Institute IWU, Chemnitz, Germany)
- Vladimir Boskovic (IMAT, Tools & Forming, Graz, Austria)
- Eren Billur (Billur Metal, Bursa, Turkey)
- Reiner Kelsch (voestalpine, Schwäbisch Gmünd, Germany)
- Michael Selent (SELMATEC, Scharnebeck, Germany)
- Christian Conrad (Fraunhofer IZFP, Saarbrücken, Germany)
- Michael Düring (AutoForm Engineering, Krimpen aan den IJssel, NL)
- Nathan Harris (TRUMPF USA, Plymouth, MI, USA)
- Paul Thom (Schuler Inc., Canton, MI, USA)
- Aleksander Koprivc (Zwick GmbH, Ulm, Germany)
- Scott Braitto (SEYI America, E. Chicago, USA)
- Richard Teague (TELOS Global, Caryville, TN, USA)
- Christoph Rechberger (EDRO Speciality Steels, Conshohocken, PA, USA)
- Natesh Krishnan (Saint Gobain, Worcester, MA, USA)
- Michael Kerausch (ESI-Group, Farmington Hills, MI, USA)
- Manuel Lopez (Gestamp BIW, Sant Esteve, Spain)
- Jörg Hahn (Nikon, Inc., Tokyo, Japan)
- Federico Melotti (Impression Technologies Ltd, Coventry, UK)
- Jan Schmiing (Eisenmann ETS, Bovenden, Germany)
- Steffen Sturm, InfraTec GmbH, Dresden, Germany)
- Joe Magyarosi (CIMCO, Concorde, Ontario, Canada)
- Eric Kam (ESI-Group, Farmington Hills, MI, USA)

THURSDAY, September 20th | 08:55 am – 06:00 pm Presentations

- Requests, Requirements & Trends
- Blank Materials and Coatings
- Tools and Dies in PHT
- Equipment & Machinery
- Supporting Processes & Quality Assurance

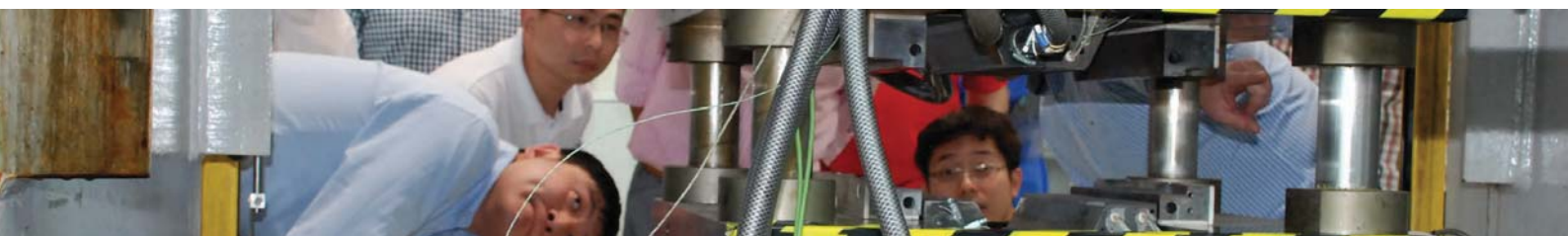


In a series of short presentations, representatives from leading players in industrial hot stamping describe and illustrate key aspects and optimization procedures. The entire thematic complexity will be brought together by the knowledge and commentaries of internationally renowned experts.

FRIDAY, September 21st | 08:55 am – 06:00 pm Chose your own adventure



Within the selected topical units, specialized skills are given to provide insight and understanding in planning and preprocessing technology, heating, simulation of tools and dies and in post-processing technology, all related to complexity of parts and functional integration in the PHS process.



| Welcome | |
|------------|--|
| 08:55 a.m. | Richard Teague & Christian Kovacs (TELOS Global, Caryville, TN, USA) |

| Session 1 Requests, Requirements & Trends | |
|---|---|
| 09:00 a.m. | Complexity of Parts versus Production Costs Frank Schieck (Fraunhofer IWU, Chemnitz, Germany) |
| 09:20 a.m. | Microstructural Influences in Press Hardened Steels Luke Reini & Alan Pearson (General Motors Company, Global Vehicle Engineering, Detroit, USA) |
| 10:00 a.m. | Gestamp: Back to the Roots of Cold Stamping Design Rules Manuel Lopez (Gestamp BIW, Sant Esteve Sesrovires, Spain) |
| 10:20 a.m. | Press Hardening in the Indirect Process – How to overcome the Obstacle of impossible Part Complexity Reiner Kelsch, (voestalpine, Schwäbisch Gmünd, Germany) |
| 10:40 a.m. | Break |

| Session 2 Blank Materials and Coatings | |
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| 11:10 a.m. | New Materials and Processes for Functional Integration in Car Body Components (Eren Billur, Billur Metal, Bursa, Turkey) |
| 11:30 a.m. | Innovative Hot Form Quench (HFQ®) Process for Hot Stamping of Aluminum Federico Melotti (Impression Technologies Ltd, Coventry, UK) |
| 11:50 a.m. | Lunch Break |

| Session 3 Tools and Dies in PHT | |
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| 01:00 p.m. | Opportunities & Challenges in Part Consolidation Richard Teague (TELOS Global, Caryville, TN, USA) |
| 01:20 p.m. | Tool & Die Materials for Hot Stamping Christoph Rechberger (EDRO Speciality Steels, Conshohocken, PA, USA) |
| 01:40 p.m. | Manufacturing Digital Twins and Press Hardening Stamping System Eric Kam (ESI-Group, Farmington Hills, MI, USA) |
| 02:00 p.m. | Break |

| Session 4 Equipment & Machinery | |
|---------------------------------|---|
| 02:30 p.m. | Using Servo Presses for PHS Scott Braitto (SEYI America, E. Chicago, USA) |
| 02:50 p.m. | Hot Stamping Market Paradox – Increasing Demand with less Parts per Car Paul Thom (Schuler Inc., Canton, USA) |
| 03:10 p.m. | Next Generation Rollers for Hot Stamping Lines Natesh Krishnan (Saint Gobain, Worcester, MA, USA) |
| 03:30 p.m. | Nikon's Custom Ceramic Coating and Ceramic Roller for Hot Stamping Jörg Hahn (Nikon, Inc., Tokyo, Japan) |
| 03:50 p.m. | Ready to meet Press Hardened Steel – Single Product Tracking Challenges Jan Schmiing (Eisenmann Thermal Solution, Bovenden, Germany) |
| 04:05 p.m. | Break |

| Session 5 Supporting Processes & Quality Assurance | |
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| 04:30 p.m. | New Laser Cutting and Softening Solutions Nathan Harris (TRUMPF USA, Plymouth, MI, USA) |
| 04:50 p.m. | Robust Machine Vision Systems on Hot Stamping Lines Michael Selent (SELMATEC, Scharnebeck, Germany) |
| 05:10 p.m. | Process Integrated Inspection of Joints during Assembling Processes using NDT Methods Christian Conrad (Fraunhofer IZFP, Saarbruecken, Germany) |
| 05:30 p.m. | Reliable Materials Testing in Support of efficient Hot Forming Processes Aleksander Koprivic (Zwick GmbH, Ulm, Germany) |

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| 05:50 p.m. | Summary |
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| 06:00 p.m. | End of Day 1 |
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LEARN MORE ABOUT FURNACE TECHNOLOGY FROM EISENMANN, DIE TECHNOLOGY FROM TELOS GLOBAL AND MUCH MORE.

On the second day you have the opportunity to put your knowledge into practice by participating in 10 new and updated hands-on trainings. Descriptions are provided according to your business needs and interests. Some keynote speakers in the PHS field will provide trainings, and offer a look into their areas of expertise.

WHAT WILL YOUR PATH BE?

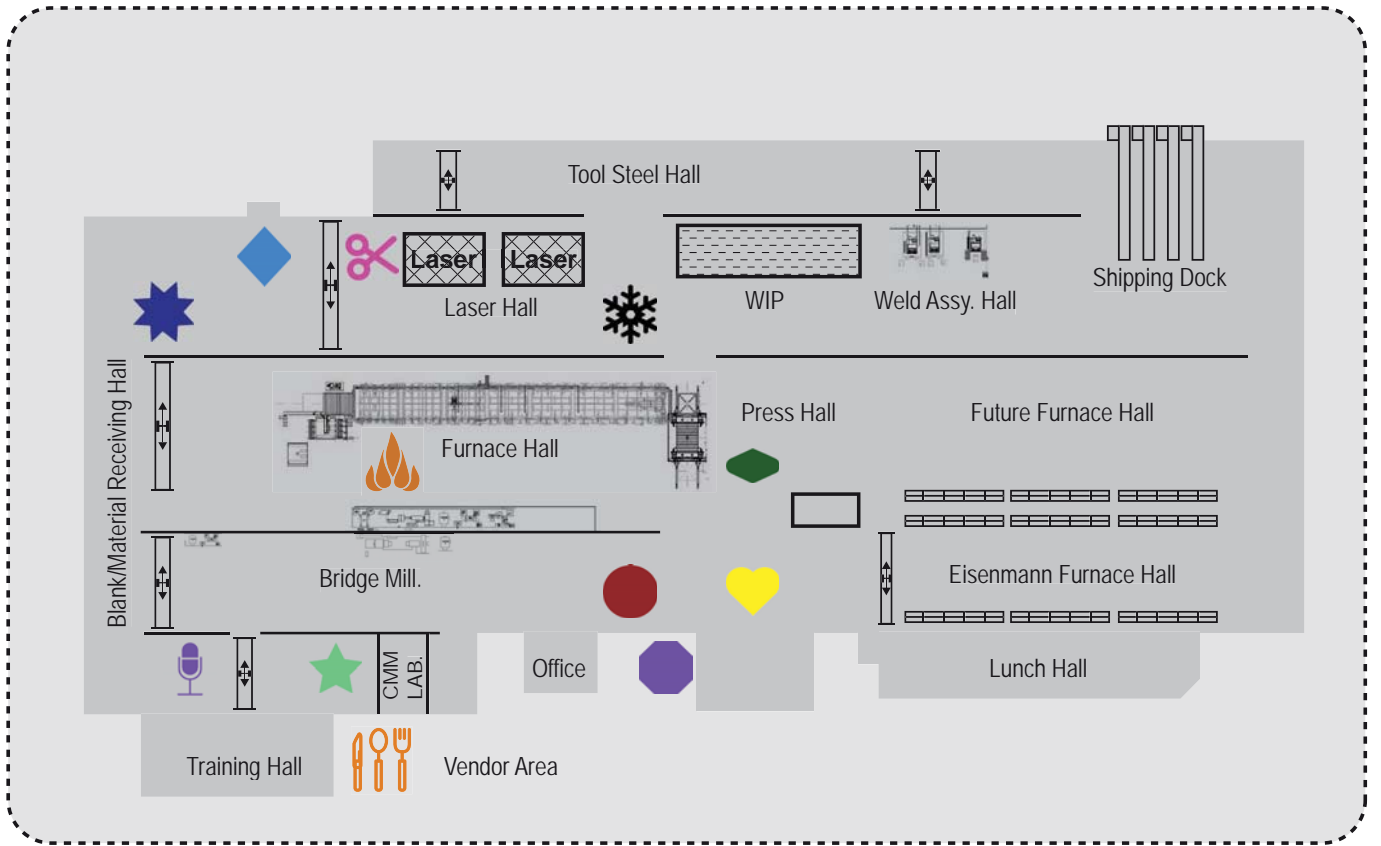
“Learn more about our state of the art furnace and line technology. TELOS and Eisenmann will provide insight about different strategies on how to configure a production line and the tool design for it. It will be shown these can influence the Total Cost of Ownership (TCO) and what aspects are crucial to drop the long-term cost of a line. See the latest developments of furnace technology and how you can benefit from them. Take the chance to see advanced roller materials and coatings. The latest methods of data acquisition and line control will be presented as well, including an integrated system for single product tracking.”

Jan Schmiing Eisenmann
Thermal Solutions, Bovenden, Germany

“TELOS Global is very excited to invite you to the NAFTA PHS Training center. This gives us unique exposure to those that are directly involved in the day to day operations, challenges and ideas surrounding PHS technology.

We will be addressing the topic of “The importance of Optimizing the PHS Process”. This topic is a priority of TELOS Global for 2 reasons, the first is importance of addressing the high cost of capital equipment by showing a quicker ROI through more efficient equipment and processes that yield higher thru-put. The second to address the high cost of the manufacturing and maintenance PHS tooling and secondary production processes.”

Richard Teague, CEO, TELOS Global



Eisenmann Furnace & InfraTec GmbH



ESI, Human-Centric Production Processes



3-MA, Non Destructive Training



AutoForm Simulation



Laboratory Internship



Material Quality Control



Laser Cutting & Laser Trimming



Zwick, Destructive Testing



TELOS Global Line and Die Technology



CIMCO Chilling System



Lecture Hall



Lunch Hall



EXAMPLE

You can begin your day by attending the training with Eisenmann & InfraTec from 09:00 a.m. until 10:50 a.m.

Then, after the short break, you can make your way over to the Fraunhofer 3-MA & Zwick training from 11:10 a.m. until 01:00 p.m.

After enjoying lunch and networking, you dive back in by checking out the training called “VCQI-9 Compliant Temperature Measurements & Real-Time Alignment Control” with Selmatec between 02:00 p.m. and 03:50 p.m.

Finally, once you’ve taken a short coffee break, finish up from 04:10 p.m. until 06:00 p.m. with AutoForm during their Virtual PHS-Process Layout training.

By the end of the day, you should be able to take home a wide range of techniques and information based on your choices.



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|--------------------|--|---|---|
| 08:55 a.m. | Start | | |
| 09:00 – 10:50 a.m. | EISENMANN & InfraTec GmbH State of the Art Line Technology for PHS & Thermographic Process Monitoring – Influences & Importance of different Parameters for Temperature Control in Press-Hardening | Selmatec CQI-9 Compliant Temperature Measurements & Real-Time Alignment Controlproduction | Fraunhofer 3-MA & Zwick 3MA, the NDT tool for PHS Process Monitoring and Product Quality control does a lot more. Give it a try! / Techniques for Testing Hot Stamped Specimens on a 100 kN AllroundLine Universal Testing Machine |
| 10:50 – 11:10 a.m. | Short Break | | |
| 11:10 – 01:00 p.m. | TELOS Global “Cooling Strategy” & CIMCO 1.4mm Usibor 1500P & 2.0mm Usibor 1500P(Quench rate for cooling) / Die Cooling Chilled Water Control (Show runs for 30 minutes only) | EISENMANN & InfraTec GmbH State of the Art Line Technology for PHS & Thermographic Process Monitoring – Influences & Importance of different Parameters for Temperature Control in Press-Hardening | Selmatec CQI-9 Compliant Temperature Measurements & Real-Time Alignment Control |
| 01:00 – 02:00 p.m. | Lunch & Networking | | |
| 02:00 – 03:50 p.m. | AutoForm Typical Press Hardening Process Parameters | Fraunhofer 3-MA & Zwick 3MA, the NDT tool for PHS Process Monitoring and Product Quality control does a lot more. Give it a try! / Techniques for Testing Hot Stamped Specimens on a 100 kN Allround-Line Universal Testing Machine | EISENMANN & InfraTec GmbH State of the Art Line Technology for PHS & Thermographic Process Monitoring – Influences & Importance of different Parameters for Temperature Control in Press-Hardening |
| 03:50 – 04:10 p.m. | Coffee Break | | |
| 04:10 – 06:00 p.m. | AutoForm Typical Press Hardening Process Parameters | Selmatec CQI-9 Compliant Temperature Measurements & Real-Time Alignment Control | Fraunhofer 3-MA & Zwick 3MA, the NDT tool for PHS Process Monitoring and Product Quality control does a lot more. Give it a try! / Techniques for Testing Hot Stamped Specimens on a 100 kN Allround-Line Universal Testing Machine |
| 06:00 p.m. | End of Day | | |



AutoForm
Typical Press Hardening
Process Parameters

IMAT & Billur Metal
PHS Material & Quality Control
Complex Geometries in Automotive Press
Shops

TELOS Global
"Cooling Strategy" & CIMCO
1.4mm Usibor 1500P & 2.0mm Usibor
1500P(Quench rate for cooling) /
Die Cooling Chilled Water Control
(Show runs for 30 minutes only)

IMAT & Billur Metal
PHS Material & Quality Control
Complex Geometries in Automotive Press
Shops

TRUMPF
Laser Cutting & Trimming
Door Ring cutting on the 7040 & regular
Hot Stamping Parts on the 8030

Fraunhofer 3-MA & Zwick
3MA, the NDT tool for PHS Process
Monitoring and Product Quality
control does a lot more. Give it a try! /
Techniques for Testing Hot Stamped
Specimens on a 100 kN AllroundLine
Universal Testing Machine

Selmatec
CQI-9 Compliant Temperature
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PRODUCTION

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PRODUCTION

„WE ARE ABOUT TO SEE A NEW ERA OF PHS, WHERE COLD STAMPED UHSS CANNOT COMPETE.“

“Either you have to process PHS in an existing production line, or you might need to plan the necessary process parameter range in not yet existing manufacturing equipment. In many cases, Finite-Element-Analysis can provide you with valuable information for such assessments and decision making processes. Simply based on an importable part geometry, the entire process is represented and single process steps adequately simulated. How influential parameters can affect the quality of the final part geometry, is subject to an investigation based on parameter variations – as typical for many practical use cases. In the hands-on-training all attendees are invited to set-up process models and to introduce their desired process parameter combinations.

We will refer to various process and modelling options in order to point out their specific advantages. The outcomes of the single attendees in terms of final part quality will be compared and discussed. Thus, a comprehensive understanding of the relationship between single parameter variations and process options and the final part quality is enabled. Furthermore, sophisticated approaches for the systematic detection of optimal process set-ups will be presented and discussed.”

**Michael Düring, Product Manager,
AutoForm Engineering**

“As global and modular platforms become the industry standard, millions of vehicles are sharing common parts now. With this trend, the initial fixed costs for dies and ramp-up are divided to more number of units. Breakeven point for complicated parts that can replace assemblies (through part consolidation) are now shifted. We are about to see a new era of PHS, where cold stamped UHSS cannot compete.”

Eren Billur, Technical Manager, Billur Metal



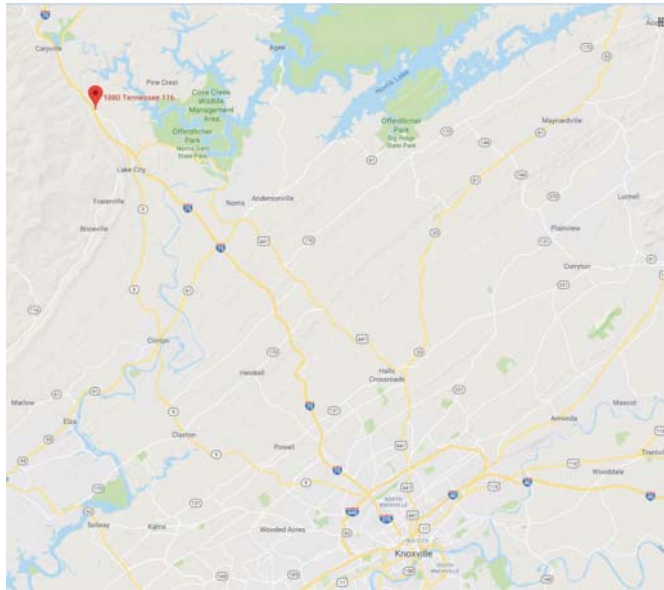


VENUE

COMPETENCE CENTER FOR HOT STAMPING TECHNOLOGY
takes place at:

TELOS GLOBAL
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Caryville, Tennessee 37714
USA

Phone: +1 865 426 5214
Email: lmcentee@telosphs.com
Web: www.telosphs.com



TELOS GLOBAL

Target-orientated competence development creates the foundation for Sustainable Business Success. The intention of our trainings goes further than qualifying your employees. It is the productive implementation of the learned competences, put into practice, that are a fundamental contribution to your company's success.

We are here, to support and strengthen your competitive advantage and provide you with what your competitors don't have.

ACCOMODATION

Hampton Inn Caryville-I-75/Cove Lake-State
Park 4459 Veterans Memorial Hwy.
Caryville, TN 37714, USA

Holiday Inn Express & Suites Caryville
154 John McGhee Blvd.
Caryville, TN 37714, USA

McCloud Mtn. Resort
Caryville, Tennessee 37714, USA

Hampton by Hilton Knoxville/Clinton I-75
105 Hillvale Road
Clinton, Tennessee, 37716, USA

Twin Cove Resort and Marina
1835 Ridge Rd
Caryville, TN 37714, USA

When you book your room, at one of these accommodations,
please mention the event at TELOS Global.

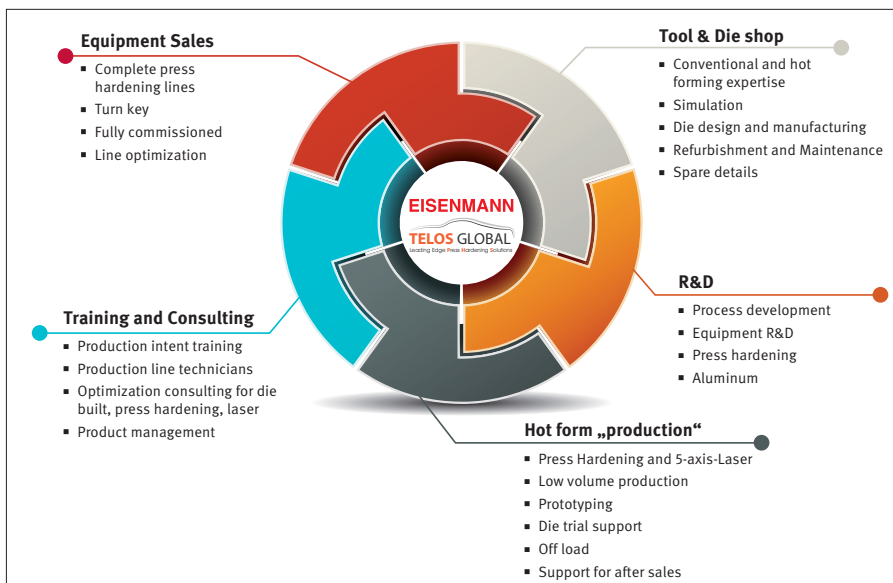


“WE TAKE ON THE CHANGES IN PHT, WE GET THINGS DONE, AND WE CHART THE COURSES TOWARDS NEW OPPORTUNITIES WORKING BOLDLY AND CONSISTENTLY.”

Christian Kovacs, Europe Key Account Manager, TELOS Global

Waiting? Hesitating? Killing time? Not us!

Each day, in our work and talks with customers - assemblers, developers, technicians, engineers, purchasers, field reps and managers – brings us up to date and in touch with new and exciting challenges. We all do our part; we join forces, work together and put our all into working passionately in giving you what you need for your company to develop.



We are all dealing with change and showing initiative. We are dedicated to making your business fit for the future and more competitive in turbulent times.

We look forward to working with you.

Mission Statement

The automotive market is in constant motion. The pace of technological change has accelerated which has resulted in shorter and more complex development cycles. Therefore, it is vital for us not to rest on the laurels of our experience, but to question and enhance our performance at all times. Telos Global specializes in the conception, design, services, trainings and off-load production support associated with high-quality press hardened and aluminum stampings, tooling and the associated thermal and production equipment. Our state-of-the-art production line manufactures customized press hardened parts that our engineers develop in close collaboration with our customers. Our in-house toolmaking shop supplies the tooling required, from prototypes through to the serial products. Besides these core competencies, we process products and train on state of the art Equipment using the talent and support of our entire workforce and partners.

