

TRAINING-ID: 1000-L2-04

Advanced Training - Tooling in Press Hardening Technology (PHT) (2 days)

DESCRIPTION

The advanced training in the field of tooling is based on the learned in basic training bases. There are taught vocational skills in the area of tool design. Beginning from an existing component geometry our trainers show the different work steps to create the geometry and function of a PHS-tool.

We consider together virtual engineering approaches like FEM and CAD. In particular the cooling of PHS-Tools is demonstrated because it is essentially important.

Design philosophies, possible errors and the selection of proper tool materials are also included in this seminar. It is completed by real case studies of PHS- tools from Schuler. Additionally, you have the possibility to get insights in Try-out, Tool setting and an operating PHS-line by guided tours.

AUDIENCE

Engineers, technicians and foremen in the fields of tooling, production, quality assurance, assembly and process planning.

PREREQUISITES

Successful completion of the Principles of PHS „Heat Treatment & Hot Forming of Steel“.

BENEFITS

In cooperation with leading engineers and technicians in the field of press hardening and the key aspect on tooling, a training concept will be developed. The aim is to introduce new engineers and technicians into the special field of tool design in hot sheet metal forming and press hardening, to show the different challenges in this field and different design concepts.

By this training a fast and coordinated know-how transfer should be established in order to reduce the amount of trial and errors of beginners in this new technology.

METHODS

digicon Academy provides a focused, practically and economically oriented knowledge transfer in the form of seminar lectures and field tests on samples. The involved trainers are highly qualified and experienced key players in the PHS-market.

CONTENT

The main focus of this training is the following key aspects and their sub items.

T1: Introduction and fundamentals in Press Hardening of Steel (PHS)

- Recapitulation Process fundamentals - Direct Press Hardening Process Chart, Overview of the needed material structure – ZTU, UHSS product examples
- Which quality characteristics have to be fulfilled? - Critical quenching rate, Interface between tool/press/cooling, Thermal expansion, Form- ability of 22MnB5, Product Warping, Cooling media mass flow, etc...
- PHS product design, most important process parameters, tool concepts, thermal treatment

T2: Process Parameters for Tools

- Cooling approaches, handling of problem areas
- Segmented construction
- Tool design
- Failure possibilities (drawing clearance, wear, blank holder, positioning ejector, etc.)
- Failure criteria by replica or drawing clearance measuring
- Process control by measurement system in the tool
- OEM Parts with welding patches (Process and tool Design)
- Presentation about different coatings (AlSi, Zinc coating, uncoating...)
- Flow, pressure, temperature of cooling networks
- Advantages and disadvantages of different types of design (Direct, Bridge...)
- Type of pipes recommended (pipes material, diameter ...)

T3: Virtual Engineering

- From the component geometry to the tool
- Interface definition and using software
- How the product geometry has to be? Already possibilities for optimization? What is not possible (for example: undercuts)
- Active surface construction
- Blank shape
- FEM Simulation (Live presentation case study AutoForm vs. Pam- Stamp vs. LS-Dyna)
- CAD (Catia)
- Trimming

T4: Tool Materials and Coatings

- Hot forming tool steel (mechanical and thermal properties)
- Tool coating
- Laser Material Deposition (LMD)
- Recent developments

T5: Practical Examples

- Case Studies

P1: Practical Examples

- Tool-Shop for Hot Forming Tools
- Tool Setting
- Training-Center PHS-Line

T6: Summarization

- Summary of the training
- FAQ
- Feedback

