Press Line Simulation

Saving time on the way to the optimum multi-stage press – thanks to simulation and the SIMOTION Motion Control system

Press Line Simulation from Siemens is an innovative software tool for comprehensive programming, analysis and simulation of multi-stage presses. The digital simulation of the whole sheet-metal stamping process allows all operations to be prepared in advance and to be optimized virtually at an early planning phase. In this way, the software provides valuable information for the designer and planner, long before any part is actually manufactured. Press Line Simulation supports different tasks in the sheet-metal process, such as material flow planning, die design, tooling design, and press setup. The interface to the press controller (SIMOTION®) allows the real application to be visualized.

The benefits at a glance: Business value ...

- Virtual optimization and verification of all function components
- Minimization of possible errors through simulation
- Shorter time-to-market for the final product
- Reduced ROI time thanks to considerably shorter setup times and increased material throughput
- Higher productivity through variation of programming parameters

... and technological value

Simulation offers immediately measurable advantages, especially for the engineers of the press shop and the tool designers. Press manufacturers use Press Line Simulation to check performance limits and as a software tool for rapid commissioning of the press at the end users site. OEMs benefit from a higher return on their investment, a faster start to productive operation and, overall, from an increase in productivity.
Using Press Line Simulation

Press Line Simulation produces a high-precision model of the press line, including the associated die set, tooling and the sheet-metal parts themselves. For this purpose, the necessary modules and geometries are imported from the CAD system. The calculations are carried out after the corresponding kinematics have been added. The software provides tabular reports of the results, curve diagrams of the kinematics model and a 3D graphics window as the working area for the press model. This allows all the movements of the function components to be visualized, from synchronization of the press and the sheet-metal transport to the cam drives. Collisions are represented as curve characteristics and can be stored in the log together with automatically created screenshots.

Customized functionalities

- Intelligent press models: Use a fully customized model of your press and match it to your requirements, including assembly and kinematics data, programming functions, tool change and signal programming.
- Material flow analysis: Verify the planned positions of the sheet-metal parts. Check whether the part can be withdrawn from the die without collisions or whether the intermediate station can change the part's position and orientation adequately.
- Automated tooling design: Build the tooling automatically and attach them directly to the transfer system. Create parts lists, assembly structures and CAD data – collision-free and verified.
- Die setup and verification: Create interference-free spaces and check the die structure and kinematics in the virtual press. Define cam drives and test for internal collisions.

Additional functions

- Offline programming and testing: the optimized and tested programming parameters and setting values can be transferred directly to the press.
- Integrated interface to the press controller: the controller calculates motion data and maximum possible stroke rates for optimizing the motion curves.
- Force calculation: holding forces of cups and grippers are calculated automatically in line with the corresponding press parameters.
- Remote CAD interface: bidirectional data exchange with CAD systems, such as NX or Catia.

System requirements

- PC with Windows XP
- CPU 3 GHz
- RAM 2 GB
- OpenGL compatible standard graphics card

Volkswagen die shop

Use traced motion data in simulation

Example: Slide height - f (stroke angle)

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