FORGE®

Rolling Flat and Long Products

If you want to precisely model rolling processes of long and flat products, then this is the course for you!

Rolling is used for the production of long products (profiles or tubes) or flat products (plates or sheets) formed from various materials (steel, aluminum or titanium alloy). With FORGE®, it is possible to simulate these two types of manufacturing processes as well as tube rolling used in the nuclear or oil industry. There are two types of approaches. The 'incremental' approach makes it possible to check the conformity of the rolled profiles, detect defects of the centering or torsion type at the entry of the bars and determine the volume of drop-offs. The 'stationary iterative' approach used for hot rolling makes it possible to quickly simulate the rolling mill and evaluate inter-cage tensions. During this training, you will discover how to set up data for simulations of rolling in the incremental approach as well as in the stationary iterative approach.

You will also know how to identify defects of the centering type. You will thus be able to effectively and accurately simulate the rolling processes.

LEVEL

Intermediate – Users willing to reinforce their skills in simulating hot rolling of long and flat products.

PREREQUISITES

Good basic knowledge of FORGE® use is required.
Have completed the 'Starting with FORGE®' training or its equivalent.

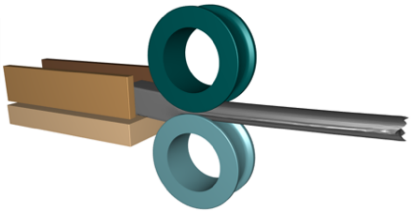
GOALS

- **Data setup for rolling cases with an incremental approach**
- **Analyzing and interpreting computation results (deformation, change in temperature, etc.)**
- **Identifying defects of the centering or torsion type at the entry of the bars**
- **Understanding the stationary approach implemented in FORGE®**
- **Validating the characteristics of the rolling mill, for example the required number of roll stands, the initial inlet speed, the reduction rate per pass, the temperature and the rotational speed of the cylinders, the friction conditions, etc.**

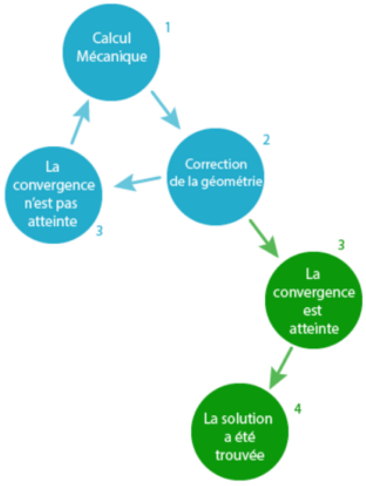
TRAINING	DURATION	PRICE EXCL. TAX	PARTICIPANTS
In-company	2 days	€3200 per training	1 to 3 people

DAY 1 > 8.30 a.m. to 12.00 p.m. & 1.30 p.m. to 5.00 p.m.

Introduction	• Presentation of Transvalor • Course goals
Data setup incremental rolling	• Creating or importing geometry directly into FORGE® • Importing geometries • Generating a mesh: definition of Bi-meshing • Reviewing remeshing parameters • Material file • Positioning the tools • Configuring the kinematics • Defining the axis of gravity
Functions	• Sensors • Marking grids
Report analysis	• Deformation and temperature change • Shape of the product at each instant of the process • Forces and torques exerted on the rolling cages • Defects of the centering or torsion type at the entry of the bars • Volume of drop offs
Computation of the regime established by the stationary iterative method	• Principle of the method • Data setup - Initial geometry - Extrusion option - Direction of rolling - Manually defining lengths - Manually selecting the initial plane - Meshing of the geometry - Definition of the kinematics of the rollers - Direction of flow of the material - Storage frequency (iterations) - Number of iterations in the computation • Analysis of the results on the final computation increments - Temperature, equivalent stress - Inter-cage tensions



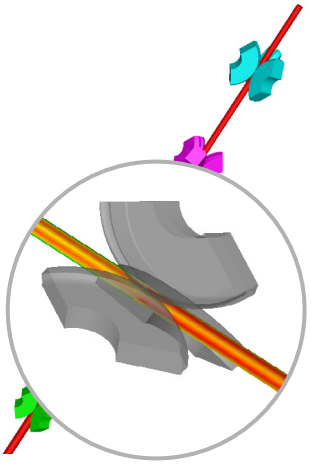
Rolling process with an incremental approach



Rolling process with an incremental approach

DAY 2 > 8.30 a.m. to 12.00 p.m. & 1.30 p.m. to 5.00 p.m.

Data setup of several cases	• Sequenced computation • Computation with separated roll stands • Computation with cooling between passes • Sequenced computation with meshing interface groups
Comparisons of incremental & stationary iterative approach	• Analysis of the product in progress and after deformation • Computation time • Limitations
Customer's process	• Data setup • Starting computation • Report analysis
Conclusions	• Questions and course assessment



Rolling process with a stationary iterative approach