



Rolling flat and long products

You want to precisely model all rolling processes of long and flat products?

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 the tube rolling used in the nuclear or oil industry. There are two types of approaches. The so-called '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 so-called '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 cases 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.**

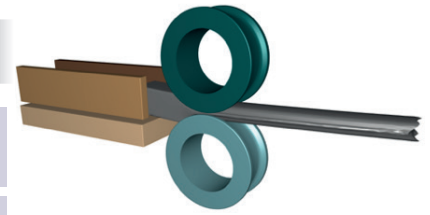


| TRAINING | DURATION | PRICE EXCL. TAX | PARTICIPANTS |
|------------|----------|---------------------|---------------|
| In-company | 2 days | 3000 € per training | 1 to 3 people |

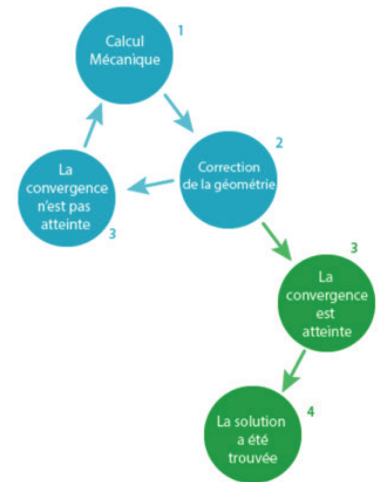
Contact us to arrange the date and place of the training

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

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|---|--|
| Introduction | <ul style="list-style-type: none"> • Transvalor presentation • Course goals |
| Data setup incremental rolling | <ul style="list-style-type: none"> • Creating or importing its geometry directly into FORGE® • Generating a mesh: definition of Bi-meshing • Reviewing remeshing parameters • Material file • Positioning the tools • Configuring the kinematics • Defining the axis of gravity |
| Functions | <ul style="list-style-type: none"> • Sensors • Marking |
| Report analysis | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Principle of the method • Data setup <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - Temperature, equivalent stress - Inter-cage tensions |



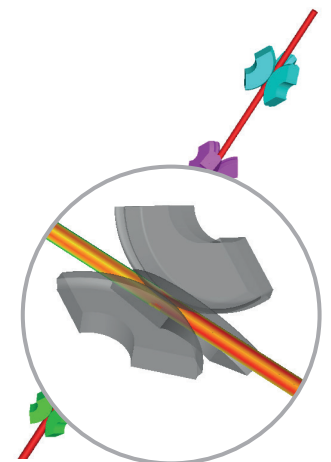
Rolling process with an incremental approach



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.

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|--|---|
| Data setup of several cases | <ul style="list-style-type: none"> • Chained computation • Computation with separated roll stands • Computation with cooling between passes • Sequenced computation with meshing interface groups |
| Comparisons of incremental & stationary iterative approach | <ul style="list-style-type: none"> • Analysis of the product in progress and after deformation • Computation time • Limitations |
| Customer case | <ul style="list-style-type: none"> • Data setup • Launching computation • Results analysis |
| Conclusions | <ul style="list-style-type: none"> • Questions and course assessment |



Rolling process with a stationary iterative approach