



Ring Rolling

Do you want to precisely model ring rolling processes? This FORGE® training is made for you!

Ring rolling is used to produce rings for the aerospace industry (engine components) and the energy industry (wind turbine parts). It is also used by the automotive industry to manufacture bearings, most often at ambient temperature. This two-day course will teach you how to effectively and precisely simulate this process. You will

discover how to perform data setup for radial, vertical and radial-axial rolling, from creating the ring to configuring the process while taking account of the rolling process kinematics. You will also discover sensor and marking functions.

LEVEL

Intermediate - Users willing to enhance their knowledge in ring rolling simulation

PREREQUISITES

**A good basic knowledge of FORGE® use is required.
Have completed the ‘Starting with FORGE®’ training or equivalent course.**

GOALS

- **Data setup for ring rolling, radial and radial-axial cases**
- **Using the actual kinematics of the process for circular, radial and radial-axial rolling data setup**
- **Analyze the main results (shape, strain, defects, stresses, etc.)**

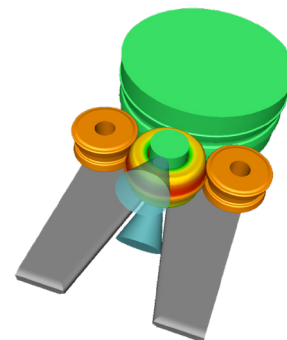
OTHER RECOMMENDED COURSES

- **FORGE® - Automatic optimization**
- **FORGE® - Heat treatment of steel and aluminum**
- **FORGE® - Die analysis**

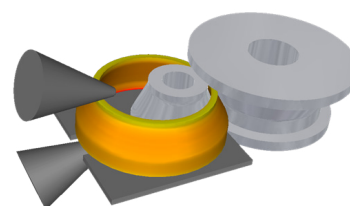
TRAINING	DURATION	PRICE EXCL. TAX	PARTICIPANTS
In-company	1.5 days	€2400 per training	1 to 3 people

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

Introduction	<ul style="list-style-type: none"> • Presentation of Transvalor • Course goals
Data setup - generic radial ring rolling	<ul style="list-style-type: none"> • Creating a ring or importing its geometry directly into FORGE® • Creating 3D tool geometry • Generating structured ring meshing with an ALE meshing method (Arbitrary Lagrangian Eulerian) • Generating meshing for a non-axisymmetric ring • Reviewing remeshing parameters • Material file • Positioning tools and table • Configuring process parameters
Data setup - generic vertical ring rolling	<ul style="list-style-type: none"> • Determining gravity axis • Defining centering rollers • Configuring simulation parameters
Functions	<ul style="list-style-type: none"> • Sensors • Marking grid
Result analysis	<ul style="list-style-type: none"> • Predicting ring shape • Checking the correct filling for shaped rings • Predicting defects (i.e. fish tail) • Temperature distribution and required reheat • Microstructure evolution (grain size, etc.) • Assessing torques and maximum forces on dies



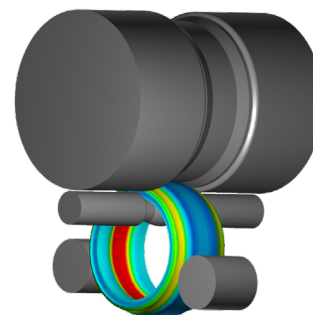
Ring rolling with temperature evolution



Radial-axial circular rolling

DAY 2 > 8.30 a.m. to 12.00 p.m.

Radial-axial ring rolling	<ul style="list-style-type: none"> • Schematic view of elements to be entered • Configuration of standard rolling mill: ring enlargement speed according to its outer diameter. • Configuration of standard rolling mill: mandrel speed according to the outer diameter of the ring. • Configuration of upper roller advanced control
Standard control: Ring enlargement speed according to its outer diameter	<ul style="list-style-type: none"> • Data setup • Starting computation • Result analysis: piloting curves
Conclusions	<ul style="list-style-type: none"> • Questions and course assessment



Vertical circular rolling