



# Z-mat connection to external Finite Element solvers

**Z-mat includes several pieces of software which constitute an efficient set of tools for advanced material-oriented FE analysis. In this course, you will learn advanced Z-mat's material models used within major Finite Elements solvers.**

This one-day training session provides basic knowledge about the use of Z-mat and major external FE solvers like Abaqus, Ansys and Samcef, and a large base of constitutive plasticity and viscoplasticity models.

Participants will discover the technical aspects, available tools and options of the Z-mat's interface.

In addition, the results interfaces that enable the use of Z-master and Z-post modules for visualization and data post-processing will be presented.

## LEVEL



**Beginner**

## PREREQUISITES



**A good basic knowledge of User Material Modeling is required.**

## GOALS



- **Understanding of User Material subroutine principles**
- **Setup of simulations with linear and non-linear material models**
- **Launching computations**
- **Visualization, interpretation and analysis of results**

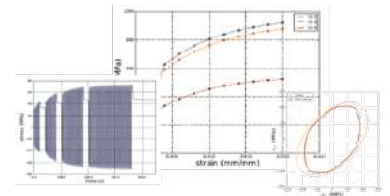


TRAINING	DURATION	PRICE TAXES NOT INCL.	PARTICIPANTS
In-company	1 day	1400 € per training	1 to 3 people

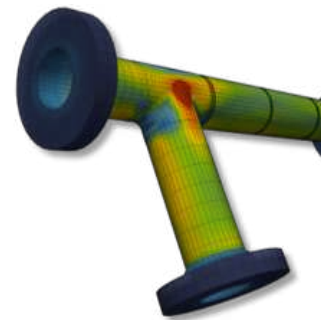
**Contact us to set the course date and location.**

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

<p><b>Introduction</b></p>	<ul style="list-style-type: none"> <li>• Presentation of Transvalor</li> <li>• Course goals</li> </ul>
<p><b>Simulation workflow &amp; setup</b></p>	<ul style="list-style-type: none"> <li>• Quick review of software installation (Linux, Windows), environment variables, connection to external FE solvers</li> <li>• Presentation of Z-set's distribution (documentation, tests base)</li> <li>• Getting started: native material model vs user material model</li> <li>• Examples of basic Z-mat's material models</li> <li>• Z-sim: material model driver</li> <li>• Internal variables, storage, Zpreload utility, 2D/3D cases</li> <li>• Setup with Z-mat or external FE solvers</li> <li>• Analysis of tutorials</li> </ul>
<p><b>Computation</b></p>	<ul style="list-style-type: none"> <li>• Simulation launching scripts</li> <li>• Multicore execution</li> </ul>
<p><b>Results analysis</b></p>	<ul style="list-style-type: none"> <li>• Results files</li> <li>• Understanding of stored fields</li> <li>• Results visualization with native viewers and Z-master</li> </ul>
<p><b>Advanced capabilities</b></p>	<ul style="list-style-type: none"> <li>• Advanced controls and options (integrators, modifiers, debug)</li> <li>• Multi-material models</li> <li>• Structural elements, plane-stress analysis</li> <li>• Cluster submission</li> <li>• Connection to Z-post (simple post-processing example)</li> </ul>
<p><b>Conclusions</b></p>	<ul style="list-style-type: none"> <li>• Questions and course assessment</li> </ul>



Constitutive laws



Tube connections under thermomechanical fatigue (collaboration with EDF)