

## Guide of reading of methodological documentations U2

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### Summary

This document is an inventory of methodological documentations U2.

## 1 General information on the finite elements

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- [U2.01.02] Note of use of the boundary conditions treated by elimination
- [U2.01.04] Documentation of the sizes of Code\_Aster
- [U2.01.05] Constraints, efforts, forces and deformations
- [U2.01.09] analytical Definition of a stress field and a field of internal variables initial
- [U2.01.10] Note of use on the choice of the finite elements
- [U2.01.11] Note of use of the handling of fields

## 2 Use of the elements of structure

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- [U2.02.01] Note of use of the voluminal elements plates, hulls, hulls SHB, grids and membranes
- [U2.02.02] Note of use of the elements TUYAU\_\*

## 3 Non-linear mechanics

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- [U2.04.01] the Councils of use of STAT\_NON\_LINE
- [U2.04.02] the Councils of implementation of non-linear calculations
- [U2.04.03] Choice of the behavior élasto- (visco) - plastic
- [U2.04.04] Note of use of the contact
- [U2.04.07] Use of transitory methods of resolution for the strongly nonlinear quasi-static problems
- [U2.06.13] General advices of use of the operator DYNA\_NON\_LINE
- [U2.10.01] Note of use of the coupling between Code\_Aster and the modules of laws of Zmat behavior and UMAT

## 4 Breaking process, tires and damage

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- [U2.05.00] methodological Guide on the approaches in breaking process
- [U2.05.01] Note of use of the operators of breaking process for the classical approach (non-linear elasticity)
- [U2.05.02] Note of use of method X-FEM
- [U2.05.04] Note of use for the calculation of limiting load
- [U2.05.05] Structural analysis in fatigue vibratory
- [U2.05.06] Realization of calculations of damage into quasi-static
- [U2.05.07] Note of use of the models of cohesive zones
- [U2.05.08] Realization of a calculation of prediction of rupture per cleavage
- [U2.05.09] Note of use of method GTP

## 5 Mechanical analyses

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- [U2.06.01] Implementation of a calculation of clean modes of a structure
- [U2.06.03] Note of modeling of the mechanical cushioning
- [U2.06.14] the Councils of implementation of calculations in Interaction Fluid-Structure
- [U2.08.04] Note of calculation to buckling
- [U2.09.02] Realization of the calculation of an assembly pin-attaches
- [U2.09.03] Note of use of the calculation and the postprocessing of a mechanical study according to the RCCM

## 6 Metallurgy and welding

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- [U2.03.04] Note of use for calculations thermometallomecanic on steels
- [U2.03.05] Note of use for the digital simulation of welding

## 7 Civil engineer and soil mechanics

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- [U2.03.06] Realization of a study civil engineer with cables of prestressing
- [U2.03.07] Panorama of the tools available to carry out structural analyses of concrete Génie Civil
- [U2.04.05] Note of use of model THM
- [U2.04.06] How to dig a tunnel: methodology of excavation
- [U2.04.08] static and dynamic Calculations on works géomechanics with the law of Hujeux

## 8 Earthquake

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- [U2.06.07] Interaction ground-structure (ISS) in seismic analysis with the Code\_Aster interface - MISS3D
- [U2.06.08] dynamic Separation of foundation in interaction ground-structure (ISS) by method of springs of ground
- [U2.06.09] seismic Analysis: application to pipings
- [U2.06.10] Realization of a study of civil engineer under seismic loading
- [U2.06.11] Analysis of the seismic behaviour of the large metal tanks
- [U2.06.12] Interaction ground-structure in seismic analysis with taking into account of space variability
- [U2.06.15] Calculation of seism resistance of the concrete dams
- [U2.06.21] Interaction ground-structure (ISS) and interaction ground-fluid-structure (ISFS) in seismic analysis with the Code\_Aster interface - MISS3D

## 9 Revolving machines

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- [U2.06.31] Note of modeling of the gyroscopy
- [U2.06.32] Note of implementation of calculations of rotors

## 10 Methods to reduce the size of modeling

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- [U2.06.04] Note for the construction of scale models in dynamics
- [U2.07.01] Note of use of modeling FOURIER
- [U2.07.02] Note of use of the static under-structuring
- [U2.07.03] Realization of a study of structural modification starting from measured data
- [U2.07.04] dynamic Condensation of model by under static structuring
- [U2.07.05] Implementation of calculation by dynamic under-structuring

## 11 Performance and quality of calculations

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- [U2.07.06] dynamic Validation of model per correlation calculation-tests
- [U2.08.01] Use of the indicators of error and associated strategies of adaptation of grids
- [U2.08.03] Note of use of the linear solveurs
- [U2.08.05] Digital simulation of Monte Carlo
- [U2.08.06] Note of use of parallelism
- [U2.08.07] Distribution of parametric calculations
- [U2.08.08] Use of the Method of the Solutions Manufactured for the software checking
- [U2.08.09] Adaptation of grid into non-linear

## 12 Tools for postprocessing

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- [U2.51.01] Note of use of Grace for Code\_Aster
- [U2.51.02] Layout of curves with Code\_Aster