

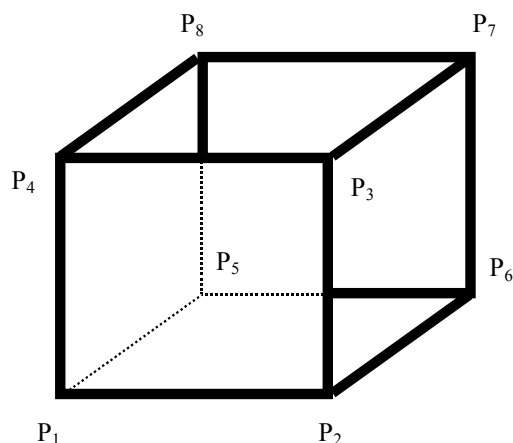
SSNV149 - Test of ENDO_ISOT_BETON

Summarized:

One presents in this test two quasi static computations of a volume element in homogeneous strain with constitutive law ENDO_ISOT_BETON.

1 Problem of reference

1.1 Geometry and boundary conditions



Blocages

P1P2P3P4 : $dz=0$

P1P5P8P4 : $dx=0$

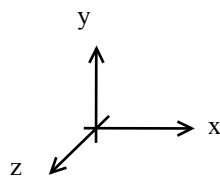
P1P5 : $dy=0$

P2P6 : $dy=0$

Traction/compression

P2P6P7P3 : dx imposé

$\{dx, dy, dz\}$ sont les déplacements des noeuds suivant les trois directions.



Appears 1.1-a: Geometry and boundary conditions of the uniaxial tests

the adopted boundary conditions ensure a homogeneous strain in the element.

1.2 Material properties

Behavior elastic:

$$E = 300000 \text{ MPa} ; \nu = 0,3$$

Behavior damaging:

$$\sigma_Y = 3 \text{ MPa} ; E_T = -6000 \text{ MPa}$$

2 Reference solution

This test is a test of non regression.

3 Modelization A

3.1 Characteristic of the modelization

Modelization 3D

Element MECA_HEXA8.

3.2 Characteristics of the mesh

Many nodes: 8

Number of meshes and types: 1 HEXA8

3.3 Properties of the material

Behavior damaging:

$$\begin{aligned}\sigma_{seuil}^T &= 3 \text{ MPa} \\ \sigma_{seuil}^C &= 11\,225 \text{ MPa} \\ E_T &= -6000 \text{ MPa}\end{aligned}$$

3.4 Way of loading

the element is subjected to a uniaxial tension followed by a discharge and of a uniaxial pressing.

3.5 Quantities tested and results

Time	Name of the field	Component	Aster	Place
24	DEPL	<i>DX</i>	<i>N2</i>	- 8.006E+06
24	SIEF_ELGA	<i>SIXX</i>	<i>MI</i> , point 1	- 2.03628E+07
24	VARI_ELGA	<i>VI</i>	<i>MI</i> , point 1	8.14067E-01

4 Modelization B

4.1 Properties of the material

Behavior damaging:

$$\begin{aligned}\sigma_{seuil}^T &= 3 \text{ MPa} \\ \sigma_{seuil}^C &= 40 \text{ MPa} \\ E_T &= -6000 \text{ MPa}\end{aligned}$$

4.2 Way of loading

the element is subjected to a uniaxial pressing.

4.3 Quantities tested and results

Time	Name of the field	Component	Aster	Place
25	DEPL	<i>DX</i>	<i>N2</i>	- 1.28E-05
25	SIEF_ELGA	<i>SIXX</i>	<i>MI</i> , point 1	- 3.84E+07
25	VARI_ELGA	<i>VI</i>	<i>MI</i> , point 1	0.00E+00
27	DEPL	<i>DX</i>	<i>N2</i>	- 1.37E-05
27	SIEF_ELGA	<i>SIXX</i>	<i>MI</i> , point 1	- 4.06405E+07
27	VARI_ELGA	<i>VI</i>	<i>MI</i> , point 1	2.90913 E-02
37	DEPL	<i>DX</i>	<i>N2</i>	- 1.82E-05
37	SIEF_ELGA	<i>SIXX</i>	<i>MI</i> , point 1	- 4.55227E+07
37	VARI_ELGA	<i>VI</i>	<i>MI</i> , point 1	1.00E+00

5 Summary of the results

the purpose of the modelization A are to show the crack Re-closing in compression after a phase of damaging tension. The modelization B watch effects of the parameter σ_{seuil}^C (forced threshold in a simple compression test). It should be noted that the stress threshold does not correspond in computation exactly to the stress of initiation of the damage in compression, this is due to the fact that the criterion is evaluated starting from the strains with time step preceding and not with time step running. The error observed thus depends on the size on time step.