SSNP129 - Validation of the lawful law of behavior BETON_REGLE_PR

Summary:

The purpose of this CAS-test is to validate the lawful law of behavior BETON_REGLE_PR.
It is about an elementary test on a mesh where one is able to display an analytical solution.

1 Problem of reference

1.1 Geometry

One considers a plate of dimension 1.

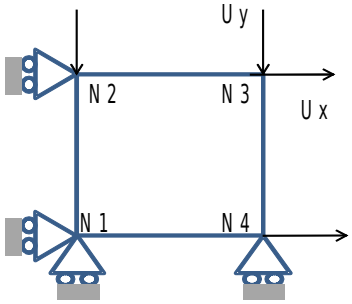

Figure 1.1-1: Diagram of the CAS-test

1.2 Boundary conditions and loadings

It is considered that the problem thus remains plan $DZ=DRX=DRY=DRZ=0$.
A condition of symmetry is applied to the sides $N1N2$ and $N1N3$.
One applies to $N2N3$ a following uniform displacement y equal to $-0,002$.
One applies to $N3N4$ a following uniform displacement x equal to $0,0002$.

1.3 Properties of material

$E=2,1\cdot 10^{6}\,MPa$
$\nu=0,2$
$E_T=-10^{4}\,MPa$
$\sigma_y^t=3\,MPa$
$\sigma_y^c=30\,MPa$
$\varepsilon_c=10^{-3}$
$n=2$

2 Reference solution

The solution is analytical

3 Modeling A

3.1 Characteristics of modeling

Modeling hull type DKT.

3.2 Characteristics of the grid

1 $QUAD4$.

4 Results of modeling A

4.1 Sizes tested and results

One tests the nodal forces with the nodes $N2$ and $N4$, respectively in the directions y and x , at the moments $t=4,6$ and $t=10$.

Field FORC_NODA :

Identification	Reference	*Tolerance*
Node $N4$, Fx , moment $t=4,6$	$1,29\times10^{6}$	10^{-4} %
Node $N2$, Fy , moment $t=4,6$	$-1,4706\times10^{7}$	10^{-4} %
Node $N4$, Fx , moment $t=10$	10^{6}	10^{-4} %
Node $N2$, Fy , moment $t=10$	$-1,5\times10^{7}$	10^{-4} %

5 Summary of the results

The results are validated.