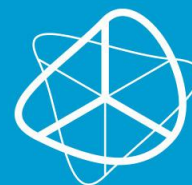


Debernardi T8 beam ATENA-C4A + ANSYS 2025R1

[1] ČERVENKA, V., ČERVENKA, J. A KADLEC, L. MODEL UNCERTAINTIES IN NUMERICAL SIMULATIONS OF REINFORCED CONCRETE STRUCTURES. *STRUCTURAL CONCRETE*. 2018, S. 1–18. DOI: 10.1002/SUCO.201700287.

[2] Červenka J., Červenka V., Laserna S. On crack band model in finite element analysis of concrete fracture in engineering practice. *Engineering Fracture Mechanics*. 2018;197:27-47. <https://doi.org/10.1016/j.engfracmech.2018.04.010>



DESIGNTEC
computer aided engineering

DEBERNARDI T8

- Modelled as symmetric half of the beam

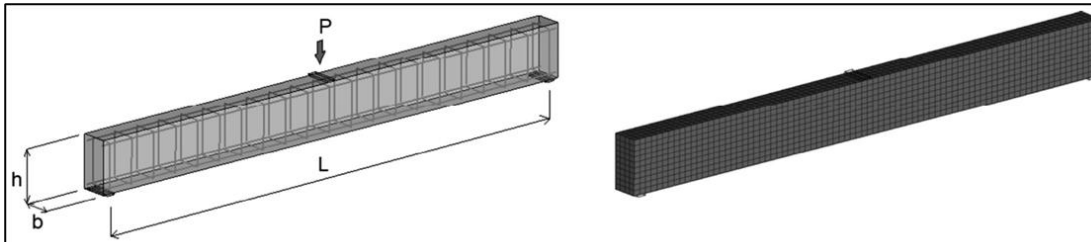
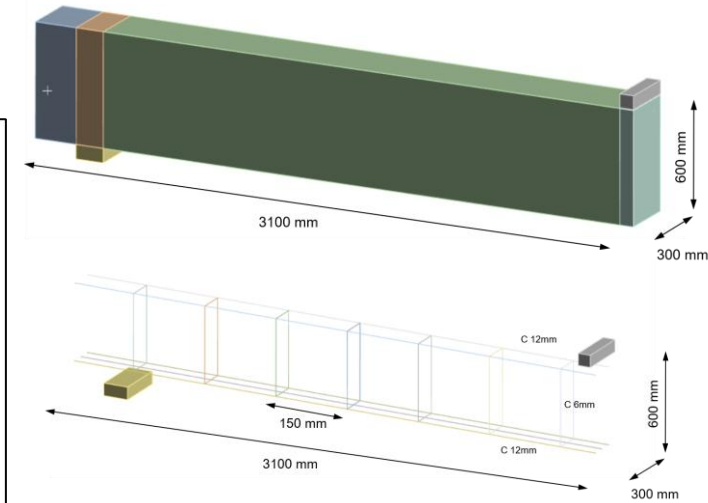


FIGURE 16 Beams tested by Debernardi and Taliano.¹⁸ Geometry (left), FE mesh (right)

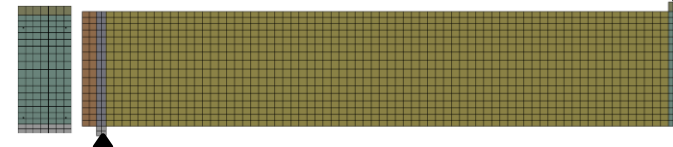
TABLE 5 Parameters of Debernardi beams

Slab	Span (mm)	h (mm)	b (mm)	Tens. Reinf.	ρ_b	Cover Tens.	Comp. Reinf.	Cover Comp.	Stirrups
T1	2000	200	100	1Ø12	0.0064	24	1Ø8	22	Ø6/150
T2	2000	200	100	2Ø12	0.0129	24	2Ø8	22	Ø6/150
T3	2000	200	100	3Ø12	0.0193	24	2Ø8	22	Ø6/150
T4	4,000	400	200	2Ø12	0.0031	35	2Ø10	45	Ø6/200
T5	4,000	400	200	4Ø12	0.0062	35	2Ø10	45	Ø6/200
T6	4,000	400	200	8Ø12	0.0126	40	2Ø10	45	Ø6/200
T7	4,000	400	200	12Ø12	0.0194	50	2Ø12	45	Ø6/200
T8	6,000	600	300	2Ø12	0.0013	35	2Ø12	70	Ø6/150
T9	6,000	600	300	4Ø12	0.0027	35	2Ø12	70	Ø6/150
T10	6,000	600	300	9Ø12	0.0060	35	2Ø12	70	Ø6/150
T11	6,000	600	300	18Ø12	0.0123	50	2Ø12	70	Ø6/150



ANSYS

Deformation from 0 to 150 mm
Free rotation of loading plate

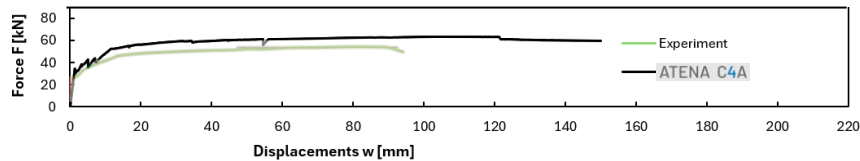
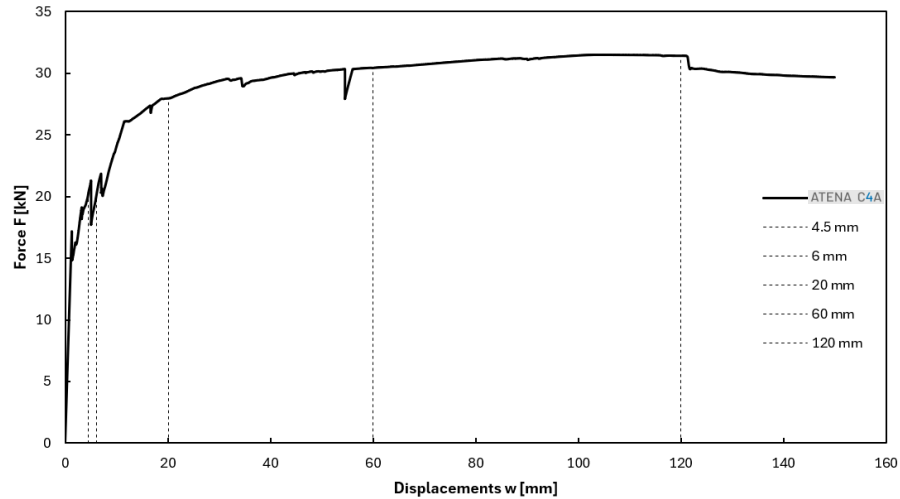


$u_x = \text{free}$
 $u_y = 0$
 $u_z = 0$

Symmetrical
geometry
 $u_x = 0$

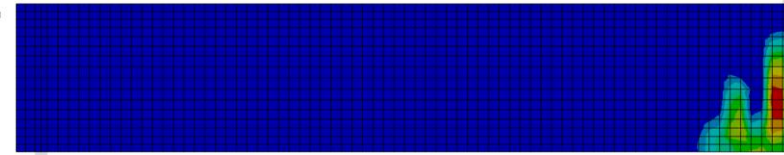
RESULTS

L-D diagram



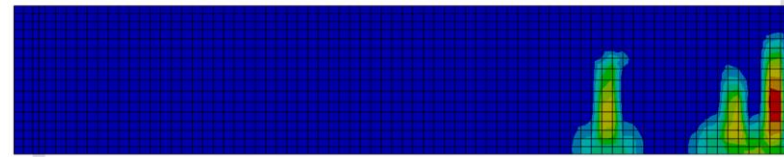
SVAR49 - Crack width for material direction X
Expression: SVAR50
Time: 4.4551 s
7/16/2026 8:03:27 AM

0.00013956 Max
0.00012405
0.00010855
9.304e-5
7.7533e-5
6.3027e-5
4.652e-5
3.1013e-5
1.5507e-5
0 Min



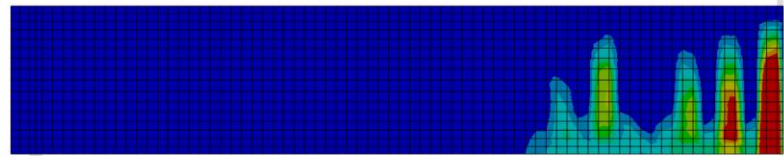
SVAR49 - Crack width for material direction X
Expression: SVAR50
Time: 6.0009 s
7/16/2026 8:04:00 AM

0.0001404 Max
0.0001248
0.0001092
9.3603e-5
7.8003e-5
6.2402e-5
4.6802e-5
3.1201e-5
1.5601e-5
0 Min



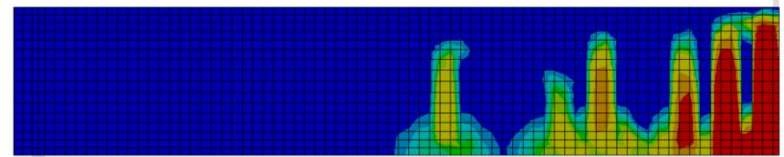
SVAR49 - Crack width for material direction X
Expression: SVAR50
Time: 20.051 s
7/16/2026 8:04:38 AM

0.00070067 Max
0.0003
0.0002625
0.000225
0.0001875
0.00015
0.0001125
7.5e-5
3.75e-5
0 Min



SVAR49 - Crack width for material direction X
Expression: SVAR50
Time: 60.039 s
7/16/2026 8:07:11 AM

0.0033891 Max
0.0003
0.0002
0.0001
8.3333e-5
6.6667e-5
5e-5
3.3333e-5
1.6667e-5
0 Min



SVAR49 - Crack width for material direction X
Expression: SVAR50
Time: 120.04 s
7/16/2026 8:07:40 AM

0.0064616 Max
0.0003
0.0002
0.0001
8.3333e-5
6.6667e-5
5e-5
3.3333e-5
1.6667e-5
0 Min

