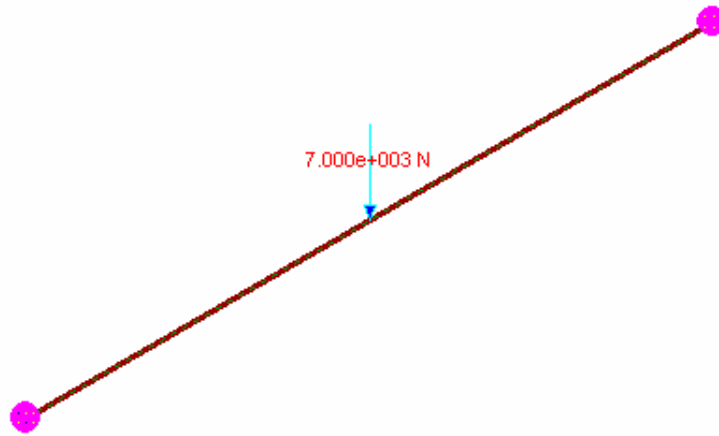
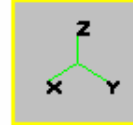


TEST SCHEDULE CASTALIA_STAT037BIS		
SOLVING	BEAM PROBLEM	SOL.SAR.STAT037BIS
FINITE ELEMENT	SOLVER	CLEVER (SARGON ©)



**Problem description:**

Beam (end 1 fixed - end 2 simply supported) with internal shear force

**Keywords (english):** validation, benchmark, statics, finite elements, fem, solver, precision, reliability, quality control, beam, error measure

**Keywords (italian):** validazione, benchmark, statica, elementi finiti, fem, solutore, precisione, affidabilità, controllo qualità, travi, misura di errore

**Editorial note:**

Target values are based on theoretical values, cross check values or accepted values. Where “theoretical” values are used, target values have been computed using well known formulae and/or published results.

**Note:**

Shear area is not used, that is shear energy neglected. Dxi and Dzi are the offsets from lower Z alignment leftmost available node.

TEST SCHEDULE CASTALIA_STAT037BIS		
SOLVING	BEAM PROBLEM	SOL.SAR.STAT037BIS
FINITE ELEMENT	SOLVER	CLEVER (SARGON ©)

GEOMETRY & CONSTRAINTS				
Full Length [mm]	Dx1 [mm]			Constraints
3000	1500	-	-	As shown

LOAD			
Type	Value	Point of application	
force concentrated	7.000e+003	Dx1	
		-	
		-	
		-	

MATERIAL					Fe360
$f_y$ [N/mm <sup>2</sup> ]	$f_u$ [N/mm <sup>2</sup> ]	E [N/mm <sup>2</sup> ]	$\nu$	$\alpha$	
2.350e+002	3.600e+002	2.060e+005	3.000e-001	1.200e-005	

CROSS-SECTION					Sezione1
A [mm <sup>2</sup> ]	J <sub>2</sub> [mm <sup>4</sup> ]	J <sub>3</sub> [mm <sup>4</sup> ]	J <sub>t</sub> [mm <sup>4</sup> ]	W <sub>2</sub> [mm <sup>3</sup> ]	W <sub>3</sub> [mm <sup>3</sup> ]
1.000e+000	1.000e+000	0.000e+000	0.000e+000	1.000e+000	0.000e+000
W <sub>pl2</sub> [mm <sup>3</sup> ]	W <sub>pl3</sub> [mm <sup>3</sup> ]	i <sub>2</sub> [mm]	i <sub>3</sub> [mm]	i <sub>t</sub> [mm]	
1.000e+000	0.000e+000	1.000e+000	0.000e+000	0.000e+000	

OTHER DATA					

TARGET VALUES	vs	COMPUTED VALUES
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Description	T <sub>v</sub>	T <sub>vk</sub>	C <sub>v</sub>	(C <sub>v</sub> - T <sub>v</sub> )	100 $\frac{T_v - C_v}{C_v}$
Shear T3, I extreme. Beam # 1. Load case # 1	4.8125e+003	Th	4.8125e+003	0.0000e+000	0.0000
Shear T3, J extreme. Beam # 1. Load case # 1	2.1875e+003	Th	2.1875e+003	0.0000e+000	0.0000
Bending M2, I extreme. Beam # 1. Load case # 1	-3.9375e+006	Th	-3.9375e+006	0.0000e+000	-0.0000
Bending M2, J extreme. Beam # 1. Load case # 1	0.0000e+000	Th	-4.6566e-010	-4.6566e-010	-0.0000

Cv computed value  
 Tv target value  
 TvK target value kind (theoretical, cross check, accepted).  
     Th theoretical value  
     Cr cross check value (theoretical target value is not known, results obtained with a different program are used as target values).  
     Ac accepted value (a value which, on the basis of some argument, can be considered acceptable).  
 100(Tv - Cv) / Cv relative error percentage

Computational notes:

**Authors:** Ing. Marco Croci, Ing. Paolo Rugarli  
**Computed errors:** checksolvers.exe, by Castalia srl.

