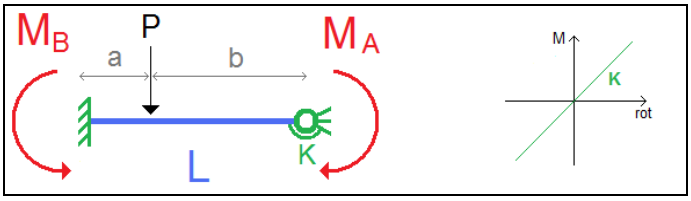
CURAN: BEAMS (HERMITIAN)	TEST 025	rev.1 21/10/13	version 10.70
VALIDATION, CROSS CHECKS, RELIABILITY, BENCHMARK	Tested by: Marco Croci - Checked by: Paolo Rugarli		



MODEL		
MODEL NAME	OUTPUT FILE	ANALYSIS TYPE
curanBE_025.WSR	curanBE_025.CS1.EEN	nonlinear static (Curan)

DATA						
L [mm]	P [N]	a [mm]	b [mm]	E [N/mm^2]	I [mm^4]	K [Nmm/rad]
1000	1000	500	500	210000	6.667E+03	4.200E+06

THEORETICAL COMPUTATION

Beam material is linear elastic (fibers are not modeled). End moments are:

$$M_A = \frac{rPL}{4-r}\frac{a}{L}\frac{b}{L}\left[3\left(1-\frac{a}{L}\right)\right] \qquad r = \frac{1}{1+\frac{3EI}{KL}} = 0.5 \qquad M_B = \frac{PL}{4-r}\frac{a}{L}\frac{b}{L}\left[2\left(1+\frac{a}{L}\right)-0.5\left(2-\frac{a}{L}\right)\right]$$

CROSS-CHECK

End Moment	Theory [Nmm]	Sargon [Nmm]	% difference (S-T)/T*100
$M_A=M_{1limit}$	5.357E+04	5.357E+04	0.0
$M_B=M_{B,total}$	1.607E+05	1.607E+05	0.0

NOTES
- L force is parallel to web (strong axis bending).
- Formulae for M_A and M_B computation given in *Practical Analysis of Semi-Rigid Frame Design*, Editor: W F Chen, World Scientific Publishing.
- r_i=0: hinge; r_i=1: fixed.
- shear area: not considered. Beam elements number: 2