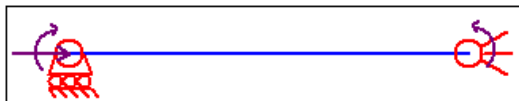


TEST SCHEDULE B 27	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 3	EC3.BUC.NNM3.002



Program: WEURO © version October 2007 for Sargon and Cescoplus
Keywords: EN 1993, Eurocode 3, example, validation, benchmark, reliability, quality control, error measure. **Parole chiave:** Eurocodice 3, esempio, validazione, test, affidabilità, controllo di qualità, misura dell'errore
Tv=exploitation target value, **Cv**=exploitation computed value
Authors: Ing. Marco Croci, Ing. Paolo Rugarli

BEAM			
Length [mm]	Buckling factors	Left end	Right end
1000	$\beta_2=1$ $\beta_3=1$	SIMPLY SUPPORTED	HINGE

LOAD			
Type	Value	Point of application	
COMPRESSION	N=10.000N	LEFT END	
Type	Value	Point of application	
BENDING MOMENT M_3	M=1.000.000Nmm	LEFT END	
BENDING MOMENT M_3	M=-1.000.000Nmm	RIGHT END	

MATERIAL	S275					
f_y [N/mm ²]	f_u [N/mm ²]	E [N/mm ²]	ν	γ_{M0}	γ_{M1}	γ_{M2}
275	430	2,10E+05	0,3	1,1	1,1	1,25

CROSS SECTION	O 54x3,2	CLASS: $N \rightarrow 1$ $M_3 \rightarrow 1$ $N + M_3 \rightarrow 1$ (reclasses method****)			
A [mm ²]	J_2 [mm ⁴]	J_3 [mm ⁴]	J_t [mm ⁴]	W_2 [mm ³]	W_3 [mm ³]
510,7	1,654e+05	1,654e+05	3,308e+05	6,126e+03	6,126e+03
W_{pl2} [mm ³]	W_{pl3} [mm ³]	i_2 [mm]	i_3 [mm]	i_t [mm]	
8,269E+03	8,269E+03	18	18	0	

OTHER DATA*				
	k_{yy}	k_{yz}	k_{zy}	k_{zz}
Method 1	/	0,608	/	1,013
Method 2	/	0,624	/	1,039

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$\begin{aligned}
 T_{v1,j} &= N / (\chi_2 A f_y / \gamma_{M1}) + k_{yz} M_3 / (W_{pl3} f_y / \gamma_{M1}) \\
 T_{v2,j} &= N / (\chi_3 A f_y / \gamma_{M1}) + k_{zz} M_3 / (W_{pl3} f_y / \gamma_{M1})
 \end{aligned}
 \left. \vphantom{\begin{aligned} T_{v1,j} \\ T_{v2,j} \end{aligned}} \right\} T_{v\text{method } j} = \max(T_{v1,j}, T_{v2,j})$$

$T_{v\text{method1}}^{**}$	$T_{v\text{method2}}^{***}$
5,796E-01	5,924E-01

CHECKER'S RESULTS (COMPUTED VALUES) AND COMPARISON WITH THE TARGET

$C_{v\text{method1}}$	$(C_{v1} - T_{v1}) / T_{v1}$	$C_{v\text{method2}}$	$(C_{v2} - T_{v2}) / T_{v2}$
5,796E-01	3,997E-05	5,924E-01	-1,940E-05

(*) formulae given in EN 1993-1-1 6.3.3, annex A and annex B

(**) more accurated

(***) easier to use

(****) P. Rugarli, *Strutture in acciaio, La classificazione delle sezioni, Commento all'Eurocodice 3*, EPC Libri, 2007