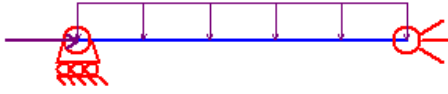


TEST SCHEDULE B 28	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 2	EC3.BUC.NN3.001



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	$\beta_1=0$ $\beta_2=1$ $\beta_3=1$	SIMPLY SUPPORTED		HINGE		
LOAD						
Type		Value		Point of application		
COMPRESSION		N=100.000N		LEFT END		
Type		Value				
DISTRIBUTED LOAD q_3		q=12N/mm				
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		IPE 100		CLASS: N' →1 M ₂ →1 N' + M ₂ →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]	
1032	1,710e+06	1,592e+05	1,202E+04	3,420e+04	5,789e+03	
W _{pl2} [mm ³]	W _{pl3}	i ₂ [mm]	i ₃ [mm]	i _t [mm]		
3,941e+04	9,145E+03	40,7	12,42	15,88		
h	b	t _w	t _f	r		
100	55	4,1	5,7	7		
OTHER DATA*						
		k _{yy}	k _{yz}	k _{zy}	k _{zz}	
Method 1		1,060	/	0,611	/	
Method 2		0,981	/	0,589	/	

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$\left. \begin{aligned} Tv_{1,j} &= N / (\chi_2 A f_y / \gamma_{M1}) + k_{yy} M_2 / (\chi_{LT} W_{pl2} f_y / \gamma_{M1}) \\ Tv_{2,j} &= N / (\chi_3 A f_y / \gamma_{M1}) + k_{zy} M_2 / (W_{pl2} f_y / \gamma_{M1}) \end{aligned} \right\} Tv_{method j} = \max(Tv_{1,j}, Tv_{2,j})$$

Tv _{method1} **	Tv _{method2} ***
6,954E-01	6,920E-01

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

Cv _{method1}	(Cv ₁ -Tv ₁)/Tv ₁	Cv _{method2}	(Cv ₂ -Tv ₂)/Tv ₂
6,953E-01	-1,804E-04	6,918E-01	-3,438E-04

(*) 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

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