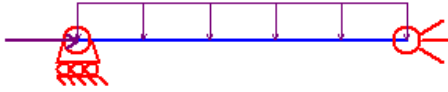


TEST SCHEDULE B 31	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 2	EC3.BUC.NN3.004



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
4000	$\beta_1=0$	$\beta_2=1$	$\beta_3=1$	FREE		FIXED
LOAD						
Type			Value		Point of application	
COMPRESSION			N=350.000N		LEFT END	
Type			Value			
DISTRIBUTED LOAD q_3			$q=70\text{N/mm}$			
MATERIAL						
S235		CLASS: $N \rightarrow 2$ $M_2 \rightarrow 1$ $N + M_2 \rightarrow 2$ (reclasses method****)				
f_y [N/mm ²]	f_u [N/mm ²]	E [N/mm ²]	ν	γ_{M0}	γ_{M1}	γ_{M2}
235	360	2,10E+05	0,3	1,1	1,1	1,25
CROSS SECTION		IPE 360				
A [mm ²]	J_2 [mm ⁴]	J_3 [mm ⁴]	J_t [mm ⁴]	W_2 [mm ³]	W_3 [mm ³]	
7273	1,627E+08	1,043E+07	3,732E+05	9,037E+05	1,228E+05	
W_{pl2} [mm ³]	W_{pl3}	i_2 [mm]	i_3 [mm]	i_t [mm]		
1,019E+06	1,911E+05	149,5	37,9	49,07		
h	b	t_w	t_f	r		
360	170	8	12,7	18		
OTHER DATA*						
		k_{yy}	k_{yz}	k_{zy}	k_{zz}	
Method 1		1,059	/	0,583	/	
Method 2		0,969	/	0,581	/	

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$\left. \begin{aligned} T_{v1,j} &= N / (\chi_2 A f_y / \gamma_{M1}) + k_{yy} M_2 / (\chi_L W_{pl2} f_y / \gamma_{M1}) \\ T_{v2,j} &= N / (\chi_3 A f_y / \gamma_{M1}) + k_{zy} M_2 / (W_{pl2} f_y / \gamma_{M1}) \end{aligned} \right\} T_{v\text{method } j} = \max(T_{v1,j}, T_{v2,j})$$

$T_{v\text{method1}}^{**}$	$T_{v\text{method2}}^{***}$
9,109E-01	8,525E-01

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

$C_{v\text{method1}}$	$(C_{v1} - T_{v1}) / T_{v1}$	$C_{v\text{method2}}$	$(C_{v2} - T_{v2}) / T_{v2}$
9,110E-01	8,035E-05	8,524E-01	-8,995E-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

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