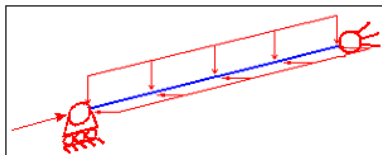


TEST SCHEDULE B 46	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 2 + BENDING 3	EC3.BUC.NNQ2Q3.005



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
4500	$\beta_1=0$	$\beta_2=1$	$\beta_3=1$	SIMPLY SUPPORTED		HINGE
LOAD						
Type			Value		Point of application	
COMPRESSION			N=500.000N		LEFT END	
Type			Value			
DISTRIBUTED LOAD q_2			q=50N/mm			
Type			Value			
DISTRIBUTED LOAD q_3			q=150N/mm			
MATERIAL						
S235		CLASS: N $\rightarrow$ 1 M ₂ $\rightarrow$ 1 M ₃ $\rightarrow$ 1 N + M ₂ + M ₃ $\rightarrow$ 1 (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						
HE 300 M						
A [mm ²]	J ₂ [mm ⁴]	J ₃ [mm ⁴]	J _t [mm ⁴]	W ₂ [mm ³]	W ₃ [mm ³]	
30308	5,920E+08	1,940E+08	1,408E+07	3,482E+06	1,252e+06	
W _{pl2} [mm ³]	W _{pl3} [mm ³]	i ₂ [mm]	i ₃ [mm]	i _t [mm]		
4,078E+06	1,913E+06	139,8	80	89,49		
h	b	t _w	t _f	r		
340	310	21	39	27		
OTHER DATA*						
	k_{yy}	k_{yz}	k_{zy}	k_{zz}		
Method 1	0,999	0,663	0,534	0,984		
Method 2	0.961	0.603	0.577	1.006		

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$\left. \begin{aligned}
 T_{v1,j} &= N / (\chi_2 A f_y / \gamma_{M1}) + k_{yy} M_2 / (W_{pl2} f_y / \gamma_{M1}) + k_{yz} M_3 / (W_{pl3} f_y / \gamma_{M1}) \\
 T_{v2,j} &= N / (\chi_3 A f_y / \gamma_{M1}) + k_{zy} M_2 / (W_{pl2} f_y / \gamma_{M1}) + k_{zz} M_3 / (W_{pl3} f_y / \gamma_{M1})
 \end{aligned} \right\} T_{v\text{method } j} = \max(T_{v1,j}, T_{v2,j})$$

$T_{v\text{method}1}^{**}$	$T_{v\text{method}2}^{***}$
7,221E-01	6,872E-01

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

$C_{v\text{method}1}$	$(C_{v1} - T_{v1}) / T_{v1}$	$C_{v\text{method}2}$	$(C_{v2} - T_{v2}) / T_{v2}$
7,222E-01	1,574E-04	6,872E-01	-5,103E-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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