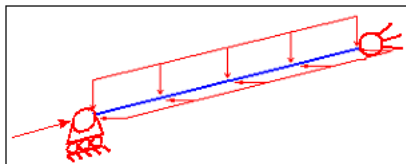


TEST SCHEDULE B 44	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 2 + BENDING 3	EC3.BUC.NNQ2Q3.003



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	$\beta_1=0 \quad \beta_2=1 \quad \beta_3=1$	SIMPLY SUPPORTED	HINGE

LOAD		
Type	Value	Point of application
COMPRESSION	N=500.000N	LEFT END
Type	Value	
DISTRIBUTED LOAD q_2	$q=10\text{N/mm}$	
Type	Value	
DISTRIBUTED LOAD q_3	$q=20\text{N/mm}$	

MATERIAL	S355					
f_y [N/mm ²]	f_u [N/mm ²]	E [N/mm ²]	ν	γ_{M0}	γ_{M1}	γ_{M2}
355	510	2,10e+05	0,3	1,1	1,1	1,25

CROSS SECTION	RHS 90x90x7x14	CLASS: N ⁺ →1 M ₂ →1 M ₃ →1 N ⁺ + M ₂ + M ₃ →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]
2198	2,486e+06	2,486e+06	4,117e+06	5,525e+04	5,525e+04
W_{pl2} [mm ³]	W_{pl3} [mm ³]	i_2 [mm]	i_3 [mm]	i_t [mm]	
6,699e+04	6,699e+04	33,63	33,63	0	
h	b	t	r		
90	90	7	14		

OTHER DATA*				
	k_{yy}	k_{yz}	k_{zy}	k_{zz}
Method 1	0,927	0,563	0,563	0,927
Method 2	1,083	0,650	0,650	1,083

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

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

$T_{v\text{method1}}^{**}$	$T_{v\text{method2}}^{***}$
8,774E-01	9,004E-01

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

$C_{v\text{method1}}$	$(C_{v1} - T_{v1}) / T_{v1}$	$C_{v\text{method2}}$	$(C_{v2} - T_{v2}) / T_{v2}$
8,776E-01	2,090E-04	9,004E-01	4,524E-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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