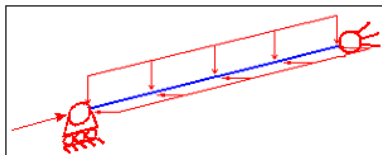


TEST SCHEDULE B 47	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 2 + BENDING 3	EC3.BUC.NNQ2Q3.Q06



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=50.000N		LEFT END		
Type		Value				
DISTRIBUTED LOAD q_2		q=15N/mm				
Type		Value				
DISTRIBUTED LOAD q_3		q=25N/mm				
MATERIAL		S235				
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		CLASS: N ⁻ →2 M ₂ →1 M ₃ →2 N ⁻ + M ₂ + M ₃ →2 (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]	
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	1,012	0,738	0,530	1,040		
Method 2	0.954	0.628	0.572	1.046		

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

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

$T_{v\text{method1}}$ **	$T_{v\text{method2}}$ ***
1,194E+00	1,212E+00

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

$C_{v\text{method1}}$	$(C_{v1} - T_{v1}) / T_{v1}$	$C_{v\text{method2}}$	$(C_{v2} - T_{v2}) / T_{v2}$
1,195E+00	6,507E-04	1,212E+00	1,270E-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