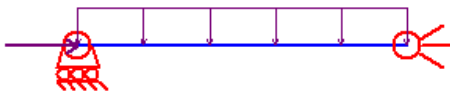


<b>TEST SCHEDULE B 28</b>	<b>EN 1993-1-1: 2005 (EUROCODE 3)</b>	<b>Sargon ©, Cescopius ©</b>
BUCKLING	COMPRESSION + BENDING 2	<b>EC3.BUC.NN3.001</b>



**Program:** WEURO © version October 2007 for Sargon and Cescopius  
**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

<b>BEAM</b>			
Length [mm]	Buckling factors	Left end	Right end
1000	$\beta_1=0 \quad \beta_2=1 \quad \beta_3=1$	SIMPLY SUPPORTED	HINGE

<b>LOAD</b>			
Type	Value	Point of application	
COMPRESSION	N=100.000N	LEFT END	
Type	Value		
DISTRIBUTED LOAD $q_3$	$q=12\text{N/mm}$		

<b>MATERIAL</b>	<b>S275</b>					
$f_y$ [N/mm <sup>2</sup> ]	$f_u$ [N/mm <sup>2</sup> ]	E [N/mm <sup>2</sup> ]	$\nu$	$\gamma_{M0}$	$\gamma_{M1}$	$\gamma_{M2}$
275	430	2,10E+05	0,3	1,1	1,1	1,25

<b>CROSS SECTION</b>	<b>IPE 100</b>	<b>CLASS: N → 1 M<sub>2</sub> → 1 N + M<sub>2</sub> → 1 (reclasses method****)</b>			
A [mm <sup>2</sup> ]	J <sub>2</sub> [mm <sup>4</sup> ]	J <sub>3</sub> [mm <sup>4</sup> ]	J <sub>t</sub> [mm <sup>4</sup> ]	W <sub>2</sub> [mm <sup>3</sup> ]	W <sub>3</sub> [mm <sup>3</sup> ]
1032	1,710e+06	1,592e+05	1,202E+04	3,420e+04	5,789e+03
W <sub>pl2</sub> [mm <sup>3</sup> ]	W <sub>pl3</sub>	i <sub>2</sub> [mm]	i <sub>3</sub> [mm]	i <sub>t</sub> [mm]	
3,941e+04	9,145E+03	40,7	12,42	15,88	
h	b	t <sub>w</sub>	t <sub>f</sub>	r	
100	55	4,1	5,7	7	

<b>OTHER DATA*</b>				
	$k_{yy}$	$k_{yz}$	$k_{zy}$	$k_{zz}$
Method 1	1,060	/	0,611	/
Method 2	0,981	/	0,589	/

#### TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

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

Tv <sub>method1</sub> **	Tv <sub>method2</sub> ***
6,954E-01	6,920E-01

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

Cv <sub>method1</sub>	(Cv <sub>1</sub> -Tv <sub>1</sub> )/Tv <sub>1</sub>	Cv <sub>method2</sub>	(Cv <sub>2</sub> -Tv <sub>2</sub> )/Tv <sub>2</sub>
6,953E-01	<b>-1,804E-04</b>	6,918E-01	<b>-3,438E-04</b>

(\*) 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