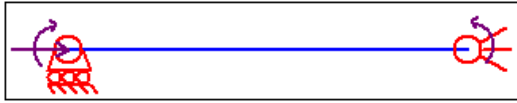


TEST SCHEDULE B 26	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
BUCKLING	COMPRESSION + BENDING 3	EC3.BUC.NNM3.001



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=100.000N	LEFT END	
Type	Value	Point of application	
BENDING MOMENT M_3	M=1.000.000.000Nmm	LEFT END	
BENDING MOMENT M_3	M=-1.000.000.000Nmm	RIGHT END	

MATERIAL	S275					
f_y [N/mm ²]	f_u [N/mm ²]	E [N/mm ²]	ν	γ_{M0}	γ_{M1}	γ_{M2}
275→255	430	2,10E+05	0,3	1,1	1,1	1,25

CROSS SECTION	HSH 600X828	CLASS: N → 1 M₃ → 1 N + M₃ → 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]
1,055E+05	6,544e+09	2,737e+09	1,813e+08	2,181e+07	9,124e+06
W _{pl2} [mm ³]	W _{pl3} [mm ³]	i ₂ [mm]	i ₃ [mm]	i _t [mm]	
2,550e+07	1,379e+07	149	161	173,2	
h	b ₁ =b ₂	t _w	t _{f1} =t _{f2}		
600	600	32	76		

OTHER DATA*				
	k_{yy}	k_{yz}	k_{zy}	k_{zz}
Method 1	/	0,677	/	0,996
Method 2	/	0,599	/	0,998

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$TV_{1,j} = N / (\chi_2 A f_y / \gamma_{M1}) + k_{yz} M_3 / (W_{pl3} f_y / \gamma_{M1})$$

$$TV_{2,j} = N / (\chi_3 A f_y / \gamma_{M1}) + k_{zz} M_3 / (W_{pl3} f_y / \gamma_{M1})$$

$$TV_{method\ j} = \max(TV_{1,j}, TV_{2,j})$$

TV _{method1} **	TV _{method2} ***
3,157E-01	3,163E-01

CHECKER'S RESULTS (COMPUTED VALUES) AND COMPARISON WITH THE TARGET			
Cv _{method1}	(Cv ₁ -Tv ₁)/Tv ₁	Cv _{method2}	(Cv ₂ -Tv ₂)/Tv ₂
3,156E-01	-2,984E-04	3,162E-01	-3,828E-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

According to table 3.1 when cross section thickness is higher than 40mm yield stress should be decreased. Here a yield stress equal to 255N/mm² has been used.