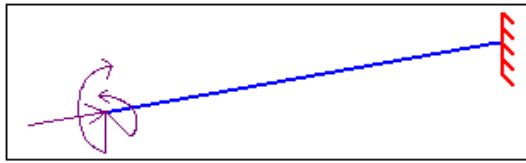


TEST SCHEDULE R 40	EN 1993-1-1: 2005 (EUROCODE 3)	Sargon ©, Cescoplus ©
RESISTANCE	COMPRESSION + BENDING 2 + BENDING 3	EC3.RES.NNM2M3.001



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]	Left end	Right end
5000	FREE	FIXED

LOADS			
Type	Value	Point of application	
BENDING MOMENT M_2	$M=100.000.000\text{Nmm}$	LEFT END	
Type	Value	Point of application	
BENDING MOMENT M_3	$M=5.000.000\text{Nmm}$	LEFT END	
Type	Value	Point of application	
COMPRESSION	$N=800.000\text{N}$	LEFT END	

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 M₂ → 1 M₃ → 2 N⁻ + M₂ + M₃ → 2 (reclasses metod*)			
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				
$a=(A-2bt_f)/A$	N_{pl} [N]	$n=N_{Ed}/N_{pl}$	$M_{pl,y}=W_{pl,y} \cdot f_y / \gamma_{M0}$ [Nmm]	$M_{Ny}=M_{pl,y} \cdot (1-n) / (1-0,5a)$ [Nmm]
0,406	1,554E+06	0,515	2,177E+08	1,325E+08
$M_{pl,z}=W_{pl,z} \cdot f_y / \gamma_{M0}$ [Nmm]	$M_{Nz}=M_{pl,y} [1 - ((n-a)/(1-a))^2]$ [Nmm]		α	$\beta=5n$
4,083E+07	3,946E+07		2	2,574

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$T_v = (M_2/M_{N2})^\alpha + (M_3/M_{N3})^\beta$$

T_v
5,742E-01

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

C_v	$(C_v - T_v) / T_v$
5,740E-01	-3,644E-04

(*) P. Rugarli, *Strutture in acciaio, La classificazione delle sezioni, Commento all'Eurocodice 3*, EPC Libri, 2007