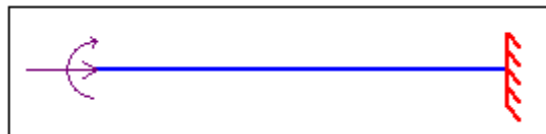


<b>TEST SCHEDULE R 39</b>	<b>EN 1993-1-1: 2005 (EUROCODE 3)</b>	<b>Sargon ©, Cescoplus ©</b>
RESISTANCE	COMPRESSION + BENDING 2	<b>EC3.RES.NNM2.004</b>



**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

<b>BEAM</b>		
Length [mm]	Left end	Right end
5000	FREE	FIXED

<b>LOADS</b>			
Type	Value	Point of application	
BENDING MOMENT $M_2$	$M=70.000.000\text{Nmm}$	LEFT END	
Type	Value	Point of application	
COMPRESSION	$N=900.000\text{N}$	LEFT END	

<b>MATERIAL</b>	<b>S235</b>					
$f_y$ [N/mm <sup>2</sup> ]	$f_u$ [N/mm <sup>2</sup> ]	$E$ [N/mm <sup>2</sup> ]	$\nu$	$\gamma_{M0}$	$\gamma_{M1}$	$\gamma_{M2}$
235	360	2,10E+05	0,3	1,1	1,1	1,25

<b>CROSS-SECTION</b>	<b>HE 200 B</b>	<b>CLASS: N<sup>-</sup> →1 M<sub>2</sub> →1 N<sup>+</sup> + M<sub>2</sub> →1 (reclasses method*)</b>			
A [mm <sup>2</sup> ]	$J_2$ [mm <sup>4</sup> ]	$J_3$ [mm <sup>4</sup> ]	$J_t$ [mm <sup>4</sup> ]	$W_2$ [mm <sup>3</sup> ]	$W_3$ [mm <sup>3</sup> ]
7808	5,696e+07	2,003e+07	5,928e+05	5,696e+05	2,003e+05
$W_{pl2}$ [mm <sup>3</sup> ]	$W_{pl3}$ [mm <sup>3</sup> ]	$i_2$ [mm]	$i_3$ [mm]	$i_t$ [mm]	
6,426e+05	3,058e+05	85,40	50,70	57,74	
h	b	$t_w$	$t_f$	r	
200	200	9	15	18	

<b>OTHER DATA</b>				
$a=(A-2bt_f)/A$	$N_{pl}$ [N]	$n=N_{sd}/N_{pl}$	$M_{pl}=W_{pl}^*f_y/\gamma_{M0}$ [Nmm]	$M_N=M_{pl}(1-n)/(1-0,5a)$ [Nmm]
0,232	1,668E+06	0,540	1,373E+08	7,149E+07

**TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS**

$$T_v = M_2 / M_N$$

9,792E-01

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

$C_v$	$(C_v - T_v) / T_v$
9,792E-01	<b>3,603E-05</b>

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