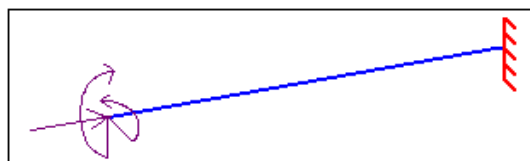


<b>TEST SCHEDULE R 42</b>	<b>EN 1993-1-1: 2005 (EUROCODE 3)</b>	<b>Sargon ©, Cescoplus ©</b>
<b>RESISTANCE</b>	<b>COMPRESSION + BENDING 2 + BENDING 3</b>	<b>EC3.RES.NNM2M3.003</b>



**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
1000	FREE	FIXED

<b>LOADS</b>			
Type	Value	Point of application	
BENDING MOMENT $M_2$	$M=4.000.000.000\text{Nmm}$	LEFT END	
Type	Value	Point of application	
BENDING MOMENT $M_3$	$M=3.000.000.000\text{Nmm}$	LEFT END	
Type	Value	Point of application	
COMPRESSION	$N=25.000.000\text{N}$	LEFT END	

<b>MATERIAL</b>	<b>S490</b>					
$f_y$ [N/mm <sup>2</sup> ]	$f_u$ [N/mm <sup>2</sup> ]	$E$ [N/mm <sup>2</sup> ]	$\nu$	$\gamma_{M0}$	$\gamma_{M1}$	$\gamma_{M2}$
490	570	2,10E+05	0,3	1,1	1,1	1,25

<b>CROSS SECTION</b>	<b>HSH 600X828</b>	<b>CLASS: N<sup>+</sup> →1 M<sub>2</sub> →1 M<sub>3</sub> →1 N<sup>+</sup> + M<sub>2</sub> + M<sub>3</sub> →1 (reclasses metod*)</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> ]
1,055E+05	6,544e+09	2,737e+09	1,813e+08	2,181e+07	9,124e+06
$W_{pl2}$ [mm <sup>3</sup> ]	$W_{pl3}$ [mm <sup>3</sup> ]	$i_2$ [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		

<b>OTHER DATA</b>				
$a=(A-2bt_f)/A$	$N_{pl}=Af_y/\gamma_{M0}$ [N]	$M_{pl2}=W_{pl2}f_y/\gamma_{M0}$ [Nmm]	$M_{pl3}=W_{pl3}f_y/\gamma_{M0}$ [Nmm]	$n=N/N_{pl}$
0,136	43.173.818	10.431.818.182	5.641.363.636	0,579
$\alpha$	$\beta=5n$	$M_{N2}=M_{pl2}(1-n)/(1-0,5\alpha)$ [Nmm]	$M_{N3}=M_{pl3}[1-((n-a)/(1-a))^2]$ [Nmm]	Reduced $f_y$ [N/mm <sup>2</sup> ]
2	2,895	4.711.615.234	4.157.919.488	450

**TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS**

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

$T_v$
1,109E+00

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

$C_v$	$(C_v - T_v)/T_v$
1,109E+00	<b>-3,722E-04</b>

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

NOTE: According to table 3.1 when cross section thickness is higher than 40mm yield stress should be decreased: here a yield stress equal to 450N/mm<sup>2</sup> has been used.

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