

| | | |
|--------------------------|---------------------------------------|------------------------------|
| TEST SCHEDULE B 7 | EN 1993-1-1: 2005 (EUROCODE 3) | Sargon ©, Cescoplus © |
| BUCKLING | COMPRESSION | EC3.BUC.NN.007 |



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 | $\beta_1=0 \quad \beta_2=1 \quad \beta_3=1$ | HINGE | SIMPLY SUPPORTED |

| | | |
|-------------|------------|----------------------|
| LOAD | | |
| Type | Value | Point of application |
| COMPRESSION | N=100.000N | 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 | 430 | 2,10E+05 | 0,3 | 1,1 | 1,1 | 1,25 |

| | | | | | |
|------------------------------|------------------------------|---------------------------------|--------------------------|--------------------------|--------------------------|
| CROSS-SECTION | UPN 120 | CLASS: N⁻ → 1 | | | |
| A [mm ²] | J_2 [mm ⁴] | J_3 [mm ⁴] | J_t [mm ⁴] | W_2 [mm ³] | W_3 [mm ³] |
| 1698 | 3,642e+06 | 4,320e+05 | 4,15e+04 | 6,071e+04 | 1,106e+04 |
| W_{pl2} [mm ³] | W_{pl3} [mm ³] | i_2 [mm] | i_3 [mm] | i_t [mm] | |
| 7,268e+04 | 2,127e+04 | 46,31 | 15,93 | 15,88 | |
| h | b | t_w | t_f | r | r1 |
| 120 | 55 | 7 | 9 | 9 | 4,5 |

| | | | | | |
|--------------------|------------|-------------|-------------|-------------------|-------------------|
| OTHER DATA* | | | | | |
| α_2 | α_3 | λ_2 | λ_3 | $\bar{\lambda}_2$ | $\bar{\lambda}_3$ |
| 0,49 | 0,49 | 21,59 | 62,77 | 0,249 | 0,723 |
| Φ_2 | Φ_3 | χ_2 | χ_3 | $N_{b2,Rd}$ [N] | $N_{b3,Rd}$ [N] |
| 0,543 | 0,890 | 0,975 | 0,710 | (413.989) | 301.557 |

TARGET VALUES BASED ON PRELIMINAR COMPUTATIONS

$$Tv = N/N_{b3,Rd}$$

| |
|-----------|
| Tv |
| 3,316E-01 |

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

| | |
|-----------|-------------------|
| Cv | (Cv-Tv)/Tv |
| 3,316E-01 | -3,613E-05 |

(*) formulae for $\lambda_{2,3}$, $\bar{\lambda}_{2,3}$, $\chi_{2,3}$ and $N_{b2,3,Rd}$ are given in EN 1993-1-1 6.3.1