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NORME EUROPÉENNE

EUROPÄISCHE NORM

**EN 1993-1-9:2005/AC**

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English version  
Version Française  
Deutsche Fassung

**Eurocode 3: Design of steel structures - Part 1-9: Fatigue**

**Eurocode 3: Calcul des structures en acier  
- Partie 1-9: Fatigue**

**Eurocode 3: Bemessung und Konstruktion  
von Stahlbauten - Teil 1-9: Ermüdung**

This corrigendum becomes effective on 1 April 2009 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 1 avril 2009 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 1. April 2009 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No.: EN 1993-1-9:2005/AC:2009 D/E/F

## **Modifications due to EN 1993-1-9:2005/AC:2005**

### **1) Modification to Clause 2**

*The corrections are to add a "P" after the clause number and replace "should" with "shall" where appropriate. The corrections are underlined as shown.*

"

(1)P Structural members shall be designed for fatigue such that there is an acceptable level of probability that their performance will be satisfactory throughout their design life.

"

## **Modifications due to EN 1993-1-9:2005/AC:2009**

### **2) Modification to Clause 3**

*Paragraph '(7)', list entry 'b)', change "the  $\beta$  – values equal to those for ultimate limit state verifications" into: "the  $\beta$ -values to be at least equal to those required for ultimate limit state verifications".*

### **3) Modifications to Clause 4**

*Paragraph '(2)', change the text in the last sentence between the brackets "(see Table 4.1 for circular sections, Table 4.2 for rectangular sections)" into: "(see Table 4.1 for circular hollow sections, Table 4.2 for rectangular hollow sections; these sections are subject to the geometrical restrictions according to Table 8.7)".*

*Paragraph '(2)', 'Table 4.1' and 'Table 4.2', in the columns 'Verticals' for 'K-type joints', change "1,0" into: "-".*

*Paragraph '(2)', 'NOTE', change "NOTE" into: "NOTE 1".*

*Paragraph '(2)', add:*

"

NOTE 2 Ranges of geometric validity:

For CHS planar joints (K-, N-, KT-joints):

$$0,30 \leq \beta \leq 0,60$$

$$12,0 \leq \gamma \leq 30,0$$

$$0,25 \leq \tau \leq 1,00$$

$$30^\circ \leq \theta \leq 60^\circ$$

For SHS joints (K-, N-, KT-joints):

$$0,40 \leq \beta \leq 0,60$$

$$6,25 \leq \gamma \leq 12,5$$

$$0,25 \leq \tau \leq 1,00$$

$$30^\circ \leq \theta \leq 60^\circ$$

".

#### 4) Modification to Clause 5

Paragraph '(5)', 'NOTE', change reference to "8(2)" into: "8(3)".

#### 5) Modification to 7.1

Paragraph '(2)', change "For constant amplitude nominal stresses fatigue strengths can" into: "For constant amplitude nominal stress ranges the fatigue strength can".

#### 6) Modifications to Clause 8

Paragraph '(4)', 'NOTE 1', change "adopted for shear stress ranges" into: "adopted also for shear stress ranges".

'Table 8.1', second row '[Detail category] 160', third column, change in this cell:

- the description "Rolled and extruded products:" into: "Rolled or extruded products:";
- the description "Plates and flats" into: "Plates and flats with as rolled edges";
- the description: "Rolled sections" into: "Rolled sections with as rolled edges".

'Table 8.1', fifth row '[Detail category] 100 (m=5)', third column, change in this cell "Rolled and extruded products" into: "Rolled or extruded products".

'Table 8.2', third column 'Description', 2<sup>nd</sup>, 3<sup>d</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> rows '[Detail categories] 125, 112, 100 and 140', change in the cells the description "Automatic" into: "Automatic or fully mechanized".

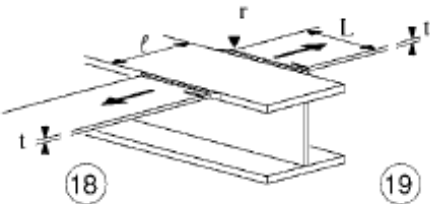
'Table 8.2', fourth column 'Requirements', 9<sup>th</sup> row, delete from the cell: "Free from defects outside the tolerances of EN 1090".

'Table 8.3', 2nd row, right-hand column, change in the cell "rewelded" into: "welded".

'Table 8.3 (continued)', last row, 1st column, change the text "As detail 1 in Table 8.5" into: "40".

'Table 8.3 (continued)', last row, 2nd column, delete the indication of the plate thickness: "t" from the following figure:

"

|                          |                                                                                     |                                                             |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|
| As detail 1 in Table 8.5 |  | 18) Transverse butt weld at intersecting flanges.           |
| As detail 4 in Table 8.4 |                                                                                     | 19) With transition radius according to Table 8.4, detail 4 |

"

'Table 8.4', 8th, 9th and 10th rows, 3rd column in these rows, delete:

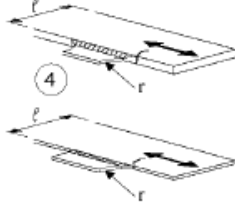
"

L: attachment length as in detail 1, 2 or 3

"

from the following figure:

"

|    |                                                              |                                                                                                                                      |
|----|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 90 | $\frac{r}{L} \geq \frac{1}{3}$<br>or<br>$r > 150 \text{ mm}$ |  <p>L: attachment length as in detail 1, 2 or 3</p> |
| 71 | $\frac{1}{6} \leq \frac{r}{L} \leq \frac{1}{3}$              |                                                                                                                                      |
| 50 | $\frac{r}{L} < \frac{1}{6}$                                  |                                                                                                                                      |

"

'Table 8.4', 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> rows, 2<sup>nd</sup> column in these rows (see just above), change in the second column " $\frac{r}{L}$ " into:  
" $\frac{r}{\ell}$ ".

'Table 8.5', 11<sup>th</sup> row '36\*', 3<sup>rd</sup> column, change:

"

3) Root failure in partial penetration Tee-butt joints or fillet welded joint and effective full penetration in Tee-butt joint.

"

into:

"

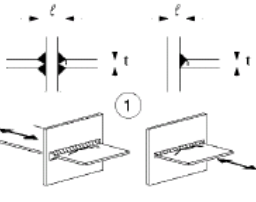
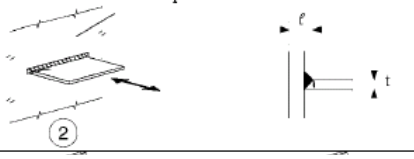
3) Root failure in partial penetration Tee-butt joints or fillet welded joint and in Tee-butt weld, according to Figure 4.6 in EN 1993-1-8:2005.

"

'Table 8.5', 2<sup>nd</sup> column, 2<sup>nd</sup> and 3<sup>rd</sup> rows:

"

Table 8.5: Load carrying welded joints

| Detail category          | Constructional detail  |                                                                                     | Description                                                                                                                                                                                                   | Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 80                       | $\ell < 50 \text{ mm}$ | all t [mm]                                                                          |  <p>Cruciform and Tee joints:</p> <p>1) Toe failure in full penetration butt welds and all partial penetration joints.</p> | <p>1) Inspected and found free from discontinuities and misalignments outside the tolerances of EN 1090.</p> <p>2) For computing <math>\Delta\sigma</math>, use modified nominal stress.</p> <p>3) In partial penetration joints two fatigue assessments are required. Firstly, root cracking evaluated according to stresses defined in section 5, using category 36* for <math>\Delta\sigma_w</math> and category 80 for <math>\Delta\sigma_{\infty}</math>. Secondly, toe cracking is evaluated by determining <math>\Delta\sigma</math> in the load-carrying plate.</p> |
| 71                       | $50 < \ell \leq 80$    | all t                                                                               |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 63                       | $80 < \ell \leq 100$   | all t                                                                               |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 56                       | $100 < \ell \leq 120$  | all t                                                                               |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 56                       | $\ell \geq 120$        | $t \leq 20$                                                                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 50                       | $120 < \ell \leq 200$  | $t \geq 20$                                                                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 45                       | $200 < \ell \leq 300$  | $20 < t \leq 30$                                                                    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 40                       | $\ell > 300$           | $30 < t \leq 50$                                                                    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| As detail 1 in Table 8.5 | flexible panel         |  | <p>2) Toe failure from edge of attachment to plate, with stress peaks at weld ends due to local plate deformations.</p>                                                                                       | <p>Details 1) to 3):<br/>The misalignment of the load-</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

"

as the figures in Table 8.5 as shown below should be made more clear as done in the German version, insert the same figures from the German version (see below):

"

**Tabelle 8.5: Geschweißte Stöße**

| Kerbfall                      | Konstruktionsdetail            | Beschreibung                                                                                                                                                                                                                                                                                                                                          | Anforderungen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 80                            | $\ell < 50$                    | <b>Kreuz- und T-Stöße:</b><br><br>1) Riß am Schweißnahtübergang in voll durchgeschweißten Stumpfnähten und allen nicht durchgeschweißten Nähten.<br><br>2) Riß am Schweißnahtübergang, ausgehend von der Kante des Anschlußbleches, mit Spanungskonzentrationen an den Schweißnahtenden infolge Blechverformungen.<br><br>3) Wurzelriß bei nicht voll | 1) Nach Prüfung frei von Diskontinuitäten und Exzentrizitäten außerhalb der Toleranzen nach EN 1090.<br><br>2) $\Delta\sigma$ ist mit korrigierten Nennspannungsschwingbreiten zu ermitteln.<br><br>3) Es sind 2 Ermüdungsnachweise erforderlich: zum einen der Nachweis gegen Riß der Schweißnahtwurzel mit Spannungen nach Kapitel 5 mit Kerbgruppe 36* für $\sigma_w$ und Kerbgruppe 80 für $\tau_w$ , zum anderen der Nachweis des Nahtüberganges mit Bestimmung von $\Delta\sigma$ in den belasteten Blechen. |
| 71                            | $50 < \ell \leq 80$            |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 63                            | $80 < \ell \leq 100$           |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 56                            | $100 < \ell \leq 120$          |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 56                            | $\ell > 120$                   |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 50                            | $120 < \ell \leq 200$          |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 45                            | $200 < \ell \leq 300$          |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 40                            | $\ell > 300$                   |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| wie Kerbfall 1 in Tabelle 8.5 | verformbares Anschlußblech<br> |                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

"