Singapore Standard SS EN 1991-3:2010(2023)

Eurocode 1 – Actions on structures
– Part 3: Actions induced by cranes and machinery

CORRIGENDUM NO. 1

January 2023

This Corrigendum is an identical adoption of EN 1991-3:2006/AC:2012 published by the European Committee for Standardisation.

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Version Française
Deutsche Fassung

Eurocode 1 - Actions on structures - Part 3: Actions induced by cranes and machinery

Eurocode 1 - Actions sur les structures - Partie 3: Actions induites par les appareils de levage et les machines

Eurocode 1 - Einwirkungen auf Tragwerke - Teil 3: Einwirkungen infolge von Kranen und Maschinen

This corrigendum becomes effective on 5 December 2012 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 5 décembre 2012 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 5. Dezember 2012 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

1 Modifications to 1.2

Just above the reference to EN 1990, add the following new reference:

"

EN 1090-2	Execution of steel structures and aluminium structures – Part 2: Technical requirements for steel structures

".

On the last line, replace:

"

EN 1993-6	Design of steel structures – Part 6: Crane runway beams

"

with:

"

EN 1993-6	Design of steel structures – Part 6: Crane supporting structures

".

2 Modification to 1.3

In Paragraph (1), replace "prEN 1991" *with* "EN 1991".

3 Modification to 1.5

In Paragraph (2), in the list Greek lower case letters, replace:

"

$\varphi_1, \varphi_2, \varphi_3$ $\varphi_4, \varphi_5, \varphi_6, \varphi_7$	dynamic factor applied to actions induced by cranes

"

with:

"

$\varphi_1, \varphi_2, \varphi_3$ $\varphi_4, \varphi_5, \varphi_6, \varphi_7$	dynamic factor applied to actions induced by cranes

".

4 Modification to 2.1

Replace the two bullet points with the following ones:

"

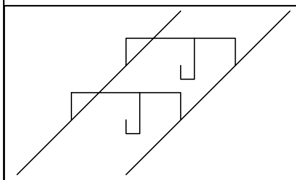
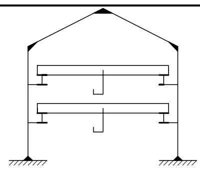
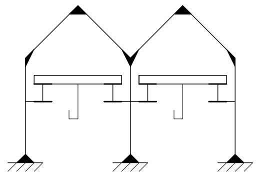
- monorail hoist blocks, see 2.5.1,
- overhead travelling cranes, see 2.5.2.

".

5 Modification to 2.5.3

In Paragraph (2), replace Table 2.3 with the following:

"

	For crane runway	**For crane supporting structures**	
		Single-bay building	**Multi-bay building**
			
Vertical crane action	3	4 NOTE: The most unfavourable position of the 4 cranes might be: a) 3 cranes behind each other and 1 on a further runway or b) 2 cranes behind each other and 2 on a further runway or c) 2 cranes behind each other and 2 above each other on 2 further runways	6 NOTE: The most unfavourable position of the 6 cranes might be: a) crane position as in a single bay building plus 2 additional cranes in another bay or b) 6 cranes distributed over several bays
Horizontal crane action	1 NOTE: Consider two cranes if they operate together in order to lift heavy loads and if that is more unfavourable	2 NOTE: 2 cranes per bay operating above each other	4 NOTE: Under consideration of conditions for crane runways and for single-bay buildings

".

6 Modification to 2.6

In Paragraph (2)P, replace the whole Table 2.4 with the following one:

"

Table 2.4 — Dynamic factors φ_i for vertical loads

	Values of dynamic factors
φ_1	$0,9 < \varphi_1 < 1,1$ The two values 1,1 and 0,9 reflect the upper and lower values of the vibrational pulses.
φ_2	$\varphi_2 = \varphi_{2,\min} + \beta_2 v_h$ v_h - steady hoisting speed in m/s $\varphi_{2,\min}$ and β_2 see Table 2.5
φ_3	$\varphi_3 = 1 - \frac{\Delta m}{m}(1+\beta_3)$ where Δm released or dropped part of the hoisting mass m total hoisting mass $\beta_3 = 0,5$ for cranes equipped with grabs or similar slow-release devices $\beta_3 = 1,0$ for cranes equipped with magnets or similar rapid-release devices
φ_4	$\varphi_4 = 1,0$ provided that the class 1 functional tolerances for rail tracks as specified in EN 1090-2 are observed.
NOTE: If Class 1 functional tolerances for rail tracks as specified in EN 1090-2 are not observed, the dynamic factor φ_4 can be determined with the model provided by EN 13001-2.	

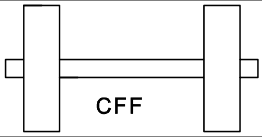
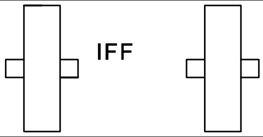
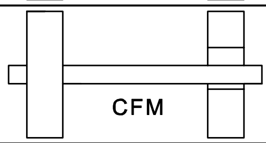
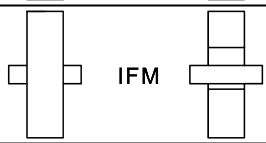
".

7 Modification to 2.7.4

Paragraph (4), replace Tables 2.8 and 2.9 with the following ones:

"

Table 2.8 — Determination of the distance *h*

Fixing of wheels according to lateral movements	**Combination of wheel pairs**		***h***
	coupled (c)	**independent (i)**	
Fixed/Fixed FF			$\frac{m \xi_1 \xi_2 \ell^2 + \Sigma e_j^2}{\Sigma e_j}$
Fixed/Movable FM			$\frac{m \xi_1 \ell^2 + \Sigma e_j^2}{\Sigma e_j}$

Where:

h is the distance between the instantaneous centre of rotation and the relevant guidance means;

m is the number of pairs of coupled wheels (*m* = 0 for independent wheel pairs);

$\xi_1 \ell$ is the distance of the instantaneous centre of rotation from rail 1;

$\xi_2 \ell$ is the distance of the instantaneous centre of rotation from rail 2;

ℓ is the span of the appliance;

e_j is the distance of the wheel pair *j* from the relevant guidance means.

Table 2.9 — Determination of distance $\lambda_{S,i,j,k}$ values

System	$\lambda_{S,j}$	$\lambda_{S,1,j,L}$	$\lambda_{S,1,j,T}$	$\lambda_{S,2,j,L}$	$\lambda_{S,2,j,T}$
CFF	$1-\frac{\sum e_j}{nh}$	$\frac{\xi_1 \xi_2}{n}\frac{\ell}{h}$	$\frac{\xi_2}{n}\left(1-\frac{e_j}{h}\right)$	$\frac{\xi_1 \xi_2}{n}\frac{\ell}{h}$	$\frac{\xi_1}{n}\left(1-\frac{e_j}{h}\right)$
IFF		0	$\frac{\xi_2}{n}\left(1-\frac{e_j}{h}\right)$	0	$\frac{\xi_1}{n}\left(1-\frac{e_j}{h}\right)$
CFM	$\xi_2\left(1-\frac{\Sigma e_j}{nh}\right)$	$\frac{\xi_1 \xi_2}{n}\frac{\ell}{h}$	$\frac{\xi_2}{n}\left(1-\frac{e_j}{h}\right)$	$\frac{\xi_1 \xi_2}{n}\frac{\ell}{h}$	0
IFM		0	$\frac{\xi_2}{n}\left(1-\frac{e_j}{h}\right)$	0	0

Where:
n is the number of wheel pairs;
$\xi_1 \ell$ is the distance of the instantaneous centre of rotation from rail 1;
$\xi_2 \ell$ is the distance of the instantaneous centre of rotation from rail 2;
ℓ is the span of the appliance;
e_j is the distance of the wheel pair *j* from the relevant guidance means;
h is the distance between the instantaneous centre of rotation and the relevant guidance means.

".

8 Modification to 2.12.2

In the NOTE, replace "EN 1993-6, 9.4.2.3" *with* "EN 1993-6, 9.4.2(3)".