

English Version

Eurocode 2: Design of concrete structures - Part 1-2: General rules - Structural fire design

Eurocode 2: Calcul des structures en béton - Partie 1-2:
Règles générales - Calcul du comportement au feu

Eurocode 2: Bemessung und Konstruktion von
Stahlbeton- und Spannbetontragwerken - Teil 1-2:
Allgemeine Regeln - Tragwerksbemessung für den
Brandfall

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 250.

This draft amendment A1, if approved, will modify the European Standard EN 1992-1-2:2004. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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

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Работен документ

European foreword

This document (EN 1992-1-2:2004/prA1:2017) has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Работен документ

1 Modification of 4.2.1(1)

Replace existing NOTE 2 in paragraph (1) of 4.2.1 with the following new NOTE 2:

"NOTE 2 A simplified method for fire design of slender columns in braced and unbraced systems is given in Annex C."

2 Modification of 5.3.3(1)

Delete the following sentence in paragraph (1) of 5.3.3:

"Further information is given in Annex C."

3 New Annex C

Replace the existing Annex C with the following:

"

Annex C (informative)

Buckling of columns under fire conditions

(1) The tables in this annex provide information for assessing columns with rectangular cross section in braced or unbraced structures giving the maximum permissible slenderness ratio under fire conditions, $\lambda_{fi,max}$. The slenderness ratio in the fire situation is $\lambda_{fi} = l_{0,fi} / i$, where the effective column length, $l_{0,fi}$, is defined by the actual length of the column, l , and the support conditions under fire conditions.

The effective length in fire $l_{0,fi}$ can be taken as the effective length l_0 in cold conditions in all cases. For braced building structures where the required standard fire exposure is higher than 30 min and the column is continuous through a slab providing fire separation, the effective length $l_{0,fi}$ may be taken as $0,5 l$ for intermediate floors and $0,5 l \leq l_{0,fi} \leq 0,7 l$ for the upper floor. Intermediate values of $l_{0,fi} / l$ can be chosen depending of the actual moment restraints at the supports under fire conditions. For unbraced structures $l_{0,fi}$ should be taken as the lesser of $2l$ or l_0 in cold conditions.

The radius of gyration i is shown in Figure C.1.

(2) The following parameters are needed to use the tables in this annex:

R_{xx} Required fire resistance as standard fire duration (xx minutes)

h, b Dimensions of column cross section, $b \leq h$

A_c Cross sectional area of column, $A_c = b \cdot h$

n_{fi} Load degree: $n_{fi} = \frac{N_{Ed,fi}}{\left(\frac{A_c \times f_{cd}}{\alpha_{cc}} \right) + (A_{sc} \times f_{sd} + A_{st} \times f_{sd})}$ (C.1)

ω Modified mechanical reinforcement degree: $\omega = \frac{A_{sc} \times f_{sd} + A_{st} \times f_{sd}}{\frac{A_c \times f_{cd}}{\alpha_{cc}}}$, $A_{sc} = A_{st}$

A_{sc} and A_{st} are defined in (3).

- e_N Modified, total first order eccentricity of the normal force, $N_{Ed,fi}$, in the fire condition, see Figure C.1. However, $e_N \geq e_0$, see EN 1992-1-1:2004, 6.1(4)
- a Axis distance for the reinforcement
- $N_{Ed,fi}$ The design axial load in the fire condition
- $M_{Ed,fi}$ The design first order moment in the fire condition

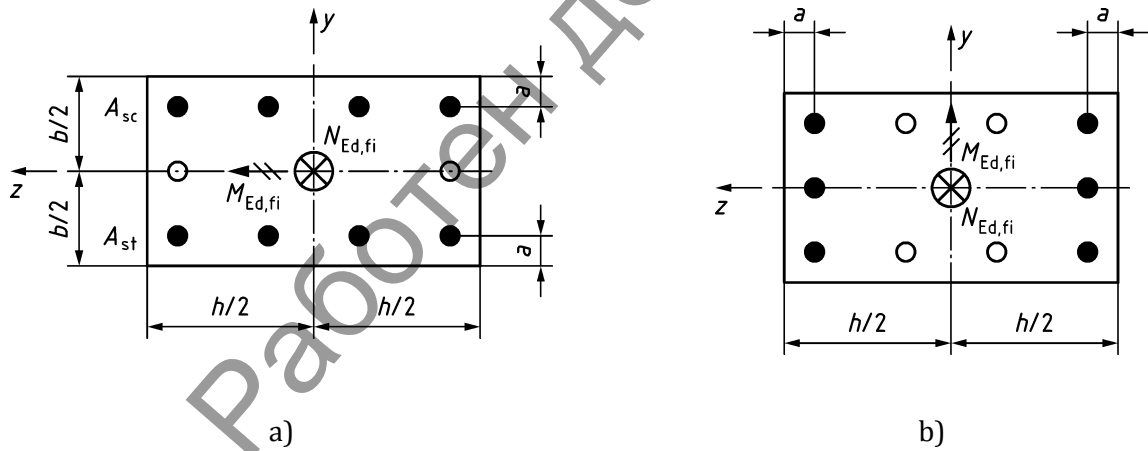
The design values of the concrete strength, f_{cd} , and of the reinforcement yield strength, f_{sd} , are given according to the ultimate limit state at the temperature $\theta = 20^\circ\text{C}$. The tables are not applicable for $f_{ck} > 50$ MPa. The reference dimension for the cross section in the tables is always the smaller cross section dimension b .

(3) A_{sc} is the reinforcement cross section area at the axis distance a from the column's compressive side, and A_{st} is the reinforcement cross section area at the axis distance a from the column's tensile/least compressed side. Other reinforcing bars in the cross section are disregarded.

Each possible buckling direction should be examined. The tables can be used for buckling around both the z -axis and the y -axis as defined in Figure C.1. They can also be used for asymmetric rectangular cross sections. For buckling around both the z -axis or the y -axis, the smaller dimension b should be used as the parameter in the tables.

For buckling around the y -axis, the actual first order eccentricity of the normal force in the fire condition may be reduced by the factor b/h . Using the tables, e_N always is at least 20 mm.

For columns with asymmetric reinforcement arrangements, the minimum values of A_{sc} and A_{st} shall be used.



Key

- Reinforcing bars to be disregarded
- Reinforcing bars

Figure C.1 — Rectangular cross sections

$$\text{Buckling around } z\text{-axis: } e_N = \frac{M_{Ed,fi}}{N_{NEd,fi}}; \quad \text{Buckling around } y\text{-axis: } e_N = \frac{b}{h} \times \frac{M_{Ed,fi}}{N_{NEd,fi}} \geq 0,5 \frac{M_{Ed,fi}}{N_{NEd,fi}}$$

$$i = \frac{b}{\sqrt{12}}$$

$$i = \frac{h}{\sqrt{12}}$$

(4) For rectangular cross sections the minimum number of reinforcing bars in each A_{sc} and A_{st} is given in the following table:

Table C.1 — Minimum number of reinforcing bars

ω	Minimum dimension of column section, b					
	600 mm	500 mm	400 mm	300 mm	250 mm	200 mm
0,1	3	3	3	2	2	2
0,2	3	3	3	2	2	2
0,5	3	3	3	2	2	2
1,0	5	4	3	2	2	2

(5) In accordance with EN 1992-1-1:2004, 4.4.1.2(3) the axis distance for the reinforcing bars in the cross section shall fulfil $a \geq 1,5 \cdot \phi_{st}$, where ϕ_{st} is the bar diameter.

(6) Using the tables within this annex, linear interpolation is permitted.

Table C.2 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R30

R30	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	55	55	52	55	55	50	55	55	47	55	50	40	55	47	35	55	42	28
	20	45	55	55	55	55	55	55	55	55	55	55	55	49	55	55	44	55	49	36
	20	65	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	46	37
	20	85	55	55	55	55	55	55	55	55	55	55	55	55	55	54	47	54	44	
	50	25	55	55	46	55	54	42	55	50	36	54	39	21	49	32		40	18	
	50	45	55	55	55	55	55	52	55	55	45	55	47	27	55	38		47	19	
	50	65	55	55	55	55	55	55	55	55	51	55	51	31	55	38		43		
	50	85	55	55	55	55	55	55	55	55		55	47	28	52	33		37		
	100	25	55	48	32	55	42	22	52	33		35			21					
	100	45	55	55	41	55	51	29	55	40		45			30					
	100	65	55	55	47	55	55	33	55	43					28					
	100	85	55	55		55	55	32	55	39					22					
$\omega = 0,2$	20	25	55	55	54	55	55	52	55	55	48	55	53	40	55	50	36	55	44	28
	20	45	55	55	55	55	55	55	55	55	55	55	55	51	55	55	45	55	51	36
	20	65	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	36
	20	85	55	55	55	55	55	55	55	55	55	55	55	54	55	54	45	55	42	34
	50	25	55	55	47	55	55	43	55	54	37	55	43	21	55	36		50	22	
	50	45	55	55	55	55	55	55	55	55	47	55	52	29	55	43		55	24	
	50	65	55	55	55	55	55	55	55	55	54	55	55	32	55	40		48		
	50	85	55	55	55	55	55	55	55	55	51	55	47	26	55	31		38		
	100	25	55	53	33	55	47	24	55	38		48			37					
	100	45	55	55	44	55	55	33	55	47		55	18		48			23		
	100	65	55	55	51	55	55	38	55	51		55			45					
	100	85	55	55		55	55	35	55	43		52			28					
$\omega = 0,5$	20	25	55	55	55	55	55	53	55	55	50	55	55	40	55	54	35	55	47	28
	20	45	55	55	55	55	55	55	55	55	55	55	55	53	55	55	47	55	55	37
	20	65	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	33
	20	85	55	55	55	55	55	55	55	55	55	55	55	51	55	51	39	54	36	25
	50	25	55	55	49	55	55	45	55	55	38	55	47	20	55	40		55	27	
	50	45	55	55	55	55	55	55	55	55	52	55	55	33	55	50		55	32	
	50	65	55	55	55	55	55	55	55	55	55	55	55	36	55	46		55		
	50	85	55	55	55	55	55	55	55	55	51	55	47	19	55	26		34		
	100	25	55	55	35	55	54	25	55	46		55	22		55			45		

	100	45	55	55	50	55	55	40	55	55	15	55	33		55			51		
	100	65	55	55	55	55	55	46	55	55	14	55	31		55					
	100	85	55	55	55	55	55	39	55	50		55			30					
$\omega = 1,0$	20	25	55	55	55	55	55	55	55	55	49	55	55	39	55	55	34	55	49	25
	20	45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	55	37
	20	65	55	55	55	55	55	55	55	55	55	55	55	55	55	55	48	55	47	31
	20	85	55	55	55	55	55	55	55	55	55	55	55	47	55	48	33	49	27	
	50	25	55	55	53	55	55	47	55	55	38	55	49	17	55	42		55	29	
	50	45	55	55	55	55	55	55	55	55	55	55	55	35	55	55	16	55	37	
	50	65	55	55	55	55	55	55	55	55	55	55	55	39	55	50		55		
	50	85	55	55	55	55	55	55	55	55	51	55	46		55	16		22		
	100	25	55	55	39	55	55	27	55	50		55	25		55			55		
	100	45	55	55	55	55	55	46	55	55	22	55	42		55			55		
	100	65	55	55	55	55	55		55	55	25	55	41		55			23		
	100	85	55	55	55	55	55		55	53		55			26					

Table C.3 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R60

R60	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	55	48	39	55	46	36	52	43	31	43	35	21	38	30		31	20	
	20	45	55	55	48	55	55	45	55	51	39	55	42	29	49	36	22	40	25	
	20	65	55	55	55	55	55	52	55	55	46	55	47	36	51	39	27	38	25	
	20	85	55	55	55	55	55	55	55	55	50	55	47	38	48	37	29	33	24	
	50	25	52	43	32	50	40	27	45	34	16	33	20		25					
	50	45	55	53	40	55	49	35	55	42	24	46	28		38	15		24		
	50	65	55	55	47	55	55	41	55	48	29	51	32		40	15		23		
	50	85	55	55	54	55	55	47	55	49	32	49	31		36					
	100	25	45	34	15	40	27		31	10										
	100	45	55	43	23	54	36		45	20		26								
	100	65	55	49	28	55	41		51	23		30								
	100	85	55	54	32	55	44		52	22		28								
$\omega = 0,2$	20	25	55	49	38	55	47	35	55	43	30	44	34	19	40	29		33	18	
	20	45	55	55	49	55	55	46	55	54	40	55	44	30	55	38	22	45	26	
	20	65	55	55	55	55	55	54	55	55	48	55	50	36	55	40	26	42	25	
	20	85	55	55	55	55	55	55	55	55	51	55	48	37	51	37	27	33	21	
	50	25	55	44	31	54	41	25	50	35	14	35	19		28					
	50	45	55	55	42	55	53	36	55	46	26	54	31		46	18		33		
	50	65	55	55	50	55	55	43	55	52	31	55	35		48	18		29		
	50	85	55	55	55	55	55	49	55	53	34	55	32		41					
	100	25	50	35	11	45	28		38	11										
	100	45	55	48	25	55	40		55	26		38			23					
	100	65	55	55	31	55	46	10	55	30		43			25					
	100	85	55	55	36	55	50	12	55	29		39								
$\omega = 0,5$	20	25	55	50	35	55	47	31	55	43	26	48	30		43	24		36		
	20	45	55	55	51	55	55	47	55	55	42	55	47	30	55	40	21	54	28	
	20	65	55	55	55	55	55	55	55	55	50	55	54	37	55	43	26	47	26	
	20	85	55	55	55	55	55	55	55	55	53	55	51	37	55	38	24	34	18	
	50	25	55	45	26	55	41	19	55	34		39			33			20		
	50	45	55	55	43	55	55	38	55	51	27	55	35		55	23		44		
	50	65	55	55	53	55	55	47	55	55	35	55	40		55	23		36		
	50	85	55	55	55	55	55	53	55	55	37	55	36		48	14				
	100	25	55	35		55	27		49			18								

	100	45	55	54	27	55	47	9	55	34		55			43					
	100	65	55	55	37	55	55	20	55	40		55			41					
	100	85	55	55	43	55	55	23	55	40		53			25					
$\omega = 1,0$	20	25	55	55	36	55	50	30	55	40	18	48	22		43	14		35		
	20	45	55	55	55	55	55	50	55	55	42	55	50	29	55	42	19	55	30	
	20	65	55	55	55	55	55	55	55	55	52	55	55	37	55	45	26	52	27	
	20	85	55	55	55	55	55	55	55	55	55	55	54	37	55	39	22	34		
	50	25	55	50	27	55	43	15	55	30		39			32			18		
	50	45	55	55	48	55	55	41	55	55	28	55	38		55	25		49		
	50	65	55	55	55	55	55	51	55	55	38	55	44		55	28		41		
	50	85	55	55	55	55	55	55	55	55	40	55	40		53	17				
	100	25	55	41		55	29		54			18								
	100	45	55	55	32	55	55	14	55	39		55			51			27		
	100	65	55	55	44	55	55	27	55	48		55			51					
	100	85	55	55	50	55	55	31	55	48		55			34					

Table C.4 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R90

R90	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	49	42	33	47	40	29	44	36	23	34	26		29	18		21		
	20	45	55	49	39	55	46	35	53	41	29	41	30	16	35	22		25		
	20	65	55	55	46	55	53	42	55	47	35	48	35	22	40	25		26		
	20	85	55	55	52	55	55	47	55	51	40	48	36	25	37	25	14	22		
	50	25	45	37	25	42	33	19	37	26		24								
	50	45	55	44	31	52	40	24	46	32	9	32	13		23					
	50	65	55	51	37	55	46	30	54	37	15	39	18		28					
	50	85	55	55	43	55	50	35	55	40	19	39	17		26					
	100	25	38	27		32	19		23											
	100	45	48	34	9	42	25		33											
	100	65	55	40	16	51	31		41			16								
	100	85	55	44	19	55	34		43			16								
$\omega = 0,2$	20	25	52	42	31	50	40	27	46	35	21	35	24		30	16		21		
	20	45	55	51	39	55	48	35	55	43	29	45	31	15	39	22		27		
	20	65	55	55	47	55	55	43	55	50	36	54	36	22	44	26		28		
	20	85	55	55	54	55	55	49	55	53	40	53	37	24	40	25		22		
	50	25	48	37	23	45	33	16	40	26		25			15					
	50	45	55	46	31	55	41	24	53	34		37	13		28					
	50	65	55	55	39	55	49	31	55	40	17	46	20		35					
	50	85	55	55	45	55	54	36	55	43	21	45	19		30					
	100	25	41	27		36	18		27											
	100	45	55	36	8	50	27		42			17								
	100	65	55	45	19	55	35		52	14		30								
	100	85	55	50	23	55	39		54	13		28								
$\omega = 0,5$	20	25	55	41	26	54	38	22	51	33	15	36	18		31			20		
	20	45	55	53	38	55	50	34	55	44	27	51	30		44	20		29		
	20	65	55	55	49	55	55	44	55	54	37	55	39	21	51	28		32		
	20	85	55	55	55	55	55	51	55	55	42	55	39	23	45	25		22		
	50	25	53	35	16	50	31		46	22		27			18					
	50	45	55	48	30	55	44	22	55	35		44			35					
	50	65	55	55	41	55	55	34	55	45	20	55	24		43					
	50	85	55	55	48	55	55	40	55	48	23	54	23		36					
	100	25	47	24		42	11		35											

	100	45	55	39		55	30		55			30								
	100	65	55	52	22	55	42		55	25		44			24					
	100	85	55	55	29	55	47		55	26		40								
$\omega = 1,0$	20	25	55	42	23	55	37	16	52	27		35			29					
	20	45	55	55	41	55	55	35	55	45	24	54	27		46	17		30		
	20	65	55	55	54	55	55	48	55	55	38	55	41	20	55	30		35		
	20	85	55	55	55	55	55	55	55	55	43	55	41	23	48	26		23		
	50	25	55	37	8	55	29		47	12		25								
	50	45	55	55	33	55	48	22	55	35		47			37					
	50	65	55	55	46	55	55	37	55	50	21	55	28		49			22		
	50	85	55	55	54	55	55	44	55	53	26	55	27		40					
	100	25	55	24		51			36											
	100	45	55	47		55	35		55			33								
	100	65	55	55	29	55	50		55	31		52			32					
	100	85	55	55	36	55	55	10	55	34		48			20					

Table C.5 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R120

R120	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	45	38	29	43	36	24	39	31	17	29	19		23					
	20	45	52	44	33	50	40	29	45	35	21	32	21		26					
	20	65	55	50	39	55	46	35	53	40	27	39	25		30					
	20	85	55	55	45	55	51	40	55	44	32	40	27	15	29	14				
	50	25	41	34	21	38	29	12	32	20		17								
	50	45	48	38	25	45	33	16	38	24		21								
	50	65	55	45	31	54	39	22	46	29		30			18					
	50	85	55	50	35	55	43	27	50	32		31			15					
	100	25	33	23		27	12		15											
	100	45	41	28		35	17		24											
	100	65	51	34		44	23		33											
	100	85	55	38	6	49	26		37											
$\omega = 0,2$	20	25	47	38	27	44	35	22	41	30	14	29	16		23					
	20	45	55	44	32	53	41	28	49	35	20	33	19		27					
	20	65	55	53	40	55	49	35	55	42	27	44	26		33					
	20	85	55	55	46	55	54	41	55	46	32	44	27	13	31					
	50	25	43	33	18	39	28		34	19		18								
	50	45	53	39	23	49	34	14	43	24		23								
	50	65	55	48	32	55	42	23	54	32		36			23					
	50	85	55	53	37	55	46	28	55	35		36			19					
	100	25	35	22		30	8		19											
	100	45	46	28		40	17		30											
	100	65	55	37		54	27		43			17								
	100	85	55	42	11	55	30		47			17								
$\omega = 0,5$	20	25	49	35	20	47	31	15	43	25		30			23					
	20	45	55	44	29	55	40	24	55	34	15	36	13		27					
	20	65	55	55	41	55	52	36	55	45	27	51	28		38					
	20	85	55	55	48	55	55	42	55	49	33	50	29		34	14				
	50	25	46	29		43	23		38	10		20								
	50	45	55	39	18	55	33		50	22		27								
	50	65	55	52	32	55	46	24	55	36		44			29					
	50	85	55	55	39	55	52	30	55	40	9	44			24					
	100	25	39	15		34			25											

	100	45	54	27		49	13		40											
	100	65	55	42	6	55	32		55			31								
	100	85	55	49	17	55	38		55	11		29								
$\omega = 1,0$	20	25	55	33	12	50	27		43	17		28			17					
	20	45	55	50	30	55	43	22	55	31		34			24					
	20	65	55	55	45	55	55	38	55	47	27	55	28		41	14				
	20	85	55	55	53	55	55	45	55	53	34	55	31		38	15				
	50	25	52	25		46	16		36			15								
	50	45	55	44	19	55	35		52	17		24								
	50	65	55	55	36	55	51	26	55	38		49			33					
	50	85	55	55	44	55	55	34	55	44	12	49	14		29					
	100	25	46			37			22											
	100	45	55	33		55	16		42											
	100	65	55	51	13	55	39		55	14		37								
	100	85	55	55	24	55	46		55	22		36								

Table C.6 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R180

R180	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	40	34	22	37	30	17	31	22		21								
	20	45	45	37	26	42	33	20	35	24		22								
	20	65	51	41	30	47	37	25	39	27	12	25								
	20	85	55	46	35	53	41	29	44	30	17	27								
	50	25	36	28	13	32	22		23											
	50	45	41	32	16	37	25		28	10										
	50	65	47	36	21	42	29	7	33	14		13								
	50	85	54	40	25	48	33	13	37	17		16								
	100	25	27	16		20														
	100	45	33	20		26														
	100	65	40	23		32			17											
$\omega = 0,2$	20	25	40	32	20	37	28	13	31	19		21								
	20	45	48	37	24	44	32	18	37	23		23								
	20	65	55	42	30	52	37	24	43	27	10	26								
	20	85	55	48	35	55	43	29	49	31	16	29								
	50	25	36	27	6	32	20		24											
	50	45	44	31	14	40	25		31											
	50	65	52	36	19	47	29		37	14		14								
	50	85	55	43	26	55	35	14	43	19		19								
	100	25	28	13		21														
	100	45	37	19		30			15											
	100	65	45	24		39			25											
$\omega = 0,5$	20	25	41	28	11	38	22		32	11		19								
	20	45	53	35	19	49	30	12	41	19		21								
	20	65	55	43	27	55	37	21	49	27		26								
	20	85	55	52	36	55	46	29	55	34	15	33								
	50	25	37	20		33	10		25											
	50	45	49	29		45	21		35											
	50	65	55	37	15	55	29		44	12		14								
	50	85	55	46	26	55	39	14	52	23		25								
	100	25	29			23														

	100	45	43	12		37			23											
	100	65	55	24		48			34											
	100	85	55	36		55	22		43											
$\omega = 1,0$	20	25	42	20		38	13		30											
	20	45	55	36	15	53	28		40	11		14								
	20	65	55	48	28	55	40	19	52	25		25								
	20	85	55	55	39	55	50	31	55	36	14	36			15					
	50	25	38	6		32			22											
	50	45	55	29		49	17		34											
	50	65	55	42	16	55	32		47											
	50	85	55	53	29	55	43	15	55	26		29								
	100	25	30			20														
	100	45	52	11		41			21											
	100	65	55	31		55	9		37											
	100	85	55	43		55	29		50											

Table C.7 — Maximum permissible slenderness ratio under fire conditions for braced and unbraced columns: R240

R240	b (mm)		600			500			400			300			250			200		
	n _{FI}		0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6	0,2	0,4	0,6
	e _N (mm)	a (mm)	$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$			$\lambda_{fi,max}$		
$\omega = 0,1$	20	25	37	30	18	33	25	9	25	11										
	20	45	41	33	21	36	27	12	28	13										
	20	65	45	36	24	39	29	16	31	16										
	20	85	50	39	28	44	32	20	34	19	12									
	50	25	33	24		27	16		17											
	50	45	36	27	8	30	18		20											
	50	65	41	30	12	34	21		23											
	50	85	46	33	17	39	24		28											
	100	25	24	10		14														
	100	45	28	12		18														
	100	65	33	15		23														
	100	85	39	19		29			10											
$\omega = 0,2$	20	25	37	29	15	33	23		26											
	20	45	42	32	19	37	25	8	29	10										
	20	65	48	35	22	42	29	13	33	14										
	20	85	55	40	28	48	33	19	37	19	12									
	50	25	33	22		27	13		17											
	50	45	38	26		32	16		21											
	50	65	44	29	9	37	20		26											
	50	85	52	34	16	44	24		31											
	100	25	25			15														
	100	45	31	9		21														
	100	65	37	14		28														
	100	85	45	20		35			18											
$\omega = 0,5$	20	25	38	23		33	16		26											
	20	45	45	28	11	39	21		29											
	20	65	53	34	18	47	26		35	9										
	20	85	55	41	26	55	34	16	42	19										
	50	25	34	14		28			18											
	50	45	41	21		35			22											
	50	65	50	27		43	16		29											
	50	85	55	35	13	51	25		36											
	100	25	26			16														

	100	45	34			26														
	100	65	44	7		35			13											
	100	85	54	22		44			25											
$\omega = 1,0$	20	25	37	14		32			21											
	20	45	48	24		40	13		26											
	20	65	55	37	15	53	26		35											
	20	85	55	47	27	55	36	15	45	19										
	50	25	33			26														
	50	45	44	14		35			17											
	50	65	55	30		48	15		28											
	50	85	55	41	14	55	28		40											
	100	25	24			11														
	100	45	37			24														
	100	65	54	12		41			9											
	100	85	55	29		53			29											