

DE Tower Software Information Sheet

Eurocode Implementation – Partial Factor for Actions

Eurocode 3, Design of steel structures - Part 3-1: Towers, masts and chimneys — Towers and masts based on the Reliability Class. There are 3 Reliability Classes:

Reliability Class	
3	towers and masts erected in urban locations, or where their failure is likely to cause injury or loss of life; towers and masts used for vital telecommunication facilities; other major structures where the consequences of failure would be likely to be very high
2	all towers and masts that cannot be defined as class 1 or 3
1	towers and masts built on unmanned sites in open countryside; towers and masts, the failure of which would not be likely to cause injury to people

The design load combinations are made of permanent and variable load cases that are multiplied by partial factors. Partial factors are dependent on the tower Reliability Class.

Type of Effect	Reliability Class	Permanent Actions	Variable Actions
Unfavorable	3	1.2	1.6
	2	1.1	1.4
	1	1.0	1.2

Permanent actions are usually the gravitational / dead loads, while the variable actions refer mainly to wind actions, but earthquake loads are variable actions, too.

The Engineer is responsible for choosing the Reliability Category. However, consultation with the Customer is required to ascertain the intended use of the tower and whether the tower usage

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may change in the future. In addition, if the tower project is subject to building approval, the Reliability Class shall be agreed with the jurisdiction that requires building approval.

The default Reliability Class shall be Reliability Class 2 and only if the towers meet the description for Reliability Classes 1 and 3, the lower or higher partial factors shall be used.

The above partial factors are from the Eurocode. However, these factors can be different based on the country specific National Annex.

The National Annexes for France, Belgium, Luxembourg and Ireland have adopted the partial factors from the EN 1993-3-1.

Other countries, such as UK and Germany have chosen different partial factors.

Type of Effect	Reliability Class	Permanent Actions		Variable Actions	
		UK	Germany	UK	Germany
Unfavorable	3	1.2	1.3	1.6	1.5
	2	1.1	1.3	1.45	1.5
	1	1.0	1.3	1.3	1.5

Germany has same partial factors, irrespective of the Reliability Class. UK has higher variable actions partial factors for Reliability Classes 2 and 1.

The National Annexes for UK and Ireland are very similar, almost word by word, identical.

However, they differ in a significant way by having different partial factors for wind loads.

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