INTERNATIONAL STANDARD

ISO 22111

Second edition 2019-09

Bases for design of structures — General requirements

Bases du calcul des constructions — Exigences générales



ISO 22111:2019(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office CP 401 • Ch. de Blandonnet 8 CH-1214 Vernier, Geneva Phone: +41 22 749 01 11 Fax: +41 22 749 09 47 Email: copyright@iso.org Website: www.iso.org

Published in Switzerland

Coi	Pag			
Fore	word		v	
Intro	oductio	n	vi	
1	Scop	e	1	
2	Norn	native references	1	
3	Terms and definitions			
	3.1	General terms		
	3.2	Terms related to design and assessment		
	3.3	Terms related to actions and resistances	5	
4	Symbols and abbreviated terms			
	4.1	General		
	4.2	Latin characters		
	4.3	Greek characters		
	4.4	Subscripts	9	
5	Fundamental requirements for structural performance			
	5.1	General	9	
	5.2	Design situations		
	5.3	Limit states		
	5.4	Considerations for actions, environmental influences and action combinations		
	5.5	Considerations for resistance		
	5.6	Considerations for design verification		
6		sification for establishing reliability		
	6.1	Safety consideration		
	6.2	Serviceability consideration		
	6.3	Reliability classes		
7		ciples of limit states design	13	
	7.1	General		
	7.2	Verification of ultimate limit states		
	7.3	Verification of serviceability limit states	13	
8	Actio	ns		
	8.1	General		
		Permanent actions		
	8.3	Variable actions		
	8.4	Accidental actions		
	8.5 8.6	Evaluation of actions and their effects		
	8.7	Characteristic values of actions		
0				
9	Combinations of actions 9.1 General			
	9.1 9.2	Design scenarios		
	9.3	Additional considerations for serviceability limit state		
	9.4	Design values of combinations of action effects		
4.0				
10	10.1	stance General		
	10.1	Material properties		
	10.2	Geometrical data		
	10.3	Characteristic values of resistance parameters		
	10.5	Design value of resistance		
11				
11	Anar 11.1	ysis and testingAnalysis		
		Testing		

ISO 22111:2019(E)

12	Demonstrating conformance with requirements 12.1 General 12.2 Ultimate limit state		20		
	12.1	General	20		
	12.2	Ultimate limit state	21		
		12.2.1 Resistance	21		
		12.2.2 Static equilibrium	21		
		12.2.3 Accidental design situation	21		
		12.2.4 Seismic design situation	21		
	12.3	12.2.4 Seismic design situation Serviceability	21		
	12.4	Robustness	22		
		12.4.1 General	22		
		12.4.2 Design strategies	22		
		12.4.3 Prescriptive verification measures	23		
		12.4.4 Collapse scenarios	23		
	12.5	12.4.4 Collapse scenarios Durability	23		
Annex	Annex A (informative) Guidance for the adoption of this document				
Annex	B (infe	ormative) Formats for presentation of design values for combinations of actions	30		
Annex	c C (info	ormative) Target reliability differentiation in existing standard practice	36		
Annex	D (inf	ormative) Design procedure	39		
Biblio	Bibliography				

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 98, *Bases for design of structures*, Subcommittee SC 2, *Reliability of structures*.

This second edition cancels and replaces the first edition (ISO 22111:2007), which has been technically revised. The main change compared to the previous edition is as follows:

— the document has been made consistent with the latest edition of ISO 2394 (ISO 2394:2015).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.