
Summer toboggan runs —
Part 1:
Safety requirements and test methods

Pistes de luge d'été —

Partie 1: Exigences de sécurité et méthodes d'essai





COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 List of significant hazards	3
5 Safety requirements	5
5.1 Manufacturing.....	5
5.1.1 Materials.....	5
5.1.2 Safety measures against loosening of connections.....	5
5.1.3 Welded joints.....	5
5.1.4 Corrosion and surface protection, protection against rot.....	5
5.2 Toboggan.....	6
5.2.1 General.....	6
5.2.2 Toboggan for rail-guided summer toboggan runs.....	6
5.2.3 Toboggan for tub-guided summer toboggan runs.....	6
5.2.4 Braking.....	7
5.3 Track.....	7
5.3.1 Structural design of the system on the site.....	7
5.3.2 Rail-guided summer toboggan runs.....	7
5.3.3 Tub-guided summer toboggan runs.....	7
5.3.4 Visibility down the track and braking distances.....	8
5.4 Entrance and exit area.....	8
5.4.1 General.....	8
5.4.2 Entrance areas.....	9
5.4.3 End of downhill track.....	9
5.4.4 Exit areas.....	9
5.5 Uphill transport system.....	9
5.5.1 General.....	9
5.5.2 Technical design.....	9
5.5.3 Means of conveyance and connection to the means of conveyance.....	10
5.5.4 Tensioning devices.....	10
5.5.5 Drives and their components.....	10
5.6 Special safety equipment and precautions.....	11
5.7 Clearance zone.....	11
5.7.1 Downhill travel.....	11
5.7.2 Uphill transport.....	13
5.7.3 Squeezing and shearing points.....	13
5.8 Electrical equipment.....	14
5.8.1 Electrical systems.....	14
5.8.2 Control systems.....	14
6 Calculations	15
6.1 General.....	15
6.2 Actions.....	15
6.2.1 General.....	15
6.2.2 Permanent actions.....	15
6.2.3 Variable actions.....	16
6.2.4 Accidental actions.....	17
6.2.5 Impact.....	17
6.2.6 Vibrations occurring in directly passable components.....	18
6.3 Strength verification by calculation.....	18
6.3.1 General.....	18
6.3.2 Toboggan calculation.....	18

6.3.3	Tub calculation	19
6.3.4	Rail calculation	19
6.3.5	Calculation of supporting structure	19
6.3.6	Brake calculation	19
6.4	Verification of fatigue	20
6.4.1	General	20
6.4.2	Fatigue loads	20
6.5	Verification of stability	20
6.5.1	Safety against overturning, sliding and lifting off	20
6.5.2	Ground anchorages	22
7	Testing and inspection	26
7.1	General	26
7.2	Examination of the technical documentation	27
7.3	Acceptance test prior to commissioning (initial acceptance test)	27
7.3.1	General	27
7.3.2	Functional check	28
7.4	Periodic inspection	29
7.5	Inspection after modification	29
7.5.1	Examination of calculations	29
7.5.2	On-site inspection	29
7.6	Test report	30
8	Marking	30
8.1	Summer toboggan run	30
8.2	Toboggan	31
9	Commissioning	31
10	Technical documentation	31
10.1	General	31
10.2	Construction specification	31
10.3	Structural drawings and manufacturing drawings	31
10.4	Structural calculations	32
10.5	Risk assessment	32
10.6	Operating manual	32
	Annex A (informative) Example of load combinations in accordance with EN 1993	33
	Annex B (normative) Track calculation	35
	Bibliography	44

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*.

A list of all the parts in the ISO 19202 series can be found on the ISO website.

