ISO 19202-1:2017-06 (E)

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

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Listofsignificanthazards 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