

Rockfall protection net - Product data sheet

System name:	Geobruigg ROCCO-2000
Address Manufacturer:	Geobruigg AG, Aachstrasse 11, 8590 Romanshorn, Switzerland

Basics

Source	Designation	Author	Date/Year
1	Basics for the quality assessment of rockfall protection nets and their foundation - Guidance for practice	Reto Baumann (FOEN ¹), Werner Gerber (WSL ²)	2018
2	Report on the quality assessment of the rockfall protection net Geobruigg ROCCO-2000 (2000 kJ); Report No. 81FE-010121-L-04-BB-01	Katharina Schwarz-Platzer, Natalia Wyss, Stephan Fricker (BFH ³)	20.04.2021
3	Evaluation Report to European Technical Assessment ETA 19/0568	Antónia Ďuricová (TSUS ⁴)	06.03.2020
4	Documentation Manufacturer	Geobruigg AG	
	System manual (technical documentation, inst. instructions, calculation of anchor forces)	Geobruigg AG	09.04.2021
	Maintenance manual	Geobruigg AG	28.07.2020

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System description

(Sources 3 and 4)

Specifications			Source	
Energy absorption (MEL)	2000 kJ	Level 5	3	
Nominal height (MEL)	4.06 m	-	3	
Residual height (MEL)	2.48 m	Class A	3	
Posts:	Profile	<6 m: HEA 180; from 6 m: HEA 220	-	3
	Steel quality	S355J0	-	3
	Length	4.3 m - 6.3 m	-	4
	Standard distance	10 m	-	4
Ropes:	Standard	EN 12385-2+A1	-	3
	Diameter	22 mm (support ropes, lateral & retaining ropes), 20 mm (vertical rope)	-	3
Net:	Type / Designation	BUTTERFLY ring net 12/3/350	-	3, 4
	Standard (wire, coating)	EN 10264-2, EN 10244-2	-	3
	Wire diameter	3 mm	-	3
	Number of windings	12	-	3
	Ring diameter	350 mm	-	3
Weight of the heaviest inseparable component	181 kg (post length 4.3 m) resp. 349 kg (post length 6.3 m)	-	4	

Deceleration processes (SEL 1, SEL 2, MEL) (Source 2)

Test	<i>m</i> (kg)	<i>d</i> (m)	<i>v</i> (m/s)	<i>w</i> (m)	<i>t</i> (s)	<i>Ek</i> (kJ)	<i>Ew</i> (kJ)	<i>En</i> (kJ)
SEL 1	2'260	1.06	25.43	6.39	0.36	730.9	141.6	872.5
SEL 2	2'260	1.06	25.43	5.40	0.27	731.0	119.6	850.6
MEL	4'680	1.35	29.61	8.15	0.41	2'051.3	374.3	2'425.6

Maximum rope forces (SEL 1, SEL 2, MEL) (Source 2)

Rope/s	To lake	To mountain	Sa mountain	Tu lake	Rhs 4+5	Rhs 6+7	Rhs 8
Number of ropes	2	2	1	2	2	2	1
No. measuring cell (manufacturer)	K126	K123	K121	K133	K130	K132	K134
SEL 1 (kN)	233	-	118	110	92	101	23
SEL 2 (kN)	270	-	177	137	134	142	38
MEL (kN)	238	241	171	117	195	176	16

Anchor forces (MEL) (Source 2 and 4)

Anchor	To	Sat	Tu	Rhs max
Number of ropes	2	1	2	2
No. measuring cell (manufacturer)	K126	K121	K133	K130
Test	SEL2	SEL2	SEL2	MEL
Max. force (kN)	270	177	137	195
Factor	1.3	1.3	1.3	1.3
Substitute load (kN)	351	230	178	254

Assessment (score)		<i>(Source 2)</i>		
Criteria		max. possible	min. recommended	reached
A1	Priority criteria	16	16	16
A2	Assessment of the nets	10	8	10
A3.1	Technical documentation	16	13	16
A3.2	Assembly instructions (without transmission ropes)	38	30	38
A3.3	Maintenance manual	19	15	19
Total		99	82	99

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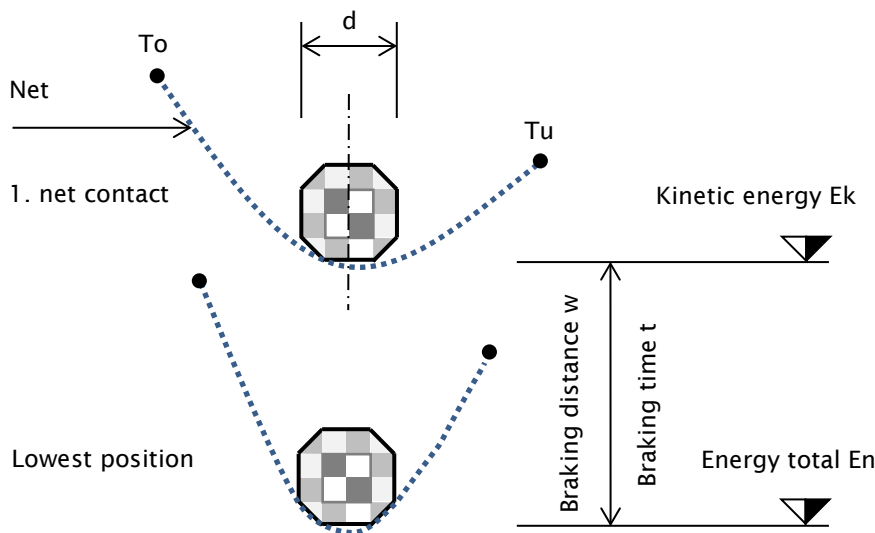


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Designations in the product data sheet of rockfall protection nets

Symbol	Unit	Meaning
d	[m]	Height, width and depth of test body
m	[kg]	Weight of test body
v	[m/s]	Velocity of the test body at the first net contact
w	[m]	Braking distance of the test body in the net
t	[s]	Braking time of the test body in the net
E_k	[kJ]	Kinetic energy of the test body at first net contact
E_w	[kJ]	Potential energy of the test body due to braking distance
E_n	[kJ]	Total energy with respect to the lowest position of the test body
T_o, T_u	[kJ]	Top or bottom support rope, maximum force in it
S_a	[kJ]	Lateral rope, maximum strength in it
$Rhs\ max$	[kJ]	Retaining rope, maximum force in it
SEL 1	-	Service Energy Level 1. Test
SEL 2	-	Service Energy Level 2. Test
MEL	-	Maximum Energy Level

Sketch of designations for deceleration processes



Sketch of designations of measuring cells, ropes and anchor forces

