



Type approval of safety nets for protection against rockfall

Test Certificate No. S 02-3

System description

• System designation	ISOSTOP 500 kJ		
• Address of designer	isofer ag, Industriequartier, 8934 Knonau, Switzerland		
• System description			
– Energy class		500kJ	
– Posts:	profile	HEA 140	
	length a_l	3.0 m	
	interval a_s	10 m	
– Support ropes:	type	DIN 3058	
	diameter	16 mm	
– Net:	type	twisted wire cable net 8/9/200 mm	
	diameter	8 mm, peripheral cable 9 mm	
	mesh	200 x 200 mm	
	height h_v	2.80 m	
– System drawings			
	Description	No.	Date
	Safety net for protection against rockfall.	-	May 2002
	Type approval 500 kJ (general documentation)		

Basic documentation

• Field test			
WSL test report	Date 29 July 2002	Report no. 02-3	
• Overall assessment			
Overall assessment of the EKLS	Date 27 June and 5 September 2002	Report no. S 02-3	

Test results

• Preliminary test of outer part			
– Penetration of test body		yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>	
– Additional observations		none	



• Preliminary energy test (50%)	250 kJ
– Penetration of test body	yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>
– Braking time t_s	0.21 s
– Braking distance b_s	2.80 m
– Sum of the tensile forces in the 2 upper cables	86 kN
– Sum of the tensile forces in the 2 lower cables	90 kN
– Maximum of the tensile forces in a stay cable	48 kN
– List of damaged elements	No damage to load bearing structural members. Fourteen of the 20 braking elements were deformed and 10 were replaced prior to the main test.
– Assessment of repairs	The extent of repairs necessary following the test is ascertained to be slight. The time required was 10 man-hours.
• Main energy test (100%)	500 kJ
– Penetration of test body	yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>
– Braking time t_s	0.30 s
– <i>Maximum permissible braking distance b_s</i>	6.0 m
– Measured braking distance b_s	4.40 m
– <i>Minimum permissible residual braking height h_n</i>	1.5 m
– Measured residual braking height h_n	1.66 m
– Sum of the tensile forces in the 2 upper cables	118 kN
– Sum of the tensile forces in the 2 lower cables	140 kN
– Maximum of the tensile forces in a stay cable	110 kN
– List of damaged elements	One of the lower support cables was ruptured. Fourteen of the 20 braking elements were deformed.
• Assessment of special criteria	
– Comments on assembly and on the assembly instructions	No particular difficulties were encountered with assembly.
– Comments on adaptability to the terrain	Adaptability to the terrain is normal.
– Comments on design complexity	The design is simple. Damaged elements are easy to replace.
– Comments on anticipated life cycle	The supports and shackles are galvanised. The wire cables and nets are heavily galvanised according to DIN 2078. The cable clamps are galvanised according to DIN 1142. The anticipated life cycle is ascertained to be adequate.



Overall assessment

Test passed

Test passed with reservations

Examined based on the following guidelines: GERBER, W. 2001: Guideline for the approval of rockfall protection kits. Environment in practice. Swiss Agency for the Environment, Forests and Landscape (SAEFL), Swiss Federal Research Institute WSL. Berne, 39 pages. Revised June 2006.

RESERVATION: Should deficiencies arise following certification of the safety net, FOEN may revoke product release and delete it from the type approval list.

Date

19.05.2006

Name, position

Andreas Götz, Vice Director

Signatures

Replaces the Certificate No. S 02-3 of 14 October 2002

Federal Office for the Environment FOEN
Risk Prevention Division
3003 BERN
[http:// www.umwelt-schweiz.ch/typenpruefung](http://www.umwelt-schweiz.ch/typenpruefung)