

PFEIFER ISOFER



Dual testperformance
barrier ISOSTOP 250 E

03/2015



Rockfall protection barriers
100 – 5000 kJ

ISOSTOP

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Tested in accordance with the latest standard of the ETAG 027 test guideline



The ISOSTOP E systems have passed the suitability test in accordance with the ETAG 027 guideline with the best possible result. After testing with 100 % nominal energy, a residual height of more than 50 % of the original height was measured in the impact zone. This corresponds to performance category A.

In another test section, the barriers were loaded twice consecutively with 33 % nominal energy without the system having to be repaired. Here as well, the test block was successfully stopped and all other test conditions were also fulfilled.

The certification test for the ISOSTOP E series was performed at the swiss federal rockfall test facility in Walenstadt. The tests were carried out by the WSL. The product certification was accomplished by the independent and officially authorized construction building and testing and research Institute TSUS.

Tested under the strict conditions
of test guideline ETAG 027 and
certified by a state accreditation
authority.

ISOSTOP

Product benefits of the ISOSTOP E Barriers

- Tested in acc. to ETAG 027
- CE marked
- Highest performance class A
- Patented system components
- Weight reduction by optimized interaction of system components
- Easy to install
- Simple maintenance due to modular composition



The components

→ Diagonal wire cable net

The net consists of high tensile wire cables that are fixed diagonally with cable-protecting cross clamps. The diagonal arrangement of the meshed cables allows optimum distribution of stone loading up to the load bearing cables of the ISOSTOP E systems. Easy installation with shackles.



→ FLEXNET wire rope net

Core element of the ISOSTOP low energy systems is the innovative new patented FLEXNET. It is characterized by its flexibility and has great reserves for a sequenz of rockfalls. The net is delivered in folded packages and the support cable runs directly through the loops, that allows an easy installation.



→ Rope-loop-brake element

The approved ISOFER Rope-loop-brake element performs in a straight line along the entire braking distance. It's a robust and reliable component of our established barrier systems.



→ ISODISK

The new modular concepted ISODISK is the latest evolution of brake elements. It is based on the principle of ripping-material bridges to anticipate the impact energy. The modular system is optimized for the interaction with the other ISOSTOP system components.



→ Pillars and base plates

HEA and RHP profiles are used in the column design of the ISOSTOP E series. The transport and installation weight is thus comparatively low.



→ Cable anchoring

The cable can be anchored with bow anchors, our spiral cable anchors or with the standard GEWI tie rods. We have developed the ISOFER ear-anchor for these tie rods. The ear-anchor absorbs high transverse forces and is highly durable due to thick hot-dip galvanising. The tie rod remains protected against all external influences.



The installation

→ Foundations

The anchoring points are measured and marked according to the installation plan. Foundations are designed by project engineers.



→ Installation handbook

The installation handbook provides the installer with detailed 3D drawings and explains all steps to be taken to install the barrier.



→ Alignment of the posts

The lightweight constructed posts of the ISOSTOP E barriers can easily be placed by hand, with a crane or by helicopter.



→ Tensioning

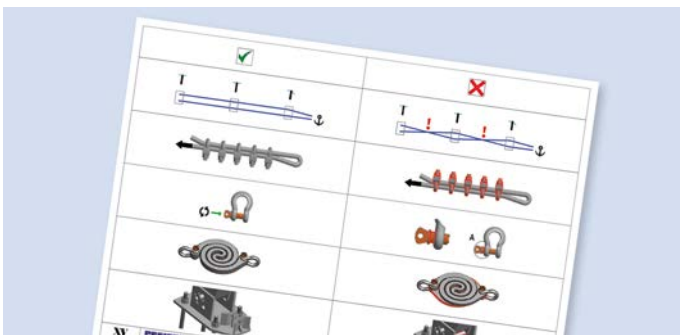
All wire ropes are firmly tensioned and clamped with wire rope clips.



→ Net installation

All nets are either shackled to the bearing ropes or the ropes are run through the net meshes directly.

The secondary layer consisting of square mesh or hex-mesh is being installed on the up-slope side of the barrier.



→ Installation checklist and maintenance

The installation checklist provides a basis for the final acceptance of the barrier.

The maintenance hand book includes a check list for the sequent servicing of the barrier to the maintain long terme performance.



The references

→ Switzerland

System: ISOSTOP 1000
Protected object: road



→ Switzerland

System: ISOSTOP 100 E DIMinutive
Protected object: road



→ Japan

System: ISOSTOP 3000
Protected object: road



→ Scotland

System: DEBRIS STOP 200-HM
Protected object: road



→ Italy

System: ISOSTOP 1000 E
Protected object: road



→ Norway

System: ISOSTOP 2000 Ev
Protected object: infrastructure



→ Turkey

System: ISOSTOP 500 E

Protected object: tunnel entrances, hydroelectric power station



→ Spain / Andorra

System: ISOSTOP 3000

Protected object: road and infrastructures



→ Hong Kong

System: ISOSTOP 3000

Protected object: buildings and infrastructures



→ Japan

System: ISOSTOP 2000

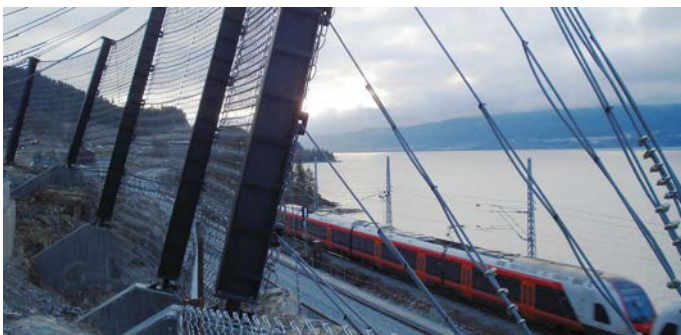
Protected object: road



→ Norway

System: ISOSTOP 250 E

Protected object: infrastructure



→ Norway

System: TS-5000-ZD

Protected object: railway and road

Technical Data of ISOSTOP E

	ISOSTOP E 100 kJ	ISOSTOP E 250 kJ	ISOSTOP E 500 kJ	ISOSTOP E 1000 kJ	ISOSTOP E 2000 kJ	TS-3000-ZD 3000 kJ	TS-5000-ZD 5000 kJ
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Specifications

Post	Rigid	Hinged	Hinged	Hinged	Hinged	Hinged	Hinged
Energy Class	0 (100 kJ)	1 (250 kJ)	2 (500 kJ)	3 (1000 kJ)	5 (2000 kJ)	6 (3000 kJ)	8 (5000 kJ)
Height Range	2,0–3,5 m	2,5–3,0 m	3,0–3,5 m	4,0–5,0 m	4,0–5,0 m	5,0–6,0 m	6,0–7,0 m
Post Spacing	8–12 m	8–12 m	8–12 m	8–12 m	8–12 m	8–12 m	8–12 m
Certification	ETAG 027	ETAG 027	ETAG 027	ETAG 027	ETAG 027	ETAG 027	ETAG 027

Test Report Summary

Test Report number	ETA-12/600	ETA-13/0462	ETA-10/0194	ETA-12/0019	ETA-13/1046	ETA-11/0227	ETA-10/0202
CE Number	1301-CPD-0845	1301-CPD-0904	1301-CPD-0646	1301-CPR-0754	pendent	1159-CDP-0311/12	1159-CDP-0305/12
Test Height	2,0 m / 3,0m	2,5 m	3,0 m	4,0 m	4,0 m	5,0 m	6,0 m
Maximum Elongation	3,16 m / 3,65 m	3,80 m	5,21 m	7,45 m	7,70 m	7,22 m	8,62 m
Residual Height Category	A	A	A	A	A	A	A

Primary Net

Type	Flexnet	Flexnet	Diagonal Wire Rope Net	Diagonal Wire Rope Net	Diagonal Wire Rope Net	Omega-Net	Omega-Net
Rope Diameter	Ø8 mm	Ø8 mm	Ø8 mm	Ø9 mm	Ø12 mm	Ø9 mm	Ø9 mm
Mesh Opening	250 mm	250 mm	300 mm	250 mm	250 mm	185 mm	185 mm
Corrosion Protection	Zn or ZnAl	Zn or ZnAl	Zn or ZnAl	Zn or ZnAl	Zn or ZnAl	Zn or ZnAl	Zn or ZnAl
Bearing Rope Connection	Threaded	Threaded	Shackle	Shackle	Shackle	Threaded	Threaded
Panel Connection	Shackle	Shackle	Shackle	Shackle	Shackle	Shackle	Shackle

Support Structure

Post	RHP 160	RHP 120	HE 100 A	HE 120 A	HE 160 A	HE 300 A	HE 400 B
Post Height	2,1 m / 3,1 m	2,6 m	3,24 m	4,1 m	4,1 m	5,14 m	6,14 m
Integrated Steps	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated Rope Guides	Yes	Yes	Yes	No	No	Yes	Yes
Base Plate Connection	Welded	Bolt	Bolt	Bolt	Bolt	Tongue and Pin	Tongue and Pin
Base Plate Footprint	480 x 300 mm	500 x 250 mm	400 x 250 mm	500 x 250 mm	500 x 300 mm	790 x 350	790 x 350
Anchors per Base Plate	2–3	2–4	2–4	2–4	2–4	2	2

Rope and Brakes

Bearing Ropes	Ø16 mm	Ø18 mm	Ø18 mm	Ø18 + Ø16 mm	Ø20 mm	4 x Ø24 mm	4 x Ø24 mm
Middle Ropes	–	–	–	–	–	2 x Ø24 mm	4 x Ø24 mm
Retaining Ropes	–	Ø12 mm	Ø12 mm	Ø16 mm	Ø20 mm	Ø24 mm	Ø24 mm
Brake Element Type	BE 18 x 1,0 m / ISODISK	ISODISK	BE 18 x 1,5 m	Dual Simplex 1,0 / 3,0 m	ISODISK	AVT Phx 60/30-2.5	AVT Phx 80/30-2.5

Energy classes

Energy	Height									
	2,0 m	2,5 m	3,0 m	3,5 m	4,0 m	4,5 m	5,0 m	6,0 m	7,0 m	8,0 m
100 kJ	●	●	●	●						
250 kJ	●	●	●	●						
500 kJ			●	●	●	●				
1.000 kJ				○	●	●	●	●		
1.500 kJ					●	●	●	●		
2.000 kJ					●	●	●	●	●	●
3.000 kJ							●	●	●	●
5.000 kJ								●	●	

● ETAG 027 Certified ● CH-Certified ○ Certificate in Preparation



All systems are listed in the official approval list of:

→ www.eota.eu

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