Technický a skúšobný ústav stavebný, n. o.
Building Testing and Research Institute
Studená 3
821 04 Bratislava
Slovak Republic
Phone: +421 2 49228101
E-mail: sternova@tsus.sk
Website: www.tsus.sk

Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
www.eota.eu

European Technical Assessment ETA 21/0454 – version 01 of 02/06/2021

General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:	**Technický a skúšobný ústav stavebný, n. o.**
Trade name of the construction product	Weldmesh gabion boxes and mattresses: Inerteco Gabions
Product family to which the construction product belongs	Product area code: 20 Structural Metallic Products and Ancillaries
Manufacturer	INER.TE.CO S.r.l. Via Luigi Pirandello, 67 I-00137 Roma Italy www.inerteco.com
Manufacturing plant	INER.TE.CO S.r.l. Via Maremmana Inferiore, 98 I-00019 Villa Adriana, Tivoli, RM Italy
This European Technical Assessment contains	10 pages including 4 annexes which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	EAD 200020-00-0102
This version replaces	–

Specific part

1 Technical description of the product

A gabion is a container made from welded wire panels of variable sizes, uniformly partitioned into internal cells, interconnected with other similar units, and filled with stone at the project site to form flexible, permeable, monolithic structures used for earth retention, soil reinforcement, river training, erosion control, fascia systems, free-standing walls and rainscreens. A mattress is welded steel wire mesh container uniformly partitioned into internal cells with relatively small height in relation to other dimensions.

Welded wire gabions can be manufactured as:

- Welded gabions are manufactured as welded wire panel made from wire which is Zn95/Al5 alloy coated before welding into the fabric with C-ring, spiral or looped ends with locking pins connection components produced from Zn95/Al5 alloy coated wire.

Detailed data about product is shown in annexes.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

Weldmesh gabion boxes and mattresses: Inerteco Gabions are intended to be used for: earth retention, soil reinforcement, river training, erosion control, fascia systems, architectural claddings, sound barriers, free-standing walls and noise mitigation works.

The assumed working life of the Weldmesh gabion boxes and mattresses for the intended use is in accordance with EN 10223-8: 2013, Annex A, in relation to different wire coating and corrosive categories of environment when installed in the works.

The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[1].

[1] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

3 Performance of the product and references to the methods used for its assessment

The performance of the products is summarized in Table 1.

Table 1 – Performance of the product

Product-type: Weldmesh gabion boxes and mattresses: Inerteco Gabions	**Intended use:** Earth retention, soil reinforcement, river training, erosion control, fascia systems, architectural claddings, free-standing walls, sound barriers, noise mitigation works.		
BRW	**Essential characteristic**	**References to the methods used for assessment**	**Performance**
1	Wire diameter	EAD 200020-00-0102, 2.2.1	D_w (mm) Annex 2 and Annex 4
	Wire tensile strength	EAD 200020-00-0102, 2.2.2	f_t (N/mm^2) Annex 2 and Annex 4
	Dimensions of product, mesh size and connection components	EAD 200020-00-0102, 2.2.3	*H, L, W, M* × *N* (mm) Annex 2 Specific dimensions (mm) Annex 3
	Corrosion protection: non-ferrous metallic coating type	EAD 200020-00-0102, 2.2.4	Annex 4
	Class of coating mass		Annex 4
	Mass of hot dip galvanized coating		Annex 4
	Additional corrosion protection: organic coating type coating thickness and wire diameter coating concentricity	EAD 200020-00-0102, 2.2.5	Not relevant
	Weld shear strength	EAD 200020-00-0102, 2.2.6	The average shear strength of four welds selected randomly from one panel is not in line with with cl. 7.5 in EN 10223-8 and the average shear strength is 46,1% while the minimum single shear strength is 45,0% of the breaking load of wire.
	C-ring (or similar fastener) resistance to opening	EAD 200020-00-0102, 2.2.7	Fm = 2,50 kN
	Tensile strength/force of gabion/mattress including connection	EAD 200020-00-0102, 2.2.8	No performance assessed
	Durability in artificial atmospheres Sulphur dioxide test with general condensation of moisture: number of cycles showing less than 5 % of mesh samples surface covered by DBR (dark brown rust): Zn95/Al5 (class A)	EAD 200020-00-0102, 2.2.9.1	No performance assessed
	Neutral salt spray test with general condensation of moisture: number of hours showing less than 5 % of mesh samples surface covered by DBR (dark brown rust): Zn95/Al5 (class A)	EAD 200020-00-0102, 2.2.9.2	1 000 hours
4	Protection against injury	EAD 200020-00-0102, 2.2.10	No performance assessed
5	Airborne sound insulation	EAD 200020-00-0102, 2.2.11	No performance assessed
	Sound absorption	EAD 200020-00-0102, 2.2.12	No performance assessed
NOTE. - BWRs 2, 3, 6 and 7 are not relevant, see EAD 200020-00-0102.			

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

4.1 System of assessment and verification of constancy of performance

According to the Decision 98/214/EC of the European Commission[2],the system of assessment and verification of constancy of performance system 2+ applies, see Table 2.

Table 2 – System of assessment and verification of constancy of performance applicable to weldmesh gabion boxes and mattresses: Inerteco Gabions

Product(s)	Intended use(s)	Level(s) or class(es)	System(s) of assessment and verification of constancy of performance
Structural connectors metallic rivets, bolts (nuts and washers) and H. R. bolts (high strength friction grip bolts), studs, screws, railway fasteners	For uses in structural metallic works	Any	2+

The manufacturer shall draw up the declaration of performance and determine the product type on the basis of the assessments and verifications of constancy of performance carried out under the system 2+ as laid down in the Commission Delegated Regulation (EU) No 568/2014 of 18 February 2014, Annex V, 1.3. This system provides for:

(a) the manufacturer shall carry out:

  (i) an assessment of the performance of the construction product on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of that product;

  (ii) factory production control;

  (iii) testing of samples taken at the manufacturing plant by the manufacturer in accordance with the prescribed test plan;

(b) the notified factory production control certification body shall decide on the issuing, restriction, suspension or withdrawal of the certificate of conformity of the factory production control on the basis of the outcome of the following assessments and verifications carried out by that body:

  (iv) initial inspection of the manufacturing plant and of factory production control;

  (v) continuing surveillance, assessment and evaluation of factory production control.

4.2 Construction products for which the European Technical Assessment has been issued

Manufacturers undertaking tasks under system 2+ shall consider the European Technical Assessment issued for the construction product in question as the assessment of the performance of that product. Manufacturer shall therefore not undertake the task referred to in point 4.1 (a)(i).

[2] Official Journal of the European Communities L 80 of 18 March 1998, p.46.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

5.1 Tasks and responsibilities of the manufacturer

At the manufacturing plant the manufacturer has implemented and continuously maintains a factory production control system. All elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures.

The factory production system ensures that the performance of the "Gabion products" is in conformity with the European Technical Assessment. Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in TSÚS.

The manufacturer is responsible for preparing the declaration of performance. When all criteria of the assessment and verification of constancy of performance including certification are met, the manufacturer shall issue a declaration of performance.

5.2 Tasks and responsibilities of the notified body

The corner stones of the actions to be undertaken by the notified factory production control certification body in the procedure of assessment and verification of constancy of performance for "Inerteco Gabions" are laid down in Table 3.

Table 3 – Control plan for the notified body (bodies) for the weldmesh gabion boxes and mattresses: Inerteco Gabions; corner stones

Nr	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
(1)	(2)	(3)	(4)	(5)	(6)
Initial inspection of the manufacturing plant and of factory production control					
1	Ascertain that, in accordance with the prescribed test plan, the factory, in particular personnel and equipment, and the factory production control, are suitable to ensure a continuously and orderly manufacturing the product with the specifications given in the specific parts as well as in the Annexes of the European Technical Assessment.	–	Laid down in control plan	–	1
Continuing surveillance, assessment and evaluation of factory production control					
2	Verifying that the system of factory production control and the specified manufacturing process are maintained, taking account of the prescribed test plant.	–	Laid down in control plan	–	1/year

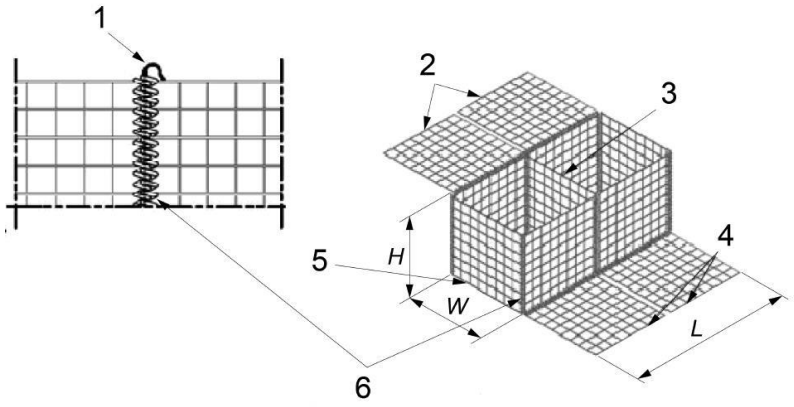
Technický a skúšobný ústav stavebný, n. o.
Building Testing and Research Institute
Studená 3, 821 04 Bratislava, Slovak Republic

On behalf of the Technický a skúšobný ústav stavebný, n. o.
Bratislava, 02 June 2021

prof. Ing. Zuzana Sternová, PhD.
Head of Technical Assessment Body

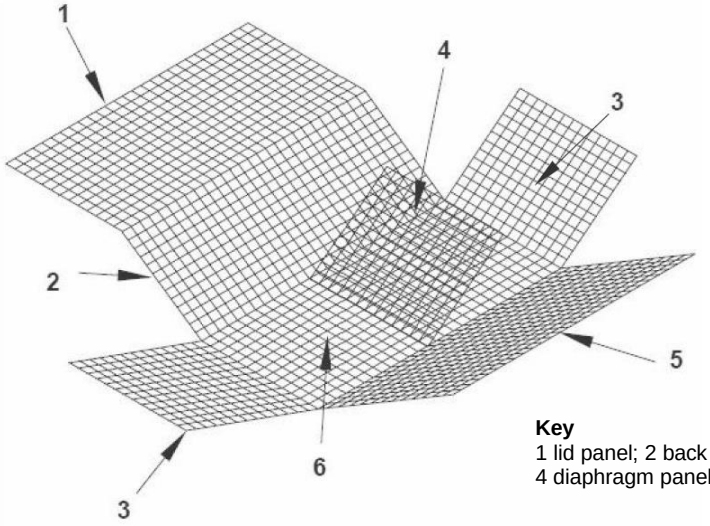
Annexes

Annex 1 Components of gabion products
Annex 2 Welded panel wire characteristics, mesh sizes, dimensions of gabions and mattresses
Annex 3 Connection and shapes and dimensions of connection components
Annex 4 Characteristics of wires of connection components



Key
1 joining pin; 2 lid; 3 diaphragm
4 base; 5 and 6 helical (spiral binders)
H height
L length
W width

Components of welded gabions



Key
1 lid panel; 2 back panel; 3 end panel;
4 diaphragm panel; 5 face panel; 6 base panel

Welded wire mesh panels of welded gabions

Components of gabion products	**Annex 1** **of European Technical Assessment** **ETA 21/0454**

Typical mesh sizes and wire characteristics

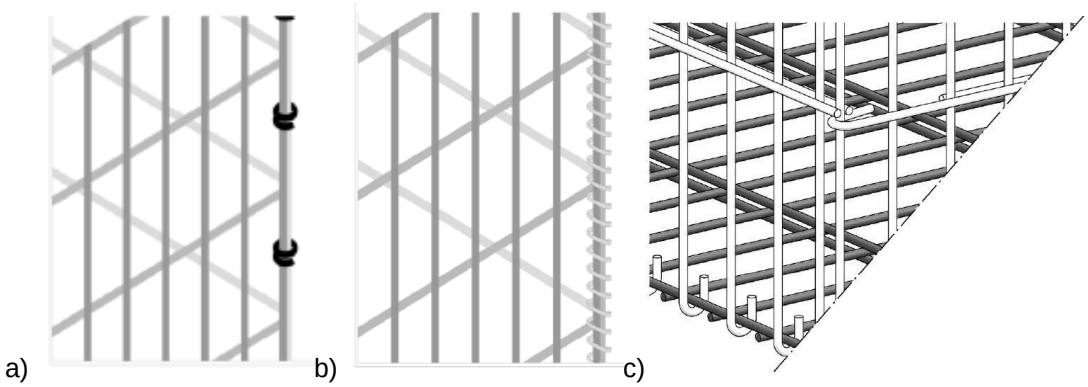
Mesh size (mm)	**Wire diameter** (mm)	**Tensile strength of wire[1)]**	**Type and minimum mass of coating**
50 × 200	5,8	$f_t \geq 500$ MPa	Non-ferrous metallic coating: Zn95/Al5, class A, EN 10244-2: 2009, Table 2
[1)] Tensile strength of wire is in line with cl. 7.4 of EN 10223-8: 2013.			

Dimensions of gabions and mattresses

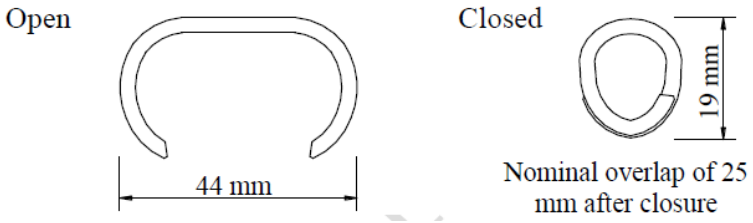
Product	**Dimensions** (m)
welded panel	1 × 0,3; 0,3 × 0,5; 0,5 × 0,5; 1 × 0,5; 2 × 0,5; 1 × 1; 1,3 × 1; 1,5 × 1; 2 × 1; 3,2 × 1,1; 3 × 1; 3,2 × 2
Tolerances 7.2 of EN 10223-8: 2013	±35 mm
Products with different dimensions are possible in accordance with the requirements of the individual design.	

Dimensions of gabion boxes are given by different variations of the used gabion blocks.

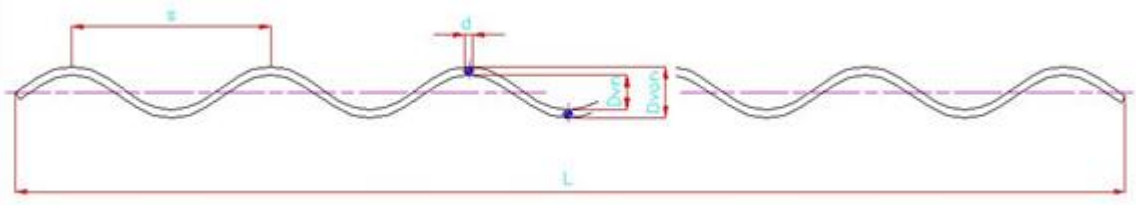
Welded panel wire characteristics, mesh sizes, dimensions of gabions and mattresses	**Annex 2 of European Technical Assessment ETA 21/0454**



Connection of welded panels with: a) C-rings, b) spiral and c) looped ends with locking pins



Shape and dimension of C-ring



Dimensions of spirals

Dimensions of spirals

L (mm)	***d*** (mm)	D_{vn} (mm)	D_{von} (mm)	***s*** (mm)
300	5,8	24; 17; 15	35; 25; 23	100; 50
500	5,8	24; 17; 15	35; 25; 23	100; 50
1000	5,8	24; 17; 15	35; 25; 23	100; 50
1500	5,8	24; 17; 15	35; 25; 23	100; 50

Connection and shapes and dimensions of connection components	**Annex 3 of European Technical Assessment ETA 21/0454**

Characteristics of wires of connection components

Connection type	**Coating type**	**Diameter** (mm) **Minimum outer**[1)]	**Minimum mass of coating**[2)] (g/m²)	**Tensile strength** (N/mm²)
C-ring	Zn95/Al5	3,00 ±0,070	255	≥ 1 720
Spirals		5,80 ±0,090	290	$f_t \geq 500$
Locking pins				

[1)] Tolerances of non-ferrous metallic coated wires are in accordance with Table 1 of EN 10218-2: 2012.
[2)] Non-ferrous metallic coating in accordance with Table 2 of EN 10244-2: 2009, class A.

Characteristics of wires of connection components, properties	**Annex 4 of European Technical Assessment ETA 21/0454**

REFERENCES

[1] Description of product, INER.TE.CO S.r.l., Italy, 2021

[2] Inspection Certificate 3.1, TECNOFIL, Italy, 10 October 2020

[3] Test Report No. SAC/0006/19, Salt spray test, OMECO S.r.l., 10 January 2019

[4] Test Report No. 80-21-00253, Tensile tests, TSUS, Prešov, Slovak Republic, 20 March 2021

[5] Regulation (EU) No. 305/2011 of the European Parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/ECC

[6] EAD 200020-00-0102 WELDMESH GABION BOXES AND MATTRESSES

STANDARDS

EN 10204: 2004	Metallic products. Types of inspection documents
EN 10218-1: 2012	Steel wire and wire products. General. Part 1: Test methods
EN 10218-2: 2012	Steel wire and wire products. General. Part 2: Wire dimensions and tolerances
EN 10223-8: 2013	Steel wire and wire products for fencing and netting. Part 8: Welded mesh gabion products
EN 10244-1: 2009	Steel wire and wire products. Non-ferrous metallic coatings on steel wire. Part 1: General principles
EN 10244-2: 2009	Steel wire and wire products. Non-ferrous metallic coatings on steel wire. Part 2: Zinc or zinc alloy coatings
EN ISO 9223: 2012	Corrosion of metals and alloys. Corrosivity of atmospheres. Classification, determination and estimation (ISO 9223: 2012)
EN ISO 9227: 2017	Corrosion tests in artificial atmospheres. Salt spray tests (ISO 9227: 2017)