



ETA-Danmark A/S
Göteborg Plads 1
DK-2150 Nordhavn
Tel. +45 72 24 59 00
Fax +45 72 24 59 04
Internet www.etadanmark.dk

Authorised and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA



European Technical Assessment ETA-17/0059 of 10/03/2017

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

Ledro Steel Box / Ledro Steel Ecobox

Product family to which the above construction product belongs:

Weldmesh gabion boxes

Manufacturer:

Metallurgica Ledrense Soc. Coop
Ledro Steel
Via Ampola 14
IT-38067 Ledro
Tel. +39 464 596061
Fax +39 464 596045
Internet www.metallurgicaledrense.net

Manufacturing plant:

Metallurgica Ledrense Soc. Coop

This European Technical Assessment contains:

12 pages including 1 Annex which form an integral part of the document

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

EAD 200020-00-0102 Weldmesh gabion boxes and mattresses, edition November 2016

This version replaces:

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

This ETA covers Ledro Steel box and Ledro Steel Ecobox welded gabion boxes produced from metallic-coated welded wire fabric and metallic-coated wire for stiffeners. Gabions are box structures made of welded wire mesh, normally filled on site with coarse armour-stone. This ETA is limited to the characteristics of the wires, wire mesh and panel assemblies; filling the gabion is outside the scope of this ETA.

The gabion is a wire fabric container, which when filled with suitable stone, may be used as a component in a retaining structure or as a barrier against erosion (e.g. for river training). The wire is pre-coated with zinc-aluminium alloy. Steel wire bracing stiffeners are positioned in the mid panel of the gabion boxes to prevent the deformation and maintain the shape.

See annex A for a description of the gabions and components.

2 Specification of the intended use in accordance with the applicable EAD

Ledro Steel box and Ledro Steel Ecobox welded mesh gabions are intended to be used for earth retention, soil reinforcement, river training, erosion control, fascia systems, free-standing walls, architectural cladding and rain screen applications. The use of welded mesh gabions should be outside the influence of corrosive soils and waters containing salt or other chemical substances considered corrosive for steel and steel products.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the product of 50 years.

This working life assumes normal environmental conditions in terms of corrosivity category C2 according to ISO 9223, Table 4, and EN 12500, Table 1, respectively. These provisions are based upon the current state of the art and the available knowledge and

experience. For corrosivity category C2, the intended working life of gabion products with metallic coatings of zinc-aluminium alloy, based on the conditions as given in section 3.1 of this ETA, is assumed to be no less than that calculated on the basis of mass loss for the metallic coating as given in ISO 9223, Table 5, and EN 12500, Table 1.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

Characteristic	Assessment of characteristic									
3.1 Mechanical resistance and stability (BWR1)										
Diameters of wire	See Annex A. Tolerances on Diameter of Metallic Coated Wire is in accordance with EN 10218-2, Table 1, Tolerance Class T1.									
Wire tensile strength and elongation	Wire tensile strength > 500 MPa according to the pt.3 of the EN 10218-1 with the limitations given in the pt. 7.4 of the EN 10223-8 after the cold worked processing. <table><tr><th>Wire</th><th>Tensile strength, mean value, MPa</th><th>Elongation, mean value, %</th></tr><tr><td>4 mm</td><td>641</td><td>7,22</td></tr><tr><td>6 mm</td><td>553</td><td>6,47</td></tr></table>	Wire	Tensile strength, mean value, MPa	Elongation, mean value, %	4 mm	641	7,22	6 mm	553	6,47
Wire	Tensile strength, mean value, MPa	Elongation, mean value, %								
4 mm	641	7,22								
6 mm	553	6,47								
Dimensions of product H, L, W, mesh size M x N and dimensions of connection components	See Annex A									
Corrosion protection	The steel wires are zinc-aluminium alloy coated with minimum 275 g/m ² coating for wires with diameter 3.80-4.40 mm and minimum 290 g/m ² coating for wires with diameter 5.20-8.20 mm corresponding to class A in accordance with EN 10244-2									
Weld shear strength	The average shear strength of four welds selected randomly from one panel shall not be less than 75% of the breaking load of the wire (maximum force during tensile test) with no single shear strength of weld below 50% in accordance with cl. 7.5 in EN 10223-8									
Tensile strength of gabion/mattress including connection (in kN/m)	No performance assessed									
Durability	Durability against neutral salt spray test. The weld mesh panels, connectors, hooks and stiffeners which are zinc-aluminium alloy coated with with minimum 275 g/m ² coating for wires with diameter 3.80-4.40 mm and minimum 290 g/m ² coating for wires with diameter 5.20-8.20 mm were subjected to a test duration of 1000 hours and showed less than 5 % dark brown rust.									
3.4 Safety and accessibility in use (BWR4)										
Protection against injury	The gabion poses no obvious risk of injury caused by sharp edges of jut out wires.									
3.5 Protection against noise (BWR5)										
Airborne sound insulation	No Performance assessed									
Sound absorption	No Performance Assessed									

4 Attestation and verification of constancy of performance (AVCP)


4.1 AVCP system

According to the decision 1998/214/EC the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2017-03-10 by



Thomas Bruun
Managing Director, ETA-Danmark

ANNEX A

Description of the gabions and components

The Ledrense gabions have parallelepiped or cube shape. The gabions are composed by, see figure n° 1:

- Bottom element.
- Top element.
- 4 lateral elements (2 length direction and 2 width direction).
- Internal stiffeners (the number depends by the dimension of the gabions).

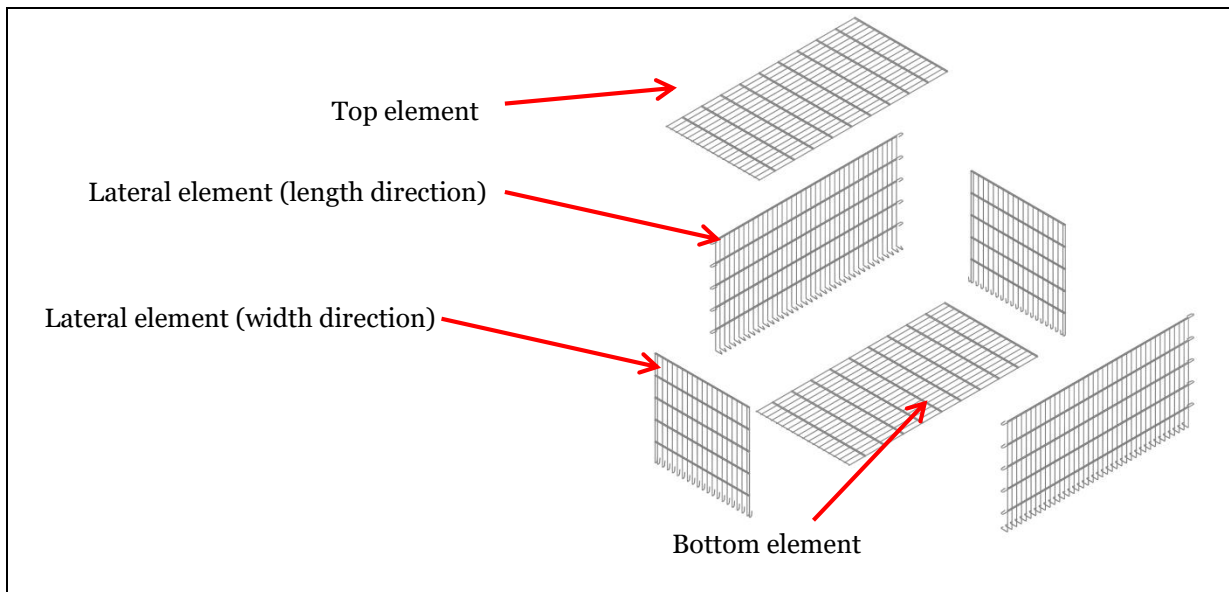


Figure n° 1

All the elements above are made of:

- **LEDRO STEEL BOX:** double steel wire of diameter 6 mm for the horizontal direction (except for the boundaries, which are single) and single steel wire of diameter 6mm for the vertical direction. See figure n° 2.
- **LEDRO STEEL ECOBOX:** single steel wire of diameter 4 mm for the horizontal direction and single steel wire of diameter 4mm for the vertical direction. See figure n° 3.

The steel wires are zinc-aluminium alloy coated with minimum 275 g/m² coating for wires with diameter 3.80-4.40 mm and minimum 290 g/m² coating for wires with diameter 5.20-8.20 mm corresponding to class A in accordance with EN 10244-2

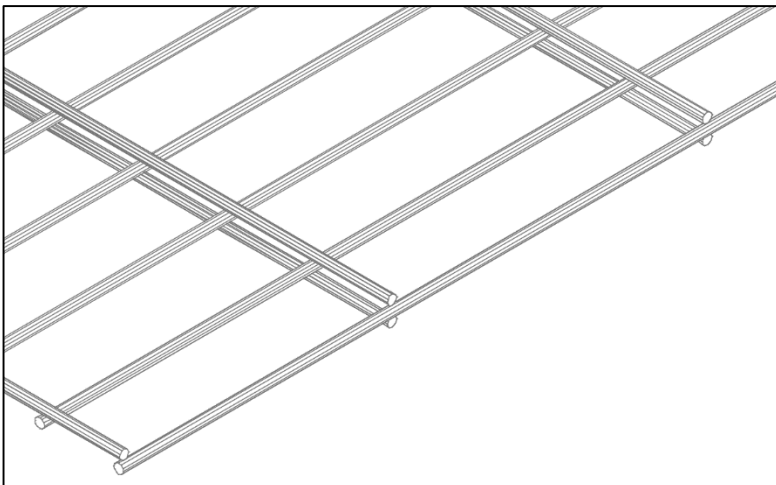


Figure n° 2

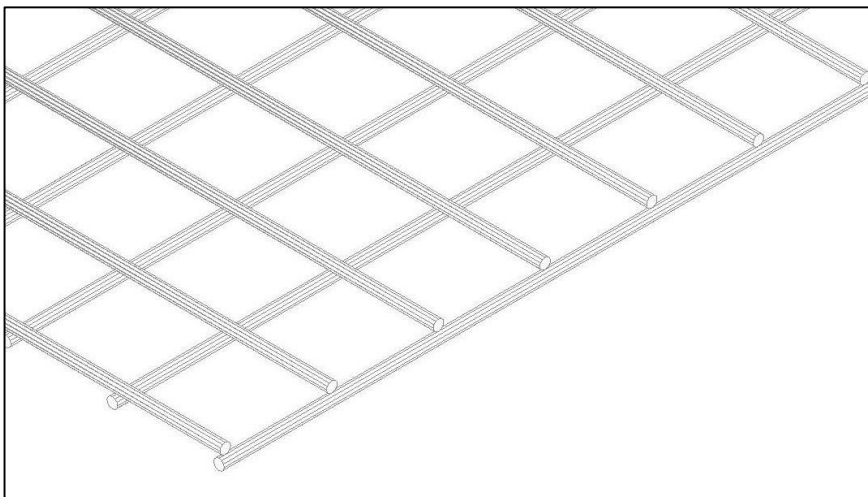


Figure n° 3

The lateral elements (length direction) are connected by a J-shaped hook, incorporated in the lateral elements, with the bottom element, see figure n° 4.

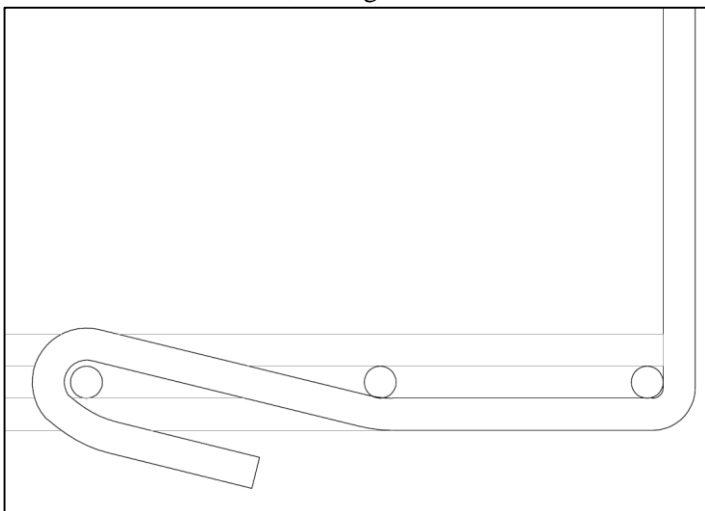


Figure n° 4

The lateral elements (width direction) are connected by a U-shaped hook, incorporated in the lateral elements, with the bottom element, see figure n° 5.

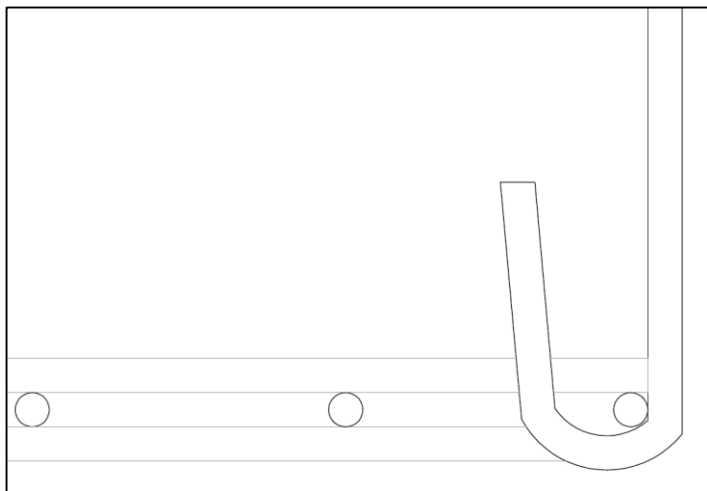


Figure n° 5

The lateral elements (length and width direction) are connected each other by a U hook, incorporated in the lateral elements (length direction), see figure n° 6.

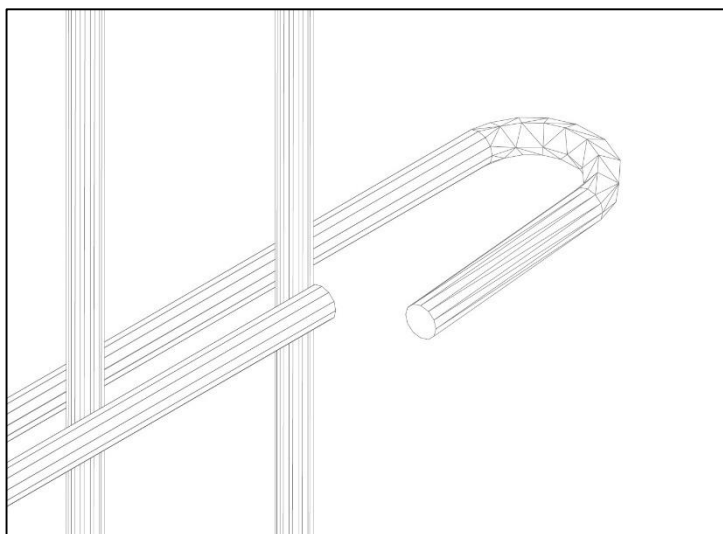


Figure n° 6

The stiffeners connect the lateral elements two-two with the following rule: length-length and width-width, in number and positions in according with the instruction given by the manufacturer, mainly in function of the dimensions of the gabions. See figure n° 7 as an example.

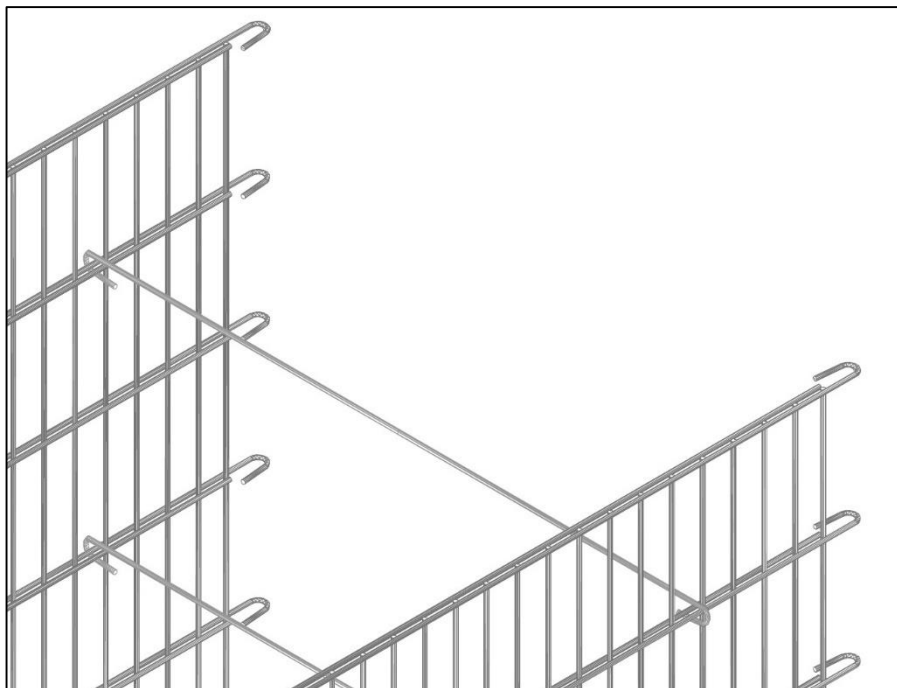


Figure n° 7

All the hooks and stiffeners are designed to give stability and structural resistance at the gabions for the movements and placement phases, and ensure the monolithic behaviour of the gabions.

The gabions are delivered in the following sizes

	GABIONS		
	LEDRO STEEL BOX (13) Nominal Dimensions (mm)		
Commercial name (HxLxW)	H	L	w
50x50x50	515	515	500
100x100x50	1015	1015	500
100x100x100	1015	1015	990
50x100x50	515	1015	500
50x100x100	515	1015	990
100x150x50	1015	1515	500
100x150x100	1015	1515	990
50x150x50	515	1515	500
50x150x100	515	1515	990
100x200x50	1015	2015	500
100x200x100	1015	2015	990
50x200x50	515	2015	500
50x200x100	515	2015	990

Commercial name [HxLxW)	ECOBX (8) Nominal Dimensions (mm)		
	H	L	w
100x100x50	1015	1010	510
100x100x100	1015	1010	1005
50x100x50	510	1010	510
50x100x100	510	1010	1005
100x200x50	1015	2015	510
100x200x100	1015	2015	1005
50x200x50	510	2015	510
50x200x100	510	2015	1005

The elements of the gabions are described below

Commercial name	LEDRO STEEL BOX (7) Nominal Dimensions (mm)	
	TOP ELEMENT	
	w	L
50x50	467	476
50x100	467	972
100x100	967	972
50x150	467	1471
100x150	967	1471
50x200	467	1967
100x200	967	1967

Commercial name	LEDRO STEEL BOX (7) Nominal Dimensions (mm)	
	LATERAL ELEMENT (LENGTH DIRECTION)	
	H	L
50x50	501	515
50x100	501	1014
100x100	998	1014
50x150	501	1514
100x150	998	1514
50x200	501	2013
100x200	998	2013

	LEDRO STEEL BOX (4) Nominal Dimensions (mm)	
	LATERAL ELEMENT (WIDTH DIRECTION)	
Commercial name	H	w
SOxSO	492	477
50x100	492	977
100x100	1002	977
100x50	1002	477

	LEDRO STEEL BOX (7) Nominal Dimensions (mm)	
	BOTTOM ELEMENT	
Commercial name	w	L
SOxSO	467	476
50x100	467	972
100x100	967	972
50x150	467	1471
100x150	967	1471
50x200	467	1967
100x200	967	1967

	ECOBBOX (4) Nominal Dimensions (mm)	
	TOP ELEMENT	
Commercial name	W	L
50x100	489	992
100x100	993	992
50x200	489	1976
100x200	993	1976

	ECOBBOX (4) Nominal Dimensions (mm)	
	LATERAL ELEMENT LENGTH	
Commercial name	H	L
50x100	499	1009
100x100	1002	1009
50x200	499	2013
100x200	1002	2013

	ECOBBOX (4) Nominal Dimensions (mm)	
	LATERAL ELEMENT (WIDTH	
Commercial name	H	W
50x100	497	993
100x100	1004	993
50x50	497	495
100x50	1004	495

Commercial name	ECOBX (4) Nominal Dimensions (mm)	
	W	L
50x100	489	992
100x100	993	992
50x200	489	1976
100x200	993	1976

STIFFENERS

6 mm FOR BOTH PRODUCTS: LEDRO STEEL BOX & ECOBOX	
Commercial name	Nominal mm
500	520
1000	1021
1500	1524
2000	2021

WIRES

FOR BOTH PRODUCTS: LEDRO STEEL BOX & ECOBOX	
Commercial name	Nominal diameter, mm
4	4,00
6	6,00

MASH

LEDRO STEEL BOX (2) Nominal Dimensions (mm)		
Commercial name (MxN)	MASH	
	M (vertical)	N (horizontal)
200x50	198	48

MASH

ECOBX (2) Nominal Dimensions (mm)		
Commercial name (MxN)	MASH	
	M (vertical)	N (Horizontal)
60x60	65	65