



**INSTITUTO DE CIENCIAS
DE LA CONSTRUCCIÓN
EDUARDO TORROJA**

C/ Serrano Galvache n. 4 28033 Madrid (Spain)
Tel.: (34) 91 302 04 40 Fax: (34) 91 302 07 00
direccion.ietcc@csic.es www.ietcc.csic.es

European Technical Assessment

ETA 12/0097 of 30/01/2018

English translation prepared by IETcc. Original version in Spanish language

General Part

Technical Assessment Body issuing the ETA designated according to Art. 29 of Regulation (EU) 305/2011:

Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product

LUSAN. Anti-twist FIXBOLT anchor bolt.

Product family to which the construction product belongs

Torque controlled expansion anchor made of galvanized steel of sizes M6, M8, M10, M12 and M16 for use in non-cracked concrete only.

Manufacturer

LUSAN FIJACIONES Y ANCLAJES S.L.
Pol. Pla de la Bruguera. c/ Solsonés, 66
08211 Castellar del Vallés, Barcelona, Spain

Manufacturing plants

Pol. Pla de la Bruguera. c/ Solsonés, 66
08211 Castellar del Vallés, Barcelona, Spain

This European Technical Assessment contains

10 pages including 3 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

European Technical Assessment EAD 330232-00-0601 "Mechanical Fasteners for use in concrete", ed. October 2016

English translation prepared by IETcc

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission according to article 25 (3) of Regulation (EU) No 305/2011.

SPECIFIC PART

1. Technical description of the product

The LUSAN FIXBOLT anchor in the range of M6 to M16 is an anchor made of galvanised steel, which is placed into a drilled hole and anchored by torque-controlled expansion.

Product and product description is given in annex A.

2. Specification of the intended use in accordance with the applicable European Assessment Document.

The performances given in section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a mean to 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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance under static or quasi static loading	See annexes C1 to C3
Displacements under tension and shear loads	See annexes C2 and C3

3.2 Safety in case of fire (BWR 2)

No performance determined

3.3 Hygiene, health and the environment (BWR 3)

This requirement is not relevant for the anchors.

3.4 Safety in use (BWR 4)

The essential characteristics regarding safety in use are included under the basic works requirements Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

This requirement is not relevant for the anchors.

3.6 Energy economy and heat retention (BWR 6)

This requirement is not relevant for the anchors.

English translation prepared by IETcc

3.7 Sustainable use of natural resources (BWR 7)

No performance determined

4. Assessment and Verification of Constancy of Performances (hereinafter AVCP) system applied, with reference to its legal base

The applicable European legal act for the system of Assessment and Verification of Constancy of Performances (see annex V to Regulation (EU) No 305/2011) is 96/582/EC.

The system to be applied is 1.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document.

The technical details necessary for the implementation of the AVCP system are laid down in the quality plan deposited at Instituto de Ciencias de la Construcción Eduardo Torroja.



Instituto de ciencias de la construcción Eduardo Torroja
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

C/ Serrano Galvache n.º 4. 28033 Madrid.
Tel: (+34) 91 302 04 40 Fax. (+34) 91 302 07 00
www.ietcc.csic.es



On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
Madrid, 30th of January 2018

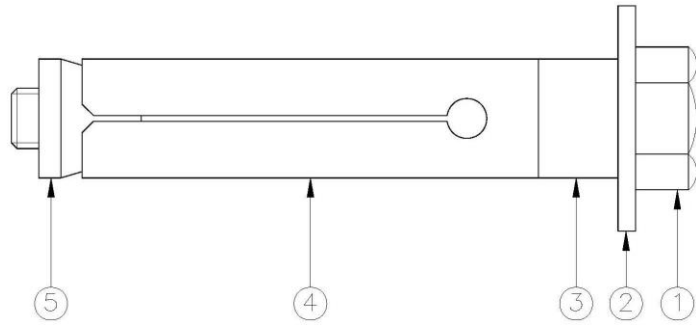
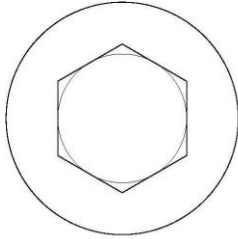
A handwritten signature in blue ink, appearing to read 'Marta Mª Castellote Armero', written over a faint, illegible stamp.

Marta Mª Castellote Armero
Director

English translation prepared by IETcc

Product

LUSAN FIXBOLT anchor



- 1.- Body
- 2.- Washer
- 3.- Plastic ring
- 4.- Expansion clip
- 5.- Cone

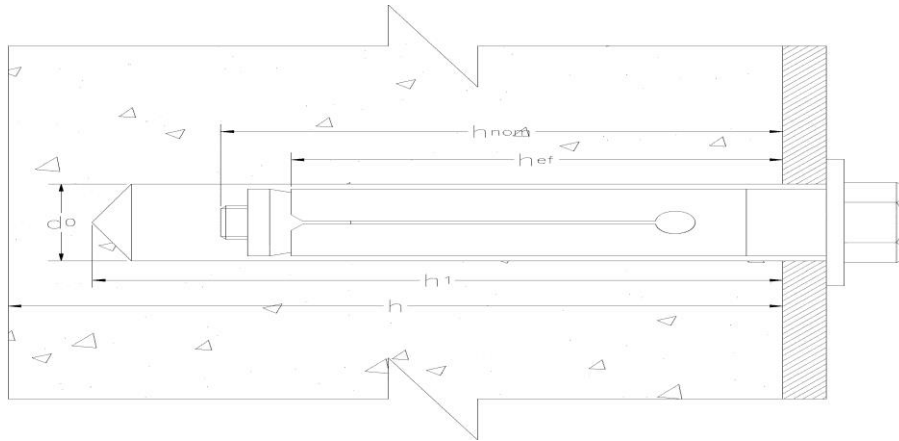
Identification on anchor:

Each anchor is marked with its diameter size number and its clip outer anchoring diameter (with the exception of M16 anchors).

LUSAN FIXBOLT anchor	Annex A1
Product description	
Product	

English translation prepared by IETcc

Installed condition



- h_{ef} : Effective anchorage depth
- h_1 : Drilling hole depth
- h_c : Minimum concrete depth
- t_{fix} : Fixture thickness
- d_0 : Drill bit
- d_f : Diameter of clearance hole on fixture

Table A1: materials

Item	Designation	FIXBOLT ZINC PLATED
1	Body	Steel class 8.8 ISO 898-1
2	Washer	Special washer Type DIN 125-L
3	Plastic ring	PVC
4	Expansion clip	Steel slab
5	Cone	Carbon steel EN 10277-3

LUSAN FIXBOLT anchor

Product description

Installed condition and Materials

Annex A2

Specifications of intended use

Anchorage subjected to:

- Static or quasi static loads

Base materials:

- Reinforced or unreinforced normal weight concrete according to EN 206-1:2008
- Strength classes C20/25 to C50/60 according to EN 206-1:2008
- Uncracked concrete

Use conditions (environmental conditions):

- Anchorages subjected to dry internal conditions.

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete.
- Verifiable calculation rules and drawings are prepared taking into account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages under static or quasi-static actions are designed for design method A in accordance with:
 - ETAG 001, Annex C, edition August 2010
 - prEN1992-4

Installation:

- Hole drilling by rotary plus hammer mode.
- Anchor installation carried out by appropriately qualified personal and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.

LUSAN FIXBOLT anchor	Annex B1
Intended use	
Specifications	

English translation prepared by IETcc

Table C1: Installation parameters for LUSAN FIXBOLT anchor

Installation parameters			Performances				
			M6	M8	M10	M12	M16
d_o	Nominal diameter of drill bit:	[mm]	8	10	12	16	20
d_f	Fixture clearance hole diameter:	[mm]	9	12	14	18	22
T_{inst}	Nominal installation torque:	[Nm]	15	25	35	50	80
L_{min}	Total length of the bolt	[mm]	45	60	70	80	110
L_{max}		[mm]	60	80	100	110	140
h_{min}	Minimum thickness of concrete member:	[mm]	100	100	100	110	160
h_1	Depth of drilled hole:	[mm]	50	65	75	85	115
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	66,5	77	103,5
h_{ef}	Effective anchorage depth:	[mm]	30	40	50	53	78
t_{fix}	Thickness of fixture	[Nm]	5-20	5-25	5-35	10-35	10-40
s_{min}	Minimum allowable spacing:	[mm]	90	120	150	165	240
c_{min}	Minimum allowable distance:	[mm]	45	60	75	82,5	120

LUSAN FIXBOLT anchor

Performances

Installation parameters

Annex C1

English translation prepared by IETcc

Table C2: Characteristic values to tension loads of design method C according to ETAG 001, Annex C, CEN/TS 1992-4 or prEN1992-4 for LUSAN FIXBOLT anchor

Characteristic values of resistance to tension loads of design method C			Performance				
			M6	M8	M10	M12	M16
Tension loads: steel failure							
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	10,1	19,1	34,3	49,6	85,9
γ_{Ms}	Partial safety factor: ¹⁾	[-]	1,68	1,68	1,68	1,68	1,68
Tension loads: pull-out failure in concrete							
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	5	7,5	9	12	20
γ_{Mp}	Partial safety factor: ¹⁾	[-]	1.8	1.5	1.5	1.5	1.8
Tension loads: concrete cone and splitting failure							
h_{ef}	Effective embedment depth:	[mm]	30	40	50	53	78
γ_{Mc}	Partial safety factor: ¹⁾	[-]	1.8	1.5	1.5	1.5	1.8
$s_{cr,N}$	Critical spacing:	[mm]	90	120	150	159	234
$c_{cr,N}$	Critical edge distance:	[mm]	45	60	75	79,5	117
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	160	192	220	260	336
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	80	96	110	130	168
γ_{Msp}	Partial safety factor: ¹⁾	[-]	1.8	1.5	1.5	1.5	1.8

Displacements under tension loads			Performance				
			M6	M8	M10	M12	M16
N	Service tension load in cracked and uncracked concrete C20/25 to C50/60:	[kN]	2,4	4,3	5,7	7,6	11,5
δ_{N0}	Short term displacement under tension loads:	[mm]	0,09	0,08	0,05	0,02	0,06
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1,59	1,59	1,59	1,59	1,59

¹⁾ in absence of other national regulations

LUSAN FIXBOLT anchor	Annex C2
Performances	
Characteristic values for tension loads	

English translation prepared by IETcc

Table C3: Characteristic values to shear loads of design method C according to ETAG 001, Annex C, CEN/TS 1992-4 or prEN1992-4 for LUSAN FIXBOLT anchor

Characteristic values of resistance to shear loads of design method C			Performance				
			M6	M8	M10	M12	M16
Shear loads: steel failure without lever arm							
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	7,5	13,8	22,0	32,0	60,1
γ_{Ms}	Partial safety factor: ¹⁾	[-]	1,25	1,25	1,25	1,25	1,25
Shear loads: concrete pryout failure							
K	K factor:	[-]	1,0	1,0	1,0	1,0	2,0
γ_{Mpr}	Partial safety factor: ¹⁾	[-]	1,8	1,5	1,5	1,5	1,8
Shear loads: concrete edge failure							
l_f	Effective anchorage depth under shear loads:	[mm]	30	40	50	53	78
d_{nom}	Outside anchor diameter:	[mm]	8	10	12	16	20
γ_{Mc}	Partial safety factor: ¹⁾	[-]	1,8	1,5	1,5	1,5	1,8

Displacements under shear loads			Performance				
			M6	M8	M10	M12	M16
V	Service shear load:	[kN]	4,3	6,9	11,4	16,6	34,3
$\bar{\delta}_{V0}$	Short term displacement under shear loads:	[mm]	0,5	1,8	3,3	5,8	5,3
$\bar{\delta}_{V\infty}$	Long term displacement under shear loads:	[mm]	0,75	2,70	4,95	8,70	7,95

¹⁾ in absence of other national regulations

LUSAN FIXBOLT anchor

Performances

Characteristic values for shear load.

Annex C3