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Autorisé et notifié conformément à l'article 10 de la directive 89/106/EEC du Conseil, du 21 décembre 1988, relative au rapprochement des dispositions législatives, réglementaires et administratives des Etats membres concernant les produits de construction.

CSTB le futur en construction

MEMBRE DE L'EOTA

European Technical Approval ETA-07/0047

(English language translation, the original version is in French language)

Nom commercial : **Trade name:**	**SPIT GUARDIA** **SPIT GUARDIA A4**
Titulaire : **Holder of approval:**	**Société Spit** **Route de Lyon** **F-26501 BOURG-LES-VALENCE** **France**
Type générique et utilisation prévue du produit de construction : **Generic type and use of construction product:**	Cheville métallique à expansion par vissage à couple contrôlé, de fixation dans le béton non fissuré: diamètres ϕ12. **Torque-controlled expansion anchor for use in non cracked concrete: sizes ϕ12**
Validité du : au : **Validity from / to:**	**04/09/2012** **04/09/2017**
Usine de fabrication : **Manufacturing plant:**	**Société Spit** **Route de Lyon** **F-26501 BOURG-LES-VALENCE** **France**
Le présent Agrément technique européen contient : **This European Technical Approval contains:**	12 pages incluant 4 annexes faisant partie intégrante du document. **12 pages including 4 annexes which form an integral part of the document.**

This European Technical Approval cancels and replaces ETA-07/0047 with validity from 17/12/2008 to 03/09/2012

Cet Agrément Technique Européen annule et remplace l'ETA-07/0047 valide du 17/12/2008 au 03/09/2012

I LEGAL BASES AND GENERAL CONDITIONS

1. This European Technical Approval is issued by the Centre Scientifique et Technique du Bâtiment in accordance with:

   - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by the Council Directive 93/68/EEC of 22 July 1993 [2] and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council [3];
   - Décret n° 92-647 du 8 juillet 1992 [4] concernant l'aptitude à l'usage des produits de construction;
   - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex of Commission Decision 94/23/EC[5];
   - Guideline for European Technical Approval of « Metal Anchors for use in Concrete » ETAG 001, edition 1997, Part 1 « Anchors in general » and Part 2 « Torque-controlled expansion anchors ».

2. The Centre Scientifique et Technique du Bâtiment is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant (for example concerning the fulfilment of assumptions made in this European Technical Approval with regard to manufacturing). Nevertheless, the responsibility for the conformity of the products with the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3. This European Technical Approval is not to be transferred to manufacturers or agents of manufacturer other than those indicated on page 1; or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4. This European Technical Approval may be withdrawn by the Centre Scientifique et Technique du Bâtiment pursuant to Article 5 (1) of the Council Directive 89/106/EEC.

5. Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of the Centre Scientifique et Technique du Bâtiment. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6. The European Technical Approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

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1 Official Journal of the European Communities n° L 40, 11.2.1989, p. 12
2 Official Journal of the European Communities n° L 220, 30.8.1993, p. 1
3 Official Journal of the European Union n° L 284, 31.10.2003, p. 25
4 Journal officiel de la République française du 14 juillet 1992
5 Official Journal of the European Communities n° L 17, 20.1.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1. Definition of product

The Spit GUARDIA anchor is an anchor made of zinc electroplated steel or stainless steel, which is placed into a drilled hole and anchored by torque-controlled expansion.
For the installed anchor see Figure given in Annex 1.

1.2. Intended use

The anchor is intended to be used for anchorages for which requirements for mechanical resistance and stability and safety in use in the sense of the Essential Requirements 1 and 4 of Council Directive 89/106/EEC shall be fulfilled and failure of anchorages made with these products would compromise the stability of the works, cause risk to human life and/or lead to considerable economic consequences.

The anchor is to be used only for anchorages subject to static or quasi-static loading in reinforced or unreinforced normal weight concrete of strength classes C20/25 minimum to C50/60 maximum according to ENV 206-1: 2000-12. It may be anchored in non-cracked concrete only.

The **GUARDIA 12x105/20** carbon steel anchors may only be used in concrete subject to dry internal conditions.

The **GUARDIA 12x110/20 A4** stainless steel anchors may be used in concrete subject to dry internal conditions and also in concrete subject to external atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

The provisions made in this European Technical Approval are based on an assumed intended working life of the anchor of 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 means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of product and methods of verification

2.1. Characteristics of product

The GUARDIA 12x105/20 and GUARDIA 12x110/20 A4 anchors correspond to the drawings and provisions given in Annexes 1 to 2. The characteristic material values, dimensions and tolerances of the anchors not indicated in Annexes 1 and 2 shall correspond to the respective values laid down in the technical documentation[6] of this European Technical Approval. The characteristic anchor values for the design of anchorages are given in Annexes 3 to 4.

Each anchor is marked with the identifying mark of the producer according to Annex 1.

The anchor shall only be packaged and supplied as a complete unit.

2.2. Methods of verification

The assessment of fitness of the anchor for the intended use in relation to the requirements for mechanical resistance and stability and safety in use in the sense of the Essential Requirements 1 and 4 has been made in accordance with the « Guideline for European Technical Approval of Metal Anchors for use in Concrete », Part 1 « Anchors in general » and Part 2 « Torque-controlled expansion anchors », on the basis of Option 7.

6 The technical documentation of this European Technical Approval is deposited at the Centre Scientifique et Technique du Bâtiment and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure, is handed over to the approved bodies.

3 Evaluation of Conformity and CE marking

3.1. Attestation of conformity system

The system of attestation of conformity 2 (i) (referred to as system 1) according to Council Directive 89/106/EEC Annex III laid down by the European Commission provides:

a) tasks for the manufacturer:

1. factory production control,
2. further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan.

b) tasks for the approved body:

3. initial type-testing of the product,
4. initial inspection of factory and of factory production control,
5. continuous surveillance, assessment and approval of factory production control.

3.2. Responsibilities

3.2.1. Tasks of the manufacturer, factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Approval.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the prescribed test plan[7]. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of incoming materials such as nuts, washers, wire for bolts and metal band for expansion sleeves shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. tensile strength, hardness, surface finish.

The manufactured components of the anchor shall be subjected to the following tests:

- Dimensions of component parts:
  Cone (diameters, lengths, thread, angle of the cone, roughness of the cone);
  Expansion sleeve (length, thickness, catch sizes);
  Headed bolt (length, diameter, thread, wrench size across flats);
  washer (diameters, thickness).
- Material properties: Headed bolt (yielding and ultimate tensile strengths), Cone (hardness), washer (hardness).
- Thickness of the zinc electroplated treatment of the elements.
- Visual control of correct assembly and of completeness of the anchor.

The frequency of controls and tests conducted during production and on the assembled anchor is laid down in the prescribed test plan taking account of the automated manufacturing process of the anchor.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- designation of the product, basic material and components;
- type of control or testing;

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7 The prescribed test plan has been deposited at the Centre Scientifique et Technique du Bâtiment and is handed over only to the approved bodies involved in the conformity attestation procedure.

- date of manufacture of the product and date of testing of the product or basic material and components;
- result of control and testing and, if appropriate, comparison with requirements;
- signature of person responsible for factory production control.

The records shall be presented to the inspection body during the continuous surveillance. On request, they shall be presented to the Centre Scientifique et Technique du Bâtiment.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the prescribed test plan which is part of the technical documentation of this European Technical Approval.

3.2.2. Tasks of approved bodies

3.2.2.1. Initial type-testing of the product

For initial type-testing the results of the tests performed as part of the assessment for the European Technical Approval shall be used unless there are changes in the production line or plant. In such cases the necessary initial type-testing has to be agreed between the Centre Scientifique et Technique du Bâtiment and the approved bodies involved.

3.2.2.2. Initial inspection of factory and of factory production control

The approved body shall ascertain that, in accordance with the prescribed test plan, the factory and the factory production control are suitable to ensure continuous and orderly manufacturing of the anchor according to the specifications mentioned in 2.1. as well as to the Annexes to the European Technical Approval.

3.2.2.3. Continuous surveillance

The approved body shall visit the factory at least once a year for routine inspection. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking account of the prescribed test plan.

Continuous surveillance and assessment of factory production control have to be performed according to the prescribed test plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body or inspection body, respectively, to the Centre Scientifique et Technique du Bâtiment. In cases where the provisions of the European Technical Approval and the prescribed test plan are no longer fulfilled the conformity certificate shall be withdrawn.

3.3. CE-Marking

The CE marking shall be affixed on each packaging of anchors. The symbol « CE » shall be accompanied by the following information:

- identification number of the certification body;
- name or identifying mark of the producer and manufacturing plant;
- the last two digits of the year in which the CE-marking was affixed;
- number of the EC certificate of conformity;
- number of the European Technical Approval;
- use category (ETAG 001-1 Option 7);
- size.

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1. Manufacturing

The anchor is manufactured in accordance with the provisions of the European Technical Approval using the automated manufacturing process as identified during inspection of the plant by the Centre Scientifique et Technique du Bâtiment and the approved body and laid down in the technical documentation.

4.2. Installation

4.2.1. Design of anchorages

The fitness of the anchors for the intended use is given under the following conditions:

- The anchorages are designed in accordance with the « Guideline for European Technical Approval of Metal Anchors for Use in Concrete », Annex C, Method A, for torque-controlled expansion anchors under the responsibility of an engineer experienced in anchorages and concrete work.

- Verifiable calculation notes and drawings are prepared taking 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 support, etc.).

4.2.2. Installation of anchors

The fitness for use of the anchor can only be assumed if the anchor is installed as follows:

- anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on the site;
- use of the anchor only as supplied by the manufacturer without exchanging the components of an anchor;
- anchor installation in accordance with the manufacturer's specifications and drawings prepared for that purpose and using the appropriate tools;
- checks before placing the anchor to ensure that the strength class of the concrete in which the anchor is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply;
- check of concrete being well compacted, e.g. without significant voids;
- clearing the hole of drilling dust;
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured, if the thickness of fixture is not greater than the maximum thickness of fixture marked on the anchor
- keeping of the edge distance and spacing to the specified values without minus tolerances;
- positioning of the drill holes without damaging the reinforcement;
- in case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not to the anchor in the direction of load application;
- application of the torque moment given in Annex 3 using a calibrated torque wrench.

4.2.3. Responsibility of the manufacturer

It is the manufacturer's responsibility to ensure that the information on the specific conditions according to 1 and 2 including Annexes referred to in 4.2.1. and 4.2.2. is given to those who are concerned. This information may be made by reproduction of the respective parts of the European Technical Approval. In addition all installation data shall be shown clearly on the package and/or on an enclosed instruction sheet, preferably using illustration(s).

The minimum data required are:
- drill bit diameter,
- thread diameter,
- maximum thickness of the fixture,
- minimum embedment depth,
- minimum hole depth,
- required torque moment,
- information on the installation procedure, including cleaning of the hole, preferably by means of an illustration,
- reference to any special installation equipment needed,
- identification of the manufacturing batch.

All data shall be presented in a clear and explicit form.

The original French version is signed by

Le Directeur Technique
C. BALOCHE

Assembled anchor:

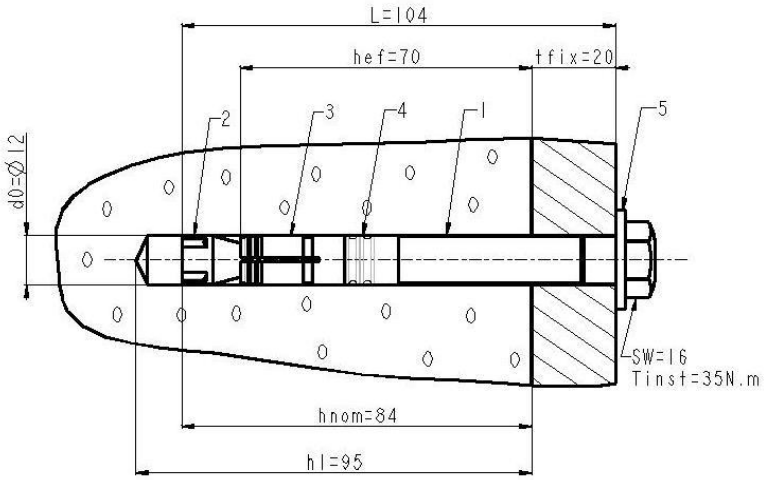


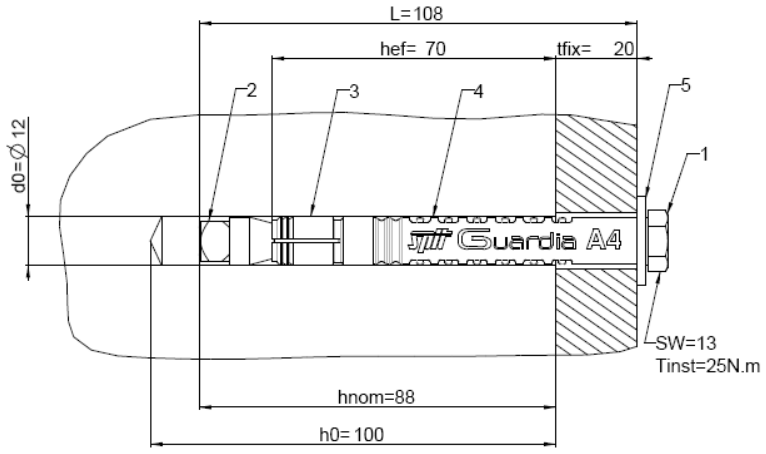
GUARDIA 12x105/20



GUARDIA 12x110/20 A4

Anchor in use:





Marking:

Guardia

Guardia A4

SPIT GUARDIA torque-controlled expansion anchor	Annex 1 of European Technical Approval ETA-07/0047
Product and intended use	

Table 1: Materials

	Designation	Material	Protection
GUARDIA 12x105/20	Headed bolt	Cold forged Steel NF EN 10263-2 or bar turning steel (Type 1.0737) NF EN 10087	Electroplated zinc coating
	Cone	Cold forged Steel NF A 35-557	Electroplated zinc coating
	Expansion sleeve	bar turning (type 1.0737) NF EN 10087	Electroplated zinc coating
	Plastic ring	PEHD	-
	Washer	Electroplated steel NF E 25 514	Electroplated zinc coating
GUARDIA 12x110/20 A4	Headed bolt	Stainless steel A4-70 acc. NF EN ISO 3506-1	-
	Cone	Stainless steel A4 X2CrNiMo 17-12-2 1.4404, 1.4401 acc. NF EN 10088-3	-
	Expansion sleeve	Stainless steel A4 X2CrNiMo 17-12-2 1.4404, 1.4401 acc. NF EN 10088-3	-
	Washer	Stainless steel A4 X5CrNiMo 17-12-2 acc. NF EN 10088-2	-
	Plastic sleeve	Polyacetal	-

Table 2: Installation data

Anchor type	L (mm) (0)	d_{cut} (mm) (1)	d_f (mm) (2)	T_{inst} (mm) (3)	h_{min} (mm) (4)	h_1 (mm) (5)	h_{ef} (mm) (6)	t_{fix} (mm) (7)
GUARDIA 12x105/20	104	12	14	35	150	95	70	20
GUARDIA 12x110/20 A4	110	12	14	25	150	100	70	20

(0) Total length of the bolt (mm)
(1) Nominal diameter of drill bit, d_{cut} (mm)
(2) Diameter of clearance hole in the fixture, d_f (mm)
(3) Required torque moment, T_{inst} (Nm)
(4) Minimum thickness of concrete member, h_{min} (mm)
(5) Depth of drilled hole to deepest point, h_1 (mm)
(6) Effective anchorage depth, h_{ef} (mm)
(7) Maximum thickness of the fixture, $t_{fix,maxi}$ (mm)

Non-cracked concrete only			GUARDIA 12x105/20	GUARDIA 12x110/20 A4
Effective anchorage depth	h_{ef}	(mm)	70	70
Minimum spacing	s_{min}	(mm)	70	70
Minimum edge distance	c_{min}	(mm)	50	50

SPIT GUARDIA torque-controlled expansion anchor	Annex 2
Materials - Installation data	of European Technical Approval ETA-07/ 0047

Table 3: Characteristic values of resistance to tension loads of design method A

			GUARDIA 12x105/20	GUARDIA 12x110/20 A4
Steel failure				
Characteristic resistance	$N_{Rk,s}$	(kN)	25	26
Partial safety factor	γ_{Ms}	-	1,4	1,87
Pull-out failure				
Characteristic resistance	$N_{Rk,p}$	(kN)	1)	20
Partial safety factor	γ_{Mp}	-	-	1,5
Concrete cone failure 2) and splitting failure				
Effective anchorage depth	h_{ef}	[mm]	70	70
Partial safety factor in non cracked concrete	γ_2		1.0	1.0
	γ_{Mc}		1,5	1,5
Spacing	$s_{cr,N}$	(mm)	210	210
	$s_{cr,sp}$	(mm)	210	210
Edge distance	$c_{cr,N}$	(mm)	105	105
	$c_{cr,sp}$	(mm)	105	105

1) The pull-out failure mode is not decisive in non-cracked concrete; it does not have to be calculated by the designer.
2) For concrete cone failure, the characteristic resistance of a Guardia anchor placed in uncracked concrete is calculated by using the equation (5.2) in ETAG 001 Annex C, § 5.2.2.4.

Table 4: Displacements under tension loads

	GUARDIA 12x105/20	GUARDIA 12x110/20 A4
	C20/25 to C50/60 uncracked concrete	C20/25 to C50/60 uncracked concrete
N [kN]	12,9	9,5
δ_{N0} [mm] short term	2,6	2,2
$\delta_{N\infty}$ [mm] long term	2,6	2,2

SPIT GUARDIA torque-controlled expansion anchor	Annex 3 of European Technical Approval ETA-07/ 0047
Design method A, characteristic values of resistance to tension loads; displacements	

Table 5: Characteristic values of resistance to shear loads of design method A

			GUARDIA 12x105/20	GUARDIA 12x110/20 A4
Steel failure without lever arm				
Characteristic resistance	$V_{Rk,s}$	(kN)	14,25	12,8
Partial safety factor	γ_{Ms}	-	1,50	1,56
Steel failure with lever arm				
Characteristic resistance	$M^0_{Rk,s}$	(N.m)	33	26
Partial safety factor	γ_{Ms}	-	1,50	1,56
Concrete pry-out failure				
Factor in equation (5.6) of ETAG Annex C, § 5.2.3.3	k	-	2	2
Partial safety factor	γ_2	-	1,0	1,0
	γ_{Mc}	-	1,50	1,50
Concrete edge failure				
Effective length of anchor under shear loading	l_f	(mm)	32	65
Outside diameter of anchor	d_{nom}	(mm)	12	12
Partial safety factor	γ_{Mc}	-	1,50	1,50

Table 6: Displacements under shear loads

Shear load in non- cracked concrete C20/25 to C50/60 (kN)	GUARDIA 12x105/20	GUARDIA 12x110/20 A4
V [kN]	6,6	5,9
δ_{V0} [mm] short term	1,0 (+1,2)	4,7 (+1,2)
δv_∞ [mm] long term	1,5 (+1,2)	7,1 (+1,2)

Displacement: the table shows the deformation to be expected from the anchor itself, while the bracket value indicates the movement between the anchor body and the hole drilled in the concrete member or the hole in the fixture.

SPIT GUARDIA torque-controlled expansion anchor	Annex 4
Design method A, characteristic values of resistance to shear loads; displacements	of European Technical Approval ETA-07/ 0047