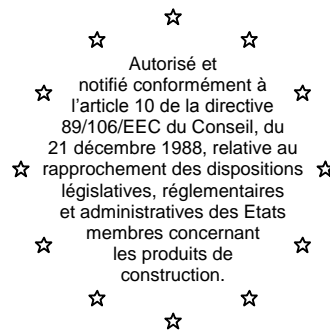


# Centre Scientifique et Technique du Bâtiment

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**MEMBRE DE L'EOTA**

## European Technical Approval

## ETA-05/0053

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

Nom commercial :

**Trade name:**

**SPIT GRIP**

Titulaire :

**Holder of approval:**

**Société SPIT**

**Route de Lyon**

**BP 104**

**26501 BOURG LES VALENCE**

Type générique et utilisation prévue du produit de construction :

Cheville métallique en acier galvanisé, à expansion par déformation contrôlée, de fixation dans le béton non fissuré : diamètres M6, M8, M10, M12 et M16.

**Generic type and use of construction product:**

**Deformation-controlled expansion anchor, made of galvanised steel, for use in non cracked concrete: sizes M6, M8, M10, M12 and M16.**

Validité du :

au :

**Validity from / to:**

**18/03/2010**

**18/03/2015**

Usine de fabrication :

**Manufacturing plant:**

**Société SPIT**

**Route de Lyon**

**BP 104**

**26501 BOURG LES VALENCE**

**France**

Le présent Agrément technique européen contient :

**This European Technical Approval contains:**

12 pages incluant 5 annexes faisant partie intégrante du document.

**12 pages including 5 annexes which form an integral part of the document.**

**This European Technical Approval cancels and replaces ETA-05/0053 with validity from 18/03/2005 to 18/03/2010.**

Cet Agrément Technique Européen annule et remplace l'ETA-05/0053 valide du 18/03/2005 au 18/03/2010



Organisation pour l'Agrément Technique Européen  
European Organisation for Technical Approvals

## 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<sup>1</sup>, modified by the Council Directive 93/68/EEC of 22 July 1993<sup>2</sup>;
  - Décret n° 92-647 du 8 juillet 1992<sup>3</sup> 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<sup>4</sup>;
  - Guideline for European Technical Approval of « Metal Anchors for use in Concrete » ETAG 001, edition June 1997, Part 1 « Anchors in general » and Part 4 « Deformation-controlled expansion anchors », edition July 1998.
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.
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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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<sup>1</sup> Official Journal of the European Communities n° L 40, 11.2.1989, p. 12

<sup>2</sup> Official Journal of the European Communities n° L 220, 30.8.1993, p. 1

<sup>3</sup> Journal officiel de la République française du 14 juillet 1992

<sup>4</sup> 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 GRIP 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 deformation-controlled expansion. The SPIT GRIP anchor is produced in two versions (SPIT GRIP and SPIT GRIP L) differing only by a shoulder at the top of the SPIT GRIP L body.

For the installed anchor see Figure given in Annex 1.

The fixture shall be fixed with a fastening screw or threaded rod according to 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 class C 20/25 at minimum to C 50/60 at most according to ENV 206-1: 2000-12. It may be anchored in non-cracked concrete only.

The anchor may only be used in concrete subject to dry internal conditions.

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 anchor in the range of M6 to M16 corresponds to the drawings and provisions given in Annexes 1 to 3. The characteristic material values, dimensions and tolerances of the anchor not indicated in Annexes 1 to 3 shall correspond to the respective values laid down in the technical documentation<sup>5</sup> of this European Technical Approval. The characteristic anchor values for the design of anchorages are given in Annexes 4 and 5.

Each anchor is marked on the expansion sleeve as mentioned in Annex 1 with the product name GRIP, the diameter and the total length. Ex: GRIP M10 x 40.

To make the difference after installation between the size M10 x 30 and the size M10 x 40, the size M10 x 30 is treated with a yellow protection whereas all other sizes have a "white" protection.

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

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<sup>5</sup> 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.

## 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 4 « Deformation-controlled expansion anchors », on the basis of Option 7.

## 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<sup>6</sup>. 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:
  - Expansion plug (diameter, length, angle of the cone);
  - Expansion sleeve (length, thickness, diameters);
  - Setting tool (length and diameter of pin)
- Material properties:
  - Expansion plug (yielding and ultimate tensile strengths);
  - Expansion sleeve (yielding and ultimate tensile strength)

<sup>6</sup> The prescribed test plan has been deposited at the Centre Scientifique et Technique du Bâtiment and is only made available to the approved bodies involved in the conformity attestation procedure.

- Thickness of the galvanised treatment.
- 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;
- 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 regular 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 CE marking consists of the letters “CE” followed by the identification number of the inspection body. The CE marking shall be accompanied by:

- 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 deformation-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.).

The minimum strength class of the fastening screw or threaded rod shall meet the requirements given in Annex 1. The minimum screwing depth of the fastening screw or threaded rod shall meet the requirements according to Annex 3. The length of the fastening screw or threaded rod shall be defined according to the requirements given in Annex 3, taking into account available thread length, the minimum screwing depth, the thickness of the fixture and tolerances of member and fixture.

#### **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 special tools;
- thickness of the fixture corresponding to the range of required thickness values for the type of anchor;
- 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 setting depth is complied with. This compliance is ensured if the expansion sleeve does not exceed the concrete surface;
- anchor expansion by impacting the expansion plug using the setting tools given in Annex 3 with dimensions according to Annex 3 Table 4. The anchor is properly set up if the stop of the pin reached the expansion plug. The impression of the setting tool is marked on the distance sleeve as illustrated in Annex 2 figure 3;
- 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;
- the fastening screw or threaded rod shall correspond to the requirements given in Annex 1
- 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:

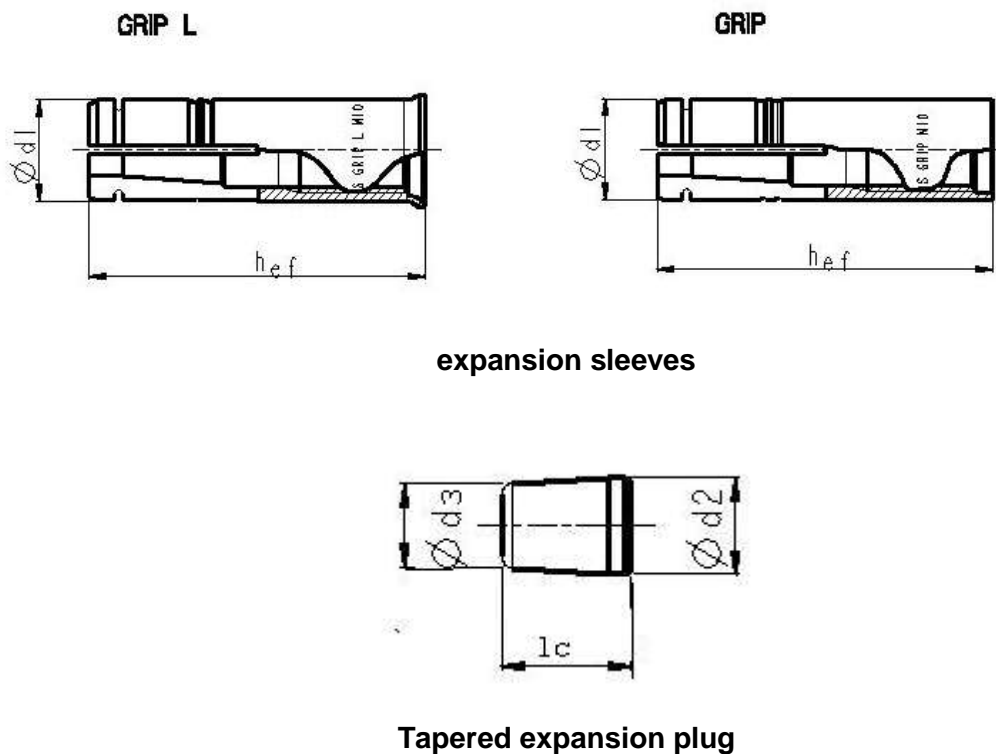
- drill bit diameter,
- thread diameter,
- minimum effective anchorage depth,
- available thread length and minimum screwing depth of the fastening screw or threaded rod,
- minimum strength class of the screw or threaded rod according to EN ISO 898-1
- minimum hole depth,
- required torque moment,
- 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**

**Figure 1: Elements and dimension**



**Table 1 : dimensions**

GRIP L and GRIP	L M6x30 M6x30	L M8x30 M8x30	L M10x30	L M10x40 M10x40	L M12x50 M12x50	L M16x65 M16x65
$h_{ef}$ [mm]	30	30	30	40	50	65
$d_1$ [mm]	7.95	9.95	11.95	11.95	14.9	19.8
$d_2$ [mm]	5	6.5	8.2	8.2	10.3	13.8
$d_3$ [mm]	4.1	5.8	7.1	7.1	9.3	12.9
$l_c$ [mm]	10	9.5	11	11	14	21

**Table 2 : Materials**

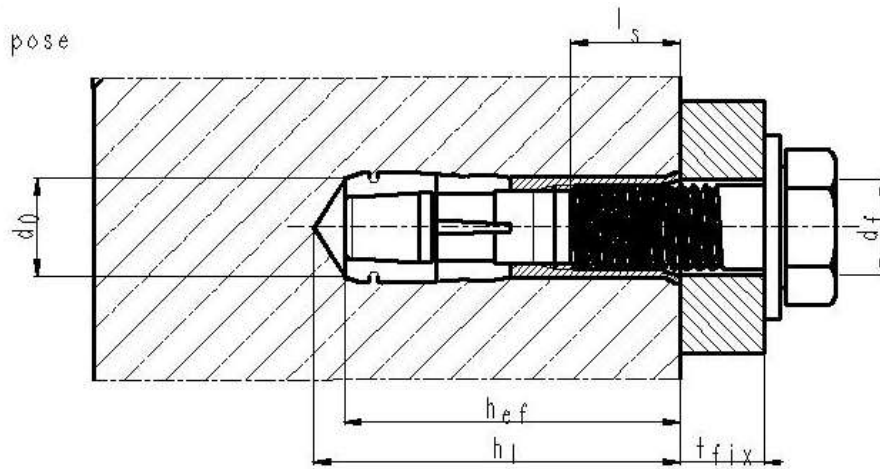
Part	Designation of anchor part	Material	Protection
1	Anchor sleeve M6 to M16	Steel 11SMnPb30	Galvanised $\geq 5 \mu\text{m}$
2	Tapered expansion plug M6 to M16	FB10 NF A 35-053	Galvanised $\geq 5 \mu\text{m}$

**Requirements for the fastening screw or threaded rod :**  
 Minimum strength class 4.6 acc. to EN ISO 898-1

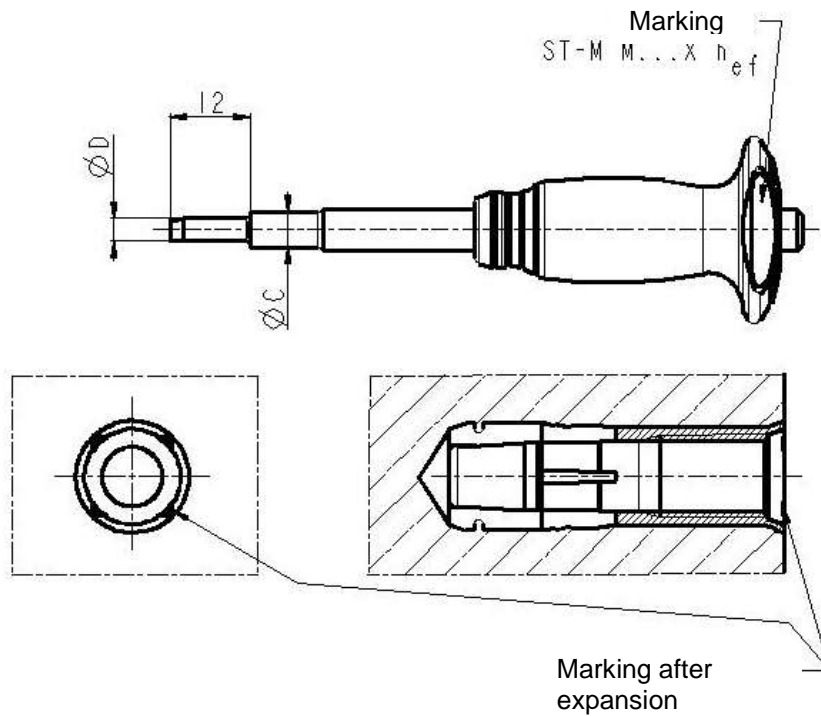
<b>SPIT GRIP drop-in anchor</b>	<b>Annex 1</b>  of European Technical Approval <b>ETA-05/0053</b>
<b>Product, dimensions and materials</b>	



**Figure 2 : Schema of the anchor in use**



**Figure 3 : setting tool and marking at the end of expansion**



<p><b>SPIT GRIP drop-in anchor</b></p>	<p><b>Annex 2</b></p>
<p><b>Intended use and setting tools</b></p>	<p>of European                  Technical Approval  <b>ETA-05/0053</b></p>

**Table 3 : Installation data :**

Size	Drill hole diameter $d_0$ [mm]	Diameter of the thread $d$	Depth of drill hole $h_1$ [mm]	Effective anchorage depth $h_{ef}$ [mm]	Minimum thickness of concrete $h_{min}$ [mm]	Available internal thread $L_{th}$ [mm]	Minimal screwing depth $L_{sdmin}$	Setting torque $T_{inst}$ [Nm]	diameter of clearance hole $d_f$ [mm]
M6x30	8	6	32	30	100	13	10	5	7
M8x30	10	8	33	30	100	13	10	10	9
M10x30	12	10	33	30	100	12	11	22	12
M10x40	12	10	43	40	100	15	12	22	12
M12x50	15	12	54	50	100	21	14	36	14
M16x65	20	16	70	65	130	28	18	80	18

**Table 4: Dimensions of the setting tool**

Setting tool	Anchor size	$\varnothing D$ [mm]	$\varnothing C$ [mm]	$l_2$ [mm]
ST-M M6x30	M6x30	4.9	8.3	20.0
ST-M M8x30	M8x30	6.4	10.3	20.5
ST-M M10x30	M10x30	8.2	12.5	19.0
ST-M M10x40	M10x40	8.2	12.5	29.0
ST-M M12x50	M12x50	10.0	15.0	36.0
ST-M M16x65	M16x65	13.5	20.0	44.0

**Table 5: Minimum spacing and edge distance**

			M6x30	M8x30	M10x30	M10x40	M12x50	M16x65
Minimum spacing	$S_{min}$	[mm]	60	70	80	95	125	130
Minimum edge distance	$C_{min}$	[mm]	105	105	140	140	195	227

**SPIT GRIP drop-in anchor**

**Installation data**

**Annex 3**

of European  
 Technical Approval  
**ETA-05/0053**

**Table 6 : Characteristic values of resistance to tension loads of design method A**

Anchor size			M6x30*	M8x30*	M10x30*	M10x40	M12x50	M16x65
<b>Steel failure</b>								
Characteristic resistance <b>steel 4.6</b>	$N_{Rk,s}$	[kN]	8,0	14,6	23,2	33,7	62,8	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	2.0					
Characteristic resistance <b>steel 5.6</b>	$N_{Rk,s}$	[kN]	10,1	18,3	29	42,2	78,5	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	2.0					
Characteristic resistance <b>steel 5.8</b>	$N_{Rk,s}$	[kN]	10,1	20,6	26,9	45,6	76,3	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,5	1,82	1,82	1,98	1,91	
Characteristic resistance <b>steel 8.8</b>	$N_{Rk,s}$	[kN]	15	20,6	26,9	45,6	76,3	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,63	1,82	1,82	1,98	1,91	
<b>Pull-out failure = not decisive failure mode</b>								
<b>Concrete cone failure and splitting failure</b>								
Effective anchorage depth	$h_{ef}$	(mm)	30	30	30	40	50	65
Increasing factor	C30/37	$\psi_c$	-	1,22				
	C40/50			1,41				
	C50/60			1,55				
Partial safety factor	$\gamma_{Mc}^{1)}$	-	1,8 <sup>2)</sup>					
Spacing	$s_{cr,N}$	(mm)	3 $h_{ef}$					
	$s_{cr,sp}$	(mm)	210	210	210	280	350	454
Edge distance	$c_{cr,N}$	(mm)	1,5 $h_{ef}$					
	$c_{cr,sp}$	(mm)	105	105	105	140	175	227

\* use restricted to anchoring of structural elements statically indeterminate

<sup>1)</sup> In absence of other national regulations

<sup>2)</sup>  $\gamma_2=1,2$  is included

**Table 7 : Displacements under tension loads**

Anchor size		M6x30	M8x30	M10x30	M10x40	M12x50	M16x65
Tension load in C20/25 to C50/60 non-cracked concrete		5,1	5,1	5,1	7,8	11,0	16,2
Displacement	$\delta_{N0}$ (mm)	0,10					
	$\delta_{N\infty}$ (mm)	0,15					

**SPIT GRIP drop-in anchor**

**Design method A : characteristic values under tension loads and displacements**

**Annex 4**

of European  
 Technical Approval  
**ETA-05/0053**

**Table 8 : Characteristic values of resistance to shear loads of design method A**

Anchor size			M6x30*	M8x30*	M10x30*	M10x40	M12x50	M16x65
<b>Steel failure without lever arm</b>								
Characteristic resistance <b>steel 4.6</b>	$V_{Rk,s}$	[kN]	4,0	7,3	11,6	16,9	31,4	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,67					
Characteristic resistance <b>steel 5.6</b>	$V_{Rk,s}$	[kN]	5,0	9,2	14,5	21,1	39,2	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,67					
Characteristic resistance <b>steel 5.8</b>	$V_{Rk,s}$	[kN]	4,2	10,3	13,4	22,8	38,2	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,36	1,52	1,52	1,65	1,59	
Characteristic resistance <b>steel 8.8</b>	$V_{Rk,s}$	[kN]	4,2	10,3	13,4	22,8	38,2	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,36	1,52	1,52	1,65	1,59	
<b>Steel failure with lever arm</b>								
Characteristic resistance <b>steel 4.6</b>	$M_{Rk,s}^0$	[N.m]	5,1	15	30	52	133	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,67					
Characteristic resistance <b>steel 5.6</b>	$M_{Rk,s}^0$	[N.m]	6,4	19	37	65	166	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,67					
Characteristic resistance <b>steel 5.8</b>	$M_{Rk,s}^0$	[N.m]	6,4	19	37	65	166	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,25					
Characteristic resistance <b>steel 8.8</b>	$M_{Rk,s}^0$	[N.m]	10,2	30	60	105	266	
Partial safety factor	$\gamma_{Ms}^{1)}$	-	1,25					
<b>Concrete pryout failure</b>								
Factor in equation (5.6) ETAG Annex C, 5.2.3.3	k	-	1					2
Partial safety factor	$\gamma_{Mc}^{1)}$	-	1,5 <sup>2)</sup>					
<b>Concrete edge failure</b>								
Effective length of anchor under shear loading	$l_f$	[mm]	30	30	30	40	50	65
Outside diameter of anchor	d <sub>nom</sub>	[mm]	7,95	9,95	11,95	14,9	19,8	
Partial safety factor	$\gamma_{Mc}^{1)}$	-	1,5 <sup>2)</sup>					

\* use restricted to anchoring of structural elements statically indeterminate

<sup>1)</sup> In absence of other national regulations

<sup>2)</sup>  $\gamma_{z2}=1,0$  is included

**Table 9 : Displacements under shear loads**

Anchor size		M6x30	M8x30	M10x30	M10x40	M12x50	M16x65
Shear load in concrete in C20/25 to C50/60 non-cracked concrete		2,2	4,9	6,3	6,3	9,9	17,1
Displacement	$\delta_{N0}$ (mm)	0,5	0,9	0,8	0,6	1,1	1,1
	$\delta_{N\infty}$ (mm)	0,8	1,3	1,2	0,9	1,6	1,7

**SPIT GRIP drop-in anchor**

**Design method A : characteristic values under shear loads and displacements**

**Annex 5**

of European  
 Technical Approval  
**ETA-05/0053**