European Technical Approval

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

Nom commercial : 
Trade name:

Powers Fasteners Europe
Stanley Black&Decker Deutschland GmbH
Black-&-Decker Str. 40
65510 Idstein
Germany

Vis à béton en acier galvanisé, diamètre M8 et M10, pour béton fissuré et non fissuré.
Concrete screw made of galvanised steel of size M8 and M10 for use in cracked and uncracked concrete.

Validity from / to:
01/02/2013
31/01/2018

Factory A

12 pages incluant 5 annexes faisant partie intégrante du document.

Cet Agrément Technique Européen remplace l’ Agrément ETA-07/0155 valide du 27/03/2009 au 27/03/2014
This European Technical Approval replaces ETA-07/0155 with validity from 27/03/2009 to 12/07/2012

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:

   - Décret n° 92-647 du 8 juillet 1992⁴ concernant l’aptitude à l’usage des produits de construction;

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 This European Technical Approval may be withdrawn by the Centre Scientifique et Technique du Bâtiment pursuant to Article 5 (1) of the Council Directive 89/106/EEC.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

---

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
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 Snake anchor is a screw manufactured from carbon steel and subsequently heat treated. It is an internally threaded self tapping anchor, diameter M8 and M10 installed by drilling a pilot hole with a standard ANSI bit (supplied with the Snake anchor) and screwed into the predrilled hole with a hex driver setting tool fitted on a impact screw driver. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread. 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 C 20/25 at minimum and C 50/60 at most according to EN 206-1: 2000-12. It may be anchored in cracked or uncracked concrete.

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

The connection of the fixture to the Snake anchor must be made with threaded elements of grade ≥ 4.8 only. The use of metric screws is not permitted.

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 Snake screw anchor corresponds to the drawings and provisions given in Annex 1. The characteristic material values, dimensions and tolerances of the anchor not indicated in Annex 1 shall correspond to the respective values laid down in the technical documentation\textsuperscript{6} of this European Technical Approval.

The characteristic anchor values for the design of anchorages are given in Annexes 3 and 4.

\textsuperscript{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.
The product name, the nominal diameter of the anchor, the length of the anchor and the length of the internal threaded part are printed on the packaging unit according to Annex 5.

The anchor shall only be packaged and supplied as a complete unit including drill bit and hex setting tool.

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 3 « Undercut anchors » on the basis of option 1.

In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

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

3.2.1.1. 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 plan7. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of incoming materials shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties.

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.

7 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.
The results of factory production control are recorded and evaluated. 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.

3.2.1.2. Other tasks of the manufacturer
The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved. The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions 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.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

3.2.2.3. Continuous surveillance
The approved certification body involved by the manufacturer 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 and CSTB informed without delay.

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:

- Commercial name;
- Name or identifying mark of the producer and manufacturing plant;
- Name of approval body and ETA number;
- Identification number of the certification body;
- Number of the EC certificate of conformity;
- Use category (ETAG 001-3 Option 1);
- The last two digits of the year in which the CE-marking was affixed;
- 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 approved body and laid down in the technical documentation.

The European Technical Approval is issued for the product on the basis of agreed data/information, deposited with Centre Scientifique et Technique du Bâtiment, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Centre Scientifique et Technique du Bâtiment before changes are introduced. Centre Scientifique et Technique du Bâtiment will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

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, 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. The holes must be drilled with the drill bit supplied in the Snake’s package only;
- anchor installation in accordance with the manufacturer’s specifications and drawings prepared for that purpose and using the appropriate special 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 ensuring the specified embedment depth; this is ensured if the hex setting tool is used for installation of the anchor and the flange of the setting tool rest on the concrete surface after the installation
- 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;
- **Only threaded parts of grade ≥ 4.8 are permitted**
- application of the torque moment not exceeding the value given in Annex 2 and using a calibrated torque wrench.
- **For the size M8: check that the thread engagement is full anchor depth; the use of metric screws is not permitted.**

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 as well as in sections 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 installation depth,
- minimum hole depth,
- 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
Table 1: Dimensions and material of Snake

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the anchor</td>
<td>mm</td>
<td>31</td>
</tr>
<tr>
<td>Diameter of the shaft</td>
<td>mm</td>
<td>12.7</td>
</tr>
<tr>
<td>Diameter of the thread</td>
<td>mm</td>
<td>14.7</td>
</tr>
<tr>
<td>Length of the internal threaded part</td>
<td>mm</td>
<td>18</td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td>Steel C10B21</td>
</tr>
</tbody>
</table>

Marking of the anchor with the letter “S” at the bottom end of the Snake concrete screw.

Intended use:
Use in cracked or non-cracked concrete in dry internal conditions
For the threaded parts only steel grade ≥ 4.8 is permitted

SNAKE Concrete Screw anchor

Product, Dimensions and material

Annex 1
of European Technical Approval
ETA-07/0155
Important notice for the size M8:
Check that the thread engagement is full anchor depth. The use of metric screws is not permitted.

Table 2: Installation parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>M</th>
<th>M8</th>
<th>M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner diameter of the thread</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal drill bit diameter</td>
<td>d0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting diameter of the drill bit</td>
<td>d_{cut} ≥</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d_{cut} ≤</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the drill hole</td>
<td>h1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embedment depth of the anchor</td>
<td>h_{nom} ≥</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum torque moment</td>
<td>T_{max} ≤</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: This is a ½ inch ANSI drill bit supplied in the same packaging than the Snake anchors.

Table 3: Minimum thickness of concrete, minimum spacing and edge distances

<table>
<thead>
<tr>
<th>Parameter</th>
<th>h_{min} [mm]</th>
<th>s_{min} [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum thickness of concrete member</td>
<td>100</td>
<td>80</td>
</tr>
</tbody>
</table>

SNake Concrete Screw anchor

Annex 2

Installation parameters

ETA-07/0155
### Table 5: Design method A
**Characteristic values for tension load**

<table>
<thead>
<tr>
<th>Steel failure</th>
<th>M8</th>
<th>M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic resistance $N_{Rk,s}$</td>
<td>kN</td>
<td>15.4</td>
</tr>
<tr>
<td>Partial safety factor $\gamma_{Ms}$</td>
<td>-</td>
<td>1.48</td>
</tr>
</tbody>
</table>

**Pull out failure**

| Characteristic resistance in uncracked concrete $N_{Rk,p}$ | C20/25 | kN | 5.0 |
| Characteristic resistance in cracked concrete $N_{Rk,p}$ | C20/25 | kN | 3.0 |

**Increasing factor for the Characteristic resistance in cracked and uncracked concrete**

- $\psi_c$ C25/30 - 1.10
- $\psi_c$ C30/37 - 1.22
- $\psi_c$ C35/45 - 1.34
- $\psi_c$ C40/50 - 1.41
- $\psi_c$ C45/55 - 1.48
- $\psi_c$ C50/60 - 1.55

**Partial safety factor $\gamma_{Mp}$** - 1.80

**Concrete cone failure / Splitting**

| Embedment depth for the design $h_{ef}$ | mm | 28 |
| Spacing | $s_{cr,N}$ | mm | 84 |
| Edge distance | $c_{cr,N}$ | mm | 42 |

**Partial safety factor $\gamma_{Mc} = \gamma_{Mp}$** - 1.80

### Table 6: Displacements under tension loads

<table>
<thead>
<tr>
<th>Uncracked concrete</th>
<th>M8 or M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension load $N$</td>
<td>kN</td>
</tr>
<tr>
<td>Displacement $\delta_{N0}$</td>
<td>mm</td>
</tr>
<tr>
<td>$\delta_{N\infty}$</td>
<td>mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cracked concrete</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension load $N$</td>
<td>kN</td>
</tr>
<tr>
<td>Displacement $\delta_{N0}$</td>
<td>mm</td>
</tr>
<tr>
<td>$\delta_{N\infty}$</td>
<td>mm</td>
</tr>
</tbody>
</table>

**Note 2:** The embedment depth $h_{ef}$ for the design is calculated as $h_{ef} = 0.85 \cdot (h_{nom} - 0.5 \cdot h_{t} - h_{d})$. This embedment depth for the design is calculated in order that the characteristic loads fit with the design model of the ETAG 001 Annex C. The embedment depth $h_{ef}$ for the design must not be mixed up with the setting depth $h_{nom}$ which is the actual depth of the anchor. In the case of the Snake anchor, $h_{nom} = 41$ mm.

---

**SNAKE Concrete Screw anchor**

**Design method A**

**Characteristic values for tension loads, Displacements**

---

**Annex 3**

of European Technical Approval

ETA-07/0155
### Table 7: Design method A
**Characteristic values for shear load**

<table>
<thead>
<tr>
<th>Steel failure without lever arm</th>
<th>V_{Rk,s} kN</th>
<th>M8</th>
<th>M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial safety factor</td>
<td>\gamma_{MS}</td>
<td>-</td>
<td>1.50</td>
</tr>
<tr>
<td>Steel failure with lever arm</td>
<td>M^0_{Rk,s} N.m</td>
<td>16.0</td>
<td>31.0</td>
</tr>
<tr>
<td>Characteristic resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial safety factor</td>
<td>\gamma_{MS}</td>
<td>-</td>
<td>1.50</td>
</tr>
<tr>
<td>Pry out failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor k in ETAG 001 Annex C equation 5.6</td>
<td>k</td>
<td>-</td>
<td>1.0</td>
</tr>
<tr>
<td>Partial safety factor</td>
<td>\gamma_{Mpr}</td>
<td>-</td>
<td>1.50</td>
</tr>
</tbody>
</table>

**Concrete edge failure**

| Effective length of anchor l_f mm | 31.8 |
| Diameter of anchor d_nom mm      | 12.7 |
| Partial safety factor \gamma_{MC} | - | 1.50 |

**Note 3:** Pry out failure mode is predominant

Steel failure with lever arm has to be considered in order to take account of the distance from the upper part of the anchor and the concrete surface.

### Table 8: Displacements under shear loads

<table>
<thead>
<tr>
<th>Cracked concrete and Uncracked concrete</th>
<th>M8 or M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shear load V kN</td>
<td>2.4</td>
</tr>
<tr>
<td>Displacement \delta_{V0} mm</td>
<td>1.0</td>
</tr>
<tr>
<td>Displacement \delta_{V\infty} mm</td>
<td>1.5</td>
</tr>
</tbody>
</table>

---

**Snake Concrete Screw anchor**

**Design method A**

**Characteristic values for shear loads, Displacements**

**Annex 4**

**of European Technical Approval**

**ETA-07/0155**
Instructions For Use:

Using the proper drill bit size, drill a hole into the base material to the required depth. The tolerances of the carbide drill bit used should meet the requirement of ANSI Standard B212.15 (see Annex 2 table 2).

Blow the hole clean.

Select a powered impact wrench that does not exceed the maximum torque (see Annex 2 table 4), for the selected anchor diameter. Attach the snake+ setting tool supplied by Powers Fasteners to the impact wrench. Mount the anchor onto the setting tool.

Drive the anchor into the hole until the shoulder of the Snake + setting tool comes into contact with the surface of the base material. Do not spin the setting tool off the anchor to disengage.

Insert the rod into the Snake, taking care not to exceed the maximum specified tightening torque of the steel insert element, T_{max}. For Snake M8 minimum thread engagement must be full anchor depth and the use of metric screws is not permitted. For Snake M10 minimum thread engagement should be at least 10mm.

Labels printed on the packaging:

<table>
<thead>
<tr>
<th>Powers Fasteners</th>
<th>SNAKE Concrete Screw anchor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annex 5</td>
<td>of European Technical Approval</td>
</tr>
<tr>
<td>ETA-07/0155</td>
<td></td>
</tr>
</tbody>
</table>