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GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL
of
PLASTIC ANCHORS
FOR MULTIPLE USE IN CONCRETE AND MASONRY
FOR NON-STRUCTURAL APPLICATIONS

Part five : PLASTIC ANCHORS FOR USE IN
AUTOCLAVED AERATED CONCRETE (AAC)

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FOREWORD

In this Part of ETAG "Plastic Anchors for Multiple Use in Concrete and Masonry for Non-Structural Applications" the methods of verification and the assessments required for the use of plastic anchors in autoclaved aerated concrete (AAC) are given. For a general assessment of plastic anchors, on principle, Part 1 applies.

This Guideline applies to the use of plastic anchors in autoclaved aerated concrete between strength classes P 2 and P 7, inclusively, according to EN 771-4 [9] "Autoclaved aerated concrete masonry units" or prEN 12 602 [10] "Reinforced components of autoclaved aerated concrete".

The required tests for suitability are given in Table 5.1 a and b and the tests for admissible service conditions are given in Table 5.2 a and b. The determination of admissible service conditions and determination of characteristic resistances for plastic anchors to be used in AAC are completely given in 6.4.3.

The same numbering of paragraphs as in Part 1 is used.

The plastic anchors for use in autoclaved aerated concrete (AAC) shall be used for multiple fixings. By multiple anchor use it is assumed that in the case of excessive slip or failure of one anchor the load can be transmitted to neighbouring anchors without significantly violating the requirements on the fixture in the serviceability and ultimate limit state.

Therefore the design of the fixture may specify the number n_1 of fixing points to fasten the fixture and the number n_2 of anchors per fixing point. Furthermore by specifying the design value of actions N_{Sd} on a fixing point to a value $\leq n_3$ (kN) up to which the strength and stiffness of the fixture are fulfilled and the load transfer in the case of excessive slip or failure of one anchor need not to be taken into account in the design of the fixture.

The following default values for n_1 , n_2 and n_3 may be taken:

$n_1 \geq 4$; $n_2 \geq 1$ and $n_3 \leq 4.5$ kN or

$n_1 \geq 3$; $n_2 \geq 1$ and $n_3 \leq 3.0$ kN.

Section two: GUIDANCE FOR THE ASSESSMENT OF THE FITNESS FOR USE

5. METHODS OF VERIFICATION

5.4. Safety in use

5.4.2. Tests for suitability

The tests shall be carried out according to Annex A.

In general, all the tests shall be performed with single plastic anchors without edge and spacing effects under tension loading.

(1) Tests for plastic anchors for use in non-cracked AAC (AAC blocks)

The tests may be performed in single units or in a wall with units glued together. The walls may be lightly prestressed in vertical direction to allow handling and transportation the wall.

The types of suitability tests, test conditions, the number of required tests and the criteria applied to the results are given in Table 5.1 a: non-cracked AAC (AAC blocks).

Suitability tests of the functioning under conditioning and temperature may be omitted if there are information about the influence (α -factor) of the load bearing behaviour from suitability tests in concrete according to Part 2 or in solid masonry according to Part 3.

(2) Tests for plastic anchors for use in reinforced AAC (prefabricated reinforced AAC members)

Some additional tests have to be carried out in prefabricated reinforced AAC, if the anchor shall also be assessed for the use in reinforced AAC. The types of the additional suitability tests, test conditions, the number of required tests and the criteria applied to the results are given in Table 5.1 b: reinforced AAC (prefabricated reinforced AAC members).

Table 5.1a Suitability tests for plastic anchors for use in non-cracked AAC (AAC blocks)

	1	2	3	4	5	6	7	8
	Purpose of test	strength of AAC	Drill bit	Ambient temperature (1)	Condition polymeric sleeve (8)	Minimum number of tests per anchor size (11)	Criteria ultimate load req. α	Remarks to the test procedure described in Part 1
1	Setting capacity for nailed-in anchors only	Low strength AAC 2	$d_{cut,max}$	mint°C(2)	standard	5	≥ 0.9	5.4.2.2
			$d_{cut,max}$	mint°C(2)	standard	5	≥ 0.9	
4	Functioning under conditioning of anchor sleeve	Low strength AAC 2	$d_{cut,m}$	normal	dry	5	≥ 0.8	5.4.2.5
			$d_{cut,m}$	normal	wet	5	≥ 0.8	
5	Functioning, effect of temperature	Low strength AAC 2	$d_{cut,m}$	mint°C(3)	standard	5	≥ 1.0	5.4.2.6
			$d_{cut,m}$	0°C(4)	standard	5	≥ 1.0	
			$d_{cut,m}$	+50°C(6)	standard	5	≥ 1.0	
			$d_{cut,m}$	+80°C(6)	standard	5	$\geq 0.8(10)$	
7	Functioning under sustained loads	Low strength AAC 2	$d_{cut,m}$	normal	standard	5	≥ 0.9	5.4.2.7 (13)
			$d_{cut,m}$	+50°C(6)	standard	5	≥ 0.9	
9	Maximum torque moment	Low strength AAC 2	$d_{cut,m}$	normal	standard	5		5.4.2.8

Table 5.1b Additional suitability tests for plastic anchors for use in reinforced AAC (prefabricated reinforced AAC members)

	1	2	3	4	5	6	7	8	9
	Purpose of test	Strength of reinforced AAC	Crack width Δw (mm)	Drill bit	Ambient temperature (1)	Condition polymeric sleeve (8)	Minimum number of tests per anchor size	Criteria ultimate load req. α	Remarks to the test procedure described in Part 1
3a	Functioning in cracks (14)	AAC 2	0.35	$d_{cut,m}$	normal	standard	5	≥ 0.75	5.4.2.4
		AAC 7	0.35	$d_{cut,m}$	normal	standard	5	≥ 0.75	

- (1) Normal ambient temperature: 21 ± 3 °C (plastic anchor and bas material AAC),
- (2) Minimum installation temperature as specified by the manufacturer; normally 0 °C to + 5 °C.
- (3) Tests with lowest service temperature as specified by the manufacturer -5°C, -20°C, -40°C
- (4) Installation at minimum installation temp. as specified by the manufacturer; normally 0 °C to + 5 °C.
- (6) For temperature range b), Part 1, 4.4.2.6; for other temperature range see Part 1, 5.4.2.6 and 6.4.2.6
- (8) Conditioning of polymeric anchor sleeve according to Part 1, 5.4.2.5
- (10) Reference values from the tests with maximum long term temperature +50°C
- (11) Number of tests, if one anchor size only; if more than one size shall be assessed, then the smallest, the medium and the largest size shall be tested. Intermediate sizes shall be tested according to line 1, 7, 9; these intermediate sizes shall not be tested, if the tests from line 1 of Table 5.2 a show regularity in failure mode and ultimate load.
- (13) N_{Rk} Part 1, 5.4.2.7 (5.3); characteristic resistance N_{Rk} as given in the ETA evaluated according to 6.4.3.3
- (14) The tests shall be carried out with the most unfavourable direction of expansion determined in test line 1, Table 5.2a.

5.4.3. Tests for admissible service conditions

For determination of the admissible service conditions the tests given in Tables 5.2 a and/or b shall be carried out for all sizes.

If existing information is available from the manufacturer and the corresponding test report contains all relevant data, then the Approval Body may reduce the number of tests for admissible service conditions, making use of this existing information. However, it will be considered in the assessment only if the results are consistent with the Institute's test results.

All tests for determination of admissible service conditions shall be carried out in single units or in a wall for non-cracked AAC and in prefabricated reinforced AAC at normal ambient temperature ($+21^{\circ}\text{C} \pm 3^{\circ}\text{C}$) and standard conditioning of the polymeric sleeve. The drill holes shall be drilled using $d_{\text{cut,m}}$ drill bits. The anchor installation shall be carried out according with the manufacturer's published instructions.

Table 5.2 a Tests for admissible service conditions for plastic anchors for use in non-cracked AAC (AAC blocks)

	1	2	3	4	5	6	7
	Purpose of test	Strength of AAC	Load direction	Distances	Member thickness h	Minimum number of tests for s,m,l (2)	Remarks
1	Characteristic resistance for tension loading not influenced by edge and spacing effects	AAC 2 AAC 7	N	$s > s_{\text{min}}$ $c > c_{\text{min}}$	$\geq h_{\text{min}}$	5 5	test with single anchor in the centre of the block
2	Edge distance to end of wall for characteristic tension resistance (1)	AAC 2	N	$s > s_{\text{min}}$ $c = c_{\text{min}}$	$= h_{\text{min}}$	5	test with single anchor at the corner

Table 5.2 b Tests for admissible service conditions for plastic anchors for use in reinforced AAC (prefabricated reinforced AAC members)

	1	2	3	4	5	6	7	8
	Purpose of test	Strength class of reinforced AAC	Crack width Δw [mm]	Load direction	Distances	Member thickness h	Minimum number of tests s,m,l (2)	Remarks
1	Characteristic resistance for tension loading not influenced by edge and spacing effects	AAC 2 AAC 7	0,2	N	$s > s$ $c > c_{\text{min}}$	$\geq h_{\text{min}}$	5 5	test with single anchor
2	Edge distance to end of member for characteristic tension resistance (1)	AAC 2	0	N	$s > s$ $c = c_{\text{min}}$	$= h_{\text{min}}$	5	test with single anchor at the corner

(1) Tension tests with double anchor group with s_{min} near the free edge ($c = c_{\text{min}}$) to determine the characteristic resistance depending for the minimum spacing s_{min} and the minimum edge distance c_{min} are required if the chosen minimum spacing is lower than the following values:

$$s_{\text{min}} < 4 c_{\text{min}} \quad (\text{groups with spacing parallel to the edge})$$

$$s_{\text{min}} < 2 c_{\text{min}} \quad (\text{groups with perpendicular perpendicular to the edge})$$

(2) Anchor sizes small (s), medium (m) and large (l) of an anchor system should be tested; intermediate sizes need not to be tested

6. ASSESSING AND JUDGING THE FITNESS FOR USE

6.4. Safety in use

6.4.1.2. Conversion of ultimate loads to take account of concrete-, masonry- and steel strength

In contrast to Equation (6.0b) the conversion of the test results in autoclaved aerated concrete shall be carried out as follows:

(1) General

The tests results shall be converted as far as compressive strength and dry density are concerned.

(2) Compressive strength

- AAC blocks:

For AAC blocks the characteristic compressive strength shall be determined from the declared value of compressive strength according to prEN 771-4 [10] using the factor of 0.9.

$$f_{ck} = 0.9 f_{c,decl}$$

- Prefabricated reinforced AAC members:

For prefabricated reinforced AAC members the characteristic compressive strengths f_{ck} of strength AAC 2 and AAC 7 given in prEN 12 602 [10] shall be used for conversion of the test results.

(3) Dry density

As reference values of dry density the following minimum values of dry density shall be used for AAC for conversion of the test results:

$$\text{AAC 2:} \quad \rho_{\min} = 350 \text{ kg/m}^3$$

$$\text{AAC 7:} \quad \rho_{\min} = 650 \text{ kg/m}^3$$

(4) Conversion of test results

The test results obtained for low and high strength AAC shall be converted using the following Equation:

$$F_{R_u}^{t_k} = F_{R_u}^t \frac{\rho_{\min}^{3/4} \times f_{ck}}{\rho_{\text{test}}^{3/4} \times f_{c,\text{test}}} \quad (\text{kN}) \quad (6.5)$$

From the above, the 5 %-fractile for the ultimate load shall be derived.

(5) Characteristic failure load (ultimate load) of the different strength of AAC

For the strength between low and high strength AAC the characteristic failure loads shall be determined by linear interpolation of the converted test results.

6.4.1.3 In all tests the following criteria shall be met

(2) In general, in each test series, the coefficient of variation of the ultimate load shall be smaller than $v = 20\%$ in the suitability tests and $v = 15\%$ in the admissible service condition tests.

If the coefficient of variation of the ultimate load in the suitability test is greater than 20%, then the following α_v -value has to be taken into account:

$$\alpha_v = \frac{1}{1 + 0,03 \times (v[\%] - 20)} \leq 1.0 \quad (6.6a)$$

If the coefficient of variation of the ultimate load in the admissible service condition test is greater than 15%, then the following α_v -value has to be taken into account:

$$\alpha_v = \frac{1}{1 + 0,03 \times (v[\%] - 15)} \leq 1.0 \quad (6.6.b)$$

6.4.2. Criteria valid for suitability tests

In the suitability tests according to Table 5.1 a and/or b the criteria described in the relevant sections of Part 1, 6.4 shall be met. The values of the reference tests are taken from the tests according to Table 5.2 a, line 1 (for non-cracked AAC) and Table 5.2 b, line 1 (for reinforced AAC) with the worst expansion direction of the anchor.

If there are existing tests for suitability of the functioning under conditioning and temperature carried out in concrete according to Part 2 or in solid masonry according to Part 3, Table 5.1, line 4 and 5, then the results of these suitability tests ($\min\alpha_1$, $\min\alpha_2$ and $\min\alpha_v$) may be taken for the determination of the characteristic values of the plastic anchors to be used in autoclaved aerated concrete.

6.4.3. Admissible service conditions

6.4.3.1. General

In all tension tests, the requirement for the load/displacement curves shall satisfy the requirements laid down in Part 1, 6.4.1.3 (1). The requirement of the coefficient of variation of the ultimate load is taken from 6.4.1.3 (2) Equation (6.6b).

6.4.3.2. Characteristic resistance of single anchor for the different conditions

(1) Tension loading not influenced by edge and spacing effects (Table 5.2a or b, line 1)

The characteristic resistances for single anchors without edge and spacing effects under tension loading shall be calculated as follows:

$$N_{Rk1} = N_{Rk1,0} \times \min^1(\min \alpha_1 ; \min \alpha_{2, \text{line } 1,7}) \times \min \alpha_{2, \text{line } 4,5} \times \min \alpha_v \quad (6.7)$$

¹⁾The lowest value of $\min \alpha_1$ or $\min \alpha_{2, \text{line } 1,7}$ is govern.

with: $N_{Rk1,0}$ = characteristic resistance from the tests Table 5.2a or b, line 1 converted according to 6.4.1.2.

$\min \alpha_1$ = minimum value α_1 (reduction factor from the load/displacement behaviour) according to Part 1, Equation (6.2) of all tests (≤ 1.0)

$\min \alpha_{2, \text{line } 4,5}$ = minimum value α_2 (reduction factor from the ultimate loads of the suitability tests) according to Part 1, Equ. (6.5) of suitability tests according to Table 5.1, line 4 and 5 (conditioning and temperature) (≤ 1.0)

$\min \alpha_{2, \text{line } 1,7}$ = minimum value α_2 (reduction factor from the ultimate loads of the suitability tests) according to Part 1, Equ. (6.5) of suitability tests according to Table 5.1, line 1 and 7 (≤ 1.0)

$\min \alpha_v$ = minimum value α_v to consider a coefficient of variation of the ultimate loads in the suitability and admissible service condition tests larger than 20% or 15% respectively, Equations (6.6a) and (6.6b).

(2) Tension loading influenced by minimum edge effects (Table 5.2a or b, line 2)

The characteristic resistances for single anchors near the free edge under tension loading shall be calculated as follows:

$$N_{Rk2} = N_{Rk2,0} \times \min \alpha_1 \times \min \alpha_v^1 \quad (6.8)$$

with: $N_{Rk2,0}$ = characteristic resistance from the tests Table 5.2a or b, line 2 converted according to 6.4.1.2.

$\min \alpha_1$ = minimum value α_1 (reduction factor from the load/displacement behaviour) according to Part 1, Equation (6.2) of all tests (≤ 1.0)

$\min \alpha_v$ = minimum value α_v to consider a coefficient of variation of the ultimate loads in the suitability and admissible service condition tests larger than 20% or 15% respectively, Equations (6.6a) and (6.6b).

¹⁾ If pull-out failure is observed in tests according to Table 5.2a or b, line 2, then the evaluation should be done according to Equation (6.7).

(3) Tension loading influenced by minimum spacing effects (Table 5.2a or b, footnote (1))

The characteristic resistances for single anchors with minimum spacing near the free edge under tension loading shall be calculated as follows:

$$N_{Rk3} = N_{Rk3,0} \times \min \alpha_1 \times \min \alpha_V \quad 1) \quad (6.9)$$

with: $N_{Rk3,0}$ = characteristic resistance from the tests Table 5.2a or b, footnote (1) converted according to 6.4.1.2.

$\min \alpha_1$ = minimum value α_1 (reduction factor from the load/displacement behaviour) according to Part 1, Equation (6.2) of all tests (≤ 1.0)

$\min \alpha_V$ = minimum value α_V to consider a coefficient of variation of the ultimate loads in the suitability and admissible service condition tests larger than 20% or 15% respectively, Equations (6.6a) and (6.6b).

¹⁾ If pull-out failure is observed in tests according to Table 5.2a or b, footnote (1), then the evaluation should be done according to Equation (6.7).

(4) Shear loading

If no shear tests available, the characteristic shear resistances $V_{Rk,AAC}$ for aerated concrete edge failure may be calculated according to, Annex C for concrete edge failure as follows:

$$V_{Rk,AAC} = 0.5 V_{Rk,c} \quad (\text{shear loading in direction to the free edge})$$

$$V_{Rk,AAC} = 1.0 V_{Rk,c} \quad (\text{shear loading in other directions})$$

The concrete strength $f_{ck,cube}$ has to be replaced by the aerated concrete strength f_{ck} in the relevant Equation of Annex C.

If shear tests towards the edge are performed and aerated concrete edge failure occurs the characteristic shear resistance shall be calculated as follows:

$$V_{Rk,AAC} = V_{Rk,AAC,0} \times \min \alpha_V \quad (6.10)$$

with: $V_{Rk,AAC,0}$ = characteristic resistance evaluated from the results of shear tests converted according to 6.4.1.2

$\min \alpha_V$ = minimum value α_V to consider a coefficient of variation of the ultimate loads in the suitability and admissible service condition tests larger than 20% or 15% respectively, Equations (6.6a) and (6.6b).

The characteristic shear resistances $V_{Rk,s}$ of the metal expansion element for single anchors may be calculated as follows:

$$V_{Rk,s} = 0.5 \times A_s \times f_{uk} \quad (6.11)$$

with: A_s = stressed cross section of steel

f_{uk} = characteristic steel ultimate tensile strength (nominal value)

6.4.3.3 Characteristic resistance of single anchor in the ETA

For the determination of the characteristic resistance F_{Rk} the design values for N_{Rk1} , N_{Rk2} , N_{Rk3} , $V_{Rk,s}$, and $V_{Rk,AAC}$ have to be calculated under consideration of the appropriated partial safety factors. The corresponding partial safety factors are given in 7.1.2.

The minimum design value is decisive for the characteristic resistance F_{Rk} given in the ETA.

The value of the characteristic resistance F_{Rk} should be rounded to the following numbers:

0.3 / 0.4 / 0.5 / 0.6 / 0.75 / 0.9 / 1.2 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 6 / 7.5 / 9/ kN

6.4.3.4 Displacement behaviour

As a minimum, the displacements under short and long term tension and shear loading shall be given in the ETA for a load F which corresponds approximately to the value according to Equation (6.12)

$$F = \frac{F_{Rk}}{\gamma_F \times \gamma_M} \quad (6.12)$$

with; F_{Rk} = characteristic resistance according to 6.4.3.3
 γ_F = 1.4
 γ_M = corresponding material partial safety factor

The displacements under short term tension loading (δ_{NO}) are evaluated from the tests with single anchors without edge or spacing effects according to Table 5.2a, line 1 or Table 5.2.b, line 1. The value derived shall correspond approximately to the 95 %-fractile for a confidence level of 90 %.

The long term tension loading displacements $\delta_{N\infty}$ may be assumed to be approximately equal to 2.0-times the value δ_{NO} .

The displacements under short term shear loading (δ_{VO}) are evaluated from the corresponding shear tests with single anchors. The value derived should correspond approximately to the 95 %-fractile for a confidence level of 90 %.

If no shear tests are performed the displacements under short term shear loading (δ_{VO}) for a plastic anchors with metal expansion element may be determined for the loading according to Equation (6.12) with a shear stiffness of 500 N/mm.

The long term shear loading displacements $\delta_{V\infty}$ may be assumed to be approximately equal to 1.5-times the value δ_{VO} .

Under shear loading, the displacements might increase due to a gap between fixture and anchor. The influence of this gap is taken into account in design.

7. ASSUMPTIONS AND RECOMMENDATIONS UNDER WHICH THE FITNESS FOR USE OF THE PRODUCTS IS ASSESSED

7.1. Design methods for anchorage in autoclaved aerated concrete

7.1.1. Multiple use

The plastic anchors for use in autoclaved aerated concrete (AAC) shall be used for multiple fixings. By multiple anchor use it is assumed that in the case of excessive slip or failure of one anchor the load can be transmitted to neighbouring anchors without significantly violating the requirements on the fixture in the serviceability and ultimate limit state.

Therefore the design of the fixture may specify the number n_1 of fixing points to fasten the fixture and the number n_2 of anchors per fixing point. Furthermore by specifying the design value of actions N_{Sd} on a fixing point to a value $\leq n_3$ (kN) up to which the strength and stiffness of the fixture are fulfilled and the load transfer in the case of excessive slip or failure of one anchor need not to be taken into account in the design of the fixture.

The following default values for n_1 , n_2 and n_3 may be taken:

$$n_1 \geq 4; n_2 \geq 1 \text{ and } n_3 \leq 4.5 \text{ kN or}$$

$$n_1 \geq 3; n_2 \geq 1 \text{ and } n_3 \leq 3.0 \text{ kN.}$$

7.1.2. Design and safety concept

The design concept with partial safety factors should be used for anchorages in autoclaved aerated concrete.

In the absence of national regulations the following partial safety factors for resistances γ_M may be used:

Steel failure:

Tension loading:

$$\gamma_{Ms} = \frac{1.2}{f_{yk} / f_{uk}} \geq 1.4 \quad (7.1)$$

Shear loading of the anchor with and without lever arm:

$$\gamma_{Ms} = \frac{1.0}{f_{yk} / f_{uk}} \geq 1.25 \quad f_{uk} \leq 800 \text{ N/mm}^2 \text{ and } f_{yk}/f_{uk} \leq 0.8 \quad (7.2)$$

$$\gamma_{Ms} = 1.5 \qquad f_{uk} > 800 \text{ N/mm}^2 \text{ or } f_{yk}/f_{uk} > 0.8 \qquad (7.3)$$

Other failure modes: $\gamma_M = 2.0$ (7.4)

7.1.3. Specific conditions for the design method in autoclaved aerated concrete

(1) The ETA should contain only one characteristic resistance F_{Rk} independent of the load direction and the mode of failure. The appropriated partial safety factor and the corresponding values c_{min} and s_{min} for this characteristic resistance shall also be given.

(2) The characteristic resistance F_{Rk} for a single plastic anchor may be taken also for a group of two or four plastic anchors with a spacing equal or larger than the minimum spacing s_{min} .

The distance between single plastic anchors or a group of anchors should be $s \geq 250\text{mm}$.

(3) If the vertical joints of the wall are designed not to be filled with mortar then the design resistance N_{Rd} has to be limited to 2.0 kN to ensure that a pull-out of one brick out of the wall will be prevented. This limitation can be omitted if interlocking units are used for the wall or when the joints are designed to be filled with mortar.

(4) If the joints of the masonry are not visible the characteristic resistance F_{Rk} has to be reduced with the factor $\alpha_j = 0.5$.

If the joints of the masonry are visible (e.g. unplastered wall) following has to be taken into account:

The characteristic resistance F_{Rk} may be used only, if the wall is designed such that the joints are to be filled with mortar.

If the wall is designed such that the joints are not to be filled with mortar then the characteristic resistance F_{Rk} may be used only, if the minimum edge distance c_{min} to the vertical joints is observed. If this minimum edge distance c_{min} can not be observed then the characteristic resistance F_{Rk} has to be reduced with the factor $\alpha_j = 0.5$.

(5) For prefabricated reinforced components the following has to be taken into account if no special tests or calculation for the resistance of the member made of AAC will carried out:

- The design value of shear resistance in the member caused by the anchorage are less or equal to 40% of the design value of resistance of the member in the critical cross section.
- The edge distance c is ≥ 150 mm for slabs of width ≤ 700 mm.
- The spacing s of fixing points is ≥ 600 mm. Fixing points are single anchors or groups of 2 or 4 anchors.

Section four:

ETA CONTENT

9. THE ETA CONTENT

9.1.4. Characteristics of the anchor with regard to safety in use and methods of verification

- characteristic values to be used for the calculation of the ultimate limit state:

The ETA should contain only one characteristic resistance F_{Rk} for one base material independent of the load direction and the mode of failure. The appropriated partial safety factor and the corresponding values c_{min} and s_{min} for this characteristic resistance shall also be given.

9.1.6. Assumptions under which the fitness of the anchor for the intended use was favourably assessed

The specific conditions (2), (3), (4) and (5) for the design method according to 7.1.3 should be given in the ETA as well.

The ETA also has to include that the plastic anchor shall not be installed and used in water saturated aerated concrete.