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**European Technical Assessment Body
for construction products**



European Technical Assessment

**ETA-26/0354
of 2 July 2026**

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Paderborn

Product family
to which the construction product belongs

Calcium Sulfoaluminate Cement

Manufacturer

Heidelberg Materials AG
Zementwerk Paderborn
Am Atlaswerk 16
33106 Paderborn
GERMANY

Manufacturing plant

Heidelberg Materials AG
Werk Paderborn
GERMANY

This European Technical Assessment
contains

8 pages including 1 annex which form an integral part of
this assessment

This European Technical Assessment is
issued in accordance with Article 95(4) of
Regulation (EU) 2024/3110, on the basis of

EAD 150001-01-0301

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Specific Part

1 Technical description of the product

The calcium sulfoaluminate cement "Paderborn" referred to in this document is a cement with rapid hardening features. This cement is not covered by the harmonised European standard EN 197-1.

The calcium sulfoaluminate content (Yeelimite) in this cement is at least 35 % by mass.

The range of composition of the calcium sulfoaluminate cement "Paderborn" is listed below:

Calcium sulfoaluminate clinker	70 – 90 % by mass
Cement CEM I and/or CEM II according to EN 197-1	0 % by mass
Calcium sulfate (as defined in EN 197-1, clause 5.4)	6 – 24 % by mass
Limestone (as defined in EN 197-5, clause 4)	0 % by mass
Fly ash (as defined in EN 197-1, clause 5.2.4)	0 % by mass
Minor additional constituents (as defined in EN 197-1, clause 5.3)	< 5 % by mass ¹
Additives (as defined in EN 197-1, clause 5.5)	< 2 % by mass ²
Organic additives (as defined in EN 197-1, clause 5.5)	< 0,2 % by mass

The calcium sulfoaluminate clinker (CSAK) is made by sintering a precisely specified mixture of raw materials (raw meal, paste or slurry) containing elements, usually expressed as oxides, CaO, Al₂O₃, SiO₂, Fe₂O₃, SO₃ and small quantities of other materials.

The calcium sulfoaluminate clinker is a hydraulic material which is composed mainly of C₄A₃S̄ / C₄(A,F)₃S̄ (Yeelimite). The Yeelimite content of the clinker is greater than 50 % by mass.

The calcium sulfoaluminate cement "Paderborn" complies with the specifications of the standard EN 197-1 except the following properties, see Table 1.

Table 1: Comparison of calcium sulfoaluminate cement characteristics and specifications of EN 197-1

Properties of the calcium sulfoaluminate cement	Properties of common cement according to EN 197-1
Calcium sulfoaluminate clinker (CSAK) (70 – 90 % by mass)	Portland cement clinker
Initial setting time < 45 min	Initial setting time ≥ 45 min (clause 7.1.2)
Sulfate content (as SO ₃) > 4,0 % by mass	Sulfate content (as SO ₃) ≤ 4,0 % by mass (clause 7.3, table 4)
Chloride content ≤ 0,14 % by mass	Chloride content ≤ 0,10 % by mass (clause 7.3, table 4)

¹ The residues of CSA clinker process can be integrated as minor additional constituents.

² EN 197-1 clause 5.5 specified: The total quantity of additives shall not exceed 1,0 % by mass of the cement (except for pigments). The quantity of organic additives on a dry basis shall not exceed 0,2 % by mass of the cement. A higher quantity may be incorporated in cements provided that the maximum quantity, in %, is declared on the packaging and/or the delivery note.

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

The calcium sulfoaluminate cement "Paderborn" is cement for production of concrete, mortar, grouts and other mixes including in particular cast-in-situ and prefabricated structural concrete³ conforming to EN 206.

The calcium sulfoaluminate cement "Paderborn" is especially characterised by a rapid hardening. The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of concrete incorporating the calcium sulfoaluminate cement "Paderborn" of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Early strength ($1 \leq t \leq 24$ h)	$R_{C,8h} = 12,4$ MPa ($\geq 10,0$ MPa)
Standard strength (28 days)	$R_{C,28d} \geq 52,5$ MPa
Initial setting time	IST = 25 min
Soundness	S = 0 mm
Sulfate content (as SO ₃)	SO ₃ = 22 ± 5 % by mass
Chloride content	Cl ⁻ = 0,14 % by mass
Insoluble residue	No performance assessed.
Loss on ignition	LOI = 1,04 % by mass
Aspects of durability with relevance only for the essential characteristics linked with BWR1	
Effect of different storage temperatures on mortar which hardened under standard conditions	No performance assessed.
Shrinkage of concrete	No performance assessed.
Effect of different curing temperatures on mortar at early age	No performance assessed.
Sulfate resistance (external sulfate attack)	Method SR _{FPM} : No performance assessed. Method SR _{SPM} : No performance assessed.
Delayed ettringite formation	No performance assessed.
Carbonation of concrete	Method C _{dcr} : No performance assessed. Method C _{rsc} : No performance assessed.

³

e. g. EN 490, EN 516, EN 1168, EN 1317, EN 1338, EN 1340, EN 1520, EN 1858, EN 1857, EN 1916, EN 1917, EN 13084, EN 12446, EN 12737, EN 13224, EN 15037, EN 14844, EN 12839, EN 14843, EN 13978, EN 12843, EN 12951, EN 13224, EN 13813, EN 13877, EN 14843, EN 14992, EN 15037, EN 15258, EN 15435, EN 15498

Essential characteristic	Performance
Resistance to chloride penetration	Method M_{nss} : $M_{nss,37d} = 7,2 \cdot 10^{-12} \text{ m}^2/\text{s}$; $M_{nss,98d} = 2,43 \cdot 10^{-12} \text{ m}^2/\text{s}$ Method $D_{nss,90}$: No performance assessed.
Freeze-thaw resistance without de-icing agent	Method FT_{slab} : No performance assessed. Method FT_{beam} : No performance assessed. Method FT_{CIF} : $S_{28} = 0,03 \text{ kg/m}^3$; $f_{C28} = 77,1 \text{ MPa}$; $RDM_{UPPT,28} = 97,9 \%$ See Annex A, clause A1 Method FT_{cube} : $P_{100} = 1,50 \%$ by mass; $f_{C28} = 70,7 \text{ MPa}$ See Annex A, clause A2
Freeze-thaw resistance with de-icing agent	Method FTS_{CDF} : No performance assessed. Method FT_{slab} : No performance assessed.

3.2 Reaction to fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	No performance assessed.

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	
CMR substances	
Substance/s classified as EU-cat. Carc. 1A and/or 1B ^{a)}	No performance assessed.
Substance/s classified as EU-cat. Muta. 1A and/or 1B ^{a)}	
Substance/s classified as EU-cat. Repr. 1A and/or 1B ^{a)}	
Leachable Substances	Eluate concentration R_{64d} acc. to EN 16637-2
TOC	No performance assessed.
Sulfate (SO_4^{2-})	No performance assessed.
Chloride (Cl^-)	No performance assessed.
Fluoride (F^-)	No performance assessed.
Antimony (Sb)	No performance assessed.
Arsenic (As)	No performance assessed.
Barium (Ba)	No performance assessed.
Lead (Pb)	No performance assessed.

Cadmium (Cd)	No performance assessed.
Chromium (Cr)	No performance assessed.
Chromium (Cr ⁶⁺)	No performance assessed.
Cobalt (Co)	No performance assessed.
Copper (Cu)	No performance assessed.
Molybdenum (Mo)	No performance assessed.
Nickel (Ni)	No performance assessed.
Mercury (Hg)	No performance assessed.
Selenium (Se)	No performance assessed.
Thallium (Tl)	No performance assessed.
Vanadium (V)	No performance assessed.
Zinc (Zn)	No performance assessed.
Release scenario regarding BWR 3: S/W 1 and S/W 2	
a) In accordance with Regulation (EC) No 1272/2008	

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD No. 150001-01-0301, the applicable European legal act is: Commission Decision 97/555/EC, as amended by Commission Decision 2010/683/EU.

The system to be applied is: 1+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 2 July 2026 by Deutsches Institut für Bautechnik

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beglaubigt:
Wagner

ANNEX A: Assessment

A1 Freeze-thaw resistance without de-icing agent – Method: CIF procedure FT_{CIF}

The testing procedure was done according to EAD 150001-01-0301, clause 2.2.16.3.

Table A1.1: Compressive strength of the tested concrete made with CSA cement "Paderborn" after 28 d

Specimen	Compressive strength [f_{C28}]
-	MPa
1	77,9
2	74,5
3	78,9
mean value	77,1

Table A1.2: Single values (sv) and mean value (mv) of scaling (CF-Procedure) and relative dynamic modulus of elasticity (RDM) of concrete made with CSA cement "Paderborn" after 10, 14 and 28 freeze-thaw cycles (FTC)

FTC	RDM			Scaling		
-	%			kg/m ²		
-	sv		mv	sv		mv
2	3	4	5	6	7	8
10	98,1	98,5	99,2	0,02	0,02	0,02
	100,0	99,3		0,02	0,01	
	100,3	-		0,03	-	
14	98,2	98,3	99,0	0,02	0,02	0,02
	99,7	99,5		0,02	0,01	
	99,2	-		0,04	-	
28	96,3	97,6	97,9	0,03	0,03	0,03
	98,0	98,5		0,03	0,02	
	99,3	-		0,05	-	

A2 Freeze-thaw resistance without de-icing agent – Method: cube procedure FT_{cube}

The testing procedure was done according to EAD 150001-01-0301, clause 2.2.16.4.

Table A2.1: Compressive strength of the tested concrete made with CSA cement "Paderborn" after 28 d

Specimen	Compressive strength [f_{C28}]
-	MPa
1	69,9
2	71,7
3	70,6
mean value	70,7

Table A2.2: Single values (sv) and mean value (mv) of scaling (cube test) of concrete made with CSA cement "Paderborn" after 7, 15, 28, 42, 56, 70 and 100 freeze-thaw cycles (FTC)

FTC	Scaling		
	% by mass		
	cubes 1 + 2	cubes 3 + 4	mv
0	0,00	0,00	0,00
7	0,10	0,10	0,10
15	0,10	0,10	0,10
28	0,10	0,10	0,10
42	0,20	0,20	0,20
56	0,40	0,30	0,35
70	0,50	0,50	0,50
100	1,70	1,30	1,50