



European Technical Approval ETA-10/0374

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung
Trade name

"Mowilith LDM 6880"

Zulassungsinhaber
Holder of approval

Celanese Emulsions GmbH
Industriepark Höchst, C 657
65926 Frankfurt/Main
DEUTSCHLAND

Zulassungsgegenstand
und Verwendungszweck
*Generic type and use
of construction product*

Organischer Betonzusatzstoff
Polymeric Concrete Addition

Geltungsdauer:
Validity: vom
from
bis
to

10 February 2011
10 February 2016

Herstellwerk
Manufacturing plant

Celanese Emulsions GmbH
Industriepark Höchst, Geb. D 326
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DEUTSCHLAND

Diese Zulassung umfasst
This Approval contains

10 Seiten
10 pages

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik 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 products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998⁴, as amended by law of 31 October 2006⁵;
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to 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 manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

¹ Official Journal of the European Communities L 40, 11 February 1989, p. 12
² Official Journal of the European Communities L 220, 30 August 1993, p. 1
³ Official Journal of the European Union L 284, 31 October 2003, p. 25
⁴ *Bundesgesetzblatt Teil I 1998*, p. 812
⁵ *Bundesgesetzblatt Teil I 2006*, p. 2407, 2416
⁶ Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of the product and intended use

1.1 Definition of the construction product

The polymeric concrete addition "Mowilith LDM 6880" is a copolymer-based, aqueous, saponification resistant polymer dispersion. It reduces the concrete permeability against substances hazardous to water as well as enhances the tensile strength of concrete.

1.2 Intended use of the construction product

The product is a polymeric concrete addition for use in concrete, mortar and other mixes for construction and for the manufacturing of construction products.

Direct contact with prestressing steel is not recommended. The use of polymeric concrete addition for grout for prestressing tendons according to EN 447⁷ is not approved.

Pre-fabricated concrete elements, which are fabricated using a polymeric concrete addition, shall be approved according to the CUAP 06.05/16 "Pre-fabricated elements made of concrete and reinforced concrete used in facilities to deal with liquid chemicals (substances hazardous to water)" with regard to the suitability for the use in facilities to deal with liquid chemicals (substances hazardous to water).

1.3 Assumed working life of the construction product

The provisions made in this European technical approval are based on an assumed working life of concrete incorporating the polymeric concrete addition "Mowilith LDM 6880" for the intended use of 50 years, provided that the conditions laid down in sections 4.2 and 5 for installation and packaging, transport, storage are met. 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 Homogeneity

The homogeneity shall be determined visually⁸. The polymeric concrete addition "Mowilith LDM 6880" shall be homogeneous when used. Segregation shall not exceed the limit stated by the manufacturer.

⁷ EN 447 Grout for prestressing tendons - Basic requirements

⁸ A sample shall be put in a 1-litre-glas-cylinder and covered for three months. The segregation of the addition is observed daily during the first 5 days, twice a week during the next 3 weeks, and once a week during the rest of the time (dust-like sedimentation at the bottom of the cylinder may be disregarded).

2.2 Colour

The colour shall be determined visually. The colour of the polymeric concrete addition "Mowilith LDM 6880" shall be uniform and similar to the description declared by the manufacturer.

2.3 Analysis of dry residue (infrared analysis)

The dry residue shall be analysed by infrared analysis in accordance with EN 480-6⁹. The infrared spectrum of the dry residue shall show no significant change when compared to the reference spectrum provided by the manufacturer.

2.4 Analysis of dry residue (thermogravimetric analysis)

The dry residue shall be analysed by thermogravimetry according to EN ISO 11358¹⁰ in nitrogen atmosphere¹¹. The thermogravimetric diagrams (TG and DTG) of the dry residue shall show no significant change when compared to the reference diagram provided by the manufacturer.

2.5 Absolute density

The absolute density shall be determined in accordance with EN ISO 2811-1¹². The absolute density of the polymeric concrete addition "Mowilith LDM 6880" shall comply with the requirement $1,03 \pm 0,02 \text{ g/cm}^3$.

2.6 Conventional dry material content

The conventional dry material content shall be determined in accordance with EN ISO 3251¹³ (method B). The conventional dry material content of the polymeric concrete addition "Mowilith LDM 6880" shall comply with the requirement $51 \pm 2 \%$ by mass.

2.7 Dynamic viscosity

The dynamic viscosity shall be determined in accordance with EN ISO 3219^{14,15}. The viscosity of the polymeric concrete addition "Mowilith LDM 6880" shall comply with the requirement $40 \text{ mPa}\cdot\text{s} \pm 40 \%$.

2.8 pH-value

The pH-value shall be determined in accordance with ISO 976¹⁶. The pH-value of the polymeric concrete addition "Mowilith LDM 6880" shall lie in between the manufacturer's stated range of 7,0 to 9,0.

⁹ EN 480-6:2005 Admixtures for concrete, mortar and grout - Test methods - Part 6: Infrared analysis
¹⁰ EN ISO 11358:1997 Plastics - Thermogravimetry (TG) of polymers - General principles (ISO 11358:1997)
¹¹ The dynamic method shall be used, with a heating rate of 10 K/min and a temperature range from room temperature to at least 700°C.
¹² EN ISO 2811-1: 2001 + AC:2006 Paints and varnishes - Determination of density - Part 1: Pycnometer method (ISO 2811-1:1997)
¹³ EN ISO 3251:2008 Paints, varnishes and plastics - Determination of non-volatile-matter content (ISO 3251:2008)
¹⁴ EN ISO 3219:1994 Plastics - Polymers/resins in the liquid state or as emulsions or dispersions - Determination of viscosity using a rotational viscometer with defined shear rate (ISO 3219:1993)
¹⁵ Two specimens shall be tested in a rotational viscometer at 23°C. The shear rate shall be increased to a maximum of 300 s^{-1} within 3 minutes.
¹⁶ ISO 976:1996+ Amd. 1:2006 Rubber and plastics - Polymer dispersions and rubber latices - Determination of pH

2.9 Total chlorine

The total chlorine content shall be determined in accordance with EN ISO 1158^{17,18}. The total chlorine content of the polymeric concrete addition "Mowilith LDM 6880" shall not be greater than 0,10 % by mass.¹⁹

2.10 Water soluble chloride

The water soluble chloride content shall be determined in accordance with EN 480-10²⁰. The water soluble chloride content of the polymeric concrete addition "Mowilith LDM 6880" shall not be greater than 0,10 % by mass.

2.11 Setting time

The setting time shall be determined in accordance with EN 196-3^{21,22}. The initial setting time of the cement paste with polymeric concrete addition "Mowilith LDM 6880" shall be at least 60 min, the final setting time shall be less than 12 h.

2.12 Soundness

The soundness shall be determined through the expansion in accordance with EN 196-3²¹. A reference cement paste in accordance with EN 196-3²¹ and a cement paste in accordance with clause 2.11 shall be used. The expansion shall not be greater than 10 mm. The additional expansion of the cement paste with polymeric concrete addition shall not exceed 4 mm when compared to the reference cement paste.

2.13 Air content of fresh concrete

The air content of fresh concrete shall be determined by the method described in EN 12350-7²³ and shall not be greater than 5 % by volume using a concrete with the following composition.

- ¹⁷ EN ISO 1158:1998 Plastics - Vinyl chloride homopolymers and copolymers - Determination of chlorine content (ISO 1158:1998)
- ¹⁸ The procedure shall be modified as follows: The sample size in method B shall be increased to 0,1 g of dry addition. Silver nitrate and ammonium thiocyanate solutions shall be used at 0,01N.
- ¹⁹ If there is no significant difference between the total chlorine and the water soluble chloride content, only the water soluble chloride content should be determined in subsequent tests.
- ²⁰ EN 480-10:2009 Admixtures for concrete, mortar and grout - Test methods - Part 10: Determination of water soluble chloride content
- ²¹ EN 196-3: 2005+A1:2008 Methods of testing cement - Part 3: Determination of setting times and soundness
- ²² The cement paste consists of 100 % by mass test cement plus 20 % by mass polymeric concrete addition as well as the required amount of water to reach standard consistence. The entire polymeric concrete addition shall be taken into account for the water. The test cement shall be a Portland cement CEM I 42,5 R according to EN 197-1. The test cement shall fulfil the following requirements: Tricalcium aluminate 6 to 12 % by mass, Alkalis (Na₂O eqv) 0,5 - 1,2 % by mass, Fineness > 300 m²/kg.
- ²³ EN 12350-7:2009 Testing fresh concrete - Part 7: Air content - Pressure methods

	Composition per m ³ fresh concrete									
concrete I without "Mowilith LDM 6880"	c = 320 kg CEM I 42,5 R according to EN 197-1 ²⁴ g = kg aggregates ¹⁾ w = 160 kg water w/c = 0,50									
concrete II with "Mowilith LDM 6880"	c = 320 kg CEM I 42,5 R according to EN 197-1 ²⁴ pca = 64 kg "Mowilith LDM 6880" g = kg aggregates ¹⁾ w = 96 kg water (w+pca)/c = 0,50									
1) Aggregates according to EN 12620 ²⁵ with the following grading curve shall be used:										
Size [mm]	0,125	0,25	0,5	1	2	4	8	16	32	
Passing [% by mass]	1,5**	5	12	18	26	35	50	71	100	
** recommended value										

2.14 Corrosion behaviour

The effect on corrosion susceptibility is determined in accordance with EN 480-14²⁶ using a mortar with the following composition. The determination of the corrosion behaviour shall show no corrosion-promoting effect according to EN 934-1²⁷, clause 5.2.

	Mortar composition for 3 test specimen									
mortar I without "Mowilith LDM 6880"	c = 450g CEM I 42,5 R according to EN 197-1 ²⁴ g = 1.350 g standard sand w = 225g water w/c = 0,50									
mortar II with "Mowilith LDM 6880"	c = 450g CEM I 42,5 R according to EN 197-1 ²⁴ pca = 90 g "Mowilith LDM 6880" g = 1.350 g standard sand w = 135g water (w+pca)/c = 0,50									

²⁴ EN 197-1:2000 + A1:2004 Cement - Part 1: Composition, specifications and conformity criteria for common cements

²⁵ EN 12620: 2002+A1:2008 Aggregates for concrete

²⁶ EN 480-14:2006 Admixtures for concrete, mortar and grout - Test methods - Part 14: Determination of the effect on corrosion susceptibility of reinforcing steel by potentiostatic electrochemical test

²⁷ EN 934-1:2008 Admixtures for concrete, mortar and grout - Part 1: Common requirements

2.15 Compressive strength of mortar

The compressive strength of mortar at 7, 28 and 90 days is determined in accordance with EN 196-1²⁸ using a mortar in accordance with clause 2.14. The consistence of the fresh mortar shall be determined by flow table method according to EN 1015-3²⁹. The compressive strength of the specimens with polymeric concrete addition shall be at least 90 % of the compressive strength of the reference specimens when tested at 7 and 28 days.

2.16 Compressive strength of concrete

The compressive strength of concrete at 7, 28 and 90 days is determined according to EN 12390-3³⁰ using a concrete in accordance with clause 2.13. The test specimens are made according to EN 12390-2^{31,32}. The consistence of the fresh concrete shall be determined by flow table method according to EN 12350-5³³ and the air content by the method described in EN 12350-7³⁴. The compressive strength of the concrete with polymeric concrete addition shall be at least 90 % of the compressive strength of the reference concrete when tested at 7 and 28 days.

2.17 Tensile splitting strength

No performance determined (NPD).

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the communication of the European Commission³⁵ system 1+ of the attestation of conformity laid down in the Decision 1999/469/EC of the European Commission³⁶ amended by 2001/596/EC applies.

This system of attestation of conformity is defined as follows:

System 1+: Certification of the conformity of the product by an approved certification body on the basis of:

- (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;
 - (6) audit-testing of samples taken at the factory.

Note: Approved bodies are also referred to as "notified bodies".

28	EN 196-1:2005	Methods of testing cement - Part 1: Determination of strength
29	EN 1015-3:1999 +A1:2004+A2:2006	Methods of test for mortar for masonry - Part 3: Determination of consistence of fresh mortar (by flow table)
30	EN 12390-3:2009	Testing hardened concrete - Part 3: Compressive strength of test specimens
31	EN 12390-2:2009	Testing hardened concrete - Part 2: Making and curing specimens for strength tests
32	The concretes made with and without polymeric concrete addition are demoulded after 24 h and immersed in water until the age of 7 days. Afterwards they are stored in normal climate 20/65.	
33	EN 12350-5:2009	Testing fresh concrete - Part 5: Flow table test
34	EN 12350-7:2009	Testing fresh concrete - Part 7: Air content - Pressure methods
35	Letter of the European Commission of 16.01.2009 to EOTA	
36	Official Journal of the European Communities L 184/27 of 17.07.1999	

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use initial materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.³⁷

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

3.2.1.2 Other tasks for 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 polymeric concrete addition in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 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 for the approved bodies

The approved body shall perform the

- initial type-testing of the product,
- initial inspection of factory and of factory production control,
- continuous surveillance, assessment and approval of factory production control,
- audit-testing of samples taken at the factory (the place or site where the product is produced)

in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

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.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

³⁷

The "control plan" is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

3.3 CE marking

The CE marking shall be affixed on the packaging and the accompanying commercial documents respectively. The letters "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European technical approval,
- Description of the product: Polymeric concrete addition
- Tensile splitting strength: NPD.

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

4.1 Manufacturing

The polymeric concrete addition "Mowilith LDM 6880" is manufactured from specified constituents in a production plant.

The European technical approval is issued for the product on the basis of agreed data and information, deposited with Deutsches Institut für Bautechnik, 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 Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

4.2 Installation

The product is a polymeric concrete addition for use in concrete, mortar and other mixes for construction and for the manufacturing of construction products.

Direct contact with prestressing steel is not recommended. The use of polymeric concrete addition for grout for prestressing tendons according to EN 447⁷ is not approved.

The recommended maximum dosage of polymeric concrete addition is 20 % by cement mass. The tolerance of batching the addition shall not exceed a tolerance of ± 3 %.

For determination of the w/c-ratio the polymeric concrete addition shall be taken into account for the water.

The use of concrete additions may cause adverse effects on the properties of concrete, which may be determined. Furthermore the air content of concrete may be increased significantly by the concrete addition.

For each case of application initial tests shall be carried out with the intended concrete composition and the intended addition to demonstrate that the concrete can be processed reliably with the intended consistency provided under the conditions of the site and that the required properties are achieved.

5 Indications to the manufacturer concerning packaging, transport and storage

Materials shall be handled and stored with care according to EN 934-6³⁸.

It is the responsibility of the manufacturer of the product to ensure that the information of these provisions is given to those involved.

NOTE:

Manufacturer's stated values and characteristics shall be provided in writing to the user upon request for:

- analysis of dry residue (infrared analysis and thermogravimetric analysis)
- absolute density
- conventional dry material content
- dynamic viscosity
- pH value

In the production plant the addition shall be stored in closed containers.

The addition may be delivered in suitable bulk-delivery transportation systems, which shall be clean and free of other materials, or in suitable packages. During transportation the addition shall be prevented from pollution.

Packages and documents related to bulk deliveries shall be marked with the manufacturer's name, the product's trademark, the production date and the following information:

- "Freeze-protected storage required"
- "Applicable for 6 months after production"

Georg Feistel
Head of Department

beglaubigt:
Bahlmann

³⁸ EN 934-6: 2001 + A1:2005 Admixtures for concrete, mortar and grout - Part 6: Sampling, conformity control and evaluation of conformity