

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-19/0246  
of 21 November 2019

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

Cem-FIL MiniBars

Product family  
to which the construction product belongs

Polymer macro fibres reinforced with alkali resistant glass  
fibre for the use in concrete

Manufacturer

ReforceTech Ltd  
Pamdohlen House  
DOORADOYLE RAD, LIMERICK  
REPUBLIC IRLAND

Manufacturing plant

ReforceTech AS  
Luftveien 4  
NO - 3440 ROYKEN  
NORWAY

This European Technical Assessment  
contains

6 pages including 1 annex which forms an integral part of  
this assessment.

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 260024-00-0301

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## Specific part

### 1 Technical description of the product

The polymer macro fibres reinforced with alkali resistant glass fibre "Cem-FIL MiniBars" are made of a polymeric matrix coating a glass thread containing zirconium dioxide to achieve a high alkali resistance. The zirconium dioxide content ( $ZrO_2$ ) of the Alkali resistant (AR) glass is  $\geq 16$  % by mass. The moisture content of the AR glass thread with sizing is  $\leq 0,50$  % by mass. The strand-in-cement-strength (SIC strength) of the AR glass thread with sizing is  $\geq 250$  N/mm<sup>2</sup> (cp. EAD 260002-00-0301). The glass fibres are twisted using a sacrificial thread and saturated and coated with a vinyl ester resin. Thereby the macro fibres possess a helix structure. The fibres are manufactured from specified constituents in a production plant and produced as chopped strands in different lengths (43, 55, 60 mm).

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

The polymer macro fibres reinforced with alkali resistant glass fibre "Cem-FIL MiniBars" are intended to be used for preparation of concrete, mortar and other mixes for construction and for the manufacturing of precast construction products for structural use.

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 polymer macro fibres reinforced with alkali resistant glass fibre "Cem-FIL MiniBars" 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**

**Table 1 Mechanical resistance and stability (BWR 1)**

Essential characteristic	Performance	
Shape/cross section	circular, see Annex A, Fig. 1	
Equivalent diameter	0,72 mm	
Length	43, 55, 60 mm	
Density	2,14 g/cm <sup>3</sup>	
Content of resin (coating)	16 % by mass	
Tensile strength	≥ 900 N/mm <sup>2</sup>	
Modulus of elasticity	≥ 43.700 N/mm <sup>2</sup>	
Softening temperature (Melting point)	104 °C	
Point of ignition (Decomposition point)	410 °C	
IR analysis of coating	See Annex A, Fig. 2	
Effect on the consistency of concrete	Fibre dosage "Cem-FIL Minibars 43": 10 kg/m <sup>3</sup>	See Annex A, Tab. 1
Effect on the strength of concrete (Residual flexural tensile strength)		See Annex A, Tab. 2

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

In accordance with EAD No. 260024-00-0301, the applicable European legal act is: 1999/469/EC(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**

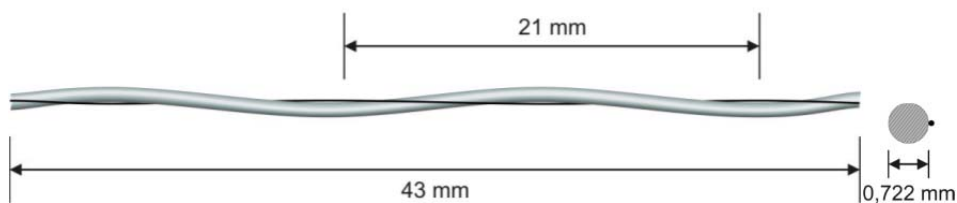
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 21 November 2019 by Deutsches Institut für Bautechnik

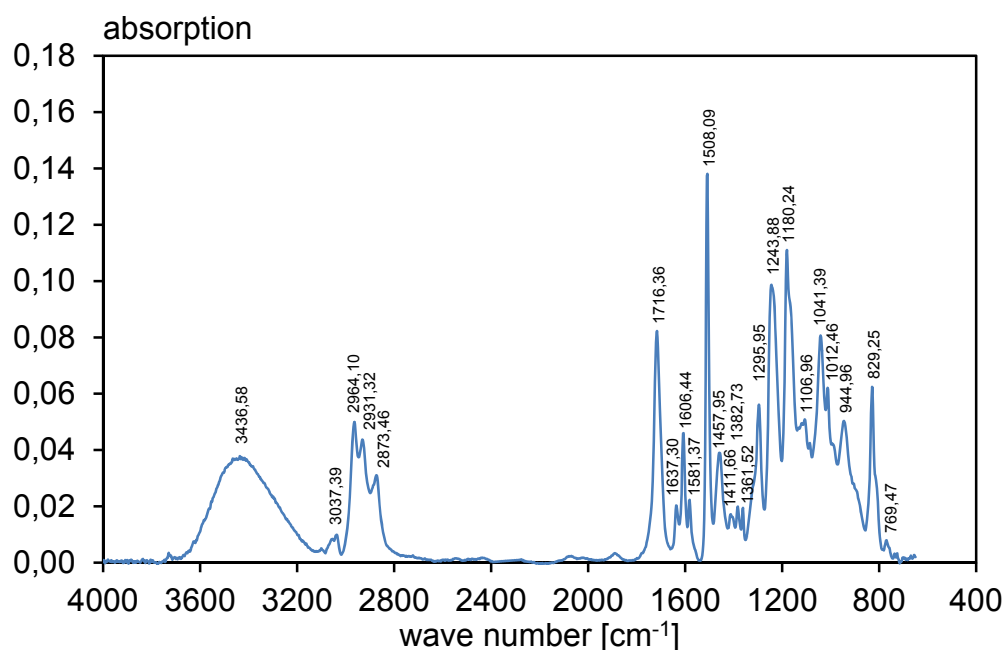
BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Bahlmann

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**Figure 1:** Shape (helix structure) and cross section



**Figure 2:** IR analysis of coating

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**Table 1:** Flow diameter and vebe time of fresh concrete

Concrete	Dosage of "Cem-FIL MiniBars 43"	Flow diameter		Vebe time	
		mm		s	
Reference concrete	-	295	295	6,30	6,30
		295		6,28	
		295		6,32	
Fibre concrete	10 kg/m <sup>3</sup>	300	300	7,27	7,49
		300		8,09	
		300		7,11	

**Table 2:** Residual flexural strength (fibre dosage of 10 kg/m<sup>3</sup>)

Test specimen (beams)	$f_{ct,L}^f$	$f_{R,1}$	$f_{R,2}$	$f_{R,3}$	$f_{R,4}$
		0,5 mm CMOD	1,5 mm CMOD	2,5 mm CMOD	3,5 mm CMOD
MPa					
1	3,871	2,861	3,469	3,307	2,629
2	3,898	1,812	1,942	1,906	1,688
3*	0,948	2,602	2,515	2,429	2,099
4	3,788	2,358	2,634	2,696	2,582
5	3,545	1,935	1,981	2,005	1,881
6	3,614	2,589	2,975	3,071	2,951
7	3,742	1,360	1,309	1,339	1,202
8	4,031	2,119	2,222	2,278	1,915
9	4,277	2,610	2,984	3,096	2,583
10	4,072	2,010	2,121	1,974	1,867
11	3,956	2,504	2,885	3,034	2,928
12	3,781	2,256	2,572	2,605	2,388
average	3,627	2,251	2,467	2,478	2,226

\*test specimen 3: unrepresentative results due to prior damage

Cem-FIL MiniBars

Results of performance assessment

Annex A  
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