



TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.  
BUILDING TESTING AND RESEARCH INSTITUTE, Slovak Republic  
Studená 3, 821 04 Bratislava

Product Certification Body  
Notified Body 1301



Reg. No. 004/P-016

Issue No.



## REPORT of Certification of constancy of performance No. C04/20/0040/20/CB

pursuant to the Annex V, cl. 1.2 to the Construction Product Regulation (EU) No 305/2011 (CPR) of the European Parliament and of the Council of 9 March 2011 as amended by Commission Delegated Regulation (EU) No 568/2014 of 18 February 2014.

**Product:** Polymer wavy fibres (monofilaments),  
trade name **ArmoTec**

**Manufacturer:** LLC Clight Group  
98 V. Sukhomlinsky str.,  
52005 Dnipropetrovsk region, Dniprovskiy district,  
Slobozhanske town, Ukraine

**Manufacturing plant:** LLC Clight Group  
98 V. Sukhomlinsky str.,  
52005 Dnipropetrovsk region, Dniprovskiy district,  
Slobozhanske town, Ukraine

### Product applicability for intended use in construction work:

Polymer wavy fibers, trade name ArmoTec are designed specifically for the reinforcement of concrete, mortars and other cementitious mixes (construction application is understood, that the effect of additional fibres is included as contribution to essential carrying capacity of concrete members).

Polymer wavy fibers, trade name ArmoTec are allowed to be used as ground supported slabs, joint less floors and jointed floors, external roads and pavements, manhole covers, residential application and tunnel application.

The application of certification of constancy of performance has been registered under code C04/20/0040/20. Properties and technical specifications relevant to the assessment of constancy of performance of the product are listed in the following overview.

In accordance with the basic material used for the production of the fibres (EN 14889-2, Art. 5.1)) Polymer wavy fibers, trade name ArmoTec are classified as Group II.

Orgán technického posudzovania (TAB)  
Autorizovaná osoba TP04  
Notifikovaná osoba 1301  
Autorizovaná osoba SK04



Úsek posudzovania zhody  
Studená 3, 821 04 Bratislava

Pobočka Bratislava  
Studená 3, 821 04 Bratislava  
Pobočka Nové Mesto n/Váhom  
Trenčianska 1875/12, 915 05 Nové Mesto n/Váhom  
Pobočka Nitra  
Braneckého 2, 949 01 Nitra  
Pobočka Zvolen  
Jesenského 15, 960 01 Zvolen

Pobočka Žilina  
A Rudnaya 90, 010 01 Žilina  
Pobočka Košice  
Kramanova 5, 040 01 Košice  
Pobočka Prešov  
Budovateľská 53, 080 01 Prešov  
Pobočka Tatranská Štrba  
Bellova 72/24, 059 41 Štrba – Tatranská Štrba

Representative that has undergone the assessment of the performance on the basis of testing:

**Polymer wavy fibres (monofilaments) ArmoTec**

Basic material – polypropylene macrofibers of irregular rectangle cross section, wavy shape,

Equivalent diameter of 0,85 mm, length of 40 mm

Compliance of criteria is presented in Table 1.

Table 1 – Polymer wavy fibers

Characteristics	Criterion and Technical specification	Detected parameter	Evaluation
<b>Dimensions and tolerances of fibres</b>			
Length L	EN 14889-1, Art. 5.2.1 for individual value 40 mm ± 10 % for average value 40 mm ± 5 %	min.: 39,91 mm max.: 40,24 mm average: 40,12 mm	comply
Equivalent diameter D	EN 14889-1, Art. 5.2.1 for individual value 0,85 mm ± 10 % for average value 0,85 mm ± 5 %	min.: 0,839 mm max.: 0,865 mm average: 0,849 mm	comply
Length/diameter ratio $\lambda$	EN 14889-2, Art. 5.3.2 for individual value 47 ± 15 % for average value 47 ± 7,5 %	min.: 46,38 max.: 47,76 average: 47,15	comply
<b>Mechanical properties of wire</b>			
Tensile strength $R_m$	EN 14889-1, Art. 5.3 for individual value 400 MPa ± 15 % for average value 400 MPa ± 7,5 %	min.: 349 MPa max.: 438 MPa average: 392 MPa	comply
Modulus of elasticity E	EN 14889-1, Art. 5.4 6000 MPa ± 15%	min.: 5207 MPa max.: 6950 MPa average: 6060 MPa	comply
<b>Effect on consistence of concrete, EN 12350-3 (VeBe test)</b>			
Consistence on the reference concrete without fibres	EN 14889-1, Art. 5.7	average 6 s	comply
Identical mix with fibres. Dosage of fibres: 4 kg/m <sup>3</sup>	EN 14889-1, Art. 5.7	average 6 s	comply
<b>Effect on strength of concrete</b>			
Residual flexural tensile strength of concrete with fibres of 12 specimens (beams) after 28 days, according to EN 14845-2 Dosage of fibres: 4 kg/m <sup>3</sup>	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,5 MPa at cracking of beam CMOD = 0,5 mm	min.: 1,26 MPa max.: 1,90 MPa average: 1,6 MPa	comply
	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,0 MPa at cracking of beam CMOD = 3,5 mm	min.: 1,39 MPa max.: 2,04 MPa average: 1,8 MPa	comply

The applied system of Factory Production Control was checked during the Initial Inspection executed on 21.05.2020 and is attached to the Annex No. 1.

The factory production control complies with the requirements of the CPR and technical specifications: EN 14889-2.

**Commentary to obtained results:**

The test results of the fibres ArmoTec are reported in the Test Report No. 20-20-0561, issued by TSÚS, Bratislava branch, on 15. 05. 2020. The test report is archived at the TSUS, Bratislava branch and at the manufacturer. The copy of the test report is given in Annex no. 2.

**List of technical specifications:**

EN 14889-2: 2006 Fibres for concrete - Part 2: Polymer fibres - Definitions, specifications and conformity

**Conclusion:**

The certification of the product has been assessed constancy of performances of the product with the declared criteria and related technical specifications EN 14889-2.

**Based on the results of the initial inspection we recommended issuing the certificate of constancy of performance.**

Date of issue: 22. 05. 2020

Duration of validity: without restriction

Elaborated by: Július Marko

Approved by  
Bratislava Branch Director: Patrik Ševčík

**Distribution list**

Issue No.	Archiving of the issue, recipient of designation
1	Manufacturer/Applicant
2	TSÚS – archive ÚPZ
3	TSÚS – branch archive

**List of Annexes**

Annex No. 1 Report of initial inspection of the manufacturing plant and of factory production control  
No.: C04/20/0040/20/CB issued in Bratislava on 22.05.2020

Annex No. 2 Test Report No. 20-20-0561 issued in Bratislava on 15.05.2020

**Notice**

The copying or using of this certification report for any kind of publishing or advertising etc. is possible only as one component part, the handling with an explicit part of the certificate documents is possible only with the written agreement of the Notified Body 1301.



TECHNICKÝ A SKÚŠOBNÝ ÚSTAV STAVEBNÝ, n. o.  
BUILDING TESTING AND RESEARCH INSTITUTE, Slovak Republic  
Studená 3, 821 04 Bratislava

Inspection Body of type A  
Product Certification Body  
Notified Body 1301



Issue No. 

## REPORT of Initial Inspection of the Manufacturing Plant and of Factory Production Control

Pursuant to the Construction Product Regulation (EU) No 305/2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

**No. C04/20/0040/20/IB**

*for certification of constancy of performance of the product*

**Product:** Polymer fibres, wavy fibers (monofilaments), trade name **ArmoTec**  
Group II

**Manufacturer:** LLC Clight Group  
98 V. Sukhomlinsky str.,  
52005 Dnipropetrovsk region, Dniprovskiy district,  
Slobozhanske town, Ukraine

**Manufacturing plant:** LLC Clight Group  
98 V. Sukhomlinsky str.,  
52005 Dnipropetrovsk region, Dniprovskiy district,  
Slobozhanske town, Ukraine

Date of issue: 22. 05. 2020



Elaborated by: Julius Marko

Approved by  
Bratislava Branch Director Patrik Sevcik

Orgán technického posudzovania (TAB)  
Autorizovaná osoba TP04  
Notifikovaná osoba 1301  
Autorizovaná osoba SK04

Úsek posudzovania zhody  
Studená 3, 821 04 Bratislava

Pobočka Bratislava  
Studená 3, 821 04 Bratislava  
Pobočka Nové Mesto n/Váhom  
Trenčianska 1875/12, 915 05 Nové Mesto n/Váhom  
Pobočka Nitra  
Braneckého 2, 949 01 Nitra  
Pobočka Zvolen  
Jesenského 15, 960 01 Zvolen

Pobočka Žilina  
A Rudnaya 90, 010 01 Žilina  
Pobočka Košice  
Kрманова 5, 040 01 Košice  
Pobočka Prešov  
Budovateľská 53, 080 01 Prešov  
Pobočka Tatranská Štrba  
Bellova 72/24, 059 41 Štrba – Tatranská Štrba

## 1 Composition of the Inspection team

The inspection was performed based on agreed initial inspection plan in composition:  
Ing. Julius Marko PhD. – head inspector

## 2 Time schedule of the inspection

The inspection was performed on: 10.05.2020

Number of application for certification of conformity of the factory production control: C04/20/0040/20

## 3 List of technical specifications, standards and legal provisions related to the product

EN 14889-2: 2007 Fibres for concrete - Part 2: Polymer fibres - Definitions, specifications and conformity

EN 14845-1: 2007 Test methods for fibres in concrete. Part 1: Reference concretes

Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC,

## 4 Intended use of the product in construction work

Polymer fibres are intended to be used for construction applications of concrete, mortar or grout (construction application is understood, that the effect of additional fibres is included as contribution to essential carrying capacity of concrete members, fibres are allowed to be used in all types of concretes and mortars include air-placed concrete, flooring and prefabricates).

## 5 Description of production technology

The raw materials in granules (virgin polypropylene) are fed into the receiving hopper of the extruder, after that the polypropylene is heated and passed under pressure through filament extrusion device. It turns out thin wires (diameters about 3-4 mm), which are cooled and then heated in several stages in special cambers and pulled out on the calf wheels. After that polypropylene wires are embossing and cutting to the needed fibers lengths or embossing and formatting of fiber bundles in a water-soluble film cutting into cylinders.

## 6 Assessment of the performance of the construction product in accordance with technical specifications and legal provisions

The manufacturer has carried out determination of the product type according to technical specifications. The tests were executed by Technický a skúšobný ústav stavebný, n.o., laboratory of Bratislava branch.

According to the determined product type of the construction product corresponding characteristics were assessed with technical specifications and legal provisions: EN 14889-2, EN 14845-1, technical data sheet

## 7 Proceeding of the initial inspection of the manufacturing plant and of factory production control

The proceeding and findings of the initial inspection of production and factory production control are mentioned in the check list No. C04/20/0040/20IB, which is in the Annex 1.

Manufacturer was represented by the following employees:

Mr. Yurii Syvash – commercial director

Mr. Ivan Opoliarov – head of external cooperation department

List of examined technical documents of factory production control:

**Quality manual**, issued on 15.01.2014, 98 V. Sukhomlinsky str., 52005 Dnipropetrovsk region, Dniprovskiy district, Slobozhanske town, Ukraine

**Control plan** of manufacturing of fibres for concrete, precise control according to EN14889-2:2007, issued on 30.04.2020.

**Card of order** of fibres ArmoTec, which contains object of order, specification of order, dimensions of fibres, time of production.

## 8 Estimated non-conformities

The performance of the initial inspection of the manufacturing plant and factory production control were not found any discrepancies to the technical specifications and legal provisions.

## 9 Overall evaluation of the inspection

The performance of the initial inspection does not reveal any non-conformity.

The applied system of factory production control is in accordance with the technical specifications, legal provisions: EN 14889-2: 2006.

The continuing surveillances will be provided in accordance with the technical specifications related to the construction product and in accordance with the Construction Product Regulation (EU) No 305/2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

The date of the next continuing surveillance is stated on June 2021.

## 10 Distribution list

Issue No.	Archiving of the issue, recipient of designation
1	Manufacturer/Applicant
2	TSÚS – archive ÚPZ
3	TSÚS – branch archive

## 11 List of Annexes

Annex No. 1 Checklist No. C04/20/0040/20/IB