



Notifikovaná osoba č. 1301

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

Certificate of constancy of performance

1301 – CPR – 1612

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

**Steel fibres for concrete COLD DRAWN STEEL FIBRES
Group I**

for structural uses in the all types of concrete, mortar or grout.

The product types are in the Annex 1 of this certificate.

Placed on the market under the name of

**Raajratna Metal Industries limited
99, Bileshwarpura, Ahmedabad-Mehsana Highway
Taluka: Kalol, Dist.: Gandhinagar-382729 Gujarat
India**

and produced in the manufacturing plant

**Raajratna Metal Industries limited
99, Bileshwarpura, Ahmedabad-Mehsana Highway
Taluka: Kalol, Dist.: Gandhinagar-382729 Gujarat
India**

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 14889-1: 2006

under system 1 for the performance set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 30 October 2020 and will remain valid as long as neither the harmonised standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

Bratislava, 8 March 2021



Daša Kozáková
Dipl. Ing. Daša Kozáková
Head of Notified Body 1301

123310

Annex 1 of the Certificate 1301 – CPR – 1612

Product types:

Steel fibres for concrete COLD DRAWN STEEL FIBRES STRIGHT HP RAAJ

Diameters (mm)								
0.160	0.175	0.180	0.200	0.220	0.250	0.280	0.300	0.350
0.380	0.400	0.450	0.500	0.600	0.700	0.800	1.000	-

Lengths (mm)								
6	10	12	12.5	13	14	15	17	19
20	22	25	27	30	35	40	-	-

Steel fibres for concrete COLD DRAWN STEEL FIBRES STRIGHT RAAJ

Diameters (mm)								
0.160	0.175	0.180	0.200	0.220	0.250	0.280	0.300	0.350
0.380	0.400	0.450	0.500	0.600	0.700	0.800	1.000	-

Lengths (mm)								
6	10	12	12.5	13	14	15	17	19
20	22	25	27	30	35	40	-	-

Steel fibres for concrete COLD DRAWN STEEL FIBRES HOOKED RAAJ

Diameters (mm)								
0.380	0.400	0.450	0.500	0.550	0.600	0.700	0.800	1.000

Lengths (mm)								
25	30	50	-	-	-	-	-	-

Steel fibres for concrete COLD DRAWN STEEL FIBRES WAVED RAAJ

Diameters (mm)								
0.300	0.350	0.380	0.400	0.450	0.500	-	-	-

Lengths (mm)								
10	12,5	13	15	20	22	25	28	30
35	40	-	-	-	-	-	-	-



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

Raajratna Metal Industries limited
99, Bileshwarpura
Ahmedabad-Mehsana Highway
Taluka: Kalol, Dist.: Gandhinagar-382729
Gujarat
India

Our ref.

ÚPZ-0313/ORA/21/To

Handled by/ext.

Ing. Kozáková/

00421249228110

Mailed from/date

Bratislava/8 March 2021

Certificate of constancy of performance No. 1301-CPR-1612

Please find enclosed the second edition of above quoted Certificate whereas the proceeding of certification of constancy of performance following your application submitted under the registration code C04/21/0029/20 is completed.

Let us to remind you that pursuant to chapter II Art. 4 paragraph 1 of the Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR) ("the Regulation"), the manufacturer has the obligation to issue a declaration of performance (DoP) before placing a construction product on the market.

The marking of products by the CE shall be carried out in terms of Art. 8 paragraph 2 of the Regulation.

Sincerely yours,

Ing. Daša Kozáková
Deputy Director

Technický a skúšobný ústav stavebný, n. o.
Studená 3
821 04 BRATISLAVA 2
-4-

Copy: TSÚS – ÚPZ
TSÚS – Branch Bratislava

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 cesta 1872/12, 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
Krmanova 5, 040 01 Košice
Pobočka Prešov
Budovateľská 53, 080 01 Prešov
Pobočka Tatranská Štrba
Štefánikova 24, 059 41 Tatranská Štrba



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.: 1

REPORT of Certification of constancy of performance No. C04/21/0029/20/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.

Products:

trade names:

COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14
diameter of 0,16 mm, length of 14 mm, tensile strength of 1200 N/mm²

COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5
diameter of 0,30 mm, length of 12,5 mm, tensile strength of 1500 N/mm²

COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30
diameter of 0,50 mm, length of 30 mm, tensile strength of 1500 N/mm²

COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30
diameter of 0,38 mm, length of 30 mm, tensile strength of 2000 N/mm²

Manufacturer:

Raajratna Metal Industries limited
99, Bileshwarpura, Ahmedabad-Mehsana Highway,
Taluka: Kalol, Dist.: Gandhinagar-382729 Gujarat,
India

Manufacturing plant:

Raajratna Metal Industries limited
99, Bileshwarpura, Ahmedabad-Mehsana Highway,
Taluka: Kalol, Dist.: Gandhinagar-382729 Gujarat,
India

Product applicability for intended use in construction work:

Steel fibres, trade name COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14, COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5, COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30 and COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30 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).

Steel fibres, trade name COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14, COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5, COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30 and COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30 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 C04/21/0029/20. 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 14889-1, Art. 5.1)). The steel fibres are classified as Group I.

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
Krmanova 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:

COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14

-basic material: cold drawn steel, straight shape, diameter of 0,16 mm, length of 14 mm

-compliance of criteria is presented in Table 1.

Table 1 – COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14

Essential characteristics	Criterion and Technical specification	Detected parameter	Evaluation
Dimensions and tolerances of fibres			
Length L	EN 14889-1, Art. 5.2.2 for individual value 14 mm $\pm$ 10 % for average value 14 mm $\pm$ 1,5 mm	min.: 13,93 mm max.: 14,21 mm average: 14,07 mm	comply
Diameter D	EN 14889-1, Art. 5.2.3.1 for individual value 0,16 mm $\pm$ 10 % for average value 0,16 mm $\pm$ 0,015 mm	min.: 0,155 mm max.: 0,162 mm average: 0,159 mm	comply
Length/diameter ratio λ	EN 14889-1, Art. 5.2.1 for individual value 87 $\pm$ 15 % for average value 87 $\pm$ 7,5 %	min.: 86,0 max.: 89,6 average: 87,4	comply
Mechanical properties of wire			
Tensile strength R_m	EN 14889-1, Art. 5.3 for individual value 1600 MPa $\pm$ 15 % for average value 1600 MPa $\pm$ 7,5 %	min.: 1537 MPa max.: 1656 MPa average: 1601 MPa	comply
Modulus of elasticity E	EN 14889-1, Art. 5.4 190 000 MPa $\pm$ 15 %	min.: 188156 MPa max.: 203548 MPa average: 196340 MPa	comply
Effect on consistence of concrete, EN 12350-3 (VeBe test)			
Consistence on the reference concrete without fibres	EN 14889-1, Art. 5.7	average 6 s	comply
Identical mix with fibres. Dosage of fibres of 20kg/m ³	EN 14889-1, Art. 5.7	average 6 s	comply
Effect on strength of concrete			
Residual flexural tensile strength of concrete with fibres of 12 specimens (beams) after 28 days, according to EN 14845-2 Dosage of fibres of 20 kg/m ³	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,5 MPa at cracking of beam CMOD = 0,5 mm	min.: 1,5 MPa max.: 3,2 MPa average: 2,1 MPa	comply
	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,0 MPa at cracking of beam CMOD = 3,5 mm	min.: 0,7 MPa max.: 1,4 MPa average: 1,1 MPa	comply

COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5

-basic material: cold drawn steel, straight shape, diameter of 0,30 mm, length of 12,5 mm

-compliance of criteria is presented in Table 2.

Table 2 – COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5

Essential characteristics	Criterion and Technical specification	Detected parameter	Evaluation
Dimensions and tolerances of fibres			
Length L	EN 14889-1, Art. 5.2.2 for individual value 12,5 mm $\pm$ 10 % for average value 12,5 mm $\pm$ 1,5 mm	min.: 12,40 mm max.: 12,54 mm average: 14,49 mm	comply
Diameter D	EN 14889-1, Art. 5.2.3.1 for individual value 0,30 mm $\pm$ 10 % for average value 0,30 mm $\pm$ 0,015 mm	min.: 0,293 mm max.: 0,302 mm average: 0,297 mm	comply
Length/diameter ratio λ	EN 14889-1, Art. 5.2.1 for individual value 42 $\pm$ 15 % for average value 42 $\pm$ 7,5 %	min.: 41,0 max.: 42,5 average: 42,0	comply
Mechanical properties of wire			
Tensile strength R_m	EN 14889-1, Art. 5.3 for individual value 1500 MPa $\pm$ 15 % for average value 1500 MPa $\pm$ 7,5 %	min.: 1473 MPa max.: 1514 MPa average: 1502 MPa	comply
Modulus of elasticity E	EN 14889-1, Art. 5.4 180 000 MPa $\pm$ 15 %	min.: 184972 MPa max.: 189520 MPa average: 188210 MPa	comply
Effect on consistence of concrete, EN 12350-3 (VeBe test)			
Consistence on the reference concrete without fibres	EN 14889-1, Art. 5.7	average 6 s	comply
Identical mix with fibres. Dosage of fibres of 20 kg/m ³	EN 14889-1, Art. 5.7	average 7 s	comply
Effect on strength of concrete			
Residual flexural tensile strength of concrete with fibres of 12 specimens (beams) after 28 days, according to EN 14845-2 Dosage of fibres of 20 kg/m ³	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,5 MPa at cracking of beam CMOD = 0,5 mm	min.: 1,3 MPa max.: 2,2 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.: 0,6 MPa max.: 1,3 MPa average: 1,0 MPa	comply

COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30

-basic material: cold drawn steel, straight shape, diameter of 0,50 mm, length of 30 mm

-compliance of criteria is presented in Table 3.

Table 3 – COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30

Essential characteristics	Criterion and Technical specification	Detected parameter	Evaluation
Dimensions and tolerances of fibres			
Length L	EN 14889-1, Art. 5.2.2 for individual value 30 mm $\pm$ 10 % for average value 30 mm $\pm$ 1,5 mm	min.: 29,92 mm max.: 30,12 mm average: 29,97 mm	comply
Diameter D	EN 14889-1, Art. 5.2.3.1 for individual value 0,50 mm $\pm$ 10 % for average value 0,50 mm $\pm$ 5 %	min.: 0,486 mm max.: 0,507 mm average: 0,498 mm	comply
Length/diameter ratio λ	EN 14889-1, Art. 5.2.1 for individual value 61 $\pm$ 15 % for average value 61 $\pm$ 7,5 %	min.: 59,6 max.: 61,4 average: 61,0	comply
Mechanical properties of wire			
Tensile strength R_m	EN 14889-1, Art. 5.3 for individual value 1400 MPa $\pm$ 15 % for average value 1400 MPa $\pm$ 7,5 %	min.: 1405 MPa max.: 1437 MPa average: 1419 MPa	comply
Modulus of elasticity E	EN 14889-1, Art. 5.4 180 000 MPa $\pm$ 15 %	min.: 183372 MPa max.: 187127 MPa average: 185007 MPa	comply
Effect on consistence of concrete, EN 12350-3 (VeBe test)			
Consistence on the reference concrete without fibres	EN 14889-1, Art. 5.7	average 6 s	comply
Identical mix with fibres. Dosage of fibres of 20kg/m ³	EN 14889-1, Art. 5.7	average 7 s	comply
Effect on strength of concrete			
Residual flexural tensile strength of concrete with fibres of 12 specimens (beams) after 28 days, according to EN 14845-2 Dosage of fibres of 20 kg/m ³	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,5 MPa at cracking of beam CMOD = 0,5 mm	min.: 1,3 MPa max.: 2,1 MPa average: 1,7 MPa	comply
	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,0 MPa at cracking of beam CMOD = 3,5 mm	min.: 0,8 MPa max.: 1,9 MPa average: 1,2 MPa	comply

COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30

-basic material: cold drawn steel, straight shape, diameter of 0,38 mm, length of 30 mm

-compliance of criteria is presented in Table 4.

Table 4 – COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30

Essential characteristics	Criterion and Technical specification	Detected parameter	Evaluation
Dimensions and tolerances of fibres			
Length L	EN 14889-1, Art. 5.2.2 for individual value 30 mm $\pm$ 10 % for average value 30 mm $\pm$ 1,5 mm	min.: 29,92 mm max.: 30,78 mm average: 30,07 mm	comply
Diameter D	EN 14889-1, Art. 5.2.3.1 for individual value 0,38 mm $\pm$ 10 % for average value 0,38 mm $\pm$ 5 %	min.: 0,371 mm max.: 0,385 mm average: 0,379 mm	comply
Length/diameter ratio λ	EN 14889-1, Art. 5.2.1 for individual value 80 $\pm$ 15 % for average value 80 $\pm$ 7,5 %	min.: 78,1 max.: 81,9 average: 80,2	comply
Mechanical properties of wire			
Tensile strength R_m	EN 14889-1, Art. 5.3 for individual value 1400 MPa $\pm$ 15 % for average value 1400 MPa $\pm$ 7,5 %	min.: 1409 MPa max.: 1429 MPa average: 1419 MPa	comply
Modulus of elasticity E	EN 14889-1, Art. 5.4 180 000 MPa $\pm$ 15%	min.: 184301 MPa max.: 186525 MPa average: 185348 MPa	comply
Effect on consistence of concrete, EN 12350-3 (VeBe test)			
Consistence on the reference concrete without fibres	EN 14889-1, Art. 5.7	average 6 s	comply
Identical mix with fibres. Dosage of fibres: 20kg/m ³	EN 14889-1, Art. 5.7	average 7 s	comply
Effect on strength of concrete			
Residual flexural tensile strength of concrete with fibres of 12 specimens (beams) after 28 days, according to EN 14845-2 Dosage of fibres: 20 kg/m ³	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,5 MPa at cracking of beam CMOD = 0,5 mm	min.: 2,1 MPa max.: 4,9 MPa average: 3,4 MPa	comply
	EN 14889-1, Art. 5.8 residual flexural tensile strength > 1,0 MPa at cracking of beam CMOD = 3,5 mm	min.: 2,1 MPa max.: 4,2 MPa average: 3,1 MPa	comply

The applied system of Factory Production Control was checked during the Initial Inspection executed on 26.10.2020 and Report of the Initial Inspection of the Manufacturing Plant is archived at the TSUS, Bratislava branch and at the manufacturer.

The factory production control complies with the requirements of the CPR and with the technical specifications of EN 14889-1.

Commentary to obtained results:

The test results of the fibres COLD DRAWN STEEL FIBRES STRIGHT RAAJ 0,16 x 14 reported in the Test Report No. 20-20-1603 issued by TSÚS, Bratislava branch, on 21.12.2020,
the test results of the fibres COLD DRAWN STEEL FIBRES WAVED RAAJ 0,30 x 12,5 reported in the Test Report No. 20-20-1602 by TSÚS, Bratislava branch, on 21.12.2020,
the test results of the fibres COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,50 x 30 reported in the Test Report No. 20-20-1601 by TSÚS, Bratislava branch, on 21.12.2020 and
the test results of the fibres COLD DRAWN STEEL FIBRES HOOKED RAAJ 0,38 x 30 reported in the Test Report No. 20-20-1600 by TSÚS, Bratislava branch, on 21.12.2020 are archived at the TSUS, Bratislava branch and at the manufacturer. The copies of the test reports are given in Annexes No. 1, 2, 3 and 4.

List of technical specifications:

EN 14889-1: 2006 Fibres for concrete - Part 1: Steel 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 14889-1.

Based on the test results and results of the initial inspection we recommended issuing the second issue of the certificate 1301-CPR-1612.

Date of issue: 02. 03. 2021

Duration of validity: without restriction

Elaborated by:

Július Marko

Approved by
BratislavaBranch 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 Test Report No. 20-20-1600 issued in Bratislava on 01.12.2020
Annex No. 2 Test Report No. 20-20-1601 issued in Bratislava on 01.12.2020
Annex No. 3 Test Report No. 20-20-1602 issued in Bratislava on 01.12.2020
Annex No. 4 Test Report No. 20-20-1603 issued in Bratislava on 01.12.2020

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.