/The identity of the Russian and English documents is confirmed by
the South Urals Chamber of Commerce and Industry (SUCCI)/

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Certified by State Centre Test - St. Petersburg
No. SP01.01.806.116 valid through December 24, 2021

To General Director,
COMPOSITE GROUP
CHELYABINSK LLC

Approved by
Head of Laboratory
/signed/ A.V. Benin
/Seal:
Emperor Alexander I St.Petersburg State Transport University
Saint Petersburg;
Testing Laboratory For test results
Professor Belelyubsky Mechanical Laboratory/

TEST CERTIFICATE No. 566/7144/1
dated May 24, 2019

Measurements made for: composite reinforcement bar Ø6, Ø8, Ø10 mm

Regulations:
GOST 31938-2012 Fibre-reinforced polymer bar for concrete reinforcement. General specifications
GOST 32492-2013 Polymer composite frame for reinforcement of concrete structures. Methods for determination of physical and mechanical properties

Testing Environment:
1. Air Temperature 20˚C
2. Humidity 68%
3. Atmospheric pressure 764 mm Hg

Testing instrumentation:
1. Humidity and temperature meter measuring atmospheric pressure ИВТМ-7М 3-Д; Serial No. 43159; Calibration Certificate 108485 valid through June 26, 2019
2. Test System INSTRON SATEC 1200 KN J30; Serial No. KN1200K5783; Calibration Certificate 4219-18 valid through June 3, 2019
3. Laboratory Electronic Scales MW-1200; 14805-00; Serial No. 40606787; Calibration Certificate 0201266 valid through November 21, 2019
4. Vernier calipers IIIIЦ; Serial No. Э35133; Calibration Certificate 0153790 valid through September 11, 2019

Name, type, calibration information

Test results are given in Appendix on three pages.

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Table 1.1 – Nominal diameter measurement results: reinforced bar Ø6 mm

Specimen	m_1, g (in air)	m_2, g (in water)	l, mm	d, mm	Average nominal diameter value, mm
6-1	122.0	62.0	187.5	6.38	6.40
6-2	130.0	65.0	198.0	6.47	
6-3	123.0	63.0	190.0	6.34	
6-4	135.0	68.0	206.0	6.44	
6-5	128.0	66.0	195.0	6.36	
6-6	131.0	66.0	200.0	6.43	

Table 1.2 – Tensile testing: reinforced bar Ø6 mm

Specimen	Diameter, mm	Destructive load, kN	Tensile strength, σ_B, MPA		Tangent modulus of elasticity, Ef, GPa	
			Finding	As specified in Table 4 GOST 31938-2012	Finding	As specified in Table 4 GOST 31938-2012
19.7144.01	6.4	33.96	1056.02	800	50.61	50
19.7144.02		34.76	1080.94		50.77	
19.7144.03		36.39	1131.79		50.83	

CONCLUSION: Tensile strength, σ_B of the tested specimens <u>is in conformity</u> with GOST 31938-2012.
Tangent modulus of elasticity, Ef of the tested specimens <u>is in conformity</u> with GOST 31938-2012.

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Table 2.1 – Nominal diameter measurement results: reinforced bar Ø8 mm

Specimen	m_1, g (in air)	m_2, g (in water)	l, mm	d, mm	Average nominal diameter value, mm
8-1	173.0	74.50	195.00	8.02	8.02
8-2	184.0	84.00	197.00	8.04	
8-3	185.0	84.80	199.50	8.00	
8-4	182.0	84.00	196.00	7.98	
8-5	173.0	75.30	193.00	8.03	
8-6	179.0	80.00	193.50	8.07	

Table 2.2 – Tensile testing: reinforced bar Ø8 mm

Specimen	Diameter, mm	Destructive load, kN	Tensile strength, σ_B, MPA		Tangent modulus of elasticity, Ef, GPa	
			Finding	As specified in Table 4 GOST 31938-2012	Finding	As specified in Table 4 GOST 31938-2012
19.7144.04	8.02	53.53	1060.19	800	50.60	50
19.7144.05		55.75	1104.20		50.42	
19.7144.06		54.85	1086.28		50.73	

CONCLUSION: Tensile strength, σ_B of the tested specimens <u>is in conformity</u> with GOST 31938-2012.
Tangent modulus of elasticity, Ef of the tested specimens <u>is in conformity</u> with GOST 31938-2012.

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Table 3.1 – Nominal diameter measurement results: reinforced bar Ø10 mm

Specimen	m_1, g (in air)	m_2, g (in water)	l, mm	d, mm	Average nominal diameter value, mm
10-1	213.0	57.5	198.0	10.00	10.02
10-2	261.0	103.3	203.5	9.94	
10-3	249.0	82.5	203.7	10.20	
10-4	216.0	63.0	195.0	10.00	
10-5	214.0	54.5	203.1	10.00	
10-6	213.0	57.0	199.0	9.99	

Table 3.2 – Tensile testing: reinforced bar Ø10 mm

Specimen	Diameter, mm	Destructive load, kN	Tensile strength, σ_B, MPA		Tangent modulus of elasticity, Ef, GPa	
			Finding	As specified in Table 4 GOST 31938-2012	Finding	As specified in Table 4 GOST 31938-2012
19.7144.07	10.02	78.87	1000.76	800	51.11	50
19.7144.08		80.69	1023.85		51.78	
19.7144.09		82.54	1047.31		51.34	

CONCLUSION: Tensile strength, σ_B of the tested specimens <u>is in conformity</u> with GOST 31938-2012.
Tangent modulus of elasticity, Ef of the tested specimens <u>is in conformity</u> with GOST 31938-2012.

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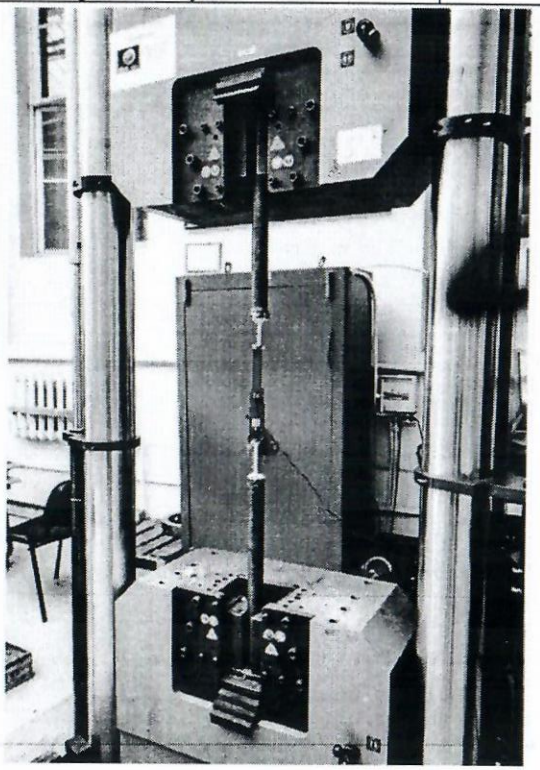

Fig. 1 – Testing. General view

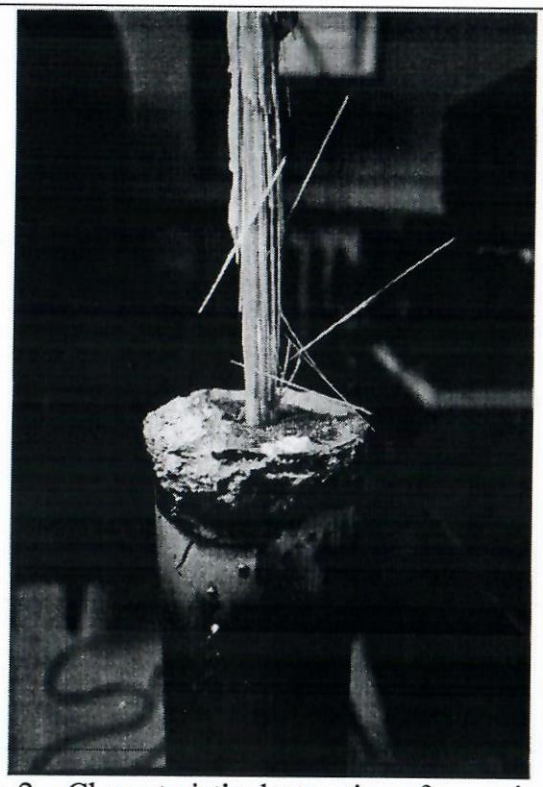

Fig. 2 – Characteristic destruction of a specimen

/Seal below: The South Urals Chamber of Commerce and Industry
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OKPO 12580250 Chelyabinsk the Russian Federation/

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Начальник отдела переводов ЮУТПП
А.П. Ковалева
Челябинск
11.09.2019

AFFIDAVIT OF ACCURACY
IT IS CERTIFIED hereby that the documents in the English and Russian languages are identical.
Head of Translation Department of the SUCCI
A.P. Kovaleva
Chelyabinsk

Начальник отдела
перевода Ковалева А.П.
На основании приказа
№А-138 от 31.12.2015 г.