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RIGA TECHNICAL UNIVERSITY
INSTITUTE OF MATERIALS AND STRUCTURES

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Riga, LV-1048, Latvia.

**Testing of glass fibre reinforcement bar samples
in accordance with ISO 10406-1-2015 standard
Report No. 5/2023**

Customer: Composite PRO, SIA (LLC)
Address: 23 Krūkļu Street, Vīkuļi, Babīte Parish, Mārupe Municipality, LV-2107, Latvia.

Riga 2023

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Address: 23 Krūkļu Street, Vīkuļi, Babīte Parish, Mārupe Municipality,
LV-2107, Latvia

Object to be tested: Testing of glass fibre reinforcement bar samples in accordance with
ISO 10406-1 2015 standard

Testing objective: Determination of tensile strength

Samples received: 3 July 2023

Testing started / 04 July 2023
completed: 06 July 2023

Place of testing Institute of Materials and Structures of RTU

Object to be tested

Testing was carried out on six 4 mm diameter glass fibre reinforcement bar samples in accordance with ISO 10406-1-2015 standard determining material strengths. The experimental testing resulted in the following characteristics: tensile strength and modulus of elasticity of the glass fibre fabric according to ISO 10406-1-2015 standard.

Testing procedure and results

The glass fibre reinforcement bar samples were tested using a calibrated Zwick testing machine, Model Z600. Machine specifications:

ZWICK Static Test System Z600 (Fig. 1)

- Total displacement: 1,000 mm;
- Maximum load: 600 kN;
- Computerised data processing;
- Applicable to tensile, compressive and bending tests.



Fig. 1. ZWICK Z600 static testing system.

Environmental conditions

T = 21°C,

Air humidity = 51%

Testing speed: after deformation = 1% / min

Testing includes 5 pages.

Reports

Testing results are representative of the given product sample only.
Partial reproduction of the test report in part is not allowed.

Testing was carried out by A. Korjakins,

Testing was carried out on material supplied by the customer, without any preparation and modifications.

1. Testing results

Designations:

E – elastic modulus, GPa
 f_u – tensile strength, MPa
 F_u – maximum effort, kN
 ϵ_u – maximum %
 L_0 – length of deformation measurer, mm
 l_0 – sample length, mm
D – diameter of the reinforcement bar, mm
A – cross-sectional area, mm²

Testing was carried out on six samples of reinforcement bar diameter in accordance with ISO 10406-1 standard determining the strength and modulus of elasticity of the material in tension. The sample was made by the Customer.

The tensile testing results for 4 mm diameter specimens are shown in the Table 1 and Fig.2.

Table 1. Tensile testing results for 6 mm diameter samples.

	E	f_u	F_u	ϵ_u	L_0	l_0	D	A
No	GPa	MPa	kN	%	mm	mm	mm	mm ²
1_1	18	1,602	20.74	3.65	100	400	4.06	12.9
1_2	64	1,243	16.65	2.86	100	400	4.13	13.4
1_3	55	1,353	17.86	3.94	100	400	4.1	13.2
1_4	56	1,400	19.13	5.12	100	400	4.17	13.7
1_5	57	1,421	19.31	3.79	100	400	4.16	13.6
1_6	53	1,382	18.69	4.54	100	400	4.15	13.5

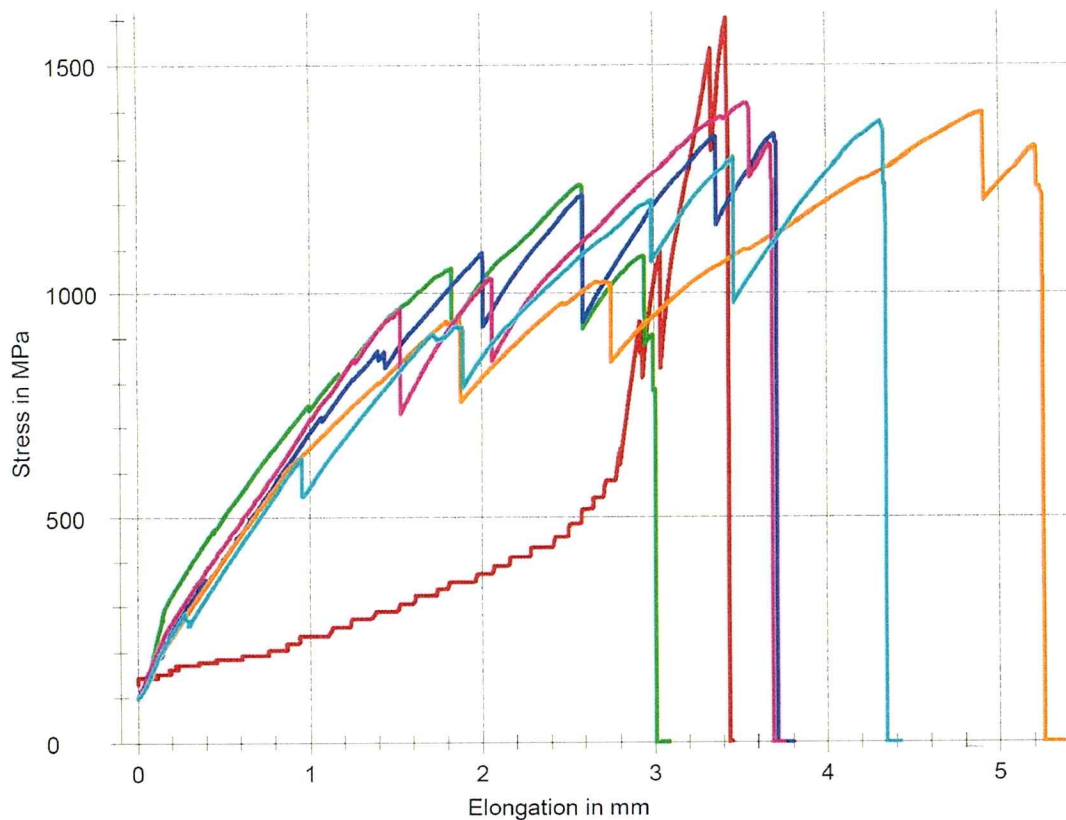


Fig. 2. Results of the tension tests for 4 mm diameter samples.

2. Conclusions

Experimental testing resulted in tensile strengths of glass fibre strands in accordance with ISO 10406-1-2015.

The summarised testing results for 4 mm diameter bars are shown in Table 2

Table 2.

Diameter 4 mm	E	f_u	F_u	ϵ_u	L_0	D	A
n = 5	GPa	MPa	kN	%	mm	mm	mm ²
x	57.0	1,360	18.73	2.13	100	4.1	13.39
Standard deviation	3.96	69.74	1.55	0.66	0	0.05	0.29

Signature:



Dr.sc.ing. Sen. Researcher Aleksandrs Korjakins