

## Tensile strength test

### Revision

Information about the manufacturer are added to this report.

Changed in:

- Section 2 Test objects

### 1 Introduction

By commission of SP Technical Research Institute of Sweden, tensile tests were performed.

Test place: SP Structural and Solid Mechanics in Borås.

### 2 Test objects

Designation: Round specimens, fiberglass reinforcement bars.

Test piece preparation: The test pieces were received machined from customer

Selection of test objects: The test objects have been produced and selected by ARMASTEK Scientific & Production Company Ltd, INN 5908043456 OGRN 1095908000990, 614101 Perm Fedoseeva St.27.

Arrival of test objects: The test objects arrived at SP Structural and Solid Mechanics on August 2014.

### 3 Test method and implement

Test method: Tensile test specimens were tested in accordance with ISO 10406-1 2008. The tests were performed in a constant deformation control.

Measurements: Tensile strength, tensile rigidity ( $E_a$ ) and Ultimate strain.

### 4 Test results

The test results shown in this report refer only to the tested objects. The test results from tensile strength according to ISO 10406-1 2008 are shown in Table 1.

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**Table 1. Results from tensile strength test.**

Test piece No.	Diameter [mm]	Tensile strength [MPa]	Tensile rigidity [kN] (Load/strain)	Ultimate strain [%]
6mm_1	5.78	969.2	10	2.77
6mm_2	5.39	1083.8	10	2.48
6mm_3	5.54	1266.1	11	3.00
6mm_4	5.40	1047.5	11	2.16
6mm_5	5.25	1287.9	10	2.68
10mm_1	8.91	1312.7	37	2.16
10mm_2	9.07	1351.0	35	2.45
10mm_3	8.90	1331.9	36	2.21
10mm_4	8.98	1227.8	36	2.19
10mm_5	9.05	1254.2	37	2.10
16mm_1_new	16.10	1182.8	100	*2.40
16mm_2_new	16.62	1243.6	93	2.70
16mm_3_new	16.58	1215.4	99	2.65
16mm_4_new	16.20	1096.4	96	*2.20
16mm_5_new	16.77	1177.6	95	2.80

\*Samples were pulled out of anchorage before breakage

## 5 Measurement uncertainty

The measurement uncertainty for the tests is shown in Table 2. Reported uncertainty corresponds to an approximate 95 % confidence interval around the measured value. The interval has been calculated in accordance with EA-4/16 (EA guidelines on the expression of uncertainty in quantitative testing), which is normally accomplished by quadratic addition of the actual standard uncertainties and multiplication of the resulting combined standard uncertainty by the coverage factor  $k=2$ .

**Table 2. The measurement uncertainty in per cent of measured value.**

Tensile strength, $R_m$	< 1.1 %
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