



TEST REPORT No. 20-14-0411

BASIC DATA

Order No.: 20140052

Client: ARMASTEK EU, s. r. o.
Tomášikova 26, 821 01 Bratislava,
Slovak Republic

Manufacturer: OOO NPK ARMASTEK
Street Fedosejeva 27
614 101 Perm
Russian Federation

Manufacturing plant: OOO NPK ARMASTEK
Street Fedosejeva 27
614 101 Perm
Russian Federation

OBJECT OF TESTING

Product: composite reinforcing armatures, rods of length of 1000 mm, diameters of $\varnothing 10$ mm and $\varnothing 16$ mm, density of 1975 kg/m³

Production and sampling date: unknown

Sampler: client

Place and date of delivery: Testing laboratory TSÚS Bratislava branch, 19. 12. 2013

Designation of sample by lab: 672/13

TESTS

Test of cohesion of composite reinforcing armature – accredited test

Test procedure: EN 10 080: 2006 – Steel for the reinforcement of concrete. Weldable reinforcing steel. General

Description of test specimens: composite reinforcing armatures of diameters of 10 mm and 16 mm imbedded into concrete cubes of dimensions of 200 mm x 200 mm x 200 mm

Test specimens prepared by: testing laboratory

Test conditions: laboratory conditions, temperature of $20 \pm 3^\circ\text{C}$

Deviations from the standard: none

Date of test: 22. 4. 2014

Test personnel: Viktor Ďaďo

Test of compressive strength of concrete – accredited test

Test procedure: EN 12390-3: 2010 Testing hardened concrete. Part 3: Compressive strength of test specimens.

Description of test specimens: concrete cubes of dimensions of 200 mm x 200 mm x 200 mm

Test specimens prepared by: testing laboratory

Test conditions: laboratory conditions, temperature of $20 \pm 3^\circ\text{C}$

Deviations from the standard: none

Date of test: 22. 4. 2014

Test personnel: Peter Kiršner

Applied instrumentation:

ID	Name	Range	Unit	Division
M207215	Pressing machine	1000	kN	0,01
M207141	Pressing machine	300	kN	0,01
M200105	Electronic scales	50÷34000	g	1
M207258	Incremental sensor	30	mm	0,001
M207291	Calliper	0÷200	mm	0,01
M207299	Calliper	0÷600	mm	0,01

TEST RESULTS**Results of the test of cohesion of composite reinforcing armature****Table 1 - Cohesion of composite reinforcing armature of diameter of 10 mm**

No.:	Max. tensile force (kN)	Cohesion strength in C20/25 (N/mm ²)	Cohesion strength in C40/50 (N/mm ²)
1	29,43	13,02	26,05
2	28,52	12,62	25,24
3	32,74	14,49	28,98
4	27,45	12,15	24,30
Average	29,54	13,07	26,14

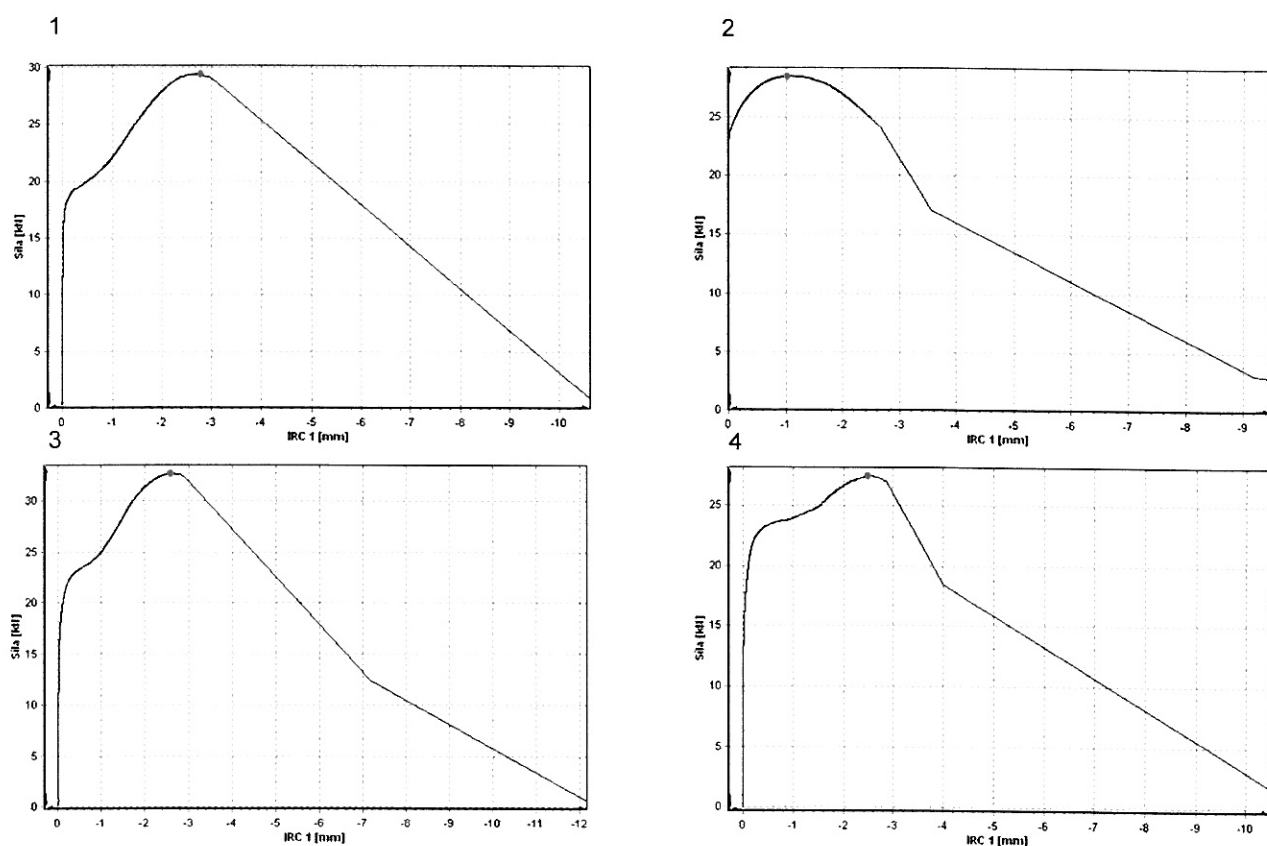


Figure 1: Force / displacement courses of the composite reinforcing armatures of diameters of 10 mm

Table 2 - Cohesion of composite reinforcing armature of diameter of 16 mm

No.:	Max. tensile force (kN)	Cohesion strength in C20/25 (N/mm ²)	Cohesion strength in C40/50 (N/mm ²)
1	36,27	6,04	12,08
2	53,89	8,97	17,95
3	59,87	9,97	19,94
4	40,44	6,73	13,47
4	43,82	7,30	14,59
Average	46,86	7,80	15,61

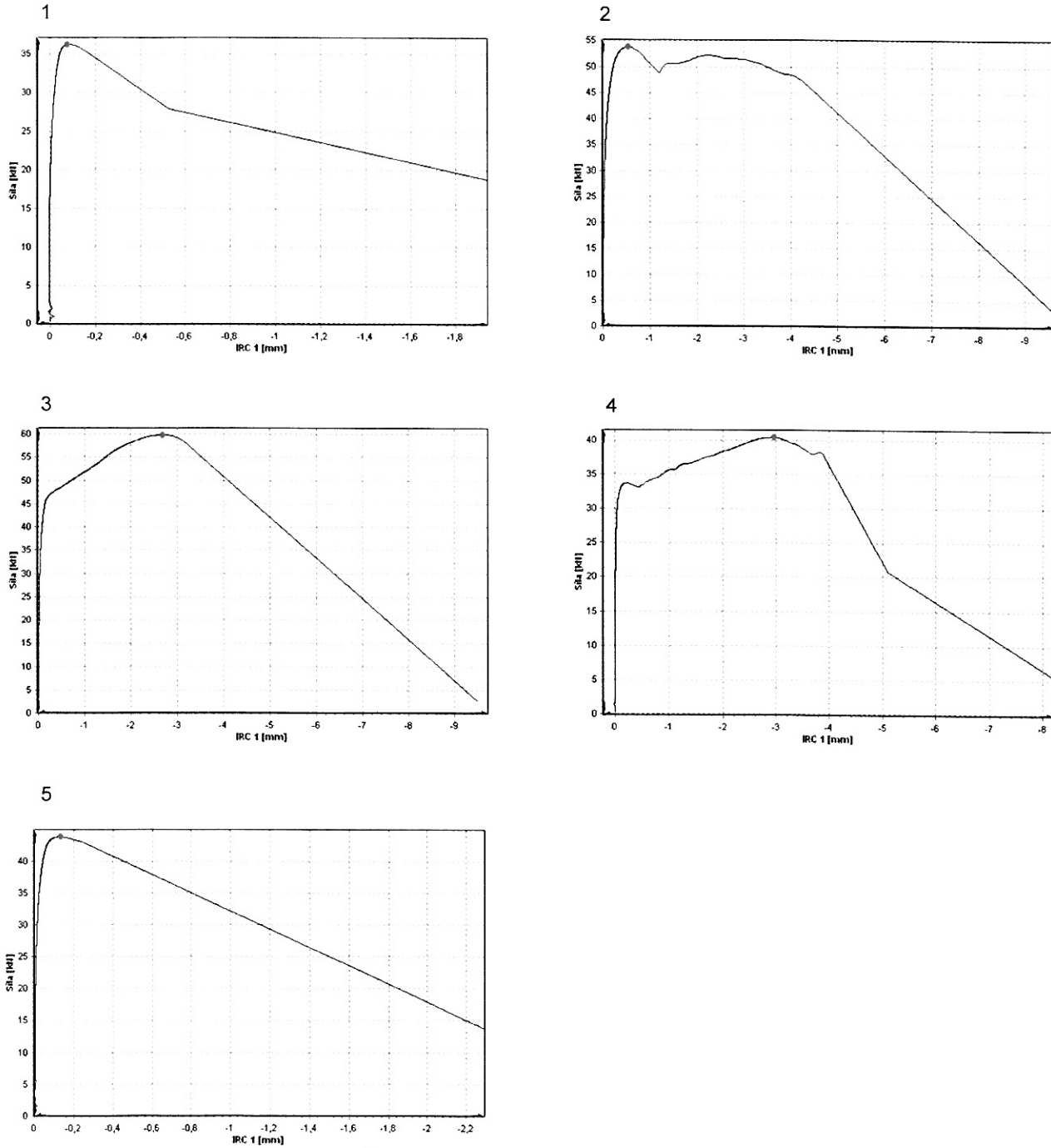


Figure 2: Force / displacement courses of the composite reinforcing armatures of diameters of 16 mm

Results of test of compressive strength of concrete

Table 3 - Density and compressive strength of hardened concrete

ID of testing samples	Date of testing	Dimensions of the sample ¹⁾			Weight	Density rounded to 10 kg/m ³ ± U	Force at deformation	Type ²⁾ of deformation	Age	Compression strength	
		Pressed area		Height						Calculate d	Rounded to 0,1 MPa ± U
		(mm)	(mm)	(mm)	(kg)	(kg/m ³)	(kN)		(days)	(MPa)	
1/25.03.14	22.04.-14	201,7	201,1	201,6	19,314	2360 ± 10	1586,7	B	28	39,1	39,1 ± 0,5
2/25.03.14	22.04.-14	200,8	201,8	199,5	19,331	2390 ± 10	1593,3	B	28	39,3	39,5 ± 0,6
3/25.03.14	22.04.-14	201,1	201,9	200,8	19,455	2390 ± 10	1190,2	B	28	29,3	29,3 ± 0,4
4/25.03.14	22.04.-14	202,0	200,6	200,9	19,058	2340 ± 10	1575,9	B	28	38,9	38,9 ± 0,5
5/25.03.14	22.04.-14	200,2	201,1	200,1	19,034	2360 ± 10	1604,5	B	28	39,8	39,8 ± 0,5
6/25.03.14	22.04.-14	200,9	200,4	201,4	19,223	2370 ± 10	1205,3	B	28	29,9	29,9 ± 0,5
7/25.03.14	22.04.-14	201,7	201,9	201,3	19,138	2330 ± 10	1462,2	B	28	35,9	35,9 ± 0,5
8/25.03.14	22.04.-14	199,4	199,6	198,1	18,754	2360 ± 10	1474,9	B	28	37,0	37,0 ± 0,5
9/25.03.14	22.04.-14	201,4	200,7	201,1	18,900	2330 ± 10	1458,5	B	28	36,1	36,1 ± 0,5
10/25.03.14	22.04.-14	200,5	200,2	200,5	19,047	2370 ± 10	1561,4	B	28	38,9	38,9 ± 0,5

Date of report:

22. 4. 2014

Prepared by:

Viktor Ďaďo

Authorized by:

Julius Marko, PhD.
Head of Laboratory Branch



Notes:

- Unless the Test Laboratory makes the sampling, data on the manufacturer, its manufacturing plant and about the sampling are presented according to information provided by the client.
- Presented results are relevant to the product sample only.
- This report shall not be reproduced except in full without written approval of the Test Laboratory.

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