

# TESTING CENTER OF CABLE PRODUCTS

Autogennaya str. 7, Kharkov, 61099, Ukraine,  
Phone: +38 057 754 52 75  
E-mail: lab@yuzhcable.com.ua

Accredited by:  
National Accreditation Agency of Ukraine - A national accreditation body of Ukraine  
Certificate of Accreditation № 20353 dated January 16, 2024; Valid until January 15, 2029

## TEST REPORT

Report reference number 22  
Tested by Andrew Konoplev, Alina Shurupova  
Approved by Nikolay Zykov  
Date of issue 06-Feb-24  
Testing laboratory Testing center of cable products,  
Address Autogennaya str. 7, Kharkov, 61099, Ukraine,  
Phone: +38 057 754 52 75, E-mail: lab@yuzhcable.com.ua  
Manufacturer YUZH CABLE WORKS, PJSC  
Address Autogennaya str. 7, Kharkov, 61099, Ukraine  
Standard IEC 60502-1:2004 Power cables with extruded insulation and their accessories for rated voltages from 1 kV ( $U_m = 1,2$  kV) up to 30 kV ( $U_m = 36$  kV) - Part 1: Cables for rated voltages of 1 kV ( $U_m = 1,2$  kV) and 3 kV ( $U_m = 3,6$  kV)  
Test procedure Tests  
Cable type CABLU ARMAT 0,6/1 kV 5×16 Al  
Trade mark YUZH CABLE  
Rating(s)  $U_0/U$  0,6/1  
Dates of receipt of test item 22-Jan-24  
Dates of performance of tests From 23-Jan-24 to 05-Feb-24  
Summary of test results PASS

Ref No.	Tests	Prescribed	Observed					Verdict
1	<b>Electrical tests</b>		GR	BU	BN	BK	GY	
1.1	Resistance of conductors ( $\Omega/\text{km}$ )	Max. 1,91	1,88	1,87	1,85	1,85	1,88	Pass
1.2	Volume resistivity of insulation at $(90\pm 2)^\circ\text{C}$ ( $\Omega\cdot\text{cm}$ )	Min. $10^{12}$	5,63	5,64	5,75	6,02	5,98	Pass
	Insulation resistance constant $K_i$ at $(90\pm 2)^\circ\text{C}$ ( $\text{M}\Omega\cdot\text{km}$ )	Min. 3,67	7,95	8,15	8,22	8,28	7,99	Pass
1.3	Voltage test 3,5 kV/5 min	No breakdown of the insulation	No breakdown of the insulation					Pass
2	<b>Non-electrical tests</b>							
2.1	Measurement of thickness of insulation - nominal value (mm)	0,7	0,74	0,74	0,75	0,73	0,75	Pass
2.2	Measurement of thickness of extruded inner covering - nominal value (mm)	1,0	1,15					Pass
2.3	Measurement of thickness of the armour galvanized steel tapes - value (mm)	0,5	0,5					Pass
2.4	Measurement of thickness of sheath - nominal value (mm)	1,7	1,85					Pass
2.5	Outer diameter of cable (mm)		22					

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Ref No.	Tests	Prescribed	Observed					Verdict
2.6	Mechanical properties of insulation							
	<i>Without ageing:</i>							
	Tensile strength (N/mm <sup>2</sup> )	Min. 12,5	18,8	19,4	18,5	19,8	18,0	Pass
	Elongation-at-break (%)	Min. 200	445	440	500	420	520	Pass
	<i>After ageing in air oven:</i>							
	Duration (h) / Temperature (°C)	168/(135±3)						
	Tensile strength variation (%)	Max. ±25	-4,9	-4,4	-5,1	-3,8	-5,7	Pass
	Elongation-at-break variation (%)	Max. ±25	-6,0	-6,2	-7,7	-7,2	-6,7	Pass
	<i>Hot set test</i>							
	Time under load (min) / Temperature (°C)	15/(200±3)						
mechanical stress (N/cm <sup>2</sup> )	20							
Elongation under load (%)	Max. 175	60	65	70	65	80	Pass	
Permanent elongation after cooling (%)	Max. 15	0	0	0	0	0	Pass	
<i>Water absorption</i>								
Duration (h) / Temperature (°C)	336/(85±2)							
Increase of mass (mg/cm <sup>2</sup> )	Max. 1,0	0,20	0,21	0,22	0,19	0,21	Pass	
<i>Shrinkage test</i>								
Duration (h) / Temperature (°C)	1/(130±3)							
Shrinkage (%)	Max. 4,0	1,9	1,9	2,0	2,1	1,8	Pass	
2.7	Mechanical properties of sheath							
	<i>Without ageing:</i>							
	Tensile strength (N/mm <sup>2</sup> )	Min. 12,5			20,9			Pass
	Elongation-at-break (%)	Min. 300			630			Pass
	<i>After ageing in air oven:</i>							
	Duration (h) / Temperature (°C)	240/(110±2)						
	Elongation-at-break (%)	Min. 300			595			Pass
<i>Shrinkage test</i>								
Duration (h) / Temperature (°C)	5/(80±2)							
Heating, cycles	5							
Shrinkage (%)	Max. 3,0			1,61			Pass	
<i>Pressure test at high temperature</i>								
Duration (h) / Temperature (°C)	6/(110±2)							
Median of the depth of indentation (%)	Max. 50			22			Pass	

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Ref No.	Tests	Prescribed	Observed					Verdict
2.8	Additional ageing test on pieces of completed cables							
	Duration (h) / Temperature (°C)	168/(100±2)						
	<i>mechanical properties of insulation:</i>							
	Tensile strength variation (%)	Max. ±25	-8,3	-8,9	-8,5	-9,2	-9,9	Pass
	Elongation-at-break variation (%)	Max. ±25	-9,2	-9,6	-9,8	-10,3	-10,6	Pass
	<i>mechanical properties of sheath:</i>							
	Elongation-at-break (%)	Min. 300	575					Pass

Nikolay Zykov,  
 Head of TCCP

Andrew Konoplev,  
 Head of the Laboratory of electrical tests

Alina Shurupova,  
 Head of Laboratory of promising developments

