



ELECTRO CABLE GROUP

LLC «ZAPOROZHYE FACTORY OF NON-FERROUS METALS»

LLC «ZAPOROZHYE FACTORY OF NON-FERROUS ALLOYS»

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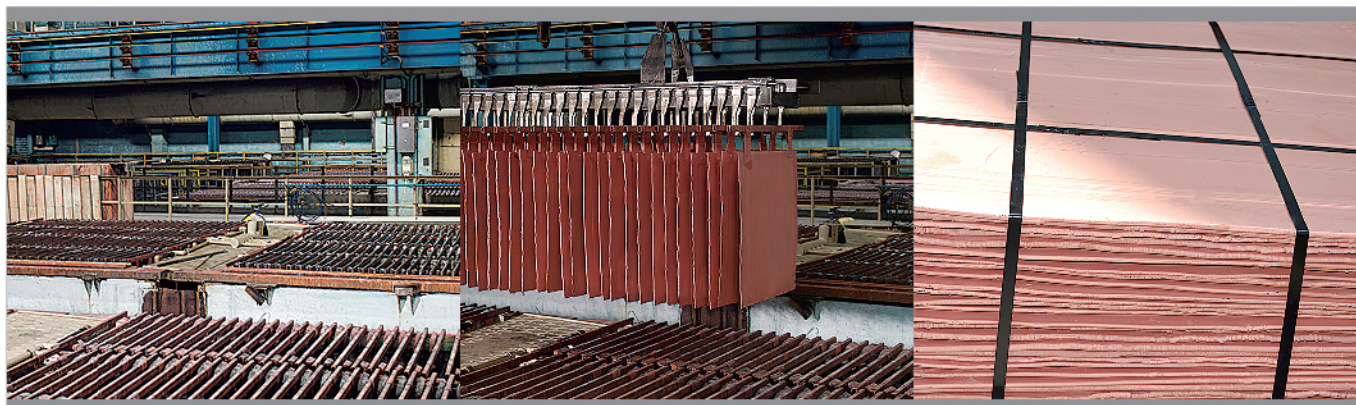
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Our company is a holding, which consists of a group of companies with powerful industrial base and reputation as a reliable business partner. Our products are manufactured under the trade mark ELECTRO CABLE GROUP

OUR COMPANY PRODUCE AND SALE:

- **COPPER CATHODES, CU CONTENT 99,99%**
- **COPPER WIRE OXYGEN-FREE, DIA 8MM**
- **DRAWN COPPER WIRES**
- **COPPER CONDUCTORS**

COPPER CATHODES produced by electrolytic refining



Typical analysis of ZFNA copper cathodes upon gost 546:2004

Cu	Impurities by groups, % not more than									
	1 st group			Impurities sum of 1 st group	2 nd group					
	Bi	Se	Te		Cr	Mn	Sb	Cd	As	P
99,996	0,0002	0,0002	0,0002	0,0004	0,0001	0,0001	0,0002	0,0002	0,0001	0,0001
Impurities sum of 2 st group	3 ^d group		4 th group	5 th group						
	Pb		S	Sn	Ni	Fe	Si	Zn	Co	
0,0008	0,0004		0,0007	0,0002	0,0002	0,0003	0,0001	0,0005	0,0001	
Impurities sum of 5 th group	Ag		Specified impurities sum, not more than							
0,0014	0,0006		0,0043							

PACKING AND DIMENSIONS

- a) Average weight of the each cathode is 55-65 kg
- b) Package height is not less than 500 mm, weight of the each package is not more than 1500 kg
- c) Dimensions of each cathode are 980 mm x 880 mm
- d) Every package is marked with identification label
- e) Bundled with metal tape

Our cathodes are in conformance to international standards:

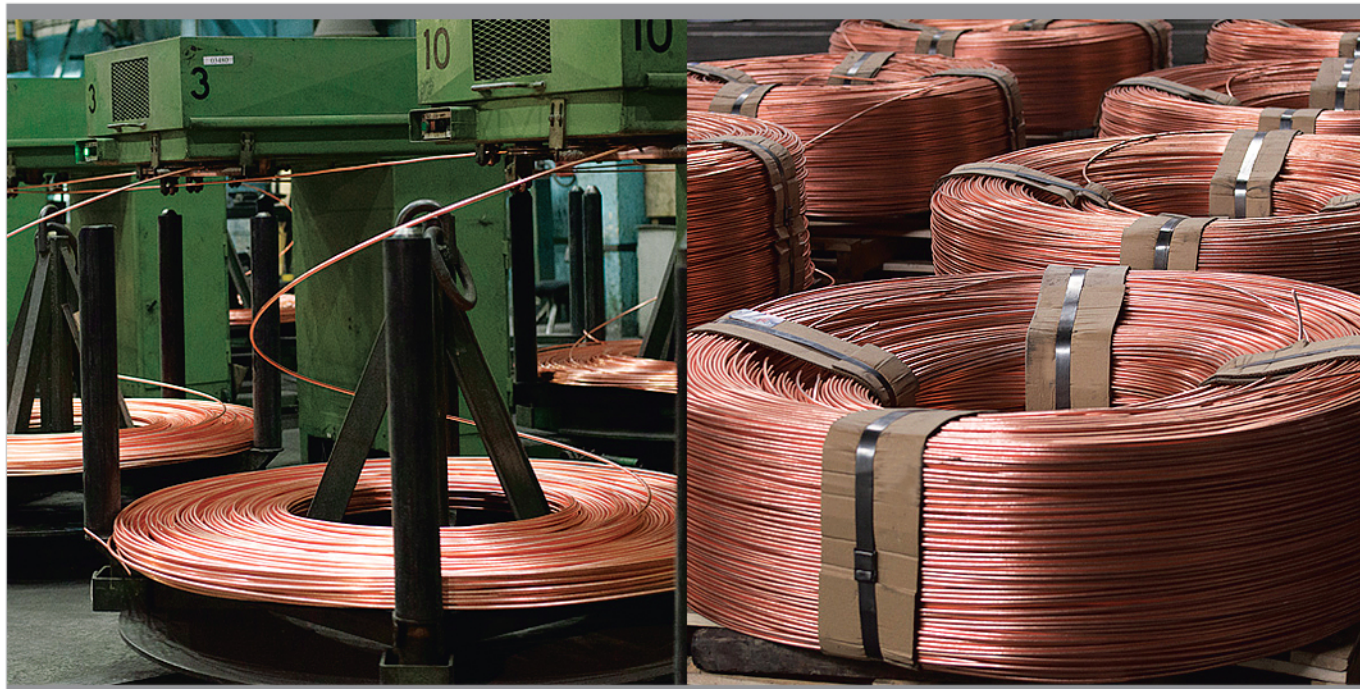
ASTM: 58A-77, B133, B152, B359

DIN 1787-73

JIS: H3510-86, H3100-86, H3300

GOST 859-2001

OXYGEN-FREE COPPER WIRE Cu-OF DSTU:EN 1977:2009 diameter 8 mm, produced by method of UPCAST with equipment from Outokumpu (Finland).



Typical quality data for oxygen-free copper wire Cu-OF DSTU EN1977:2009

Element	Cu	Bi	Sb	As	P	Pb	S	Sn	Ni	Fe
Fact	99.994	0.0001	0.0002	0.0001	0.0001	0.0006	0.0011	0.0002	0.0003	0.0003
Element	Zn	Ag	O ₂	Se	Te	Cr	Mn	Cd	Si	Co
	not more, %			Detected but not be subject to limitation, %						
Fact	0.0004	0.0008	0.0008	0.0001	0.0002	0.0001	0.0001	0.0002	0.0001	0.0001

Parameters:	Standard	Fact
Diameter of copper wire, mm, not more	(8±0,3)	8,024
Ovality, mm, not more	±0,3	0,05
Hydrogen embrittlement, number of bends	until break	21
Ultimate tensile strength, N/m ² 10 ⁻⁶ , not less	160	177
Elongation, %, not less	35	41
Specific electrical resistance, Ohm m 10 ⁻⁶ , not less	0,01724	0,01713

PACKING AND DIMENSIONS

- Packed on a wooden pallet, size 1400 x 1400 x 180 mm (weight 30-50 kg) and bundled with steel stripes onto cardboard strips
- Size of coil is 1500 x 600 x 450 mm, but may vary depending on weight
- Approximate coil weight is 3300-3500 kg
- Coil covered across by PET-film to avoid dirtying.

COPPER WIRE ROUND ELECTROTECHNICAL, grade MM produced with equipment from Niehoff (Germany) from oxygen-free copper wire, diameters available:

- from 0.15 mm to 0.57 mm delivered not stranded (wires laid parallel) in amount from 6 to 16 wires on metal drums № 630.

- from 1.17 mm to 3.56 mm, delivered in Euro-containers or on metal drums № 630.

Ovality at diameter:

from 0.15 to 0.2mm ± 0.002mm	Elongation, not less 19%
from 0.2 to 0.3mm ± 0.003mm	Elongation, not less 20%
from 0.3 to 0.4mm ± 0.003mm	Elongation, not less 20%
from 0.4 to 0.5mm ± 0.005mm	Elongation, not less 20%
from 1.17 to 2.95mm ± 0,01mm	Elongation, not less 30%
from 2.95 to 3.56mm ± 0,02mm	Elongation, not less 30%
Specific electric resistance, not more 0.01724 Ohm x m x 10 ⁻⁶ .	

PACKING AND DIMENSIONS

a) Average net weight of the each container is 1000 kg (for truck shipping), 2000 kg (for container shipping)

b) Packaging in carton container, on wooden pallet

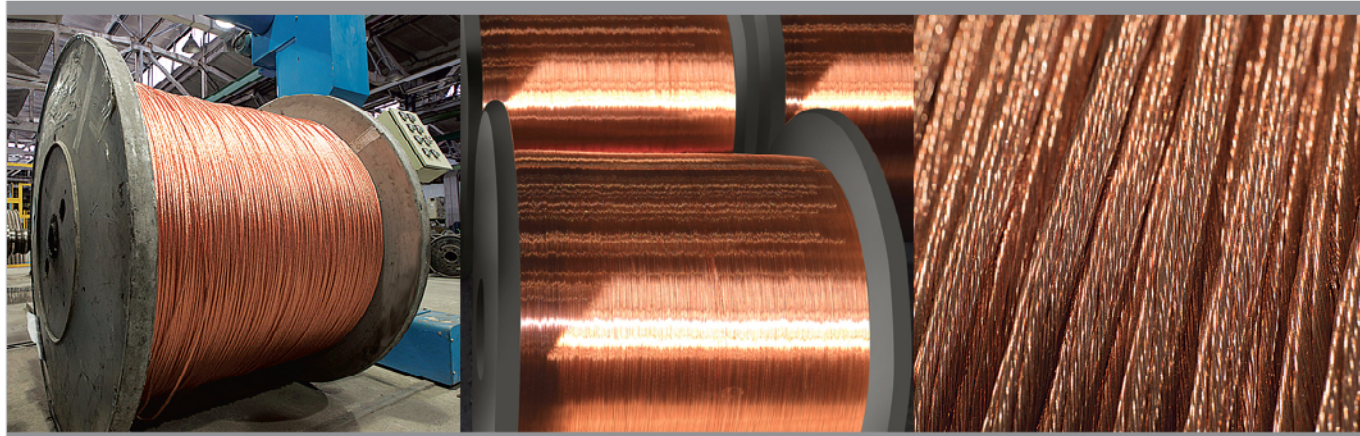
c) Photo of packed material:



Typical quality data for oxygen-free copper used for wire drawing:

Element	Cu	Bi	Sb	As	P	Pb	S	Sn	Ni	Fe
Fact	99.94	0,0001	0,002	0,0001	0.0001	0.0006	0.0011	0.0002	0.0003	0.00013
Element	Zn	Ag	O ₂	Se	Te	Cr	Mn	Cd	Si	Co
	not more, %			Detected but not be subject to limitation, %						
Fact	0.001	0.0003	0.001	0.000	0.0002	0.000	0.0002	0.0006	0.000	0.000

COPPER CONDUCTORS with cross-section from 0,18 mm² to 1000 mm² – 2,3,4,5 classes of flexibility produced with equipment from SAMP, (Italy), Niehoff (Germany), Caballe (Spain).



Diameters of wires used for production of conductors 3,4,5 classes:

- 0.15; 0.198; 0.24; 0.3; 0.4; 0.5; 0.57 mm.

Stranding of conductors is possible starting from 6 wires.

Conductors delivered on:

- Drum № 630 - metal and wooden
- Drum № 1250 - metal and wooden
- Drums № 10 - № 20 wooden

All conductors are manufactured from oxygen-free high purity copper.

Copper conductors 1 – 5 flexibility class are manufactured from copper wires of own production, cross sections from 0,5 mm² to 1000 mm² with direction of stranding in accordance with customer demands. Construction of conductor can be agreed with customer and can be in range from 6 wires to 3913 wires. All conductors of 2nd class flexibility with cross-section more than 50 mm² and higher comes tighten.

The most actual constructions

Main technical details of conductors 5th class flexibility

Nominal cross-section of conductor, mm ²	Construction	Electrical resistance to direct current of 1 km of conductor at 20°C Ohm, not more than	Weight 1 km of conductor, kg (for reference)
0,5	15x0,198	39	4,160
0,75	23x0,198	26,00	6,37
1,0	29x0,198	19,5	8,04
1,5	30x0,238	13,3	12,01
2,5	50x0,238	7,98	20,02
4,0	50x0,3	4,95	31,81
6,0	74x0,3	3,3	47,08
10,0	72x0,4	1,91	81,27
16,0	119x0,4	1,21	134,33
25,0	196x0,4	0,78	212,82
35	266x0,4	0,554	300,26
50	378x0,4	0,386	426,68
70	342x0,5	0,272	603,20
95	456x0,5	0,206	817,84
120	589x0,5	0,161	1038,84
150	740x0,5	0,129	1305,17
185	851x0,5	0,106	1500,94
240	1184x0,5	0,0801	2088,27
300	1110x0,57	0,0641	2544,30
400	1403x0,57	0,0486	3215,90