

CATENARY WIRE

Physical Constant (*As epr RDSO)

Material Group	Nominal Density at 20°C (g/cm ³)	Final Modulus of Elasticity (Gpa)	CLE	Maximum Resistivity at 20°C ohm.mm ² /Km	Temperature Coefficient
			(per °C)		(per °C)
Copper Cadmium	8.945	120	17 x 10 ⁻⁶	21.769	0.0031
Copper Magnesium	8.89	120	17 x 10 ⁻⁶	*	0.00185

1) In a temperature range from -50°C up to 100°C the coefficient of temperature for the resistance is constant

* Under progress

Cadmium Copper (CuCd) Catenary Wire (*As epr RDSO)

Chemical Composition

For Copper wire bar/copper cathode/CC copper Rod								
Cu + Ag	Bi + Te + Se	Pb	Sb	AS	Sn + Ni + Fe + Si + Zn + CO	Oxygen		
99.90%	<20 ppm	<5 ppm	<4 ppm	<5 ppm	<50 ppm	<450 ppm		
For Cadmium Copper Billets								
Cu + Ag	Cd	P	Bi + Te + Se	Pb	Sb	AS	Sn + Ni + Fe + Si + Zn + CO	Oxygen
>= 98.90 %	0.7 to 0.1 %	<50 ppm	<20 ppm	<5 ppm	<4 ppm	<5 ppm	<50 ppm	<450 ppm

Mechanical and Electrical properties of Catenary Wire

Nominal equivalent area of hard drawn copper	No. of strand and diameter of wire	Approx overall Diameter	Weight per km			Resistance per km at 20°C corrected to std Weight		Minimum breaking load of conductor	Calculated area of cadmium copper
			Std	Max	Min	Std	Max		
			Kg	Kg	Kg	Ohm	Ohm		
mm ²	mm	mm						Kgf	mm ²
20	7/2.10	6.3	218.7	223	214.3	0.905	0.914	1443	24.04
53	19/2.10	10.5	597.3	609.2	585.3	0.336	0.339	3920	64.84
102	37/2.10	14.7	1169	1193	1146	0.173	0.175	7650	125.6

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Magnesium Copper (CuMg) Catenary Wire (*As epr RDSO)

Chemical Composition

Cu + Ag	Mg	Bi	Pb	P	Oxygen
Remaining	0.1 to 0.7 %	<10 ppm	<5 ppm	<50 ppm	<20 ppm

Mechanical and Electrical properties of Catenary Wire

Nominal equivalent area of hard drawn copper	No. of strand and diameter of wire	Approx overall Diameter	Weight per km			Resistance per km at 20°C corrected to std Weight		Minimum breaking load of conductor	Calculated area of cadmium copper
			Std Kg	Max Kg	Min Kg	Std Ohm	Max Ohm		
mm ²	mm	mm						Kgf	mm ²
19.84	7/2.10	6.3	217.6	221.76	213.58	0.8958	0.9123	1432.7	24.05
53.5	19/2.10	10.5	594.4	605.78	583.41	0.3322	0.3387	3915.9	64.85
103.62	37.2.10	14.7	1163.5	1185.8	1142	0.1717	0.175	7625.7	125.6

As per RDSO Draft Specification, Approval Under progress

