

Nominal stranding and flexibility class

Nominal cross-section		Solid cores 1 x d	Compacted round cores Number of strands	d n x d	Other stranding options - Number of strands / Diameter of strand (mm)												
(mm ²)	AWG				0.50 n x 0.50	0.40 n x 0.40	0.30 n x 0.30	0.25 n x 0.25	0.20 n x 0.20	0.16 n x 0.16	0.15 n x 0.15	0.13 n x 0.13	0.10 n x 0.10	0.07 n x 0.07	0.05 n x 0.05		
0.03	-	1 x 0.20											10	20			
0.05	30	1 x 0.25								3	4	7		30			
0.07	-	1 x 0.30								4		10	20	40			
0.09	28							3			7	12		50			
0.12	-	1 x 0.40						4		7	9	15	30	60			
0.13	26							3		7	10	17					
0.14	-	1 x 0.43								8	11	18		70			
0.15	-							5			12	19	40	80			
0.2	-	1 x 0.50						4		10	12	15	26	50	100		
0.22	24	1 x 0.52				3			7	11	13	17	28		110		
0.25	-		7 x 0.22					5		8		14	19	30	60	130	
0.34	22	1 x 0.67				3	5	7	11	17	19	26	40	90	180		
0.38	-							8		12	19	22	30	50	100	200	
0.5	-	1 x 0.80	19 x 0.18		4	7	10	16	25	28	38	60	130	260			
0.6	20		4 x 0.43	3	5	9	12	19	30	34	46	80	160	310			
0.75	-	1 x 0.98	7 x 0.37														
0.75	-		19 x 0.22	4	6	11	15	24	37	42	56	100	200	390			
0.88	18					7	12	18	26	44	50	70	110	230	450		
0.93	-			5			19	30	47	54	72		240	470			
1	-	1 x 1.13	7 x 0.43														
1	-		19 x 0.26			8	14	21	32	50	57	77	120	260	520		
1.34	16		7 x 0.49	7	11	19	27	41	70	77	108	170	350	680			
1.5	-	1 x 1.38	7 x 0.52														
1.5	-		19 x 0.32	8	12	21	30	48	77	84	120	190	390	750			
2	14	1 x 1.60	7 x 0.64														
2	14		19 x 0.37	11	17	27	43	65	108	112	168	290	550	1 080			
2.5	-	1 x 1.77	7 x 0.67	13	19	35	50	80	126	140	192	320	650	1 280			
3	-			16	24	45	61	98	156	180	247	420	780	1 530			
-	12		37 x 0.34	17	26	46	66	103	168	192	266	450	840	1 650			
4	-	1 x 2.24	7 x 0.85	21	32	56	80	126	204	224	323	550	1 050	2 060			
5	-			26	40	70	105	168	264	300	399	680	1 330	2 610			
-	10		37 x 0.43	27	42	77	107	171	266	304	418	700	1 370	2 690			
6	-	1 x 2.74	7 x 1.04	31	48	84	120	192	304	343	475	800	1 540	3 020			
-	8			43	66	119	171	266	418	481	666	1 130	2 200	4 320			
10	-		7 x 1.33	50	77	140	209	322	518	592	814	1 380	2 700	5 300			
-	6			68	105	190	276	444	703	814	1 110	1 880	3 690				
16	-		7 x 1.68														
16	-		19 x 1.04	77	119	224	323	516	814	925	1 258	2 130	4 180				
-	4			108	168	316	444	703	1 110	1 295	1 739	2 940	5 770				
25	-		7 strands	123	192	354	518	798	1 295	1 480	2 013	3 400					
35	2		7 strands	166	259	495	703	1 121	1 739	2 013	2 684	4 540					
-	1			219	342	608	888	1 406	2 196	2 501	3 355	5 670					
50	-		19 strands	237	370	740	1 036	1 628	2 562	2 928	3 904						
-	1/0			272	425	777	1 147	1 813	2 867	3 294	4 392						
70	2/0		19 strands	333	543	1 036	1 406	2 257	3 477	3 965	5 307						
-	3/0			432	684	1 221	1 776	2 775	4 392	5 002							
95	-		19 strands	444	740	1 369	1 813	2 979	4 453	5 124							
-	4/0			546	851	1 517	2 196	3 441	5 429								
120	-		19 strands	568	925	1 776	2 318	4 144									
-	250 MCM			645	1 036	1 850	2 684	4 209									
150	300 MCM		19 strands	703	1 184	2 220	2 867	4 880									
185	350 MCM		37 strands	888	1 443	2 738	3 660	5 856									
-	400 MCM			1 036	1 628	2 928	4 270										
240	-		37 strands	1 184	1 924	3 552	4 758										
-	500 MCM			1 295	2 035	3 626	5 246										
300	600 MCM		61 strands	1 480	2 368	4 209											
-	700 MCM			1 830	2 849	5 063											
400	750 MCM		61 strands	1 952	3 050	5 429											

As per standard IEC 60228 (or NF C 32-018): Class 1 (or A) Class 2 (or B) Class 5 (or C) Class 6 (or D)

Note: The nominal stranding compositions indicated in the table above (and in all pages of all OMERIN catalogues) are indicative. The number and/or diameter of the strand(s) may vary within the limits defined by the applicable standard(s). Only the maximum linear resistance at 20°C is the guaranty of compliance with the standard.

Stranding compositions in bold are preferential; the others are given for informational purposes and are not available on standard products.

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**Main properties
of metals commonly used
by OMERIN SAS:**

Type of metal	OMERIN name	Continuous operating temperature °C	Peak temperature °C	Melt temperature °C	Density at 20 °C g.cm ⁻³	Volume electrical resistivity at 20 °C. μΩ.cm	Resistance variation coefficient (α) at 20 °C 10 ⁻³ .K ⁻¹	Thermal conductivity at 20 °C W.m ⁻¹ .K ⁻¹	Specific heat capacity J.kg ⁻¹ .K ⁻¹	Linear dilation coefficient from +20 °C to +100 °C 10 ⁻⁶ .K ⁻¹	Tensile strength Rm MPa
Bare copper	CuA1	180	400	1 083	8.89	1.7241	3.93	389	385	16.8	230
Deoxidised bare copper	CuC1	180	400	1 083	8.89	1.7241	3.93	389	385	16.8	230
Tin-plated copper	CuSn	180	300	1 083	8.89	1.7654 to 1.8508	3.66 to 3.84	386	385	16.8	230
Silver-plated copper	CuAg	200	450	1 083	8.91 to 9.05	1.7241	3.93 to 3.95	389	385	16.8	230
Nickel-plated copper	CuNi	300	500	1 083	8.89	1.7960	3.95	386	387	16.7	240
27% nickel-plated copper	CuNi27%	450	700	1 083	8.89	2.4284	4.22	359	404	15.8	240
Nickel	Ni	600	900	1 455	8.9	9.1	5.37	70	456	13	400
Nickel Chrome 80/20	NiCr80/20	1 000	1 200	1 400	8.35	108	0.06	11.3	450	17.5	800
Aluminium	Alu	120	200	660	2.7	2.8264	4.03	237	890	22	130
Galvanized steel	Galva	600	900	1 455	7.9	73	4	16.3	460	18	850
Stainless steel (AISI 304)	SS 304	600	900	1 455	7.9	73	4	16.3	460	18	850

**Maximum linear resistance
of cores at 20°C
As per IEC 60228**

Nominal cross-section mm ²	Maximum linear resistance of core at 20 °C (Ω/km)											
	Class 1 Bare strands Strands coated with metal layer		Minimum number of strands in core	Class 2 Bare strands Strands coated with metal layer		Aluminium strands	Class 5 Max. strand diameter in core (mm) Bare strands Strands coated with metal layer		Class 6 Max. strand diameter in core (mm) Bare strands Strands coated with metal layer			
0.5	36.0	36.7		7	36.0		36.7	-	0.21	39.0	40.1	0.16
0.75	24.5	24.8	7	24.5	24.8	-	0.21	26.0	26.7	0.16	26.0	26.7
1	18.1	18.2	7	18.1	18.2	-	0.21	19.5	20.0	0.16	19.5	20.0
1.5	12.1	12.2	7	12.1	12.2	-	0.26	13.3	13.7	0.16	13.3	13.7
2.5	7.41	7.56	7	7.41	7.56	-	0.26	7.98	8.21	0.16	7.98	8.21
4	4.61	4.70	7	4.61	4.70	-	0.31	4.95	5.09	0.16	4.95	5.09
6	3.08	3.11	7	3.08	3.11	-	0.31	3.30	3.39	0.21	3.30	3.39
10	1.83	1.84	7	1.83	1.84	3.08	0.41	1.91	1.95	0.21	1.91	1.95
16	1.15	1.16	7	1.15	1.16	1.91	0.41	1.21	1.24	0.21	1.21	1.24
25	-	-	7	0.727	0.734	1.20	0.41	0.780	0.795	0.21	0.780	0.795
35	-	-	7	0.524	0.529	0.868	0.41	0.554	0.565	0.21	0.554	0.565
50	-	-	19	0.387	0.391	0.641	0.41	0.386	0.393	0.31	0.386	0.393
70	-	-	19	0.268	0.270	0.443	0.51	0.272	0.277	0.31	0.272	0.277
95	-	-	19	0.193	0.195	0.320	0.51	0.206	0.210	0.31	0.206	0.210
120	-	-	37	0.153	0.154	0.253	0.51	0.161	0.164	0.31	0.161	0.164
150	-	-	37	0.124	0.126	0.206	0.51	0.129	0.132	0.31	0.129	0.132
185	-	-	37	0.0991	0.100	0.164	0.51	0.106	0.108	0.41	0.106	0.108
240	-	-	37	0.0754	0.0762	0.125	0.51	0.0801	0.0817	0.41	0.0801	0.0817
300	-	-	61	0.0601	0.0607	0.100	0.51	0.0641	0.0654	0.41	0.0641	0.0654
400	-	-	61	0.0470	0.0475	0.0778	0.51	0.0486	0.0495	-	-	-

**Maximum linear resistance
of cores at 20°C**
As per NF C 32-018

Maximum linear resistance of core at 20 °C (Ω/km)														
Nominal cross-section mm ²	Indicative stranding	Class A			Indicative stranding	Min. number of strands in core	Class B			Indicative stranding	Max. strand diameter in core (mm)	Class C		
		Bare or silver-coated strands	Tin-plated strands	Nickel-plated strands			Bare or silver-coated strands	Tin-plated strands	Nickel-plated strands			Bare or silver-coated strands	Tin-plated strands	Nickel-plated strands
0.03	1 x 0.20	599	616	662	-	-	-	-	-	-	-	-	-	-
0.05	1 x 0.25	384	394	424	-	-	-	-	-	-	-	-	-	-
0.055	-	-	-	-	7 x 0.10	7	373	391	419	-	-	-	-	-
0.06	-	-	-	-	-	-	-	-	-	15 x 0.07	0.08	356	372	399
0.08	1 x 0.32	230	234	252	7 x 0.12	7	252	259	279	10 x 0.10	0.11	261	274	293
0.12	1 x 0.40	146	148	160	7 x 0.15	7	161	166	178	15 x 0.10	0.11	174	182	195
0.15	-	-	-	-	-	-	-	-	-	19 x 0.10	0.11	136	143	153
0.20	1 x 0.50	93.1	95.0	102	-	-	-	-	-	-	-	-	-	-
0.22	-	-	-	-	7 x 0.20	7	89.9	92.5	99.4	19 x 0.12	0.13	92.0	94.6	102
0.28	1 x 0.60	64.7	65.9	71.0	-	-	-	-	-	-	-	-	-	-
0.34	-	-	-	-	7 x 0.25	7	57.5	59.2	63.6	19 x 0.15	0.16	58.9	60.6	65.1
0.40	-	-	-	-	-	-	-	-	-	12 x 0.20	0.21	52.4	53.9	58.0
0.50	1 x 0.80	36.0	36.7	39.5	7 x 0.30	7	39.6	40.7	43.8	16 x 0.20	0.21	39.0	40.1	43.1
0.60	-	-	-	-	-	-	-	-	-	19 x 0.20	0.21	32.8	33.7	36.3
0.64	1 x 0.90	28.5	29.0	31.2	-	-	-	-	-	-	-	-	-	-
0.75	-	-	-	-	-	-	-	-	-	24 x 0.20	0.21	26.0	26.7	28.7
0.80	1 x 1.00	23.1	23.3	-	-	-	-	-	-	-	-	-	-	-
0.93	-	-	-	-	19 x 0.25	19	21.0	21.6	23.2	-	-	-	-	-
1.00	1 x 1.13	18.1	18.2	-	-	-	-	-	-	32 x 0.20	0.21	19.5	20.0	21.5
1.13	1 x 1.20	16.0	16.2	-	-	-	-	-	-	-	-	-	-	-
1.34	-	-	-	-	19 x 0.30	19	14.6	15.0	16.1	-	-	-	-	-
1.50	-	-	-	-	-	-	-	-	-	30 x 0.25	0.26	13.3	13.7	14.7
1.91	-	-	-	-	27 x 0.30	27	10.3	10.6	11.3	-	-	-	-	-
2.61	-	-	-	-	37 x 0.30	37	7.49	7.70	8.28	-	-	-	-	-

Maximum linear resistance of core at 20 °C (Ω/km)					
Nominal cross-section mm ²	Indicative stranding	Max. strand diameter in core (mm)	Class D		
			Bare or silver-coated strands	Tin-plated strands	Nickel-plated strands
0.03	-	-	-	-	-
0.05	-	-	-	-	-
0.055	27 x 0.05	0.06	387	405	434
0.06	-	-	-	-	-
0.08	19 x 0.07	0.08	281	294	315
0.12	30 x 0.07	0.08	178	186	199
0.15	37 x 0.07	0.08	143	149	160
0.20	-	-	-	-	-
0.22	27 x 0.10	0.11	95.9	100	108
0.28	-	-	-	-	-
0.34	30 x 0.12	0.13	58.3	59.9	64.4
0.40	-	-	-	-	-
0.50	28 x 0.15	0.16	39.6	40.7	43.8
0.60	-	-	-	-	-
0.64	-	-	-	-	-
0.75	42 x 0.15	0.16	26.4	27.1	29.2
0.80	-	-	-	-	-
0.93	-	-	-	-	-
1.00	56 x 0.15	0.16	19.8	20.4	21.9
1.13	-	-	-	-	-
1.34	-	-	-	-	-
1.50	83 x 0.15	0.16	13.3	13.7	14.8
1.91	-	-	-	-	-
2.61	-	-	-	-	-

**Maximum linear resistance
of cores at 20°C**
As per UL 1581

Nominal cross-section (mm ²)	Maximum linear resistance of core at 20 °C (Ω/km)		
	Single-strand bare copper conductor UL 1581 - Table 30.1	Single-strand tin-plated copper conductor UL 1581 - Table 30.2	Multi-strand bare copper conductor UL 1581 - Table 30.3
30 AWG	347	361	354
29 AWG	271	282	277
28 AWG	218	227	223
27 AWG	172	179	175
26 AWG	138	143	140
25 AWG	108	112	111
24 AWG	85.9	89.3	87.6
23 AWG	67.9	70.6	69.2
22 AWG	54.3	56.4	55.4
21 AWG	42.7	44.4	43.6
20 AWG	33.9	35.2	34.6
19 AWG	26.9	28.0	27.4
18 AWG	21.4	22.2	21.8
17 AWG	16.9	17.6	17.3
16 AWG	13.5	14.0	13.7
15 AWG	10.6	11.1	10.9
14 AWG	8.45	8.78	8.62
13 AWG	6.69	6.97	6.82
12 AWG	5.31	5.53	5.43
11 AWG	4.22	4.39	4.30
10 AWG	3.343	3.476	3.409
9 AWG	2.652	2.730	2.705
8 AWG	2.102	2.163	2.144
7 AWG	1.667	1.716	1.700
6 AWG	1.323	1.361	1.348
5 AWG	1.049	1.079	1.070
4 AWG	0.8315	0.8559	0.8481
3 AWG	0.6595	0.6788	0.6727
2 AWG	0.5231	0.5384	0.5335
1 AWG	0.4146	0.4268	0.4230
1/0 AWG	0.3287	0.3367	0.3354
2/0 AWG	0.2608	0.2670	0.2660
3/0 AWG	0.2069	0.2119	0.2110
4/0 AWG	0.1640	0.1680	0.1673
250 kcmil	-	-	0.1416
300 kcmil	-	-	0.1180
350 kcmil	-	-	0.1011
400 kcmil	-	-	0.08851
450 kcmil	-	-	0.07867
500 kcmil	-	-	0.7080
550 kcmil	-	-	0.06436
600 kcmil	-	-	0.05900
650 kcmil	-	-	0.05447
700 kcmil	-	-	0.05057
750 kcmil	-	-	0.04721
800 kcmil	-	-	0.04425
900 kcmil	-	-	0.03933
1000 kcmil	-	-	0.03540

Conductor metal	Strand diameter (mm)	Correction coefficient Kc
CuAl (as per ASTM B 3)	-	1
CuAg (as per ASTM B 298)	-	1
CuSn (as per ASTM B 33)	0.076 ≤ Ø < 0.28	0.9315
	0.28 ≤ Ø < 0.51	0.9416
	0.51 ≤ Ø < 2.6	0.9616
	2.6 ≤ Ø < 7.4	0.9716
	7.4 ≤ Ø < 11.7	0.9766
CuNi (as per ASTM B 355)	-	0.96
CuNi27% (as per ASTM B 355)	-	0.71

To determine the maximum linear resistance at 20 °C of the cores made of the metals above, the following formula is applied:

$$R_{linmax\ metal} = R_{linmax\ CuAl} / Kc$$