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## Percon® 24 Copper Alloy Conductor Wire

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### Introduction

Percon® 24 was developed specifically to meet the requirement of AS22759, AS29606, NEMA WC 67, ASTM B 624, and MIL-DTL-25038. It replaces cadmium containing PD 135 in these applications. A truly high performance conductor comprising a minimum strength of 60 ksi (414 MPa), elongation of 6%, electrical conductivity of 90% IACS minimum, excellent flex life and exceptional softening resistance to elevated operating or high fluoropolymer insulating temperatures.

### Key Attributes

- › Excellent resistance to corrosive environments.
- › Does not contain any cadmium or environmentally hazardous elements.

Percon 24 is available in bare, or plated with nickel, silver or gold and in light weight constructions.

Custom constructions are available, please contact the sales department.

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Fisk Alloy Wire, Inc.  
P.O. Box 26  
10 Thomas Road  
Hawthorne, NJ 07507 U.S.A.

Phone: (973) 825-8500  
Fax (973) 825-8501  
E-mail: [sales@fiskalloy.com](mailto:sales@fiskalloy.com)

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## Physical Properties and Specifications

PHYSICAL PROPERTIES		
PROPERTY	ENGLISH	METRIC
Tensile	60 ksi	414 MPa
Elongation	6%	6%
Electrical Conductivity	90% IACS @ 68°F	0.522 MΩ/cm @ 20°C
Electrical Resistivity	11.52 Ω-cmil/ft @ 68°F	1.915 μΩ-cm @ 20°C
Melting Point	1972°F	1078°C
Density	0.323 lbs/in <sup>3</sup>	8.94 g/cm <sup>3</sup>
Thermal Coefficient of Resistance	0.00190/°F	0.00352/°C

SPECIFICATIONS
AS29606
AS22759
ASTM B264
NEMA WC67
MIL-DTL-25038

## Alloy Characteristics

ALLOY NAME	TEMPER	TENSILE STRENGTH	CONDUCTIVITY	ELONGATION	FLEX LIFE	MECHANICAL PROCESSING	AVAILABLE PLATINGS	SOFTENING RESISTANCE
COPPER	Soft	32,000	100%	15%	P	E	S, N, T	-
COPPER	Hard	60,000	96%	1%	P	E	S, N, T	P
PERCON 24	Soft	60,000	90%	8%	E	E	S, N	E
C18135	Soft	60,000	90%	8%	E	E	S, N	E
PERCON 11	Hard	80,000	90%	1/5	G	VG	S, N, T	VG
PERCON 17	Soft	58,000	85%	6%	G	E	S, N	VG
PERCON 17	Hard	95,000	80%	1%	VG	E	S, N, T	G
PERCON 19	Hard	110,000	73%	1%	E	E	S, N, T	G
CALCIUM COPPER	Hard	100,000	80%	1%	VG	VG	S, N, T	G
CCS (40%)	Hard	110,000	39%	1%	E	G	S, N, T	G

E = Excellent, VG = Very Good, G = Good, P = Poor, S = Silver Plate, N = Nickel Plate, T = Tin Plate

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## 7-Strand Constructions

SILVER PLATED PERCON 24 - SOFT (MIN 40 MICRO-INCH SILVER THICKNESS EXCEPT *)												
AWG	CONST	PLATE %	DIAMETER				RESISTANCE		WEIGHT		BREAK STRENGTH	
			inch		mm		max		max		min	
			min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
22	7/30	2	0.0297	0.0303	0.754	0.770	17.0	55.7	2.20	3.28	32.3	144
24	7/32	2.6	0.0237	0.0243	0.602	0.617	26.6	87.4	1.42	2.11	20.6	91.6
26	7/34	3	0.0186	0.0192	0.472	0.488	43.3	142	0.887	1.32	12.7	56.4
28	7/36	4	0.0147	0.0153	0.373	0.389	69.3	227	0.564	0.840	8.20	36.5
30	7/38	5	0.0117	0.0123	0.297	0.312	109	358	0.366	0.542	5.20	23.1
32	7/40	6.5	0.0090	0.0096	0.229	0.244	185	607	0.223	0.332	2.97	13.2
34	7/42	8	0.0072	0.0078	0.183	0.198	289	948	0.148	0.220	1.90	8.45
36	7/44	10	0.0057	0.0063	0.145	0.160	459	1507	0.0963	0.143	1.19	5.30
38	7/46*	10	0.0045	0.0049	0.114	0.125	739	2424	0.0589	0.0876	0.742	3.30
40	7/48*	10	0.0035	0.0039	0.090	0.099	1,194	3918	0.0370	0.0551	0.459	2.04
42	7/50*	10	0.0028	0.0031	0.072	0.079	1,882	6173	0.0237	0.0352	0.291	1.30
44	7/52*	10	0.0022	0.0025	0.056	0.062	3,036	9961	0.0147	0.0219	0.181	0.804
46	7/54*	10	0.0018	0.0020	0.045	0.050	4,776	15670	0.0093	0.0138	0.115	0.511
NICKEL PLATED PERCON 24 SOFT (MIN 50 MICRO-INCH NICKEL THICKNESS)												
AWG	CONST	PLATE %	DIAMETER				RESISTANCE		WEIGHT		BREAK STRENGTH	
			inch		mm		max		max		min	
			min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
22	7/30	2	0.0297	0.0309	0.754	0.785	17.3	56.8	2.30	3.42	32.3	144
24	7/32	2.6	0.0237	0.0249	0.602	0.632	27.4	89.9	1.48	2.20	20.6	91.6
26	7/34	3	0.0186	0.0198	0.472	0.503	44.6	146.3	0.939	1.40	12.7	56.5
28	7/36	4	0.0147	0.0147	0.373	0.404	71.3	233.9	0.606	0.902	8.20	36.5
30	7/38	5	0.0117	0.0117	0.297	0.328	112.2	368.1	0.397	0.591	5.20	23.1
32	7/40	6.5	0.0090	0.0090	0.229	0.259	194.6	638.4	0.249	0.371	2.97	13.2

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# Percon®24 Copper Alloy Conductor Wire

## 19-Strand Unilay Constructions

SILVER PLATED PERCON 24 (40 MICRO-INCH SILVER THICKNESS)												
AWG	CONST	PLATE %	DIAMETER				RESISTANCE		WEIGHT		BREAK STRENGTH	
			inch		mm		max		max		min	
			min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
14	19/27	1.5	0.0663	0.0677	1.684	1.720	3.11	10.2	12.1	18.0	177	786
16	19/29	2	0.0529	0.0538	1.343	1.367	4.90	16.1	7.63	11.3	115	512
18	19/30	2	0.0467	0.0477	1.187	1.211	6.43	21.1	6.00	8.93	90.3	402
20	19/32	2.6	0.0373	0.0382	0.947	0.971	10.1	33.1	3.86	5.75	58.1	258
22	19/34	3	0.0293	0.0302	0.743	0.767	16.5	54.8	2.43	3.61	35.8	159
24	19/36	4	0.0231	0.0241	0.587	0.611	26.2	86.0	1.53	2.28	22.4	100
26	19/38	5	0.0184	0.0194	0.468	0.492	41.1	135	0.994	1.48	14.2	63.2
28	19/40	6.5	0.0142	0.0151	0.360	0.384	68.2	224	0.607	0.903	8.06	35.8
30	19/42	8	0.0113	0.0123	0.288	0.312	106	349	0.400	0.596	5.16	22.9
32	19/44 <sup>(1)</sup>	10	0.0095	0.0105	0.241	0.267	171	561	0.264	0.393	3.23	14.4
34	19/46 <sup>(1)</sup>	10	0.0075	0.0082	0.191	0.208	274	900	0.161	0.240	2.01	8.96

(1) True Concentric

NICKEL PLATED PERCON 24 (50 MICRO-INCH NICKEL THICKNESS)												
AWG	CONST	PLATE %	DIAMETER				RESISTANCE		WEIGHT		BREAK STRENGTH	
			inch		mm		max		max		min	
			min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
18	19/30	2	0.0467	0.0481	1.187	1.223	6.79	22.3	6.11	9.09	90.3	402
20	19/32	4	0.0373	0.0387	0.947	0.983	11.4	37.4	3.94	5.86	58.1	258
22	19/34	4	0.0293	0.0307	0.473	0.779	18.6	61.0	2.49	3.70	35.8	159
24	19/36	4	0.0231	0.0245	0.587	0.623	30.1	98.8	1.58	2.35	22.4	100
26	19/38	7	0.0184	0.0198	0.468	0.504	49.4	162	1.03	1.54	14.2	63.2
28	19/40	7	0.0142	0.0156	0.360	0.396	80.3	263	0.638	0.950	8.06	35.8
30	19/42	8	0.0113	0.0127	0.288	0.324	128	418	0.426	0.633	5.16	22.9

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# Percon®24 Copper Alloy Conductor Wire

## Single End Constructions

NICKEL PLATED PERCON 24 - SOFT (50 INCH MICRO NICKEL THICKNESS)												
AWG	STD PLATE %	DIAMETER					RESISTANCE		WEIGHT		BREAK STRENGTH	
		inch			mm		max		max		min	
		Nom	min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
30	2	0.0101	0.0099	0.0103	0.251	0.262	122.4	401.6	0.321	0.478	4.62	20.6
31	4	0.0090	0.0088	0.0092	0.224	0.234	158.3	519.4	0.256	0.381	3.65	16.2
32	4	0.0081	0.0079	0.0083	0.201	0.211	196.4	644.3	0.208	0.310	2.94	13.1
33	4	0.0071	0.0069	0.0073	0.175	0.185	257.4	844.5	0.161	0.240	2.24	10.0
34	4	0.0064	0.0062	0.0066	0.157	0.168	318.8	1,046	0.132	0.196	1.81	8.05
35	4	0.0057	0.0055	0.0059	0.140	0.150	405.1	1,329	0.105	0.156	1.42	6.32
36	4	0.0051	0.0049	0.0053	0.124	0.135	510.4	1,675	0.0850	0.126	1.129	5.02
37	7	0.0046	0.0044	0.0048	0.112	0.122	653.9	2,145	0.0697	0.108	0.912	4.06
38	7	0.0041	0.0039	0.0043	0.099	0.109	832.3	2,731	0.0560	0.0833	0.717	3.19
39	7	0.0036	0.0034	0.0038	0.086	0.097	1,095	3,592	0.0437	0.0650	0.545	2.42
40	7	0.0032	0.0030	0.0034	0.076	0.086	1,407	4,616	0.0350	0.0521	0.424	1.89

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# Percon<sup>®</sup> 24 Copper Alloy Conductor Wire

SILVER PLATED PERCON 24 - SOFT (40 INCH MICRO SILVER THICKNESS)												
AWG	STD PLATE %	DIAMETER					RESISTANCE		WEIGHT		BREAK STRENGTH	
		inch			mm		max		max		min	
		Nom	min	max	min	max	Ω/mft	Ω/km	lb/mft	kg/km	lb	N
30	2	0.0100	0.0099	0.0101	0.251	0.257	117.5	385.5	0.311	0.463	4.62	20.6
31	2.5	0.0089	0.0088	0.0090	0.224	0.229	148.8	488.2	0.240	0.357	3.65	16.2
32	2.5	0.0080	0.0079	0.0081	0.201	0.206	184.6	605.6	0.200	0.298	2.94	13.1
33	3	0.0070	0.0069	0.0071	0.175	0.180	242.0	794.0	0.154	0.229	2.24	10.0
34	3	0.0063	0.0062	0.0064	0.157	0.163	299.7	983.3	0.125	0.186	1.81	8.05
35	4	0.0056	0.0055	0.0057	0.140	0.145	308.8	1,013	0.0995	0.148	1.42	6.32
36	4	0.0050	0.0049	0.0051	0.124	0.130	479.8	1,574	0.0796	0.118	1.13	5.02
37	5	0.0045	0.0044	0.0046	0.112	0.117	595.0	1,952	0.0649	0.0966	0.912	4.06
38	5	0.0040	0.0039	0.0041	0.099	0.104	757.4	2,485	0.0516	0.0768	0.717	3.19
39	6.1	0.0035	0.0034	0.0036	0.086	0.091	996.5	3,269	0.0398	0.0592	0.545	2.42
40	6.1	0.0031	0.0030	0.0032	0.076	0.081	1,280	4,199	0.0315	0.0469	0.424	1.89
41	8	0.0028	0.0027	0.0029	0.0686	0.0737	1,580	5,184	0.0259	0.0385	0.344	1.53
42	8	0.0025	0.0024	0.0026	0.061	0.0660	2,000	6,562	0.0208	0.0310	0.271	1.21
43	10	0.0022	0.0021	0.0023	0.0533	0.0584	2,612	8,569	0.0163	0.0243	0.208	0.925
44	10	0.0020	0.0019	0.0021	0.0483	0.0533	3,191	10,469	0.0136	0.0202	0.170	0.756
45 <sup>(1)</sup>	12	0.00178	0.00166	0.0019	0.0432	0.048	4,705	15,436	0.0107	0.0159	0.234	1.04
46 <sup>(1)</sup>	12	0.0016	0.0015	0.0017	0.0381	0.0432	5,999	19,681	0.0086	0.0128	0.183	0.814
47 <sup>(1)</sup>	15	0.0014	0.0013	0.0015	0.033	0.038	7,790	25,557	0.0069	0.0103	0.141	0.627
48 <sup>(1)</sup>	15	0.0012	0.0012	0.0013	0.028	0.033	9,975	32,726	0.0056	0.0083	0.110	0.489
49 <sup>(1)</sup>	15 <sup>(2)</sup>	0.00111	0.00109	0.0012	0.026	0.030	12,709	41,696	0.0046	0.0068	0.087	0.387
50 <sup>(1)</sup>	15 <sup>(2)</sup>	0.00099	0.	0.00109	0.023	0.028	16,515	54,182	0.0037	0.0055	0.067	0.298

(1) These single end sizes will be hard temper (2) These single end sizes will not have 40 micro-inches of silver

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