RUBADUEWIRE

1977
Edwin A Rubadue **founded Rubadue Wire** in Southern California

1986
Rubadue Invents **Triple Insulated Wire**

1989
Rubadue Wire opens its new facility in **Fontana, California**

1995
Expands and moves to **Greeley, CO**

2001
Opens Warehouse in **Hong Kong**

2002
Wins Plunkett® Award from DuPont for **innovation in Teflon® for North America**

2005
Edwin officially retires, company is managed by **Sue Welsh, Dan Rubadue and Ed C Rubadue**

2012
Expansion of **manufacturing facility** in Greeley

2014
Becomes **Employee Owned** under Pelican Holdings. Acquires UL on 300C AWM

2016
Acquires Kerrigan-Lewis and **begins producing litz**

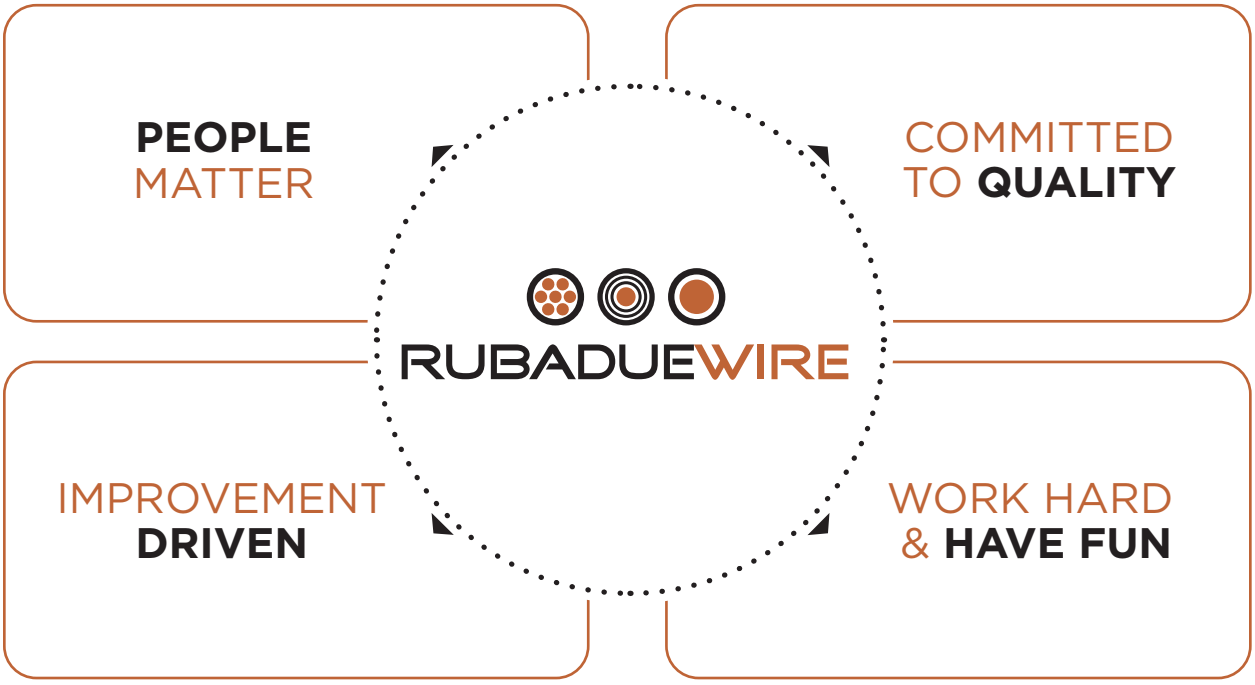
2018
Relocated to **Loveland, Colorado**

RUBADUEWIRE

Value Proposition

At Rubadue Wire we create value by focusing on the key pillars to our customers' success.

- Service through Partnership
- Proven Engineering Support
- Continuing to Produce the Highest Quality Product



ISO 9001 • ROHS COMPLIANT • ISO 14001

5610 Boeing Drive, Loveland, CO 80538, USA | 970.351.6100 | **RUBADUE.com**

INSULATED WINDING WIRE PART NUMBER BUILDER

(letter signifying) **LAYERS OF INSULATION**	**AVG SIZE**	**CONDUCTOR MATERIAL**	**STRANDS IN CONDUCTOR**	**INSULATION TYPE**	**COLOR CODE** *(visible color)*	**INSULATION THICKNESS PER LAYER MILS** *(thousandths of an inch)*
S Single (1) Basic	**GAUGE NUMBER** *(Standard Sizing)*	**A** = TPC	**01** Solid	**F** = FEP	**0** = Black	**-1** = .001"/layer
D Double (2) Supplemental	**4 AWG** to **40 AWG**	**B** = SPC	**07** 7 Strands	**H** = Hytrel®	**1** = Brown	**-1.5** = .0015"/layer
T Triple (3) Reinforced	**XX** = LITZ	**C** = BS	**19** 19 Strands	**K** = Kynar® PVDF	**2** = Red	**-2** = .002"/layer
		D = SPA 135	**37** 37 Strands	**N** = Nylon	**3** = Orange	**-3** = .003"/layer
		E = Enamel	**65** 65 Strands	**P** = PFA	**4** = Yellow	**-5** = .005"/layer
		H = Heavy Enamel	**Litz** = #Strands/AWG	**PE** = Polyethylene	**5** = Green	**Available from .001" to .250"**
		L = Litz Wire*		**PF** = Foam PE	**6** = Blue	
		N = NPC		**U** = Polyurethane	**7** = Violet	
		Q = QPN		**V** = PVC	**8** = Gray	
		S = Stainless Steel		**Z** = Special ETFE (200°C)	**9** = White	
		Litz & Alloys*		**EC** = 300°C	**C** = Clear	
		** Contact Customer Service*				
		Others Available	**Others Available**	**Others Available**		

EXAMPLE

T *Triple Insulated (3)*	**24** *24 AWG*	**A** *Tin Plated Copper*	**01** *Solid Conductor*	**P** *PFA*	**0XX** *Black*	**-2** *.002"/layer (.006" overall)*

EXAMPLE 2 (LITZ)

D *Double Insulated (2)*	**XX** *Always Defined XX*	**L** *LITZ*	**360/44** *Stands/AWG*	**F** *FEP*	**6X** *Blue*	**-3** *.003"/layer (.006" overall)*

EXAMPLE 3 (COILBOND®)

T *Triple Insulated (3)*	**24** *24 AWG*	**A** *Tin Plated Copper*	**01** *Solid Conductor*	**T** *ETFE*	**5XX** *Green*	**-1.5** *.0015"/layer (.0045" overall)*	**-SB** *Self-Bonding*	**-1.5** *.0015"/layer*

RUBADUEWIRE

RUBADUE LITZ
PART NUMBER BUILDER

RUBADUE LITZ *(letter signifying)*	NUMBER OF STRANDS	STRAND SIZE	ENAMEL BUILD	MAGNET WIRE GRADE	SERVE LAYER (S) *(optional)*	UNIQUE IDENTIFIER -XX
RL -	**5 -** 5 Strands **7 -** 7 Strands **19 -** 19 Strands **41 -** 41 Strands **625 -** 625 Strands **10000 -** 10,000 Strands **Others Available**	**GAUGE NUMBER** *(Standard Sizing)* **12 AWG** to **50 AWG**	**S** = Single **H** = Heavy **T** = Triple **Q** = Quad	**79** = MW 79-C **80** = MW 80-C **77** = MW 77-C **35** = MW 35-C **16** = MW 16-C **82** = MW 82-C **83** = MW 83-C **Others Available**	**-SN** Single Nylon Serve **-DN** Double Nylon Serve	**-01** = Construction 1 **-02** = Construction 2

EXAMPLE

RL- *Rubadue Litz*	**2500-** *2500 Strands*	**44** *44 AWG*	**S** *Single Build*	**77** *MW 77-C*	*No Serve*	**-02** *Construction 2*

EXAMPLE 2 (SINGLE NYLON SERVE)

RL- *Rubadue Litz*	**400-** *400 Strands*	**38** *38 AWG*	**H** *Heavy Build*	**79** *MW 79-C*	**-SN** *Single Nylon Serve*	**-03** *Construction 3*

EXAMPLE 3 (DOUBLE NYLON SERVE)

RL- *Rubadue Litz*	**5-** *5 Strands*	**30** *30 AWG*	**Q** *Quad Build*	**80** *MW 80-C*	**-DN** *Double Nylon Serve*	**-01** *Construction 1*

RUBADUEWIRE

Notes

Table of Contents

ISO 9001 • ROHS COMPLIANT • ISO 14001

5610 Boeing Drive, Loveland, CO 80538, USA | 970.351.6100 | **RUBADUE.com**

Bare Litz Wire

LITZ WIRE IS USED WHEREVER A REDUCTION IN AC LOSSES IS REQUIRED AND CAN BE FOUND IN MANY MAJOR INDUSTRY SEGMENTS. Its greater flexibility makes it superior to other wires in the same cross section. Litz wire is made of several strands of enameled magnet wire that are bunched or stranded together.

COMMON APPLICATIONS:

- Electric Vehicles and Charging Stations
- Wireless Charging
- Switch Mode Power Supplies
- Induction Heating
- Solar Inverters
- Renewable Energy
- Linear Motors & Motion Control
- Medical Power Supplies

PLEASE NOTE: *LITZ CONDUCTOR DIAMETERS CAN VARY BY SUPPLIER, PLEASE REQUEST A SPECIFICATION SHEET TO ENSURE THE DIAMETER WILL MEET YOUR APPLICATION REQUIREMENT(S). Litz constructions listed in this catalog are a small sample of the products offered. Contact the Sales Department for additional constructions.*

RoHS

Rubadue **BARE ROUND LITZ WIRES**

PRODUCT CONSTRUCTION:

INDIVIDUAL WIRE SIZE RANGE:
50AWG *(0,02mm)* to 12 AWG *(2,05mm)*

TOTAL NUMBER OF WIRES:
From 2 wires to over 10,000 wires

TOTAL CONDUCTOR DIAMETER:
Overall twisted diameter up to .350" *(8,9mm)*

TEMPERATURE CLASS:
From 155°C up to 240°C

OPTIONAL COATINGS:
Nylon Serve in Single or Double Layer

Extruded Insulations Such As: ETFE, FEP, PFA

Other options available. Contact factory for more details.

AGENCY APPROVALS:
UL recognized component
per OBMW2 File #: E190291

RoHS Compliant

Rubadue Litz Wires are approved for use with many Electrical Insulation Systems. Contact factory for more details.

RECOMMENDED OPERATING FREQUENCY: 60 Hz to 1 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
24	477	3	28	1	0.030	0.752	0.02257	1.50	3/28
22	795	5	28	1	0.037	0.940	0.01354	2.50	5/28
20	1113	7	28	1	0.041	1.044	0.00967	3.50	7/28
18	1590	10	28	1	0.055	1.392	0.00677	5.00	10/28
16	2703	17	28	1	0.065	1.657	0.00398	8.50	17/28
14	4134	26	28	1	0.081	2.049	0.00268	13.0	26/28
12	6678	42	28	2	0.110	2.787	0.00169	21.4	3X14/28
10	10335	65	28	2	0.137	3.468	0.00109	33.1	5X13/28
8	16695	105	28	2	0.174	4.407	0.00068	53.5	5X21/28
6	26235	165	28	2	0.218	5.525	0.00044	84.1	5X3/11/28
4	42930	270	28	2	0.278	7.067	0.00027	138	5X3/18/28
2	66780	420	28	2	0.347	8.814	0.00017	214	5X4/21/28

RECOMMENDED OPERATING FREQUENCY: 1 kHz to 10 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
26	300	3	30	1	0.024	0.598	0.03598	0.945	3/30
24	500	5	30	1	0.029	0.748	0.02159	1.58	5/30
22	700	7	30	1	0.033	0.831	0.01542	2.21	7/30
20	1000	10	30	1	0.044	1.107	0.01079	3.15	10/30
18	1600	16	30	1	0.050	1.279	0.00675	5.04	16/30
16	2600	26	30	1	0.064	1.631	0.00428	8.19	26/30
14	4100	41	30	1	0.081	2.048	0.00271	12.9	41/30
12	6500	65	30	2	0.109	2.759	0.00174	20.5	5X13/30
10	10500	105	30	2	0.138	3.506	0.00108	33.1	5X21/30
8	16500	165	30	2	0.173	4.396	0.00069	52.0	5X33/30
6	27000	270	30	2	0.221	5.623	0.00043	85.1	5X3/18/30
4	42000	420	30	2	0.276	7.013	0.00028	132	5X3/28/30
2	66000	660	30	2	0.346	8.791	0.00018	208	5X4/33/30

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Rubadue **BARE ROUND LITZ WIRES**

RECOMMENDED OPERATING FREQUENCY: 10 kHz to 20 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
26	252	5	33	1	0.021	0.535	0.04318	0.793	5/33
24	403	8	33	1	0.025	0.647	0.02699	1.27	8/33
22	655	13	33	1	0.032	0.825	0.01661	2.06	13/33
20	1059	21	33	1	0.041	1.049	0.01028	3.33	21/33
18	1613	32	33	1	0.051	1.294	0.00695	5.07	32/33
16	2571	51	33	1	0.064	1.634	0.00436	8.09	51/33
14	4285	85	33	2	0.089	2.258	0.00267	13.7	5X17/33
12	6553	130	33	2	0.110	2.792	0.00174	21.0	5X26/33
10	10586	210	33	2	0.140	3.549	0.00108	34.0	5X42/33
8	16635	330	33	2	0.175	4.448	0.00069	53.4	5X66/33
6	26465	525	33	2	0.221	5.611	0.00044	84.9	5X5/21/33
4	41588	825	33	2	0.277	7.034	0.00028	133	5X5/33/33
2	66541	1320	33	2	0.350	8.897	0.00018	213	5X4/66/33

RECOMMENDED OPERATING FREQUENCY: 20 kHz to 50 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
30	100	4	36	1	0.013	0.341	0.11015	0.318	4/36
28	175	7	36	1	0.017	0.427	0.06294	0.557	7/36
26	250	10	36	1	0.022	0.569	0.04406	0.796	10/36
24	400	16	36	1	0.026	0.657	0.02754	1.27	16/36
22	650	26	36	1	0.033	0.838	0.01746	2.07	26/36
20	1025	41	36	1	0.041	1.052	0.01107	3.26	41/36
18	1625	65	36	1	0.052	1.325	0.00698	5.17	65/36
16	2625	105	36	2	0.071	1.802	0.00441	8.52	5X21/36
14	4125	165	36	2	0.089	2.258	0.00280	13.4	5X33/36
12	6625	265	36	2	0.113	2.862	0.00175	21.5	5X53/36
10	10500	420	36	2	0.142	3.603	0.00112	34.1	5X3/28/36
8	16500	660	36	2	0.178	4.517	0.00071	53.6	5X3/44/36
6	26250	1050	36	2	0.224	5.697	0.00045	85.2	5X5/42/36
4	41250	1650	36	2	0.281	7.141	0.00029	134	5X5/66/36

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Rubadue **BARE ROUND LITZ WIRES**

RECOMMENDED OPERATING FREQUENCY: 50 kHz to 100 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
32	64	4	38	1	0.011	0.274	0.17390	0.200	4/38
30	112	7	38	1	0.014	0.343	0.09936	0.349	7/38
28	160	10	38	1	0.018	0.457	0.06955	0.499	10/38
26	256	16	38	1	0.021	0.528	0.04347	0.798	16/38
24	416	26	38	1	0.027	0.673	0.02756	1.30	26/38
22	640	40	38	1	0.033	0.835	0.01792	2.00	40/38
20	1024	64	38	1	0.042	1.056	0.01120	3.19	64/38
18	1680	105	38	2	0.057	1.448	0.00695	5.34	5X21/38
16	2640	165	38	2	0.071	1.815	0.00443	8.40	5X33/38
14	4240	265	38	2	0.091	2.300	0.00276	13.5	5X53/38
12	6720	420	38	2	0.114	2.895	0.00177	21.4	5X3/28/38
10	10560	660	38	2	0.143	3.629	0.00113	33.6	5X3/44/38
8	16800	1050	38	2	0.180	4.578	0.00071	53.4	5X5/42/38
6	26400	1650	38	2	0.226	5.739	0.00045	84.0	5X5/66/38
5	33600	2100	38	2	0.281	7.139	0.00035	109	5X5X3/28/38
4	42000	2625	38	2	0.314	7.982	0.00028	136	5X5X5/21/38

RECOMMENDED OPERATING FREQUENCY: 100 kHz to 200 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
36	29	3	40	1	0.008	0.192	0.39179	0.095	3/40
34	48	5	40	1	0.009	0.240	0.23508	0.158	5/40
32	67	7	40	1	0.011	0.267	0.16791	0.221	7/40
30	106	11	40	1	0.013	0.341	0.10685	0.348	11/40
28	163	17	40	1	0.017	0.423	0.06914	0.537	17/40
26	259	27	40	1	0.021	0.534	0.04486	0.854	27/40
24	404	42	40	1	0.026	0.665	0.02884	1.33	42/40
22	634	66	40	1	0.033	0.834	0.01835	2.09	66/40
20	1057	110	40	2	0.045	1.152	0.01122	3.55	5X22/40
18	1634	170	40	2	0.056	1.433	0.00726	5.48	5X34/40
16	2595	270	40	2	0.071	1.806	0.00457	8.70	5X54/40
14	4084	425	40	2	0.089	2.265	0.00296	13.7	5X5/17/40
12	6535	680	40	2	0.113	2.865	0.00185	21.9	5X4/34/40
10	10331	1075	40	2	0.142	3.603	0.00117	34.7	5X5/43/40
8	16577	1725	40	2	0.198	5.033	0.00073	56.7	5X5X3/23/40
6	26428	2750	40	2	0.250	6.354	0.00046	90.5	5X5X5/22/40
4	41804	4350	40	2	0.315	7.992	0.00029	143	5X5X3/58/40

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Rubadue **BARE ROUND LITZ WIRES**

RECOMMENDED OPERATING FREQUENCY: 200 kHz to 350 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
38	**19**	**3**	**42**	**1**	**0.006**	**0.154**	**0.61218**	**0.059**	**3/42**
36	25	4	42	1	0.007	0.172	0.45913	0.079	4/42
34	**44**	**7**	**42**	**1**	**0.008**	**0.213**	**0.26236**	**0.14**	**7/42**
32	69	11	42	1	0.011	0.272	0.16696	0.22	11/42
30	**100**	**16**	**42**	**1**	**0.013**	**0.329**	**0.11478**	**0.32**	**16/42**
28	163	26	42	1	0.016	0.419	0.07278	0.51	26/42
26	**256**	**41**	**42**	**1**	**0.021**	**0.526**	**0.04615**	**0.81**	**41/42**
24	406	65	42	1	0.026	0.662	0.02911	1.3	65/42
22	**656**	**105**	**42**	**2**	**0.035**	**0.901**	**0.01837**	**2.1**	**5X21/42**
20	1031	165	42	2	0.044	1.129	0.01169	3.3	5X33/42
18	**1625**	**260**	**42**	**2**	**0.056**	**1.417**	**0.00742**	**5.2**	**5X52/42**
16	2625	420	42	2	0.071	1.802	0.00468	8.4	5X3/28/42
14	**4125**	**660**	**42**	**2**	**0.089**	**2.258**	**0.00298**	**13.3**	**5X3/44/42**
12	6563	1050	42	2	0.112	2.848	0.00187	21.1	5X5/42/42
10	**10313**	**1650**	**42**	**2**	**0.141**	**3.571**	**0.00119**	**33.1**	**5X5/66/42**
8	16875	2700	42	2	0.198	5.037	0.00073	55.3	5X5X3/36/42
6	**26563**	**4250**	**42**	**2**	**0.249**	**6.319**	**0.00046**	**87.1**	**5X5X5/34/42**
4	42188	6750	42	2	0.314	7.964	0.00029	138.3	5X5X5/54/42

RECOMMENDED OPERATING FREQUENCY: 350 kHz to 850 kHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
38	**16**	**4**	**44**	**1**	**0.005**	**0.135**	**0.73258**	**0.050**	**4/44**
36	28	7	44	1	0.007	0.168	0.41862	0.087	7/44
34	**40**	**10**	**44**	**1**	**0.009**	**0.224**	**0.29303**	**0.12**	**10/44**
32	64	16	44	1	0.010	0.258	0.18314	0.20	16/44
30	**100**	**25**	**44**	**1**	**0.013**	**0.323**	**0.12077**	**0.31**	**25/44**
28	160	40	44	1	0.016	0.408	0.07548	0.50	40/44
26	**256**	**64**	**44**	**1**	**0.020**	**0.516**	**0.04718**	**0.80**	**64/44**
24	420	105	44	2	0.028	0.708	0.02930	1.3	5X21/44
22	**640**	**160**	**44**	**2**	**0.034**	**0.874**	**0.01923**	**2.0**	**5X32/44**
20	1020	255	44	2	0.043	1.103	0.01207	3.2	5X51/44
18	**1620**	**405**	**44**	**2**	**0.055**	**1.390**	**0.00775**	**5.1**	**5X3/27/44**
16	2580	645	44	2	0.069	1.754	0.00486	8.2	5X3/43/44
14	**4100**	**1025**	**44**	**2**	**0.087**	**2.211**	**0.00306**	**13.0**	**5X5/41/44**
12	6500	1625	44	2	0.110	2.784	0.00193	20.6	5X5/65/44
10	**10400**	**2600**	**44**	**2**	**0.143**	**3.622**	**0.00121**	**33.6**	**5X5X4/26/44**
8	16500	4125	44	2	0.180	4.562	0.00076	53.3	5X5X5/33/44
6	**26500**	**6625**	**44**	**2**	**0.228**	**5.781**	**0.00047**	**85.6**	**5X5X5/53/44**
4	42000	10500	44	2	0.287	7.290	0.00030	136	5X5X5/3/28/44

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Rubadue **BARE ROUND LITZ WIRES**

RECOMMENDED OPERATING FREQUENCY: 850 kHz to 1.4 MHz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
40	9.8	4	46	1	0.004	0.106	1.15872	0.050	4/46
38	17.2	7	46	1	0.005	0.132	0.66213	0.087	7/46
36	24.6	10	46	1	0.007	0.176	0.46349	0.12	10/46
34	39.4	16	46	1	0.008	0.203	0.28968	0.20	16/46
32	64.0	26	46	1	0.010	0.259	0.18368	0.32	26/46
30	100.9	41	46	1	0.013	0.325	0.11648	0.51	41/46
28	160	65	46	1	0.016	0.409	0.07347	0.81	65/46
26	258	105	46	2	0.022	0.557	0.04635	1.3	5X21/46
24	406	165	46	2	0.027	0.698	0.02949	2.1	5X33/46
22	640	260	46	2	0.034	0.876	0.01872	3.3	5X52/46
20	1033	420	46	2	0.044	1.113	0.01181	5.3	5X3/28/46
18	1624	660	46	2	0.055	1.395	0.00752	8.4	5X3/44/46
16	2583	1050	46	2	0.069	1.760	0.00473	13.3	5X5/42/46
14	4182	1700	46	2	0.091	2.303	0.00292	22.0	5X5X4/17/46
12	6642	2700	46	2	0.114	2.902	0.00184	34.9	5X5X3/36/46
10	10455	4250	46	2	0.143	3.641	0.00117	54.9	5X5X5/34/46
8	16605	6750	46	2	0.181	4.589	0.00074	87.3	5X5X5/54/46
6	26138	10625	46	2	0.243	6.174	0.00047	137	5X5X5/5/17/46

RECOMMENDED OPERATING FREQUENCY: 1.4 MHz to 3.0 Mhz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
40	10.8	7	48	1	0.004	0.107	1.06153	0.034	7/48
38	15.4	10	48	1	0.006	0.142	0.74307	0.049	10/48
36	24.6	16	48	1	0.007	0.165	0.46442	0.079	16/48
34	41.6	27	48	1	0.008	0.213	0.28897	0.13	3/9/48
32	64.7	42	48	1	0.010	0.266	0.18577	0.21	3/14/48
30	100	65	48	1	0.013	0.331	0.12003	0.32	5/13/48
28	162	105	48	2	0.018	0.450	0.07576	0.53	5X3/7/48
26	254	165	48	2	0.022	0.565	0.04821	0.83	5X3/11/48
24	400	260	48	2	0.028	0.709	0.03060	1.30	5X4/13/48
22	647	420	48	2	0.036	0.926	0.01894	2.15	5X3X4/7/48
20	1016	660	48	2	0.046	1.161	0.01205	3.38	5X3X4/11/48
18	1617	1050	48	2	0.058	1.465	0.00758	5.37	5X5X3/14/48
16	2618	1700	48	2	0.073	1.864	0.00468	8.70	5X5X4/17/48
14	4158	2700	48	2	0.099	2.518	0.00295	14.2	5X5X3X3/12/48
12	6738	4375	48	2	0.126	3.206	0.00182	23.1	5X5X5X5/7/48
10	10395	6750	48	2	0.157	3.982	0.00118	35.6	5X5X5X3/18/48
8	16363	10625	48	2	0.197	4.996	0.00075	56.0	5X5X5X5/17/48

PLEASE NOTE: *LITZ CONDUCTOR DIAMETERS CAN VARY BY SUPPLIER, PLEASE REQUEST A SPECIFICATION SHEET TO ENSURE THE DIAMETER WILL MEET YOUR APPLICATION REQUIREMENT(S). Due to fluctuations inherent in litz wire construction, all sizes are approximate. Please advise our Sales Department of any special requirements or tolerances.*

Rubadue **BARE ROUND LITZ WIRES**

RECOMMENDED OPERATING FREQUENCY: 1.4 MHz to 3.0 Mhz

Equivalent AWG	Nominal Circular Mil Area	Number of Wires	Magnet Wire Size *(AWG)*	Litz Wire Type	Nominal OD (in.)	Nominal OD (mm)	Maximum DC Resistance *(ohms/ft at 20°C)*	Nominal Lbs/ 1,000 Ft.	Litz Wire Construction
40	9.8	10	50	1	0.004	0.105	1.16586	0.031	10/50
38	16	16	50	1	0.005	0.133	0.72866	0.050	16/50
36	29	30	50	1	0.007	0.182	0.40805	0.094	3/10/50
34	41	42	50	1	0.008	0.215	0.29147	0.132	3/16/50
32	64	65	50	1	0.011	0.267	0.18833	0.204	5/13/50
30	106	108	50	2	0.015	0.369	0.11557	0.345	3X3/12/50
28	162	165	50	2	0.018	0.456	0.07565	0.527	5X3/11/50
26	255	260	50	2	0.023	0.572	0.04801	0.830	5X4/13/50
24	417	425	50	2	0.029	0.731	0.02937	1.36	5X5/17/50
22	647	660	50	2	0.037	0.937	0.01891	2.15	5X3X4/11/50
20	1029	1050	50	2	0.047	1.182	0.01189	3.42	5X5X3/14/50
18	1666	1700	50	2	0.059	1.504	0.00734	5.54	5X5X4/17/50
16	2573	2625	50	2	0.079	2.004	0.00475	8.80	5X5X3X3/12/50
14	4190	4275	50	2	0.101	2.558	0.00292	14.3	5X5X3X3/19/50
12	6615	6750	50	2	0.127	3.214	0.00185	22.6	5X5X5X3/18/50
10	10413	10625	50	2	0.159	4.032	0.00117	35.6	5X5X5X5/17/50

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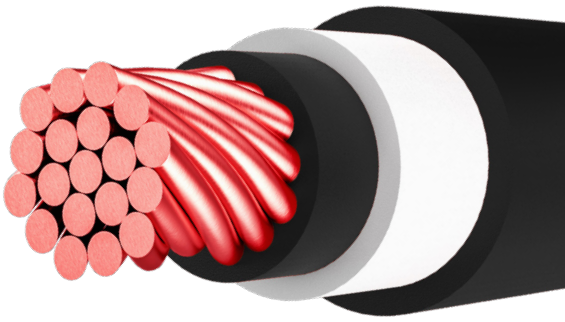
Litz Wires

LITZ WIRE IS MADE OF SEVERAL STRANDS OF ENAMELLED MAGNET WIRE THAT ARE BUNCHED OR STRANDED TOGETHER. It is used where losses caused by the skin-and proximity effect on a single wire are too high due to the operating frequency. At the same time the operating temperature is reduced by its use. Litz wire has much greater mechanical flexibility than a single wire with the same cross-section.

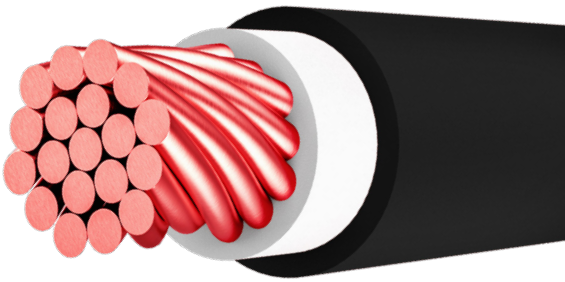
PLEASE NOTE: *LITZ CONDUCTOR DIAMETERS CAN VARY BY SUPPLIER, PLEASE REQUEST A SPECIFICATION SHEET TO ENSURE THE DIAMETER WILL MEET YOUR APPLICATION REQUIREMENT(S). Litz constructions listed in this catalog are a small sample of the products offered. Contact the Sales Department for additional constructions.*

NOTE: *The type of NEMA Magnet wire used in the litz construction will be listed in parentheses at the end of the part number. Example TXXL550/44FXXX-2(MWXX)*

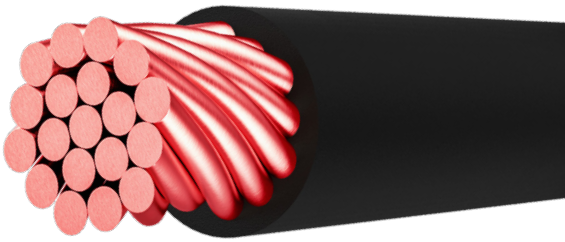
Triple Insulated



Double Insulated

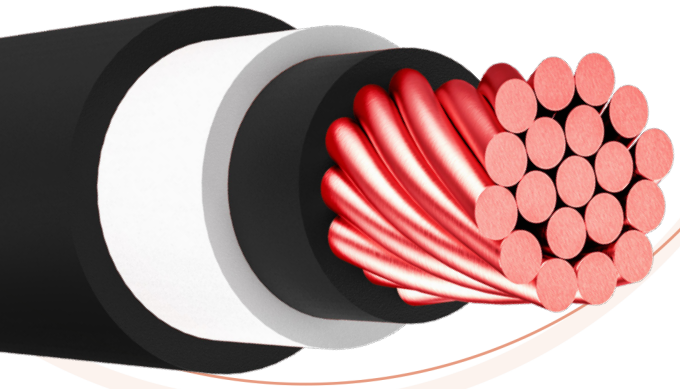


Single Insulated



Triple Insulated

Litz Wire
FEP INSULATION



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Department.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 1000 Vpk

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:

UL OBJT2 File No. E206198

UL/IEC 60950-1 (Ed. 2), Annex U

IEC 61010-1 (Ed. 3)

VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 3000 psi

BREAKDOWN: Please request specification sheet

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
TXXL350/38FXXX-2(MWXX)	**13**	**0.1041**	**5600**	**350**	**38**	**0.1161**	**50-100 kHz**
TXXL350/38FXXX-3(MWXX)	13	0.1041	5600	350	38	0.1221	50-100 kHz
TXXL825/44FXXX-2(MWXX)	**15**	**0.0817**	**3300**	**825**	**44**	**0.0937**	**400-850 kHz**
TXXL825/44FXXX-3(MWXX)	15	0.0817	3300	825	44	0.0997	400-850 kHz
TXXL120/38FXXX-2(MWXX)	**18**	**0.0569**	**1920**	**120**	**38**	**0.0689**	**50-100 kHz**
TXXL120/38FXXX-3(MWXX)	18	0.0569	1920	120	38	0.0749	50-100 kHz
TXXL550/44FXXX-2(MWXX)	**17**	**0.0623**	**2200**	**550**	**44**	**0.0743**	**400-850 kHz**
TXXL550/44FXXX-3(MWXX)	17	0.0623	2200	550	44	0.0803	400-850 kHz
TXXL66/38FXXX-2(MWXX)	**20**	**0.0422**	**1056**	**66**	**38**	**0.0542**	**50-100 kHz**
TXXL66/38FXXX-3(MWXX)	20	0.0422	1056	66	38	0.0602	50-100 kHz
TXXL108/40FXXX-2(MWXX)	**20**	**0.0420**	**1038**	**108**	**40**	**0.0540**	**100-200 kHz**
TXXL108/40FXXX-3(MWXX)	20	0.0420	1038	108	40	0.0600	100-200 kHz
TXXL360/44FXXX-2(MWXX)	**19**	**0.0504**	**1440**	**360**	**44**	**0.0624**	**400-850 kHz**
TXXL360/44FXXX-3(MWXX)	19	0.0504	1440	360	44	0.0684	400-850 kHz
TXXL07/28FXXX-2(MWXX)	**20**	**0.0411**	**1111**	**7**	**28**	**0.0531**	**60 Hz - 1 kHz**
TXXL07/28FXXX-3(MWXX)	20	0.0411	1111	7	28	0.0591	60 Hz - 1 kHz
TXXL19/36FXXX-2(MWXX)	**24**	**0.0280**	**475**	**19**	**36**	**0.0400**	**20-50 kHz**
TXXL19/36FXXX-3(MWXX)	24	0.0280	475	19	36	0.0460	20-50 kHz
TXXL230/44FXXX-2(MWXX)	**21**	**0.0403**	**920**	**230**	**44**	**0.0523**	**400-850 kHz**
TXXL230/44FXXX-3(MWXX)	21	0.0403	920	230	44	0.0583	400-850 kHz
TXXL19/34FXXX-2(MWXX)	**22**	**0.0350**	**754**	**19**	**34**	**0.0470**	**20 kHz**
TXXL19/34FXXX-3(MWXX)	22	0.0350	754	19	34	0.0530	20 kHz
TXXL40/40FXXX-2(MWXX)	**25**	**0.0256**	**384**	**40**	**40**	**0.0376**	**100-200 kHz**
TXXL07/32FXXX-2(MWXX)	24	0.0264	448	7	32	0.0384	10 kHz

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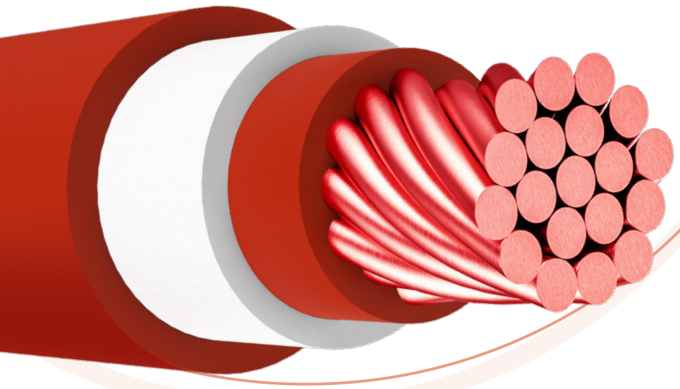
Triple Insulated

Litz Wire
ETFE INSULATION



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Department.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: Chemours Tefzel® ETFE

RATING:
TEMPERATURE: 155°C
VOLTAGE: UL: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 1000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 700 Vpk for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3) (40 AWG - 18 AWG)
IEC 61558-1, IEC 61558-2-16, 60601-1 (Ed.3), 61010-1 (Ed. 3)
VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 6500 psi

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
TXXL180/38TXXX-2(MWXX)	**16**	**0.0746**	**2880**	**180**	**38**	**0.0866**	**50 - 100 khz**
TXXL180/38TXXX-3(MWXX)	16	0.0746	2880	180	38	0.0926	50 - 100 khz
TXXL15/30TXXX-1.5(MWXX)	**19**	**0.0488**	**1500**	**15**	**30**	**0.0578**	**1 - 10 khz**
TXXL15/30TXXX-2(MWXX)	19	0.0488	1500	15	30	0.0608	1 - 10 khz
TXXL15/30TXXX-3(MWXX)	**19**	**0.0488**	**1500**	**15**	**30**	**0.0668**	**1 - 10 khz**
TXXL360/44TXXX-2(MWXX)	19	0.0504	1440	360	44	0.0624	400 - 850 khz
TXXL360/44TXXX-3(MWXX)	**19**	**0.0504**	**1440**	**360**	**44**	**0.0684**	**400 - 850 khz**
TXXL19/36TXXX-2(MWXX)	24	0.0280	475	19	36	0.0400	20 - 50 khz
TXXL19/36TXXX-3(MWXX)	**24**	**0.0280**	**475**	**19**	**36**	**0.0460**	**20 - 50 khz**
TXXL35/38TXXX-2(MWXX)	23	0.0307	560	35	38	0.0427	50 - 100 khz
TXXL35/38TXXX-3(MWXX)	**23**	**0.0307**	**560**	**35**	**38**	**0.0487**	**50 - 100 khz**
TXXL07/30TXXX-1.5(MWXX)	22	0.0327	700	7	30	0.0417	1 - 10 khz
TXXL07/30TXXX-2(MWXX)	**22**	**0.0327**	**700**	**7**	**30**	**0.0447**	**1 - 10 khz**
TXXL230/44TXXX-2(MWXX)	21	0.0403	920	230	44	0.0523	400 - 850 khz
TXXL230/44TXXX-3(MWXX)	**21**	**0.0403**	**920**	**230**	**44**	**0.0583**	**400 - 850 khz**
TXXL40/40TXXX-1.5(MWXX)	25	0.0256	384	40	40	0.0346	100 - 200 khz
TXXL40/40TXXX-2(MWXX)	**25**	**0.0256**	**384**	**40**	**40**	**0.0376**	**100 - 200 khz**
TXXL07/32TXXX-1.5(MWXX)	24	0.0264	448	7	32	0.0354	10 khz
TXXL07/32TXXX-2(MWXX)	**24**	**0.0264**	**448**	**7**	**32**	**0.0384**	**10 khz**
TXXL19/40TXXX-1.5(MWXX)	28	0.0175	183	19	40	0.0265	100 - 200 khz
TXXL19/40TXXX-2(MWXX)	**28**	**0.0175**	**183**	**19**	**40**	**0.0295**	**100 - 200 khz**
TXXL05/32TXXX-1.5(MWXX)	25	0.0238	320	5	32	0.0328	10 khz
TXXL05/32TXXX-2(MWXX)	**25**	**0.0238**	**320**	**5**	**32**	**0.0358**	**10 khz**
TXXL16/44TXXX-1.5(MWXX)	32	0.0108	64	16	44	0.0198	400 - 850 khz

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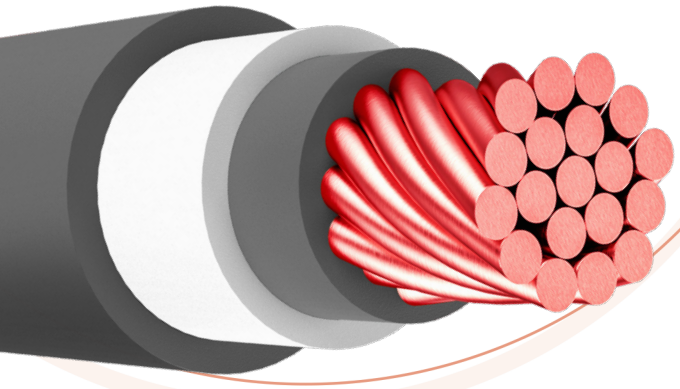
Triple Insulated

Litz Wire
TCA3



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Department.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: Modified ETFE

RATING:
TEMPERATURE: 155°C
VOLTAGE: UL: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 1000 Vpk

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3) (40 AWG - 18 AWG)
IEC 61558-1, 60601-1 (Ed. 3), 61010-1 (Ed. 3)
VDE License Nr. 40000223: Class F
SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Please request specification sheet

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
TCA3 7/30 LITZ (MWXX)	**22**	**0.0327**	**700**	**7**	**30**	**0.0417**	**1-10 kHz**
TCA3 40/40 LITZ (MWXX)	25	0.0256	384	40	40	0.0346	100-200 kHz
TCA3 7/32 LITZ (MWXX)	**24**	**0.0264**	**448**	**7**	**32**	**0.0354**	**10 kHz**
TCA3 19/40 LITZ (MWXX)	28	0.0175	183	19	40	0.0265	100-200 kHz
TCA3 5/32 LITZ (MWXX)	**25**	**0.0238**	**320**	**5**	**32**	**0.0328**	**10 kHz**
TCA3 16/44 LITZ (MWXX)	32	0.0108	64	16	44	0.0198	400-850 kHz
TCA3 150/44 LITZ (MWXX)	**23**	**0.0348**	**600**	**150**	**44**	**0.0438**	**400-850 kHz**
TCA3 09/35 LITZ (MWXX)	26	0.0215	282	9	35	0.0305	20 kHz
TCA3 135/38 LITZ (MWXX)	**17**	**0.0604**	**2160**	**135**	**38**	**0.0694**	**50-100 kHz**
TCA3 19/36 LITZ (MWXX)	24	0.0280	475	19	36	0.0370	20-50 kHz
TCA3 25/38 LITZ (MWXX)	**24**	**0.0260**	**400**	**25**	**38**	**0.0350**	**50-100 kHz**
TCA3 35/38 LITZ (MWXX)	23	0.0307	560	35	38	0.0397	50-100 kHz
TCA3 7/35 LITZ (MWXX)	**27**	**0.0189**	**220**	**7**	**35**	**0.0279**	**20 kHz**

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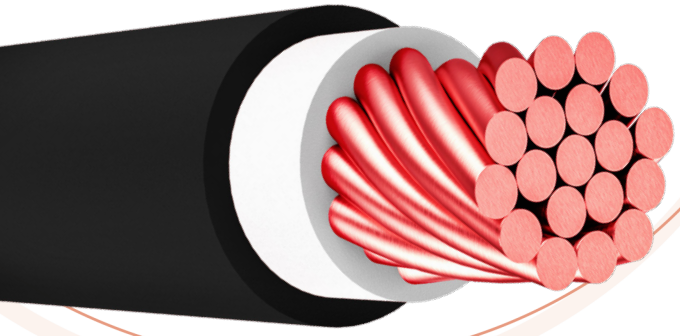
Double Insulated

Litz Wire
FEP INSULATION



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Department.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:

UL OBJT2 File No. E206198

UL/IEC 60950-1 (Ed. 2), Annex U

VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 3000 psi

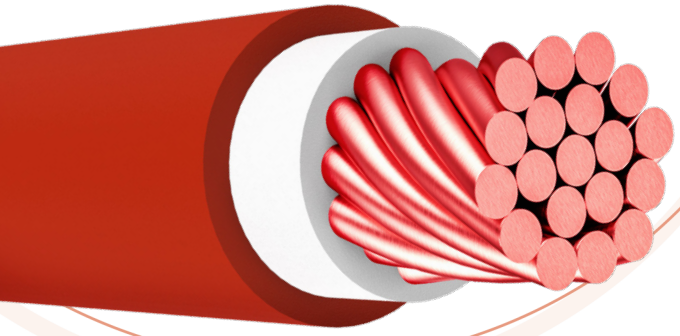
BREAKDOWN: Please request specification sheet

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
DXXL825/44FXX-3(MWXX)	**15**	**0.0817**	**3300**	**825**	**44**	**0.0937**	**400 - 850 khz**
DXXL120/38FXX-2(MWXX)	18	0.0569	1920	120	38	0.0649	50 - 100 khz
DXXL120/38FXX-3(MWXX)	**18**	**0.0569**	**1920**	**120**	**38**	**0.0689**	**50 - 100 khz**
DXXL550/44FXX-2(MWXX)	17	0.0623	2200	550	44	0.0703	400 - 850 khz
DXXL550/44FXX-3(MWXX)	**17**	**0.0623**	**2200**	**550**	**44**	**0.0743**	**400 - 850 khz**
DXXL100/38FXX-2(MWXX)	18	0.0520	1600	100	38	0.0600	50 - 100 khz
DXXL100/38FXX-3(MWXX)	**18**	**0.0520**	**1600**	**100**	**38**	**0.0640**	**50 - 100 khz**
DXXL07/28FXX-2(MWXX)	20	0.0411	1111	7	28	0.0491	60 hz - 1 khz
DXXL07/28FXX-3(MWXX)	**20**	**0.0411**	**1111**	**7**	**28**	**0.0531**	**60 hz - 1 khz**
DXXL66/38FXX-2(MWXX)	20	0.0422	1056	66	38	0.0502	50 - 100 khz
DXXL66/38FXX-3(MWXX)	**20**	**0.0422**	**1056**	**66**	**38**	**0.0542**	**50 - 100 khz**
DXXL360/44FXX-2(MWXX)	19	0.0504	1440	360	44	0.0584	400 - 850 khz
DXXL360/44FXX-3(MWXX)	**19**	**0.0504**	**1440**	**360**	**44**	**0.0624**	**400 - 850 khz**
DXXL20/34FXX-2(MWXX)	22	0.0372	794	20	34	0.0452	20 khz
DXXL20/34FXX-3(MWXX)	**22**	**0.0372**	**794**	**20**	**34**	**0.0492**	**20 khz**
DXXL07/30FXX-2(MWXX)	22	0.0327	700	7	30	0.0407	1 - 10 khz
DXXL07/30FXX-3(MWXX)	**22**	**0.0327**	**700**	**7**	**30**	**0.0447**	**1 - 10 khz**
DXXL19/36FXX-2(MWXX)	24	0.0280	475	19	36	0.0360	20 - 50 khz
DXXL19/36FXX-3(MWXX)	**24**	**0.0280**	**475**	**19**	**36**	**0.0400**	**20 - 50 khz**
DXXL07/32FXX-2(MWXX)	24	0.0264	448	7	32	0.0344	10 khz
DXXL07/32FXX-3(MWXX)	**24**	**0.0264**	**448**	**7**	**32**	**0.0384**	**10 khz**
DXXL40/40FXX-2(MWXX)	25	0.0256	384	40	40	0.0336	100 - 200 khz
DXXL230/44FXX-2(MWXX)	**21**	**0.0403**	**920**	**230**	**44**	**0.0483**	**400 - 850 khz**

PLEASE NOTE: *LITZ CONDUCTOR DIAMETERS CAN VARY BY SUPPLIER, PLEASE REQUEST A SPECIFICATION SHEET TO ENSURE THE DIAMETER WILL MEET YOUR APPLICATION REQUIREMENT(S). Due to fluctuations inherent in litz wire construction, all sizes are approximate. Please advise our Sales Department of any special requirements or tolerances.*

Double Insulated

Litz Wire
ETFE INSULATION



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Departement.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** UL: 600 Vpk

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:

UL OBJT2 File No. E206198

UL/IEC 60950-1 (Ed. 2), Annex U

UL 60601-1 (Ed. 3), IEC 61558-2-16

VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 6500 psi

BREAKDOWN: Please request specification sheet

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
DXXL825/44TXX-3(MWXX)	**15**	**0.0817**	**3300**	**825**	**44**	**0.0937**	**400 - 850 khz**
DXXL120/38TXX-2(MWXX)	18	0.0569	1920	120	38	0.0649	50 - 100 khz
DXXL120/38TXX-3(MWXX)	**18**	0.0569	**1920**	**120**	**38**	**0.0689**	**50 - 100 khz**
DXXL550/44TXX-2(MWXX)	17	0.0623	2200	550	44	0.0703	400 - 850 khz
DXXL550/44TXX-3(MWXX)	**17**	**0.0623**	**2200**	**550**	**44**	**0.0743**	**400 - 850 khz**
DXXL100/38TXX-2(MWXX)	18	0.0520	1600	100	38	0.0600	50 - 100 khz
DXXL100/38TXX-3(MWXX)	**18**	**0.0520**	**1600**	**100**	**38**	**0.0640**	**50 - 100 khz**
DXXL07/28TXX-2(MWXX)	20	0.0411	1111	7	28	0.0491	60 hz - 1 khz
DXXL07/28TXX-3(MWXX)	**20**	**0.0411**	**1111**	**7**	**28**	**0.0531**	**60 hz - 1 khz**
DXXL66/38TXX-2(MWXX)	20	0.0422	1056	66	38	0.0502	50 - 100 khz
DXXL66/38TXX-3(MWXX)	**20**	**0.0422**	**1056**	**66**	**38**	**0.0542**	**50 - 100 khz**
DXXL360/44TXX-2(MWXX)	19	0.0504	1440	360	44	0.0584	400 - 850 khz
DXXL360/44TXX-3(MWXX)	**19**	**0.0504**	**1440**	**360**	**44**	**0.0624**	**400 - 850 khz**
DXXL20/34TXX-2(MWXX)	22	0.0372	794	20	34	0.0452	20 khz
DXXL20/34TXX-3(MWXX)	**22**	**0.0372**	**794**	**20**	**34**	**0.0492**	**20 khz**
DXXL07/30TXX-2(MWXX)	22	0.0327	700	7	30	0.0407	1 - 10 khz
DXXL07/30TXX-3(MWXX)	**22**	**0.0327**	**700**	**7**	**30**	**0.0447**	**1 - 10 khz**
DXXL19/36TXX-2(MWXX)	24	0.0280	475	19	36	0.0360	20 - 50 khz
DXXL19/36TXX-3(MWXX)	**24**	**0.0280**	**475**	**19**	**36**	**0.0400**	**20 - 50 khz**
DXXL07/32TXX-2(MWXX)	24	0.0264	448	7	32	0.0344	10 khz
DXXL07/32TXX-3(MWXX)	**24**	**0.0264**	**448**	**7**	**32**	**0.0384**	**10 khz**
DXXL40/40TXX-2(MWXX)	25	0.0256	384	40	40	0.0336	100 - 200 khz
DXXL230/44TXX-2(MWXX)	**21**	**0.0403**	**920**	**230**	**44**	**0.0483**	**400 - 850 khz**
DXXL05/32TXX-2(MWXX)	25	0.0238	320	5	32	0.0318	10 khz

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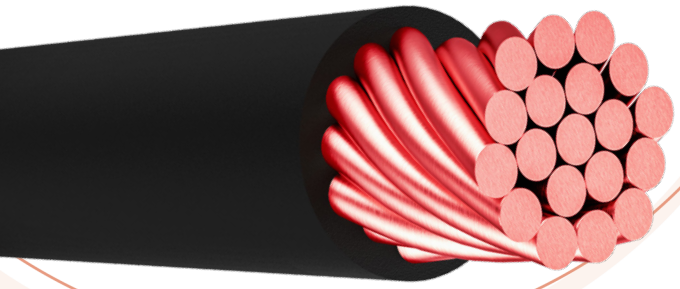
Single Insulated

Litz Wire
FEP INSULATION



Product Construction:

SIZE RANGE: Sizes listed are a small sample of the litz products offered. Contact the Sales Department.

CONDUCTOR: NEMA MW 79-C | NEMA MW 80-C

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS: High frequency applications. See litz wire introduction page.

COMPLIANCES:

UL OBJT2 File No. E260198

UL 60950-1 (ed. 2), Annex U

SYSTEM APPROVALS: UL 1446
- RXT-2 (Class F)
- TCA (Class F)
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 3000 psi

BREAKDOWN: Please request specification sheet

PART NUMBER	EQUIV. AWG	CORE O.D. (in)	CIR. MILS	NO. STRANDS	AWG OF STRANDS	NOMINAL O.D.(in)	SUGGESTED OPERATING FREQUENCY
SXXL825/44FX-3(MWXX)	**15**	**0.0817**	**3300**	**825**	**44**	**0.0877**	**400-850 khz**
SXXL120/38FX-3(MWXX)	18	0.0569	1920	120	38	0.0629	50-100 khz
SXXL550/44FX-3(MWXX)	**17**	**0.0623**	**2200**	**550**	**44**	**0.0683**	**400-850 khz**
SXXL100/38FX-3(MWXX)	18	0.0520	1600	100	38	0.0580	50-100 khz
SXXL07/28FX-2(MWXX)	**20**	**0.0411**	**1111**	**7**	**28**	**0.0451**	**60hz-1 khz**
SXXL07/28FX-3(MWXX)	20	0.0411	1111	7	28	0.0471	60hz-1 khz
SXXL66/38FX-2(MWXX)	**20**	**0.0422**	**1056**	**66**	**38**	**0.0462**	**50-100 khz**
SXXL66/38FX-3(MWXX)	20	0.0422	1056	66	38	0.0482	50-100 khz
SXXL360/44FX-3(MWXX)	**19**	**0.0504**	**1440**	**360**	**44**	**0.0564**	**400-850 khz**
SXXL20/34FX-2(MWXX)	22	0.0372	794	2	34	0.0412	20 khz
SXXL20/34FX-3(MWXX)	**22**	**0.0372**	**794**	**2**	**34**	**0.0432**	**20 khz**
SXXL07/30FX-2(MWXX)	22	0.0327	700	7	30	0.0367	1-10 khz
SXXL07/30FX-3(MWXX)	**22**	**0.0327**	**700**	**7**	**30**	**0.0387**	**1-10 khz**
SXXL19/36FX-2(MWXX)	24	0.0280	475	19	36	0.0320	20-50 khz
SXXL19/36FX-3(MWXX)	**24**	**0.0280**	**475**	**1**	**36**	**0.0340**	**20-50 khz**
SXXL07/32FX-2(MWXX)	24	0.0264	448	7	32	0.0304	10 khz
SXXL07/32FX-3(MWXX)	**24**	**0.0264**	**448**	**7**	**32**	**0.0324**	**10 khz**
SXXL40/40FX-2(MWXX)	25	0.0256	384	40	40	0.0296	100-200 khz
SXXL230/44FX-3(MWXX)	**21**	**0.0403**	**920**	**230**	**44**	**0.0463**	**400-850 khz**

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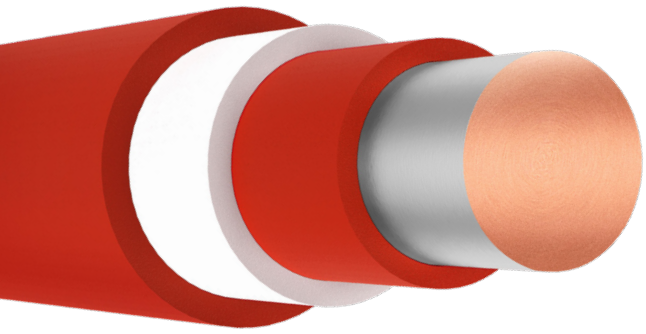
Triple Insulated Wire

RUBADUE WIRE WAS THE FIRST COMPANY TO DESIGN AND MANUFACTURE TRIPLE INSULATED WIRES. Triple insulated wires can be used to meet several design requirements:

- Wind directly on top of magnet wire
- Wind bobbin wall to wall
- Use as primary or secondary winding
- Meet creepage and clearance requirements
- High voltage
- Applications requiring reinforced isolation
- Ground insulation in UL 1446 systems
- Leakage or loss reduction
- Transformer leadout between circuits
- Reduced space, volume, weight
- Increased safety
- High speed winding capable

Triple insulated wires can be manufactured in a variety of types, sizes, insulations, ratings, and colors.

Triple Insulated ETFE .001" / Layer



Chemours Tefzel® ETFE: *Fluoropolymer compound with excellent electrical properties, heat resistance, chemical resistance, and abrasion resistance.*

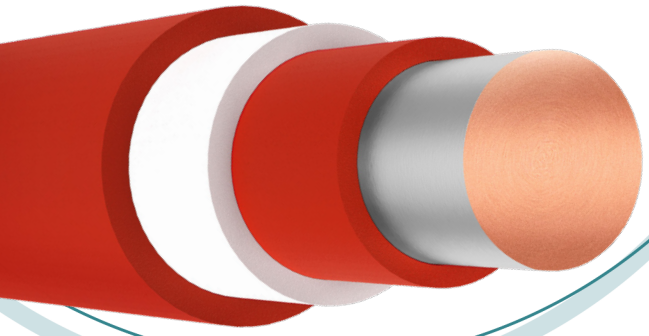
TCA - MODIFIED ETFE: *Designed for more economical /efficient manufacturing. Comes standard in one color, most sizes readily available.*

CHEMOURS TEFLON® FEP: *Fluoropolymer compound with exceptional dielectric properties, heat resistance, chemical resistance, and flexibility.*

CHEMOURS TEFLON® PFA: *Fluoropolymer compound with superior heat resistance, exceptional dielectric properties, and chemical resistance.*

Triple Insulated

Chemours
TEFZEL® ETFE .001"/LAYER



Product Construction:

SIZE RANGE: 20 AWG - 40 AWG

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 1000 Vpk

APPLICATIONS:
Thinnest TIW on the market
Size/Safety critical reinforced isolation
Pulse and signal transformers

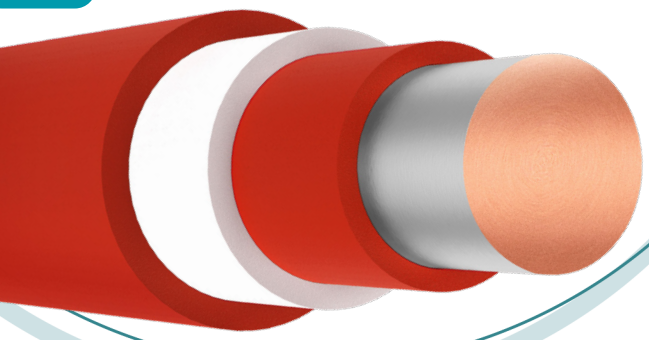
COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 4500 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T20A01TXXX-1	**20**	**0.0320**	**0.813**	**0.0380**	**0.965**	**3.33**
T21A01TXXX-1	21	0.0285	0.724	0.0345	0.876	2.68
T22A01TXXX-1	**22**	**0.0253**	**0.643**	**0.0313**	**0.795**	**2.14**
T23A01TXXX-1	23	0.0226	0.574	0.0286	0.726	1.73
T24A01TXXX-1	**24**	**0.0201**	**0.511**	**0.0261**	**0.663**	**1.38**
T25A01TXXX-1	25	0.0179	0.455	0.0239	0.607	1.12
T26A01TXXX-1	**26**	**0.0159**	**0.404**	**0.0219**	**0.556**	**0.90**
T27A01TXXX-1	27	0.0142	0.361	0.0202	0.513	0.73
T28A01TXXX-1	**28**	**0.0126**	**0.320**	**0.0186**	**0.472**	**0.59**
T29A01TXXX-1	29	0.0113	0.287	0.0173	0.439	0.49
T30A01TXXX-1	**30**	**0.0100**	**0.254**	**0.0160**	**0.406**	**0.39**
T31A01TXXX-1	31	0.0089	0.226	0.0149	0.378	0.32
T32A01TXXX-1	**32**	**0.0080**	**0.203**	**0.0140**	**0.356**	**0.27**
T33A01TXXX-1	33	0.0071	0.180	0.0131	0.333	0.22
T34A01TXXX-1	**34**	**0.0063**	**0.160**	**0.0123**	**0.312**	**0.18**
T35A01TXXX-1	35	0.0056	0.142	0.0116	0.295	0.15
T36A01TXXX-1	**36**	**0.0050**	**0.127**	**0.0110**	**0.279**	**0.13**
T37A01TXXX-1	37	0.0045	0.114	0.0105	0.267	0.11
T38A01TXXX-1	**38**	**0.0040**	**0.102**	**0.0100**	**0.254**	**0.10**
T39A01TXXX-1	39	0.0035	0.089	0.0095	0.241	0.08
T40A01TXXX-1	**40**	**0.0031**	**0.079**	**0.0091**	**0.231**	**0.07**

Triple Insulated

Chemours
TEFZEL® ETFE .0015"/LAYER



Product Construction:

SIZE RANGE: 14 AWG – 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C
VOLTAGE: UL/VDE: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 1,000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 700 Vpk for medical equipment
VDE: 1000 Vpk for other certifications

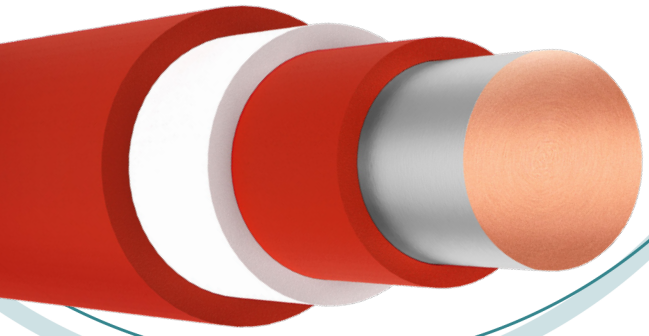
APPLICATIONS:
High power flyback converter for LED
PDA's/Lighting
Medical/Dental/Electronic

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
UL 60601-1 (Ed. 3)
IEC 61558-1, IEC 61558-2-16, 60601-1(Ed. 3), 61010-1(Ed. 3)
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• TCA Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 7000 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
T14A01TXXX-1.5	**14**	**0.0641**	**1.628**	**0.0731**	**1.857**	**13.15**
T16A01TXXX-1.5	16	0.0508	1.290	0.0598	1.519	8.39
T18A01TXXX-1.5	**18**	**0.0403**	**1.024**	**0.0493**	**1.252**	**5.39**
T20A01TXXX-1.5	20	0.0320	0.813	0.0410	1.041	3.47
T21A01TXXX-1.5	**21**	**0.0285**	**0.724**	**0.0375**	**0.953**	**2.80**
T22A01TXXX-1.5	22	0.0253	0.643	0.0343	0.871	2.25
T23A01TXXX-1.5	**23**	**0.0226**	**0.574**	**0.0316**	**0.803**	**1.83**
T24A01TXXX-1.5	24	0.0201	0.511	0.0291	0.739	1.48
T25A01TXXX-1.5	**25**	**0.0179**	**0.455**	**0.0269**	**0.683**	**1.20**
T26A01TXXX-1.5	26	0.0159	0.404	0.0249	0.632	0.98
T27A01TXXX-1.5	**27**	**0.0142**	**0.361**	**0.0232**	**0.589**	**0.80**
T28A01TXXX-1.5	28	0.0126	0.320	0.0216	0.549	0.66
T29A01TXXX-1.5	**29**	**0.0113**	**0.287**	**0.0203**	**0.516**	**0.55**
T30A01TXXX-1.5	30	0.0100	0.254	0.0190	0.483	0.45
T31A01TXXX-1.5	**31**	**0.0089**	**0.226**	**0.0179**	**0.455**	**0.38**
T32A01TXXX-1.5	32	0.0080	0.203	0.0170	0.432	0.32
T33A01TXXX-1.5	**33**	**0.0071**	**0.180**	**0.0161**	**0.409**	**0.27**
T34A01TXXX-1.5	34	0.0063	0.160	0.0153	0.389	0.23
T35A01TXXX-1.5	**35**	**0.0056**	**0.142**	**0.0146**	**0.371**	**0.20**
T36A01TXXX-1.5	36	0.0050	0.127	0.0140	0.356	0.17
T37A01TXXX-1.5	**37**	**0.0045**	**0.114**	**0.0135**	**0.343**	**0.16**
T38A01TXXX-1.5	38	0.0040	0.102	0.0130	0.330	0.14
T39A01TXXX-1.5	**39**	**0.0035**	**0.089**	**0.0125**	**0.318**	**0.12**
T40A01TXXX-1.5	40	0.0031	0.079	0.0121	0.307	0.11

Triple Insulated

Chemours
TEFZEL® ETFE .002"/LAYER



Product Construction:

SIZE RANGE: 10 AWG – 36 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C
VOLTAGE: UL/VDE: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 1,000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 700 Vpk for medical equipment
VDE: 1000 Vpk for other certifications

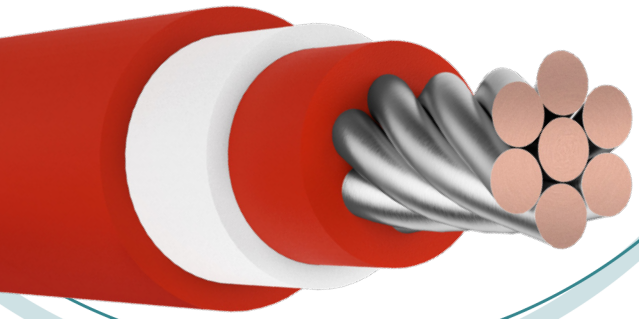
APPLICATIONS:
Patient connected devices
Renewable energy applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61558-1, IEC 61558-2-16, 60601-1 (Ed. 3), 61010-1 (Ed. 3)
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• TCA Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 9000 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
T10A01TXXX-2	**10**	**0.1019**	**2.588**	**0.1139**	**2.893**	**32.93**
T12A01TXXX-2	12	0.0808	2.052	0.0928	2.357	20.97
T14A01TXXX-2	**14**	**0.0641**	**1.628**	**0.0761**	**1.933**	**13.41**
T16A01TXXX-2	16	0.0508	1.290	0.0628	1.595	8.60
T17A01TXXX-2	**17**	**0.0453**	**1.151**	**0.0573**	**1.455**	**6.92**
T18A01TXXX-2	18	0.0403	1.024	0.0523	1.328	5.56
T19A01TXXX-2	**19**	**0.0359**	**0.912**	**0.0479**	**1.217**	**4.48**
T20A01TXXX-2	20	0.0320	0.813	0.0440	1.118	3.62
T21A01TXXX-2	**21**	**0.0285**	**0.724**	**0.0405**	**1.029**	**2.94**
T22A01TXXX-2	22	0.0253	0.643	0.0373	0.947	2.37
T23A01TXXX-2	**23**	**0.0226**	**0.574**	**0.0346**	**0.879**	**1.95**
T24A01TXXX-2	24	0.0201	0.511	0.0321	0.815	1.58
T25A01TXXX-2	**25**	**0.0179**	**0.455**	**0.0299**	**0.759**	**1.30**
T26A01TXXX-2	26	0.0159	0.404	0.0279	0.709	1.07
T27A01TXXX-2	**27**	**0.0142**	**0.361**	**0.0262**	**0.665**	**0.89**
T28A01TXXX-2	28	0.0126	0.320	0.0246	0.625	0.74
T29A01TXXX-2	**29**	**0.0113**	**0.287**	**0.0233**	**0.592**	**0.63**
T30A01TXXX-2	30	0.0100	0.254	0.0220	0.559	0.53
T31A01TXXX-2	**31**	**0.0089**	**0.226**	**0.0209**	**0.531**	**0.45**
T32A01TXXX-2	32	0.0080	0.203	0.0200	0.508	0.39
T33A01TXXX-2	**33**	**0.0071**	**0.180**	**0.0191**	**0.485**	**0.33**
T34A01TXXX-2	34	0.0063	0.160	0.0183	0.465	0.29
T35A01TXXX-2	**35**	**0.0056**	**0.142**	**0.0176**	**0.447**	**0.26**
T36A01TXXX-2	36	0.0050	0.127	0.0170	0.432	0.23

Triple Insulated

Chemours
TEFZEL® ETFE .003"/LAYER



Product Construction:

SIZE RANGE: UL: 10 AWG – 32 AWG
VDE: 8 AWG – 32 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C

VOLTAGE: UL/VDE: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 1,000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 700 Vpk for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS: Xenon arc lamps
Lighting (CCFL)
Medical/Power supply

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61558-1, IEC 61558-2-16, UL/
IEC 60601-1 (Ed. 3), 61010-1(Ed. 3)
VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

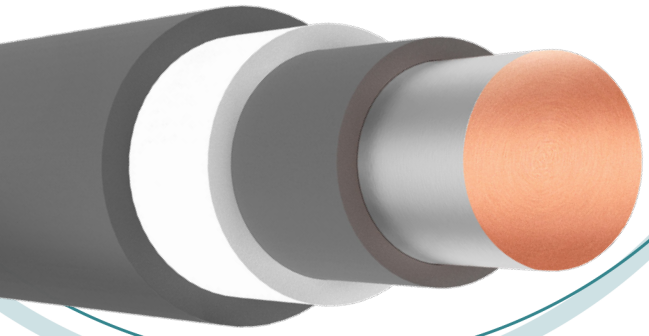
TENSILE STRENGTH: 6500 psi

BREAKDOWN: Approx. 13000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A01TXXX-3	**10**	**0.1019**	**2.588**	**0.1199**	**3.045**	**33.74**
T10A37TXXX-3	10(37/26)	0.1070	2.718	0.1250	3.175	31.30
T12A01TXXX-3	**12**	**0.0808**	**2.052**	**0.0988**	**2.510**	**21.67**
T12A19TXXX-3	12(19/25)	0.0862	2.189	0.1042	2.647	20.78
T14A01TXXX-3	**14**	**0.0641**	**1.628**	**0.0821**	**2.085**	**13.92**
T14A19TXXX-3	14(19/27)	0.0679	1.725	0.0859	2.182	13.40
T16A01TXXX-3	**16**	**0.0508**	**1.290**	**0.0688**	**1.748**	**9.06**
T16A19TXXX-3	16(19/29)	0.0539	1.369	0.0719	1.826	8.77
T18A01TXXX-3	**18**	**0.0403**	**1.024**	**0.0583**	**1.481**	**5.95**
T18A19TXXX-3	18(19/30)	0.0476	1.209	0.0656	1.666	7.05
T20A01TXXX-3	**20**	**0.0320**	**0.813**	**0.0500**	**1.270**	**3.94**
T20A19TXXX-3	20(19/32)	0.0385	0.978	0.0565	1.435	4.74
T22A01TXXX-3	**22**	**0.0253**	**0.643**	**0.0433**	**1.100**	**2.65**
T22A19TXXX-3	22(19/34)	0.0295	0.749	0.0475	1.207	3.13
T24A01TXXX-3	**24**	**0.0201**	**0.511**	**0.0381**	**0.968**	**1.83**
T24A19TXXX-3	24(19/36)	0.0242	0.615	0.0422	1.072	2.16
T26A01TXXX-3	**26**	**0.0159**	**0.404**	**0.0339**	**0.861**	**1.28**
T28A01TXXX-3	28	0.0126	0.320	0.0306	0.777	0.93
T30A01TXXX-3	**30**	**0.0100**	**0.254**	**0.0280**	**0.711**	**0.70**
T32A01TXXX-3	32	0.0080	0.203	0.0260	0.660	0.55

Triple Insulated

TCA3



Product Construction:

SIZE RANGE: 14 AWG – 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Modified ETFE

RATING: **TEMPERATURE:** 155°C
VOLTAGE: UL/VDE: 1500 Vpk for electronic equipment
UL: 707 Vrms for medical equipment
VDE: 700 Vpk for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS: Various SMPS products
Electronic/Medical/Dental

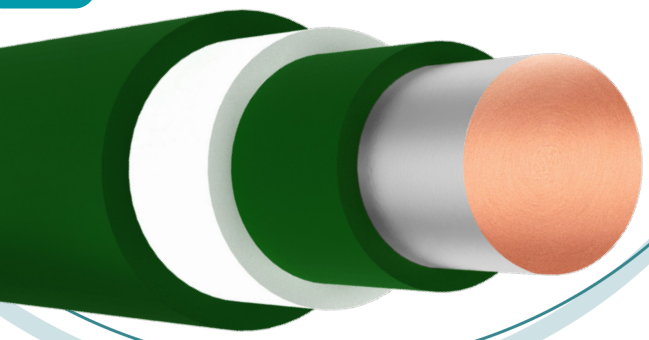
COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61558-2-16, 60601-1 (Ed. 3), 61010-1 (Ed. 3)
VDE License Nr. 40000223: Class F
SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 7000 V
TCA3 products come standard in Gray

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
TCA3 18 AWG	**18**	**0.0403**	**1.024**	**0.0493**	**1.252**	**5.39**
TCA3 19 AWG	19	0.0359	0.912	0.0449	1.140	4.32
TCA3 20 AWG	**20**	**0.0320**	**0.813**	**0.0410**	**1.041**	**3.47**
TCA3 21 AWG	21	0.0285	0.724	0.0375	0.953	2.80
TCA3 22 AWG	**22**	**0.0253**	**0.643**	**0.0343**	**0.871**	**2.25**
TCA3 23 AWG	23	0.0226	0.574	0.0316	0.803	1.83
TCA3 24 AWG	**24**	**0.0201**	**0.510**	**0.0291**	**0.739**	**1.48**
TCA3 25 AWG	25	0.0179	0.455	0.0269	0.683	1.20
TCA3 26 AWG	**26**	**0.0159**	**0.404**	**0.0249**	**0.632**	**0.98**
TCA3 27 AWG	27	0.0142	0.361	0.0232	0.589	0.80
TCA3 28 AWG	**28**	**0.0126**	**0.320**	**0.0216**	**0.549**	**0.66**
TCA3 29 AWG	29	0.0113	0.287	0.0203	0.516	0.55
TCA3 30 AWG	**30**	**0.0100**	**0.254**	**0.0190**	**0.483**	**0.45**
TCA3 31 AWG	31	0.0089	0.226	0.0179	0.455	0.38
TCA3 32 AWG	**32**	**0.0080**	**0.203**	**0.0170**	**0.432**	**0.32**
TCA3 33 AWG	33	0.0071	0.180	0.0161	0.409	0.27
TCA3 34 AWG	**34**	**0.0063**	**0.160**	**0.0153**	**0.389**	**0.23**
TCA3 35 AWG	35	0.0056	0.142	0.0146	0.371	0.20
TCA3 36 AWG	**36**	**0.0050**	**0.127**	**0.0140**	**0.356**	**0.17**
TCA3 37 AWG	37	0.0045	0.114	0.0135	0.343	0.16
TCA3 38 AWG	**38**	**0.0040**	**0.102**	**0.0130**	**0.330**	**0.14**
TCA3 39 AWG	39	0.0035	0.089	0.0125	0.318	0.12
TCA3 40 AWG	**40**	**0.0031**	**0.079**	**0.0121**	**0.307**	**0.11**

Triple Insulated

FEP .002"/LAYER



Product Construction:

SIZE RANGE: 10 AWG - 36 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 1000 Vpk

APPLICATIONS: AC/DC adaptors
Electronic/Medical/Dental

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61010-1 (Ed. 3)
VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

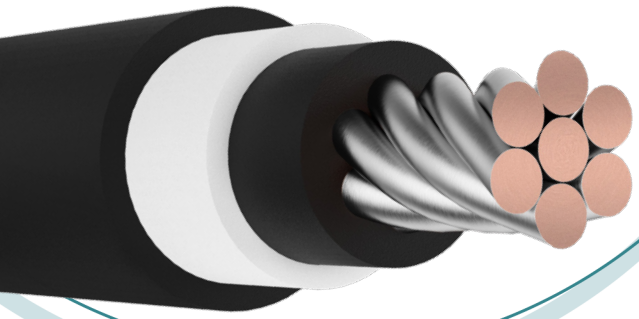
TENSILE STRENGTH: 3000 psi

BREAKDOWN: Approx. 9000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A37FXXX-2	10 (37/26)	0.1070	2.718	0.1190	3.023	30.19
T12A19FXXX-2	12 (19/25)	0.0862	2.189	0.0982	2.494	19.97
T14A19FXXX-2	14 (19/27)	0.0679	1.725	0.0799	2.029	13.07
T16A01FXXX-2	16	0.0508	1.290	0.0628	1.595	8.81
T16A19FXXX-2	16 (19/29)	0.0539	1.369	0.0659	1.674	8.31
T18A01FXXX-2	18	0.0403	1.024	0.0523	1.328	5.75
T18A19FXXX-2	18(19/30)	0.0476	1.209	0.0596	1.514	6.83
T20A01FXXX-2	20	0.0320	0.813	0.0440	1.118	3.77
T20A19FXXX-2	20(19/32)	0.0385	0.978	0.0505	1.283	4.55
T22A01FXXX-2	22	0.0253	0.643	0.0373	0.947	2.50
T22A19FXXX-2	22(19/34)	0.0295	0.749	0.0415	1.054	2.97
T24A01FXXX-2	24	0.0201	0.511	0.0321	0.815	1.69
T24A19FXXX-2	24(19/36)	0.0242	0.615	0.0362	0.919	2.01
T25A01FXXX-2	25	0.0179	0.455	0.0299	0.759	1.40
T26A01FXXX-2	26	0.0159	0.404	0.0279	0.709	1.16
T27A01FXXX-2	27	0.0142	0.361	0.0262	0.665	0.97
T28A01FXXX-2	28	0.0126	0.320	0.0246	0.625	0.82
T29A01FXXX-2	29	0.0113	0.287	0.0233	0.592	0.70
T30A01FXXX-2	30	0.0100	0.254	0.0220	0.559	0.59
T31A01FXXX-2	31	0.0089	0.226	0.0209	0.531	0.51
T32A01FXXX-2	32	0.0080	0.203	0.0200	0.508	0.45
T33A01FXXX-2	33	0.0071	0.180	0.0191	0.485	0.39
T34A01FXXX-2	34	0.0063	0.160	0.0183	0.465	0.34
T35A01FXXX-2	35	0.0056	0.142	0.0176	0.447	0.30
T36A01FXXX-2	36	0.0050	0.127	0.0170	0.432	0.27

Triple Insulated

FEP .003"/LAYER



Product Construction:

SIZE RANGE: 10 AWG - 36 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 1000 Vpk

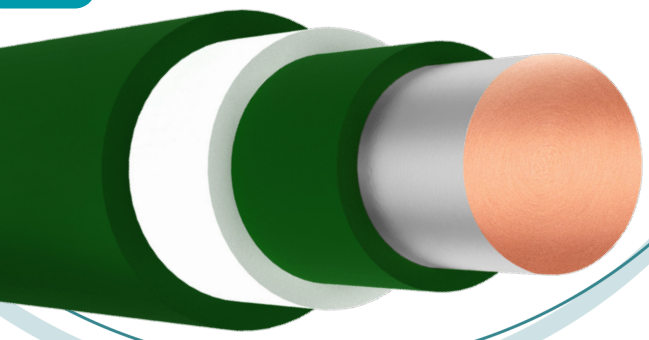
APPLICATIONS: Power Supply/Transformer

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61010-1 (Ed. 3)
VDE License Nr. 6715: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• TCA Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 3000 psi
BREAKDOWN: Approx. 12000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A37FXXX-3	**10(37/26)**	**0.1070**	**2.718**	**0.1250**	**3.175**	**32.01**
T12A19FXXX-3	12(19/25)	0.0862	2.189 0	.1042	2.647	21.37
T14A19FXXX-3	**14(19/27)**	**0.0679**	**1.725**	**0.0859**	**2.182**	**13.88**
T16A01FXXX-3	16	0.0508	1.290	0.0688	1.748	9.42
T16A19FXXX-3	**16(19/29)**	**0.0539**	**1.369**	**0.0719**	**1.826**	**9.19**
T18A01FXXX-3	18	0.0403	1.024	0.0583	1.481	6.25
T18A19FXXX-3	**18(19/30)**	**0.0476**	**1.209**	**0.0656**	**1.666**	**7.40**
T20A01FXXX-3	20	0.0320	0.813	0.0500	1.270	4.20
T20A19FXXX-3	**20(19/32)**	**0.0385**	**0.978**	**0.0565**	**1.435**	**5.03**
T22A01FXXX-3	22	0.0253	0.643	0.0433	1.100	2.87
T22A19FXXX-3	**22(19/34)**	**0.0295**	**0.749**	**0.0475**	**1.207**	**3.37**
T24A01FXXX-3	24	0.0201	0.511	0.0381	0.968	2.01
T24A19FXXX-3	**24(19/36)**	**0.0242**	**0.615**	**0.0422**	**1.072**	**2.37**
T26A01FXXX-3	26	0.0159	0.404	0.0339	0.861	1.44
T26A19FXXX-3	**26(19/38)**	**0.0190**	**0.483**	**0.0370**	**0.940**	**1.65**
T28A01FXXX-3	28	0.0126	0.320	0.0306	0.777	1.06
T28A19FXXX-3	**28(19/40)**	**0.0152**	**0.386**	**0.0332**	**0.843**	**1.22**
T30A01FXXX-3	30	0.0100	0.254	0.0280	0.711	0.82

Triple Insulated

FEP .005"/LAYER



Product Construction:

SIZE RANGE: 10 AWG - 28 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 1000 Vpk

APPLICATIONS:
Battery charger
Power supply lead outs

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61010-1 (Ed. 3)
VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

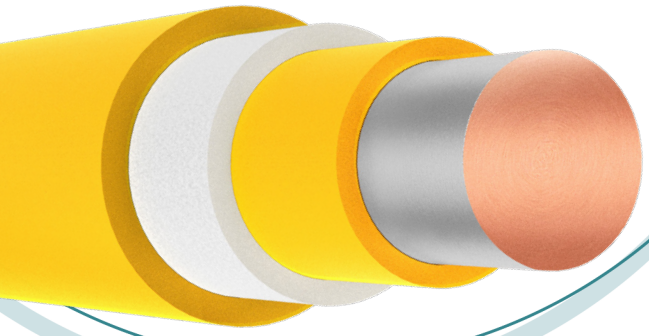
TENSILE STRENGTH: 3000 psi

BREAKDOWN: Approx. 15000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A37FXXX-5	**10(37/26)**	**0.1070**	**2.718**	**0.1370**	**3.480**	**34.37**
T12A19FXXX-5	12(19/25)	0.0862	2.189	0.1162	2.951	23.35
T14A19FXXX-5	**14(19/27)**	**0.0679**	**1.725**	**0.0979**	**2.487**	**15.53**
T16A01FXXX-5	16	0.0508	1.290	0.0808	2.052	10.77
T16A19FXXX-5	**16(19/29)**	**0.0539**	**1.369**	**0.0839**	**2.131**	**10.59**
T18A01FXXX-5	18	0.0403	1.024	0.0703	1.786	7.41
T18A19FXXX-5	**18(19/30)**	**0.0476**	**1.209**	**0.0776**	**1.971**	**8.69**
T20A01FXXX-5	20	0.0320	0.813	0.0620	1.575	5.21
T20A19FXXX-5	**20(19/32)**	**0.0385**	**0.978**	**0.0685**	**1.740**	**6.16**
T22A01FXXX-5	22	0.0253	0.643	0.0553	1.405	3.75
T22A19FXXX-5	**22(19/34)**	**0.0295**	**0.749**	**0.0595**	**1.511**	**4.33**
T24A01FXXX-5	24	0.0201	0.511	0.0501	1.273	2.80
T24A19FXXX-5	**24(19/36)**	**0.0242**	**0.615**	**0.0542**	**1.377**	**3.23**
T26A01FXXX-5	26	0.0159	0.404	0.0459	1.166	2.16
T26A19FXXX-5	**26(19/38)**	**0.0190**	**0.483**	**0.0490**	**1.245**	**2.42**
T28A01FXXX-5	28	0.0126	0.320	0.0426	1.082	.72
T28A19FXXX-5	**28(19/40)**	**0.0152**	**0.386**	**0.0452**	**1.148**	**1.93**

Triple Insulated

PFA .0015"/LAYER



Product Construction:

SIZE RANGE: UL: 10 AWG - 40 AWG
VDE: 14 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C

VOLTAGE: UL/VDE: 1000 Vpk for electronic equipment
VDE: 1000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 600 Vrms for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS:
High temp power supplies
Medical equipment
Transformers

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
VDE License Nr. 6716: Class H
IEC 61558-1, IEC 61010-1 (Ed. 3), 61558-2-16, 60601-1 (Ed. 3)
RoHS Compliant

SYSTEM APPROVALS: UL 1446
Information provided upon request

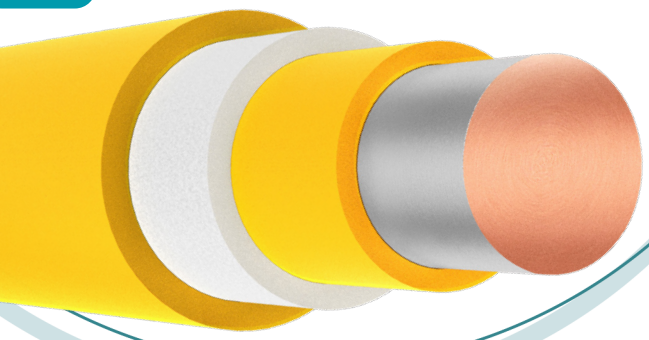
TENSILE STRENGTH: 3600 psi

BREAKDOWN: Approx. 8000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T16A01PXXX-1.5	**16**	**0.0508**	**1.290**	**0.0598**	**1.519**	**8.56**
T17A01PXXX-1.5	17	0.0453	1.151	0.0543	1.379	6.88
T18A01PXXX-1.5	**18**	**0.0403**	**1.024**	**0.0493**	**1.252**	**5.52**
T19A01PXXX-1.5	19	0.0359	0.912	0.0449	1.140	4.45
T20A01PXXX-1.5	**20**	**0.0320**	**0.813**	**0.0410**	**1.041**	**3.58**
T21A01PXXX-1.5	21	0.0285	0.724	0.0375	0.953	2.91
T22A01PXXX-1.5	**22**	**0.0253**	**0.643**	**0.0343**	**0.871**	**2.34**
T23A01PXXX-1.5	23	0.0226	0.574	0.0316	0.803	1.92
T24A01PXXX-1.5	**24**	**0.0201**	**0.511**	**0.0291**	**0.739**	**1.55**
T25A01PXXX-1.5	25	0.0179	0.455	0.0269	0.683	1.27
T26A01PXXX-1.5	**26**	**0.0159**	**0.404**	**0.0249**	**0.632**	**1.04**
T27A01PXXX-1.5	27	0.0142	0.361	0.0232	0.589	0.86
T28A01PXXX-1.5	**28**	**0.0126**	**0.320**	**0.0216**	**0.549**	**0.71**
T29A01PXXX-1.5	29	0.0113	0.287	0.0203	0.516	0.60
T30A01PXXX-1.5	**30**	**0.0100**	**0.254**	**0.0190**	**0.483**	**0.50**
T31A01PXXX-1.5	31	0.0089	0.226	0.0179	0.455	0.42
T32A01PXXX-1.5	**32**	**0.0080**	**0.203**	**0.0170**	**0.432**	**0.36**
T33A01PXXX-1.5	33	0.0071	0.180	0.0161	0.409	0.31
T34A01PXXX-1.5	**34**	**0.0063**	**0.160**	**0.0153**	**0.389**	**0.27**
T35A01PXXX-1.5	35	0.0056	0.142	0.0146	0.371	0.23
T36A01PXXX-1.5	**36**	**0.0050**	**0.127**	**0.0140**	**0.356**	**0.20**
T37A01PXXX-1.5	37	0.0045	0.114	0.0135	0.343	0.18
T38A01PXXX-1.5	**38**	**0.0040**	**0.102**	**0.0130**	**0.330**	**0.16**
T39A01PXXX-1.5	39	0.0035	0.089	0.0125	0.318	0.15
T40A01PXXX-1.5	**40**	**0.0031**	**0.079**	**0.0121**	**0.307**	**0.13**

Triple Insulated

PFA .002"/LAYER



Product Construction:

SIZE RANGE: UL: 10 AWG - 32 AWG
VDE: 14 AWG - 32 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C

VOLTAGE: UL/VDE: 1000 Vpk for electronic equipment
VDE: 1000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 600 Vrms for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS:
Lower partial discharge
High temp power supplies
Medical equipment

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61558-1, IEC 61558-2-16, 60601-1 (Ed.3)
61010-1 (Ed. 3)
VDE License Nr. 6716: Class H
RoHS Compliant

SYSTEM APPROVALS: UL 1446
Information provided upon request

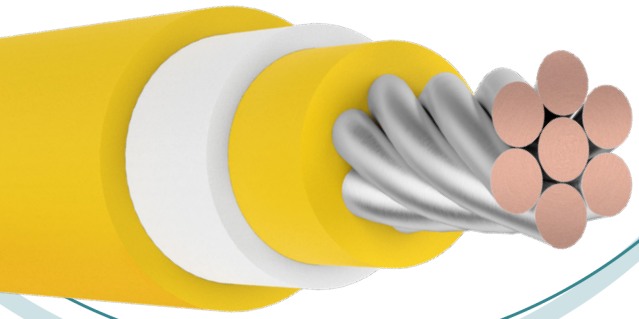
TENSILE STRENGTH: 3600 psi

BREAKDOWN: Approx. 10000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A01PXXX-2	**10**	**0.1019**	**2.588**	**0.1139**	**2.893**	**33.33**
T10A37PXXX-2	10 (37/26)	0.1070	2.718	0.1190	3.023	30.19
T12A01PXXX-2	**12**	**0.0808**	**2.052**	**0.0928**	**2.357**	**21.29**
T12A19PXXX-2	12 (19/25)	0.0862	2.189	0.0982	2.494	19.97
T14A01PXXX-2	**14**	**0.0641**	**1.628**	**0.0761**	**1.933**	**13.67**
T14A19PXXX-2	14 (19/27)	0.0679	1.725	0.0799	2.029	13.07
T16A01PXXX-2	**16**	**0.0508**	**1.290**	**0.0628**	**1.595**	**8.81**
T16A19PXXX-2	16 (19/29)	0.0539	1.369	0.0659	1.674	8.31
T18A01PXXX-2	**18**	**0.0403**	**1.024**	**0.0523**	**1.328**	**5.75**
T19A01PXXX-2	19	0.0359	0.912	0.0479	1.217	4.65
T20A01PXXX-2	**20**	**0.0320**	**0.813**	**0.0440**	**1.118**	**3.77**
T21A01PXXX-2	21	0.0285	0.724	0.0405	1.029	3.08
T22A01PXXX-2	**22**	**0.0253**	**0.643**	**0.0373**	**0.947**	**2.50**
T23A01PXXX-2	23	0.0226	0.574	0.0346	0.879	2.06
T24A01PXXX-2	**24**	**0.0201**	**0.511**	**0.0321**	**0.815**	**1.69**
T25A01PXXX-2	25	0.0179	0.455	0.0299	0.759	1.40
T26A01PXXX-2	**26**	**0.0159**	**0.404**	**0.0279**	**0.709**	**1.16**
T27A01PXXX-2	27	0.0142	0.361	0.0262	0.665	0.97
T28A01PXXX-2	**28**	**0.0126**	**0.320**	**0.0246**	**0.625**	**0.82**
T29A01PXXX-2	29	0.0113	0.287	0.0233	0.592	0.70
T30A01PXXX-2	**30**	**0.0100**	**0.254**	**0.0220**	**0.559**	**0.59**
T31A01PXXX-2	31	0.0089	0.226	0.0209	0.531	0.51
T32A01PXXX-2	**32**	**0.0080**	**0.203**	**0.0200**	**0.508**	**0.45**

Triple Insulated

PFA .003"/LAYER



Product Construction:

SIZE RANGE: UL: 10 AWG - 30 AWG
VDE: 14 AWG - 30 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C

VOLTAGE: UL/VDE: 1000 Vpk for electronic equipment
VDE: 1000 Vrms (IEC 61558-1, IEC 61558-2-16)
VDE: 600 Vrms for medical equipment
VDE: 1000 Vpk for other certifications

APPLICATIONS:
Microwaves
Other high temp/high dielectric applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
IEC 61558-1, IEC 61558-2-16, 60601-1 (Ed.3)
61010-1 (Ed. 3)
VDE License Nr. 6716: Class H
RoHS Compliant

SYSTEM APPROVALS: UL 1446
Information provided upon request

TENSILE STRENGTH: 3600 psi

BREAKDOWN: Approx. 13000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
T10A01PXXX-3	**10**	**0.1019**	**2.588**	**0.1199**	**3.045**	**34.42**
T10A37PXXX-3	10 (37/26)	0.1070	2.718	0.125	03.175	31.26
T12A01PXXX-3	**12**	**0.0808**	**2.052**	**0.0988**	**2.510**	**22.22**
T12A19PXXX-3	12 (19/25)	0.0862	2.189	0.1042	2.647	20.86
T14A01PXXX-3	**14**	**0.0641**	**1.628**	**0.0821**	**2.085**	**14.37**
T15A01PXXX-3	15	0.0571	1.450	0.0751	1.908	11.65
T16A01PXXX-3	**16**	**0.0508**	**1.290**	**0.0688**	**1.748**	**9.42**
T17A01PXXX-3	17	0.0453	1.151	0.0633	1.608	7.68
T18A01PXXX-3	**18**	**0.0403**	**1.024**	**0.0583**	**1.481**	**6.25**
T19A01PXXX-3	19	0.0359	0.912	0.0539	1.369	5.11
T20A01PXXX-3	**20**	**0.0320**	**0.813**	**0.0500**	**1.270**	**4.20**
T21A01PXXX-3	21	0.0285	0.724	0.0465	1.181	3.47
T22A01PXXX-3	**22**	**0.0253**	**0.643**	**0.0433**	**1.100**	**2.87**
T23A01PXXX-3	23	0.0226	0.574	0.0406	1.031	2.40
T24A01PXXX-3	**24**	**0.0201**	**0.511**	**0.0381**	**0.968**	**2.01**
T25A01PXXX-3	25	0.0179	0.455	0.0359	0.912	1.70
T26A01PXXX-3	**26**	**0.0159**	**0.404**	**0.0339**	**0.861**	**1.44**
T27A01PXXX-3	27	0.0142	0.361	0.0322	0.818	1.24
T28A01PXXX-3	**28**	**0.0126**	**0.320**	**0.0306**	**0.777**	**1.06**
T29A01PXXX-3	29	0.0113	0.287	0.0293	0.744	0.94
T30A01PXXX-3	**30**	**0.0100**	**0.254**	**0.0280**	**0.711**	**0.82**

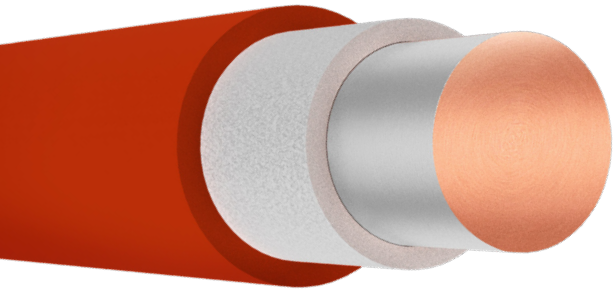
Double Insulated Wire

RUBADUE WIRE MANUFACTURES SEVERAL DOUBLE INSULATED WIRES TO BE USED IN SUPPLEMENTARY ISOLATION APPLICATIONS.
Double insulated wires can be used to meet several design requirements:

- Wind bobbin wall to wall
- Meet creepage and clearance requirements
- High voltage
- Applications requiring supplementary isolation
- Leakage or loss reduction
- Reduced space, volume, weight
- Increased safety
- High speed winding capable

Double insulated wires can be manufactured in a variety of types, sizes, insulations, ratings, and colors.

Double Insulated PFA .003" / Layer



Chemours Tefzel® ETFE: *Fluoropolymer compound with excellent electrical properties, heat resistance, chemical resistance, and abrasion resistance.*

TCA - MODIFIED ETFE: *Designed for more economical /efficient manufacturing. Comes standard in one color, most sizes readily available.*

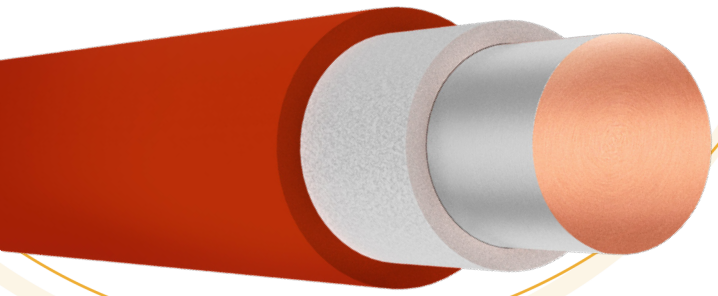
CHEMOURS TEFLON® FEP: *Fluoropolymer compound with exceptional dielectric properties, heat resistance, chemical resistance, and flexibility.*

CHEMOURS TEFLON® PFA: *Fluoropolymer compound with superior heat resistance, exceptional dielectric properties, and chemical resistance.*

RoHS

Double Insulated

Chemours
TEFZEL® ETFE .001"/LAYER



Product Construction:

SIZE RANGE: 30 AWG - 40 AWG

CONDUCTOR:
Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Thinnest DIW on the market
Size/Safety critical supplementary isolation
Telecom

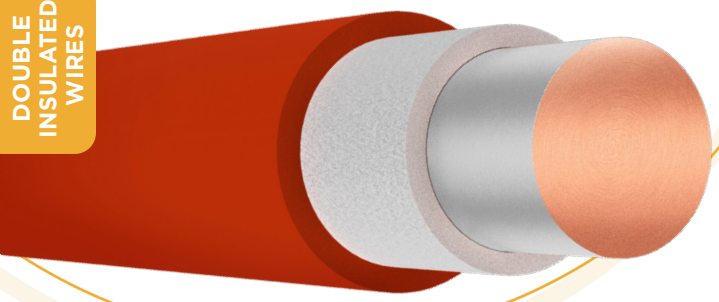
COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 62368-1, Annex J
SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 3000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D30A01TXX-1	30	0.0100	0.254	0.0140	0.356	0.36
D31A01TXX-1	31	0.0089	0.226	0.0129	0.328	0.29
D32A01TXX-1	32	0.0080	0.203	0.0120	0.305	0.24
D33A01TXX-1	33	0.0071	0.180	0.0111	0.282	0.20
D34A01TXX-1	34	0.0063	0.160	0.0103	0.262	0.16
D35A01TXX-1	35	0.0056	0.142	0.0096	0.244	0.13
D36A01TXX-1	36	0.0050	0.127	0.0090	0.229	0.11
D37A01TXX-1	37	0.0045	0.114	0.0085	0.216	0.09
D38A01TXX-1	38	0.0040	0.102	0.0080	0.203	0.08
D39A01TXX-1	39	0.0035	0.089	0.0075	0.191	0.06
D40A01TXX-1	40	0.0031	0.079	0.0071	0.180	0.05

Double Insulated

Chemours
TEFZEL® ETFE .0015"/LAYER



Product Construction:

SIZE RANGE: UL: 16 AWG – 40 AWG, VDE: 14 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2)am;1, Annex U
IEC 61558-2-16
VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

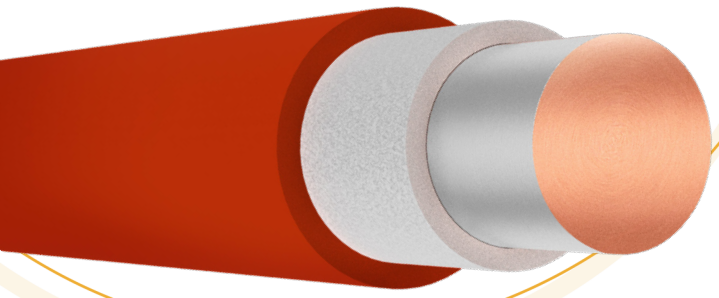
TENSILE STRENGTH: 6500 psi

BREAKDOWN: Approx. 4500 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
D18A01TXX-1.5	18	0.0403	1.024	0.0463	1.176	5.22
D19A01TXX-1.5	19	0.0359	0.912	0.0419	1.064	4.17
D20A01TXX-1.5	20	0.0320	0.813	0.0380	0.965	3.33
D21A01TXX-1.5	21	0.0285	0.724	0.0345	0.876	2.68
D22A01TXX-1.5	22	0.0253	0.643	0.0313	0.795	2.14
D23A01TXX-1.5	23	0.0226	0.574	0.0286	0.726	1.73
D24A01TXX-1.5	24	0.0201	0.511	0.0261	0.663	1.38
D25A01TXX-1.5	25	0.0179	0.455	0.0239	0.607	1.12
D26A01TXX-1.5	26	0.0159	0.404	0.0219	0.556	0.90
D27A01TXX-1.5	27	0.0142	0.361	0.0202	0.513	0.73
D28A01TXX-1.5	28	0.0126	0.320	0.0186	0.472	0.59
D29A01TXX-1.5	29	0.0113	0.287	0.0173	0.439	0.49
D30A01TXX-1.5	30	0.0100	0.254	0.0160	0.406	0.39
D31A01TXX-1.5	31	0.0089	0.226	0.0149	0.378	0.32
D32A01TXX-1.5	32	0.0080	0.203	0.0140	0.356	0.27
D33A01TXX-1.5	33	0.0071	0.180	0.0131	0.333	0.22
D34A01TXX-1.5	34	0.0063	0.160	0.0123	0.312	0.18
D35A01TXX-1.5	35	0.0056	0.142	0.0116	0.295	0.15
D36A01TXX-1.5	36	0.0050	0.127	0.0110	0.279	0.13
D37A01TXX-1.5	37	0.0045	0.114	0.0105	0.267	0.11
D38A01TXX-1.5	38	0.0040	0.102	0.0100	0.254	0.10
D39A01TXX-1.5	39	0.0035	0.089	0.0095	0.241	0.08
D40A01TXX-1.5	40	0.0031	0.079	0.0091	0.231	0.07

Double Insulated

Chemours
TEFZEL® ETFE .002"/LAYER



Product Construction:

SIZE RANGE: UL: 16 AWG - 38 AWG, VDE: 14 AWG - 38 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 6500 psi

BREAKDOWN: Approx. 6000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D18A01TXX-2	18	0.0403	1.024	0.0483	1.227	5.33
D19A01TXX-2	19	0.0359	0.912	0.0439	1.115	4.27
D20A01TXX-2	20	0.0320	0.813	0.0400	1.016	3.43
D21A01TXX-2	21	0.0285	0.724	0.0365	0.927	2.76
D22A01TXX-2	22	0.0253	0.643	0.0333	0.846	2.21
D23A01TXX-2	23	0.0226	0.574	0.0306	0.777	1.79
D24A01TXX-2	24	0.0201	0.511	0.0281	0.714	1.45
D25A01TXX-2	25	0.0179	0.455	0.0259	0.658	1.17
D26A01TXX-2	26	0.0159	0.404	0.0239	0.607	0.95
D27A01TXX-2	27	0.0142	0.361	0.0222	0.564	0.78
D28A01TXX-2	28	0.0126	0.320	0.0206	0.523	0.63
D29A01TXX-2	29	0.0113	0.287	0.0193	0.490	0.53
D30A01TXX-2	30	0.0100	0.254	0.0180	0.457	0.43
D31A01TXX-2	31	0.0089	0.226	0.0169	0.429	0.36
D32A01TXX-2	32	0.0080	0.203	0.0160	0.406	0.30
D33A01TXX-2	33	0.0071	0.180	0.0151	0.384	0.26
D34A01TXX-2	34	0.0063	0.160	0.0143	0.363	0.22
D35A01TXX-2	35	0.0056	0.142	0.0136	0.345	0.18
D36A01TXX-2	36	0.0050	0.127	0.0130	0.330	0.16
D37A01TXX-2	37	0.0045	0.114	0.0125	0.318	0.14
D38A01TXX-2	38	0.0040	0.102	0.0120	0.305	0.12

Double Insulated

Chemours
Tefzel® ETFE .003"/Layer

DOUBLE INSULATED WIRES

Product Construction:

SIZE RANGE: UL: 10 AWG - 40 AWG, VDE: 14 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600Vpk

APPLICATIONS: Electronic
Supplementary isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 136743: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

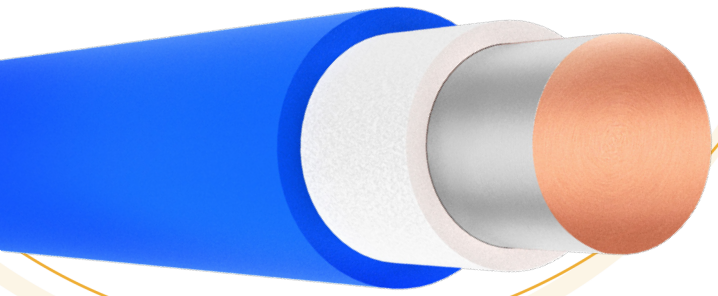
TENSILE STRENGTH: 6500 psi

BREAKDOWN: Approx. 9000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D10A37TXX-3	10(37/26)	0.1070	2.718	0.1190	3.023	30.45
D12A01TXX-3	12	0.0808	2.052	0.0928	2.357	21.01
D12A19TXX-3	12(19/25)	0.0862	2.189	0.0982	2.494	20.08
D14A01TXX-3	14	0.0641	1.628	0.0761	1.933	13.37
D14A19TXX-3	14(19/27)	0.0679	1.725	0.0799	2.029	12.83
D16A01TXX-3	16	0.0508	1.290	0.0628	1.595	8.60
D18A01TXX-3	18	0.0403	1.024	0.0523	1.328	5.56
D20A01TXX-3	20	0.0320	0.813	0.0440	1.118	3.62
D21A01TXX-3	21	0.0285	0.724	0.0405	1.029	2.94
D22A01TXX-3	22	0.0253	0.643	0.0373	0.947	2.37
D23A01TXX-3	23	0.0226	0.574	0.0346	0.879	1.95
D24A01TXX-3	24	0.0201	0.511	0.0321	0.815	1.58
D25A01TXX-3	25	0.0179	0.455	0.0299	0.759	1.30
D26A01TXX-3	26	0.0159	0.404	0.0279	0.709	1.07
D27A01TXX-3	27	0.0142	0.361	0.0262	0.665	0.89
D28A01TXX-3	28	0.0126	0.320	0.0246	0.625	0.74
D29A01TXX-3	29	0.0113	0.287	0.0233	0.592	0.63
D30A01TXX-3	30	0.0100	0.254	0.0220	0.559	0.53
D31A01TXX-3	31	0.0089	0.226	0.0209	0.531	0.45
D32A01TXX-3	32	0.0080	0.203	0.0200	0.508	0.39

Double Insulated

TCA2



Product Construction:

SIZE RANGE: UL: 16 AWG - 40 AWG, VDE: 14 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Modified ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS: Telecom/Electronic
Supplementary isolation applications
Medical/Dental

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 40000223: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

TENSILE STRENGTH: 6500 psi

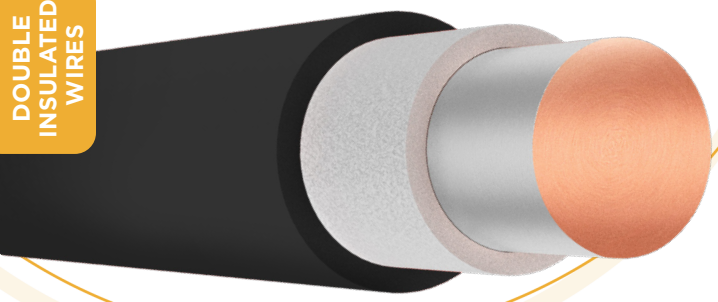
BREAKDOWN: Approx. 4500 V

TCA2 products come standard in Blue

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
TCA2 18 AWG	18	0.0403	1.024	0.0463	1.176	5.22
TCA2 19 AWG	19	0.0359	0.912	0.0419	1.064	4.17
TCA2 20 AWG	20	0.032	0.813	0.0380	0.965	3.33
TCA2 21 AWG	21	0.0285	0.724	0.0345	0.876	2.68
TCA2 22 AWG	22	0.0253	0.643	0.0313	0.795	2.14
TCA2 23 AWG	23	0.0226	0.574	0.0286	0.726	1.73
TCA2 24 AWG	24	0.0201	0.511	0.0261	0.663	1.38
TCA2 25 AWG	25	0.0179	0.455	0.0239	0.607	1.12
TCA2 26 AWG	26	0.0159	0.404	0.0219	0.556	0.90
TCA2 27 AWG	27	0.0142	0.361	0.0202	0.513	0.73
TCA2 28 AWG	28	0.0126	0.320	0.0186	0.472	0.59
TCA2 29 AWG	29	0.0113	0.287	0.0173	0.439	0.49
TCA2 30 AWG	30	0.0100	0.254	0.0160	0.406	0.39
TCA2 31 AWG	31	0.0089	0.226	0.0149	0.378	0.32
TCA2 32 AWG	32	0.0080	0.203	0.0140	0.356	0.27
TCA2 33 AWG	33	0.0071	0.180	0.0121	0.307	0.23
TCA2 34 AWG	34	0.0063	0.160	0.0113	0.287	0.19
TCA2 35 AWG	35	0.0056	0.142	0.0106	0.269	0.16
TCA2 36 AWG	36	0.0050	0.127	0.0100	0.254	0.13
TCA2 37 AWG	37	0.0045	0.114	0.0095	0.241	0.11
TCA2 38 AWG	38	0.0040	0.102	0.0090	0.229	0.10
TCA2 39 AWG	39	0.0035	0.089	0.0085	0.216	0.08
TCA2 40 AWG	40	0.0031	0.079	0.0081	0.206	0.07

Double Insulated

FEP .002"/LAYER



Product Construction:

SIZE RANGE: 10 AWG - 38 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

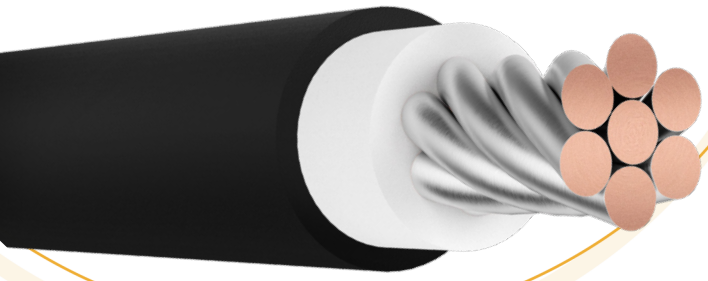
TENSILE STRENGTH: 3000 psi

BREAKDOWN: Approx. 6000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D18A01FXX-2	18	0.0403	1.024	0.0483	1.227	5.45
D18A19FXX-2	18(19/30)	0.0476	1.209	0.0556	1.412	6.49
D20A01FXX-2	20	0.0320	0.813	0.0400	1.016	3.52
D20A19FXX-2	20(19/32)	0.0385	0.978	0.0465	1.181	4.26
D22A01FXX-2	22	0.0253	0.643	0.0333	0.846	2.29
D22A19FXX-2	22(19/34)	0.0295	0.749	0.0375	0.953	2.73
D24A01FXX-2	24	0.0201	0.511	0.0281	0.714	1.51
D24A19FXX-2	24(19/36)	0.0242	0.615	0.0322	0.818	1.81
D25A01FXX-2	25	0.0179	0.455	0.0259	0.658	1.23
D26A01FXX-2	26	0.0159	0.403	0.0239	0.607	1.04
D27A01FXX-2	27	0.0142	0.361	0.0222	0.564	0.83
D28A01FXX-2	28	0.0126	0.320	0.0206	0.523	0.68
D29A01FXX-2	29	0.0113	0.287	0.0193	0.490	0.57
D30A01FXX-2	30	0.0100	0.254	0.0180	0.457	0.47
D31A01FXX-2	31	0.0089	0.226	0.0169	0.429	0.39
D32A01FXX-2	32	0.0080	0.203	0.0160	0.406	0.34
D33A01FXX-2	33	0.0071	0.180	0.0151	0.384	0.29
D34A01FXX-2	34	0.0063	0.160	0.0143	0.363	0.24
D35A01FXX-2	35	0.0056	0.142	0.0136	0.345	0.21
D36A01FXX-2	36	0.0050	0.127	0.0130	0.330	0.18
D37A01FXX-2	37	0.0045	0.114	0.0125	0.318	0.16
D38A01FXX-2	38	0.0040	0.102	0.0120	0.305	0.14

Double Insulated

FEP .003"/LAYER



Product Construction:

SIZE RANGE: 10 AWG - 36 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/ Electronic
Supplementary isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
VDE License Nr. 6715: Class F

SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant

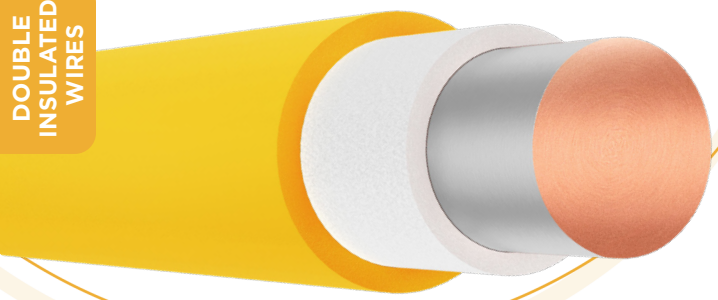
TENSILE STRENGTH: 3000 psi

BREAKDOWN: Approx. 9000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D10A37FXX-3	10(37/26)	0.1070	2.718	0.1190	3.023	30.91
D12A01FXX-3	12	0.0808	2.052	0.0928	2.357	21.36
D12A19FXX-3	12(19/25)	0.0862	2.189	0.0982	2.494	20.46
D14A01FXX-3	14	0.0641	1.628	0.0761	1.933	13.66
D14A19FXX-3	14(19/27)	0.0679	1.725	0.0799	2.029	13.13
D16A01FXX-3	16	0.0508	1.290	0.0628	1.595	8.83
D16A19FXX-3	16(19/29)	0.0539	1.369	0.0659	1.674	8.57
D18A01FXX-3	18	0.0403	1.024	0.0523	1.328	5.75
D18A19FXX-3	18(19/30)	0.0476	1.209	0.0596	1.514	6.83
D20A01FXX-3	20	0.0320	0.813	0.0440	1.118	3.77
D20A19FXX-3	20(19/32)	0.0385	0.978	0.0505	1.283	4.55
D22A01FXX-3	22	0.0253	0.643	0.0373	0.947	2.50
D22A19FXX-3	22(19/34)	0.0295	0.749	0.0415	1.054	2.97
D24A01FXX-3	24	0.0201	0.511	0.0321	0.815	1.69
D24A19FXX-3	24(19/36)	0.0242	0.615	0.0362	0.919	2.01
D26A01FXX-3	26	0.0159	0.404	0.0279	0.709	1.16
D26A19FXX-3	26(19/38)	0.0190	0.483	0.0310	0.787	1.34
D28A01FXX-3	28	0.0126	0.320	0.0246	0.625	0.82
D28A19FXX-3	28(19/40)	0.0152	0.386	0.0272	0.691	0.95
D30A01FXX-3	30	0.0100	0.254	0.0220	0.559	0.59
D32A01FXX-3	32	0.0080	0.203	0.0200	0.508	0.45

Double Insulated

PFA .0015"/LAYER



Product Construction:

SIZE RANGE: 18 AWG - 40 AWG

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications
High temperature capacity (260°C)

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 6716: Class H

SYSTEM APPROVALS: UL 1446
• Other systems available upon request
RoHS Compliant

TENSILE STRENGTH: 3500 psi

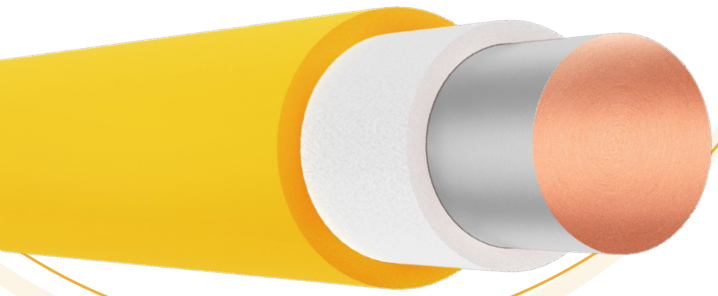
BREAKDOWN: Approx. 6000 V

INSULATION TEMPERATURE CAPACITY: 260°C

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D18A01PXX-1.5	18	0.0403	1.024	0.0463	1.176	5.31
D19A01PXX-1.5	19	0.0359	0.912	0.0419	1.064	4.25
D20A01PXX-1.5	20	0.0320	0.813	0.0380	0.965	3.41
D21A01PXX-1.5	21	0.0285	0.724	0.0345	0.876	2.74
D22A01PXX-1.5	22	0.0253	0.643	0.0313	0.795	2.19
D23A01PXX-1.5	23	0.0226	0.574	0.0286	0.726	1.78
D24A01PXX-1.5	24	0.0201	0.511	0.0261	0.663	1.43
D25A01PXX-1.5	25	0.0179	0.455	0.0239	0.607	1.16
D26A01PXX-1.5	26	0.0159	0.404	0.0219	0.556	0.94
D27A01PXX-1.5	27	0.0142	0.361	0.0202	0.513	0.76
D28A01PXX-1.5	28	0.0126	0.320	0.0186	0.472	0.62
D29A01PXX-1.5	29	0.0113	0.287	0.0173	0.439	0.52
D30A01PXX-1.5	30	0.0100	0.254	0.0160	0.406	0.42
D31A01PXX-1.5	31	0.0089	0.226	0.0149	0.378	0.35
D32A01PXX-1.5	32	0.0080	0.203	0.0140	0.356	0.29
D33A01PXX-1.5	33	0.0071	0.180	0.0131	0.333	0.24
D34A01PXX-1.5	34	0.0063	0.160	0.0123	0.312	0.20
D35A01PXX-1.5	35	0.0056	0.142	0.0116	0.295	0.17
D36A01PXX-1.5	36	0.0050	0.127	0.0110	0.279	0.15
D37A01PXX-1.5	37	0.0045	0.114	0.0105	0.267	0.13
D38A01PXX-1.5	38	0.0040	0.102	0.0100	0.254	0.11
D39A01PXX-1.5	39	0.0035	0.089	0.0095	0.241	0.09
D40A01PXX-1.5	40	0.0031	0.079	0.0091	0.231	0.08

Double Insulated

PFA .002"/LAYER



Product Construction:

SIZE RANGE: UL: 18 AWG - 38 AWG
VDE: 14 AWG - 38 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications
High temperature capacity (260°C)

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 6716: Class H
RoHS Compliant

SYSTEM APPROVALS: UL 1446
Information provided upon request

TENSILE STRENGTH: 3500 psi

BREAKDOWN: Approx. 8000 V

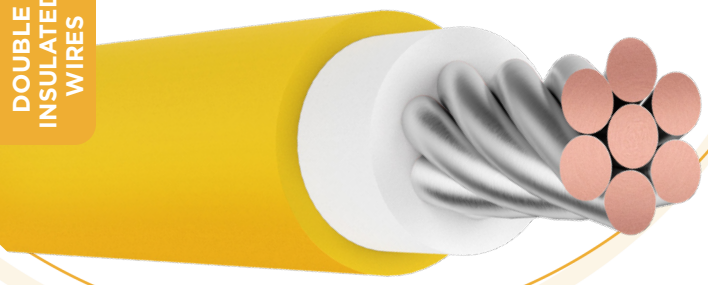
INSULATION TEMPERATURE CAPACITY: 260° C

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D18A01PXX-2	18	0.0403	1.024	0.0483	1.227	5.45
D19A01PXX-2	19	0.0359	0.912	0.0439	1.115	4.38
D20A01PXX-2	20	0.0320	0.813	0.0400	1.016	3.52
D21A01PXX-2	21	0.0285	0.724	0.0365	0.927	2.85
D22A01PXX-2	22	0.0253	0.643	0.0333	0.846	2.29
D23A01PXX-2	23	0.0226	0.574	0.0306	0.777	1.87
D24A01PXX-2	24	0.0201	0.511	0.0281	0.714	1.51
D25A01PXX-2	25	0.0179	0.455	0.0259	0.658	1.23
D26A01PXX-2	26	0.0159	0.404	0.0239	0.607	1.00
D27A01PXX-2	27	0.0142	0.361	0.0222	0.564	0.83
D28A01PXX-2	28	0.0126	0.320	0.0206	0.523	0.68
D29A01PXX-2	29	0.0113	0.287	0.0193	0.490	0.57
D30A01PXX-2	30	0.0100	0.254	0.0180	0.457	0.47
D31A01PXX-2	31	0.0089	0.226	0.0169	0.429	0.39
D32A01PXX-2	32	0.0080	0.203	0.0160	0.406	0.34
D33A01PXX-2	33	0.0071	0.180	0.0151	0.384	0.29
D34A01PXX-2	34	0.0063	0.160	0.0143	0.363	0.24
D35A01PXX-2	35	0.0056	0.142	0.0136	0.345	0.21
D36A01PXX-2	36	0.0050	0.127	0.0130	0.330	0.18
D37A01PXX-2	37	0.0045	0.114	0.0125	0.318	0.16
D38A01PXX-2	38	0.0040	0.102	0.0120	0.305	0.14

Double Insulated

PFA .003"/LAYER

DOUBLE INSULATED WIRES



Product Construction:

SIZE RANGE: UL: 18 AWG - 36 AWG
VDE: 14 AWG - 36 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Supplementary isolation applications
High temperature capacity (260°C)

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 6716: Class H
RoHS Compliant

SYSTEM APPROVALS: UL 1446
Information provided upon request

TENSILE STRENGTH: 3500 psi

BREAKDOWN: Approx. 10000 V

INSULATION TEMPERATURE CAPACITY: 260° C

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
D18A01PXX-3	18	0.0403	1.024	0.0523	1.328	5.75
D19A01PXX-3	19	0.0359	0.912	0.0479	1.217	4.65
D20A01PXX-3	20	0.032	0.813	0.0440	1.118	3.77
D21A01PXX-3	21	0.0285	0.724	0.0405	1.029	3.08
D22A01PXX-3	22	0.0253	0.643	0.0373	0.947	2.50
D23A01PXX-3	23	0.0226	0.574	0.0346	0.879	2.06
D24A01PXX-3	24	0.0201	0.511	0.0321	0.815	1.69
D25A01PXX-3	25	0.0179	0.455	0.0299	0.759	1.40
D26A01PXX-3	26	0.0159	0.404	0.0279	0.709	1.16
D27A01PXX-3	27	0.0142	0.361	0.0262	0.665	0.97
D28A01PXX-3	28	0.0126	0.320	0.0246	0.625	0.82
D29A01PXX-3	29	0.0113	0.287	0.0233	0.592	0.70
D30A01PXX-3	30	0.0100	0.254	0.0220	0.559	0.59
D31A01PXX-3	31	0.0089	0.226	0.0209	0.531	0.51
D32A01PXX-3	32	0.0080	0.203	0.0200	0.508	0.45
D33A01PXX-3	33	0.0071	0.180	0.0191	0.485	0.39
D34A01PXX-3	34	0.0063	0.160	0.0183	0.465	0.34
D35A01PXX-3	35	0.0056	0.142	0.0176	0.447	0.30
D36A01PXX-3	36	0.0050	0.127	0.0170	x0.432	0.27

Single Insulated Wire

RUBADUE WIRE MANUFACTURES SEVERAL WIRES WITH A SINGLE LAYER OF INSULATION.
Single insulated wires can be used to meet several design requirements:

- Hook-up or lead wires
- High voltage
- Applications requiring basic isolation
- Leakage or loss reduction
- Increased safety
- High speed winding capable

Single insulated wires can be manufactured in a variety of types, sizes, insulations, ratings, and colors.

Chemours Tefzel® ETFE: *Fluoropolymer compound with excellent electrical properties, heat resistance, chemical resistance, and abrasion resistance.*

TCA - MODIFIED ETFE: *Designed for more economical /efficient manufacturing. Comes standard in one color, most sizes readily available.*

CHEMOURS TEFLON® FEP: *Fluoropolymer compound with exceptional dielectric properties, heat resistance, chemical resistance, and flexibility.*

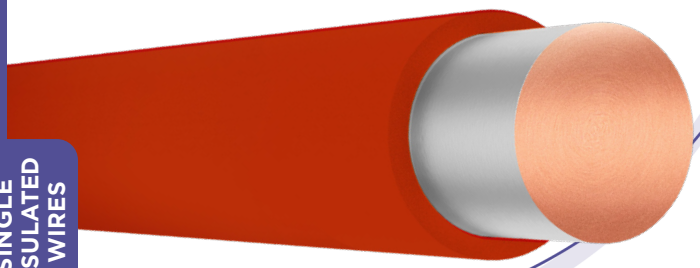
CHEMOURS TEFLON® PFA: *Fluoropolymer compound with superior heat resistance, exceptional dielectric properties, and chemical resistance.*

See the Technical Information section for additional information on insulation types and comparative properties.

Single Insulated
FEP .003"

Single Insulated

Chemours
TEFZEL® ETFE .0015"



Product Construction:

SIZE RANGE: UL: 26 AWG - 40 AWG
VDE: 26 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR:
Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

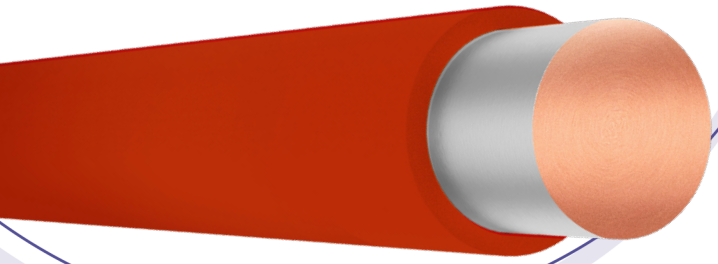
APPLICATIONS:
Telecom/Electronic
Basic isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-12-16
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 2000 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
S26A01TX-1.5	**26**	**0.0159**	**0.404**	**0.0189**	**0.480**	**0.83**
S27A01TX-1.5	27	0.0142	0.361	0.0172	0.437	0.66
S28A01TX-1.5	**28**	**0.0126**	**0.320**	**0.0156**	**0.396**	**0.53**
S29A01TX-1.5	29	0.0113	0.287	0.0143	0.363	0.43
S30A01TX-1.5	**30**	**0.0100**	**0.254**	**0.0130**	**0.330**	**0.34**
S31A01TX-1.5	31	0.0089	0.226	0.0119	0.302	0.28
S32A01TX-1.5	**32**	**0.0080**	**0.203**	**0.0110**	**0.279**	**0.23**
S33A01TX-1.5	33	0.0071	0.180	0.0101	0.257	0.18
S34A01TX-1.5	**34**	**0.0063**	**0.160**	**0.0093**	**0.236**	**0.15**
S35A01TX-1.5	35	0.0056	0.142	0.0086	0.218	0.12
S36A01TX-1.5	**36**	**0.0050**	**0.127**	**0.0080**	**0.203**	**0.10**
S37A01TX-1.5	37	0.0045	0.114	0.0075	0.191	0.08
S38A01TX-1.5	**38**	**0.0040**	**0.101**	**0.0070**	**0.178**	**0.07**
S39A01TX-1.5	39	0.0035	0.089	0.0065	0.165	0.05
S40A01TX-1.5	**40**	**0.0031**	**0.079**	**0.0061**	**0.155**	**0.05**

Single Insulated

Chemours
TEFZEL® ETFE .002"



Product Construction:

SIZE RANGE: UL: 22 AWG - 40 AWG
VDE: 22 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Basic isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2)am;1, Annex U
IEC 61558-2-16
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 3000 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
S22A01TX-2	**22**	**0.0253**	**0.643**	**0.0293**	**0.744**	**2.07**
S23A01TX-2	23	0.0226	0.574	0.0266	0.676	1.66
S24A01TX-2	**24**	**0.0201**	**0.511**	**0.0241**	**0.612**	**1.32**
S25A01TX-2	25	0.0179	0.455	0.0219	0.556	1.06
S26A01TX-2	**26**	**0.0159**	**0.404**	**0.0199**	**0.505**	**0.85**
S27A01TX-2	27	0.0142	0.361	0.0182	0.462	0.69
S28A01TX-2	**28**	**0.0126**	**0.320**	**0.0166**	**0.422**	**0.55**
S29A01TX-2	29	0.0113	0.287	0.0153	0.389	0.45
S30A01TX-2	**30**	**0.0100**	**0.254**	**0.0140**	**0.356**	**0.36**
S31A01TX-2	31	0.0089	0.226	0.0129	0.328	0.29
S32A01TX-2	**32**	**0.0080**	**0.203**	**0.0120**	**0.305**	**0.24**
S33A01TX-2	33	0.0071	0.180	0.0111	0.282	0.20
S34A01TX-2	**34**	**0.0063**	**0.160**	**0.0103**	**0.262**	**0.16**
S35A01TX-2	35	0.0056	0.142	0.0096	0.244	0.13
S36A01TX-2	**36**	**0.0050**	**0.127**	**0.0090**	**0.229**	**0.11**
S37A01TX-2	37	0.0045	0.114	0.0085	0.216	0.09
S38A01TX-2	**38**	**0.0040**	**0.102**	**0.0080**	**0.203**	**0.08**
S39A01TX-2	39	0.0035	0.089	0.0075	0.191	0.06
S40A01TX-2	**40**	**0.0031**	**0.079**	**0.0071**	**0.180**	**0.05**

Single Insulated

Chemours
Tefzel® ETFE .003"

Product Construction:

SIZE RANGE: UL: 16 AWG - 40 AWG
VDE: 16 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Chemours Tefzel® ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Electronic
Basic isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3), IEC 61558-2-16
VDE License Nr. 136743: Class F
SYSTEM APPROVALS: UL 1446
- RXT-2 Class F
- TCA Class F
- Other systems available upon request

RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 4500 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
S16A01TX-3	**16**	**0.0508**	**1.290**	**0.0568**	**1.443**	**8.18**
S18A01TX-3	18	0.0403	1.024	0.0463	1.176	5.22
S20A01TX-3	**20**	**0.0320**	**0.813**	**0.0380**	**0.965**	**3.33**
S21A01TX-3	21	0.0285	0.724	0.0345	0.876	2.68
S22A01TX-3	**22**	**0.0253**	**0.643**	**0.0313**	**0.795**	**2.14**
S23A01TX-3	23	0.0226	0.574	0.0286	0.726	1.73
S24A01TX-3	**24**	**0.0201**	**0.511**	**0.0261**	**0.663**	**1.38**
S25A01TX-3	25	0.0179	0.455	0.0239	0.607	1.12
S26A01TX-3	**26**	**0.0159**	**0.404**	**0.0219**	**0.556**	**0.90**
S27A01TX-3	27	0.0142	0.361	0.0202	0.513	0.73
S28A01TX-3	**28**	**0.0126**	**0.320**	**0.0186**	**0.472**	**0.59**
S29A01TX-3	29	0.0113	0.287	0.0173	0.439	0.49
S30A01TX-3	**30**	**0.0100**	**0.254**	**0.0160**	**0.406**	**0.39**
S31A01TX-3	31	0.0089	0.226	0.0149	0.378	0.32

Single Insulated

TCA1

Product Construction:

SIZE RANGE: UL: 26 AWG- 40 AWG
VDE: 26 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: Modified ETFE

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/ Electronic
Basic isolation applications

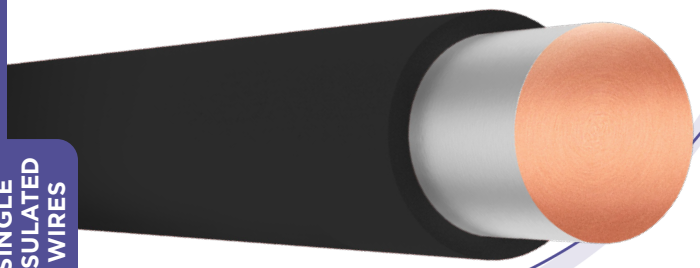
COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
IEC 61558-2-16
VDE License Nr. 40000223: Class F
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 6500 psi
BREAKDOWN: Approx. 2000 V

TCA1 products come standard in Orange

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
TCA1 26 AWG	**26**	**0.0159**	**0.404**	**0.0189**	**0.480**	**0.83**
TCA1 27 AWG	27	0.0142	0.361	0.0172	0.437	0.66
TCA1 28 AWG	**28**	**0.0126**	**0.320**	**0.0156**	**0.396**	**0.53**
TCA1 29 AWG	29	0.0113	0.287	0.0143	0.363	0.43
TCA1 30 AWG	**30**	**0.0100**	**0.254**	**0.0130**	**0.330**	**0.34**
TCA1 31 AWG	31	0.0089	0.226	0.0119	0.302	0.28
TCA1 32 AWG	**32**	**0.0080**	**0.203**	**0.0110**	**0.279**	**0.23**
TCA1 33 AWG	33	0.0071	0.180	0.0101	0.257	0.18
TCA1 34 AWG	**34**	**0.0063**	**0.160**	**0.0093**	**0.236**	**0.15**
TCA1 35 AWG	35	0.0056	0.142	0.0086	0.218	0.12
TCA1 36 AWG	**36**	**0.0050**	**0.127**	**0.0080**	**0.203**	**0.10**
TCA1 37 AWG	37	0.0045	0.114	0.0075	0.191	0.08
TCA1 38 AWG	**38**	**0.0040**	**0.102**	**0.0070**	**0.178**	**0.07**
TCA1 39 AWG	39	0.0035	0.089	0.0065	0.165	0.05
TCA1 40 AWG	**40**	**0.0031**	**0.079**	**0.0061**	**0.155**	**0.05**

Single Insulated

FEP .002"



Product Construction:

SIZE RANGE: 22(19/32) AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

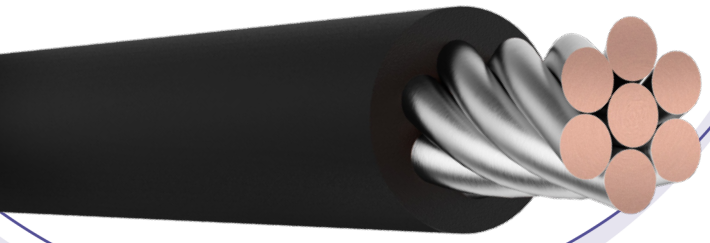
APPLICATIONS:
Telecom/Electronic
Basic isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 3000 psi
BREAKDOWN: Approx. 3000 V

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
S22A19FX-2	**22(19/32)**	**0.0295**	**0.749**	**0.0335**	**0.851**	**2.52**
S24A01FX-2	24	0.0201	0.511	0.0241	0.612	1.35
S24A19FX-2	**24(19/36)**	**0.0242**	**0.615**	**0.0282**	**0.716**	**1.63**
S25A01FX-2	25	0.0179	0.455	0.0219	0.556	1.18
S26A01FX-2	**26**	**0.0159**	**0.404**	**0.0199**	**0.505**	**0.89**
S27A01FX-2	27	0.0142	0.361	0.0182	0.462	0.71
S28A01FX-2	**28**	**0.0126**	**0.320**	**0.0166**	**0.422**	**0.57**
S29A01FX-2	29	0.0113	0.287	0.0153	0.389	0.47
S30A01FX-2	**30**	**0.0100**	**0.254**	**0.0140**	**0.356**	**0.38**
S31A01FX-2	31	0.0089	0.226	0.0129	0.328	0.31
S32A01FX-2	**32**	**0.0080**	**0.203**	**0.012**	**0.305**	**0.25**
S33A01FX-2	33	0.0071	0.180	0.0111	0.282	0.21
S34A01FX-2	**34**	**0.0063**	**0.160**	**0.0103**	**0.262**	**0.17**
S35A01FX-2	35	0.0056	0.142	0.0096	0.244	0.14
S36A01FX-2	**36**	**0.0050**	**0.127**	**0.0090**	**0.229**	**0.12**
S37A01FX-2	37	0.0045	0.114	0.0085	0.216	0.10
S38A01FX-2	**38**	**0.0040**	**0.102**	**0.0080**	**0.203**	**0.08**
S39A01FX-2	39	0.0035	0.089	0.0075	0.191	0.07
S40A01FX-2	**40**	**0.0031**	**0.079**	**0.0071**	**0.180**	**0.06**

Single Insulated

FEP .003"



Product Construction:

SIZE RANGE: 18 AWG - 40 AWG
Not all sizes listed in chart

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: FEP

RATING: **TEMPERATURE:** 155°C | **VOLTAGE:** 600 Vpk

APPLICATIONS:
Telecom/Electronic
Basic isolation applications

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
SYSTEM APPROVALS: UL 1446
• RXT-2 Class F
• Other systems available upon request
RoHS Compliant
TENSILE STRENGTH: 3000 psi
BREAKDOWN: Approx. 4500 V

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
S18A01FX-3	**18**	**0.0403**	**1.024**	**0.0463**	**1.176**	**5.31**
S18A19FX-3	18(19/30)	0.0476	1.209	0.0536	1.361	6.33
S20A01FX-3	**20**	**0.0320**	**0.813**	**0.0380**	**0.965**	**3.41**
S20A19FX-3	20(19/32)	0.0385	0.978	0.0445	1.130	4.12
S22A01FX-3	**22**	**0.0253**	**0.643**	**0.0313**	**0.795**	**2.19**
S22A19FX-3	22(19/32)	0.0295	0.749	0.0355	0.902	2.62
S24A01FX-3	**24**	**0.0201**	**0.511**	**0.0261**	**0.663**	**1.43**
S24A19FX-3	24(19/36)	0.0242	0.615	0.0302	0.767	1.71
S25A01FX-3	**25**	**0.0179**	**0.455**	**0.0239**	**0.607**	**1.25**
S26A01FX-3	26	0.0190	0.483	0.0250	0.635	0.96
S27A01FX-3	**27**	**0.0142**	**0.361**	**0.0202**	**0.513**	**0.76**
S28A01FX-3	28	0.0126	0.320	0.0186	0.472	0.62
S29A01FX-3	**29**	**0.0113**	**0.287**	**0.0173**	**0.439**	**0.52**
S30A01FX-3	30	0.0100	0.254	0.0160	0.406	0.42
S31A01FX-3	**31**	**0.0089**	**0.226**	**0.0149**	**0.378**	**0.35**
S32A01FX-3	32	0.0080	0.203	0.0140	0.356	0.29
S33A01FX-3	**33**	**0.0071**	**0.180**	**0.0131**	**0.333**	**0.24**
S34A01FX-3	34	0.0063	0.160	0.0123	0.312	0.20
S35A01FX-3	**35**	**0.0056**	**0.142**	**0.0116**	**0.295**	**0.17**
S36A01FX-3	36	0.0050	0.127	0.0110	0.279	0.15
S37A01FX-3	**37**	**0.0045**	**0.114**	**0.0105**	**0.267**	**0.13**
S38A01FX-3	38	0.0040	0.102	0.0100	0.254	0.11
S39A01FX-3	**39**	**0.0035**	**0.089**	**0.0095**	**0.241**	**0.10**
S40A01FX-3	40	0.0031	0.079	0.0091	0.231	0.08

Single Insulated

PFA .0015"

Product Construction:

SIZE RANGE: 28 AWG - 40 AWG

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C
VOLTAGE: 600 Vpk for electronic equipment
UL: 425 Vrms for medical equipment (28 - 40 AWG)

APPLICATIONS:
Telecom/Electronic
Basic isolation applications
Medical/Dental equipment
High temperature resistance: Lead free reflow

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3), IEC 61558-2-16
VDE License Nr. 6716: Class H
RoHS Compliant
TENSILE STRENGTH: 3500 psi
BREAKDOWN: Approx. 3000 V
INSULATION TEMPERATURE CAPACITY: 260°C

		CONDUCTOR		NOMINAL O.D.		
PART NUMBER	AWG	INCHES	MM	INCHES	MM	WEIGHT LB/KFT
S28A01PX-1.5	**28**	**0.0126**	**0.320**	**0.0156**	**0.396**	**0.54**
S29A01PX-1.5	29	0.0113	0.287	0.0143	0.363	0.44
S30A01PX-1.5	**30**	**0.0100**	**0.254**	**0.0130**	**0.330**	**0.35**
S31A01PX-1.5	31	0.0089	0.226	0.0119	0.302	0.29
S32A01PX-1.5	**32**	**0.0080**	**0.203**	**0.0110**	**0.279**	**0.24**
S33A01PX-1.5	33	0.0071	0.180	0.0101	0.257	0.19
S34A01PX-1.5	**34**	**0.0063**	**0.160**	**0.0093**	**0.236**	**0.16**
S35A01PX-1.5	35	0.0056	0.142	0.0086	0.218	0.13
S36A01PX-1.5	**36**	**0.0050**	**0.127**	**0.0080**	**0.203**	**0.10**
S37A01PX-1.5	37	0.0045	0.114	0.0075	0.191	0.09
S38A01PX-1.5	**38**	**0.0040**	**0.102**	**0.0070**	**0.178**	**0.07**
S39A01PX-1.5	39	0.0035	0.089	0.0065	0.165	0.06
S40A01PX-1.5	**40**	**0.0031**	**0.079**	**0.0061**	**0.155**	**0.05**

Single Insulated

PFA .002"

Product Construction:

SIZE RANGE: 26 AWG - 40 AWG

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C
VOLTAGE: 600 Vpk for electronic equipment
UL: 425 Vrms for medical equipment (28 - 40 AWG)

APPLICATIONS:
Telecom/Electronic
Basic isolation applications
Medical/Dental equipment
High temperature resistance: Lead free reflow

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3), IEC 61558-2-16
VDE License Nr. 6716: Class H
RoHS Compliant
TENSILE STRENGTH: 3500 psi
BREAKDOWN: Approx. 4000 V
INSULATION TEMPERATURE CAPACITY: 260°C

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
S26A01PX-2	**26**	**0.0159**	**0.404**	**0.0199**	**0.505**	**0.89**
S27A01PX-2	27	0.0142	0.361	0.0182	0.462	0.71
S28A01PX-2	**28**	**0.0126**	**0.320**	**0.0166**	**0.422**	**0.57**
S29A01PX-2	29	0.0113	0.287	0.0153	0.389	0.47
S30A01PX-2	**30**	**0.0100**	**0.254**	**0.0140**	**0.356**	**0.38**
S31A01PX-2	31	0.0089	0.226	0.0129	0.328	0.31
S32A01PX-2	**32**	**0.0080**	**0.203**	**0.0120**	**0.305**	**0.25**
S33A01PX-2	33	0.0071	0.180	0.0111	0.282	0.21
S34A01PX-2	**34**	**0.0063**	**0.160**	**0.0103**	**0.262**	**0.17**
S35A01PX-2	35	0.0056	0.142	0.0096	0.244	0.14
S36A01PX-2	**36**	**0.0050**	**0.127**	**0.0090**	**0.229**	**0.12**
S37A01PX-2	37	0.0045	0.114	0.0085	0.216	0.10
S38A01PX-2	**38**	**0.0040**	**0.102**	**0.0080**	**0.203**	**0.08**
S39A01PX-2	39	0.0035	0.089	0.0075	0.191	0.07
S40A01PX-2	**40**	**0.0031**	**0.079**	**0.0071**	**0.180**	**0.06**

Single Insulated

PFA .003"

Product Construction:

SIZE RANGE: 22 AWG - 40 AWG

CONDUCTOR: Tin plated copper
Solid or stranded (ASTM B-33/ASTM B-286)
Bare copper and other conductors available

INSULATIONS: PFA

RATING: **TEMPERATURE:** 180°C
VOLTAGE: 600 Vpk for electronic equipment
UL: 425 Vrms for medical equipment (28 - 40 AWG)

APPLICATIONS:
Telecom/Electronic
Basic isolation applications
Medical/Dental equipment
High temperature resistance: Lead free reflow

COMPLIANCES:
UL OBJT2 File No. E206198
UL/IEC 60950-1 (Ed. 2), Annex U
UL 60601-1 (Ed. 3), IEC 61558-2-16
VDE License Nr. 6716: Class H
RoHS Compliant
TENSILE STRENGTH: 3500 psi
BREAKDOWN: Approx. 6000 V
INSULATION TEMPERATURE CAPACITY: 260° C

PART NUMBER	AWG	CONDUCTOR		NOMINAL O.D.		WEIGHT LB/KFT
		INCHES	MM	INCHES	MM	
S22A01PX-3	22	0.0253	0.643	0.0313	0.795	2.19
S24A01PX-3	24	0.0201	0.511	0.0261	0.663	1.43
S25A01PX-3	25	0.0179	0.455	0.0239	0.607	1.25
S26A01PX-3	26	0.0159	0.404	0.0219	0.556	0.96
S27A01PX-3	27	0.0142	0.361	0.0202	0.513	0.76
S28A01PX-3	28	0.0126	0.320	0.0186	0.472	0.62
S29A01PX-3	29	0.0113	0.287	0.0173	0.439	0.52
S30A01PX-3	30	0.0100	0.254	0.0160	0.406	0.42
S31A01PX-3	31	0.0089	0.226	0.0149	0.378	0.35
S32A01PX-3	32	0.0080	0.203	0.0140	0.356	0.29
S33A01PX-3	33	0.0071	0.180	0.0131	0.333	0.24
S34A01PX-3	34	0.0063	0.160	0.0123	0.312	0.20
S35A01PX-3	35	0.0056	0.142	0.0116	0.295	0.17
S36A01PX-3	36	0.0050	0.127	0.0110	0.279	0.15
S37A01PX-3	37	0.0045	0.114	0.0105	0.267	0.13
S38A01PX-3	38	0.0040	0.102	0.0100	0.254	0.11
S39A01PX-3	39	0.0035	0.089	0.0095	0.241	0.10
S40A01PX-3	40	0.0031	0.079	0.0091	0.231	0.08

Specialty Products

Rubadue Wire manufactures a variety of specialty and custom products. The products listed in this catalog are not all inclusive of the products offered by Rubadue Wire. Please contact the Sales Department if you are in need of a custom designed product.

- CABLE JACKETING
- FIBER OPTIC COATING
- TWISTED PAIRS
- TWISTED TRIADS
- MULTI-CONDUCTOR
- CUSTOM CABLES
- FILLERS
- MULTI-STRANDED
- HIGH TEMPERATURE PRODUCTS

- HIGH VOLTAGE PRODUCTS
- MEDICAL WIRES
- UNDERWATER PRODUCTS
- SPECIALTY CONDUCTORS
- SPECIALTY INSULATIONS
- CUSTOMER FURNISHED MATERIAL
- INSULATION ON A TOLL BASIS

Conductors

- Wire sizes from 4 AWG - 40 AWG
- Capacity for cable jackets up to 0.50″
- Custom, specialty, and standard materials
- Solid and stranded constructions

Insulating Materials

Insulation thickness from .001″ to .250″. Special and customized compound variations are available upon request.

CHEMOURS™ TEFZEL® ETFE

Fluoropolymer compound with excellent electrical properties, heat resistance, chemical resistance, and abrasion resistance. Commonly used in winding wires, UL AWM wires, and medical applications.

PVC

Polyvinyl Chloride, thermoplastic polymer with a wide variety of characteristics. Varying grades can be found with high or low temperature, rigid or flexible, and electrical properties. Commonly used in UL AWM wires, hook up wires, and cables.

POLYURETHANE

Polymer with good dielectric, excellent oxidization, and abrasion resistant properties. A hard material with memory properties. Commonly used in cord and cable applications.

CHEMOURS™ TEFLON® FEP

Fluoropolymer compound with exceptional dielectric properties, heat resistance, chemical resistance, and flexibility. Commonly used in winding wires, UL AWM wires, and cable jacketing.

POLYETHYLENE

Low density, high density, solid and foamed, thermoplastic with good electrical properties. Low dielectric constant with stable performance and excellent moisture resistance. Commonly used in UL AWM wires, hook up wires, and cables.

DUPONT™ HYTREL®

Thermoplastic polyester elastomer that offers flexibility and strength. Halogen free insulation with good heat resistance. Commonly used in applications that require additional physical properties that an elastomer does not meet alone.

CHEMOURS™ TEFLON® PFA

Fluoropolymer compound with superior heat resistance, exceptional dielectric properties, and chemical resistance. Commonly used in Teflon applications requiring a higher operating temperature.

POLYPROPYLENE

Thermoplastic with similar properties to Polyethylene. Typically a harder insulation, suitable for thin wall requirements.

Technical Information

THE TECHNICAL SECTION IS A BRIEF OVERVIEW. PLEASE CONTACT THE SALES DEPARTMENT FOR DETAILED TECHNICAL INFORMATION AND PRODUCT SPECIFICATIONS.

Conductor Materials

Rubadue Wire offers a wide variety of conductors and core wires.

- Tin Plated Copper ***(TPC)***
- Magnet Wire per NEMA & IEC Standards
- Silver Plated Copper ***(SPC)***
- Bare Copper ***(BC)***
- Litz Wire ***(Multi Strand Enamel)***
- Nickel Plated Copper ***(NPC)***
- Oxygen Free Copper
- Stainless Steel
- Copper Clad Aluminum
- Copper Clad Steel
- Silver Plated Alloy
- Nickel Copper Alloy
- Custom
- Customer Furnished Materials ***(CFM)***

Conductors and core wires sizes can range from 4 AWG to 40 AWG

Solid and stranded constructions are available

Special and customized conductors are available upon request.

Rubadue Wire also offers custom cables to meet your requirements.

Please contact the Sales Department with your specifications.

TPC Resistance

Permissable Resistance and Diameter Values for Solid Tin-Plated Copper

AWG	DIAMETER			DC RESISTANCE PER 10′ @ 20°C
	MIN.	NOM	MAX	MAX RES
10	0.1010	0.1019	0.1050	0.0106
11	0.0900	0.0907	0.0934	0.0134
12	0.0800	0.0808	0.0832	0.0168
13	0.0712	0.0720	0.0742	0.0212
14	0.0635	0.0641	0.0660	0.0267
15	0.0565	0.0571	0.0588	0.0338
16	0.0503	0.0508	0.0523	0.0426
17	0.0449	0.0453	0.0467	0.0537
18	0.0400	0.0403	0.0415	0.0677
19	0.0356	0.0359	0.0370	0.0854
20	0.0317	0.0320	0.0330	0.1070
21	0.0282	0.0285	0.0294	0.1360
22	0.0250	0.0253	0.0261	0.1720
23	0.0224	0.0226	0.0233	0.2150
24	0.0199	0.0201	0.0207	0.2730
25	0.0177	0.0179	0.0184	0.3440
26	0.0157	0.0159	0.0164	0.4350
27	0.0141	0.0142	0.0146	0.5450
28	0.0125	0.0126	0.0130	0.6930
29	0.0112	0.0113	0.0116	0.8610
30	0.0099	0.0100	0.0103	1.1000
31	0.0088	0.0089	0.0092	1.4376
32	0.0079	0.0080	0.0083	1.7838
33	0.0070	0.0071	0.0074	2.2720
34	0.0062	0.0063	0.0066	2.8962
35	0.0055	0.0056	0.0059	3.6803
36	0.0049	0.0050	0.0053	4.6368
37	0.0044	0.0045	0.0048	5.7505
38	0.0039	0.0040	0.0043	7.3195
39	0.0034	0.0035	0.0038	9.6306
40	0.0030	0.0031	0.0034	12.3700
41	0.0027	0.0028	0.0031	15.2716
42	0.0024	0.0025	0.0028	19.3281
43	0.0021	0.0022	0.0025	25.2449
44	0.0019	0.0020	0.0023	30.8393

BC/SPC Resistance

Permissable Resistance and Diameter Values for Solid Bare Copper and Silver-Plated Copper

AWG	DIAMETER			DC RESISTANCE PER 10′ @ 20°C
	MIN.	NOM	MAX	MAX RES
10	0.1009	0.1019	0.1029	0.0102
11	0.0898	0.0907	0.0916	0.0129
12	0.0800	0.0808	0.0816	0.0162
13	0.0713	0.0720	0.0727	0.0204
14	0.0635	0.0641	0.0647	0.0257
15	0.0565	0.0571	0.0577	0.0325
16	0.0503	0.0508	0.0513	0.0410
17	0.0448	0.0453	0.0458	0.0517
18	0.0399	0.0403	0.0407	0.0651
19	0.0355	0.0359	0.0363	0.0823
20	0.0317	0.0320	0.0323	0.1032
21	0.0282	0.0285	0.0288	0.1304
22	0.0250	0.0253	0.0256	0.1659
23	0.0224	0.0226	0.0228	0.2067
24	0.0199	0.0201	0.0203	0.2619
25	0.0177	0.0179	0.0181	0.3310
26	0.0157	0.0159	0.0161	0.4207
27	0.0141	0.0142	0.0143	0.5217
28	0.0125	0.0126	0.0127	0.6637
29	0.0112	0.0113	0.0114	0.8268
30	0.0099	0.0100	0.0101	1.0582
31	0.0088	0.0089	0.0090	1.3392
32	0.0079	0.0080	0.0081	1.6618
33	0.0070	0.0071	0.0072	2.1165
34	0.0062	0.0063	0.0064	2.6980
35	0.0055	0.0056	0.0057	3.4284
36	0.0049	0.0050	0.0051	4.3195
37	0.0044	0.0045	0.0046	5.3569
38	0.0039	0.0040	0.0041	6.8185
39	0.0034	0.0035	0.0036	8.9715
40	0.0030	0.0031	0.0032	11.5233
41	0.0027	0.0028	0.0029	14.2263
42	0.0024	0.0025	0.0026	18.0052
43	0.0021	0.0022	0.0023	23.5170
44	0.0019	0.0020	0.0021	28.7285

Stranded Conductors

Basic Stranding Information

SIZE AWG	STRAND/ AWG OR "	DIA (INCHES)	DIA (MILS)	POUNDS PER KFT	SIZE AWG	STRAND/ AWG OR "	DIA (INCHES)	DIA (MILS)	POUNDS PER KFT
44	1	0.0020	1.97	0.01175	18	7/.0152"	0.0456	45.6	5.00
43	1	0.0022	2.22	0.01492	18	7/26	0.0490	49	5.31
42	1	0.0025	2.49	0.01877	18	19/.0092"	0.0437	43.7	5.00
41	1	0.0028	2.8	0.02373	18	19/30	0.0476	47.6	5.87
40	1	0.0031	3.1	0.02910	18	16/30	0.0450	45	4.94
39	1	0.0035	3.5	0.03710	18	41/34	0.0468	46.8	5.00
38	1	0.0040	4	0.04840	18	65/36	0.0460	46	5.00
37	1	0.0045	4.5	0.06130	17	1	0.0453	45.3	6.21
36	1	0.0050	5	0.07570	17	7/.0167"	0.0501	50.1	6.03
35	1	0.0056	5.6	0.09490	16	1	0.0508	50.8	7.81
34	1	0.0063	6.3	0.120	16	7/.0192"	0.0576	57.6	7.97
33	1	0.0071	7.1	0.153	16	7/24	0.0600	60	8.90
32	1	0.0080	8	0.194	16	19/29	0.0539	53.9	7.49
32	7/40	0.0093	9.3	0.208	16	19/.0117"	0.0560	56	7.97
31	1	0.0089	8.9	0.240	16	26/30	0.0560	56	8.02
30	1	0.0100	10	0.303	16	37/.0089"	0.0605	60.5	9.05
30	7/38	0.0120	12	0.314	16	65/34	0.0600	60	7.97
30	19/42	0.0120	12	0.374	15	1	0.0571	57.1	9.87
29	1	0.0113	11.3	0.387	15	7/.0214"	0.0642	64.2	9.90
28	1	0.0126	12.6	0.481	15	37/30	0.0667	66.7	11.40
28	7/36	0.0150	15	0.491	14	1	0.0641	64.1	12.40
28	19/40	0.0152	15.2	0.570	14	7/.0242"	0.0726	72.6	12.70
27	1	0.0142	14.2	0.610	14	19/27	0.0679	67.9	11.80
27	7/.0055"	0.0165	16.5	0.655	14	19/.0147"	0.0700	70	12.70
26	1	0.0159	15.9	0.765	14	37/29	0.0750	75	14.60
26	7/34	0.0190	19	0.773	14	41/30	0.0700	70	12.70
26	19/.0039"	0.0190	19	0.890	14	105/34	0.0760	76	12.90
26	10/36	0.0190	19	0.769	13	1	0.0720	72	15.70
26	66/44	0.0190	19	0.769	13	7/.0265"	0.0795	79.5	15.20
25	1	0.0179	17.9	0.970	12	1	0.0808	80.8	19.80
25	7/.007"	0.0210	21	1.06	12	7/.0305"	0.0915	91.5	20.20
24	1	0.0201	20.1	1.22	12	7/21	0.0850	85	17.30
24	7/32	0.0240	24	1.43	12	19/25	0.0862	86.2	18.80
24	19/36	0.0242	24.2	1.47	12	19/.0185"	0.0890	89	20.20
24	16/36	0.0242	24.2	1.47	12	37/28	0.0845	84.5	18.10
23	1	0.0226	22.6	1.55	12	65/30	0.0895	89.5	20.20
23	7/.0085"	0.0255	25.5	1.56	11	1	0.0907	90.7	24.90
22	1	0.0253	25.3	1.94	11	37/27	0.0950	95	23.10
22	7/30	0.0300	30	2.18	10	1	0.1019	101.9	31.43
22	19/34	0.0295	29.5	2.33	10	7/.0385"	0.1155	115.5	32.05
22	26/36	0.0320	32	2.04	10	19/.0234"	0.1137	113.7	32.05
21	1	0.0285	28.5	2.46	10	37/26	0.1070	107	28.88
21	7/.0106"	0.0316	31.6	2.43	10	65/28	0.1110	111	32.05
20	1	0.0320	32	3.09	10	105/30	0.1125	112.5	32.05
20	7/.0121"	0.0363	36.3	3.15	9	1	0.1144	114.4	39.62
20	7/28	0.0390	39	3.32	9	7/.0432"	0.1296	129.6	40.42
20	19/32	0.0385	38.5	3.75	9	19/.0262"	0.1270	127	40.42
20	10/30	0.0360	36	3.09	8	1	0.1285	128.5	49.98
20	26/34	0.0370	37	3.19	8	7/.0486"	0.1458	145.8	50.98
20	41/36	0.0370	37	3.19	8	19/.0295"	0.1430	143	50.98
19	1	0.0359	35.9	3.90	8	19/7/29	0.1650	165	53.46
19	7/.0136"	0.0408	40.8	4.00	8	65/26	0.1475	147.5	51.00
18	1	0.0403	40.3	4.92	8	665/36	0.1540	154	50.32

AWG to Metric Conversion Chart

This table gives solid copper conductor size cross references between American Wire Gauge (AWG) and the closest metric equivalents. As a general rule, stranded copper conductors of the same gauge size will be slightly larger than solid conductors.

AWG	DIAMETER INCHES	MILLIMETERS *(mm)*	SQUARE MILLIMETERS *(mm^2)*
4	0.2043	5.1892	21.1490
6	0.1620	4.1148	13.2980
8	0.1285	3.2639	8.3669
10	0.1019	2.5882	5.2612
12	0.0808	2.0523	3.3080
14	0.0641	1.6281	2.0819
16	0.0508	1.2903	1.3076
18	0.0403	1.0236	0.8229
19	0.0359	0.9118	0.6530
20	0.0320	0.8128	0.5189
21	0.0285	0.7239	0.4116
22	0.0253	0.6426	0.3243
23	0.0226	0.5740	0.2588
24	0.0201	0.5105	0.2047
25	0.0179	0.4546	0.1623
26	0.0159	0.4038	0.1281
27	0.0142	0.3606	0.1021
28	0.0126	0.3200	0.0804
29	0.0113	0.2870	0.0647
30	0.0100	0.2540	0.0507
31	0.0089	0.2260	0.0401
32	0.0080	0.2032	0.0324
33	0.0071	0.1803	0.0255
34	0.0063	0.1600	0.0201
35	0.0056	0.1422	0.0159
36	0.0050	0.1270	0.0127
37	0.0045	0.1143	0.0103
38	0.0040	0.1016	0.0081
39	0.0035	0.0889	0.0062
40	0.0031	0.0787	0.0049

Electrical Insulation Systems

WHAT IS UL 1446? Underwriters Laboratories Inc. (UL) has been developing and enforcing safety standards for over one hundred years. UL 1446, Standard of Safety for Systems of Insulating Materials - General, outlines the test procedures required for the thermal evaluation of electrical insulation systems (EIS). The procedures also cover the evaluation of insulation components for the addition or substitution into an established EIS. UL 1446 also specifies the test procedures required to qualify some of the individual components such as varnishes, magnet wires, and magnet wire coatings.

An established EIS is one that has known service life at operating temperatures and conditions or has been previously evaluated by a long-term thermal aging procedure recognized under UL 1446 requirements. Thermal aging is an accelerated aging program that allows the results to be extrapolated to yield a relative thermal index (RTI) for a proposed EIS that is then compared to the Thermal Index (TI) of a known EIS. This allows the proposed EIS to be assigned a thermal class, e.g., Class 155(F) for Class 180(H).

UL 1446 deals mostly with EIS intended for use in electrical equipment connected to a low-voltage distribution network, defined as not more than 600 V nominal in the US, not more than 750 V in Canada, and 1000 V ac or less in overvoltage category IV installations according to International Electrotechnical Commission (IEC) 60364. These EIS may be used in equipment with higher output voltage, such as control transformers or HID ballasts, but secondary voltage limits should be addressed in end-product standards and test procedures. Usually, this requires that the ground and interwinding thicknesses be increased proportionately so that the V/mm stress does not exceed that of the material as originally tested.

NOTE: *UL 1446 is not intended to cover EIS exposed to radiation or operating in liquids such as oils or refrigerants, or other media that may degrade insulating materials. Nor does it intend to evaluate the effect of the manufacturing process or design factors on the life of the EIS.*

WHAT IS AN INSULATION SYSTEM? An electrical insulation system (EIS) is defined by the IEC as an "insulating structure containing one or more electrical insulating materials (EIM) together with associated conducting parts employed in an electrotechnical device." This is a rather simple definition for what can be a very complex combination of materials. An EIS is composed of two sets of components - **electrical insulating materials** and **non-electrical insulating materials**.

Electrical insulating materials are the electrically stressed components used to separate conducting parts at different electrical potentials. Typical examples of electrical insulating materials include magnet wires, specialized winding wires, varnishes, and flexible sheet materials used for core insulations, as high-low barrier insulation, or slot liners in motors. Rubadue Wire always tests our systems dry (without varnish), and then varnishes can be added after with other non-electrical insulating materials. **Non-electrical insulating materials** are those materials used in combination with the major ground insulation for mechanical, heat transfer, decoration, or other non-electrically stressed applications. Typical examples of minor components include pressure-sensitive tapes, sleeving and tubing, lead wires, phase insulation, and potting compounds. These components are added after the long term aging with significantly less testing.

A more complete listing of components and their definitions can be found in Table 5.1 in UL 1446.

Some of the finer points covered in the table include:

- A Varnish may be an electrical insulating material or a non-electrical insulating material depending upon whether the original EIS was evaluated with a varnish or not.
- Layer insulation is defined as a non-electrical insulating material that serves as a mechanical barrier between successive layers of insulated conductor in the same winding, and does not serve as an electrical insulation.
- Interwinding insulation is defined as an electrical insulating material that serves as electrical insulation between windings, for example, the sheet insulation between successive layers of foil in a strip-wound coil.

WHY IS A SYSTEM IMPORTANT?

There are many benefits to be gained by using a UL Recognized EIS, the main one being that the combination of materials have been proven to be compatible when exposed to long-term thermal aging. Generally, thermal stress is the primary factor affecting the service life of the insulating materials in electrical equipment.

In electrical equipment, the EIS is considered one of the components. In order for the end-product equipment to be listed by UL, a UL Recognized Insulation System must be used. Manufacturers of electrical insulating materials will typically offer UL Recognized EIS as a service to the equipment manufacturers, saving them the time and expense required to develop an EIS for their application.

UL Recognition provides equipment manufacturers confidence that the EIS has been properly evaluated and qualified for use, which leads to safer and better products.

HOW TO OBTAIN A UL RECOGNIZED SYSTEM:

You can develop your own EIS by submitting a proposed combination of materials (a candidate EIS) to a longterm thermal aging program as outlined in UL 1446. This process will typically take 9-18 months to complete, and cost approximately $150,000 in test lab charges and UL fees.

An easier and less expensive way to obtain a UL Recognized Insulation System - adopt one. Most suppliers of electrical insulating materials have developed UL Recognized EIS that are listed under UL Recognized Component Category OBJS2 and are available for manufacturers of electrical equipment to adopt. Rubadue Wire Company, Inc. has two Class F systems available for adoption at no charge from us. UL will require a fee to add it to your file and to set up any follow up required. Rubadue Wire products are also found in other suppliers systems. Ask us about which ones. These EIS are listed on the UL Electrical Insulation System Database that can be found on the UL website. https://iq.ul.com/systems/.

All EIS that are listed on the UL database may be adopted by submitting a project request to UL along with a small fee. You do not need approval from the owner of the UL Recognized EIS to adopt it unless you need to modify the EIS.

You may also request an “electronic” adoption of an EIS listed on the database. This can be accomplished by accessing the EIS database and submitting the appropriate forms electronically. This process can help reduce the time required and costs involved. It is most commonly used when adopting an EIS that does not require modifications or additions. A major benefit to this process is that any revisions to the base EIS will be automatically added to the adopted EIS at no cost.

Remember when you look at the EIS Systems listed on UL’s database that each time a system is changed by the owner it creates a new table. RXT-2 Currently has 6 tables. The oldest table is the one that comes up first.

Electrical Insulation Systems

WHAT IS A SEALED TUBE CHEMICAL COMPATIBILITY TEST?

The Sealed Tube Chemical Compatibility Test (CCT) is a short-time test procedure to determine if the new non-electrical insulating materials to be added to the established EIS will cause detrimental degradation of the EIS.

More simply, all of the materials in the established EIS (the items that went through the long term aging), are sealed in a glass tube designated as the Control EIS. In a second tube are sealed all of the materials in the established EIS along with the desired additional components for evaluation as the Candidate EIS. Many components can be added to each tube. A separate tube is required for each varnish being added to the system.

The Control and Candidate tubes are then aged for two weeks at the established EIS temperature rating plus 25˚C; for example, a Class 180(H) EIS will be thermally aged at 205˚C. The tubes are allowed to cool and then the varnish-coated magnet wire samples are subjected to dielectric strength testing to determine if the addition of the new components in the candidate tube have caused degradation greater than 50% over those in the control tube. If not, the Candidate EIS is now acceptable as a UL Recognized EIS.

Note: All Rubadue Wire Company Systems are tested dry and the varnishes added through the Chemical Compatibility Test (CCT).

RUBADUE WIRE INSULATED SYSTEMS: UL 1446 UL File #E188330

RXT - 1 Class B - *Includes Chemours™ Tefzel® and FEP products*

RXT - 2 Class F - *This includes Chemours™ Tefzel®, FEP, and TCA insulated products.*
Chemours™ Tefzel® down to .0015″
TCA down to .0015″
FEP down to .002″

This System has been revised several times and so there are 6 different tables. The most recent are the items in Table VI. There are times UL changes the standard and will grandfather in existing systems.

For this reason sometimes our customers reference a previous table rather than the newest one to enable usage of certain combinations of components such as enamel wires and varnishes.

The most recent revisions allow for more components available globally including Asia.

TCA - Class F - This includes Chemours™ Tefzel®, FEP, and TCA insulated products.
Chemours™ Tefzel® down to .0036″
TCA3
FEP down to .0041″

This system has many components available in Asia.

Many other industry suppliers have included Rubadue Wire products in their systems, including DuPont™ which has Rubadue Wire FEP and PFA products in Class H and other systems. Please ask customer service if there are components you require that are not currently shown in a system. In some cases we may be able to update a system to meet your requirements, or advise of another system.

Insulation Comparative Properties

THERMAL	ETFE (Tefzel®)	FEP	PFA	PVC	Polyethylene (HDPE)	Polyproylene	Polyurethane	Kapton®
Continuous Operating Temperature (°C)	150-200	200	260	105	110	80	70	200
Non-Flammability	Excellent	Excellent	Excellent	Varies	-	-	-	Excellent
UL Flammability Rating	V-0	V-0	V-0	Varies	Varies	Varies	Varies	V-0
Solder Resistance	Excellent	Excellent	Very Good	Good				Excellent
Smoke	Slight	None	None	Varies		Varies		None

ELECTRICAL	ETFE (Tefzel®)	FEP	PFA	PVC	Polyethylene (HDPE)	Polyproylene	Polyurethane	Kapton®
Dielectric Strength	Excellent	Excellent	Excellent	Fair	Excellent	Excellent	Good	Excellent
Dielectric Constant	2.6	2.03	2.03	5.70	2.3	2.3	3.5	3

MECHANICAL	ETFE (Tefzel®)	FEP	PFA	PVC	Polyethylene (HDPE)	Polyproylene	Polyurethane	Kapton®
Tensile Strength (PSI)	6500	3000+	3600	4000	3800	4000	4500	17000
Elongation (%)	150-300	300	300	175-250	500	100	500	70
Abrasion Resistance	Excellent	Good	Good	Good	Good	Good	Excellent	Excellent
Bondability	Good	Poor	Poor	Good	Poor			Excellent
Hardness (Shore D)	63	55	55	Varies		90		
Flex Modulus (PSI)	30,000-150,000	75,000	71,000-85,000	Varies	150,000	150,000		
Density (gm/cc)	1.7	2.12-2.17	2.15	1.36	.95-.96	.9-.98	1.12	1.42

ENVIRONMENTAL	ETFE (Tefzel®)	FEP	PFA	PVC	Polyethylene (HDPE)	Polyproylene	Polyurethane	Kapton®
Chemical Resistance	Excellent	Excellent	Excellent	Fair-Good	Good	Good	Fair	Excellent
Water Resistance	Excellent	Excellent	Excellent	Fair-Good	Excellent	Excellent	Fair	Excellent
Long Term Stability	Excellent	Excellent	Excellent	Good	Good	Good	Good	Excellent

Rubadue Wire Company, Inc. believes this information to be reliable, but the accuracy or completeness is not guaranteed.
Kapton® is a registered trademark of DuPont Electronics, Inc.

Environmental Compliance

ENVIRONMENTAL COMPLIANCE

Rubadue Wire Co., Inc. and its employees are committed to the use of environmentally friendly products and processes. As a result of this commitment to help protect our global environment, virtually all Rubadue Wire products manufactured and shipped since 2005 have met and continue to meet the requirements of the Restriction on Hazardous Substances (RoHS) Directive and the existing Reach SVHC. Rubadue Wire is also proud to claim our continuing compliance and certification to ISO 14001 environmental standards.

ROHS COMPLIANCE -

European Directive 2015/863/EU, 2011/65/EC
Restriction of Certain Hazardous Substances Directive (RoHS)

RoHS Compliance - The amendment to the RoHS 2 directive (2015/863) added four new substances to the list of restricted materials. Those materials are Bis(2-Ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP). Rubadue Wire does not use these four substances in the manufacturing of any parts or components. To the best of our knowledge, none of our raw material suppliers use these substances in the manufacturing of their products. Rubadue Wire does not use Polybrominated Biphenyl (PBB) and Polybrominated Diphenyl Ether (PBDE) flame retardants as intentional ingredients in the manufacturing of any parts or components. To the best of our knowledge, none of our raw material suppliers use these substances in the manufacturing of their products.

European Directive 2011/65/EC also prohibits the use of certain amounts of lead, cadmium, mercury, and hexavalent chromium. Rubadue Wire products do not exceed the maximum allowable contents of these “heavy metals” in the manufacturing process. To the best of our knowledge, none of our raw material suppliers use unacceptable amounts of these substances in the manufacturing of their products.

We conduct random analysis testing of our products to ensure RoHS compliance, but we do not routinely analyze our products for substances not purposely added.

REACH - *Registration, Evaluation, and Authorization of Chemicals*

Registration, Evaluation, and Authorization of Chemicals (Reach) entered into force in June 2007 for the intent of protection to human health and the protection of the environment. The Reach SVHC list now includes 219 substances and is updated with new substances every six months. Please visit our website using the link below to see our latest Reach SVHC statement. rubadue.com/reach-svhc-certification/

REACH also addresses the continued use of 151 substances defined as “Substances with Very High Concern” (SVHC). Rubadue Wire Co., Inc. does not intentionally use or add any of the 151 (SVHC) above 0.1% weight and we have also confirmed with our raw material suppliers that these substances are not intentionally used or added above 0.1% weight.

Rubadue Wire is a certified ISO 9001:2015 and ISO 14001:2015 company.

Notes

Notes

Glossary

A

ABRASION - Damage caused by scraping or rubbing against a rough, hard surface.

ABRASION RESISTANCE – A measure of the ability of a wire, wire covering or material to resist surface wear or damage by mechanical means.

A.C. OR A-C – Abbreviation for alternating current.

ACCELERATED LIFE TEST – A test in which certain conditions such as voltage, temperature, etc. to which a wire, cable or material is subjected are increased in magnitude above normal operating values to obtain observable deterioration in a reasonable period of time, thereby providing a relative measure of theprobable material life under operating voltage, temperature, etc.

ACTIVE WIRE – The wire in an armature winding which produces useful voltage. That portion of the winding in which induction takes place.

ADMITTANCE – The measure of ease with which an alternating current flows in a circuit. The reciprocal of impedance.

AGING – The change in properties of a material with time under specific conditions.

ALLOY – A metal formed by combining two or more other metals.

ALTERNATING CURRENT – Electric current that periodically and regularly reverses its direction. The frequency of the change in flow is expressed in cycles per second (Hertz or Hz).

AMBIENT TEMPERATURE – The temperature of a medium, such as gas or liquid, surrounding an object.

AMERICAN WIRE GAGE *(AWG)* – The standard system used for measuring wire diameter.

AMPERE *(AMP)* – The unit expressing the rate of flow of an electrical current. One ampere is the current flowing through an 'ohm' of resistance at one volt potential.

ANNEAL – To heat and then gradually cool in order to relieve mechanical stresses. Annealing copper makes it softer and less brittle.

ANSI – American National StandardsInstitute. Formally American Standards Association.

ARC RESISTANCE – Time required for an arc to establish a conductive path in a material.

ASTM – American Society for Testing and Materials.

AWG – American Wire Gage.

AWM – Appliance Wiring Material; UL AWM standardized specifications with a range of temperatures and voltage ratings, conductor sizes and materials, insulation materials and thicknesses, shields or coverings.

B

BARE CONDUCTOR – A conductor not covered with insulating material.

BASIC ISOLATION *(Basic Insulation)* – One layer of insulation over a conductor.

BC – Bare Copper.

BREAKDOWN – (puncture) a disruptive discharge through insulation.

BREAKDOWN VOLTAGE – The voltage at which an insulation will breakdown, become electrically conductive, and fail.

BUNCHED STRANDING – Term applied to a group of strands twisted together in a random manner in the same direction in one operation without regard to geometric arrangement of specific strands.

C

CABLE – Either a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

CABLE ASSEMBLY – A cable with plugs or connectors on each end.

CABLE CORE – The portion of an insulated wire or cable lying under the protective or insulated covering or coverings.

CFM – Customer furnished material.

CIRCUIT – A complete path over which electrons can flow from the negative terminals of a voltage source through parts and wires to the positive terminals of the same voltage source.

CLADDING – Method of applying a layer of metal over another metal whereby the junction of the two metals is continuously welded.

CLASS B – Thermal Class B rated for 130°C temperatures.

CLASS F – Thermal Class F rated for 155°C temperatures.

CLASS H – Thermal Class H rated for 180°C temperatures.

COLOR CODE – A color system for wire or circuit identification by use of colors. (See color code chart).

COMPOSITE *(Clad)* WIRE – Wire having a core of one metal to which is fused an outer shell of one or more different metals.

COMPOUND – An insulating jacketing material made by mixing two or more ingredients, thereby resulting in one material.

CONCENTRIC – A central core surrounded by one or more layers of helically wound strands in a fixed round geometric arrangement.

CONCENTRIC-LAY CONDUCTOR – A conductor composed of a central core surrounded by one or more layers of helically laid wires.

CONCENTRICITY – In a wire or cable, the measurement of the location of the center of the conductor with respect to the geometric center of circular insulation.

Glossary

CONDUCTANCE – The reciprocal of resistance. It is the ratio of current passing through a material to the potential difference at its ends.

CONDUCTIVITY – Reciprocal of volume resistivity. Conductance of a unit cube of any material.

CONDUCTOR – A wire or combination of wires not insulated from one another, suitable for carrying electric current.

CONTINUITY CHECK – A test performed on a length of finished wire or cable to determine if the electrical current flows continuously throughout the length.

CONTRA HELICAL – The direction of a layer with respect to the previous layer. Meaning a layer spiraling in an opposite direction the preceding layer within a wire or cable.

COPOLYMER – A compound resulting from the chemical reaction of two chemically different monomers with each other.

COPPER – Copper in wire forms has the best conductivity of the common (non-precious) metals. Copper and copper alloys offer excellent corrosion resistance, high thermal conductivity, and ease of fabricating.

CORE – In wire and cables, a term used to express a component or assembly of components over which other materials are applied, such as additional insulating materials.

CORONA – A luminous discharge due to ionization of the gas surrounding a conductor around which exists a voltage gradient exceeding a certain critical value.

CORONA RESISTANCE – The time that insulation will withstand a specified level field-intensified ionization that does not result in the immediate complete breakdown of the insulation.

CORROSION – Chemical action which causes deteriorations of the surface of a metal by oxidation or chemical combination.

COULOMB – Unit quantity of electricity i.e. the quantity transferred by 1 ampere in one second.

CROSS- SECTIONAL AREA OF A CONDUCTOR – The sum of the cross-sectional areas of its component wires, that of each wire being measured perpendicular to its individual axis.

CSA – Canadian Standards Association; global provider of product testing and certification services.

CURRENT – The rate of transfer of electricity. Practical unit is the ampere which represents the transfer of one coulomb per second.

CURRENT CARRYING CAPACITY – The maximum current a conductor can carry without heating beyond a safe limit.

D

D.C. OR D-C – Abbreviation for direct current.

DE-RATING FACTOR – A factor used to reduce a current carrying capacity of a wire when used in other environments from that for which the value was established.

DIELECTRIC – Insulator.

DIELECTRIC ABSORPTION – That property of an imperfect dielectric whereby there is an accumulation of electric charges within the body of the material when it is placed in an electric field.

DIELECTRIC CONSTANT – (Permittivity or Specific Inductive Capacity). That property of a dielectric which determines the electrostatic energy stored per unit volume for unit potential gradient. Lower dielectric constant numbers are generally preferred.

DIELECTRIC LOSS – The time rate at which electric energy is transformed into heat in a dielectric when it is subjected to a changing electric field.

DIELECTRIC STRENGTH – The voltage which an insulation material can withstand before breakdown occurs.

DIELECTRIC TEST – Tests which consists of the application of a voltage higher than the rated voltage for a specified time for the purpose of determining the adequacy against breakdown of insulating materials and spacing under normal conditions.

DIRECT CURRENT – An electric current which flows in only one direction.

DISTURBED CONDUCTOR – A conductor that receives energy generated by the field of another conductor or an external source such as a transformer.

DIW – Double (layer) insulated wire.

DRAWING – In the manufacture of wire, pulling the metal through a die or series of dies for reduction of diameter to a specified size.

E

ECCENTRICITY – A measure of the center of a conductor's location with respect to the circular cross section of the insulation. Expressed as a percentage of center displacement of one circle within the other.

EIA – Abbreviation for Electronic Industries Association. Electromotive Fore (E.M.F.) Pressure or voltage. The force which causes current to flow in a circuit.

ELECTRONIC HOOK-UP WIRE – Wires used to make internal connections between various electrical parts of electronic assemblies.

ELECTRONIC INTERCONNECTING WIRE – Wires or cables used to make external connections between various units of electronic equipment.

ELECTRO-TINNED – Electrolytic process of tinning wire using pure ommercially tin.

ELONGATION – A fractional increase in the length of a material when a given amount of stress is applied.

Glossary

EMF – Abbreviation, Electromotive Force or voltage. End to End Check. Tests conducted on a completed wire and / or cable run to assure electrical continuity.

ETFE – Ethylene tetrafluoroethylene; type of insulation.

EXTRUSION – A method of forcing plastic, rubber or elastomer materials through an orifice in a continuous fashion to apply insulation or jacketing to a conductor or cable.

F

FARAD – Unit of capacitance.

FEP – Fluorinated Ethylene Propylene; type of insulation.

FILM – Sheeting having a nominal thickness not greater than 0.010 inch.

FLAT CONDUCTOR – A conductor with a width-to-thickness ratio of arbitrarily 5 to 1 or greater.

FLEX LIFE – The time of heat aging that an insulation material can withstand before failure when bent around a specific radius, (used to evaluate thermal endurance). Also, ability of conductor, wire, cable to withstand repeated bending.

FREQUENCY – The number of times an alternating current repeats its cycle in one second.

G

GAGE OR GAUGE – A term used to denote the physical size of a wire.

GROUND INSULATION – The major insulation used to achieve ground potential.

GROUND WIRE – A conductor leading from equipment to an electrical connection with the ground.

H

HARD DRAWN COPPER WIRE – Copper wire that has not been annealed after drawing.

HEAT ENDURANCE – The time of heat aging that a material can withstand before failing a specific physical test.

HEAT SHOCK – Test to determine stability of material by sudden exposure to a high temperature for a short period of time.

HELICAL – Spiral

HELIX – Spiral winding

HENRY – Unit of inductance when the induced electromotive force of one volt is produced by the inducing current changing at the rate of one ampere per second.

HERTZ – A term replacing cycles-per-second as an indication of frequency.

HI-POT – A test designed to determine the highest potential that can be applied to a conductor without breaking through the insulation.

HIGH VOLTAGE – Typically refers to a wire or cable with an operating voltage over 600 volts.

HOOK-UP WIRE – Insulated wire used for low current, low voltage (under 1000 volt) applications internally within enclosed electronic equipment.

HOT TIN DIP – A process of passing bare wire through a bath of molten tin to provide a coating.

I

IEC – International Electrotechnical Commission; international standards organization dealing with electrical, electronic, and related technologies.

IMPEDANCE – The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency.

INDUCTANCE – The property of a circuit or circuit element that opposes a change in current flow. Inductance thus causes current changes to lag behind voltage changes. Inductance is measured in henrys.

INSULATED WIRE – A conductor of electricity covered with a non-conducting material.

INSULATION - Material having a high resistance to the flow of electric current, to prevent leakage of current from a conductor.

INSULATION SYSTEM – All of the insulation materials used to insulate a particular electrical or electronic product.

INSULATION THICKNESS – Size of insulation applied to conductor, typically measured in mils or thousandths of an inch.

INSULATOR – A material of such low electrical conductivity that the flow of current through it is usually negligible.

INTERCONNECTING WIRE – The physical wiring between components (outside a module), between modules, between units or between larger portions of a system or systems.

J

JACKET – A synthetic or rubber covering over the insulation, core or sheath of a cable.

K

KILOWATT – A unit of power equal to one thousands watts.

KILOVOLT AMPERE – 1000 volts X amperes.

KILOVOLTS – 1000 volts.

L

LAY – The twist in a stranded conductor or twisted wires; distance between each complete twist.

Glossary

LITZ WIRE – (Litzendraht Wire) Wire made from a number of fine, separately-insulated enamel strands specially braided or woven together for reduced skin effect and hence, lower resistance to high frequency currents for lower RF losses.

M

MAGNET WIRE – Enamel insulated wire intended for use in windings on motors, transformer and other coils for electromagnetic devices.

MELT RANGE – The difference in degrees F or C between the melting point of material and its flow point.

MELTING POINT - The temperature at which a material changes state from solid to liquid.

MHD – Medium Hard Drawn copper wire.

MIL – 0.001" (1/1000 inch) One thousandth of an inch. A unit used in measuring the diameter of wire or thickness of insulation over a conductor.

MILLI – Prefix denoting one thousandth.

N

NEC – National Electrical Code covers the use of wire and cable in many applications.

NEMA – National Electrical Manufacturers Association.

NICKEL – Nickel offers a combination of corrosion resistance, formability, and tough physical properties. Nickel is used for alloying purposes and in nickel-clad copper wire.

NON-CONDUCTOR – An insulating material.

NPC – Nickel Plated Copper.

NYLON – The generic name for synthetic fiber-forming polyamides.

O

OD – Outside Diameter.

OHM – Unit of electrical resistance. Resistance of a circuit in which a potential difference of one volt produces a current of one ampere.

OHM'S LAW – Current in terms of electromotive force E and resistance R, given by equation: I = E/R.

OVER POTENTIAL / OVERVOLTAGE – A voltage above the normal operating voltage of a device or circuit.

P

PERCENT CONDUCTIVITY – Conductivity of a material expressed as a percentage of that of copper.

PFA – Perfluoroalkoxy; type of insulation.

PLAIN CONDUCTOR – A conductor consisting of one metal only.

PLASTIC – High polymeric substances, including both natural and synthetic products (excluding rubbers), that are capable of flowing under heat and pressure.

PLATING – One method of applying a coating of one metal over another.

POLARITY – a) An electrical condition determining the direction in which current tends to flow. b) The quality of having two opposite charges.

POLYETHYLENE *(PE)* – Thermoplastic polymer insulation.

POLYPROPYLENE – Thermoplastic insulation similar to polyethylene but stiffer and having a higher temperature capability.

POLYURETHANE – Broad class of polymer insulations.

POTTING – Sealing of a wire or cable termination or other parts with a liquid composition that hardens into an elastomer or solid plastic material.

PRIMARY INSULATION – A non-conductive material, the first layer over a current carrying conductor. The prime function being an electrical barrier for the applied potential.

PVC – Polyvinyl chloride; general purpose thermoplastic insulation.

R

REINFORCED ISOLATION *(Reinforced Insulation)* – Three layers of insulation over a conductor.

RESISTANCE – Property of a conductor that determines the current produced by a given difference of potential. The ohm is the practical unit of resistance.

RESISTIVE CONDUCTOR – A conductor used primarily because it possesses the property of high electric resistance.

RE-SPOOL – To rerun material from one package spool to another for varying reasons. Such as: testing, inspection for defects, verify lengths, etc.

RMS – Root Mean-Square – Thealternating current value that corresponds to the direct current value that will produce the same heating effect.

S

SAE – Society of Automotive Engineers.

SECONDARY INSULATION – A non-conductive material whose prime functions are to add a second electrical barrier and provide additional abrasion protection.

SHELF LIFE – Length of time under specified conditions that a material retains its usability.

SHUNT WIRE – A conductor joining two parts of an electric circuit to divert part of a current.

Glossary

SILVER – Silver is similar to gold in corrosion resistance. Costs less, provides very good conductivity and solderability. Widely used as a plating or coating over copper.

SIW – Single (layer) insulated wire.

SOLDER – A metallic alloy for joining metals.

SOLID CONDUCTOR – A conductor consisting of a single wire.

SPC – Silver Plated Copper.

SPARK TEST – A test performed on wire and cable to determine the amount of detrimental porosity (pin holes) of defects in the insulation.

STRAND – One of the wires, groups of wires, of any stranded conductor.

STRANDED CONDUCTOR – A conductor composed of a group of wires (Wires in a Stranded Conductor are usually twisted).

STRIP – To remove insulation from a wire or cable.

SUPPLEMENTARY ISOLATION *(Supplementary Insulation)* – Two layers of insulation over a conductor.

T

TANK TEST – A term used to describe a voltage dielectric test where the specimen to be tested is submerged in a liquid (usually water) and a voltage potential applied between the conductor and the liquid as ground.

TPC – Tin Plated Copper.

TEFLON® – Chemours™ trade name (Teflon® FEP & Teflon® PFA).

TEFZEL – Chemours™ trade name for Tefzel ETFE.

TENSILE STRENGTH – The pulling stress required to break a given wire.

TEMPERATURE RATING – The maximum temperature at which the insulating material may be used in continuous operation without loss of its basic properties.

TFE – Polytetrafluoroethylene. Thermal Conductivity – Ability of amaterial to conduct heat.

THERMAL ENDURANCE – The time at a selected temperature for an insulating material or system of materials to deteriorate to some predetermined level of electrical, mechanical, or chemical performance under prescribed conditions.

TIN PLATED COPPER – Copper wire that has been coated with a layer of tin. One benefit is to simplify soldering.

TIW – Three (layer) insulated wire.

TOLERANCE – A specified allowance for error from a standard or given dimension, weight, or property.

U

UL – Underwriters Laboratories Inc.; independent product safety testing and certification organization.

UNIDIRECTIONAL STRANDING – A term denoting that in a stranded conductor all layers have the same direction of lay.

UNILAY STRAND – A conductor constructed with a central core surrounded by more than one layer of helically-laid wires, with all layers having a common length and direction of lay.

V

VDE – Verband der Elektrotechnik; German Association for electrical, electronic, and information technologies. Certification organization.

VOLT – Basic unit of electrical potential.

VOLTAGE – Electrical potential or force expressed in volts.

VOLTAGE DROP – Amount of voltage loss from original input in a conductor of given size and length.

VOLTAGE RATING – The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.

W

WALL THICKNESS – A term used that expresses the thickness of an insulation or jacket.

WATT – Unit of power or work done at the rate of one joule per second or rate of work represented by current of one ampere under a pressure of one volt (voltampere).

WINDING WIRES – Basic, Supplementary, or Reinfoced Isolation / Insulation.

WITHSTAND VOLTAGE – Voltage that the conductor will safely handle in a given application without failure.

WIRE – A conductor of round, square, or rectangular section. Either bare or insulated.

WIRE GAGE – A system of numerical designations of wire sizes. See American Wire Gauge (AWM).

Part Number Index

Part Number Index

Part Number Index

Part Number Index

INDEX

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