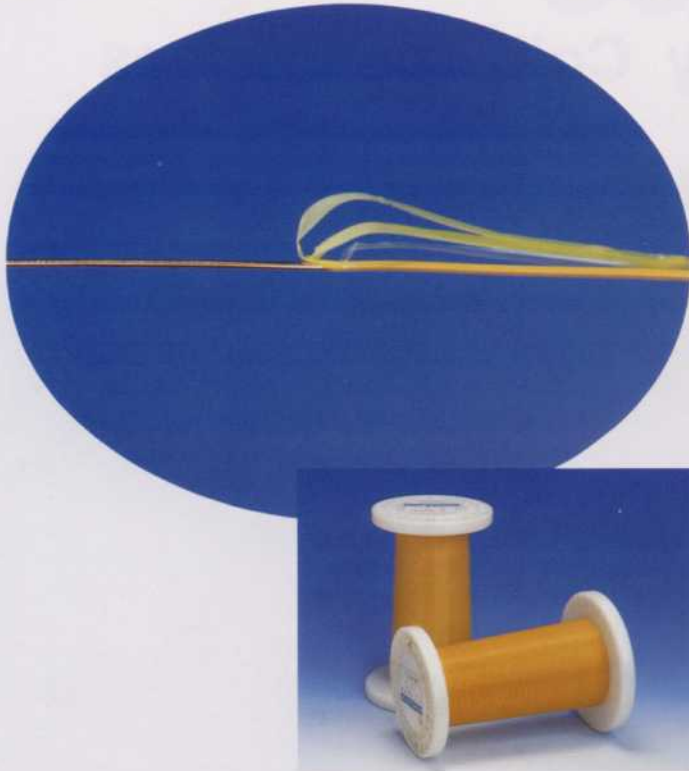


# “FURUKAWATEX” [TEX-E]

<http://www.furukawa.co.jp/makisen/eng/index.html>



## ■ FEATURES

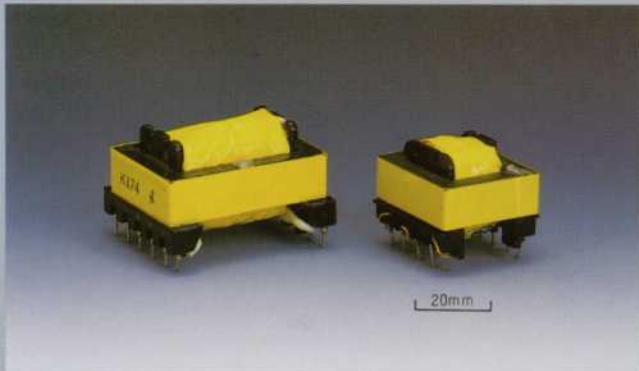
1. Classed as thermal resistance “A-E” (105 ~ 120°C) type.
2. Outstanding withstand voltage; approved as having Reinforced Insulation\*\* by test houses.
3. Solderable in a way not allowing for the stripping of the cover.
4. Can be fast coiled by using an automatic coiling machine.
5. Sizes available in a wide range of 0.2 ~ 1.0mm.

## ■ TEX-E MEETS THE FOLLOWING SAFETY CODES:

- |       |               |                 |                       |
|-------|---------------|-----------------|-----------------------|
| • UL  | UL1950        | • TÜV Rheinland | EN 60950              |
| • CSA | C22.2 No. 950 |                 | IEC65 as modified     |
|       | C22.2 No.1    |                 | DIN VDE 0860          |
|       |               |                 | HD 195 S6             |
| • BSI | EN60950       | • NEMKO         | EN60950               |
|       | EN60065       | • VDE           | DIN EN 60950 VDE 0805 |
|       |               |                 | DIN EN 60065 VDE 0860 |

- \* Class A: UL  
Class E: CSA, BSI, NEMKO, TÜV Rheinland, VDE
- \*\* Rating voltage (Working voltage)  
1000Vrms : UL., CSA, BSI, NEMKO, TÜV Rheinland  
1000Vpeak, 700 Veff : VDE

## ■ APPLICATIONS TO TRANSFORMERS



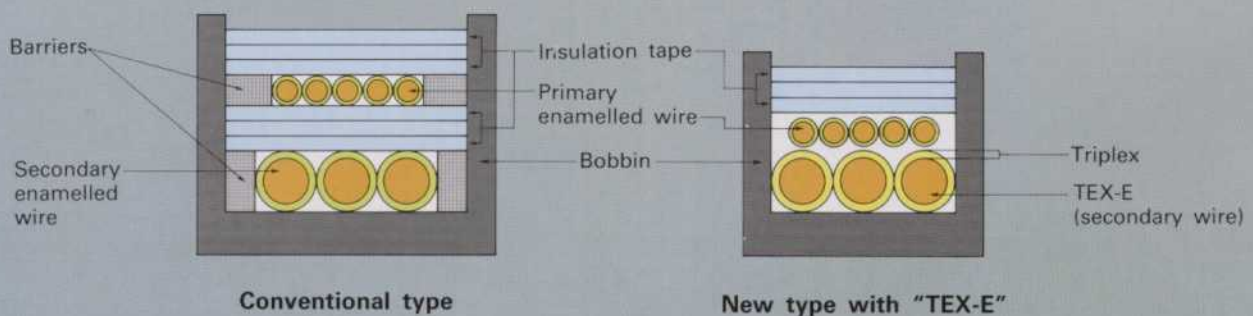
### A Comparison with Conventional Transformers:

The conventional type transformer is on the left and the transformer using TEX-E is on the right. The photograph illustrates a case in which TEX-E is used for a 20-watt class transformer.

With interlayer insulation tapes and barriers dispensed with, the transformer could be reduced by approximately half the volume and two-thirds of the weight. This could lead to both material and fabrication cost cuts.

Courtesy of Fujitsu Denso Ltd.

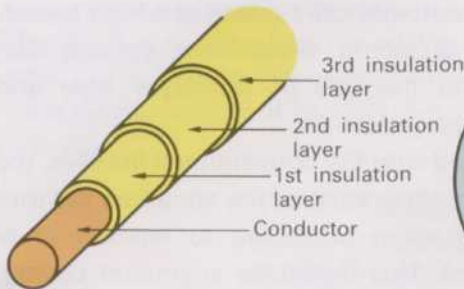
### TRANSFORMER CONSTRUCTION (an Example)



# Winding Wires (TEX-E) that Conform to the "Safety Standard Requirements" of Barrier-less, Smaller, Higher-Efficient Transformers for Switching Power Supply

## CONSTRUCTION

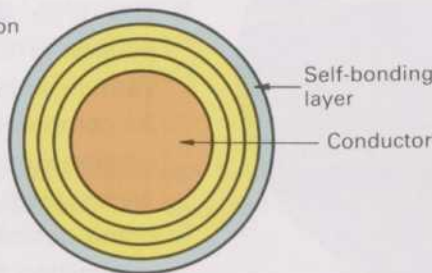
**A: Standard type (TEX-E)**



The standard type wire is made up of three insulation layers using the solderable, modified polyester, thermal-resistant resin and the polyamid resin, which were developed by Furukawa Electric.

- Registered the type in following UL, CSA, BSI, NEMKO, TÜV Rheinland, VDE

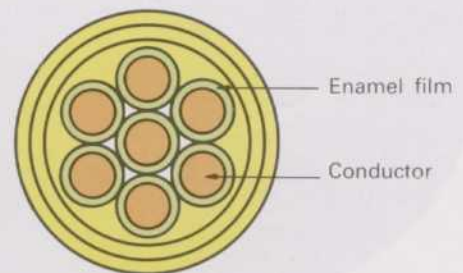
**B: Self-bonding type (TEX-ECEW3)**



TEX-ECEW3 has a self-bonding layer which covers the outer surface of the standard type wire, so that it can create a bobbin-less coil.

- Registered the type in following UL, CSA, NEMKO, TÜV Rheinland

**C: Litz wire type (TEX-ELZ)**



With TEX-ELZ, the litz wire is covered with three layers of insulation on the outer surface, which enable it to cope with high frequencies resistance.

- Registered the type in following UL, CSA, NEMKO, TÜV Rheinland

## Comparison of characteristics between UEW (conventional) wire and TEX-E

Item	1-U EW	TEX-E	
Dimensions (mm)	Overall diameter	0.440	0.600
	Conductor diameter	0.400	0.400
	Film thickness	0.020	0.100
Dielectric breakdown voltage (kV)	3 layers	11.0	> 19.0
Withstand voltage (kV) (one-minute value)	2 layers	-	9.5
	Twisted TEX-E with Bare wire	3 layers	-
Solderability at 420°C	(sec)	2.0	2.0
Continuity (NEMA 3000V)	(/30m)	15, 4, 11	0, 0, 0
Heat shock at 150°C, 1hr		2D	1D
Resistance to Softening	(°C)	270	231
Unidirectional scrape test	(N)	14.31	19.31
Reciprocating scrape test	(times)	60	285
Coefficient of static friction		0.133	0.125
Adhesion	As exposed (mm)	0.5	< 0.5
Chemical resistance (Pencil Hardness)	Xylene	5H	3H
	Styrene	5H	3H

## DIMENSIONS of TEX-E (Example)

Conductor diameter (mm)	Tolerance (mm)	Typical O.D. (mm)	Max. O.D. (mm)	Conductor resistance (Ω/km)	Weight (kg/km)
0.20	±0.008	0.400	0.417	607.6	0.398
0.21	±0.008	0.410	0.427	549.0	0.431
0.22	±0.008	0.420	0.437	498.4	0.465
0.23	±0.008	0.430	0.447	454.5	0.500
0.24	±0.008	0.440	0.457	416.2	0.537
0.25	±0.008	0.450	0.467	382.5	0.575
0.26	±0.010	0.460	0.477	358.4	0.616
0.27	±0.010	0.470	0.487	331.4	0.656
0.28	±0.010	0.480	0.497	307.3	0.697
0.29	±0.010	0.490	0.507	285.7	0.742
0.30	±0.010	0.500	0.520	262.9	0.786
0.32	±0.010	0.520	0.540	230.0	0.882
0.35	±0.010	0.550	0.570	191.2	1.033
0.37	±0.010	0.570	0.590	170.6	1.143
0.40	±0.010	0.600	0.625	145.3	1.316
0.45	±0.010	0.650	0.675	114.2	1.633
0.50	±0.010	0.700	0.725	91.43	1.985
0.55	±0.020	0.750	0.775	78.15	2.371
0.60	±0.020	0.800	0.825	65.26	2.793
0.65	±0.020	0.850	0.875	55.31	3.249
0.70	±0.020	0.900	0.925	47.47	3.741
0.75	±0.020	0.950	0.975	41.19	4.267
0.80	±0.020	1.000	1.030	36.08	4.829
0.85	±0.020	1.050	1.080	31.87	5.425
0.90	±0.020	1.100	1.130	28.35	6.056
0.95	±0.020	1.150	1.180	25.38	6.721
1.00	±0.030	1.200	1.230	23.33	7.422