Specification

FOR

600V TC-ER-THWN-2/PVC

COMMODITY CABLES, LLC.

1. Scope

This specification covers 600V, copper conductor, PVC insulated and PVC oversheathed Tray cable in accordance with UL 83, UL 1277.

This insulation is recommended for operation at maximum rated conductor temperature of 90℃.

2. Construction and Material

2.1 Conductor

Conductor shall be a circular stranded or compacted round or a compressed uncoated annealed copper conductor. The direction of lay shall be left hands(S) lay in the outer lay.

2.2 Insulation

1) Insulation

The insulation shall be consist of an extruded layer of heat resistant PVC compound complying with UL 83. The average and minimum thickness at any point shall be in accordance under table.

Size of conductor	Minimum average thickness		Minimum thickness at any point	
AWG or kcmil	mm	mils	mm	mils
14 – 12	0.38	15	0.33	13
10	0.51	20	0.46	18
8 – 6	0.76	30	0.69	27
4 – 2	1.02	40	0.91	36
1 – 4/0	1.27	50	1.14	45
250 – 500	1.52	60	1.38	54
550 – 1000	1.78	70	1.60	63
1100 – 2000	-	-	-	-

2) Nylon jacket

The nylon jacket shall be consist of an extruded layer of nylon compound and the thickness at any point of jacket shall be not less than the value given in under table.

Conductor size	Minimum thickness at any point	
AWG or kcmil	mm	mils
14 – 10	0.10	4
8 – 6	0.13	5
4 – 2	0.15	6
1 – 4/0	0.18	7
250 – 500	0.20	8
550 – 100	0.23	9

2.3 Ground wire(Bare copper)

The conductor for ground wire shall be of the same material as the phase.

2.4 Core identification

The individual cores shall be identified by colors in accordance with the following.

- 3Core : Black, Red, Blue

Rev.1→ - 4Core : Black, Red, Blue, Orange

2.5 Assembly

The required number of cores shall be assembled together.

If necessary a suitable filler or binder tape may be applied the assembled cores.

Number of conductors	Maximum length of lay
2	30 times diameter of finished insulated conductor
3	35 times diameter of finished insulated conductor
4	40 times diameter of finished insulated conductor
5 or more, or assemblies with more than one conductor size	15 times the calculated diameter of the overall assembly but, in a multiple-layer cable, the length of lay of the conductors in each of the inner layers of the cable is not specified

2.6 Jacket

The jacket shall be an extruded flame-retardant PVC compound in accordance with UL 1277.

The average and minimum thickness at any point shall be in accordance under table.

Diameter of round assembly under jacket		Minimum average thickness		Minimum thickness at any point	
mm	inch	mm	mils	mm	mils
0 – 10.80	0 – 0.425	1.14	45	0.91	36
Over 10.80 – 17.78	Over 0.425 - 0.700	1.52	60	1.22	48
Over 17.78 – 38.10	Over 0.700 - 1.500	2.03	80	1.63	64
Over 38.10 – 63.50	Over 1.500 - 2.500	2.79	110	2.24	88
Over 63.50	Over 2.500	3.56	140	2.84	112

3. TEST

The following test shall be conducted at manufacturer's works.

Testing method shall be in accordance with UL 83 and UL 1277.

1) Appearance
2) Construction
3) Conductor resistance
4) Withstand voltage
5) Insulation resistance
6) Mechanical characteristics of insulation and oversheath
7) UL 1685 Flame exposure test

4. PACKING AND MARKING

The cable shall be wound on reel so as to prevent damage during transportation.

The following description shall be marked on a flange of the reel.

1) Direction of rotation of the reel
2) Type of cable
3) Number of conductors and conductor size
4) Length of cable
5) Net & Gross weight
6) Manufacturer's name
7) Year of manufacture
8) Reel No. (if required)

5. Cable Marking

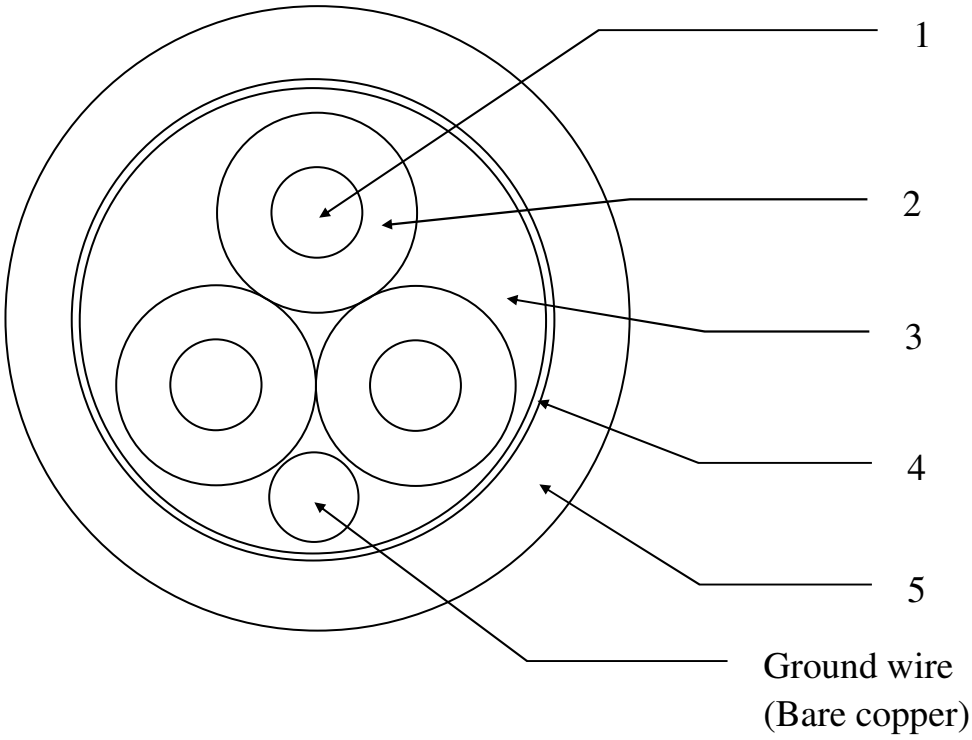
Example) COMMODITY CABLE #Exxxxxx 12AWG CU 3/C THWN-2 PVC JKT 600V 90C WET OR DRY TYPE TC-ER <UL> FT4 SUN RES DIR BUR OIL RES I MM/YYYY xxxxFT

ATTACHED TABLE (VNGTC)

Phase	Conductor			Thick. of Insulation mm		Thick. of nylon	Ground wire	Thick of Jacket		Approx. overall dia.	Max. conductor resistance (20℃)	Test voltage
No. of core	AWG or kcmil	shape	Dia.									
		No./mm	mm	min avg	min	min	AWG	Min avg	min	mm	Ω/km	kV/ 1min
3	14	7/0.615	1.85	0.38	0.33	0.10	14	1.14	0.91	9.5	8.62	2
3	12	7/0.775	2.34	0.38	0.33	0.10	12	1.14	0.91	10.5	5.43	2
3	10	7/0.978	2.94	0.51	0.46	0.10	10	1.14	0.91	12.5	3.41	2
3	8	7/1.23	3.7	0.76	0.69	0.13	10	1.52	1.22	16.0	2.14	2
3	6	Compress	4.52	0.76	0.69	0.13	8	1.52	1.22	18.0	1.346	2
3	4	Compress	5.72	1.02	0.91	0.15	8	2.03	1.63	22.5	0.846	2
3	2	Compress	7.1	1.02	0.91	0.15	6	2.03	1.63	25.5	0.531	2
4	14	7/0.615	1.85	0.38	0.33	0.10	14	1.14	0.91	10.0	8.62	2
4	12	7/0.775	2.34	0.38	0.33	0.10	12	1.14	0.91	11.5	5.43	2
4	10	7/0.978	2.94	0.51	0.46	0.10	10	1.52	1.22	14.5	3.41	2
4	8	7/1.23	3.7	0.76	0.69	0.13	10	1.52	1.22	17.5	2.14	2
4	6	Compress	4.52	0.76	0.69	0.13	8	1.52	1.22	20.0	1.346	2

* DRAWING

Rating Volt	600V	Type of Cable	TC-ER-THWN-2/PVC
No. of Core	3+G	Design Spec'	UL 83 / UL 1277



No.	Description	D e t a i l s	Remarks
1	Conductor	Circular Stranded Copper	
2	Insulation	Extruded PVC	With nylon
3	Filler	Suitable filler	If necessary
4	Binder	Plastic tape	If necessary
5	Oversheath	Extruded PVC	