

# Southwire® Machine Flex® CU 600/1000V THHN Insulation Gray TPE Jacket. Silicone-Free

Type TC-ER Machine Tray Control Cable 600/1000 Volt Copper Conductors, Polyvinyl Chloride (PVC) with nylon layer Insulation Thermoplastic Elastomer Jacket, 90°C Dry 75°C Wet -40°C Cold Impact Identification Method 4. Silicone-Free



Image not to scale. See Table 1 for dimensions.

## CONSTRUCTION:

1. **Conductor:** Class K, Flexible stranded bare annealed copper per ASTM B3, B172, and B174
2. **Insulation:** Polyvinyl Chloride (PVC) with nylon layer THHN
3. **Ground:** One Green Ground with Yellow Stripe THHN
4. **Jacket:** Sunlight Resistant Gray Thermoplastic Elastomer TPE: Other jacket colors available upon request

## APPLICATIONS AND FEATURES:

Southwire's Machine Flex® control tray cables 600/1000 Volt conform to NFPA 79 and are suited for use in wet and dry areas, conduits, ducts, troughs, trays, direct burial and where superior electrical properties are desired. These cables are capable of operating continuously at the conductor temperature not in excess of 75°C in wet locations and 90°C in dry locations, 130°C for emergency overload, and 150°C for short circuit conditions. For uses in Class I, II, Division 2 hazardous locations per NEC® Article 501 and 502. Constructions with 3 or more conductors are listed for exposed runs (TC-ER) per NEC® 336.10. Southwire's machine tray cable is ideal for use in CNC machines, grinding, cutting, metal forming, buffing, bottling equipment, conveyors, processing & packaging equipment, assembly lines, control panels, food and beverage, oil sands, plant expansion, wind energy and data centers. Multiple approvals for multiple applications. Cable is rated for -40°C cold impact. Two conductor cables contain no green/yellow ground.

## SPECIFICATIONS:

- ASTM B172 Standard Specification for Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Copper Conductors
- ASTM B174 Standard Specification for Bunch-Stranded Copper
- UL 13 Power-Limited Circuit Cables
- UL 66 Fixture Wire Type TFFN (for sizes 18 and 16 AWG)
- UL 83 Thermoplastic Insulated Wire and Cables (sizes 14 AWG to 1000 kcmil)
- UL 758 AWM Style 2587
- UL 1063 Machine Tool Wiring (MTW)
- UL 1277 TC-ER
- UL 1690 Data Processing Cable (DP-1)
- UL 2250 Instrumentation Tray Cable
- UL 2277 Type WTTC
- CSA C22.2 No. 210 Appliance wiring material products I/II A/B (Sizes 16 - 8AWG)
- CSA C22.2 No.230 Tray Cables - Rated TC





- CSA C22.2 No. 239 Control and instrumentation cables
- ICEA S-95-658 (NEMA WC70) Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy
- IEEE 1202 FT4 Flame Test (70,000) BTU/hr Vertical Tray Test
- Exceeds Ecolab PM-40-1 Material Resistance Test With 30-day Exposure, UL Verified V747862
- **CE/RoHS-2 – The CE Marking has been applied solely to express the conformance to the material restrictions identified in the RoHS-2 (2011/65/EU) Directive**
- NFPA 79 Electrical Standard for Industrial Machinery
- Made in America: Compliant with both Buy American and Buy America Act (BAA) requirements per 49 U.S.C. § 5323(j) and the Federal Transit Administration Buy America requirements per 49 C.F.R. part 661

**SAMPLE PRINT LEGEND:**

18 - 12 AWG:

SOUTHWIRE® XX AWG (X.XXmm<sup>2</sup>) X/C PVC/NYLON TYPE TC-ER E75755 (UL) 600V 90°C DRY 75°C WET SUN RES OIL RES I/II DIR BUR -40°C OR MTW FLEXING OR DP-1 OR WTTC 1000V OR PLTC OR ITC OR AWM 2587 -- LL90458 CSA CIC/TC FT4 OR AWM I/II A/B 105°C 1000V -40°C FT4 -- NOM-ANCE 90°C PVC/NYLON PVC-TPE THHN/THWN FT4 600V -- {CE} RoHS-2 MADE IN USA

10 AWG and Larger:

SOUTHWIRE® XX AWG (XX.X{MM<sup>2</sup>}) XX/C PVC/NYLON TYPE TC-ER E75755 {UL} 600V 90°C DRY 75°C WET SUN RES OIL RES I/II DIR BUR -40°C OR MTW FLEXING OR DP-1 OR WTTC 1000V OR AWM 2587 -- LL90458 {CSA} CIC/TC FT4 OR AWM I/II A/B 105°C 1000V -40°C FT4 -- {NOM}-ANCE 90°C PVC/NYLON PVC-TPE THHN/THWN FT4 600V -- {CE} RoHS-2 -- MADE IN USA



**Table 1 – Physical and Electrical Data**

Stock Number	Cond. Size	Cond. Number	Cond. Strands	Diameter Over Cond.	Insul. Thickness	Jacket Thickness	Approx. OD	Copper Weight	Approx. Weight	AC Resistance @ 75°C	Inductive Reactance	Min Bending Radius	Allowable Ampacity 75°C	Allowable Ampacity 90°C	Jacket Color
	AWG	No.	strands	inch	mil	mil	inch	lb / 1000ft	lb / 1000ft	Ω /1000ft	Ω/1000ft	inch	Amp	Amp	
<b>18 AWG</b>															
677071	18	2	16	0.044	20	45	0.266	10	35	8.613	0.036	1.0	-	14	Gray
581511	18	3	16	0.044	20	45	0.281	15	42	8.613	0.036	1.1	-	14	Black
582642	18	4	16	0.044	20	45	0.306	20	54	8.613	0.036	1.2	-	11	Gray
582644	18	5	16	0.044	20	45	0.332	25	63	8.613	0.036	1.3	-	11	Gray
139265	18	6	16	0.044	20	45	0.348	31	84	8.613	0.036	1.4	-	11	Gray
581513	18	7	16	0.044	20	45	0.358	35	79	8.613	0.036	1.4	-	9	Gray
582645	18	9	16	0.044	20	45	0.411	45	101	8.613	0.036	1.6	-	9	Gray
582646	18	12	16	0.044	20	45	0.456	60	128	8.613	0.036	1.8	-	7	Gray
582647	18	18	16	0.044	20	45	0.554	90	225	8.613	0.036	2.2	-	7	Gray
646262	18	19	16	0.044	20	45	0.560	95	200	8.613	0.036	2.2	-	7	Gray
581514	18	25	16	0.044	20	60	0.635	125	253	8.613	0.036	2.5	-	6	Gray
<b>16 AWG</b>															
677072	16	2	26	0.059	20	50	0.294	16	45	5.406	0.033	1.1	-	18	Gray
581515	16	3	26	0.059	20	50	0.311	24	58	5.406	0.033	1.2	-	18	Gray
582648	16	4	26	0.059	20	50	0.339	32	71	5.406	0.033	1.3	-	14	Gray
582649	16	5	26	0.059	20	50	0.370	40	86	5.406	0.033	1.4	-	14	Gray
139203	16	6	26	0.059	20	50	0.400	47	116	5.406	0.033	1.6	-	14	Gray
581516	16	7	26	0.059	20	50	0.400	56	107	5.406	0.033	1.6	-	12	Gray
139204	16	8	26	0.059	20	50	0.431	72	142	5.406	0.033	1.7	-	12	Gray
582651	16	9	26	0.059	20	50	0.462	72	137	5.406	0.033	1.8	-	12	Gray
139205	16	10	26	0.059	20	50	0.500	81	186	5.406	0.033	2.0	-	9	Gray
582652	16	12	26	0.059	20	50	0.509	97	174	5.406	0.033	2.0	-	9	Gray
582653	16	18	26	0.059	20	65	0.623	145	262	5.406	0.033	2.4	-	9	Gray
646263	16	19	26	0.059	20	65	0.630	154	272	5.406	0.033	2.5	-	9	Gray
581517	16	25	26	0.059	20	65	0.717	202	345	5.406	0.033	2.8	-	8	Gray
581518	16	41	26	0.059	20	90	0.948	332	590	5.406	0.033	3.8	-	6	Gray
<b>14 AWG</b>															
677073	14	2	41	0.073	20	50	0.324	25	58	3.391	0.058	1.2	20	25	Gray
581519	14	3	41	0.073	20	50	0.342	38	77	3.391	0.058	1.3	20	25	Gray
582654	14	4	41	0.073	20	50	0.375	51	96	3.391	0.058	1.5	16	20	Gray
582655	14	5	41	0.073	20	50	0.411	63	114	3.391	0.058	1.6	16	20	Gray
581521	14	7	41	0.073	20	50	0.445	89	149	3.391	0.058	1.7	14	17	Gray
673795	14	8	41	0.073	20	50	0.495	102	175	3.391	0.058	1.9	14	17	Gray
582656	14	9	41	0.073	20	50	0.516	115	188	3.391	0.058	2.0	14	17	Gray
582657	14	12	41	0.073	20	65	0.608	153	257	3.391	0.058	2.4	10	12	Gray
582658	14	18	41	0.073	20	65	0.697	230	363	3.391	0.058	2.7	10	12	Gray
581522	14	25	41	0.073	20	65	0.806	318	486	3.391	0.058	3.2	9	11	Gray
<b>12 AWG</b>															
677074	12	2	65	0.094	20	50	0.362	40	80	2.137	0.054	1.4	25	30	Gray





Stock Number	Cond. Size	Cond. Number	Cond. Strands	Diameter Over Cond.	Insul. Thickness	Jacket Thickness	Approx. OD	Copper Weight	Approx. Weight	AC Resistance @ 75°C	Inductive Reactance	Min Bending Radius	Allowable Ampacity 75°C	Allowable Ampacity 90°C	Jacket Color
	AWG	No.	strands	inch	mil	mil	inch	lb / 1000ft	lb / 1000ft	Ω /1000ft	Ω/1000ft	inch	Amp	Amp	
677188◇	12	3	65	0.094	20	50	0.389	60	108	2.137	0.054	1.5	25	30	Gray
582659◇	12	4	65	0.094	20	50	0.420	81	136	2.137	0.054	1.6	20	24	Gray
582660◇	12	5	65	0.094	20	50	0.502	101	170	2.137	0.054	2.0	20	24	Gray
139262	12	6	65	0.094	20	50	0.502	122	194	2.137	0.054	2.0	20	24	Gray
582661	12	7	65	0.094	20	50	0.502	141	219	2.137	0.054	2.0	17	21	Gray
139263	12	8	65	0.094	20	65	0.574	162	260	2.137	0.054	2.3	17	21	Gray
139264	12	9	65	0.094	20	65	0.615	182	291	2.137	0.054	2.5	17	21	Gray
10 AWG															
677075	10	2	105	0.117	25	50	0.430	64	119	1.339	0.050	1.7	35	40	Gray
677189◇	10	3	105	0.117	25	50	0.462	97	159	1.339	0.050	1.8	35	40	Gray
581523◇	10	4	105	0.117	25	50	0.502	129	201	1.339	0.050	2.0	28	32	Gray
582662	10	5	105	0.117	25	50	0.579	161	291	1.339	0.050	2.3	28	32	Gray
582663	10	7	105	0.117	25	65	0.628	226	336	1.339	0.050	2.5	24	28	Gray
8 AWG															
677190◇	8	3	168	0.153	35	65	0.626	157	314	0.861	0.052	2.5	50	55	Gray
643367◇	8	4	168	0.153	35	65	0.680	210	361	0.861	0.052	2.7	40	44	Gray
673797	8	5	168	0.153	35	70	0.766	263	450	0.861	0.052	3.0	40	44	Gray
6 AWG															
677191	6	3	259	0.198	35	70	0.725	268	440	0.541	0.051	2.9	65	75	Gray
643369◇	6	4	259	0.198	35	70	0.817	358	562	0.541	0.051	3.2	52	60	Gray
458641	6	5	259	0.198	35	80	0.902	448	671	0.541	0.051	3.6	52	60	Gray
4 AWG															
677192	4	3	420	0.235	50	80	0.889	399	649	0.340	0.048	3.5	85	95	Gray
643371◇	4	4	420	0.235	50	80	0.969	532	829	0.340	0.048	3.8	68	76	Gray
458779	4	5	420	0.235	50	80	1.073	665	1048	0.340	0.048	5.4	68	76	Gray
2 AWG															
677193	2	3	651	0.302	50	100	1.070	637	988	0.216	0.045	5.3	115	130	Gray
643373◇	2	4	651	0.302	50	100	1.196	849	1262	0.216	0.045	5.9	92	104	Gray
458778◇	2	5	651	0.302	50	100	1.286	1062	1564	0.216	0.045	6.4	92	104	Gray
TBA	1	5	836	0.347	60	80	1.426	1341	1752	0.167	0.046	7.1	104	116	Gray

All dimensions are nominal and subject to normal manufacturing tolerances

◇ Cable marked with this symbol is a standard stock item

\* Ampacities based upon 2023 NEC Table 310.16 and do not take into account the overcurrent protection limitations in NEC 240.4(D) of 15 Amps for 14 AWG CU, 20 Amps for 12 AWG CU, and 30 Amps for 10 AWG CU (independent of the conductor temperature rating and stranding if size is present in table). Also, see NEC sections 310.15 and 110.14(C) for additional requirements.

\* Ampacities have been adjusted for more than Three Current-Carrying Conductors.

