



***Color-Keyed***<sup>®</sup>

**Connector System Guide**

*Compression Connectors*

*Grounding Connectors*

*Tools for Industrial Electrical Applications*

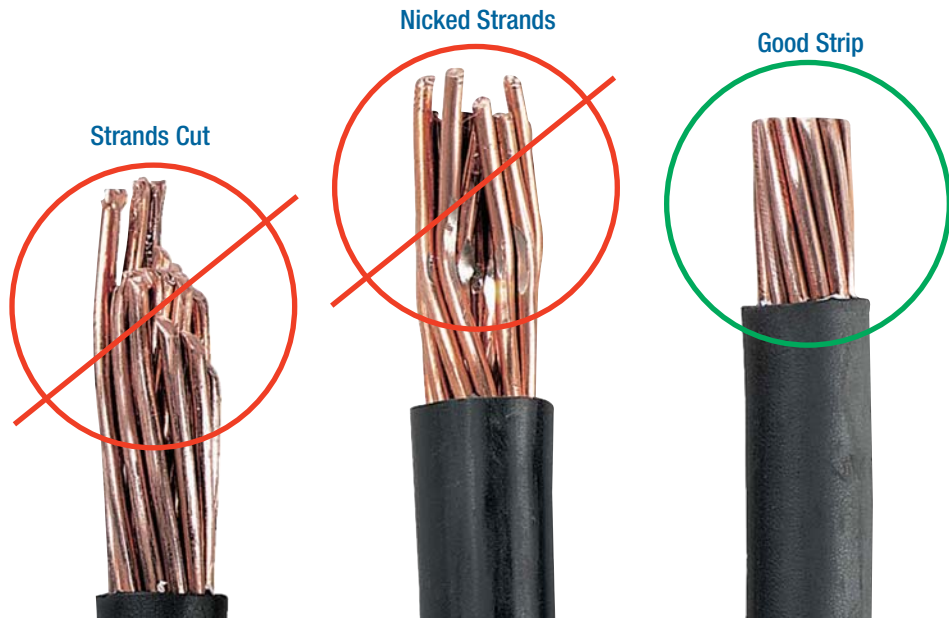
***Thomas & Betts***

**Step One**

**Preparing the Cable**



**Strip the insulation carefully to avoid nicking or cutting conductors (wire brush if required).**



**Strip the insulation to the proper length so that conductors can be fully inserted into the connector barrel.**



## Step Two

## Determining the Proper Connector

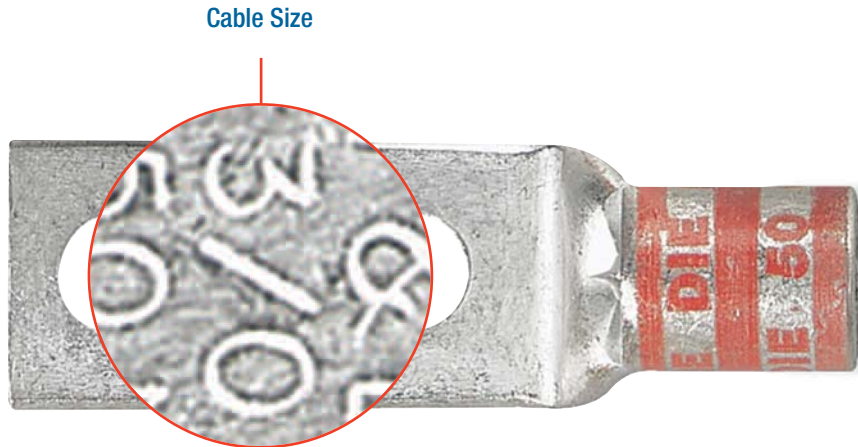


## Determine the proper Color-Keyed® Connector for the cable size being used.

- Connectors marked with just cable size or “CU” should be used on copper conductors only.
- Connectors marked “AL9” with the cable size should be used on aluminum conductors only.
- Connectors marked “AL9CU” with the cable size may be used on the aluminum or copper conductors.

*Note: Aluminum lugs with a “9” indicate 90°C rating.*

## Connectors are marked to show cable size.





## Step Three

## Choosing Tool and Proper Die



## Select the proper installing die and appropriate tool.

Color-Keyed® Connectors have colored bands or colored dots that correspond to color markings of the dies.

Connectors and dies also have a die code number marked or stamped on them. Dies have a code number engraved in the crimp surface.

Color Codes

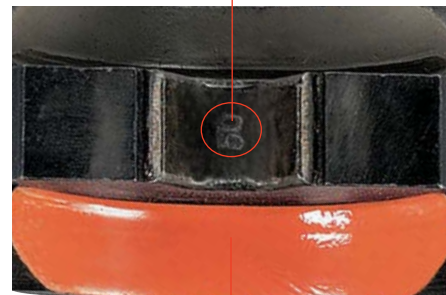


Die Code Marking

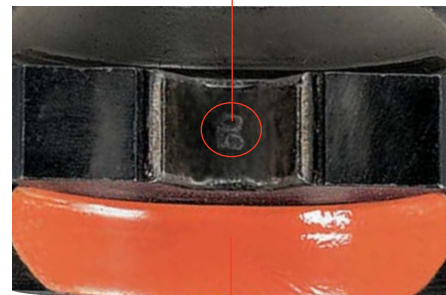


Colored Bands

Die Code Engraving



Colored Strip



## Step Four

## Installation and Inspection



**Locate tool with correct die in proper position on connector and activate tool.**

Color-Keyed® Connectors are banded by colored stripes or engraving to indicate location of die on connector for compression.

**Copper**  
Die located  
**BETWEEN** bands



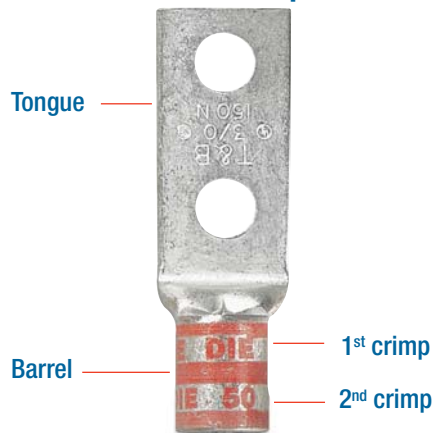
**Aluminum**  
Die located  
**ON** bands





**When making multiple crimps, make the first crimp nearest the tongue and work towards the barrel end.**

#### Die location for compression



**When properly crimped, the die code number will be embossed on the connector for easy inspection to determine if correct die and connector combination were used.**

Thomas & Betts uses “full-width” and “half-width” dies dependent on connector size and tool used. “Half-width” dies are marked with the letter “H” after the die code number.



Refer to the instruction sheet supplied with the connectors for information regarding strip length, die selection and number of compressions.

Connector Size			Color-Keyed Die Groove	TBM45S	TBM4S	TBM840	TBM8-750/-1	TBM-8/8S	TBM-5/5S	TBM6/6S (25000)		13642M (13400) Hydraulic Head		TBM12 Hydraulic Head	
Copper	Flex/24	AL/CU						TBM8 Die Cat. No.	TBM5 Die Cat. No.	Cat. No. Upper Die	Cat. No. Lower Die	Die Cat. No.	Die Code No.	Die Cat. No.	Die Code No.
8 AWG	37/24	10 AWG	RED	↕	↕	↕	↕	Order 13461	Order 13454	13475	13477	11732	21	TBM12D-1	21
6 AWG	61/24	8 AWG	BLUE							13475	13477	11733	24	TBM12D-1	24
4 AWG	91/24	6 AWG	GREY							13472	13476	11734	29	TBM12D-2	29
2 AWG	125/24		BROWN							13474	13477	11735	33	TBM12D-2	33
1 AWG	150/24	4 AWG	GREEN							13474	13477	11736	37	TBM12D-3	37
1/0	225/24	2 AWG	PINK							13475	13477	11737	42	TBM12D-3	42
2/0	275/24		BLACK							13474	13477	11738	45	TBM12D-4	45
3/0	325/24		ORANGE							13474	13477	11739	50	TBM12D-4	50
4/0	450/24		PURPLE							13475	13477	11740	54	TBM12D-5	54
250 kcmil	550/24		YELLOW							13473	13476	11771	62	TBM12D-5	62
		1 AWG	GOLD					13474	13477	11738	45	TBM12D-4	45		
		1/0	TAN					13474	13477	11739	50	TBM12D-4	50		
		2/0	OLIVE					13475	13477	11740	54	TBM12D-5	54		
		3/0	RUBY					13473	13476	11741	60	TBM12D-5	60		
300 kcmil		4/0	WHITE					13473	13476	11742	66H	TBM12D-5	66H		
350 kcmil	775/24 (short)	250 kcmil	RED					13465		11743	71H	TBM12D-4	71H		
400 kcmil	775/24 (long)	300 kcmil	BLUE					13466		11744	76H	TBM12D-4	76H		
	925/24*		N/A					13467		11745	80H				
			N/A												
500 kcmil		350 kcmil	BROWN					13468		13478	13478	11746-TB	87H	TBM12D-3	87H
600 kcmil	1100/24	400 kcmil	GREEN									11747	94H	TBM12D-3	94H
			GREEN												94H
	1325/24**		PINK												
700 kcmil		500 kcmil	PINK									11748	99H	TBM12D-2	99H
750 kcmil		650 kcmil	BLACK									11749	106H	TBM12D-2	106H
800 kcmil			ORANGE									11750	107H		
		700 kcmil	PURPLE									11751	112H	TBM12D-1	112H
900 kcmil	1925/24	750 kcmil	YELLOW									11753	115H	TBM12D-1	115H
1000 kcmil		800 kcmil	N/A												
		1000 kcmil	N/A												

\*Standard barrel only. Long barrel requires Brown 87H

\*\*Standard barrel only. Long barrel requires Black 106H

# Tool and Die Selection Chart for Power Connectors

**Color-Keyed<sup>®</sup>**

Connector Size			Color-Keyed Die Groove	TBM6BSCR/6H		TBM6ZBSCR		TBM14BSCR/14M/13100A, BPLT14BSCR, TBM14MC, JB12B, TBM14RH		TBM15BSCR/151***, BPLT15BSCR		21940 (40 TON)	
Copper	Flex/24	AL/CU		Die Cat. No.	Die Code No.	Die Cat. No.	Die Code No.	Die Cat. No.	Die Code No.	Die Cat. No.	Die Code No.	Die Cat. No.	Die Code No.
8 AWG	37/24	10 AWG	RED	6TON21	21	TBM6221	21	15520	21	15520			
6 AWG	61/24	8 AWG	BLUE	6TON24	24	TBM6224	24	15522	24	15522			
4 AWG	91/24	6 AWG	GREY	6TON29	29	TBM6229	29	15527-CK	29	15527-CK	29	11401	29
2 AWG	125/24		BROWN	6TON33	33	TBM6233	33	15528	33	15528	3	11402	33
1 AWG	150/24	4 AWG	GREEN	6TON37	37	TBM6237	37	15513-CK	37	15513-CK	37	11333	37
1/0	225/24	2 AWG	PINK	6TON42	42	TBM6242	42	15508	42	15508	42H	11334	42
2/0	275/24		BLACK	6TON45	45	TBM6245	45	15526	45	15526	45	11405	45
3/0	325/24		ORANGE	6TON50	50	TBM6250	50	15530	50	15530	50	11406	54H
4/0	450/24		PURPLE	6TON54	54	TBM6254	54	15511	54	15511	54H	11407	62
250 kcmil	550/24		YELLOW	6TON62	62	TBM6262	62	15510-CK	62	15510-CK	62	297-31669-7	45
		1 AWG	GOLD	6TON45	45	TBM6245	45	15526	45	15526	45	11405	50
		1/0	TAN	6TON50	50	TBM6250	50	15530	50	15530	50	11406	54
		2/0	OLIVE	6TON54	54	TBM6254	54	15511	54	15511	54H	11407	60
		3/0	RUBY	6TON60	60	TBM6260	60	15532-CK	60	15532-CK	62	11408	66
300 kcmil		4/0	WHITE	6TON66	66H	TBM6266	66	15534	66H	15534	66H	11409	71
350 kcmil	775/24 (short)	250 kcmil	RED	6TON71	71H	TBM6271	71	15514-CK	71H	15514-CK	71H	11363	76
400 kcmil	775/24 (long)	300 kcmil	BLUE	6TON76	76H	TBM6276	76	15512	76H	15512	76H	11410	
	925/24*		N/A	6TON80	80H	TBM6280	80	15517	80H	15517	80H		
			N/A							15606	80		
500 kcmil		350 kcmil	BROWN	6TON 87	87H	TBM6287	87	15506	87H	15506	87H	11423	87
600 kcmil	1100/24	400 kcmil	GREEN	6TON94	94H					15511	94H	11364	94
			GREEN					15536-CK	94H	15536-CK	94H		
	1325/24**		PINK										
700 kcmil		500 kcmil	PINK		99H			15506	99H	15506	99H	11424	99
750 kcmil		650 kcmil	BLACK		106H			15515-CK	106H	15515-CK	106H	74506	106
800 kcmil			ORANGE		107H					15608	107H	11425	107
		700 kcmil	PURPLE		112H					15609	112H	11426	112
900 kcmil	1925/24	750 kcmil	YELLOW		115H			1504	115H	15504	115H	11308	115
1000 kcmil		800 kcmil	N/A							15603	125H	11416	125
		1000 kcmil	N/A							15602	140H	11418	140
										15601	150H	11419	150

\*Standard barrel only. Long barrel requires Brown 87H

\*\*Standard barrel only. Long barrel requires Black 106H

\*\*\* 15500 Series dies require 15500-TB adapter. 15500F for full size die to fit TBM151 without adapter

Conductor Size Code Cable (Flex Cable)				Installation							
Main	Branch 1	Branch 2	Branch 3	H-Tap	Color	Die	Tool	# of Crimp	Die Embossing	Strip Length (in.)	Insulating Cover
8-14 (8-14)	8-14 (8-14)	–	–	CHT814-10	GREEN	15CA37RCH*	Group 1	1	37R	1/2	HTC2S
2-6 Str. / Sol. (2-8)	2-6 Str. / Sol. (2-8)	8-14 (8-14)	8-14 (8-14)	CHT214-9	BROWN	15CA71RCH*	Group 1	1	71R	7/8	HTC40
250-2 (4/0-2)	8-14 (8-14)	8-14 (8-14)	–	CHT250214-8	PURPLE	15CA80RCH*	Group 2	1	80R	1-1/8	HTC40
250-2 (4/0-2)	2-6 Str. / Sol. (2-8)	8-14 (8-14)	–	CHT25014-7	PURPLE	15CA80RCH*	Group 2	1	80R	1-1/8	HTC40
250-2 (4/0-2)	250-2 (4/0-2)	–	–	CHT2502-6	PURPLE	15CA80RCH*	Group 2	1	80R	13/16	HTC40
500-4/0 (350-4/0)	250-1/0 (4/0-1/0)	1 Str. 2-6 (1-8)	8-14 (8-14)	CHT50010-5	BROWN	15612CH	Group 2	2	N	1-1/2	HTC500
500-4/0 (350-4/0)	500-4/0 (350-4/0)	–	–	CHT50040-4	BROWN	15612CH	Group 2	2	N	1-1/2	HTC500
750-350 (550-500)	4/0-1/0 (250-1/0)	1 Str. 2-6 (1-8)	2-14 (2-14)	CHT75010-3	YELLOW	15620CH	Group 2	1	Z	1-1/2	HTC500
750-350 (550-500)	750-350 (550-350)	–	–	CHT750350-2	YELLOW	15620CH	Group 2	1	Z	1-3/8	HTC500
750 (750-500)	350-4/0 Str. & Flex	–	–	CHT75040-11	YELLOW	15620CH	Group 2	1	Z	1-1/8	HTC500
(750-500) (750)	(750-500) (350)	–	–	CHT750350-1F	WHITE	15620CHF	Group 2	1	F	1-1/8	HTC1000

\*Requires optional adapter 15500-TB when used with hydraulic head TBM15I and TBM15BSCR

Group 1 = TBM15I, TBM15BSCR, TBM14, TBM14BSCR, 13100A, JB12B, TBM14RH, TBM14MC

Group 2 = TBM15I, TBM15BSCR

# Tool and Die Chart for Standard C-Taps

**Color-Keyed®**

Code Wire Comb. Cir. Area Range				Group 1	TBM62BSCR	Group 2	Group 3	Insulation Choice	
Main	Branch 1	C-Tap	Color	Die	Die	# of Crimp	Die Embossing	Adhesive Pad	Shrink Tubing
12	14	54705	RED	6TON21	TBM6221	-	Accommodates this Range	Accommodates this Entire Range	HS12-6
14	16								
10	10	54710	BLUE	6TON24	TBM6224				
8	12								
6	10, 12	54715	GREY	6TON29	TBM6229	-			
8	8, 10, 12								
4 or 5	8, 10, 12	54720	BROWN	6TON33	TBM6233	TBM8-750C20			
6	6, 8								
3	6, 8, 10, 12***	54725	GREEN	6TON37	TBM6237	TBM8-750C2530			
4 or 5	6, 5								
2	6, 8, 10, 12	54730	PINK	6TON42	TBM6242	TBM8-750C2530	HS6-1		
3	5								
4	3								
1	4, 5, 6, 8, 10, 12	54735	BLACK	6TON45	TBM6245	TBM8-750C3540			
2	4, 5								
3	3, 4								
1/0	4, 5, 6, 8, 10, 12	54740	ORANGE	6TON50	TBM6250	TBM8-750C3540	HS4-30		
1	3, 4								
2	2, 3								
2/0	3, 4, 5, 6, 8, 10, 12	54745	PURPLE	6TON54	TBM6254	TBM8-750C4550			
1/0	2, 3								
1	1, 3								
3/0	2, 3, 4, 5, 6, 8, 10, 12	54750	YELLOW	6TON62	TBM6262	TBM8-750C4550			
2/0	1, 2								
1/0	1/0, 1								

\*\*\*When using 3 AWG on main and 12 AWG on branch with smart tools and dies, 12 AWG wire must be doubled (hair-pinned) and placed on branch for crimping

Group 1 = TBM6H / TBM62BSCR

Group 2 = TBM45S / TBM41E and require 2 compressions within each crimp area

Group 3 = TBM5 / 5S, TBM6 / 6S, TBM8/8S, TBM6H and require 1 compression within each crimp area



Main Copper Range				Regular Tools				Smart Tool			Insulation Choice		
Main	Branch 1	C-Tap*	Color	Tools	Dies	Die Code	# of Crimps***	Tools	Die	# of Crimps***	Adhesive Pad	Shrink Tubing	
1	1	54755	BLUE	13642M TBM12 TBM14M TBM15I 13100A TBM14BSCR TBM15BSCR	11744 TBM12D-4	76H	2	TBM8-750 TBM8-750M-1	TBM8-750CL	1	AC5X7	HS4-30	
1/0	1/0-2												
2/0	2/0-4												
3/0	1/0-6												
4/0	1-8												
2/0	2/0-1	54760	BROWN		11746-TB TBM12D-3	87H	2			2			HS4-400
3/0	3/0-3												
4/0	4/0-4												
250	1/0-8												
2/0	2/0-1												
3/0	3/0-2	54765	PINK		11748 TBM12D-2	99H				2		HS500-1000	
4/0	4/0-4												
250	3/0-6												
300	2/0-8												
4/0	4/0-2/0												
250	250-1	54770	BLACK		11749 TBM12D-2	106H				2			
300	4/0-4												
350	3/0-6												
250	250												
300	300-3/0												
350	350-1/0	54775	YELLOW	11753 TBM12D-1	115H				2				
400	300-2												
450	250-4												
500	250-6****												
350	350-4/0												
400	400-2/0	54780	WHITE	15503	125H			N/A	3				
450	450-1												
500	500-2												
750	4/0-6												
500	4/0-1/0									54785	N/A		
750/500	750-4/0	54790											

\* For tin plate finish add "TP" to Cat. No. listed (Example: 54755TP) \*\*Use with adapter Cat. No. 15500-TB (Note: If 15500 dies have a suffix "F", they are full sized dies and can be used with the TBM15I without an adapter.) \*\*\*When using compact copper cable, apply additional overlapping crimps so that C-Tap is crimped from end to end. 11000 series dies go with 13642M tool, TBM12D-# series dies go with TBM12 tool, and 15500 series dies go with TBM14M/14BSCR/13100A/TBM15I/15BSCR. \*\*\*\*#6 AWG branch branch must be doubled.

# Conductor Properties

**Color-Keyed®**

Size (AWG or kcmil)	Area		Conductors							Direct-Current Resistance at 75°C (167°F)					
			Quantity	Stranding		Overall			Copper						Aluminum
	mm2	Circular mils		Diameter		Diameter		Area		Uncoated		Coated		ohm/km	ohm/kFT
				mm	in.	mm	in.	mm2	in.2	ohm/km	ohm/kFT	ohm/km	ohm/kFT		
18	0.823	1620	1	—	—	1.02	0.040	0.823	0.001	25.5	7.77	26.5	8.08	42.0	12.8
18	0.823	1620	7	0.39	0.015	1.16	0.046	1.06	0.002	26.1	7.95	27.7	8.45	42.08	13.1
16	1.31	2580	1	—	—	1.29	0.051	1.31	0.002	16.0	4.89	16.7	5.08	26.4	8.05
16	1.31	2580	7	0.49	0.019	1.46	0.058	1.68	0.003	16.4	4.99	17.3	5.29	26.9	8.21
14	2.08	4110	1	—	—	1.63	0.064	2.08	0.003	10.1	3.07	10.4	3.19	16.6	5.06
14	2.08	4110	7	0.62	0.024	1.85	0.073	2.68	0.004	10.3	3.14	10.7	3.26	16.9	5.17
12	3.31	6530	1	—	—	2.05	0.081	3.31	0.005	6.34	1.93	6.57	2.01	10.45	3.18
12	3.31	6530	7	0.78	0.030	2.32	0.092	4.25	0.006	6.50	1.98	6.73	2.05	10.69	3.25
10	5.261	10380	1	—	—	2.588	0.102	5.26	0.008	3.984	1.21	4.148	1.26	6.561	2.00
10	2.261	10380	7	0.98	0.038	2.95	0.116	6.76	0.011	4.070	1.24	4.226	1.29	6.679	2.04
8	8.367	16510	1	—	—	3.264	0.128	8.37	0.013	2.506	0.764	2.579	0.786	4.125	1.26
8	8.367	16510	7	1.23	0.049	3.71	0.146	10.76	0.017	2.551	0.778	2.653	0.809	4.204	1.28
6	13.30	26240	7	1.56	0.061	4.67	0.184	17.09	0.027	1.608	0.491	1.671	0.510	2.652	0.808
4	21.15	41740	7	1.96	0.077	5.89	0.232	27.19	0.042	1.010	0.308	1.053	0.321	1.666	0.508
3	26.67	52620	7	2.20	0.087	6.60	0.260	34.28	0.053	0.802	0.245	0.833	0.254	1.320	0.403
2	33.62	66360	7	2.47	0.097	7.42	0.292	43.23	0.067	0.634	0.194	0.661	0.201	1.045	0.319
1	42.41	83690	19	1.69	0.066	8.43	0.332	55.80	0.087	0.505	0.154	0.524	0.160	0.829	0.253

## Conductor Properties (Continued)

Size (AWG or kcmil)	Area		Conductors							Direct-Current Resistance at 75°C (167°F)					
			Stranding		Overall			Copper		Aluminum					
	mm <sup>2</sup>	Circular mils	Quantity	Diameter		Diameter		Area		Uncoated		Coated		ohm/km	ohm/kFT
				mm	in.	mm	in.	mm <sup>2</sup>	in. <sup>2</sup>	ohm/km	ohm/kFT	ohm/km	ohm/kFT		
1/0	56.49	105600	19	1.89	0.074	9.45	0.372	70.41	0.109	0.399	0.122	0.415	0.127	0.660	0.201
2/0	67.43	133100	19	2.13	0.084	10.62	0.418	88.74	0.137	0.3170	0.0967	0.329	0.101	0.526	0.159
3/0	85.01	167800	19	2.39	0.094	11.94	0.470	111.9	0.173	0.2512	0.0766	0.2610	0.0797	0.413	0.126
4/0	107.2	211600	19	2.68	0.106	13.41	0.528	141.1	0.219	0.1996	0.0608	0.2050	0.0626	0.328	0.100
250		—	37	2.08	0.082	14.61	0.575	168	0.260	0.1687	0.0515	0.1753	0.0535	0.2778	0.0847
300		—	37	2.29	0.090	16.00	0.630	201	0.312	0.1409	0.0429	0.1463	0.0446	0.2318	0.0707
350		—	37	2.47	0.097	17.30	0.681	235	0.364	0.1205	0.0367	0.1252	0.0382	0.1984	0.0605
400		—	7	2.64	0.104	18.49	0.728	268	0.416	0.1053	0.0321	0.1084	0.0331	0.1737	0.0529
500		—	37	2.95	0.116	20.65	0.813	336	0.519	0.0845	0.0258	0.0869	0.0265	0.1391	0.0424
600		—	61	2.52	0.099	22.68	0.893	404	0.626	0.0704	0.0214	0.0732	0.0223	0.1159	0.0353
700		—	61	2.72	0.107	24.49	0.964	471	0.730	0.0603	0.0184	0.0622	0.0189	0.0994	0.0303
750		—	61	2.82	0.111	25.35	0.998	505	0.782	0.0563	0.0171	0.0579	0.0176	0.0927	0.0282
800		—	61	2.91	0.114	26.16	1.030	538	0.834	0.0528	0.0161	0.0544	0.0166	0.0868	0.0265
900		—	61	3.09	0.122	27.79	1.094	606	0.940	0.0470	0.0143	0.0481	0.0147	0.0770	0.0235
1000		—	61	3.25	0.128	29.26	1.152	673	1.042	0.0423	0.0129	0.0434	0.0132	0.0695	0.0212

FPN: The construction information is per NEMA WC8-1992 or ANSI/UL 1581-1998.

The resistance is calculated per National Bureau of Standards Handbook 100, dated 1966, and Handbook 109, dated 1972.

70-625 TABLES  
NATIONAL ELECTRICAL CODE, 2002 EDITION

# Temperature Rating of Conductor

**Color-Keyed**<sup>®</sup>

**Ampacities of Two or Three Insulated Conductors, Rated 0 Through 200 Volts, Within an Overall Covering (Multiconductor Cable), in Raceway in Free Air Based on Ambient Air Temperature of 30°C (86°F).**

Size (AWG or kcmil)	60°C (140°F)	60°C (140°F)	60°C (140°F)	60°C (140°F)	60°C (140°F)	60°C (140°F)	60°C (140°F)
	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, ZW	Types THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHHW, XHHW-2, ZW-2	Type TW	Types RHW, THHW, THW, THWN, XHHW	Types THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHHW, XHHW-2, ZW-2	Aluminum or Copper-Clad Aluminum
14	16*	18*	21*	16*	18*	21*	14
12	20*	24*	27*	16*	18*	21*	12
10	27*	33*	26*	21*	25*	28*	10
8	36	43	48	28	33	37	8
6	48	58	65	38	45	51	6
4	66	79	89	51	61	69	4
3	76	90	102	59	70	79	3
2	88	105	119	69	83	93	2
1	102	121	137	80	95	106	1
1/0	121	145	163	94	113	127	1/0
2/0	138	166	186	108	129	146	2/0
3/0	158	189	214	124	147	167	3/0
4/0	184	223	253	147	176	197	4/0
250	205	245	276	160	192	217	250
300	234	281	317	185	221	250	300
350	255	305	345	202	242	273	350
400	274	328	371	218	261	295	400
500	315	378	427	254	303	342	500
600	343	413	468	279	335	378	600
700	376	452	514	310	371	420	700
750	387	466	529	325	384	435	750
800	297	479	543	331	397	450	800
900	415	500	570	350	421	477	900
1000	448	542	617	382	460	521	1000

**Correction Factors**

Ambient Temp. (°C)	For ambient temperatures other than 30°C (86°F), multiply the ampacities shown above by the appropriate factor shown below.							Ambient Temp. (°C)
	1.08	1.05	1.04	1.04	1.08	1.05	1.04	
21-25	1.08	1.05	1.04	1.04	1.08	1.05	1.04	70-77
26-30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	79-86
31-35	0.91	0.94	0.96	0.96	0.91	0.94	0.96	88-95
36-40	0.82	0.88	0.91	0.91	0.82	0.88	0.91	97-104
41-45	0.71	0.82	0.87	0.87	0.71	0.82	0.87	106-113
46-50	0.58	0.75	0.82	0.82	0.58	0.75	0.82	115-122
51-55	0.41	0.67	0.76	0.76	0.41	0.67	0.76	124-131
56-60	-	0.58	0.71	0.71	-	0.58	0.71	133-140
61-70	-	0.33	0.58	0.58	-	0.33	0.58	142-158
71-80	-	-	0.41	0.41	-	-	0.41	160-176

*\*Unless otherwise specifically permitted elsewhere in this Code, the overcurrent protection for these conductor types shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG copper, or 15 amperes for 12 AWG and 25 amperes for 10 AWG aluminum and copper-clad aluminum.*

**SOURCE: NEC2002**

Table C1 Maximum Number of Conductors or Fixture Wires in Electrical Metallic Tubing (EMT)

**Color-Keyed**<sup>®</sup>**Conduit and Tubing Fill Tables for Conductors and Fixture Wires of the Same Size**

Type	Conductors										
	Conductor Size (AWG/kcmil)	16 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3)	91 (3-1/2)	103 (4)
	14	4	7	11	20	27	46	80	120	157	201
	12	3	6	9	17	23	38	66	100	131	167
	10	2	5	8	13	18	30	53	81	105	135
	8	1	2	4	7	9	16	28	42	55	70
	6	1	1	3	5	8	13	22	34	44	56
	4	1	1	2	4	6	10	17	26	34	44
	3	1	1	1	4	5	9	15	23	30	38
	2	1	1	1	3	4	7	13	20	26	33
	1	0	1	1	1	3	5	7	13	17	22
	1/0	0	1	1	1	2	4	6	11	15	19
	2/0	0	1	1	1	2	4	5	10	13	17
	3/0	0	0	1	1	1	3	5	8	11	14
	4/0	0	0	1	1	1	3	3	7	9	12
	250	0	0	0	1	1	1	3	5	7	9
	300	0	0	0	1	1	1	3	5	6	8
	350	0	0	0	1	1	1	2	4	6	7
	400	0	0	0	1	1	1	2	4	5	7
	500	0	0	0	0	1	1	1	3	4	6
	600	0	0	0	0	1	1	1	3	4	5
	700	0	0	0	0	0	1	1	2	3	4
	750	0	0	0	0	0	1	1	2	3	4
	800	0	0	0	0	0	1	1	2	3	4
	900	0	0	0	0	0	1	1	1	3	3
	1000	0	0	0	0	0	1	1	1	2	3
	14	8	15	25	43	58	96	168	254	223	424
	12	6	11	19	33	45	74	129	195	255	328
	10	5	8	14	24	33	55	96	145	190	243
	8	2	5	8	13	18	30	53	81	105	135
	14	6	10	6	28	39	64	112	169	221	282
	12	4	8	13	13	31	51	90	136	177	227
	10	3	6	10	18	24	40	70	106	138	177
	8	1	4	6	10	14	24	42	63	83	106

Note: This table is for concentric stranded conductors only. For compact stranded conductors,

Table C4 (A) should be used.

\*Types RHH, RHW and RHW-2 without outer covering.

SOURCE: NEC2002



# Conduit and Tubing Fill Tables for Conductors and Fixture Wires of the Same Size

**Color-Keyed<sup>®</sup>**

Type	Conductors										
	Conductor Size (AWG/ACMIL)	15 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3-1/2)	91 (4)	103 (4)
RHH RHW RHW-2 TW THW THW THW-2	6	1	3	4	8	11	18	32	48	63	81
	4	1	1	3	6	8	13	24	36	47	61
	3	1	1	3	5	7	12	20	31	40	52
	2	1	1	2	4	6	10	17	26	34	44
	1	1	1	1	3	4	7	12	18	24	31
	1/0	0	1	1	2	3	6	10	16	20	26
	2/0	0	1	1	1	3	5	9	13	17	22
	3/0	0	1	1	1	2	4	7	11	15	19
	4/0	0	0	1	1	1	3	6	9	12	16
	250	0	0	1	1	1	3	5	7	10	13
	300	0	0	1	1	1	2	4	6	8	11
	350	0	0	0	1	1	1	4	6	7	10
	400	0	0	0	1	1	1	3	5	7	9
	500	0	0	0	1	1	1	3	4	6	7
	600	0	0	0	1	1	1	2	3	4	6
	700	0	0	0	0	1	1	1	3	4	5
	750	0	0	0	0	1	1	1	3	4	5
800	0	0	0	0	1	1	1	3	3	5	
900	0	0	0	0	0	1	1	2	3	4	
1000	0	0	0	0	0	1	1	2	3	4	
THH THN THWN THWN-2	14	12	22	35	61	84	138	241	364	476	608
	12	9	16	26	45	61	101	176	266	347	443
	10	5	10	16	28	38	63	111	167	219	279
	8	3	6	9	16	22	36	64	96	126	161
	6	2	4	7	12	16	26	46	69	91	116
	4	1	2	4	7	10	16	28	43	56	71
	3	1	1	3	6	8	13	24	36	47	60
	2	1	1	3	5	7	11	20	30	40	51
	1	1	1	1	4	5	8	15	22	29	37
	1/0	0	1	1	3	4	7	12	19	25	32
	2/0	0	1	1	2	3	6	10	16	20	26
	3/0	0	1	1	1	3	5	8	13	17	22
	4/0	0	1	1	1	2	4	7	11	14	18
	250	0	0	1	1	1	3	6	9	11	15
	300	0	0	1	1	1	3	5	7	10	13
	350	0	0	1	1	1	2	4	6	9	11
	400	0	0	0	1	1	1	4	6	8	10
500	0	0	0	1	1	1	3	5	6	8	
600	0	0	0	1	1	1	2	4	5	7	
700	0	0	0	1	1	1	2	3	4	6	
750	0	0	0	0	1	1	1	3	4	5	
800	0	0	0	0	1	1	1	3	4	5	
900	0	0	0	0	1	1	1	3	3	4	
1000	0	0	0	0	1	1	1	2	3	4	

Note: This table is for concentric stranded conductors only. For compact stranded conductors, Table C4 (A) should be used.

SOURCE: NEC2002

## Table C4 Maximum Number of Conductors or Fixture Wires in Intermediate Metal Conduit (IMC)

Type	Conductors										
	Conductor Size (AWG/kcmil)	16 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3)	91 (3-1/2)	103 (4)
RHH, RHW, RHW-2	14	4	8	13	22	30	49	70	108	144	186
	12	4	6	11	18	25	41	58	89	120	154
	10	3	5	8	15	20	33	47	72	97	124
	8	1	3	4	8	10	17	24	38	50	65
	6	1	1	3	6	8	14	19	30	40	52
	4	1	1	3	5	6	11	15	23	31	41
	3	1	1	2	4	6	9	13	21	28	36
	2	1	1	1	3	5	8	11	18	24	31
	1	0	1	1	2	3	5	7	12	16	20
	1/0	0	1	1	1	3	4	6	10	14	18
	2/0	0	1	1	1	2	4	6	9	12	15
	3/0	0	0	1	1	1	3	5	7	10	13
	4/0	0	0	1	1	1	3	4	6	9	11
	250	0	0	1	1	1	1	3	5	6	8
	300	0	0	0	1	1	1	3	4	6	7
	350	0	0	0	1	1	1	2	4	5	7
	400	0	0	0	1	1	1	2	3	5	6
	500	0	0	0	1	1	1	1	3	4	5
	600	0	0	0	0	1	1	1	2	3	4
	700	0	0	0	0	1	1	1	2	3	4
	750	0	0	0	0	1	1	1	1	3	4
	800	0	0	0	0	0	1	1	1	3	3
	900	0	0	0	0	0	1	1	1	2	3
	1000	0	0	0	0	0	1	1	1	2	3
	1250	0	0	0	0	0	1	1	1	1	2
	1500	0	0	0	0	0	0	1	1	1	1
	1750	0	0	0	0	0	0	1	1	1	1
	2000	0	0	0	0	0	0	1	1	1	1
TW, THW, THW, THW-2	14	10	17	27	47	64	104	147	228	304	392
	12	7	13	21	36	49	80	113	175	234	301
	10	5	9	15	27	36	59	84	130	174	224
	8	3	5	8	15	20	33	47	72	97	124
	6	1	3	5	9	12	20	28	43	58	75
	4	1	2	4	6	9	15	21	32	43	56
RHH*, RHW*, RHW-2*	14	10	17	27	47	64	104	147	228	304	392
	12	7	13	21	36	49	80	113	175	234	301
	10	5	9	15	27	36	59	84	130	174	224
	8	3	5	8	15	20	33	47	72	97	124
	6	1	3	5	9	12	20	28	43	58	75
	4	1	2	4	6	9	15	21	32	43	56

Note: This table is for concentric stranded conductors only. For compact stranded conductors,

Table C4 (A) should be used.

\*Types RHH, RHW and RHW-2 without outer covering.

SOURCE: NEC2002

# Table C4 (Continued)

Type	Conductor Size (AWG/kcmil)	Conductors																		
		16 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3)	91 (3-1/2)	103 (4)									
	3	1	1	3	6	8	13	18	28	37	48									
	2	1	1	3	5	6	11	15	23	31	41									
	1	1	1	3	4	7	11	16	22	28										
	1/0	1	1	3	4	6	9	14	19	24										
	2/0	0	1	1	2	3	5	8	12	16	20									
	3/0	0	1	1	1	3	4	6	10	13	17									
	4/0	0	1	1	1	2	4	5	8	11	14									
TW	250	0	0	1	1	1	3	4	7	9	12									
THW	300	0	0	1	1	1	2	4	6	8	10									
THHW	350	0	0	1	1	1	2	3	5	7	9									
THW-2	400	0	0	1	1	1	3	4	6	8										
	500	0	0	0	1	1	1	2	4	5	7									
	600	0	0	0	1	1	1	1	3	4	5									
	700	0	0	0	0	1	1	1	3	4	5									
	750	0	0	0	1	1	1	1	2	3	4									
	800	0	0	0	0	1	1	1	2	3	4									
	900	0	0	0	0	1	1	1	2	3	4									
	1000	0	0	0	0	1	1	1	1	3	3									
	14	14	24	39	68	91	149	211	326	436	562									
	12	10	17	29	49	67	109	157	238	318	410									
	10	6	11	18	31	42	68	97	150	200	258									
	8	3	6	10	18	24	39	56	86	115	148									
	6	2	4	7	13	17	28	40	62	83	107									
	4	1	3	4	8	10	17	25	38	51	66									
	3	1	2	4	6	9	15	21	32	43	56									
	2	1	1	3	5	7	12	17	27	36	47									
	1	1	1	2	4	5	9	13	20	27	35									
1/0	1	1	1	3	4	8	11	17	23	29										
2/0	1	1	1	3	4	6	9	14	19	24										
3/0	0	1	1	2	3	5	7	12	16	20										
4/0	0	1	1	1	2	4	6	9	13	17										
250	0	0	1	1	1	3	5	8	10	13										
300	0	0	1	1	1	3	4	7	9	12										
350	0	0	1	1	1	2	4	6	8	10										
400	0	0	1	1	1	2	3	5	7	9										
500	0	0	0	1	1	1	3	4	6	7										
600	0	0	0	1	1	1	2	3	5	6										
700	0	0	0	1	1	1	1	3	4	5										
750	0	0	0	1	1	1	1	3	4	5										
800	0	0	0	0	1	1	1	3	4	5										
900	0	0	0	0	1	1	1	3	4	5										
1000	0	0	0	0	1	1	1	2	3	4										

Note: This table is for concentric stranded conductors only. For compact stranded conductors, Table C4 (A) should be used.  
SOURCE: NEC2002

## Table C8 Maximum Number of Conductors or Fixture Wires in Rigid Metal Conduit (RMC) (Based on Table 1, Chapter 9)

Type	Conductors												
	Conductor Size (AWG/kcmil)	16 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3)	91 (3-1/2)	103 (4)	129 (5)	155 (6)
RHH, RHW, RHW-2	14	4	7	12	21	28	46	66	102	136	176	276	398
	12	3	6	10	17	23	38	55	85	113	146	229	330
	10	3	5	8	14	19	31	44	68	91	118	185	267
	8	1	2	4	7	10	16	23	36	48	61	97	139
	6	1	1	3	6	8	13	18	29	38	49	77	112
	4	1	1	2	4	6	10	14	22	30	38	60	87
	3	1	1	2	4	5	9	12	19	26	34	53	76
	2	1	1	1	3	4	7	11	17	23	29	46	66
	1	0	1	1	1	3	5	7	11	15	19	30	44
	1/0	0	1	1	1	2	4	6	10	13	17	26	38
	2/0	0	1	1	1	2	4	5	8	11	14	23	33
	3/0	0	0	1	1	1	3	4	7	10	12	20	28
	4/0	0	0	1	1	1	3	4	6	8	11	17	24
	250	0	0	0	1	1	1	3	4	6	8	13	18
	300	0	0	0	1	1	1	2	4	5	7	11	16
	350	0	0	0	1	1	1	2	4	5	6	10	15
	400	0	0	0	1	1	1	1	3	4	6	9	13
500	0	0	0	1	1	1	1	3	4	5	8	11	
600	0	0	0	0	1	1	1	2	3	4	6	9	
700	0	0	0	0	1	1	1	1	3	4	6	8	
750	0	0	0	0	0	1	1	1	3	3	5	8	
800	0	0	0	0	0	1	1	1	2	3	5	7	
900	0	0	0	0	0	1	1	1	2	3	4	7	
1000	0	0	0	0	0	1	1	1	1	3	4	6	
14	9	15	25	44	59	98	140	216	288	370	581	839	
12	7	12	19	33	45	75	107	165	221	284	446	644	
10	5	9	14	25	34	56	80	126	167	212	332	480	
8	3	5	8	14	19	31	44	68	91	118	185	267	
14	6	10	17	29	39	65	93	143	191	246	387	558	
12	5	8	13	23	32	52	75	115	154	198	311	448	
10	3	6	10	18	25	41	58	90	120	154	242	350	
8	1	4	6	11	15	24	35	54	75	92	145	209	
6	1	3	5	8	11	18	27	41	55	71	111	160	
4	1	1	3	6	8	14	20	31	41	53	83	120	
3	1	1	3	5	7	12	17	26	35	45	71	103	
2	1	1	2	4	6	10	14	22	30	38	60	87	
1	1	1	1	3	4	7	10	15	21	27	42	61	
1/0	0	1	1	2	3	6	8	13	18	23	36	52	
2/0	0	1	1	2	3	5	7	11	15	19	31	44	
3/0	0	1	1	1	2	4	6	9	13	16	26	37	
4/0	0	0	1	1	1	3	5	8	10	14	21	31	
250	0	0	1	1	1	3	4	6	8	11	17	25	
300	0	0	1	1	1	2	3	5	7	9	15	22	
350	0	0	1	1	1	1	3	5	6	8	13	19	
400	0	0	1	1	1	1	3	4	6	7	12	17	
500	0	0	0	1	1	1	2	3	5	6	10	14	
600	0	0	0	1	1	1	1	3	4	5	8	12	
700	0	0	0	0	1	1	1	2	3	4	7	10	
750	0	0	0	0	1	1	1	1	2	3	4	7	
800	0	0	0	0	1	1	1	1	2	3	4	6	
900	0	0	0	0	0	1	1	1	1	3	4	6	
1000	0	0	0	0	0	1	1	1	2	3	5	8	

Note: This table is for concentric stranded conductors only. For compact stranded conductors,

Table C4 (A) should be used.

\*Types RHH, RHW and RHW-2 without outer covering.

SOURCE: NEC2002

# Table C8 (Continued) & Metric Conductors

Type	Conductor										Metric Designator (Trade Size)								
	16 (1/2)	21 (3/4)	27 (1)	35 (1-1/4)	41 (1-1/2)	53 (2)	63 (2-1/2)	78 (3)	91 (3-1/2)	103 (4)	129 (5)	155 (6)							
	14	13	22	36	63	85	140	200	309	412	531	833	1202						
	12	9	16	26	46	62	102	146	225	301	387	608	877						
	10	6	10	17	29	39	64	92	142	189	244	383	552						
	8	3	6	9	16	22	37	53	85	109	140	221	318						
	6	2	4	7	12	16	27	38	59	79	101	159	230						
	4	1	2	4	7	10	16	23	36	48	62	98	141						
	3	1	1	3	6	8	14	20	31	41	53	83	120						
	2	1	1	3	5	7	11	17	26	34	44	70	100						
	1	1	1	1	4	5	8	12	19	25	33	51	74						
	1/0	1	1	1	3	4	7	10	16	21	27	43	63						
	2/0	0	1	1	2	3	6	8	13	18	23	36	52						
	3/0	0	1	1	1	3	5	7	11	15	19	30	43						
	4/0	0	1	1	1	2	4	6	9	12	16	25	36						
	250	0	0	1	1	1	3	5	7	10	13	20	29						
	300	0	0	1	1	1	3	4	6	8	11	17	25						
	350	0	0	1	1	1	2	3	5	7	10	15	22						
	400	0	0	1	1	1	2	3	5	7	8	13	20						
	500	0	0	0	1	1	1	2	4	5	7	11	16						
	600	0	0	0	1	1	1	1	3	4	6	9	13						
	700	0	0	0	1	1	1	1	3	4	5	8	11						
	750	0	0	0	0	1	1	1	3	4	5	7	11						
	800	0	0	0	0	1	1	1	2	3	4	7	10						
	900	0	0	0	0	1	1	1	2	3	4	6	9						
	1000	0	0	0	0	1	1	1	1	3	4	6	8						

THHN  
THWN  
THWN-2

Note: This table is for concentric stranded conductors only.  
For compact stranded conductors, Table C8(A) should be used.

SOURCE: NEC2002

Wire Size MM	Wire Size AWG	Circ Mils	# of Strands	Strand Diameter	Diameter MM	Diameter In.	Color Code	Die Code
10	8	19,730	7	1.35	4.05	0.159	Red	21
16	6	31,558	0	4.50	4.50	0.177	Blue	24
16	6	31,558	7	1.70	2.10	0.200	Blue	24
25	2	49,325	7	2.14	6.42	0.253	Grey	29
25	2	49,325	19	1.35	6.75	0.266	Brown	33
35	1	69,055	19	1.53	7.65	0.300	Green	37
50	1/0	98,650	19	1.78	8.90	0.350	Pink	42
70	2/0	138,110	19	2.14	10.70	0.421	Black	45
95	3/0	187,500	19	2.52	12.60	0.496	Orange	50
95	3/0	187,500	37	1.78	12.46	0.490	Orange	50
120	250	236,760	37	2.03	14.21	0.560	Purple	54
150	300	295,950	37	2.25	15.75	0.620	White	66
185		365,000	61	2.52	17.64	0.695	Red	71
240	500	473,500	61	2.25	20.25	0.797	Brown	87
300		591,900	61	2.52	22.68	0.893	Green	94
400		789,200	61	2.85	25.65	1.000	Black	106
400		789,200	91	2.36	25.96	1.022	Black	106
500		986,500	61	3.20	28.80	1.134		125
500		986,500	91	2.65	29.15	1.148		
650		1,243,000	127	2.52	32.76	1.290		
800		1,578,400	127	2.85	37.05	1.459		
1000		1,973,000	127	3.20	41.60	1.638		





#### TBM62BSCR

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