ANSI/ICEA P-54-440
NEMA WC 51

AMPACITIES OF CABLES INSTALLED IN CABLE TRAYS

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Ampacities of Cables
Installed in Cable Trays

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Foreword

This Standards Publication for *Ampacities of Cables Installed in Cable Trays* (ICEA P-54-440, NEMA WC 51-2003) was developed by the Insulated Cable Engineers Association, Inc. (ICEA) and approved by the National Electrical Manufacturers Association (NEMA). It supersedes WC 51-1986 (R1991) Rev 1 August 1994.

ICEA/NEMA standards are adopted in the public interest and are designed to eliminate misunderstanding between the manufacturer and the user and to assist the user in selecting and obtaining the proper product for his particular need. Existence of an ICEA/NEMA standard does not in any respect preclude the manufacture or use of products not conforming to the standard. The user of this Standard is cautioned to observe any health or safety regulations and rules relative to the manufacture and use of cable made in conformity with this Standard.

Requests for interpretation of this Standard must be submitted in writing to:

Insulated Cable Engineers Association, Inc.,
P.O. Box 1568, Carrollton,
Georgia, 30112

An official written interpretation will be provided. The Association will welcome any suggestions on ways to improve this Standard.

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Scope

This Standards Publication covers the ampacity ratings for 600-15,000 volt solid dielectric cables installed in cable trays. Ampacity ratings are tabulated for single conductor cables, triplexed assemblies of single conductor cables, and three-conductor cables incorporating an overall jacket.

Ampacities have been tabulated for the cable constructions and the operating conditions normally encountered for tray applications. Correction factors to adjust the tabulated values to better reflect specific conditions are provided. These include adjustments to account for ambient and operating temperatures, cable construction, tray covers, and diversification of the cable loading.

This standard is intended primarily for use by the utility industry. It is not intended for use where compliance with the *National Electrical Code* or other regulations is mandatory.

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History

Ampacity tables for cables in trays were published in the Insulated Power Cable Engineers Association Publication No. P-33-440, April 2, 1959 (IPCEA is currently known as ICEA). It assumed a load diversity but did not specifically define the diversity. The demands of modern generating plants required a more precise definition of operating conditions for the determination of cable ampacities.

Experimental work with various cables and the loading of trays by J. Stolpe[1] and the theory developed by Stolpe, Underwriters Laboratories Inc., Lee,[2] and ICEA Publication P-46-426, IEEE S-135 *Power Cable Ampacities*, 1962 Edition provided a more accurate means of calculating ampacities of cables in trays. A joint committee of IPCEA and IEEE Insulated Conductors Committee utilized this work in preparing the ampacity tables. They were published in the IPCEA/NEMA Standards Publication for *Ampacities of Cables in Open-top Cable Trays,* IPCEA Publication No. P-54-440, NEMA Standards Publication No. WC 51-1972. They superseded the factors in Table B for cables without maintained spacing in the IPCEA "Factors for Calculating Ampacities of Cables Installed in Ladder Supports, Trays and Troughs," P-33-440, April 2, 1959. Table A of that publication covering factors for cables with maintained spacing was not affected.

The 1975 edition of the IPCEA/NEMA Standards Publication was expanded to cover 15 kV cables and includes a great many editorial corrections that clarify the 1972 document. The document was revised in April 1976 and again in August 1979. NEMA reaffirmed the document on November 20, 1980. In October 1984 a correction was made in the earlier Appendix D and was included in that edition.

The members of IEEE-IPCEA Joint Committee at the time of the initial writing were: R. C. Waldron, Chairman, D. A. Costello, E. Finch, E. L. Kolmorgen, M. J. Koulopoulos, R. H. Lee, R. A. Peterson, D. A. Silver, and J. Stolpe

The extended information contained in this revision was made possible through recent theoretical and experimental work by W. Z. Black and B. L. Harshe[3,4]. This edition has been expanded to include tray fill depths up to 4 inches and adjustment factors to account for tray covers and load diversity. In addition, the tables have been revised to reflect current cable design practices and conductor sizes through 2000 kcmil inclusive.

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Section 1
GENERAL INFORMATION

1.1 BACKGROUND

Establishing the ampacity of cables installed in cable trays can become quite complex since a cable tray may contain hundreds of cables differing in size and loading. Methods to compute cable ratings under these operating conditions were developed first by J. Stolpe. This conservative technique assumes the cables are packed into the tray and are operating at maximum loading such that the heat generated can be assumed to be uniformly distributed throughout the total cable mass. This has been and continues to be the basis for the ampacity tables provided in this standard.

More recently, B. L. Harshe and W. Z. Black have developed models that account for load diversity and the presence of tray covers in the determination of allowable cable ampacity. The validation of their models also included tests using cable fill depths up to 4 inches. In recognition of this work, the tables have been expanded to include fill depths of 3.5 inches and 4 inches and adjustment factors have been added for diversity loading and the use of tray covers.

Sample ampacity calculations are provided to demonstrate the use of the tables and adjustment factors.

1.2 REFERENCES

The following publications are adopted in part, by reference in this standard, and are available from the organizations listed below.

1.2.1 Normative References

The following normative documents contain provisions, which through reference in this text, constitute provisions of this Standards publication. By reference herein, these publications are adopted in whole or in part as indicated, in this standard.

Global Engineering Documents
15 Inverness Way East
Englewood, CO 80112

ANSI/NEMA WC70/ICEA S-95-658-1999	*Standard for Nonshielded Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy*
ANSI/NEMA WC71/ICEA S-96-659-1999	*Standard for Nonshielded Power Cables Rated 2001-5000 Volts for the Distribution of Electrical Energy*
ANSI/NEMA WC74/ICEA S-93-639-2000	*5-46 kV Shielded Power Cable for use in the Transmission & Distribution of Electrical Energy*
ANSI/ICEA S-97-682-2000	*Standard for Utility Shielded Power Cables Rated 5-46 kV for the Distribution of Electrical Energy*

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Institute of Electrical and Electronics Engineers (IEEE)
345 East 47th Street
New York, New York 10017-2394

IEEE Standard 835-1994 *IEEE Standard Power Cable Ampacity Tables*

Bureau Central de la Commission Electrotechnique International
3. rue de Varenbre
Geneve, Suisse
www.iec.ch

IEC Publication 60287-1-1 (2001-11) *Electric cables - Calculation of the current rating - Part 1-1: Current rating equations (100 % load factor) and calculation of losses - General*

1.2.2 Other References

Institute of Electrical and Electronics Engineers (IEEE)
345 East 47th Street
New York, New York 10017-2394

(1) IEEE Transaction Paper 70 TP 557 PWR, *Ampacity for Cables in Randomly Filled Trays,* J. Stolpe, 1970
(2) IEEE Transaction Paper 71 TP 543 PWR, *Ampacity for Multiconductor Cables in Trays,* R. Lee, 1971
(3) IEEE Transactions on Power Delivery Vol. 9 No. 4, Oct. 1994, *Ampacity of Cables in Single Open-Top Cable Trays,* B. Harche & W. Black
(4) IEEE Transactions on Power Delivery Vol. 12 No. 1, Jan. 1997, *Ampacity of Cables in Single Covered Trays,* B. Harche & W. Black
(5) Rating of Electric Power Cable, George J. Anders, IEEE Order Number PC5647 ISBN 0-7803-1177-9

1.3 DEFINITIONS

allowable heat generation: The maximum allowable heat generation (watts/inch^2/ft) for the cable mass per unit length of tray. Exceeding this value will cause the cables in the tray to exceed their operating temperature limits.

apparent fill depth: The calculated depth of cable in the tray. This value is used to determine the allowable heat generation for given tray fill conditions. The value is calculated by dividing the total area occupied by the cables in the tray by the width of the tray.

CAUTION: To account for the fact that cables will not pack into a solid mass, each cable in the tray is assumed to occupy a space defined by a square whose sides equal the cable diameter.

cover factor: The ampacity of a cable installed in a covered tray divided by the ampacity of the same cable in the same tray without a cover.

diversification factor: The ampacity of a cable installed in a tray containing unequally loaded cables divided by the ampacity of the same cable and tray where all cables are fully loaded.

% tray fill: The combined circular cross sectional area of the cables installed in the tray divided by the total available cross sectional area of the tray (width X height) expressed as a percentage.

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CAUTION: To determine the apparent fill depth (basis for calculations and tables) when given the % Tray Fill, the following equation must be used to account for the different methods used to determine the cross sectional area occupied by the cables. (Refer to Section 4.1 for an example*)*

$$\textit{Apparent Fill Depth} = (4/\pi) * \textit{\% Tray Fill} * \textit{Tray Depth}$$

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Section 2
TABLE DEVELOPMENT PARAMETERS

2.1 PARAMETERS USED TO DEVELOP TRAY AMPACITY TABLES

The tabulated ampacities are based on the fundamental assumption that all cables are fully loaded and operating at 100% load factor. The cables are tightly packed in a 24-inch wide uncovered tray. Variable parameters and assumptions applied in the determination and tabulation of the tray ampacities are listed and discussed below.

2.1.1 Cable Operating Temperatures

The ampacities tabulated are based on a normal conductor operating temperature of 90ºC (194ºF) and an air ambient temperature of 40ºC (104ºF).

When trays are stacked, the ambient air temperature of the upper trays will be higher depending on the amount of ventilation and the distance between the trays. The same is true in cable tunnels without forced ventilation. In these and similar situations the use of a higher ambient temperature shall be considered. A 50ºC (122ºF) ambient will frequently exist at the top of the tunnel.

Where trays contain cables having different maximum operating temperatures, ampacities for the entire group shall be limited to the lowest temperature rating

Correction factors for other operating and ambient conditions are provided for in Section 3.

2.1.2 Allowable Heat Generation

The maximum heat generation is determined by the method developed by Stolpe. The values calculated for the tabulated Apparent Fill Depths are shown below in Table 2-1. The parameters employed in this calculation are shown in Table 2-2.

Table 2-1
ALLOWABLE HEAT GENERATION

Apparent Fill Depth (inches)	Allowable Heat Generation (watts/inches/feet)
1	5.93
1.5	3.56
2	2.43
2.5	1.78
3	1.38
3.5	1.1
4	0.9

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Table 2-2
PARAMETERS USED FOR TABULATED AMPACITY

Variable	Value	Units
Tray Width	24	inches
Surface Emissivity of Cable Mass	0.8	None
Convective Heat Transfer Coefficient	0.223	Watts / sqft / degreeC
Cable Mass Temperature	90	degree C
Ambient Air Temperature	40	degree C
Thermal Resistivity of Cable Mass	400	Degree C - cm / watt

2.1.3 Calculated Depth of Cables in Trays – Apparent Fill Depth

The depth of cables in trays should be calculated as follows:

$$\textit{Calculated Depth, inches} = \frac{n_1 d_1^{\,2} + n_2 d_2^{\,2} + n_3 d_3^{\,2} + \ldots n_n d_n^{\,2}}{w}$$

where:
d_1 , d_2 , ...d_n = diameter of cables, inches.
n_1 , n_2 , ...n_n = number of cables of diameters d_1 , d_2 ,...d_n , respectively.
w = width of tray, inches.

2.1.4 Cable Diameters

The cable diameters were calculated using the nominal conductor diameters and wall thickness provided in the referenced ICEA cable standards. For cable diameters different than those shown in the tables, see paragraph 3.1.

2.1.5 Conductor Resistance

Conductor resistance values were obtained from the referenced ICEA standards and corrected for operating temperature and skin effect. The individual strands of copper conductors are coated. For triplexed assemblies and three conductor cables the resistance was further adjusted to account for 2% increase in length due to cabling. Proximity effects have been included and are based on a triangular configuration. Single conductors are assumed to lie in close triangular arrangements.

2.1.6 Calculated Free-Air Ampacity

The ampacity of cables in free-air is provided for reference. Values are based on computation methods described in IEEE Std 835 – 1994. Tabulated values in this standard are limited to 80% of the free-air ampacity based on natural convection and no solar heat absorption. The calculated conductor resistance at 90 °C including skin and proximity effects and cable diameters used in the ampacity calculation are as shown in the tables. Thermal resistivity values for the internal cable components are 350 °C-cm/watt and 500 °C-cm/watt for the insulation and jacket, respectively.

2.1.7 Ampacity Values

Tabulated values were calculated using the following equation:

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$$I = d \times \sqrt{\frac{\text{Allowable Heat Generation}}{n \times R_c}}$$

where: I = ampacity, amperes
d = cable diameter, inches
Allowable Heat Generation from Table 2-1, watts/sq.ft./degreeC
n = number of cable conductors
R_C = conductor resistance, micro-ohms/ft

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Section 3
AMPACITY ADJUSTMENT FACTORS

3.1 CORRECTION FACTOR FOR DIAMETERS OF CABLES

Diameters for cables meeting the construction requirements of the referenced ICEA standards are given in each table. For cable diameters different than the tabulated values, the ampacity can be calculated by direct proportion to the cable diameters as follows:

$$I_x = \frac{d_x}{d_o} I_o$$

where:

I_o = ampacity for cable diameter d_0 from the table.
d_o = cable diameter from the table.
I_x = ampacity for cable diameter d_x
d_x= cable diameter less than the calculated depth of those in tables.

3.2 CORRECTION FACTOR FOR TEMPERATURES

The tables are based on a conductor temperature of 90ºC and an ambient air temperature of 40ºC.

3.2.1 Ambient Temperature

If the trays are stacked, the ambient air temperature of the upper trays will be higher depending on the amount of ventilation around the trays. In cable tunnels without forced ventilation, a 50ºC ambient will frequently exist at the top of the tunnel. The following factors should be used for correcting for different ambient air temperatures.

Table 3-1
AMBIENT AIR ADJUSTMENT

Ambient Air Temperature degrees C (degrees F)	Adjustment Factor
30 (86)	1.09
35 (45)	1.05
40 (104)	1.00
45 (113)	0.95
50 (122)	0.90
55 (131)	0.85

3.2.2 Conductor Temperature

The rating for normal conductor operating temperatures differing from 90ºC should be determined by the following multiplying factors:

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Table 3-2
CONDUCTOR TEMPERATURE ADJUSTMENT

Conductor Temperature degrees C (degrees F)	Adjustment Factor
125 (257)	1.24
105 (221)	1.11
90 (194)	1.00
85 (184)	0.95
75 (167)	0.86
70 (158)	0.80
60 (140)	0.66

Where trays contain cables having different maximum operating temperatures, ampacities for the entire group shall be limited to the lowest temperature rating.

Where both the ambient temperature and conductor temperature differ from those stated in 2.1.1, the product of both correction factors should be used.

3.3 CORRECTION FACTOR FOR NUMBER OF CONDUCTORS

The tables apply to single conductor, triplexed and three-conductor cables. For other numbers of conductors, the current will vary as the square root of the conductors carrying current and the ampacity can be calculated as follows:

$$I'_x = I'_0 \left(\frac{d'_x}{d'_0} \right) \sqrt{\frac{3}{n_x}}$$

where:

I'_0 = ampacity for three-conductor cable from the table.

I'_x = ampacity for cable having n_x conductors.

d'_x = diameter of cable having n_x conductors.

d'_0 = diameter of three-conductor cable from the table.

n_x = number of conductors other than given in the table.

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3.4 CORRECTION FACTORS FOR TRAY COVERS

The following table provides ampacity correction factors for trays employing covers. The adjustment factors represent worse case conditions where the air gaps between the cable mass and cover are greater than ½ inch. For an air gap spacing less than ½ inch the thermal resistance of the air gap decreases dramatically resulting in an increase in the multiplier.

Table 3-3
TRAY COVER ADJUSTMENT

Apparent Fill Depth (inches)	Adjustment Factor
1	0.78
1.5	0.80
2	0.81
2.5	0.82
3	0.83
3.5	0.84
4	0.85

3.5 CORRECTION FACTORS FOR LOAD DIVERSITY

The thermal model used to compute tray ampacities of diversely loaded cables is based on the work of B.L. Harshe and W.Z. Black. Their “pancake” layer model assumes heavily loaded cables are located at the center (horizontal layer across the tray width) of the cable mass while lightly loaded cables are nearest the surface. This approach will lead to the maximum possible cable mass temperature and therefore a conservative ampacity but only when it can be safely assumed that the heat is generated uniformly across the tray width. Cable ampacity is calculated by multiplying the value tabulated by the ampacity correction factor provided in Table 3-4.

CAUTION: In situations where heavily loaded cables are installed in a tray and the area occupied by these loaded cables cannot be safely assumed to extend across the tray width (i.e. loaded cables are bunched together) the correction factors given in Table 3-4 should not be utilized. These situations are beyond the scope of this standard. Methods are available to address these special cases. The user should refer to Section 1.2.2 for references that provide guidance.

3.5.1 Determining the Loading Factor

Cables operating at less than 25% of the tabulated ampacity shall be considered lightly loaded and will therefore have negligible effect on the temperature rise. Cables carrying load currents greater than 25% of the tabulated values shall be considered fully loaded.

Load diversification is calculated by dividing the area occupied by the heavily loaded cables by the total area occupied by all cables in the tray.

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3.5.2 Diversity Factors

Table 3-4
LOAD DIVERSIFICATION ADJUSTMENT

Load Diversification %	Adjustment Factor	Load Diversification %	Adjustment Factor
10 or less	2.70	55	1.25
15	2.26	60	1.21
20	1.97	65	1.18
25	1.76	70	1.14
30	1.61	75	1.10
35	1.50	80	1.07
40	1.42	85	1.03
45	1.35	90	1.01
50	1.30	95 or higher	1.00

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Section 4
EXAMPLES

4.1 CALCULATING APPARENT DEPTH OF CABLE

A 4-inch deep by 24-inch wide covered cable tray currently contains the following power and control cables that are used to energize two separate but identical loads.

Cable Type	Existing Quantity	Loading Level amps/cable conductor
3/c-4/0 AWG copper, 5kV nonshielded insulated nonjacketed conductors with overall jacket	3	165
3/c-1/0 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	4	75
3/c-No. 2 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	4	12
1/c-No. 8 AWG copper, 600 volt insulated & jacketed conductors	20	5
1/c-No. 12 AWG copper, 600 volt insulated conductors	40	1

The tray is currently estimated at 20% fill, but it is planned to double the plant capacity by adding two additional units and use the existing tray to route the new circuits to their intended locations. Can the tray be utilized without exceeding the 90°C rating of the cable products it contains? Ambient air temperature is near 40°C during summer months.

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Cable Type	Proposed Quantity	Cable Information Table Number	Cable Diameter inch	Tray Area Occupied square inch
3/c-4/0 AWG copper, 5kV nonshielded insulated nonjacketed conductors with overall jacket	6	5-17	1.75	18.38
3/c-1/0 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	8	5-4	1.33	14.15
3/c-No. 2 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	8	5-4	1.09	9.50
1/c-No. 8 AWG copper, 600 volt insulated & jacketed conductors	40	5-5	0.27	2.92
1/c-No. 12 AWG copper, 600 volt insulated conductors	80	5-2	0.18	2.59
			Area Occupied by Cables - square inches	47.54
			Tray Width - inches	24
			Apparent Depth of Cables - inches	1.98
			Alternative Calculation (see definition of % fill)	
			Existing % Fill	20
			Proposed % Fill	40
			Apparent Depth of Cables – inches	2.04

4.2 SELECTING AMPACITY VALUES AND USING ADJUSTMENT FACTORS

Using the identified tables the ampacity for each cable is obtained by reading down the column containing the calculated apparent fill depth until it intercepts the row containing the appropriate conductor size. Since the tables are for trays without covers, the ampacity needs to be adjusted accordingly. The effect of the cover is obtained from Table 3-3 in this case an adjustment multiplier of 0.81 (2 inch depth of fill) is to be used.

The 80% In-Free Air ampacity is also available in the table for reference and it is recommended that the tray cable ampacity be limited to the smaller of these values. As such, for this example we obtain the following;

Cable Type	Tabulated Ampacity amps	Cable Information Table No.	Adjustment for Tray Cover Factor (Table 3-3) = 0.81	Free Air Ampacity amps	Load Requirements amps
3/c-4/0 AWG copper, 5kV nonshielded insulated nonjacketed conductors with overall jacket	191	5-17	155	258	165
3/c-1/0 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	103	5-4	83	160	75
3/c-No. 2 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	67	5-4	54	118	12
1/c-No. 8 AWG copper, 600 volt insulated & jacketed conductors	14	5-5	11	63	5
1/c-No. 12 AWG copper, 600 volt insulated conductors	6	5-2	5	34	1

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Note that the 5kV cable ampacity after correcting for the presence of a tray cover is exceeded. One solution to the problem would be to remove the cover but we also know that the analysis assumes all the cables to be fully loaded and we know in this example that this is not the case.

4.3 CALCULATING AND APPLYING DIVERSITY FACTORS

A quick analysis of the diversity is in order and the results shown below provide confidence that the existing tray can be used for these new circuits.

Cable Type	Load Requirement amps	Covered Tray Rating amps	Loading Level % of rated	Tray Area Occupied Square inch	Heat Generation Area Square inch
3/c-4/0 AWG copper, 5kV nonshielded insulated nonjacketed conductors with overall jacket	165	154	107%	18.38	18.38
3/c-1/0 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	75	84	89%	14.15	14.15
3/c-No. 2 AWG copper, 600 volt insulated nonjacketed conductors with overall jacket	12	54	22%	9.50	0.00
1/c-No. 8 AWG copper, 600 volt insulated & jacketed conductors	5	9	56%	2.92	2.92
1/c-No. 12 AWG copper, 600 volt insulated conductors	1	5	21%	2.59	0.00
				47.54	35.44
			Load Diversification	0.75	
			Diversification Factor	1.1	

The calculated diversity factor of 1.1 will yield an ampacity of 169 amps (154 x 1.1), which exceeds the required 165 amps.

4.4 MULTIPLE ADJUSTMENT FACTORS

Due to the addition of new process equipment, the ambient air temperature has increased 5°C to 45°C. In addition, concerns for cable damage resulting from internal construction activities have forced engineers to consider tray covers at least temporarily for a 2-inch filled cable tray. What effect will these actions have on the existing tray cable ratings?

From Table 3-1 a factor of 0.95 must be applied to the tabulated ampacities to attain the ampacity rating at 45°C.

From Table 3-3, the adjustment factor to compensate for tray covers will depend on the fill depth. This will range from 0.78 to 0.85. For a tray fill depth of 2 inches the adjustment factor is 0.81.

For trays having a fill depth of 2 inches, the ampacity shown in the table corresponding to the cable type in the column for a 2-inch fill depth, should be multiplied by 0.77 (0.95 x 0.81), to attain the correct ampacity.

4.5 CALCULATING AMPACITIES FOR CABLES NOT COVERED BY TABLES

Calculating the ampacity of cables not specifically covered by the tables can be accomplished by using the tabulated ampacities for three conductor cables and adjusting for the actual number of conductors and cable diameter or by using the equation from which the tables were prepared directly. Consider the following problem.

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What is the ampacity of a 7/C No. 12 AWG 600 volt cable installed in a 24-inch wide tray to a 1.5-inch fill depth? The cable is constructed of insulated copper single conductors and an overall jacket with a 0.60-inch cable diameter.

Starting with Table 5-1, the ampacity of a 3/C cable of similar construction, can be obtained from ampacity Table 5-4. A 3/C cable with an overall diameter of 0.48" has an ampacity of 11 amps. For a 7/C cable, this ampacity has to be corrected for both the number of conductors and the difference in cable diameter. To make this correction, the equation from Section 3.3 is used:

$$I'_x = I'_0 \frac{d'_x}{d'_0} \sqrt{\frac{3}{n_x}}$$

$$I'_x = 11 \times \frac{0.60}{0.48} \times \sqrt{\frac{3}{7}}$$

$$I'_x = 11 \times 1.25 \times 0.655$$

$$I'_x = 9 \; amps$$

If the tray is covered, an additional derating is required. For a 1.5-inch fill depth the adjustment factor from Table 3-3 is 0.80; therefore,

$$I'_x = 9 \; amps \times 0.80 = 7 \; amps$$

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Section 5
TABLES

5.1 INDEX TO TABLES

Table 5-1

REFERENCE TABLES FOR SPECIFIC CABLE CONSTRUCTIONS

Cable Description					Table Number	
Voltage Class	Number Conductors	Insulated Conductors		Overall Jackets	Conductor	
		Jacketed	Shielded		Copper	Alum
600	1	no	no	no	5-2	5-2A
	3	no	no	no	5-3	5-3A
	3	no	no	yes	5-4	5-4A
	1	yes	no	no	5-5	5-5A
	3	yes	no	no	5-6	5-6A
	3	yes	no	yes	5-7	5-7A
2000	1	no	no	no	5-8	5-8A
	3	no	no	no	5-9	5-9A
	3	no	no	yes	5-10	5-10A
	1	yes	no	no	5-11	5-11A
	3	yes	no	no	5-12	5-12A
	3	yes	no	yes	5-13	5-13A
5000	1	yes	no	no	5-14	5-14A
	3	yes	no	no	5-15	5-15A
100%	3	yes	no	yes	5-16	5-16A
Insulation	3	no	no	yes	5-17	5-17A
Level	1	yes	yes	no	5-18	5-18A
	3	yes	yes	no	5-19	5-19A
	3	no	yes	yes	5-20	5-20A
15000	1	yes	yes	no	5-21	5-21A
100% Ins.	3	yes	yes	no	5-22	5-22A
Level	3	no	yes	yes	5-23	5-23A

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Ampacities of 600 Volt Copper Cables

Table 5-2

1/C Insulated Non-Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.16	3413.04	26	7	5	4	4	3	3	3
12	0.18	2148.18	34	9	7	6	5	5	4	4
10	0.21	1350.11	46	14	11	9	8	7	6	5
9	0.22	1071.63	53	16	13	10	9	8	7	6
8	0.27	849.64	64	23	17	14	12	11	10	9
6	0.30	534.59	85	32	24	20	17	15	14	12
4	0.35	336.07	114	46	36	30	25	22	20	18
2	0.41	211.38	154	69	53	44	38	33	30	27
1	0.49	167.61	184	92	71	59	50	44	40	36
1/0	0.53	133.27	214	112	87	72	61	54	48	44
2/0	0.58	105.74	250	137	106	88	75	66	59	54
3/0	0.63	84.18	291	167	130	107	92	81	72	65
4/0	0.69	66.33	342	206	160	132	113	100	89	80
250	0.77	56.70	383	249	193	159	136	120	107	97
350	0.87	41.13	476	330	256	211	181	159	142	129
500	1.00	29.27	602	450	349	288	247	217	194	175
750	1.22	20.67	774	653	506	418	358	315	281	255
1000	1.37	16.72	906	816	632	522	447	394	351	318
1250	1.54	14.35	1022	990	767	634	542	478	426	386
1500	1.66	12.92	1113	1113	871	720	616	543	484	438
1750	1.78	11.89	1198	1198	974	805	689	606	541	490
2000	1.88	11.11	1272	1272	1064	879	753	663	592	535

Table 5-3

3-1/C Insulated Non-Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.34	3481.30	20	8	6	5	4	4	3	3
12	0.39	2191.14	27	12	9	7	6	6	5	5
10	0.45	1377.11	37	17	13	11	9	8	7	7
9	0.47	1093.06	42	20	15	13	11	10	9	8
8	0.58	866.63	50	28	21	18	15	13	12	11
6	0.65	545.28	67	39	30	25	21	19	17	15
4	0.75	342.79	90	57	44	36	31	27	25	22
2	0.88	215.61	123	84	65	54	46	41	36	33
1	1.06	170.96	147	114	88	73	62	55	49	44
1/0	1.14	135.93	171	137	107	88	75	66	59	54
2/0	1.25	107.86	200	169	131	108	93	82	73	66
3/0	1.36	85.86	234	206	160	132	113	100	89	80
4/0	1.49	67.65	274	255	197	163	140	123	110	99
250	1.66	57.83	307	307	238	196	168	148	132	120
350	1.88	41.95	382	382	316	261	224	197	176	159
500	2.16	29.85	483	483	431	356	305	268	239	217
750	2.63	21.09	622	622	622	515	441	388	347	314
1000	2.95	17.06	729	729	729	643	550	484	432	391
1250	3.32	14.64	822	822	822	781	668	588	525	475
1500	3.58	13.18	894	894	894	887	760	669	597	540
1750	3.84	12.13	964	964	964	964	849	748	668	604
2000	4.05	11.33	1023	1023	1023	1023	927	816	729	659

Table 5-4

3/C Insulated Non-Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.38	3481.30	20	9	7	6	5	4	4	4
12	0.48	2191.14	26	14	11	9	8	7	6	6
10	0.56	1377.11	35	21	16	14	12	10	9	8
9	0.59	1093.06	41	25	19	16	14	12	11	10
8	0.69	866.63	49	33	26	21	18	16	14	13
6	0.82	545.28	66	49	38	32	27	24	21	19
4	0.96	342.79	87	73	56	47	40	35	31	28
2	1.09	215.61	118	104	81	67	57	50	45	41
1	1.24	170.96	138	133	103	85	73	64	57	52
1/0	1.33	136.30	160	160	124	103	88	77	69	62
2/0	1.43	108.14	186	186	150	124	106	93	83	75
3/0	1.54	86.28	214	214	181	149	128	112	100	91
4/0	1.72	68.13	250	250	227	188	161	141	126	114
250	1.96	58.26	278	278	278	231	198	174	155	141
350	2.18	42.58	342	342	342	301	257	227	202	183
500	2.47	30.64	426	426	426	402	344	303	270	244
750	2.99	22.11	535	535	535	535	490	431	385	348
1000	3.32	18.17	618	618	618	618	600	528	472	427
1250	3.71	15.80	685	685	685	685	685	633	565	511
1500	4.10	14.23	742	742	742	742	742	737	658	595
1750	4.35	13.06	792	792	792	792	792	792	729	659
2000	4.57	12.06	842	842	842	842	842	842	797	721

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Ampacities of 600 Volt Aluminum Cables

Table 5-2a
1/C Insulated Non-Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.16	5410.11	20	5	4	3	3	3	2	2
12	0.18	3405.14	27	8	6	5	4	4	3	3
10	0.21	2140.09	37	11	9	7	6	5	5	4
9	0.22	1698.67	42	13	10	8	7	6	6	5
8	0.27	1346.79	50	18	14	11	10	9	8	7
6	0.30	847.40	67	25	19	16	14	12	11	10
4	0.35	532.71	90	37	29	24	20	18	16	14
2	0.41	335.08	123	55	42	35	30	26	23	21
1	0.49	265.69	146	73	57	47	40	35	32	29
1/0	0.53	210.57	170	89	69	57	49	43	38	35
2/0	0.58	167.06	199	109	85	70	60	53	47	43
3/0	0.63	132.99	232	133	103	85	73	64	57	52
4/0	0.69	105.46	271	164	127	105	90	79	70	64
250	0.77	89.25	306	198	154	127	109	96	85	77
350	0.87	64.25	381	264	205	169	145	128	114	103
500	1.00	45.53	482	361	280	231	198	174	155	141
750	1.22	31.05	631	533	413	341	292	257	230	208
1000	1.37	24.19	754	678	526	434	372	327	292	264
1250	1.54	20.12	863	836	648	535	458	403	360	326
1500	1.66	17.56	954	954	747	618	529	465	415	376
1750	1.78	15.81	1038	1038	845	698	597	526	470	425
2000	1.88	14.57	1110	1110	929	768	657	579	517	467

Table 5-3a
3-1/C Insulated Non-Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.34	5518.31	16	6	5	4	4	3	3	3
12	0.39	3473.24	22	9	7	6	5	4	4	4
10	0.45	2182.89	29	14	10	9	7	7	6	5
9	0.47	1732.64	34	16	12	10	9	8	7	6
8	0.58	1373.73	40	22	17	14	12	11	9	9
6	0.65	864.35	54	31	24	20	17	15	13	12
4	0.75	543.36	72	45	35	29	25	22	19	18
2	0.88	341.78	98	67	52	43	37	32	29	26
1	1.06	271.00	117	91	70	58	50	44	39	35
1/0	1.14	214.78	136	109	85	70	60	53	47	43
2/0	1.25	170.40	159	135	104	86	74	65	58	52
3/0	1.36	135.65	186	164	127	105	90	79	71	64
4/0	1.49	107.57	217	202	156	129	111	97	87	79
250	1.66	91.04	245	245	190	157	134	118	105	95
350	1.88	65.53	306	306	253	209	179	158	141	127
500	2.16	46.44	387	387	345	285	244	215	192	174
750	2.63	31.68	507	507	507	421	360	317	283	256
1000	2.95	24.68	606	606	606	534	457	403	360	325
1250	3.32	20.52	694	694	694	660	565	497	444	401
1500	3.58	17.91	767	767	767	761	652	574	512	463
1750	3.84	16.13	836	836	836	836	736	648	579	524
2000	4.05	14.86	894	894	894	894	809	713	636	575

Table 5-4a
3/C Insulated Non-Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.38	5518.31	16	7	6	5	4	3	3	3
12	0.42	3473.24	21	10	8	6	5	5	4	4
10	0.47	2182.89	28	14	11	9	8	7	6	6
9	0.50	1732.64	32	17	13	11	9	8	7	7
8	0.63	1373.73	39	24	19	15	13	12	10	9
6	0.71	864.35	52	34	26	22	19	16	15	13
4	0.81	543.36	70	49	38	31	27	24	21	19
2	0.98	341.78	94	75	58	48	41	36	32	29
1	1.11	271.00	110	95	73	61	52	46	41	37
1/0	1.20	214.78	127	115	89	74	63	56	50	45
2/0	1.30	170.40	148	140	108	90	77	68	60	55
3/0	1.41	136.25	171	170	132	109	93	82	73	66
4/0	1.54	108.05	199	199	161	133	114	100	90	81
250	1.74	91.44	222	222	198	164	140	123	110	100
350	1.97	66.38	274	274	263	218	186	164	146	132
500	2.25	47.59	342	342	342	294	251	221	197	179
750	2.72	33.17	437	437	437	425	364	320	286	259
1000	3.11	26.62	510	510	510	510	464	409	365	330
1250	3.49	22.81	570	570	570	570	563	496	442	400
1500	3.76	20.42	619	619	619	619	619	564	504	456
1750	4.00	18.85	659	659	659	659	659	625	558	505
2000	4.23	17.69	694	694	694	694	694	682	609	551

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Ampacities of 600 Volt Copper Cables

Table 5-5
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.16	3413.04	26	7	5	4	4	3	3	3
12	0.18	2148.18	34	9	7	6	5	5	4	4
10	0.21	1350.11	46	14	11	9	8	7	6	5
9	0.22	1071.63	53	16	13	10	9	8	7	6
8	0.27	849.64	63	23	17	14	12	11	10	9
6	0.33	534.59	86	35	27	22	19	17	15	14
4	0.38	336.07	115	50	39	32	28	24	22	20
2	0.44	211.38	155	74	57	47	40	36	32	29
1	0.53	167.61	184	100	77	64	55	48	43	39
1/0	0.57	133.23	214	120	93	77	66	58	52	47
2/0	0.62	105.71	249	147	114	94	80	71	63	57
3/0	0.67	84.13	290	178	138	114	97	86	77	69
4/0	0.73	66.27	339	218	169	140	120	105	94	85
250	0.84	56.63	378	272	211	174	149	131	117	106
350	0.94	41.01	469	357	277	229	196	172	154	139
500	1.07	29.12	591	483	374	309	265	233	208	188
750	1.29	20.50	760	694	538	444	380	335	299	270
1000	1.44	16.51	893	863	669	552	473	416	372	336
1250	1.62	14.12	1005	1005	813	672	575	506	452	409
1500	1.80	12.51	1090	1090	960	793	679	598	534	483
1750	1.92	11.49	1171	1171	1069	883	756	665	594	537
2000	2.02	10.70	1244	1244	1165	963	824	725	648	586

Table 5-6
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.34	3481.30	20	8	6	5	4	4	3	3
12	0.39	2191.14	27	12	9	7	6	6	5	5
10	0.45	1377.11	36	17	13	11	9	8	7	7
9	0.47	1093.06	42	20	15	13	11	10	9	8
8	0.58	866.63	50	28	21	18	15	13	12	11
6	0.65	545.28	68	39	30	25	21	19	17	15
4	0.75	342.79	92	57	44	36	31	27	25	22
2	0.88	215.61	124	84	65	54	46	41	36	33
1	1.06	170.96	147	114	88	73	62	55	49	44
1/0	1.14	135.89	171	137	107	88	75	66	59	54
2/0	1.25	107.82	200	169	131	108	93	82	73	66
3/0	1.36	85.81	232	206	160	132	113	100	89	80
4/0	1.49	67.59	272	255	197	163	140	123	110	99
250	1.66	57.76	306	306	238	197	168	148	132	120
350	1.88	41.83	378	378	317	262	224	197	176	159
500	2.16	29.70	477	477	432	357	305	269	240	217
750	2.63	20.91	614	614	614	518	443	390	348	315
1000	2.95	16.85	721	721	721	647	554	487	435	394
1250	3.32	14.40	813	813	813	787	674	593	530	479
1500	3.58	12.76	884	884	884	884	772	680	607	549
1750	3.84	11.72	950	950	950	950	864	761	679	614
2000	4.05	10.91	1008	1008	1008	1008	944	832	742	672

Table 5-7
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.44	3481.30	22	10	8	7	6	5	5	4
12	0.48	2191.14	28	14	11	9	8	7	6	6
10	0.56	1377.11	38	21	16	14	12	10	9	8
9	0.59	1093.06	44	25	19	16	14	12	11	10
8	0.69	866.63	51	33	26	21	18	16	14	13
6	0.82	545.28	70	49	38	32	27	24	21	19
4	0.96	342.79	94	73	56	47	40	35	31	28
2	1.09	215.61	125	104	81	67	57	50	45	41
1	1.24	170.96	146	133	103	85	73	64	57	52
1/0	1.33	136.27	168	160	124	103	88	77	69	62
2/0	1.43	108.12	195	193	150	124	106	93	83	75
3/0	1.54	86.26	225	225	181	149	128	112	100	91
4/0	1.72	68.10	262	262	227	188	161	141	126	114
250	1.96	58.22	296	296	280	231	198	174	156	141
350	2.18	42.53	362	362	362	301	257	227	202	183
500	2.47	30.57	448	448	448	402	344	303	271	245
750	2.99	22.03	558	558	558	558	491	432	386	349
1000	3.32	18.08	642	642	642	642	601	530	473	428
1250	3.71	15.71	709	709	709	709	709	635	567	513
1500	4.10	14.10	774	774	774	774	774	741	661	598
1750	4.35	12.92	826	826	826	826	826	821	733	663
2000	4.57	11.93	876	876	876	876	876	876	801	725

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Ampacities of 600 Volt Aluminum Cables

Table 5-5a
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.16	5410.11	20	5	4	3	3	3	2	2
12	0.18	3405.14	27	8	6	5	4	4	3	3
10	0.21	2140.09	37	11	9	7	6	5	5	4
9	0.22	1698.67	42	13	10	8	7	6	6	5
8	0.27	1346.79	50	18	14	11	10	9	8	7
6	0.33	847.40	68	28	21	18	15	13	12	11
4	0.38	532.71	91	40	31	26	22	19	17	16
2	0.44	335.08	123	59	45	37	32	28	25	23
1	0.53	265.69	146	79	61	51	43	38	34	31
1/0	0.57	210.57	170	96	74	61	52	46	41	37
2/0	0.62	167.06	198	117	91	75	64	56	50	46
3/0	0.67	132.95	230	142	110	91	78	68	61	55
4/0	0.73	105.43	269	173	134	111	95	84	75	67
250	0.84	89.22	302	217	168	139	119	104	93	84
350	0.94	64.17	374	286	221	183	157	138	123	111
500	1.07	45.42	474	387	300	247	212	187	167	151
750	1.29	30.94	618	565	438	362	309	272	243	220
1000	1.44	24.05	740	715	554	458	392	345	308	279
1250	1.62	19.95	846	846	684	565	484	426	380	344
1500	1.80	17.24	929	929	818	676	578	509	455	411
1750	1.92	15.48	1009	1009	921	761	651	573	512	463
2000	2.02	14.21	1079	1079	1011	835	715	629	562	508

Table 5-6a
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.34	5518.31	16	6	5	4	4	3	3	3
12	0.39	3473.24	22	9	7	6	5	4	4	4
10	0.45	2182.89	29	14	10	9	7	7	6	5
9	0.47	1732.64	33	16	12	10	9	8	7	6
8	0.58	1373.73	40	22	17	14	12	11	9	9
6	0.71	864.35	54	34	26	22	19	16	15	13
4	0.82	543.36	73	49	38	32	27	24	21	19
2	0.95	341.78	98	72	56	46	40	35	31	28
1	1.14	271.00	118	97	75	62	53	47	42	38
1/0	1.23	214.78	136	118	91	76	65	57	51	46
2/0	1.34	170.40	159	144	112	92	79	70	62	56
3/0	1.44	135.61	185	174	135	111	95	84	75	68
4/0	1.57	107.54	216	213	165	136	117	103	92	83
250	1.81	91.00	243	243	207	171	146	129	115	104
350	2.03	65.45	302	302	273	226	193	170	152	137
500	2.31	46.33	382	382	370	305	261	230	206	186
750	2.78	31.56	499	499	499	445	381	336	300	271
1000	3.10	24.53	598	598	598	563	482	425	379	343
1250	3.49	20.34	683	683	683	683	596	525	469	424
1500	3.88	17.58	753	753	753	753	713	628	560	507
1750	4.14	15.79	818	818	818	818	803	707	631	571
2000	4.36	14.49	875	875	875	875	875	777	694	627

Table 5-7a
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.44	5518.31	17	8	6	5	5	4	4	3
12	0.48	3473.24	22	11	9	7	6	6	5	4
10	0.56	2182.89	30	17	13	11	9	8	7	7
9	0.59	1732.64	34	20	15	13	11	10	9	8
8	0.69	1373.73	41	26	20	17	14	13	11	10
6	0.82	864.35	55	39	30	25	21	19	17	15
4	0.96	543.36	74	58	45	37	32	28	25	23
2	1.09	341.78	99	83	64	53	45	40	36	32
1	1.24	271.00	116	106	82	68	58	51	46	41
1/0	1.33	214.78	134	128	99	82	70	62	55	50
2/0	1.43	170.40	155	154	119	99	84	74	66	60
3/0	1.54	136.21	179	179	144	119	102	89	80	72
4/0	1.72	108.02	209	209	180	149	127	112	100	91
250	1.96	91.41	236	236	223	185	158	139	124	112
350	2.18	66.31	290	290	290	241	206	182	162	147
500	2.47	47.51	359	359	359	323	276	243	217	196
750	2.99	33.08	456	456	456	456	400	353	315	285
1000	3.32	26.50	530	530	530	530	497	437	391	353
1250	3.71	22.67	590	590	590	590	590	528	472	427
1500	4.10	20.18	647	647	647	647	647	619	553	500
1750	4.35	18.59	689	689	689	689	689	684	611	553
2000	4.57	17.42	725	725	725	725	725	725	663	600

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Ampacities of 2000 Volt Copper Cables

Table 5-8

1/C Insulated Non-Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.19	3413.04	27	8	6	5	4	4	3	3
12	0.21	2148.18	36	11	9	7	6	5	5	4
10	0.24	1350.11	48	16	12	10	9	8	7	6
9	0.25	1071.63	54	19	14	12	10	9	8	7
8	0.29	849.64	65	24	19	16	13	12	10	9
6	0.32	534.59	86	34	26	22	18	16	15	13
4	0.37	336.07	116	49	38	31	27	24	21	19
2	0.43	211.38	156	72	56	46	39	35	31	28
1	0.51	167.61	186	96	74	61	53	46	41	37
1/0	0.55	133.25	215	116	90	74	64	56	50	45
2/0	0.60	105.73	251	142	110	91	78	69	61	55
3/0	0.65	84.15	293	173	134	110	95	83	74	67
4/0	0.71	66.30	343	212	165	136	116	102	91	83
250	0.78	56.69	384	252	195	161	138	122	109	98
350	0.88	41.11	476	334	259	214	183	161	144	130
500	1.01	29.25	602	455	352	291	249	219	196	177
750	1.24	20.62	774	665	515	426	364	321	286	259
1000	1.39	16.66	906	829	643	531	454	400	357	323
1250	1.57	14.26	1021	1012	784	648	555	488	436	394
1500	1.69	12.82	1114	1114	891	736	630	554	495	448
1750	1.81	11.80	1198	1198	994	821	703	619	553	500
2000	1.91	11.01	1272	1272	1086	897	768	676	604	546

Table 5-9

3-1/C Insulated Non-Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.41	3481.30	22	10	8	6	5	5	4	4
12	0.45	2191.14	29	14	10	9	7	7	6	5
10	0.52	1377.11	38	20	15	13	11	10	8	8
9	0.54	1093.06	44	23	18	15	13	11	10	9
8	0.63	866.63	52	30	23	19	16	15	13	12
6	0.69	545.28	69	42	32	27	23	20	18	16
4	0.80	342.79	93	61	47	39	33	29	26	24
2	0.93	215.61	125	89	69	57	49	43	38	35
1	1.10	170.96	149	118	92	76	65	57	51	46
1/0	1.19	135.91	173	144	111	92	79	69	62	56
2/0	1.29	107.84	202	175	135	112	96	84	75	68
3/0	1.40	85.83	234	212	165	136	116	102	92	83
4/0	1.53	67.62	274	262	203	167	143	126	113	102
250	1.68	57.82	308	308	241	199	170	150	134	121
350	1.90	41.93	382	382	320	264	226	199	178	161
500	2.18	29.83	483	483	435	359	307	271	242	219
750	2.67	21.03	622	622	622	524	448	395	353	319
1000	3.00	16.99	730	730	730	655	561	494	441	399
1250	3.38	14.54	822	822	822	798	683	601	537	486
1500	3.64	13.08	897	897	897	897	775	683	609	551
1750	3.90	12.03	965	965	965	965	866	763	681	616
2000	4.12	11.23	1026	1026	1026	1026	947	834	744	673

Table 5-10

3/C Insulated Non-Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.44	3481.30	21	10	8	7	6	5	5	4
12	0.48	2191.14	27	14	11	9	8	7	6	6
10	0.56	1377.11	36	21	16	14	12	10	9	8
9	0.59	1093.06	42	25	19	16	14	12	11	10
8	0.67	866.63	49	32	25	20	18	15	14	12
6	0.75	545.28	65	45	35	29	25	22	19	18
4	0.90	342.79	87	68	53	44	37	33	29	27
2	1.03	215.61	117	99	76	63	54	48	42	38
1	1.16	170.96	136	125	97	80	68	60	54	49
1/0	1.24	136.29	157	149	116	96	82	72	64	58
2/0	1.34	108.13	182	181	140	116	99	87	78	71
3/0	1.45	86.27	211	211	170	141	120	106	95	86
4/0	1.58	68.12	246	246	209	172	147	130	116	105
250	1.78	58.25	273	273	254	210	180	158	141	128
350	2.01	42.57	335	335	335	277	237	209	187	169
500	2.30	30.62	418	418	418	374	320	282	252	228
750	2.82	22.10	520	520	520	520	462	407	363	329
1000	3.15	18.15	599	599	599	599	570	501	448	405
1250	3.55	15.77	666	666	666	666	666	606	541	490
1500	3.82	14.21	722	722	722	722	722	687	614	555
1750	4.07	13.03	772	772	772	772	772	765	683	618
2000	4.29	12.04	819	819	819	819	819	819	749	677

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Ampacities of 2000 Volt Aluminum Cables

Table 5-8a
1/C Insulated Non-Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.19	5410.11	22	6	5	4	3	3	3	2
12	0.21	3405.14	28	9	7	6	5	4	4	3
10	0.24	2140.09	38	13	10	8	7	6	5	5
9	0.25	1698.67	43	15	11	9	8	7	6	6
8	0.29	1346.79	51	19	15	12	11	9	8	7
6	0.32	847.40	68	27	21	17	15	13	12	10
4	0.37	532.71	92	39	30	25	21	19	17	15
2	0.43	335.08	124	57	44	37	31	28	25	22
1	0.51	265.69	147	76	59	49	42	37	33	30
1/0	0.55	210.57	171	92	72	59	51	45	40	36
2/0	0.60	167.06	200	113	88	72	62	55	49	44
3/0	0.65	132.97	233	137	106	88	75	66	59	53
4/0	0.71	105.45	272	168	130	108	92	81	73	66
250	0.78	89.25	306	201	156	129	110	97	87	78
350	0.88	64.24	381	267	207	171	146	129	115	104
500	1.01	45.51	482	365	282	233	200	176	157	142
750	1.24	31.02	631	542	420	347	297	262	234	211
1000	1.39	24.15	753	689	534	441	377	332	297	268
1250	1.57	20.05	861	854	662	547	468	412	368	333
1500	1.69	17.48	954	954	763	630	539	475	424	383
1750	1.81	15.73	1038	1038	861	711	609	536	479	433
2000	1.91	14.48	1109	1109	947	782	670	590	526	476

Table 5-9a
3-1/C Insulated Non-Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.41	5518.31	17	8	6	5	4	4	3	3
12	0.45	3473.24	22	11	8	7	6	5	5	4
10	0.52	2182.89	30	16	12	10	9	8	7	6
9	0.54	1732.64	34	18	14	12	10	9	8	7
8	0.63	1373.73	42	24	19	15	13	12	10	9
6	0.69	864.35	54	33	26	21	18	16	14	13
4	0.80	543.36	74	48	37	31	26	23	21	19
2	0.93	341.78	99	71	55	45	39	34	30	28
1	1.10	271.00	118	94	73	60	51	45	40	37
1/0	1.19	214.78	138	114	88	73	63	55	49	44
2/0	1.29	170.40	160	139	108	89	76	67	60	54
3/0	1.40	135.62	186	169	131	108	93	82	73	66
4/0	1.53	107.56	218	207	161	133	114	100	89	81
250	1.68	91.03	246	246	192	158	136	119	107	96
350	1.90	65.52	306	306	256	211	181	159	142	129
500	2.18	46.42	387	387	349	288	246	217	194	175
750	2.67	31.64	507	507	507	427	366	322	287	260
1000	3.00	24.63	606	606	606	544	466	410	366	331
1250	3.38	20.45	693	693	693	673	576	507	453	409
1500	3.64	17.83	768	768	768	768	664	585	522	472
1750	3.90	16.05	835	835	835	835	750	660	589	533
2000	4.12	14.77	894	894	894	894	826	727	649	587

Table 5-10a
3/C Insulated Non-Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.44	5518.31	17	8	6	5	5	4	4	3
12	0.48	3473.24	22	11	9	7	6	6	5	4
10	0.56	2182.89	29	17	13	11	9	8	7	7
9	0.59	1732.64	33	20	15	13	11	10	9	8
8	0.67	1373.73	39	25	20	16	14	12	11	10
6	0.75	864.35	51	36	28	23	20	17	15	14
4	0.90	543.36	70	54	42	35	30	26	23	21
2	1.03	341.78	93	78	61	50	43	38	34	31
1	1.16	271.00	108	99	77	63	54	48	43	39
1/0	1.24	214.78	125	119	92	76	65	57	51	46
2/0	1.34	170.40	145	144	112	92	79	70	62	56
3/0	1.45	135.98	168	168	135	112	96	84	75	68
4/0	1.58	107.82	195	195	166	137	117	103	92	83
250	1.78	91.26	218	218	203	168	144	126	113	102
350	2.01	65.97	270	270	270	223	191	168	150	136
500	2.30	46.99	338	338	338	302	258	228	203	184
750	2.82	32.37	430	430	430	430	382	336	300	271
1000	3.15	25.52	506	506	506	506	480	423	378	342
1250	3.55	21.49	571	571	571	571	571	519	464	419
1500	3.82	18.91	626	626	626	626	626	596	532	481
1750	4.07	17.16	673	673	673	673	673	666	595	538
2000	4.29	15.85	714	714	714	714	714	714	652	590

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Ampacities of 2000 Volt Copper Cables

Table 5-11
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.19	3413.04	26	8	6	5	4	4	3	3
12	0.21	2148.18	35	11	9	7	6	5	5	4
10	0.24	1350.11	47	16	12	10	9	8	7	6
9	0.25	1071.63	54	19	14	12	10	9	8	7
8	0.32	849.64	66	27	21	17	15	13	12	10
6	0.35	534.59	86	37	29	24	20	18	16	14
4	0.40	336.07	116	53	41	34	29	26	23	21
2	0.46	211.38	157	77	60	49	42	37	33	30
1	0.55	167.61	185	103	80	66	57	50	45	40
1/0	0.59	133.21	214	124	96	80	68	60	54	48
2/0	0.64	105.70	250	152	117	97	83	73	65	59
3/0	0.69	84.10	290	183	142	117	100	88	79	71
4/0	0.75	66.24	341	224	174	144	123	108	97	87
250	0.86	56.61	379	278	216	178	152	134	120	108
350	0.96	40.98	470	365	283	234	200	176	157	142
500	1.09	29.08	592	492	381	315	270	237	212	192
750	1.31	20.45	762	705	547	452	386	340	304	275
1000	1.46	16.46	892	876	679	561	480	423	377	341
1250	1.71	13.89	998	998	866	715	612	539	481	435
1500	1.83	12.44	1090	1090	979	809	692	610	544	492
1750	1.95	11.41	1174	1174	1089	900	770	678	605	548
2000	2.05	10.63	1246	1246	1186	980	839	739	659	596

Table 5-12
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.41	3481.30	22	10	8	6	5	5	4	4
12	0.45	2191.14	28	14	10	9	7	7	6	5
10	0.52	1377.11	38	20	15	13	11	10	8	8
9	0.54	1093.06	43	23	18	15	13	11	10	9
8	0.69	866.63	53	33	26	21	18	16	14	13
6	0.75	545.28	70	45	35	29	25	22	19	18
4	0.86	342.79	94	65	51	42	36	32	28	25
2	0.99	215.61	126	95	73	61	52	46	41	37
1	1.19	170.96	149	128	99	82	70	62	55	50
1/0	1.27	135.87	173	153	119	98	84	74	66	60
2/0	1.38	107.81	202	187	145	120	102	90	80	73
3/0	1.49	85.79	234	226	175	145	124	109	97	88
4/0	1.62	67.57	274	274	215	177	152	134	119	108
250	1.85	57.75	306	306	265	219	188	165	147	133
350	2.07	41.80	380	380	349	288	247	217	194	175
500	2.35	29.67	478	478	470	388	332	293	261	236
750	2.82	20.86	615	615	615	556	476	419	374	338
1000	3.15	16.79	722	722	722	692	592	521	466	421
1250	3.69	14.17	810	810	810	810	755	665	594	537
1500	3.95	12.69	886	886	886	886	854	752	671	607
1750	4.20	11.64	951	951	951	951	948	835	745	674
2000	4.42	10.84	1010	1010	1010	1010	1010	911	813	735

Table 5-13
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.51	3481.30	22	12	9	8	7	6	5	5
12	0.58	2191.14	29	17	13	11	10	8	8	7
10	0.63	1377.11	38	24	18	15	13	12	10	9
9	0.66	1093.06	44	28	22	18	15	14	12	11
8	0.78	866.63	52	37	29	24	20	18	16	15
6	0.90	545.28	69	54	42	35	30	26	23	21
4	1.01	342.79	92	77	59	49	42	37	33	30
2	1.13	215.61	122	108	84	69	59	52	47	42
1	1.29	170.96	144	139	107	89	76	67	60	54
1/0	1.37	136.27	166	165	128	106	90	80	71	64
2/0	1.47	108.12	191	191	154	127	109	96	86	77
3/0	1.58	86.25	221	221	185	153	131	115	103	93
4/0	1.77	68.09	256	256	234	193	165	145	130	117
250	2.00	58.21	288	288	286	236	202	178	159	144
350	2.23	42.52	353	353	353	308	263	232	207	187
500	2.51	30.55	437	437	437	409	350	308	275	249
750	3.04	22.02	542	542	542	542	499	439	392	355
1000	3.37	18.06	623	623	623	623	611	538	480	434
1250	3.90	15.64	697	697	697	697	697	669	597	540
1500	4.17	14.07	754	754	754	754	754	754	673	609
1750	4.41	12.90	804	804	804	804	804	804	743	673
2000	4.64	11.91	854	854	854	854	854	854	814	736

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Ampacities of 2000 Volt Aluminum Cables

Table 5-11a
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.19	5410.11	22	6	5	4	3	3	3	2
12	0.21	3405.14	28	9	7	6	5	4	4	3
10	0.24	2140.09	38	13	10	8	7	6	5	5
9	0.25	1698.67	43	15	11	9	8	7	6	6
8	0.32	1346.79	52	21	16	14	12	10	9	8
6	0.35	847.40	69	29	23	19	16	14	13	11
4	0.40	532.71	92	42	33	27	23	20	18	16
2	0.46	335.08	124	61	47	39	34	30	26	24
1	0.55	265.69	146	82	64	53	45	40	35	32
1/0	0.59	210.57	170	99	77	63	54	48	43	39
2/0	0.64	167.06	198	121	93	77	66	58	52	47
3/0	0.69	132.93	231	146	113	93	80	70	63	57
4/0	0.75	105.42	270	178	138	114	97	86	77	69
250	0.86	89.21	302	222	172	142	121	107	95	86
350	0.96	64.15	376	292	226	187	160	141	126	114
500	1.09	45.40	474	394	305	252	216	190	170	153
750	1.31	30.91	619	574	445	367	314	277	247	224
1000	1.46	24.01	738	726	562	464	398	350	313	283
1250	1.71	19.78	836	836	725	599	513	452	403	365
1500	1.83	17.18	928	928	833	688	589	519	463	419
1750	1.95	15.41	1010	1010	937	774	663	584	521	471
2000	2.05	14.14	1081	1081	1029	850	727	640	572	517

Table 5-12a
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.41	5518.31	17	8	6	5	4	4	3	3
12	0.45	3473.24	22	11	8	7	6	5	5	4
10	0.52	2182.89	30	16	12	10	9	8	7	6
9	0.54	1732.64	34	18	14	12	10	9	8	7
8	0.69	1373.73	42	26	20	17	14	13	11	10
6	0.75	864.35	55	36	28	23	20	17	15	14
4	0.86	543.36	74	52	40	33	28	25	22	20
2	0.99	341.78	100	75	58	48	41	36	32	29
1	1.19	271.00	118	102	79	65	56	49	44	40
1/0	1.27	214.78	137	122	94	78	67	59	52	47
2/0	1.38	170.40	160	149	115	95	81	72	64	58
3/0	1.49	135.59	186	180	139	115	99	87	77	70
4/0	1.62	107.53	217	217	170	141	120	106	95	86
250	1.85	90.99	244	244	211	175	149	132	117	106
350	2.07	65.43	303	303	279	230	197	174	155	140
500	2.35	46.31	382	382	376	311	266	234	209	189
750	2.82	31.53	501	501	501	452	387	341	304	275
1000	3.15	24.49	598	598	598	573	490	432	385	349
1250	3.69	20.17	678	678	678	678	633	557	498	450
1500	3.95	17.53	753	753	753	753	727	640	571	517
1750	4.20	15.72	818	818	818	818	816	718	641	580
2000	4.42	14.43	876	876	876	876	876	789	705	637

Table 5-13a
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
14	0.51	5518.31	18	10	7	6	5	5	4	4
12	0.58	3473.24	23	14	11	9	8	7	6	5
10	0.63	2182.89	30	19	15	12	10	9	8	7
9	0.66	1732.64	35	22	17	14	12	11	10	9
8	0.78	1373.73	42	30	23	19	16	14	13	12
6	0.90	864.35	55	43	33	28	24	21	19	17
4	1.01	543.36	73	61	47	39	33	29	26	24
2	1.13	341.78	97	86	67	55	47	41	37	33
1	1.29	271.00	114	110	85	71	60	53	47	43
1/0	1.37	214.78	132	131	102	84	72	63	57	51
2/0	1.47	170.40	152	152	123	101	87	76	68	62
3/0	1.58	135.95	176	176	148	122	104	92	82	74
4/0	1.77	107.81	203	203	186	153	131	116	103	93
250	2.00	91.24	230	230	228	188	161	142	127	115
350	2.23	65.93	283	283	283	247	212	186	166	150
500	2.51	46.94	353	353	353	330	282	248	222	201
750	3.04	32.32	447	447	447	447	412	363	324	293
1000	3.37	25.45	525	525	525	525	515	453	405	366
1250	3.90	21.39	596	596	596	596	596	572	511	462
1500	4.17	18.80	652	652	652	652	652	652	582	527
1750	4.41	17.05	699	699	699	699	699	699	647	585
2000	4.64	15.73	742	742	742	742	742	742	708	641

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Ampacities of 5000 Volt Non-shielded Copper Cables

Table 5-14
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.56	849.64	89	47	36	30	26	23	20	18
6	0.59	534.59	117	62	48	40	34	30	27	24
4	0.64	336.07	155	85	66	54	47	41	37	33
2	0.70	211.38	206	117	91	75	64	57	50	46
1	0.74	167.61	238	139	108	89	76	67	60	54
1/0	0.78	133.11	275	165	128	105	90	79	71	64
2/0	0.83	105.61	319	197	152	126	108	95	85	77
3/0	0.91	83.95	368	242	187	155	133	117	104	94
4/0	0.97	66.06	428	291	225	186	159	140	125	113
250	1.08	56.49	475	350	271	224	192	169	151	136
350	1.18	40.77	585	450	349	288	247	217	194	175
500	1.34	28.76	735	608	471	390	333	294	262	237
750	1.56	20.04	938	849	658	543	465	409	365	331
1000	1.71	15.95	1101	1043	808	667	571	503	449	406
1250	1.91	13.51	1236	1236	980	810	693	610	545	493
1500	2.03	12.03	1351	1351	1104	912	781	688	614	555
1750	2.18	10.94	1448	1448	1244	1027	879	774	691	625
2000	2.28	10.15	1538	1538	1350	1116	955	841	751	679

Table 5-15
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.21	866.63	59	58	45	37	32	28	25	23
6	1.27	545.28	77	76	59	49	42	37	33	30
4	1.38	342.79	102	102	81	67	57	51	45	41
2	1.51	215.61	135	135	112	93	79	70	62	56
1	1.60	170.96	156	156	133	110	94	83	74	67
1/0	1.68	135.77	179	179	157	130	111	98	87	79
2/0	1.79	107.73	208	208	188	155	133	117	104	94
3/0	1.96	85.63	241	241	231	191	163	144	128	116
4/0	2.09	67.39	280	280	277	229	196	173	154	139
250	2.33	57.62	311	311	311	276	236	208	186	168
350	2.54	41.58	383	383	383	355	303	267	239	216
500	2.89	29.33	482	482	482	480	411	362	323	292
750	3.36	20.44	614	614	614	614	572	504	450	407
1000	3.69	16.27	720	720	720	720	705	620	554	501
1250	4.12	13.78	809	809	809	809	809	753	672	608
1500	4.38	12.27	884	884	884	884	884	848	757	685
1750	4.70	11.16	948	948	948	948	948	948	852	771
2000	4.92	10.35	1006	1006	1006	1006	1006	1006	926	838

Table 5-16
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.12	866.63	54	53	41	34	29	26	23	21
6	1.23	545.28	72	72	57	47	41	36	32	29
4	1.33	342.79	94	94	78	65	55	49	43	39
2	1.46	215.61	124	124	108	89	77	67	60	54
1	1.54	170.96	143	143	128	106	91	80	71	65
1/0	1.63	136.23	164	164	152	126	108	95	85	76
2/0	1.79	108.09	190	190	188	155	133	117	104	94
3/0	1.99	86.20	221	221	221	193	165	145	130	117
4/0	2.11	68.03	255	255	255	230	197	174	155	140
250	2.28	58.18	281	281	281	269	230	203	181	164
350	2.51	42.46	342	342	342	342	297	261	233	211
500	2.92	30.47	424	424	424	424	407	359	320	290
750	3.32	21.93	526	526	526	526	526	481	429	388
1000	3.65	17.96	604	604	604	604	604	584	522	472
1250	4.14	15.56	671	671	671	671	671	671	636	575
1500	4.40	13.99	726	726	726	726	726	726	712	644
1750	4.65	12.82	770	770	770	770	770	770	770	711
2000	4.88	11.83	818	818	818	818	818	818	818	777

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Ampacities of 5000 Volt Nonshielded Aluminum Cables

Table 5-14a
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.56	1346.79	71	37	29	24	20	18	16	14
6	0.59	847.40	93	49	38	32	27	24	21	19
4	0.64	532.71	123	68	52	43	37	33	29	26
2	0.70	335.08	163	93	72	60	51	45	40	36
1	0.74	265.69	189	111	86	71	61	53	48	43
1/0	0.78	210.57	218	131	101	84	72	63	56	51
2/0	0.83	167.06	253	156	121	100	86	75	67	61
3/0	0.91	132.81	292	192	149	123	105	93	83	75
4/0	0.97	105.32	339	230	178	147	126	111	99	90
250	1.08	89.14	378	279	216	178	153	134	120	109
350	1.18	64.00	467	359	278	230	197	173	155	140
500	1.34	45.17	587	486	376	311	266	234	209	189
750	1.56	30.64	759	686	532	439	376	331	296	267
1000	1.71	23.65	904	856	663	548	469	413	369	334
1250	1.91	19.49	1029	1029	816	674	577	508	454	410
1500	2.03	16.86	1141	1141	933	771	660	581	519	469
1750	2.18	15.02	1236	1236	1061	877	750	661	590	534
2000	2.28	13.73	1322	1322	1161	959	821	723	645	584

Table 5-15a
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.21	1373.73	43	43	36	29	25	22	20	18
6	1.27	864.35	57	57	47	39	33	29	26	24
4	1.38	543.36	74	74	64	53	46	40	36	32
2	1.51	341.78	98	98	89	74	63	55	49	45
1	1.60	271.00	114	114	106	87	75	66	59	53
1/0	1.68	214.78	131	131	125	103	88	78	69	63
2/0	1.79	170.40	151	151	149	123	106	93	83	75
3/0	1.96	135.47	175	175	175	152	130	114	102	92
4/0	2.09	107.43	202	202	202	181	155	137	122	110
250	2.33	90.92	224	224	224	220	188	166	148	134
350	2.54	65.28	275	275	275	275	242	213	190	172
500	2.89	46.07	342	342	342	342	328	289	258	233
750	3.36	31.25	433	433	433	433	433	408	364	329
1000	3.69	24.12	508	508	508	508	508	508	455	412
1250	4.12	19.88	574	574	574	574	574	574	560	506
1500	4.38	17.20	627	627	627	627	627	627	627	578
1750	4.70	15.32	670	670	670	670	670	670	670	658
2000	4.92	14.00	711	711	711	711	711	711	711	711

Table 5-16a
3/C Insulated Jacketed Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.12	1373.73	47	42	33	27	23	20	18	17
6	1.23	864.35	62	59	46	38	32	28	25	23
4	1.33	543.36	81	80	62	51	44	39	35	31
2	1.46	341.78	107	107	86	71	61	54	48	43
1	1.54	271.00	124	124	102	84	72	63	57	51
1/0	1.63	214.78	142	142	121	100	86	75	67	61
2/0	1.79	170.40	166	166	149	123	106	93	83	75
3/0	1.99	135.47	191	191	186	154	132	116	104	94
4/0	2.11	107.43	222	222	222	183	157	138	123	112
250	2.28	90.92	248	248	248	215	184	162	145	131
350	2.51	65.28	306	306	306	280	239	211	188	170
500	2.92	46.07	384	384	384	384	331	292	261	236
750	3.32	31.25	496	496	496	496	457	403	360	325
1000	3.65	24.12	591	591	591	591	572	504	450	407
1250	4.14	19.88	674	674	674	674	674	630	562	509
1500	4.40	17.20	747	747	747	747	747	720	642	581
1750	4.65	15.32	809	809	809	809	809	806	719	651
2000	4.88	14.00	865	865	865	865	865	865	790	714

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Ampacities of 5000 Volt Non-shielded Copper Cables

Table 5-17

3/C Insulated Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.86	866.63	53	41	32	26	23	20	18	16
6	0.94	545.28	70	57	44	36	31	27	24	22
4	1.05	342.79	93	80	62	51	44	38	34	31
2	1.18	215.61	123	113	88	72	62	55	49	44
1	1.26	170.96	143	135	105	87	74	65	58	53
1/0	1.35	136.27	165	163	126	104	89	78	70	63
2/0	1.45	108.12	191	191	152	126	107	95	84	76
3/0	1.56	86.25	221	221	183	151	129	114	102	92
4/0	1.75	68.09	258	258	231	191	163	144	128	116
250	1.85	58.24	286	286	264	218	187	164	147	133
350	2.08	42.55	350	350	347	287	246	216	193	175
500	2.36	30.60	434	434	434	384	329	289	258	234
750	2.82	22.10	544	544	544	540	462	407	363	329
1000	3.15	18.15	626	626	626	626	570	501	448	405
1250	3.55	15.77	693	693	693	693	689	606	541	490
1500	3.82	14.21	750	750	750	750	750	687	614	555
1750	4.17	12.99	798	798	798	798	798	785	701	634
2000	4.40	11.99	848	848	848	848	848	848	769	696

Ampacities of 5000 Volt Nonshielded Aluminum Cables

Table 5-17a

3/C Insulated Conductors with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.86	1373.73	42	33	25	21	18	16	14	13
6	0.94	864.35	55	45	35	29	25	22	19	18
4	1.05	543.36	74	63	49	41	35	31	27	25
2	1.18	341.78	98	90	70	57	49	43	39	35
1	1.26	271.00	114	108	83	69	59	52	46	42
1/0	1.35	214.78	131	130	100	83	71	62	56	50
2/0	1.45	170.40	152	152	121	100	86	75	67	61
3/0	1.56	135.96	176	176	146	120	103	91	81	73
4/0	1.75	107.81	205	205	184	152	130	114	102	92
250	1.85	91.25	228	228	211	174	149	131	117	106
350	2.08	65.95	282	282	279	231	197	174	155	140
500	2.36	46.97	350	350	350	310	265	234	209	189
750	2.82	32.37	450	450	450	446	382	336	300	271
1000	3.15	25.52	528	528	528	528	480	423	378	342
1250	3.55	21.49	594	594	594	594	590	519	464	419
1500	3.82	18.91	650	650	650	650	650	596	532	481
1750	4.17	17.12	695	695	695	695	695	684	610	552
2000	4.40	15.81	738	738	738	738	738	738	670	606

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Ampacities of 5000 Volt Shielded Copper Cables

Table 5-18
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.53	849.64	72	44	34	28	24	21	19	17
6	0.57	534.59	94	60	47	38	33	29	26	23
4	0.61	336.07	125	81	63	52	44	39	35	32
2	0.67	211.38	166	112	87	72	61	54	48	44
1	0.71	167.61	192	134	103	85	73	64	58	52
1/0	0.75	133.12	222	158	123	101	87	76	68	62
2/0	0.80	105.62	257	190	147	121	104	91	82	74
3/0	0.88	83.97	298	234	181	150	128	113	101	91
4/0	0.94	66.08	346	282	218	180	154	136	121	110
250	1.00	56.52	385	324	251	207	177	156	140	126
350	1.10	40.83	476	419	325	268	230	202	181	163
500	1.25	28.85	599	567	439	363	310	273	244	221
750	1.44	20.21	765	765	604	499	427	376	336	304
1000	1.60	16.14	898	898	751	621	531	468	418	378
1250	1.92	13.49	1002	1002	986	815	697	614	548	496
1500	2.04	12.01	1097	1097	1097	918	785	692	617	558
1750	2.15	10.99	1179	1179	1179	1011	865	762	680	615
2000	2.26	10.19	1252	1252	1252	1104	945	832	743	672

Table 5-19
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.14	866.63	61	54	42	35	30	26	23	21
6	1.23	545.28	79	74	57	47	41	36	32	29
4	1.32	342.79	105	100	78	64	55	48	43	39
2	1.44	215.61	138	138	107	88	76	67	59	54
1	1.53	170.96	160	160	127	105	90	79	71	64
1/0	1.62	135.78	185	185	151	125	107	94	84	76
2/0	1.72	107.74	214	214	181	149	128	112	100	91
3/0	1.90	85.65	248	248	224	185	158	139	124	112
4/0	2.03	67.40	288	288	269	223	190	168	150	135
250	2.16	57.66	320	320	310	256	219	193	172	156
350	2.37	41.65	395	395	395	331	283	249	222	201
500	2.70	29.43	498	498	498	448	383	338	301	273
750	3.10	20.61	636	636	636	615	526	463	413	374
1000	3.45	16.47	746	746	746	746	655	577	515	466
1250	4.14	13.76	843	843	843	843	843	757	676	611
1500	4.40	12.25	921	921	921	921	921	853	761	689
1750	4.64	11.21	990	990	990	990	990	940	839	759
2000	4.87	10.39	1052	1052	1052	1052	1052	1025	915	828

Table 5-20
3/C Insulated Conductors Plexed with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.06	866.63	61	51	39	32	28	24	22	20
6	1.15	545.28	79	69	54	44	38	33	30	27
4	1.23	342.79	103	93	72	60	51	45	40	36
2	1.36	215.61	136	130	101	83	71	63	56	51
1	1.45	170.96	157	156	121	100	85	75	67	61
1/0	1.54	136.24	181	181	144	119	102	89	80	72
2/0	1.64	108.09	208	208	172	142	122	107	96	86
3/0	1.81	86.21	240	240	212	175	150	132	118	107
4/0	1.94	68.04	278	278	256	212	181	160	142	129
250	2.07	58.19	308	308	296	244	209	184	164	149
350	2.29	42.49	377	377	377	316	271	238	213	192
500	2.61	30.51	466	466	466	425	364	320	286	259
750	3.08	21.96	580	580	580	580	506	446	398	360
1000	3.42	17.99	664	664	664	664	621	547	488	442
1250	3.98	15.58	736	736	736	736	736	684	611	552
1500	4.24	14.02	796	796	796	796	796	768	686	620
1750	4.48	12.85	849	849	849	849	849	848	757	685
2000	4.72	11.85	896	896	896	896	896	896	830	751

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Ampacities of 5000 Volt Shielded Aluminum Cables

Table 5-18a
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	0.53	1346.79	57	35	27	23	19	17	15	14
6	0.57	847.40	75	48	37	31	26	23	21	19
4	0.61	532.71	99	64	50	41	35	31	28	25
2	0.67	335.08	132	89	69	57	49	43	38	35
1	0.71	265.69	153	106	82	68	58	51	46	41
1/0	0.75	210.57	177	126	98	81	69	61	54	49
2/0	0.80	167.06	205	151	117	96	83	73	65	59
3/0	0.88	132.82	237	186	144	119	102	90	80	72
4/0	0.94	105.33	274	223	173	143	122	108	96	87
250	1.00	89.16	306	258	200	165	141	124	111	100
350	1.10	64.05	380	335	259	214	183	161	144	130
500	1.25	45.23	478	453	351	290	248	218	195	176
750	1.44	30.75	620	620	490	405	346	305	272	246
1000	1.60	23.78	740	740	619	511	438	385	344	311
1250	1.92	19.48	834	834	821	678	580	511	456	413
1500	2.04	16.85	926	926	926	775	663	584	521	471
1750	2.15	15.07	1006	1006	1006	863	739	651	581	525
2000	2.26	13.76	1078	1078	1078	950	813	716	639	578

Table 5-19a
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.14	1373.73	48	43	34	28	24	21	19	17
6	1.23	864.35	63	59	46	38	32	28	25	23
4	1.32	543.36	83	80	62	51	44	38	34	31
2	1.44	341.78	110	110	85	70	60	53	47	43
1	1.53	271.00	127	127	101	84	72	63	56	51
1/0	1.62	214.78	147	147	120	99	85	75	67	61
2/0	1.72	170.40	170	170	144	119	101	89	80	72
3/0	1.90	135.48	197	197	178	147	126	111	99	89
4/0	2.03	107.44	228	228	213	176	151	133	119	107
250	2.16	90.94	254	254	247	204	174	154	137	124
350	2.37	65.33	315	315	315	264	226	199	178	161
500	2.70	46.14	398	398	398	358	306	270	241	218
750	3.10	31.36	515	515	515	498	426	375	335	303
1000	3.45	24.26	615	615	615	615	540	475	424	384
1250	4.14	19.87	702	702	702	702	702	630	562	509
1500	4.40	17.18	778	778	778	778	778	720	643	581
1750	4.64	15.37	845	845	845	845	845	803	717	648
2000	4.87	14.03	906	906	906	906	906	882	787	712

Table 5-20a
3/C Insulated Conductors Plexed with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
8	1.06	1373.73	48	40	31	26	22	19	17	16
6	1.15	864.35	63	55	43	35	30	27	24	21
4	1.23	543.36	82	74	57	47	41	36	32	29
2	1.36	341.78	108	103	80	66	57	50	45	40
1	1.45	271.00	125	124	96	79	68	60	53	48
1/0	1.54	214.78	144	144	114	95	81	71	64	58
2/0	1.64	170.40	166	166	137	113	97	85	76	69
3/0	1.81	135.92	191	191	169	140	120	105	94	85
4/0	1.94	107.78	222	222	204	168	144	127	113	102
250	2.07	91.23	246	246	236	195	167	147	131	119
350	2.29	65.91	302	302	302	254	217	191	171	154
500	2.61	46.91	376	376	376	343	294	258	231	209
750	3.08	32.28	478	478	478	478	418	368	328	297
1000	3.42	25.41	558	558	558	558	523	460	411	372
1250	3.98	21.35	629	629	629	629	629	584	522	472
1500	4.24	18.76	688	688	688	688	688	664	593	536
1750	4.48	17.00	738	738	738	738	738	737	658	595
2000	4.72	15.68	779	779	779	779	779	779	722	653

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Ampacities of 15000 Volt Shielded Copper Cables

Table 5-21
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	0.87	211.38	170	146	113	93	80	70	63	57
1	0.91	167.61	195	171	133	110	94	83	74	67
1/0	0.95	133.06	225	201	155	128	110	97	86	78
2/0	1.00	105.58	260	237	184	152	130	114	102	92
3/0	1.05	83.90	300	279	216	179	153	135	120	109
4/0	1.11	66.00	349	333	258	213	182	161	143	130
250	1.17	56.46	386	379	294	243	208	183	163	148
350	1.29	40.70	477	477	382	315	270	238	212	192
500	1.42	28.69	598	598	500	413	354	311	278	252
750	1.61	19.98	762	762	680	561	481	423	378	342
1000	1.84	15.77	890	890	874	722	618	544	486	440
1250	2.08	13.27	1000	1000	1000	890	762	671	599	542
1500	2.20	11.77	1092	1092	1092	1000	856	753	673	608
1750	2.31	10.74	1175	1175	1175	1099	940	828	739	669
2000	2.42	9.93	1250	1250	1250	1197	1025	902	805	729

Table 5-22
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	1.88	215.61	145	145	139	115	99	87	78	70
1	1.96	170.96	166	166	163	135	115	102	91	82
1/0	2.05	135.72	192	192	192	158	136	119	107	96
2/0	2.16	107.69	221	221	221	187	160	141	126	114
3/0	2.26	85.58	254	254	254	220	188	166	148	134
4/0	2.39	67.32	295	295	295	262	224	198	176	160
250	2.52	57.59	327	327	327	299	256	225	201	182
350	2.78	41.51	404	404	404	388	332	293	261	236
500	3.06	29.26	506	506	506	506	436	384	343	310
750	3.47	20.38	645	645	645	645	592	521	465	421
1000	3.97	16.08	753	753	753	753	753	671	599	542
1250	4.48	13.53	850	850	850	850	850	826	738	667
1500	4.74	12.00	931	931	931	931	931	928	829	749
1750	4.98	10.95	1000	1000	1000	1000	1000	1000	911	824
2000	5.22	10.13	1062	1062	1062	1062	1062	1062	993	898

Table 5-23
3/C Insulated Conductors Plexed with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	1.79	215.61	142	142	133	110	94	83	74	67
1	1.88	170.96	162	162	157	129	111	98	87	79
1/0	1.96	136.20	186	186	183	151	129	114	102	92
2/0	2.07	108.06	214	214	214	179	153	135	121	109
3/0	2.18	86.17	246	246	246	211	181	159	142	129
4/0	2.31	68.00	284	284	284	252	216	190	170	153
250	2.44	58.16	314	314	314	288	246	217	194	175
350	2.70	42.42	382	382	382	373	319	281	251	227
500	3.04	30.42	471	471	471	471	425	374	334	302
750	3.45	21.87	582	582	582	582	568	500	447	404
1000	3.81	17.87	669	669	669	669	669	611	546	494
1250	4.33	15.48	737	737	737	737	737	737	666	603
1500	4.59	13.92	794	794	794	794	794	794	745	674
1750	4.82	12.75	848	848	848	848	848	848	817	739
2000	5.06	11.76	898	898	898	898	898	898	893	808

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Ampacities of 15000 Volt Shielded Aluminum Cables

Table 5-21a
1/C Insulated Jacketed Cables

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	0.87	335.08	134	116	90	74	63	56	50	45
1	0.91	265.69	155	136	105	87	74	66	59	53
1/0	0.95	210.57	179	159	124	102	87	77	69	62
2/0	1.00	167.06	206	188	146	121	103	91	81	73
3/0	1.05	132.77	238	222	172	142	122	107	96	86
4/0	1.11	105.29	276	263	204	169	144	127	113	103
250	1.17	89.12	307	302	234	193	165	146	130	118
350	1.29	63.95	380	380	304	251	215	189	169	153
500	1.42	45.12	477	477	399	330	282	248	222	201
750	1.61	30.60	616	616	549	454	388	342	305	276
1000	1.84	23.52	729	729	716	591	506	446	398	360
1250	2.08	19.31	829	829	829	738	632	556	496	449
1500	2.20	16.66	918	918	918	840	719	633	565	511
1750	2.31	14.86	999	999	999	934	799	704	628	568
2000	2.42	13.53	1071	1071	1071	1026	878	773	690	624

Table 5-22a
3-1/C Insulated Jacketed Cables Triplexed

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	1.88	341.78	115	115	111	92	78	69	62	56
1	1.96	271.00	132	132	130	107	92	81	72	65
1/0	2.05	214.78	153	153	152	126	108	95	85	77
2/0	2.16	170.40	176	176	176	149	127	112	100	91
3/0	2.26	135.43	202	202	202	175	150	132	118	106
4/0	2.39	107.40	234	234	234	208	178	156	140	126
250	2.52	90.91	261	261	261	238	204	179	160	145
350	2.78	65.23	322	322	322	310	265	233	208	189
500	3.06	46.02	403	403	403	403	347	306	273	247
750	3.47	31.21	521	521	521	521	478	421	376	340
1000	3.97	23.99	616	616	616	616	616	550	491	444
1250	4.48	19.70	705	705	705	705	705	685	611	553
1500	4.74	16.99	782	782	782	782	782	780	696	630
1750	4.98	15.15	850	850	850	850	850	850	775	701
2000	5.22	13.80	910	910	910	910	910	910	851	770

Table 5-23a
3/C Insulated Conductors Plexed with Overall Jacket

Conductor Size AWG or kcmil	Cable Diameter Inches	Conductor Resistance micro-ohms/ft	80% of Indoor Ampacity Amperes	Calculated Depth of Cables in Tray, Inches						
				1	1.5	2	2.5	3	3.5	4
				Ampacity, Amperes						
2	1.79	341.78	112	112	105	87	75	66	59	53
1	1.88	271.00	129	129	124	103	88	77	69	63
1/0	1.96	214.78	149	149	146	120	103	91	81	73
2/0	2.07	170.40	171	171	171	143	122	108	96	87
3/0	2.18	135.89	196	196	196	168	144	127	113	102
4/0	2.31	107.76	226	226	226	200	171	151	135	122
250	2.44	91.21	250	250	250	230	197	173	155	140
350	2.70	65.86	306	306	306	299	256	226	201	182
500	3.04	46.85	380	380	380	380	342	301	269	243
750	3.45	32.22	480	480	480	480	468	412	368	333
1000	3.81	25.32	562	562	562	562	562	514	458	415
1250	4.33	21.28	628	628	628	628	628	628	568	514
1500	4.59	18.68	686	686	686	686	686	686	643	582
1750	4.82	16.92	736	736	736	736	736	736	710	642
2000	5.06	15.59	781	781	781	781	781	781	776	702

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