To: Holders of WC 51-1986 (R1991)
From: NEMA Communications Department
Date: August 23, 2000
Subject: Reaffirmation of WC 51-1986 (R1991)/ICEA No. ICEA P-54-440 Third Edition *Ampacities of Cables in Open Top Cable Trays*

Setting Standards for Excellence

The NEMA Codes and Standard Committee has reaffirmed NEMA Standard Publications No. WC 51, 1986 (R1991)/ICEA No. P-54-440 Third Edition *Ampacities of Cables in Open Top Cable Trays*. The new designator for this standard is:

WC 51-1986 (R1991, R2000)/ICEA No. ICEA P-54-440 Third Edition *Ampacities of Cables in Open Top Cable Trays*

Please insert the enclosed revised title page into your existing standard.

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NEMA Standards Publication No. WC 51-1986 (R1991, R2000)/ ICEA Standards Publication No. ICEA P-54-440 Third Edition

Ampacities of Cables in Open Top Cable Trays

Published by:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 1847
Rosslyn, VA 22209

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National Electrical Manufacturers Association
2101 L Street, N.W. Suite 300
Washington, D.C. 20037 (202) 457-8400
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TO: All holders of WC 51-1986 (R1991)

FROM: NEMA Communications Director

RE: Revision 1 to WC 51-1986 (R1991)

DATE: 3 October, 1994

Enclosed please find revision 1 to WC 51-1986 (R1991). This includes the revised page, a new title page reflecting the revised status of the publication and a list of effective pages showing the most up to date versions of every page in the standard. The old page and old title page should be removed and replaced with the new pages here. This will bring your copy of WC 58 up to date.

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WC 51-86 6470247 0005332 7

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National Electrical Manufacturers Association
2101 L Street, N.W. Suite 300
Washington, D.C. 20037 (202) 457-8400

June 23, 1987

TO ALL REPRESENTATIVES OF MEMBER COMPANIES
IN THE POWER AND CONTROL CABLE, AND THE BUILDING WIRE AND CABLE SECTIONS

Subject: Correction of Page 3 of ICEA Publication No. P-54-440/NEMA Publication No. WC 51

Dear Representative:

Enclosed is a corrected page 3 for NEMA Standards Publication No. WC 51-1986. The new page 3 contains a formula under Section 2.5 which was inadvertently left out of the publication because of a printer's error.

Please insert the new page 3 into your booklet, and remove the old page 3.

Sincerely yours,

Krystyna Bagnato

Krystyna Bagnato
Standards Publications Editor

Enc: Corrected Page 3 of WC 51-1986
Copies to: All Known Holders of WC 51
pal

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WC 51-86 6470247 0005335 2
A 3301

ICEA STANDARDS PUBLICATION/NO. P-54-440
NEMA STANDARDS PUBLICATION/NO. WC 51

icea/nema

Ampacities of Cables in Open-top Cable Trays

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037
INSULATED CABLE ENGINEERS ASSOCIATION ■ PO BOX P, SOUTH YARMOUTH, MA 02664

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NEMA WC*51 86 ■ 6470247 0509024 58T ■

ICEA P-54-440 (Third Edition)
NEMA WC 51-1986 (R1991)

WC 51

AMPACITIES OF CABLES IN OPEN-TOP CABLE TRAYS

Revision No. 1, August 1994

Published by:

National Electrical Manufacturers Association
2101 L Street, N.W., Suite 300
Washington, DC 20037

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List of Effective Pages

Pages with a revision number of 0 are originals. They have not been revised. Pages with a revision number of 1 were altered in revision 1.

Page Number	Revision Number	Page Number	Revision Number
Table of Contents	0	8	0
i	0	9	0
ii	0	10	0
iii	0	11	0
1	0	12	0
2	0	13	0
3	0	14	0
4	0	15	0
5	0	16	0
6	0	17	1
7	0		

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Table of Contents

		Paragraph	Page
	FOREWORD		i
	SCOPE		ii
	HISTORY		iii
Part 1	GENERAL		
	General Information	1.1	1
Part 2	USE OF TABLES		
	General	2.1	2
	Calculated Depth of Cables in Trays	2.2	2
	Correction Factor For Diameters of Cables	2.3	2
	Correction Factor For Temperatures	2.4	2
	Correction Factor For Number of Conductors	2.5	3
Part 3	AMPACITY TABLES		
	Ampacities of 0-600V Copper Conductor Cables in Open-top Cable Trays	3.1	4
	Ampacities of 601-2000V Copper Conductor Cables in Open-top Cable Trays	3.2	6
	Ampacities of 2001-5000V Copper Conductor Cables in Open-top Cable Trays	3.3	8
	Ampacities of 0-600V Aluminum Conductor Cables in Open-top Cable Trays	3.4	9
	Ampacities of 601-2000V Aluminum Conductor Cables in Open-top Cable Trays	3.5	11
	Ampacities of 2001-5000V Aluminum Conductor Cables in Open-top Cable Trays	3.6	13
	Ampacities of 15000 Volt Copper and Aluminum Conductor Cables in Open-top Cable Trays	3.7	14
Appendix A	Referenced Publications		16
Appendix B	Ampacity Tables, Values Used With Stolpe's Equation		17

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Foreword

This Standards Publication for *Ampacities of Cables in Open-top Cable Trays* (ICEA P-54-440, NEMA WC 51-1986) was developed by the Insulated Cable Engineers Associates, Inc. (ICEA) and approved by the National Electrical Manufacturers Association (NEMA). It supersedes WC 51-1975 (R 1980).

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 the Insulated Cable Engineers Association, Inc., P.O. Box P, South Yarmouth, Massachusetts 02664. An official written interpretation will be provided. Suggestions for improvements gained in the use of this Standard will be welcomed by the Association.

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Scope

This Standards Publication covers ampacities for 0-15,000 volt solid dielectric insulated single-conductor, triplexed, and three-conductor cables having a calculated depth up to three inches when installed in open-top cable trays. It is intended primarily for use by the utility industry.

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History

Ampacity tables for cables in trays were published in IPCEA Publication No. P-33-440, April 2, 1959, which assumed a load diversity but did not specifically define the diversity. The demands of modern generating plants, both nuclear and fossil fueled, require 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., and others [2,3] provided a more accurate means of calculating ampacities of cables in trays. This work was utilized by a joint committee of IPCEA and the IEEE Insulated Conductors Committee in preparing the ampacity tables which 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, and which 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 is 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 which 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 is now included in this edition in Appendix B.

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
J. Stolpe

[1,2,3] See Appendix A.

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AMPACITIES OF CABLES IN OPEN-TOP CABLE TRAYS

(Approved by NEMA as Authorized Engineering Information 8-20-1986.)

Part 1

GENERAL

1.1 General Information

Ampacities have been calculated based on a 100 percent load factor with all cables fully loaded and not spaced. No diversity is included. The ampacities are based on a conductor temperature of 90 °C (194 °F) and an air ambient temperature of 40 °C (104 °F). Ampacities for cable diameters other than those shown in the tables may be calculated by direct proportion to the diameter.

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Part 2

USE OF TABLES

2.1 GENERAL

In order to use the ampacity tables, the depth of cables in trays should be calculated as in 2.2. The correction factor for diameters of cables should be calculated as in 2.3. The correction factor for temperatures should be calculated as in 2.4. The correction factor for number of Conductors should be calculated as in 2.5.

2.2 CALCULATED DEPTH OF CABLES IN TRAYS

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

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

where—

$d_1, d_2 \ldots d_n$ = diameter of cables, inches.
$n_1, n_2 \ldots n_n$ = number of cables of diameters $d_1, d_2 \ldots d_n$, respectively.
w = width of tray, inches.

Ampacities tabulated herein are calculated using the equations given by Stolpe, see Appendix A, Reference 1, with maximum limitations of 80 percent of the ampacities of individual cables isolated in free air. Free air ampacities are taken from the appropriate tables in ICEA Publication No. P-46-426, IEEE S-135; see Appendix A, Reference 3.

2.3 CORRECTION FACTOR FOR DIAMETERS OF CABLES

The diameters of cables are given in each table in Part 3. For cable diameters less than the calculated depth, 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_o from the table.
d_o = cable diameter from table.
I_x = ampacity for cable diameter d_x.
d_x = cable diameter less than the calculated depth of those in tables.

2.4 CORRECTION FACTOR FOR TEMPERATURES

The tables are based on a conductor temperature of 90 °C (194 °F) and an ambient air temperature of 40 °C (104 °F). If trays are stacked, the ambient temperature of the upper trays will obviously be higher depending on the amount of ventilation around the trays. In cable tunnels without forced ventilation, a 50 °C (122 °F) ambient will frequently exist at the top of the tunnel. The following factors should be used for correcting for different ambient air temperatures.

Correction for Ambient Temperature

Ambient Temperature Degrees C (°F)	Multiplying Factor
30 (86)	1.09
35 (95)	1.05
40 (104)	1.00
45 (113)	0.95
50 (122)	0.90
55 (131)	0.85

The rating for conductor temperatures differing from 90 °C (194 °F) should be determined by the following multiplying factors:

Correction for Conductor Temperature

Conductor Temperature Degrees C (°F)	Multiplying Factor
125 (257)	1.24
90 (194)	1.00
85 (184)	0.95
75 (167)	0.86
70 (158)	0.80
60 (140)	0.66

Where both the ambient temperature and conductor temperature differ from those shown in the tables of Part 3, the product of both correction factors should be used.

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2.5 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 number of conductors carrying current, and the ampacity can be calculated as follows:

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

Where—

I'_o = 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'_o = diameter of three-conductor cable from table.

n_x = number of conductors other than given in table.

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Part 3

AMPACITY TABLES

3.1 AMPACITIES OF 0-600 V COPPER CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

3.1.1 Cables With Nonjacketed Conductors

The ampacities of 0-600 volt copper-conductor cables in open-top cable trays, where the conductor temperature is 90°C and the ambient air temperature is 40°C, for single-conductor nonjacketed cable, the value should be taken from Table 3-1; for triplexed cable with nonjacketed conductors, the value should be taken from Table 3-2; for three-conductor jacketed cable with nonjacketed conductors, the value should be taken from Table 3-3. For calculated depth of cables in trays see 2.2.

Table 3-1
AMPACITIES OF 0-600 VOLT COPPER SINGLE-CONDUCTOR NONJACKETED CABLES

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.14	6	5	4	3	3
12	0.16	8	7	5	5	4
10	0.18	12	9	8	7	6
9	0.19	14	11	9	8	7
8	0.24	20	16	13	11	10
6	0.28	29	23	19	16	14
4	0.33	44	34	28	24	21
2	0.39	65	51	42	36	31
1	0.45	85	66	54	46	41
1/0	0.49	103	80	66	57	50
2/0	0.54	128	99	82	70	62
3/0	0.59	157	122	100	86	76
4/0	0.65	195	151	125	107	94
250	0.72	234	181	149	128	113
350	0.83	318	246	204	175	153
500	0.96	440	341	282	242	212
750	1.18	657	509	421	361	317
1000	1.34	852	660	545	468	411

Table 3-2
AMPACITIES OF 0-600 VOLT COPPER TRIPLEXED CABLES WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.29	7	5	4	4	3
12	0.34	10	8	7	6	5
10	0.39	15	12	10	8	7
9	0.42	18	14	12	10	9
8	0.52	25	19	16	14	12
6	0.60	36	28	23	20	18
4	0.71	54	42	35	30	26
2	0.84	81	63	52	45	39
1	0.97	105	82	67	58	51
1/0	1.06	129	100	83	71	62
2/0	1.16	159	123	102	87	77
3/0	1.28	197	152	126	108	95
4/0	1.41	245	190	157	134	118
250	1.55	291	225	186	160	140
350	1.79	371	308	254	218	191
500	2.08	464	429	355	304	267
750	2.55	598	598	532	456	401

Table 3-3
AMPACITIES OF 0-600 VOLT COPPER THREE-CONDUCTOR JACKETED CABLES WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.38	9	7	6	5	4
12	0.43	13	10	8	7	6
10	0.48	18	14	12	10	9
9	0.51	22	17	14	12	11
8	0.64	31	24	20	17	15
6	0.72	44	34	28	24	21
4	0.83	64	49	41	35	31
2	1.00	97	75	62	53	47
1	1.13	123	95	79	67	59
1/0	1.22	149	115	95	82	72
2/0	1.32	172	140	116	99	87
3/0	1.44	199	171	142	121	107
4/0	1.57	229	211	174	149	131
250	1.78	256	256	214	183	161
350	2.01	315	315	285	245	215
500	2.30	390	390	390	336	295
750	2.83	492	492	492	492	445

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3.1.2 Cables With Jacketed Conductors

The ampacities of 0-600 volt copper-conductor cables in open-top cable trays, where the conductor temperature is 90°C and the ambient air temperature is 40°C, for single-conductor jacketed cable, the value should be taken from Table 3-4; for triplexed cable with jacketed conductors, the value should be taken from Table 3-5; for three-conductor jacketed cable with jacketed conductors, the value should be taken from Table 3-6.

Table 3-4
AMPACITIES OF 0-600 VOLT COPPER SINGLE-CONDUCTOR JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.17	7	5	5	4	3
12	0.19	10	8	6	5	5
10	0.21	14	11	9	8	7
9	0.22	16	13	10	9	8
8	0.27	23	17	14	12	11
6	0.34	36	28	23	20	17
4	0.39	52	40	33	28	25
2	0.45	75	58	48	41	36
1	0.54	102	79	65	56	49
1/0	0.58	122	95	78	67	59
2/0	0.63	149	116	96	82	72
3/0	0.68	181	140	116	99	87
4/0	0.74	222	172	142	122	107
250	0.85	276	214	176	151	133
350	0.96	368	285	235	202	177
500	1.09	500	387	320	274	241
750	1.31	718	565	467	400	352
1000	1.47	861	724	598	513	450

Table 3-5
AMPACITIES OF 0-600 VOLT COPPER TRIPLEXED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.36	9	7	6	5	4
12	0.40	12	9	8	7	6
10	0.45	17	13	11	9	8
9	0.49	21	16	13	12	10
8	0.59	28	22	18	16	14
6	0.74	45	35	29	25	22
4	0.84	64	50	41	35	31
2	0.97	94	73	60	51	45
1	1.17	127	98	81	70	61
1/0	1.26	154	119	98	84	74
2/0	1.36	186	144	119	102	90
3/0	1.48	227	176	146	125	110
4/0	1.60	268	215	178	152	134
250	1.84	299	267	221	189	166
350	2.07	371	356	294	252	221
500	2.37	464	464	404	347	304
750	2.84	598	598	593	508	446

Table 3-6
AMPACITIES OF 0-600 VOLT COPPER THREE-CONDUCTOR JACKETED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.45	11	8	7	6	5
12	0.49	15	11	9	8	7
10	0.57	22	17	14	12	11
9	0.61	26	20	17	14	13
8	0.71	34	27	22	19	16
6	0.90	55	42	35	30	26
4	1.00	77	59	49	42	37
2	1.13	109	85	70	60	53
1	1.33	129	112	92	79	70
1/0	1.42	149	134	111	95	83
2/0	1.52	172	161	133	114	100
3/0	1.64	199	195	161	138	121
4/0	1.82	229	229	202	173	152
250	2.06	256	256	247	212	186
350	2.29	315	315	315	279	245
500	2.59	390	390	390	379	333
750	3.12	492	492	492	492	492

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3.2 AMPACITIES OF 601-2000 VOLT COPPER CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

3.2.1 Cables With Nonjacketed Conductors

The ampacities of 601-2000 volt copper-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor nonjacketed cable, the value should be taken from Table 3-7; for triplexed cable with nonjacketed conductors, the value should be taken from Table 3-8; for three-conductor jacketed cable with nonjacketed conductors, the value should be taken from Table 3-9.

Table 3-7
AMPACITIES OF 601-2000 VOLT COPPER SINGLE-CONDUCTOR NONJACKETED CABLE

Conductor Size AWG or MCM	Cable Diameter Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.17	7	5	5	4	3
12	0.19	10	8	6	5	5
10	0.21	14	11	9	8	7
9	0.22	16	13	10	9	8
8	0.26	22	17	14	12	10
6	0.30	32	24	20	17	15
4	0.35	46	36	30	25	22
2	0.41	69	53	44	38	33
1	0.47	88	68	57	48	43
1/0	0.51	108	83	69	59	52
2/0	0.56	133	103	85	73	64
3/0	0.61	162	126	104	89	78
4/0	0.67	201	156	129	110	97
250	0.74	240	186	154	132	116
350	0.85	326	252	208	179	157
500	0.98	449	348	288	247	217
750	1.20	668	518	428	367	322
1000	1.36	861	670	554	475	417

Table 3-8
AMPACITIES OF 601-2000 VOLT COPPER TRIPLEXED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size AWG or MCM	Cable Diameter Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.36	9	7	6	5	4
12	0.40	12	9	8	7	6
10	0.45	17	13	11	9	8
9	0.49	21	16	13	12	10
8	0.56	27	21	17	15	13
6	0.65	40	31	25	22	19
4	0.75	57	45	37	32	28
2	0.89	86	67	55	47	41
1	1.02	111	86	71	61	53
1/0	1.11	135	105	87	74	65
2/0	1.21	166	128	106	91	80
3/0	1.32	203	157	130	111	98
4/0	1.45	252	195	161	138	121
250	1.60	299	233	192	165	145
350	1.83	371	315	260	223	196
500	2.12	464	438	362	310	272
750	2.60	598	598	543	465	409

Table 3-9
AMPACITIES OF 601-2000 VOLT COPPER THREE-CONDUCTOR JACKETED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size AWG or MCM	Cable Diameter Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.45	11	8	7	6	5
12	0.49	15	11	9	8	7
10	0.57	22	17	14	12	11
9	0.61	26	20	17	14	13
8	0.68	33	25	21	18	16
6	0.77	47	36	30	26	23
4	0.91	70	54	45	38	34
2	1.05	101	79	65	56	49
1	1.18	128	99	82	70	62
1/0	1.27	149	120	99	85	75
2/0	1.37	172	145	120	103	90
3/0	1.48	199	176	146	125	110
4/0	1.61	229	216	179	153	135
250	1.82	256	256	219	187	165
350	1.95	315	315	277	237	209
500	2.34	390	390	390	342	300
750	3.22	492	492	492	492	492

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3.2.2 Cables With Jacketed Conductors

The ampacities of 601-2000 volt copper-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor jacketed cable, the value should be taken from Table 3-10; for triplexed cable with jacketed conductors, the value should be taken from Table 3-11; for three-conductor jacketed cable with jacketed conductors, the value should be taken from Table 3-12.

Table 3-10
AMPACITIES OF 601-2000 VOLT COPPER SINGLE-CONDUCTOR JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.20	8	6	5	5	4
12	0.22	12	9	7	6	6
10	0.24	16	12	10	9	8
9	0.26	19	15	12	11	9
8	0.29	24	19	16	13	12
6	0.36	38	29	24	21	18
4	0.41	54	42	35	30	26
2	0.47	79	61	50	43	38
1	0.56	105	82	67	58	51
1/0	0.60	127	98	81	70	61
2/0	0.65	154	119	99	85	74
3/0	0.70	186	144	119	102	90
4/0	0.76	228	177	146	125	110
250	0.87	282	219	181	155	136
350	0.98	376	291	240	206	181
500	1.12	514	398	329	282	248
750	1.33	718	574	474	406	357
1000	1.49	861	734	606	520	457

Table 3-11
AMPACITIES OF 601-2000 VOLT COPPER TRIPLEXED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.43	10	8	7	6	5
12	0.47	14	11	9	8	7
10	0.52	20	15	13	11	10
9	0.55	24	18	15	13	11
8	0.63	30	24	19	17	15
6	0.78	47	37	30	26	23
4	0.89	68	53	44	37	33
2	1.02	99	76	63	54	48
1	1.22	132	103	85	73	64
1/0	1.31	160	124	102	88	77
2/0	1.40	192	148	123	105	92
3/0	1.52	229	181	150	128	113
4/0	1.65	268	222	183	157	138
250	1.92	299	279	231	198	174
350	2.16	371	371	307	263	231
500	2.41	464	464	411	352	309
750	2.88	598	598	598	515	452

Table 3-12
AMPACITIES OF 601-2000 VOLT COPPER THREE-CONDUCTOR JACKETED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
14	0.52	13	10	8	7	6
12	0.59	18	14	11	10	9
10	0.64	24	19	16	13	12
9	0.67	29	22	18	16	14
8	0.75	36	28	23	20	17
6	0.94	57	44	37	31	28
4	1.05	80	62	52	44	39
2	1.18	110	88	73	63	55
1	1.38	129	116	96	82	72
1/0	1.47	149	139	115	98	86
2/0	1.56	172	165	137	117	103
3/0	1.68	199	200	165	142	124
4/0	1.87	229	229	208	178	156
250	2.10	256	256	252	216	190
350	2.34	315	315	315	285	250
500	2.63	390	390	390	385	338
750	3.16	492	492	492	492	492

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3.3 AMPACITIES OF 2001-5000 VOLT COPPER CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

The ampacities of 2001-5000 volt copper-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor shielded and jacketed cable, the value should be taken from Table 3-13; for triplexed cable with shielded and jacketed conductors, the value should be taken from Table 3-14; for three-conductor jacketed cable with nonshielded and nonjacketed conductors, the value should be taken from Table 3-15 and for three conductor-jacketed cable with nonshielded and jacketed conductors, the value should be taken from Table 3-16.

Table 3-13
AMPACITIES OF 2001-5000 VOLT COPPER SINGLE-CONDUCTOR SHIELDED AND JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	0.47	39	30	25	22	19
6	0.53	56	43	36	31	27
4	0.58	77	60	49	42	37
2	0.64	107	83	69	59	52
1	0.68	128	99	82	70	62
1/0	0.72	152	118	97	83	73
2/0	0.77	182	141	117	100	88
3/0	0.86	229	177	146	126	110
4/0	0.92	276	214	177	152	133
250	0.99	321	249	206	176	155
350	1.07	410	318	262	225	198
500	1.20	550	426	352	302	265
750	1.39	711	600	495	425	373
1000	1.54	849	759	627	537	472

Table 3-14
AMPACITIES OF 2001-5000 VOLT COPPER TRIPLEXED CABLE WITH SHIELDED AND JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	1.01	49	38	31	27	23
6	1.15	70	54	45	38	34
4	1.26	97	75	62	53	47
2	1.39	134	104	86	74	65
1	1.47	155	124	102	88	77
1/0	1.56	178	147	122	104	92
2/0	1.66	205	176	145	125	109
3/0	1.86	236	221	183	157	138
4/0	1.99	273	267	221	189	166
250	2.13	303	303	256	219	193
350	2.32	373	373	330	283	248
500	2.60	462	462	443	380	334
750	3.00	582	582	582	537	471

Table 3-15
AMPACITIES OF 2001-5000 VOLT COPPER THREE-CONDUCTOR JACKETED CABLE WITH NONSHIELDED AND NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	0.92	44	34	28	24	21
6	1.00	61	47	39	33	29
4	1.10	84	65	54	46	41
2	1.23	119	92	76	65	57
1	1.32	143	111	92	79	69
1/0	1.41	169	133	110	94	83
2/0	1.50	194	159	131	113	99
3/0	1.62	223	193	159	137	120
4/0	1.80	257	242	200	171	150
250	1.95	284	283	234	201	176
350	2.13	348	348	303	259	228
500	2.42	428	428	413	354	311
750	2.88	534	534	534	515	452

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Table 3-16
AMPACITIES OF 2001-5000 VOLT COPPER THREE-CONDUCTOR JACKETED CABLE WITH NONSHIELDED AND JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	1.02	49	38	31	27	24
6	1.11	67	52	43	37	33
4	1.21	93	72	59	51	45
2	1.36	127	102	84	72	63
1	1.45	147	122	101	86	76
1/0	1.54	169	145	120	103	90
2/0	1.63	194	173	143	122	108
3/0	1.81	223	216	178	153	134
4/0	2.02	257	257	224	192	169
250	2.16	284	284	259	222	195
350	2.36	348	348	335	287	252
500	2.63	428	428	428	385	338
750	3.09	534	534	534	534	485

3.4 AMPACITIES OF 0-600 V ALUMINUM-CONDUCTOR CABLES IN OPEN-TOP TRAYS

3.4.1 Cables With Nonjacketed Conductors

The ampacities of 0-600 volt aluminum-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor nonjacketed cable, the value should be taken from Table 3-17; for triplexed cable with nonjacketed conductors, the value should be taken from Table 3-18; for three-conductor jacketed cable with nonjacketed conductors, the value should be taken from Table 3-19.

Table 3-17
AMPACITIES OF 0-600 VOLT ALUMINUM SINGLE-CONDUCTOR NONJACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.16	7	5	4	4	3
10	0.18	9	7	6	5	5
9	0.19	11	9	7	6	5
8	0.24	16	12	10	9	8
6	0.28	23	18	15	13	11
4	0.33	35	27	22	19	17
2	0.39	52	40	33	29	25
1	0.45	67	52	43	37	32
1/0	0.49	82	64	53	45	40
2/0	0.54	102	79	65	56	49
3/0	0.59	125	97	80	69	60
4/0	0.65	155	120	99	85	75
250	0.72	186	144	119	102	90
350	0.83	254	197	162	139	122
500	0.96	350	272	224	192	169
750	1.18	526	407	336	288	253
1000	1.34	682	532	439	376	331

Table 3-18
AMPACITIES OF 0-600 VOLT ALUMINUM TRIPLEXED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.34	8	6	5	5	4
10	0.39	12	9	8	7	6
9	0.42	14	11	9	8	7
8	0.52	20	15	13	11	10
6	0.60	29	23	19	16	14
4	0.71	43	34	28	24	21
2	0.84	65	50	41	35	31
1	0.97	84	65	54	46	40
1/0	1.06	103	80	66	56	50
2/0	1.16	126	98	81	69	61
3/0	1.28	157	121	100	86	75
4/0	1.41	194	150	124	106	93
250	1.55	232	179	148	127	112
350	1.79	291	245	203	174	152
500	2.08	366	340	281	241	212
750	2.55	478	478	422	362	318

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Table 3-19
AMPACITIES OF 0-600 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.43	10	8	7	6	5
10	0.48	15	11	9	8	7
9	0.51	17	14	11	10	8
8	0.64	25	19	16	13	12
6	0.72	35	27	22	19	17
4	0.83	51	39	32	28	24
2	1.00	77	60	49	42	37
1	1.13	98	76	63	54	47
1/0	1.22	116	92	76	65	57
2/0	1.32	134	112	92	79	69
3/0	1.44	155	137	113	97	85
4/0	1.57	179	167	138	118	104
250	1.78	200	200	170	146	128
350	2.01	247	247	227	195	171
500	2.30	308	308	308	267	234
750	2.83	396	396	396	396	353

Table 3-20
AMPACITIES OF 0-600 VOLT ALUMINUM SINGLE-CONDUCTOR JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.19	8	6	5	4	4
10	0.21	11	9	7	6	5
9	0.22	13	10	8	7	6
8	0.27	18	14	11	10	9
6	0.34	29	22	18	16	14
4	0.39	41	32	26	23	20
2	0.45	60	46	38	33	29
1	0.54	81	63	52	44	39
1/0	0.58	98	76	62	54	47
2/0	0.63	119	92	76	65	57
3/0	0.68	144	112	92	79	69
4/0	0.74	176	136	113	97	85
250	0.85	220	170	141	121	106
350	0.96	294	227	188	161	141
500	1.09	398	308	255	218	192
750	1.31	565	452	374	320	281
1000	1.47	682	583	482	413	363

3.4.2 Cables with Jacketed Conductors

The ampacities of 0-600 volt aluminum-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor jacketed cable, the value should be taken from Table 3-20; for triplexed cable with jacketed conductors, the value should be taken from Table 3-21; for three-conductor jacketed cable with jacketed conductors, the value should be taken from Table 3-22.

Table 3-21
AMPACITIES OF 0-600 VOLT ALUMINUM TRIPLEXED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.40	10	7	6	5	5
10	0.45	14	11	9	8	7
9	0.49	17	13	11	9	8
8	0.59	23	18	15	12	11
6	0.74	36	28	23	20	17
4	0.84	51	40	33	28	25
2	0.97	75	58	48	41	36
1	1.17	101	78	65	56	49
1/0	1.26	122	95	78	67	59
2/0	1.36	148	115	95	81	71
3/0	1.48	179	140	116	99	87
4/0	1.60	210	170	141	121	106
250	1.84	234	213	176	151	132
350	2.07	291	284	234	201	176
500	2.37	366	366	320	275	241
750	2.84	478	478	470	403	354

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Table 3-22
AMPACITIES OF 0-600 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.49	12	9	8	6	6
10	0.57	17	13	11	10	8
9	0.61	21	16	13	11	10
8	0.71	27	21	17	15	13
6	0.90	44	34	28	24	21
4	1.00	61	47	39	34	29
2	1.13	86	67	56	48	42
1	1.33	101	89	74	63	55
1/0	1.42	116	107	88	76	66
2/0	1.52	134	128	106	91	80
3/0	1.64	155	155	128	110	97
4/0	1.82	179	179	160	137	121
250	2.06	200	200	197	169	148
350	2.29	247	247	247	222	195
500	2.59	308	308	308	300	264
750	3.12	396	396	396	396	389

Table 3-23
AMPACITIES OF 601-2000 VOLT ALUMINUM SINGLE-CONDUCTOR NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.19	8	6	5	4	4
10	0.21	11	9	7	6	5
9	0.22	13	10	8	7	6
8	0.26	17	13	11	9	8
6	0.30	25	19	16	14	12
4	0.35	37	29	24	20	18
2	0.41	55	42	35	30	26
1	0.47	70	55	45	39	34
1/0	0.51	86	66	55	47	41
2/0	0.56	106	82	68	58	51
3/0	0.61	129	100	83	71	62
4/0	0.67	159	124	102	87	77
250	0.74	191	148	122	105	92
350	0.85	260	201	166	143	125
500	0.98	358	277	229	196	172
750	1.20	535	414	342	293	258
1000	1.36	682	539	446	382	336

3.5 AMPACITIES OF 601-2000 V ALUMINUM CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

3.5.1 Cables with Nonjacketed Conductors

The ampacities of 601-2000 volt aluminum-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor nonjacketed cable, the value should be taken from Table 3-23; for triplexed cable with nonjacketed conductors, the value should be taken from Table 3-24; for three-conductor jacketed cable with nonjacketed conductors, the value should be taken from Table 3-25.

Table 3-24
AMPACITIES OF 601-2000 VOLT ALUMINUM TRIPLEXED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.40	10	7	6	5	5
10	0.45	14	11	9	8	7
9	0.49	17	13	11	9	8
8	0.56	22	17	14	12	10
6	0.65	31	24	20	17	15
4	0.75	46	35	29	25	22
2	0.89	69	53	44	38	33
1	1.02	88	68	56	48	42
1/0	1.11	108	84	69	59	52
2/0	1.21	132	102	84	72	64
3/0	1.32	162	125	103	89	78
4/0	1.45	199	154	128	109	96
250	1.60	234	185	153	131	115
350	1.83	291	251	207	178	156
500	2.12	366	347	287	246	216
750	2.60	478	478	430	369	324

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Table 3-25
AMPACITIES OF 601-2000 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH NONJACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.49	12	9	8	6	6
10	0.57	17	13	11	10	8
9	0.61	21	16	13	11	10
8	0.68	26	20	17	14	13
6	0.77	37	29	24	20	18
4	0.91	56	43	36	30	27
2	1.05	81	63	52	44	39
1	1.18	101	79	65	56	49
1/0	1.27	116	96	79	68	59
2/0	1.37	134	116	96	82	72
3/0	1.48	155	140	116	99	87
4/0	1.61	179	171	142	121	107
250	1.82	200	200	174	149	131
350	1.95	247	247	221	189	166
500	2.34	308	308	308	271	238
750	3.22	396	396	396	396	396

Table 3-26
AMPACITIES OF 601-2000 VOLT ALUMINUM SINGLE-CONDUCTOR JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.22	9	7	6	5	4
10	0.24	13	10	8	7	6
9	0.26	15	12	10	8	7
8	0.29	19	15	12	11	9
6	0.36	30	23	19	17	15
4	0.41	43	34	28	24	21
2	0.47	63	49	40	34	30
1	0.56	84	65	54	46	40
1/0	0.60	101	78	65	55	49
2/0	0.65	123	95	79	67	59
3/0	0.70	148	115	95	81	71
4/0	0.76	181	140	116	99	87
250	0.87	225	174	144	123	108
350	0.98	300	232	192	164	144
500	1.12	409	317	262	224	197
750	1.33	565	459	379	325	286
1000	1.49	682	591	488	419	368

3.5.2 Cables With Jacketed Conductors

The ampacities of 601-2000 volt aluminum-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor jacketed cable, the value should be taken from Table 3-26; for triplexed cable with jacketed conductors, the value should be taken from Table 3-27; for three-conductor jacketed cable with jacketed conductors, the value should be taken from Table 3-28.

Table 3-27
AMPACITIES OF 601-2000 VOLT ALUMINUM TRIPLEXED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.47	11	9	7	6	5
10	0.52	16	12	10	9	8
9	0.55	19	15	12	10	9
8	0.63	24	19	15	13	12
6	0.78	38	29	24	21	18
4	0.89	54	42	35	30	26
2	1.02	79	61	50	43	38
1	1.22	105	82	68	58	51
1/0	1.31	127	99	81	70	61
2/0	1.40	153	118	98	84	74
3/0	1.52	179	144	119	102	90
4/0	1.65	210	176	145	124	109
250	1.92	234	222	184	157	138
350	2.16	291	291	244	210	184
500	2.41	366	366	326	279	245
750	2.88	478	478	477	409	359

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Table 3-28
AMPACITIES OF 601-2000 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
12	0.59	14	11	9	8	7
10	0.64	19	15	12	11	9
9	0.67	23	18	15	13	11
8	0.75	29	22	18	16	14
6	0.94	46	35	29	25	22
4	1.05	64	50	41	35	31
2	1.18	86	70	58	50	44
1	1.38	101	92	76	65	57
1/0	1.47	116	111	91	78	69
2/0	1.56	134	132	109	93	82
3/0	1.68	155	155	132	113	99
4/0	1.87	179	179	165	141	124
250	2.10	200	200	200	172	151
350	2.34	247	247	247	227	199
500	2.63	308	308	308	305	268
750	3.16	396	396	396	396	394

3.6 AMPACITIES OF 2001-5000 VOLT ALUMINUM CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

The ampacities of 2001-5000 volt aluminum-conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor shielded and jacketed cable, the value should be taken from Table 3-29; for triplexed cable with shielded and jacketed conductors, the value should be taken from Table 3-30; for three-conductor jacketed cable with nonshielded and nonjacketed conductors, the value should be taken from Table 3-31 and for three-conductor jacketed cable with nonshielded and jacketed conductors, the value should be taken from Table 3-32.

Table 3-29
AMPACITIES OF 2001-5000 VOLT ALUMINUM SINGLE-CONDUCTOR SHIELDED AND JACKETED CABLE

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	0.47	31	24	20	17	15
6	0.53	44	34	28	24	21
4	0.58	61	47	39	34	29
2	0.64	85	66	54	47	41
1	0.68	102	79	65	56	49
1/0	0.72	121	94	77	66	58
2/0	0.77	145	112	93	80	70
3/0	0.86	182	141	116	100	88
4/0	0.92	218	169	140	120	105
250	0.99	255	198	163	140	123
350	1.07	326	253	209	179	157
500	1.20	431	338	280	240	210
750	1.39	560	478	395	339	298
1000	1.54	673	609	503	431	379

Table 3-30
AMPACITIES OF 2001-5000 VOLT ALUMINUM TRIPLEXED CABLE WITH SHIELDED AND JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	1.01	39	30	25	21	19
6	1.15	56	43	36	31	27
4	1.26	77	60	49	42	37
2	1.39	104	83	68	59	52
1	1.47	121	98	81	70	61
1/0	1.56	139	117	97	83	73
2/0	1.66	164	140	116	99	87
3/0	1.86	185	176	146	125	110
4/0	1.99	214	212	175	150	132
250	2.13	237	237	204	175	153
350	2.32	294	294	262	225	198
500	2.60	367	367	352	301	265
750	3.00	470	470	470	426	374

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Table 3-31
AMPACITIES OF 2001-5000 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH NONSHIELDED AND NONJACKETED CONDUCTORS

Conductor Size AWG or MCM	Cable Diameter Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	0.92	35	27	23	19	17
6	1.00	48	38	31	27	23
4	1.10	67	52	43	37	32
2	1.23	95	73	61	52	46
1	1.32	114	88	73	63	55
1/0	1.41	132	106	88	75	66
2/0	1.50	151	127	105	90	79
3/0	1.62	174	154	127	109	96
4/0	1.80	201	192	158	136	119
250	1.95	222	222	186	160	140
350	2.13	274	274	241	207	181
500	2.42	340	340	327	281	246
750	2.88	432	432	432	409	359

Table 3-32
AMPACITIES OF 2001-5000 VOLT ALUMINUM THREE-CONDUCTOR JACKETED CABLE WITH NONSHIELDED AND JACKETED CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
8	1.02	39	30	25	21	19
6	1.11	54	42	34	29	26
4	1.21	74	57	47	41	36
2	1.36	99	81	67	57	50
1	1.45	114	97	80	69	60
1/0	1.54	132	116	96	82	72
2/0	1.63	151	138	114	98	86
3/0	1.81	174	172	142	122	107
4/0	2.02	201	201	178	152	134
250	2.16	222	222	207	177	156
350	2.35	274	274	266	228	200
500	2.63	340	340	340	305	268
750	3.09	432	432	432	432	385

3.7 AMPACITIES OF 15000 VOLT COPPER AND ALUMINUM CONDUCTOR CABLES IN OPEN-TOP CABLE TRAYS

The ampacities of 15000 volt copper and aluminum conductor cables in open-top cable trays, where the conductor temperature is 90 °C and the ambient air temperature is 40 °C, for single-conductor shielded and jacketed cable with copper conductors, the value should be taken from Table 3-33; for triplexed cable with shielded and jacketed copper conductors, the value should be taken from Table 3-34; for single-conductor shielded and jacketed cable with aluminum conductors, the value should be taken from Table 3-35, and for triplexed cable with shielded and jacketed aluminum conductors, the value should be taken from Table 3-36.

Table 3-33
AMPACITIES OF 15000 VOLT COPPER- AND ALUMINUM- SINGLE-CONDUCTOR SHIELDED AND JACKETED CABLE, WITH COPPER CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
2	0.90	151	117	96	83	73
1	0.95	179	138	114	98	86
1/0	0.99	207	162	134	115	101
2/0	1.04	238	191	158	135	119
3/0	1.09	274	224	186	159	140
4/0	1.14	318	265	219	188	165
250	1.19	352	299	247	212	186
350	1.30	434	386	319	273	240
500	1.45	543	515	426	365	320
750	1.65	698	698	588	504	443
1000	1.90	833	833	773	663	582

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Table 3-34
AMPACITIES OF 15000 VOLT COPPER- AND ALUMINUM-TRIPLEXED CABLE WITH SHIELDED AND JACKETED COPPER CONDUCTORS

Conductor Size AWG or MCM	Cable Diameter Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
2	1.95	138	138	121	103	91
1	2.05	159	159	142	122	107
1/0	2.14	183	183	167	143	126
2/0	2.25	210	210	197	169	148
3/0	2.36	242	242	232	199	175
4/0	2.46	279	279	273	234	206
250	2.57	308	308	308	264	232
350	2.81	378	378	378	342	301
500	3.13	466	466	466	458	402
750	3.57	587	587	587	587	561

Table 3-35
AMPACITIES OF 15000 VOLT COPPER- AND ALUMINUM-SINGLE-CONDUCTOR SHIELDED AND JACKETED CABLE WITH ALUMINUM CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
2	0.90	120	93	77	66	58
1	0.95	140	110	91	78	68
1/0	0.99	162	129	106	91	80
2/0	1.04	186	152	125	107	94
3/0	1.09	214	178	147	126	111
4/0	1.14	248	209	173	148	130
250	1.19	274	238	196	168	148
350	1.30	339	307	254	217	191
500	1.45	425	409	338	290	254
750	1.65	550	550	469	402	353
1000	1.90	660	660	621	532	468

Table 3-36
AMPACITIES OF 15000 VOLT COPPER- AND ALUMINUM-TRIPLEXED CABLE WITH SHIELDED AND JACKETED ALUMINUM CONDUCTORS

Conductor Size, AWG or MCM	Cable Diameter, Inches	Calculated Depth of Cables in Tray, Inches				
		1.0	1.5	2.0	2.5	3.0
		Ampacity, Amperes				
2	1.95	108	108	96	82	72
1	2.05	124	124	113	97	85
1/0	2.14	142	142	133	114	100
2/0	2.25	164	164	157	135	118
3/0	2.36	190	190	185	158	139
4/0	2.46	218	218	216	186	163
250	2.57	242	242	242	211	185
350	2.81	298	298	298	273	239
500	3.13	370	370	370	363	319
750	3.57	473	473	473	473	445

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Appendix A

REFERENCED PUBLICATIONS

Institute of Electrical and Electronics Engineers
347 East 47th Street
New York, New York 10017

[1]IEEE Transaction Paper 70 TP 557 PWR *Ampacities for Cables in Randomly Filled Trays*, by J. Stolpe, 1970
[2]IEEE Transaction Paper 71 TP 543 PWR *Ampacities of Multiconductor Cables in Trays*, by Ralph Lee, 1971

Insulated Cable Engineering Association, Inc.
P.O. Box P
South Yarmouth, Massachusetts 02664

[3]ICEA Pub. P-46-426, IEEE S-135 Power Cable Ampacities, 1962 Edition (Revised 1984)

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Appendix B

AMPACITY TABLES

Values Used With Stolpe's Equation

In this publication, the following values were assigned to the constants used in the formulae in Stolpe's paper see Appendix A, Reference 1.

h = overall convection heat transfer co-efficient for the tray in (watt/ft^2) /^{o}C

= $0.223 \left(\frac{\Delta T}{w}\right) 1/4$

w = 0.101 (ΔT) 1/4 (For 24-inch wide tray. The increase in ampacity using a 12-inch tray is = less than 2 percent. The decrease in ampacities for widths greater than 24 inches is negligible.)

ΔT= Temperature drop through air, degrees C.

w = width of tray, inches.

σ = Stefan-Boltzman constant in (watts/ft^2)/K^4

= 0.530×10^{-8}

ϵ = effective thermal emissivity of cable mass and tray surface

= 0.8 based on open-top trays. This is the arithmetic average of the top cable surface and bottom cable and tray surface emissivities Q, w/ft/in^2—

$$0.95 + \left(\frac{0.95 + 0.33}{2}\right) /2 = 0.8$$

Skin effect was taken into account but not proximity effect. Shields were assumed to be open circuited; thus, shield losses were not included.

The solution to equation (4), (5), (6), and (7) given by Stolpe in Reference 1 resulted in the following values of Q for various percent tray fill and were used for calculating the ampacities given in Tables 3-1 thru 3-36 of this publication.

Q, w/ft/in.^{2}	Depth, in.	% Tray Fill (depth)	% Tray Fill (area)
8.0	1.0	33.3	26.2
4.7	1.5	50.0	39.3
3.2	2.0	66.6	52.4
2.4	2.5	83.3	65.4
1.8	3.0	100.0	78.5

Q = Allowable heat intensity in watts/ft. per square inch of tray.

depth = Calculated depth of cables in trays.

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