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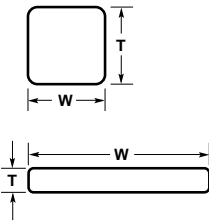
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How to Compute Circular Mil Area of Various Wire Shapes

Square or Rectangular Wire



U.S. Customary Dimensions

Multiply the width of the wire cross section in mils by the thickness of the wire cross section in mils by 1.2732 and subtract the radius factor shown below.

$$CMA = W \times T \times 1.2732 - \text{radius factor}$$

Metric Dimensions

Multiply the width of the wire cross section in millimeters by the thickness of the wire cross section in millimeters by 1973.525 and subtract the radius factor shown below.

$$CMA = W \times T \times 1973.525 - \text{radius factor}$$

Round Solid Wire AWG



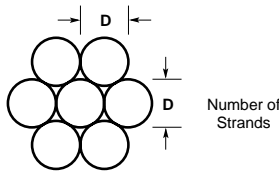
Multiply the diameter in mils by itself.

$$CMA = D^2$$

Multiply the diameter in millimeters by itself by 1550.003

$$CMA = D^2 \times 1550.003$$

Stranded Wire AWG



Multiply the diameter of one strand (in mils) by itself, and then multiply the result by the total number of strands.

$$CMA = D^2 \times N$$

Multiply the diameter of one strand in millimeters by itself by the number of strands by 1550.003.

$$CMA = D^2 \times N \times 1550.003$$

Conversion Table

To Convert From	To	Multiply By
CMA	mm ²	.0005067075
CMA	in ²	.0000007854
mm ²	in ²	.001550003
mm ²	CMA	1973.525

Note: Refer to table listing for circular mil area for common wire sizes.

Radius Factor, U.S. Customary

Radius (in.)	Radius Factor To Subtract (CMA)
.010	110
.012	158
.016	280
.020	438
.026	740
.032	1121
.040	1752
.063	4346
.094	9675

Radius must be measured.

Radius Factor, Metric

Radius (mm)	Radius Factor To Subtract (CMA)
0.25	106
0.3	153
0.35	208
0.4	272
0.5	424
0.6	611
0.8	1086
1.2	2444

Radius must be measured.

Cross Reference AMP Closed Barrel Sizes/Metric Cable

Wire Size in ² [mm ²]	Typical cables (metric)	AMP Code
.00078 [0.5]	16/0.20	22-16
.00116 [0.75]	24/0.20	22-16
.00155 [1.0]	32/0.20	1/1.13
.00233 [1.5]	30/0.25	1/1.38
.00388 [2.5]	50/0.25	1/1.78
.00620 [4.0]	56/0.30	7/0.85
.00930 [6.0]	84/0.30	7/1.04
.01550 [10]	80/0.40	7/1.35
.02480 [16]	126/0.40	7/1.70
.03875 [25]	196/0.40	7/2.14
.05425 [35]	276/0.40	19/1.53
.07750 [50]	396/0.40	19/1.78
.10850 [70]	360/0.50	19/2.14
.14725 [95]	475/0.50	19/2.52
.18600 [120]	608/0.50	37/2.93
.23250 [150]	756/0.50	37/2.25
.28675 [185]	925/0.50	37/2.52
.37200 [240]	1221/0.50	61/2.25

Cross Reference AMP Closed Barrel Sizes/Metric Aircraft Cables

Wire Size in ² [mm ²]	Typical cables (metric)	AMP Code
.00023 [0.15]	19/0.10	26-22
.00033 [0.21]	19/0.12	7/0.20
.00053 [0.34]	19/0.15	24-22
.00093 [0.60]	19/0.20	22-16; 20
.00144 [0.93]	19/0.25	22-16; 18-16
.00207 [1.34]	19/0.30	16-14; 18-16
.00282 [1.82]	37/0.25	16-14; 18-16
.00465 [3.00]	37/0.32	19/0.45
.00721 [4.65]	37/0.40	12-10
.01304 [8.41]	119/0.30	8
.01993 [12.86]	182/0.30	6
.03221 [20.78]	294/0.30	4
.05005 [32.29]	203/0.45	2
.06040 [38.97]	245/0.45 (Size 1)	2
.07938 [51.21]	322/0.45	1/0
.10354 [66.80]	420/0.45	2/0
.12769 [82.38]	518/0.45	3/0
.16393 [105.76]	665/0.45	4/0

Terminal Stud Hole Size

Use to Select Proper Size Terminal

The chart shows sizes and dimensions of various studs and the corresponding terminal stud hole sizes used with AMP devices.

For example, with stud #5 (.125 [3.18] Diameter), use AMP device listed for #5 stud (.129 [3.28] Hole Diameter).

Terminal stud hole sizes may easily be checked by fitting sample terminal to black circle. Chart shows cross reference from BA-US-Metric stud sizes.

Stud Size			Stud Dia.	Minimum Terminal Hole Diameter	Stud Size		Stud Dia.	Minimum Terminal Hole Diameter	
Imperial	U.S. Cust.	Metric			U.S. Cust.	Metric			
	#0		.060		.064				
	#1		.073		.077	5/8"	M16	.625	
	#2	M2	.086		.090				
8BA	#3		.099		.103				
6BA	#4	M2.5	.112		.116	3/4"		.750	
	#5	M3	.125		.129				
4BA	#6	M3.5	.138		.142				
	#8	M4	.164		.168	7/8"	M22	.875	
2BA	#10		.190		.194				
	#12		.216		.220				
	#14		.242		.245	1"		1.000	
0BA	1/4"	M6	.250		.260				
	5/16"	M8	.312		.323				
	3/8"	M9.5	.375		.385	1 1/8"		1.125	
	7/16"		.437		.448				
	1/2"	M12	.500		.510	1 1/4"		1.250	

Introduction

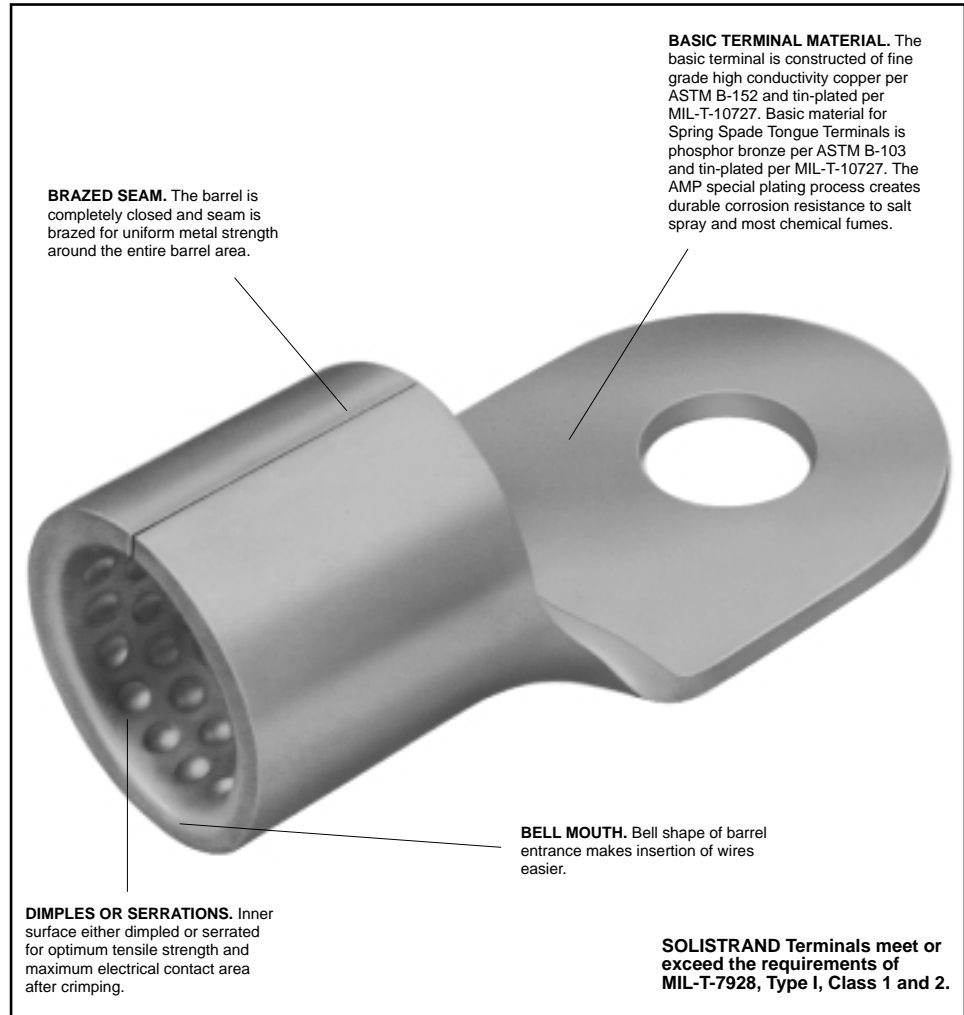
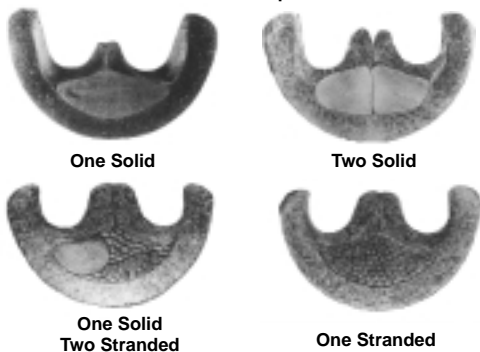
SOLISTRAND terminals and splices are specially designed to terminate solid and stranded wire, irregular shaped conductors, and combinations of these — still retaining the superior performance characteristics of single-purpose terminals and splices. Because we match the terminal to the tool each termination is uniform, making quality control easy and performance consistent. Corrosion resistance, vibration resistance and tensile strength of these terminals and splices are well within the limits of commercial and military specifications. The SOLISTRAND terminals and splice line includes parallel and butt splices, and flag, ring, spade, hooked, and flanged tongue terminals in sizes from 26 AWG [0.1 mm²] through 600 MCM [304 mm²].

The Crimp

The “W” Crimp is one of several time-proven crimp types developed by Tyco Electronics. It is not just a “kink” in a metal barrel; not something pinched over electrical wire ends. The “W” Crimp is actually two longitudinal crimps applied with precisely controlled pressure so that the conductor within the barrel flows together into the dimples or serrations of the terminal barrel creating one homogeneous mass of metal. The two indents also help to center conductors within the barrel for uniform crimping of the barrel around the wire. Furthermore, the “W” Crimp permits the use of a shorter terminal barrel, an excellent feature for confined area termination.

The “W” Crimp creates terminations of optimum electrical properties and is completely reliable, giving long service in harsh environments.

“W” Crimp



Temperature Rating: 170°C Max.

AMP SOLISTRAND Terminals and Splices (Use SOLISTRAND Tooling)

AMP Wire Size	UL® File No. E13288	Listed	LR 7189 Certified
22–16 Solid or Stranded	22–16 Solid or Stranded	22–16 Solid or Stranded	22–16 Solid or Stranded
16–14 Solid or Stranded	16–14 Solid or Stranded	16–14 Solid or Stranded	16–14 Solid or Stranded
16–14 Heavy Duty Solid or Stranded	16–14 Heavy Duty Stranded	16–14 Heavy Duty Solid or Stranded	16–14 Heavy Duty Solid or Stranded
14–12 Solid or Stranded	14–12 Stranded	14–12 Solid or Stranded	14–12 Solid or Stranded
12–10 Solid or Stranded	12–10 Stranded	12–10 Solid or Stranded	12–10 Solid or Stranded
8 thru 600 MCM Solid or Stranded	8 thru 600 MCM Stranded	8 thru 600 MCM Solid or Stranded	8 thru 600 MCM Solid or Stranded

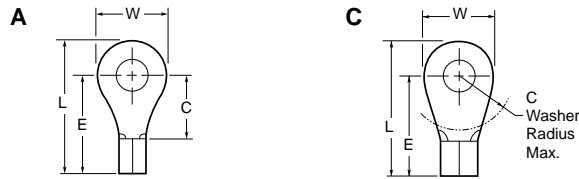
Note: 22-16 terminals and splices are stamped 22-18 in accordance with MIL-T-7928. Commercial wire range is 22-16.

Ring Tongue Terminals

Material and Finish:

Terminal Body — Copper per
ASTM B-152

Plating — Tin per MIL-T-10727


Military Specification M7928/7

Wire Size Circular Mils [mm ²]	Stud Size	Style	Dimensions				Material Thickness Max.	Wire Barrel I.D. Min.	Class	M7928/7 Dash Number	Part Number
			L Max.	E Max.	C Min.	W					
22-16 509-3,260 [0.26-1.65]	2 M2	A	.449 11.40	.337 8.56	.156 3.96	.218 5.54	.033 0.84	.061 1.55	2	1	34103 2-34103-1
	4	A	.449 11.40	.337 8.56	.156 3.96	.218 5.54	.033 0.84	.061 1.55	2	2	34104* 2-34104-6
	6 M3.5	A	.621 15.77	.462 11.73	.281 7.14	.312 7.92	.033 0.84	.061 1.55	2	3	34110* 2-34110-3
	10	A	.621 15.77	.462 11.73	.281 7.14	.312 7.92	.033 0.84	.061 1.55	2	4	34112* 2-34112-2
	5/16 M8	A	.856 21.74	.618 15.70	.437 11.10	.469 11.91	.033 0.84	.061 1.55	2	5	34114* 2-34114-2
	3/8	A	.995 25.27	.727 18.47	.546 13.87	.531 13.49	.033 0.84	.061 1.55	2	6	34115* 2-34115-2
16-14 2,050-5,180 [1.04-2.62]	4	A	.480 12.19	.352 8.94	.171 4.34	.250 6.35	.033 0.84	.085 2.16	2	11	34119* 2-34119-1
	6 M3.5	A	.590 14.99	.431 10.95	.250 6.35	.312 7.92	.033 0.84	.085 2.16	2	7	321684* 2-321684-1
	10	A	.669 16.99	.510 12.95	.250 6.35	.312 7.92	.033 0.84	.085 2.16	1 & 2	8	320093 2-320093-1
	5/16 M8	A	.855 21.72	.618 15.70	.437 11.10	.469 11.91	.033 0.84	.085 2.16	2	9	34125* 2-34125-6
	3/8	A	.995 25.27	.727 18.47	.546 13.87	.531 13.49	.033 0.84	.085 2.16	2	10	34126* 2-34126-2

Note: Part numbers are shown as loose piece over tape mounted product.

* Part numbers are available in small quantity packages.

Military Specification MS20659

Wire Size Circular Mils [mm ²]	Stud Size	Style	Dimensions				Material Thickness Max.	Wire Barrel I.D. Min.	Class	MS20659 Dash Number	Part Number
			L Max.	E Max.	C	W					
12-10 5,180-13,100 [2.62-6.64]	6 M3.5	A	.630 16.00	.487 12.37	.219 5.56	.281 7.14	.042 1.07	.129 3.28	2	165	35476* 2-35476-1
	10	A	.765 19.43	.575 14.61	.302 7.67	.375 9.53	.042 1.07	.129 3.28	1 & 2 2	105	33457* 2-33457-2
	5/16 M8	A	1.004 25.50	.736 18.69	.468 11.89	.531 13.49	.042 1.07	.129 3.28	1 & 2 2	106	33459* 2-33459-6
	3/8	A	1.098 27.89	.799 20.29	.531 13.49	.593 15.06	.042 1.07	.129 3.28	1 & 2	128	33220*
	1/2 M12	A	1.271 32.28	.893 22.68	.625 15.88	.750 19.05	.042 1.07	.129 3.28	2	166	35135
8 13,100-20,800 [6.64-10.5]	8 M4	C	.949 24.10	.743 18.87	.359 9.12	.406 10.31	.051 1.30	.172 4.37	2	140	324061*
	10	C	.949 24.10	.743 18.87	.359 9.12	.406 10.31	.051 1.30	.172 4.37	2	107	31807 2-31807-2* ²
	1/4 M6	C	.933 23.70	.696 17.68	.359 9.12	.469 11.91	.051 1.30	.172 4.37	2	141	33461* 2-33461-2* ¹
	5/16 M8	A	1.074 27.28	.790 20.07	.406 10.31	.562 14.27	.051 1.30	.172 4.37	2	108	31808*
	3/8	A	1.168 29.67	.868 22.05	.531 13.49	.594 15.09	.051 1.30	.172 4.37	2	129	33463*
6 20,800-33,100 [10.5-16.8]	10	C	1.168 29.67	.931 23.65	.531 13.49	.468 11.89	.060 1.52	.232 5.89	2	130	321298*
	1/4 M6	C	1.168 29.67	.931 23.65	.531 13.49	.468 11.89	.060 1.52	.232 5.89	2	109	321598*
	5/16 M8	C	1.246 31.65	.931 23.65	.531 13.49	.625 15.88	.060 1.52	.232 5.89	2	131	33466* 2-33466-3
	3/8	C	1.246 31.65	.931 23.65	.531 13.49	.625 15.88	.060 1.52	.232 5.89	2	110	33467*
	1/2 M12	C	1.840 46.74	1.400 35.56	1.000 25.40	.875 22.23	.060 1.52	.232 5.89	2	143	320344*

Note: Part numbers are shown as loose piece over tape mounted product.

* Part numbers are available in small quantity packages.

¹ Requires a 69875 standard AMP-TAPETRONIC machine for application.

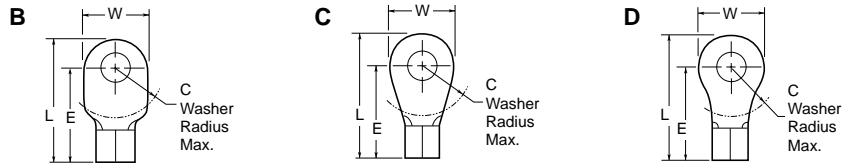
² Requires a 68250-1 Heavy Duty AMP-TAPETRONIC machine for application.

Ring Tongue Terminals (Continued)

Material and Finish:

 Terminal Body — Copper per
 ASTM B-152

Plating — Tin per MIL-T-10727

Military Specification
MS20659 (Continued)


Wire Size Circular Mils [mm ²]	Stud Size	Style	Dimensions				Material Thickness Max.	Wire Barrel I.D. Min.	Class	MS20659 Dash Number	Part Number
			L Max.	E Max.	C	W					
4 33,100–52,600 [16.8–26.7]	10	C	1.199 30.45	.946 24.03	.437 11.10	.500 12.70	.073 1.85	.280 7.11	2	144	33114
	1/4 M6	C	1.199 30.45	.946 24.03	.437 11.10	.500 12.70	.073 1.85	.280 7.11	2	111	31811 ¹
	5/16 M8	C	1.324 33.63	1.009 25.63	.500 12.70	.625 15.88	.073 1.85	.280 7.11	2	132	33115
	3/8	C	1.324 33.63	1.009 25.63	.500 12.70	.625 15.88	.073 1.85	.280 7.11	2	112	31812
	1/2 M12	B	1.902 48.31	1.462 37.13	1.000 25.40	.875 22.23	.073 1.85	.296 7.52	2	145	327175*
2 52,600–83,700 [26.7–42.4]	10	B	1.527 38.79	1.212 30.78	.531 13.49	.625 15.88	.073 1.85	.370 9.40	2	146	330301
	1/4 M6	B	1.527 38.79	1.212 30.78	.531 13.49	.625 15.88	.073 1.85	.370 9.40	2	113	320383*
	5/16 M8	B	1.527 38.79	1.212 30.78	.531 13.49	.625 15.88	.073 1.85	.370 9.40	2	147	322870*
	3/8	B	1.527 38.79	1.212 30.78	.531 13.49	.625 15.88	.073 1.85	.370 9.40	2	114	321600*
	7/16	D	1.657 42.09	1.212 30.78	.531 13.49	.890 22.61	.073 1.85	.370 9.40	2	148	320741
1/0 83,700–119,500 [42.4–60.6]	1/4 M6	C	1.925 48.90	1.532 38.91	.625 15.88	.807 20.50	.073 1.85	.444 11.28	2	117	321866
	5/16 M8	C	1.925 48.90	1.532 38.91	.625 15.88	.807 20.50	.073 1.85	.444 11.28	2	151	321867*
	3/8	C	1.925 48.90	1.532 38.91	.625 15.88	.807 20.50	.073 1.85	.444 11.28	2	118	321868
	7/16	C	1.956 49.68	1.529 38.84	.625 15.88	.875 22.23	.073 1.85	.444 11.28	2	152	36918
	1/2 M12	C	1.956 49.68	1.529 38.84	.625 15.88	.875 22.23	.073 1.85	.444 11.28	2	135	36919*
2/0 119,500–150,500 [60.6–76.3]	1/4 M6	C	1.930 49.02	1.550 39.37	.625 15.88	.926 23.52	.083 2.11	.504 12.80	2	153	321869
	5/16 M8	C	1.930 49.02	1.550 39.37	.625 15.88	.926 23.52	.083 2.11	.504 12.80	2	119	321870*
	3/8	C	1.930 49.02	1.550 39.37	.625 15.88	.926 23.52	.083 2.11	.504 12.80	2	120	321871*
	7/16	C	1.930 49.02	1.550 39.37	.625 15.88	.926 23.52	.083 2.11	.504 12.80	2	154	321872
	1/2 M12	C	1.930 49.02	1.550 39.37	.625 15.88	.926 23.52	.083 2.11	.504 12.80	2	136	321873*
3/0 150,500–190,000 [76.3–96.3]	5/16 M8	B	2.112 53.64	1.622 41.20	.625 15.88	1.020 25.91	.094 2.39	.565 14.35	2	155	321874
	3/8	B	2.112 53.64	1.622 41.20	.625 15.88	1.020 25.91	.094 2.39	.565 14.35	2	121	321875*
	7/16	B	2.112 53.64	1.622 41.20	.625 15.88	1.020 25.91	.094 2.39	.565 14.35	2	156	321876
	1/2 M12	B	2.112 53.64	1.622 41.20	.625 15.88	1.020 25.91	.094 2.39	.565 14.35	2	122	321877*
	4/0 190,000–231,000 [96.3–117]	5/16 M8	B	2.537 64.44	1.985 50.42	1.078 27.38	1.150 29.21	.105 2.67	.635 16.13	2	157
3/8		B	2.178 55.32	1.657 42.09	.625 15.88	1.087 27.61	.105 2.67	.635 16.13	2	123	321878*
7/16		B	2.178 55.32	1.657 42.09	.625 15.88	1.087 27.61	.105 2.67	.635 16.13	2	158	321879
1/2 M12		B	2.178 55.32	1.657 42.09	.625 15.88	1.087 27.61	.105 2.67	.635 16.13	2	124	321880*
5/8 M16		B	2.206 56.03	1.644 41.76	.625 15.88	1.150 29.21	.105 2.67	.635 16.13	2	159	36935
3/4		C	2.732 69.39	2.117 53.77	1.078 27.38	1.275 32.39	.105 2.67	.635 16.13	2	160	322228
7/8 M22		C	2.732 69.39	2.117 53.77	1.078 27.38	1.275 32.39	.105 2.67	.635 16.13	2	137	321625

* Part numbers are available in small quantity packages.

Application Tooling

Wire Size Range
AWG 26 to 6

Product Type	AMP Wire Size	Hand Tools	Pneumatic Tooling		Dies for 6-26, Tool 189721-1 Requires Straight Action Adapter 217200-1 or 318161-1 Dies Also Fit 69710-1 Hand Tool	Tooling For Tape Mounted Products
			Crimping Heads for 6-26, Tool 189721-1			Dies for 69875 AMP-TAPETRONIC Requires Applicator AMPOMATOR CLS IV Requires Applicators
			Single Wire Range	Multiple Wire Range		
SOLISTRAND terminals	26-22	69363 ²	—	—	—	768625-1
	24-20		—	—	—	—
	22-16	49935 ²	314516-1	—	47812, 314925-1 ⁴	68240-1
	16-14		314517-1	679301-1	47813, 314926-1 ⁴	68241-1
	12-10 & 16-14 HD	58546-1 ³	—	—	47814 ¹	68242-1
	14-12		49592 ²	314518-1	—	—
	8	—	1338757-1	—	—	68243-1
	6	—	1338758-1	—	—	—

¹ For standard wire only.

² CERTI-CRIMP Hand Tool.

³ Contains die set 58545-1. PRO-CRIMPER II commercial tool not approved for UL applications.

⁴ With locator, for terminals only.

Wire Size Range
AWG 8 to 600 MCM

Product Type	AMP Wire Size	Hand Tool	Pneumatic Tooling 69015	Hydraulic Tools With Self Contained Dies		Hydraulic and Battery Powered Tools With Interchangeable Dies						Tooling For Tape Mounted Product				
				Hand Tool	Latch Head	59973-1 Hand Tool, 69065 ² & 69067 ² Latch Heads		69097 ² "C" Head		58445-1 ² Latch Head	69082 ² "C" Head	69099 ² "C" Head	Dies for 69875 AMP-TAPETRONIC	Dies for 68250-1 HD AMP-TAPETRONIC		
						Nest	Indent	Nest	Indent				Listed dies are single indent. See product information for proper tape application tooling selection			
Standard Terminals	8	69355 ¹	49956	59975-1	690692	48126	48355	46146	46145	69216	68243-1	68312-1				
	6	59083 No CERTI-CRIMP	48172			48128		46134						69217	—	68313-1
	4	59131	48173			48129	48127	46135	46133					69218	—	—
	2		48174			48130		46136						45433	—	—
	1/0		48183			48132		46138	46137					45436	—	—
	2/0					48133	48131							45439	—	—
	3/0					48134								45442	—	—
	4/0					300430								45445	—	—
	250-300 MCM												48816	69911		
	300-350 MCM												48817	69912		
	400 MCM												48818	69913		
	500-600 MCM												48819	69914		

¹ CERTI-CRIMP Hand Tool.

² These crimping heads are recommended for use only with AMP Hydraulic Hand Pump 314979-1, DYNA-CRIMP Hydraulic Power Units 69120-1 (115 VAC) and 69120-2 (230 VAC).

7 Terminals and Splices