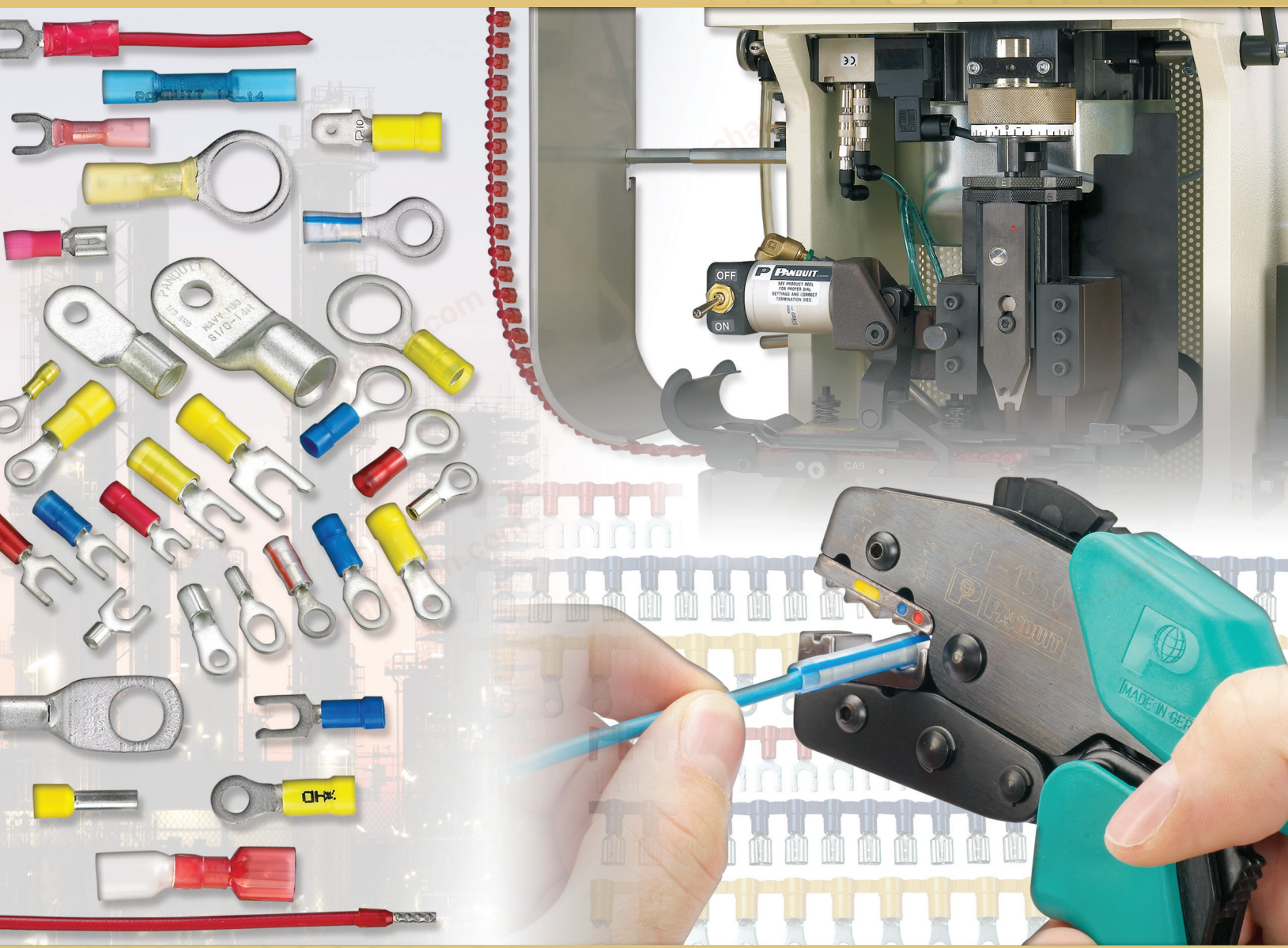
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Terminal Material Selection Guide

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PANDUIT®

Comprehensive Wire Terminal Solutions

Panduit offers a broad selection of industry approved styles, sizes, and materials to meet a full range of electrical, industrial, and networking applications

Insulation Descriptions

Non-Insulated – Highest tonnage installation, no short circuit protection

Vinyl – High flammability

Nylon – Halogen free

Fully Insulated Nylon – Halogen free, best when no dielectric barriers are present

Fully Insulated Premium Nylon– High flammability and halogen free, best when no dielectric barriers are present

Heat Shrink – Moisture corrosion protection

KYNAR* – Radiation resistance and corrosion protection

Polypropylene – Low dielectric strength

Connection Type	Product Family	Styles	Wire Range (AWG)	Insulation Material					Base Metal				Plating	
				Non-	Vinyl	Nylon	Heat Shrink	KYNAR*	Copper	Iron Copper	Brass	Steel	Tin	Nickel
Wire to Stud	Rings	Standard	26 – 2	✓	✓	✓	✓	✓	✓				✓	
		Multi-Stud	22 – 10	✓	✓	✓			✓				✓	
		Heavy Duty	16 – 12	✓	✓	✓			✓				✓	
		High Temperature	22 – 2	✓					✓					✓
	Forks	Standard	26 – 10	✓	✓	✓	✓		✓				✓	
		Locking	22 – 10	✓	✓	✓				✓			✓	
		Flange	22 – 10	✓	✓	✓			✓				✓	

Connection Type	Product Family	Styles	Wire Range (AWG)	Insulation Material						Base Metal				Plating	
				Non-	Vinyl	Nylon	Fully Insulated Nylon	Fully Insulated Premium Nylon	Heat Shrink	Copper	Iron Copper	Brass	Steel	Tin	Nickel
Wire to Tab	Female Disconnects	Standard	22 – 10	✓	✓	✓	✓	✓	✓			✓		✓	
		Supra-Grip	22 – 14				✓					✓		✓	
		Right Angle	22 – 14	✓		✓	✓					✓		✓	
		Piggyback	22 – 14		✓							✓		✓	
	Male Tabs	Standard	22 – 10	✓	✓	✓	✓	✓	✓	✓					✓
		Adaptor	n/a	✓								✓		✓	

Connection Type	Product Family	Styles	Wire Range (AWG)	Insulation Material				Base Metal				Plating	
				Non-	Vinyl	Nylon	Heat Shrink	Copper	Iron Copper	Brass	Steel	Tin	Nickel
Wire to Wire	Splice	Butt	26 – 10	✓	✓	✓	✓	✓				✓	
		Parallel	22 – 12	✓		✓					✓	✓	
		Wire Joint	24 – 10	✓		✓					✓	✓	

Connection Type	Product Family	Styles	Wire Range (AWG)	Insulation			Base Metal				Plating	
				Non-	Vinyl	Polypropyl-ene	Copper	Iron Copper	Brass	Steel	Tin	Nickel
Wire to Terminal Clamp	Ferrules	Standard	26 – 1	✓		✓	✓				✓	
		Twin Wire	22 – 6			✓	✓				✓	
	Pins	Standard	22 – 10	✓	✓		✓				✓	

*KYNAR is a registered trademark of Atofina Chemicals, Inc.

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Terminal Industry Approvals

Symbol	Agency	Spec/File Number	Requirement	Applicable Products
c UL us LISTED	Underwriters Laboratories, Inc.	UL 486 A/B – E52164	Product tested for reliable and safe performance for general purpose use	Ring and Fork Terminals
UL LISTED		UL 486C – E52164	Product tested for reliable and safe performance for general purpose use	Splice Terminals
		UL 310 – E78522	Product tested for reliable and safe performance for general purpose use	Disconnect Terminals
UL CERTIFIED		UL 486F – E472545	Product tested for reliable and safe performance for general purpose use	Ferrules
CSA®	Canadian Standards Association	C22.2 No.65 – LR31212	Product tested for reliable and safe performance for general purpose use	Ring and Fork Terminals
		C22.2 No.153 – LR31212		Disconnect Terminals
		C22.2 No. 291-14		Ferrules
ABS TYPE APPROVAL PROGRAM	American Bureau of Shipping	Steel Vessel Rules 1-1-4/7.7, 4-8-3/9.19, 4-8-4/21.28	Product tested for reliable performance in marine and offshore environments	Terminals
DFARS	US Defense Federal Acquisition Regulation Supplement	Title 10 Section 2533a, The Berry Amendment 252.225-7014 for Specialty Metals	Bans the use of various metals manufactured outside of the United States	All Terminals
IEEE	Institute of Electrical and Electronics Engineers	IEEE std 323-2003 for Qualifying Class 1E Eqpt. For Nuclear Power Generating Stations	Meets criteria for use in harsh, high radiation environments in nuclear power plants	KYNAR* Ring Terminals
	US Department of Defense	Mil Spec Qualification Test Ref #01017302. AB/08-31-2006	Approved for listing on QPL AS 7928 Class I and Class II	Ring Terminals
RoHS	European Directive 2002/95/EC	Restriction on Hazardous Substances	Supplied raw materials and components used by Panduit for manufacturing comply with the restrictions of RoHS	All Terminals

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Material Selection Criteria*

		Insulation Material			
		Vinyl	**Nylon**	**Premium Nylon**	**Kynar**
Composition	**Chemical**	Polyvinyl chloride	Polyamide 6,6	Polyamide	Polyvinylidene fluoride
	Halogen Free	No	Yes	Yes	No
	RoHS Compliant	Yes	Yes	Yes	Yes
Mechanical Properties	**Tensile Yield Strength**	6.9 kpsi	11.9 kpsi	13 kpsi	6.8 kpsi
	Tensile Modulus	465 kpsi	450 kpsi	399 kpsi	190 kpsi
	Impact Resistance	17.9 ft lb/in	112.5 ft lb/in	125.6 ft lb/in	3.9 ft lb/in
	Density	86 lb/ft^3	71 lb/ft^3	73 lb/ft^3	111 lb/ft^3
	Hardness	80 Shore D	88 Shore D	90 Shore D	77 Shore D
	Water Absorption	0.04%	7%	7%	0.04%
Electrical Properties	**Electrical Resistance**	1x10^{25} nΩ m	1x10^{21} nΩ m	1x10^{21} nΩ m	5x10^{21} nΩ m
	Dielectric	450 V/Mil	550 V/Mil	500 V/Mil	280 V/Mil
Thermal Properties	**Maximum Operating Temperature**	220°F	220°F	220°F	300°F
	Minimum Operating Temperature	-60°F	-60°F	-60°F	-60°F
	Minimum Installation Temperature	-40°F	-60°F	-60°F	-40°F
	Flammability	V0	HB	V2	V0
	Melt Temperature	400°F	500°F	500°F	335°F
Chemical Resistance	**Salts**	⊙	⊙	⊙	●
	Hydrocarbons	●	●	●	●
	Chlorinated Hydrocarbons	⊙	⊙	⊙	●
	Acids	⊙	●	●	●
	Bases	⊙	⊙	⊙	●

*The information above is intended to be used for comparison between choosing the appropriate terminal as most of the values are taken from raw material and

Key	●	⊙
	Best	Better

		Base Metal			Plating	
Heat-Shrink	**Polypropylene**	**Copper**	**Brass**	**Iron Copper**	**Tin**	**Nickel**
Polyolefin	Polypropylene	Cu	70% Cu 30% Zn	97.5% Cu 2.4% Zn	Sn	Ni
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.5 kpsi	5.9 kpsi	38 kpsi	62 kpsi	63 kpsi	2.0 kpsi	78 kpsi
0.5 kpsi	260 kpsi	17,260 kpsi	16,000 kpsi	17,000 kpsi	7,200 kpsi	32,000 kpsi
12.6 ft lb/in	65.6 ft lb/in	92.0 ft lb/in	31.7 ft lb/in	94.0 ft lb/in	62.0 ft lb/in	135.6 ft lb/in
54 lb/ft^3	57 lb/ft^3	556 lb/ft^3	532 lb/ft^3	554 lb/ft^3	459 lb/ft^3	556 lb/ft^3
11 Shore D	32 Shore D	3.0 Mohs	6.0 Mohs	6.1 Mohs	1.5 Mohs	4.0 Mohs
0.10%	0.02%	N/A	N/A	N/A	N/A	N/A
1x10^{20} nΩ m	1x10^{24} nΩ m	16.78 nΩ m	78 nΩ m	32 nΩ m	115 nΩ m	69.3 nΩ m
500 V/Mil	580 V/Mil	N/A	N/A	N/A	N/A	N/A
255°F	200°F	300°F	300°F	300°F	300°F	650°F
-60°F	-60°F	-60°F	-60°F	-60°F	-60°F	-60°F
0°F	-60°F	-60°F	-60°F	-60°F	-60°F	-60°F
HB	HB	N/A	N/A	N/A	N/A	N/A
N/A, Cross-Linked	410°F	1980°F	1685°F	1980°F	450°F	2650°F
●	●	○	○	○	●	●
○	○	●	●	●	●	●
○	○	⊙	⊙	⊙	○	○
●	●	●	⊙	●	○	⊙
●	●	⊙	⊙	⊙	○	⊙

not the finished part.

○	⊙	●
Good	Worse	Worst

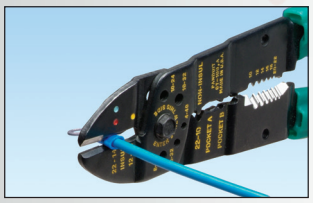
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Tools To Complete Your Termination System



Controlled Crimp Cycle Tools – CT-1002, CT-1525, CT-1550, CT-1570

- Controlled cycle mechanism assures high quality, consistent terminations
- Terminal tongue locator controls both the depth and rotation position of connectors into the crimp die to optimize process and provide best performance and quality
- Ergonomic tool design assures operator comfort, safety, and performance
- Cushion handles provide chemical resistance and a cushioned, non-slip grip



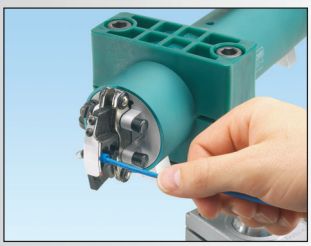
Hand Operated Pliers Type Crimp Tools – CT-100A, CT-200, CT-260

- Installer controlled crimp
- Available with wire stripping and cutting features
- Plier type crimp for #22 – 10 AWG insulated and non-insulated terminal products



Battery Powered Crimp Tools – CT-2500 and CT-2600

- Quick crimping cycle results in less time to crimp terminals
- Compact, portable, and lightweight (less than 4 lbs.) construction allows simple one-hand crimp capability in space constrained areas
- The CT-2500 has interchangeable crimp dies for connectors #22 – 10 AWG
- The CT-2600 has interchangeable crimp dies for connectors #8 – 2 AWG



Pneumatic Crimp Tool – CT-600-A

- Quickly crimps a variety of loose piece terminals in a variety of wire sizes for medium volume production
- Versatile interchangeable crimping heads let you switch terminal types quickly to meet changing production requirements; this tool, when used with only four crimp heads, can crimp a full range of # 26 – 10 AWG insulated and non-insulated terminal products
- Portable – the small size, ease of bench mounting and quick pneumatic connection allow the tool to be moved from one work station to another or to the work itself



Automated Crimp Tools – Presses, and Applicators – UC200 (CP-871), CA9, SCA-712022002 (CA10)

- Provide a superior solution for quality, high volume terminations
- Minimal cycle time and most consistent quality
- Quick exchange of die sets and product loading for minimal setup times
- System leverages industry standard mini applicator mount for seamless compatibility with Automatic Wire Processing (AWP) equipment

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