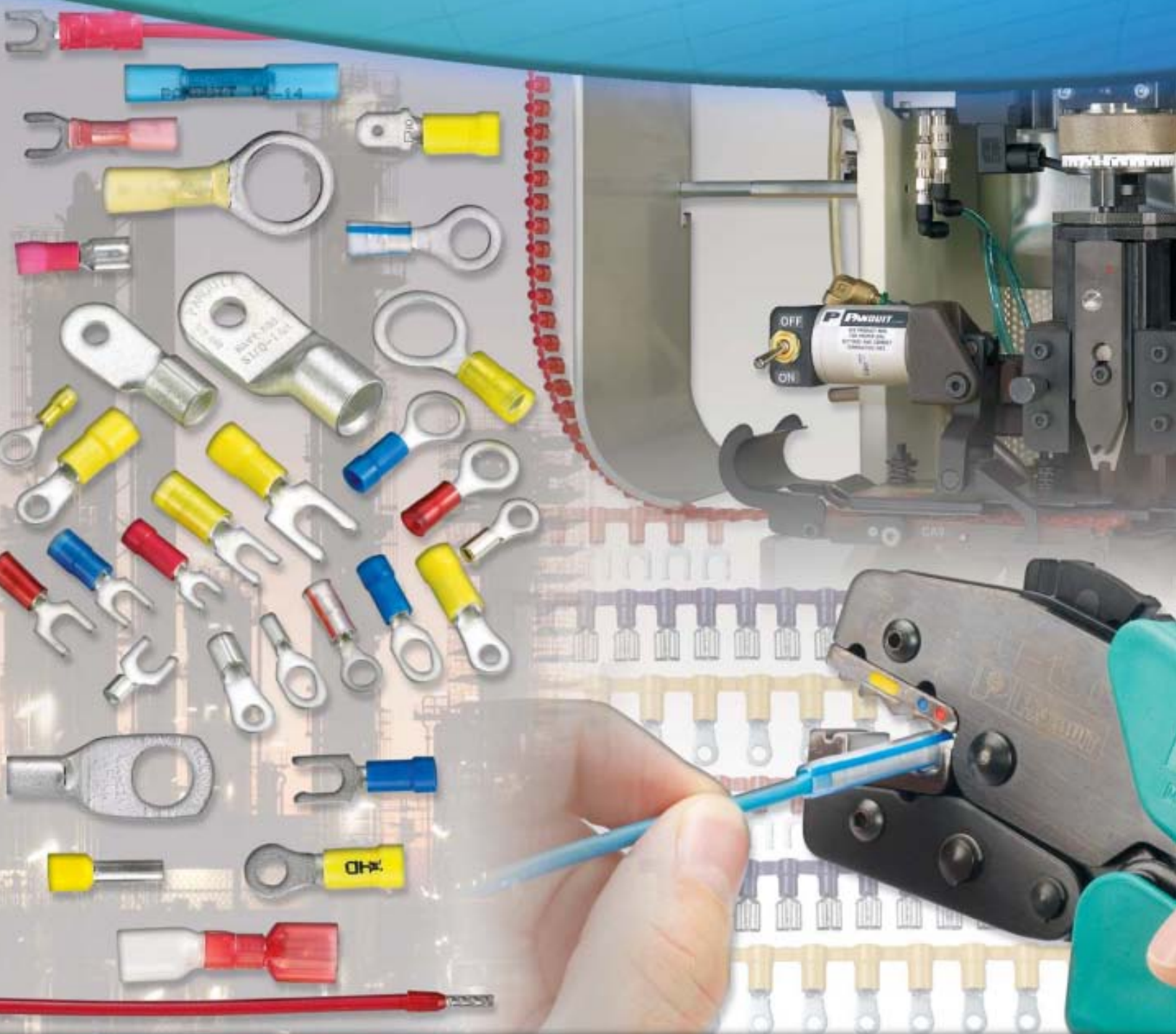


Terminal Material Selection Guide



PANDUIT®

building a smarter,
unified business foundation
Connect. Manage. Automate.

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

Unified Physical Infrastructure



| 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 | ✓ | ✓ | ✓ | | | | ✓ | | | ✓ | |
| | | Short 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 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ |
| | | Disco-Lok  | 22 – 14 | | | | ✓ | | | | | | ✓ | | ✓ |
| | | 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 | Polypropylene | Copper | Iron Copper | Brass | Steel | Tin | Nickel |
| Wire to Terminal Clamp | Ferrules | Standard | 26 – 1 | ✓ | | ✓ | ✓ | | | | ✓ | |
| | | Twin Wire | 22 – 6 | | | ✓ | ✓ | | | | ✓ | |
| | Pins | Standard | 22 – 10 | ✓ | ✓ | | ✓ | | | | ✓ | |
| | Blades | Standard | 22 – 14 | ✓ | ✓ | | ✓ | | | | ✓ | |

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

Terminal Industry Approvals

| Symbol | Agency | Spec/File Number | Requirement | Applicable Products |
|---|--|--|--|-------------------------|
|  | Underwriters Laboratories, Inc. | UL 486 A/B – E52164 | Product tested for reliable and safe performance for general purpose use | Ring and Fork Terminals |
| | | UL 486D – 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 |
|  | 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 |
|  | 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 |
|  | 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 | | | | | | Base Metal | | | Plating | |
|-----------------------|----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|---------------|---------------|------------------|---------------|----------------|
| | | Vinyl | Nylon | Premium Nylon | Kynar | Heat-Shrink | Polypropylene | Copper | Brass | Iron Copper | Tin | Nickel |
| Composition | Chemical | Polyvinyl chloride | Polyamide 6,6 | Polyamide | Polyvinylidene fluoride | Polyolefin | Polypropylene | Cu | 70% Cu 30% Zn | 97.5% Cu 2.4% Zn | Sn | Ni |
| | Halogen Free | No | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | RoHS Compliant | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | | | | | | | | | | | | |
| Mechanical Properties | Tensile Yield Strength | 6.9 kpsi | 11.9 kpsi | 13 kpsi | 6.8 kpsi | 1.5 kpsi | 5.9 kpsi | 38 kpsi | 62 kpsi | 63 kpsi | 2.0 kpsi | 78 kpsi |
| | Tensile Modulus | 465 kpsi | 450 kpsi | 399 kpsi | 190 kpsi | 0.5 kpsi | 260 kpsi | 17,260 kpsi | 16,000 kpsi | 17,000 kpsi | 7,200 kpsi | 32,000 kpsi |
| | Impact Resistance | 17.9 ft-lb/in | 112.5 ft-lb/in | 125.6 ft-lb/in | 3.9 ft-lb/in | 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 |
| | Density | 86 lb/ft³ | 71 lb/ft³ | 73 lb/ft³ | 111 lb/ft³ | 54 lb/ft³ | 57 lb/ft³ | 556 lb/ft³ | 532 lb/ft³ | 554 lb/ft³ | 459 lb/ft³ | 556 lb/ft³ |
| | Hardness | 80 Shore D | 88 Shore D | 90 Shore D | 77 Shore D | 11 Shore D | 32 Shore D | 3.0 Mohs | 6.0 Mohs | 6.1 Mohs | 1.5 Mohs | 4.0 Mohs |
| | Water Absorption | 0.04% | 7% | 7% | 0.04% | 0.10% | 0.02% | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| Electrical Properties | Electrical Resistance | 1x10 ²⁵ nΩ-m | 1x10 ²¹ nΩ-m | 1x10 ²¹ nΩ-m | 5x10 ²¹ nΩ-m | 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 |
| | Dielectric | 450 V/Mil | 550 V/Mil | 500 V/Mil | 280 V/Mil | 500 V/Mil | 580 V/Mil | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| Thermal Properties | Maximum Operating Temperature | 220°F | 220°F | 220°F | 300°F | 255°F | 200°F | 300°F | 300°F | 300°F | 300°F | 650°F |
| | Minimum Operating Temperature | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F |
| | Minimum Installation Temperature | -40°F | -60°F | -60°F | -40°F | 0°F | -60°F | -60°F | -60°F | -60°F | -60°F | -60°F |
| | Flammability | V0 | HB | V2 | V0 | HB | HB | N/A | N/A | N/A | N/A | N/A |
| | Melt Temperature | 660°F | 500°F | 500°F | 335°F | N/A, Cross-Linked | 410°F | 1980°F | 1685°F | 1980°F | 450°F | 2650°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 not the finished part.

| Key | ● | ⦿ | ○ | ⦿ | ● |
|-----|------|--------|------|-------|-------|
| | Best | Better | Good | Worse | Worst |

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 – CP-871, CA9, 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

WORLDWIDE SUBSIDIARIES AND SALES OFFICES

PANDUIT CANADA
Markham, Ontario
cs-cdn@panduit.com
Phone: 800.777.3300

PANDUIT EUROPE LTD.
London, UK
cs-emea@panduit.com
Phone: 44.20.8601.7200

PANDUIT SINGAPORE PTE. LTD.
Republic of Singapore
cs-ap@panduit.com
Phone: 65.6305.7575

PANDUIT JAPAN
Tokyo, Japan
cs-japan@panduit.com
Phone: 81.3.6863.6000

PANDUIT LATIN AMERICA
Guadalajara, Mexico
cs-la@panduit.com
Phone: 52.33.3777.6000

PANDUIT AUSTRALIA PTY. LTD.
Victoria, Australia
cs-aus@panduit.com
Phone: 61.3.9794.9020

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or by phone: 800-777-3300 and reference TMSG07

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