

# Electrical Solutions for Food and Beverage Processing Facilities

## Visit our world of electrical product solutions

Visit the “Electrical World” section of our web site at [www.tnb.com](http://www.tnb.com) for more information on Thomas & Betts solutions, including our newest products, plus user-friendly catalog and competitive part number search, application and technical support, and other useful information. Click on the Electrical World icon or go to: [tnbelectricalworld.tnb.com](http://tnbelectricalworld.tnb.com)

## Industry codes and specifications

All Thomas & Betts products for use in food and beverage processing plants meet or exceed applicable industry specifications or codes which are detailed in the appropriate T&B product literature.



## Online CAD library

Thomas & Betts offers free download of two- and three-dimensional CAD models of many of its products in more than 90 native CAD formats at: [www.tnb.com/cadlibrary](http://www.tnb.com/cadlibrary)

## American Recovery and Reinvestment Act (ARRA)



Get certification letters for compliant products online at:

[www.tnb.com/ARRA](http://www.tnb.com/ARRA)

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**Thomas & Betts**

**Thomas & Betts**



*In the US, thousands of facilities are engaged in the supply of processed foods and beverages, encompassing everything from poultry processing to soft drinks. These facilities employ well over a million workers and generate billions of dollars in annual sales.*

## Challenge and commitment.

Today's food and beverage producers must remain competitive and profitable while facing:

- Higher energy, raw material and feed costs
- Increased food safety and other legislation implemented by regulatory bodies such as the FDA, USDA, EPA and OSHA
- New foreign competition — some from third-world countries lacking strict food safety regulations — entering the US market and placing pressure on operating margins

As new food and beverage processing equipment with complex and sensitive electrical systems, controls and automation continues to replace older generation equipment, MRO expenses are rising with increasing maintenance time, technical support and power costs. Food and beverage processing plants require a high sustainability level from their electrical systems, because shutdowns can cost from minutes' to days' worth of production if a batch must be scrapped.

Plant capital expenditures are also increasing due to existing capacity constraints. They're being justified with process and packaging improvements using sanitary plant designs that reduce product contamination and facility cleaning times, while increasing operational equipment effectiveness (OEE), revenues and plant sustainability. To increase productivity and food safety, processing equipment must be designed with geometries that quickly shed contaminants and allow easy cleaning, often in harsh processing environments.

Food and beverage facility cleaning and sanitation crews often use high-pressure hosedown cleaning

equipment with high-temperature caustic chemical solutions that shorten the life of the facility and equipment. This is being offset by the use of corrosion-resistant materials such as stainless steel, aluminum, specialty alloys, high-tech non-metallics and coated materials. Food and beverage plants often have extreme temperature ranges due to processing requirements. Thermal cycling issues from ovens directly in line with flash freezers can cause reliability issues in processing areas.

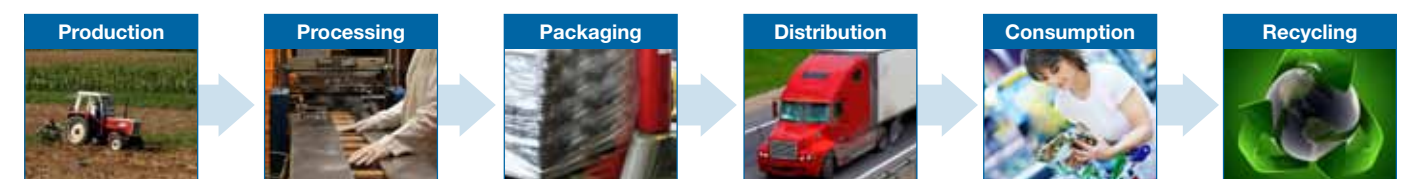
Shortened product-development cycles, smaller batch sizes, fast expiration dates and more frequent product-type changeovers require adding new automation technologies for better processing flexibility, keeping production costs down and getting products to customers quickly. With nearly 90% of food and beverage plants having fewer than 100 employees and many having been small, family-run businesses acquired by larger companies, the need for electrical system standardization has become more critical.

Thomas & Betts provides food and beverage electrical system solutions that:

- Increase your overall equipment effectiveness
- Extend the life of your electrical system by up to 300%
- Decrease electrical system changeover and downtimes by 40–50%
- Increase food safety, reduce product contamination and provide a safe workplace for your employees

These solutions enable food and beverage processors to increase revenue, plant sustainability, food safety and brand equity.

### Food Supply Chain





# Delivering value through system solutions based on engineering innovation.

## Our Value Commitment

Food and beverage producers must meet demanding production and delivery schedules while working to improve manufacturing processes and plant flexibility. Key business drivers are increasing food and personnel safety, revenues, plant sustainability and brand equity. Thomas & Betts is committed to helping you meet the unique challenges encountered in food and beverage processing with electrical solutions, services and systems that deliver value. These include:

**T&B Engineered solutions** — Our products are designed to perform dependably under conditions such as constant moisture, harsh chemicals, extreme temperatures, high-pressure washdown, ultraviolet exposure, hazardous areas, high-vibration equipment and continuous operation.

**Tested reliability** — Our products are rigorously tested for use in harsh environments, with proven results in thousands of installations.

**Expert support** — Thomas & Betts trained sales representatives and technical services experts are available at every stage of a project, from planning and site preparation through construction and MRO.

**Training and certification** — Thomas & Betts conducts training programs on specific products and systems and works closely with accredited electrical industry associations. Contact us for details.

**Product availability** — Our industry-leading distributor network assures you of reliable and on-time delivery. This global electrical product support system ensures that our solutions are available when and where you need them.



## System Solutions

For over a century, Thomas & Betts has provided food and beverage companies with electrical system solutions to help protect their people, assets, brands and customers, while increasing food safety, plant sustainability and revenues.

**Wire and Cable Management** — Thomas & Betts invented the Ty-Rap® cable tie in 1958 and continues to lead the industry in innovative wire and cable management solutions. For food and beverage processors, we offer a unique group of products to meet the demands of high-temperature processing areas and help prevent product contamination.

**Cable Protection Systems** — Electrical systems in food and beverage facilities exist in harsh conditions, often including washdown processes, corrosive environments, extreme temperatures and hazardous locations. Thomas & Betts has engineered, tested and certified raceway solutions for all types of wires, cables and cords, offering long life and safe, reliable, maintenance-free performance, regardless of environmental conditions.

**Power Connection and Control** — The advanced electronic and electrical systems used in today's automated manufacturing processes require signals and controls to be extremely accurate, consistent and reliable. Our power connection and control system solutions make this expectation a reality for your low-, medium- and high-voltage electrical system needs.

**Safety Technology** — Thomas & Betts is a worldwide leader in lightning and surge protection, hazardous location lighting, emergency lighting and supporting central battery systems. We use state-of-the-art technologies to design our electrical system solutions so they meet global safety and reliability standards.



### Key Food and Beverage Business Drivers

- Increase food and personnel safety
- Increase revenues
- Increase plant sustainability
- Increase brand equity



# ***T&B Engineered solutions for every application area***

- Receiving
- Office/Administration
- Electrical Control Room
- Plant Equipment and Maintenance Storage
- Raw Materials Storage
- Mixing/Batching
- Processing
- Baking/Freezing
- Packaging/Inspection
- Wastewater
- Shipping

At Thomas & Betts, we understand the challenges you face in the food and beverage processing industry today. We're focused on providing electrical solutions that address the critical issues in every area of your operation, so you can focus on plant sustainability, cost, quality, flexibility, safety and regulatory challenges across the production cycle. Our family of electrical solutions matches specific application criteria from start to finish inside food processing areas, assuring the quality and reliability of your electrical system throughout your facility, from incoming raw materials through shipping of finished goods. And with the industry's most efficient distribution system, we're prepared to meet your ongoing MRO, OEM and construction needs down the road.


***Food and Beverage  
Processing Facility  
Electrical System Issues***

 ***Continuous Operation  
and Sustainability***

 ***Corrosive  
Environments***

 ***Washdown and  
Sanitation Areas***

 ***Safety and  
Contamination***

 ***Extreme Temperatures  
and Temperature  
Cycling***

 ***Hazardous Locations***





# Continuous Operation and Sustainability

The costs associated with downtime in a food and beverage plant can be very high. If power is lost during production, the current production batch may have to be scrapped. Production batch cycles can range from only a few minutes to as long as several days, resulting in expensive loss of man hours, raw materials and finished goods.

Due to the high cost of downtime, most food and beverage facilities prefer to use higher performing materials and products to extend equipment life, and preventive maintenance is performed at specific intervals instead of waiting for equipment failure. To minimize plant downtime, Thomas & Betts offers you the following solutions:

- Long-lasting electrical systems to extend the plant lifecycle, reduce your capital expenditures and increase operational equipment effectiveness (OEE)
- High-performance electrical systems to work in clean-in-place (CIP) sanitation processes
- Installation training certification to help ensure plant sustainability
- Qualified technical personnel to assist you in quickly getting your plant back online
- A deep electrical solution offering to standardize your electrical system and ensure that you have the products you need on hand at your local supplier to minimize downtime

## Sta-Kon® Crimped Wire Termination Systems

- Metal insulation grip sleeve included on all nylon terminals for strain relief
- Long barrel selectively annealed
- UL Listed and CSA Certified



**Sta-Kon®**  
Crimped Wire  
Termination Systems



## T&B® Fittings Type A Liquidtight Flexible Non-Metallic Conduit with Non-Metallic or Stainless Steel Fittings

- Ideal for continuous flexing or vibration applications
- Creates a liquid-, dust- and oil-tight seal
- Suitable for operating temperatures from -20° to 60° C

## Color-Keyed® Motor Lead Disconnects

- Quick and easy change-out of electric motors — with no bolting, taping or loose connections
- UL Listed to 600V, 125° C
- Available for wire sizes up to 500 kcmil



## Industrial UPS Systems

- Developed to UL standards and designed for a 20-year service life
- Ranges from 10 to 150 kVA, incorporating state-of-the-art system topology for higher online system efficiency and longer battery life
- Digital Static Transfer Switch design provides increased redundancy and reliability



**Color-Keyed®**  
Motor Lead Disconnects

**Cyberex®**  
Industrial UPS Systems

*Do you frequently move equipment or motors?*

*What is the cost associated with scrapping an entire production batch?*

*How would a 40–50% reduction in downtime affect your bottom line?*

## Thomas & Betts products for continuous operation and sustainability

- Blackburn®**
- E-Z-Ground® Compression Connectors
  - Mechanical Grounding System
  - Exothermic Grounding System
- Color-Keyed®**
- Compression Lugs and Splices
  - KUBE® Power Connectors and Motor Lead Disconnects
  - Ergonomic Compression Tools
- Cyberex®**
- Industrial UPS Systems
- Joslyn®**
- Surge Protection Devices
- JT Packard®**
- Electrical and Data System Installation, Inspection and Maintenance Services
- Kindorf®**
- 316 Stainless Steel Modular Framing Channel, Pipe Hangers and Clamps
  - Seismic Bracing System
- Ocal®**
- PVC-Coated Conduit and Fittings
- PMA®**
- Nylon Cable Protection Systems
- Reznor®**
- Washdown Unit Heater
- Russellstoll®**
- DuraGard® Pin-and-Sleeve Plugs, Connectors and Receptacles
- Shrink-Kon®**
- Wire and Connector Insulation Products
- Sta-Kon®**
- Nylon-, Vinyl- and Non-Insulated Wire Terminals
  - Ergonomic Comfort Crimp® Tools
  - High-Temperature Wire Joints and Luminaire Disconnects
- T&B® Cable Tray**
- Aluminum, Stainless Steel and Fiberglass Support and Wire Management Systems
- T&B® Fittings**
- Liquidtight Conduit and Fittings Systems —
    - Type A Stainless Steel or Non-Metallic
    - Type B Non-Metallic
    - Type C Stainless Steel or Aluminum
    - ATX High-/Low-Temperature
  - Wire-Mesh Strain-Relief Cord and Conduit Grips
  - XD Expansion/Deflection Coupling
- Thomas & Betts products for continuous operation in your onsite electrical substation**
- Elastimold®**
- High-Voltage Separable Connectors
  - High-Voltage Solid-Dielectric Switchgear
- Fisher Pierce®**
- Faulted Circuit Indicators
- Joslyn Hi-Voltage®**
- Capacitor Switches and Air Disconnect Switches





# Corrosive Environments

Corrosion — the enemy of electrical systems — costs an estimated \$2.1 billion annually in lost equipment, plus labor and downtime. Problems caused by corrosion include:

- Equipment failure and shortened life
- Poor electrical system reliability caused by high-resistance connections
- Long maintenance repair time due to corroded parts
- Safety hazards and product contamination

Corrosive agents such as acidic food products, moisture and harsh cleaning chemicals are everyday realities in food and beverage processing. This makes the use of corrosion-resistant materials the key to extending the life and reliability of your electrical system. Thomas & Betts offers aluminum, stainless steel, specialty alloys, non-metallic, PVC or PVC-coated materials as a solution to your corrosion issues.

## Ocal®

### OCAL-BLUE® PVC-Coated Conduit

- PVC-coated, hot-dipped galvanized conduit and threads
- Fully complies with UL6, NEMA RN-1 and ANSI C80.1
- Available in gray (standard), blue, white and custom colors

## Hazlux®

### HazCote® Kynar-Coated Lighting Fixtures

- Enclosed, gasketed, sealed fixtures for adverse, wet and marine locations
- Cast aluminum with HazCote® corrosion protection
- Silicone-coated safety-glass globe to restrain glass particles in case of breakage



## T&B® Fittings

### Stainless Steel Form 8 and BlueKote® Conduit Bodies

- Marine-grade Type 316 stainless steel construction in rugged Form 8 design in sizes to 2" and LB, T, TB and LU® shapes
- Ferrous Form 7 and Form 8 designs in all popular sizes and shapes with triple-layer, corrosion-resistant BlueKote® finish
- UL Listed and CSA Certified

### XTRA FLEX® Liquidtight Non-Metallic Conduit and BULLET® Fittings

- Rugged PVC construction ensures fast, easy installation and long-lasting high performance
- Black conduit supports operating temperature range of -18° to 105° C (gray -18° to 80° C)
- Bullet® Liquidtight Fittings offer corrosion-resistant non-metallic construction with a rounded profile for easy cleaning

### CorroStall® Aluminum Conduit Boxes

- Made from special copper-free aluminum alloy to resist corrosion far better than standard copper-free aluminum
- Designed and tested to withstand prolonged exposure to corrosive agents and extreme temperatures



OCAL-BLUE®  
PVC-Coated  
Conduit

Hazlux®  
HazCote® Kynar-Coated  
Lighting Fixtures

T&B® Fittings  
Stainless Steel Form 8  
and BlueKote®  
Conduit Bodies

T&B® Fittings  
XTRA FLEX® Conduit  
and BULLET® Fittings

T&B® Fittings  
CorroStall® Aluminum  
Conduit Boxes

Have you experienced  
downtime caused by  
corrosion issues in your  
processing areas?

The right conduit and  
fitting system solution  
can extend the life of  
your electrical system  
by up to 300%.

## Thomas & Betts products for corrosive environments

- Carlton®**
- PVC Conduit and Fittings
  - Polycarbonate NEMA and JIC Enclosures
- Hazlux®**
- HazCote® Kynar-Coated Lighting Fixtures
- Kindorf®**
- 316 Stainless Steel, Aluminum, PVC-Coated and Non-Metallic Modular Framing Channel, Pipe Hangers and Beam Clamps
- Ocal®**
- PVC-Coated Conduit and Fittings
  - OCAL-BLUE® NEMA Type 4X Form 8 Conduit Bodies
- Red•Dot®**
- Code Keeper® Weatherproof While-in-Use Covers and Boxes
- Russellstoll®**
- DuraGard® Non-Metallic Pin-and-Sleeve Plugs, Connectors and Receptacles
- Sta-Kon®**
- Corrosion-Resistant, Nickel-Plated Wire Terminals
- T&B® Cable Tray**
- Aluminum, Stainless Steel and Fiberglass Support and Wire Management Systems
- T&B® Fittings**
- Stainless Steel Form 8 and BlueKote® Conduit Bodies
  - Stainless Steel and Aluminum Hubs
  - Stainless Steel and Aluminum Liquidtight Conduit Fittings
  - Silver Grip® Stainless Steel Tray Cord Fittings
  - STAR TECK® Stainless Steel and Aluminum Fittings for Jacketed Metal-Clad and Teck Cable
  - Ranger® Series Stainless Steel and Non-Metallic Liquidtight Cord Connectors
  - CorroStall® Aluminum Conduit Boxes
  - XTRA FLEX® Non-Metallic Liquidtight Conduit, Tubing and BULLET® Fittings
- Ty-Rap®**
- Coated and Uncoated Stainless Steel Cable Ties



## **Washdown and Sanitation Areas**

Many food and beverage processing plants have water and other liquid exposure due to high-pressure hosedown, condensation, accidental spills or machine oils and lubricants, all of which can shorten the life of your electrical system. When specifying electrical systems for food and beverage processing facilities, consider the following issues relating to washdown areas and liquid exposure in general:

- Liquid ingress can deteriorate or short out an electrical system immediately or over time
- Electrical system components designed with round surfaces help to shed contaminants, rather than creating a shelf where they can collect
- Processing equipment that hangs on a wall is often mounted on stand-off wall brackets to enable cleaning of all surfaces, including the back and bottom sides

Thomas & Betts electrical solutions offer protection against liquid, moisture and dust ingress.

### **T&B Fittings**

#### **Stainless Steel Liquidtight Conduit and Cord Fittings**

- Stainless steel construction resists corrosion
- Rounded gland nut deflects water from connector
- Continuous sealing ring ensures a liquidtight seal



**T&B® Fittings**  
Stainless Steel Liquidtight  
Conduit and Cord Fittings



**Ocal®**  
OCAL-BLUE® Type 4X  
Form 8 Conduit Bodies



### **Ocal®**

#### **OCAL-BLUE® PVC-Coated NEMA Type 4X Form 8 Conduit Bodies**

- Double coated inside and out for corrosion protection
- Stainless steel encapsulated cover screws can be hand-tightened — using only 15 in-lbs of torque — to achieve the UL Listed Type 4X watertight rating

### **Russellstoll®**

#### **DuraGard® Pin-and-Sleeve Connections**

- Not just watertight, but waterproof, mated or unmated
- Tested to 1,000 psi for washdown applications
- Full line of 20–60A (600 VAC/250 VDC max.) connectors, plugs and receptacles in UL94V-0 flammability-rated, corrosion-resistant, non-metallic housings

### **Shrink-Kon®**

#### **Self-Fusing Insulation Tape**

- Easy-to-install insulation for harnesses, wires or cables — no heat or adhesive required
- Just two layers form a moisture-proof, abrasion-resistant dielectric seal for low- or high-voltage applications (600V max.)



**Russellstoll®**  
DuraGard® Pin-and-  
Sleeve Connections



**Shrink-Kon®**  
Self-Fusing  
Insulation Tape

**What NEMA/IP ratings are required to withstand washdown cleaning and sanitizing processes in your facility?**

**Many food and beverage processing facilities use high-pressure hosedown cleaning at pressures up to 3,500 psi and temperatures up to 160° F.**

## **Thomas & Betts products for washdown and sanitation areas**

### **Carlton®**

- Polycarbonate NEMA and JIC Enclosures

### **Ocal®**

- PVC-Coated Conduit and Fittings
- OCAL-BLUE® NEMA Type 4X Form 8 Conduit Bodies

### **PMA®**

- Nylon Cable Protection Systems

### **Red•Dot®**

- Code Keeper® Weatherproof While-in-Use Covers and Boxes

### **Reznor®**

- Washdown Unit Heater

### **Russellstoll®**

- DuraGard® Non-Metallic Pin-and-Sleeve Plugs, Connectors and Receptacles

### **Shrink-Kon®**

- Wire and Connector Insulation Products

### **T&B® Fittings**

- Stainless Steel Form 8 and BlueKote® Conduit Bodies
- XTRA FLEX® Non-Metallic Liquidtight Conduit, Tubing and BULLET® Fittings
- Type A Liquidtight Flexible Conduit and Fittings
- ATX High-/Low-Temperature Liquidtight Flexible Metal Conduit and Fittings
- Stainless Steel and Non-Metallic Liquidtight Conduit Fittings
- Ranger® Series Stainless Steel and Non-Metallic Liquidtight Cord Connectors
- CorroStal® Aluminum Conduit Boxes

### **Ty-Rap®**

- Coated and Uncoated Stainless Steel Cable Ties





# Safety and Contamination

Safety in the food and beverage processing industry encompasses food, equipment and personnel safety issues. These include:

- Accidental or intentional contamination in food/beverage processes
- Electrical shock from exposed wiring
- Personal injury from sharp objects and repetitive motion
- Exposure to harsh chemicals and extreme temperatures

In the area of food safety, brand deterioration is a key concern. As a result of food safety recalls, which have increased over the past several years, most consumers can remember the name of a recalled brand, and many will stop buying that brand, at least temporarily, if not permanently.

In addition to offering solutions to help reduce the chance of product contamination, Thomas & Betts can also help you develop Good Manufacturing Practices (GMPs) to significantly reduce potential for employee injury or equipment damage.

## Ty-Rap®

### Detectable Nylon Cable Ties

- Detectable by X-ray equipment and by metal detectors set as low as 1.5mm ferrous sphere setting
- Bright blue color allows easy visual detection, especially on white conveyor systems
- Buoyant polypropylene version available for liquid-processing applications
- Smooth, notchless body sheds contaminants



**Ty-Rap®**  
Detectable Cable Ties



**Emergi-Lite®**  
Emergency Lighting Systems



**EZCODE®**  
Safety Labels, Tags, Signs and Barricade Tapes



**Sta-Kon®**  
Luminaire Disconnects  
**Sta-Kon®**  
Ergonomic Comfort Crimp® Tools



## EMERGI-LITE®

### Emergency Lighting Systems

- Designed to withstand damp, corrosive conditions
- Safe for use in explosive environments
- Energy efficient with long, low-maintenance service life

## EZCODE®

### Safety Labels, Tags, Signs and Barricade Tapes

- Help to ensure personnel and workplace safety, as well as regulatory compliance
- Highly visible and long-lasting materials
- Custom labels, tags and signs available
- Barricade and burial marking tapes in a variety of materials and colors

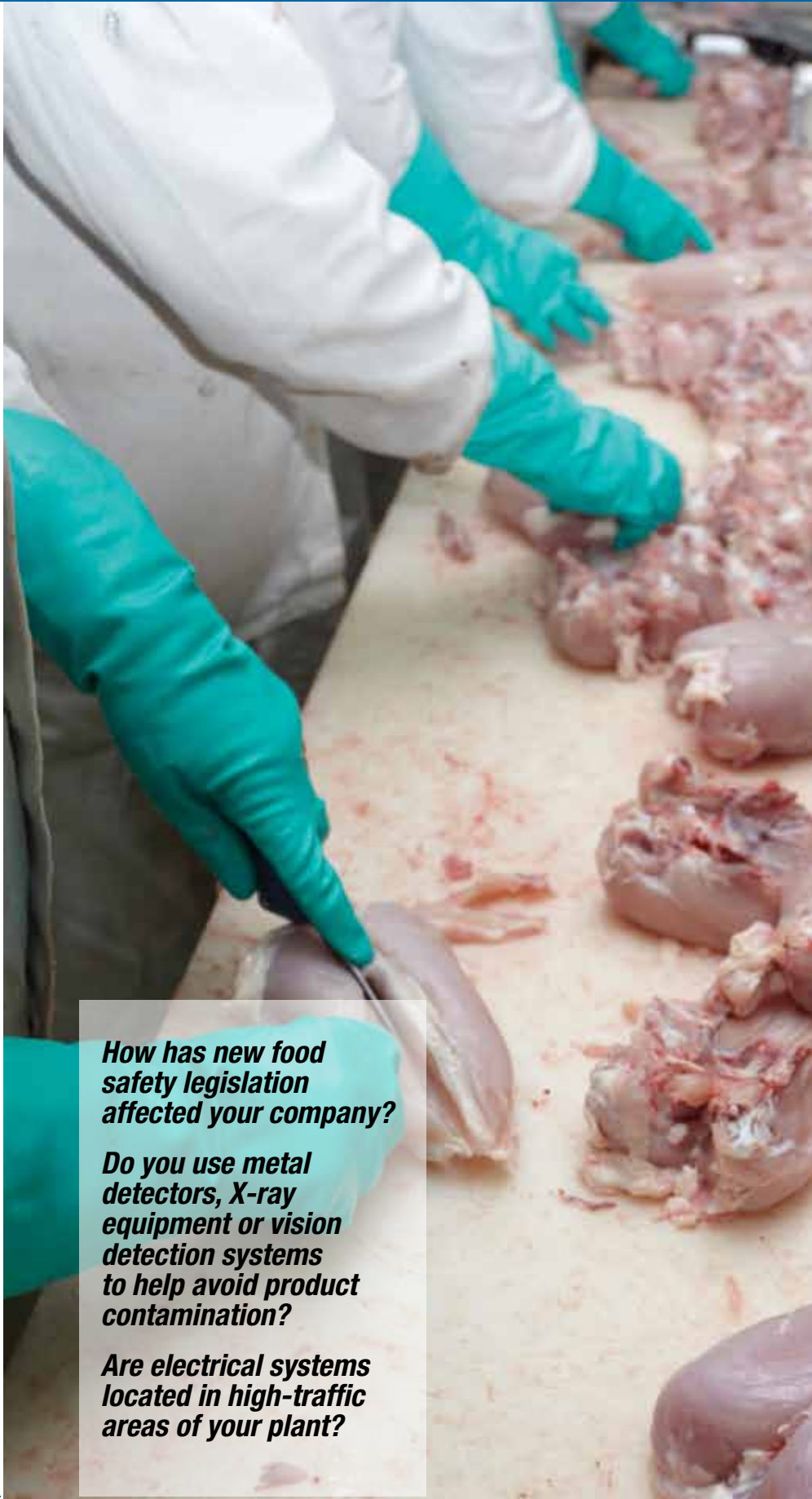
## Sta-Kon®

### Luminaire Disconnects

- Easy disconnect of ballast power for safe servicing
- Push-in and prewired designs for quick and convenient installation

### Ergonomic Comfort Crimp® Tools

- Requires up to 75% less force than standard tools
- Soft, overmolded handle grips for operator comfort



**How has new food safety legislation affected your company?**

**Do you use metal detectors, X-ray equipment or vision detection systems to help avoid product contamination?**

**Are electrical systems located in high-traffic areas of your plant?**

## Thomas & Betts products for safety and contamination

### Blackburn®

- E-Z-Ground® Compression Connectors
- Mechanical Grounding Connectors
- Exothermic Grounding System

### Color-Keyed®

- Compression Lugs and Splices
- Ergonomic Compression Tools

### Emergi-Lite®

- Emergency Exit Lighting

### EZCODE®

- Machine Warning Labels
- Danger and Warning Signs
- Reflective Industrial Markers
- Barricade and Burial Marking Tapes
- Electrical Wire and Cable Markers

### Joslyn®

- Surge Protection Devices

### JT Packard®

- Electrical and Data System Installation, Inspection and Maintenance Services

### Kindorf®

- Seismic Bracing System

### PMA®

- Nylon Cable Protection Systems

### Red•Dot®

- Code Keeper® Weatherproof While-in-Use Covers and Boxes

### Shrink-Kon®

- Wire and Connector Insulation Products

### Sta-Kon®

- Luminaire Disconnects
- Disconnect Installation Tool
- Ergonomic Comfort Crimp® Tools
- Heat-Shrink Terminals

### Steel City®

- Red Fire Alarm Boxes

### T&B® Fittings

- Silver Grip® Tray Cord Fittings
- Wire-Mesh Strain-Relief Cord and Conduit Grips

### Ty-Rap®

- Detectable Cable Ties
- Ty-Rap Tote® Cable Tie Dispensers
- Ergonomic Cable Tie Installation Tools

## Thomas & Betts products for safety in your onsite electrical substation

### Elastimold®

- High-Voltage Separable Connectors
- High-Voltage Solid-Dielectric Switchgear





# Extreme Temperatures and Temperature Cycling

As equipment size continues to be reduced and plant floor usage increases, ambient temperatures increase around the electrical system. Lighting fixtures have become more compact in design, which also raises temperatures. Food and beverage processing areas can have dryers and coolers or ovens and flash freezers directly in line with one another, causing rapid temperature swings that stress electrical systems. Thomas & Betts' electrical solutions address issues that can result from extreme temperatures, including:

- Components near ovens can soften and fail due to high temperatures
- Components melt and destroy other nearby equipment or contaminate food product
- Components near ovens or flames can catch fire and burn
- Components can become brittle and fail at low temperatures, particularly with frozen food processing
- Condensation occurs with rapid temperature changes, stressing the electrical system
- Repeated thermal expansion and contraction damages conduit systems

## Ty-Rap®

### Extra-High Temperature Nylon Cable Ties

- For use in temperatures from -40° to 150° C
- Features "The Grip of Steel®" stainless steel locking device and offers infinite adjustability
- Smooth body sheds contaminants

### Heavy-Duty Stainless Steel Cable Ties

- For use in temperatures from -80° to 538° C
- Available in both Type 304 and Type 316 stainless steel
- Quick, easy installation and secure locking



## T&B® Fittings

### High-/Low-Temperature Liquidtight Fittings

- Suitable for use in temperatures up to 150° C
- UL94V-2 flammability rating

### ATX Liquidtight Flexible Metal Conduit

- Supports operating temperatures from -60° to 150° C (up to 165° C intermittent)
- Flammability rating of UL94-HB
- Standard flexible metallic core with temperature-resistant elastomeric outer jacket

### XD Expansion/Deflection Coupling

- Ideal for use in rigid conduit runs subject to movement due to external forces or temperature changes
- Suitable for use indoors, outdoors, direct buried or embedded in concrete
- Accommodates axial expansion/contraction, parallel deflection and angular misalignment

## Sta-Kon®

### High-Temperature Wire Joints and Terminals

- Rated for temperatures up to 150° C, 600V maximum
- Molded, one-piece nylon construction for electrical insulation, rated UL94V-2



**Ty-Rap®**  
Extra-High Temperature  
and Stainless Steel Ties

**T&B® Fittings**  
High-/Low-Temperature  
Liquidtight Fittings

**T&B® Fittings**  
ATX Liquidtight Flexible  
Metal Conduit

**T&B® Fittings**  
XD Expansion/  
Deflection Coupling

**Sta-Kon®**  
High-Temperature Wire  
Joints and Terminals

*Does your food and beverage processing facility have extremely hot or cold zones and/or rapid temperature cycling?*

## Thomas & Betts products for extreme temperatures and temperature cycling

### Deltec®

- Outdoor Fastening System

### PMA®

- Nylon Cable Protection Systems

### Sta-Kon®

- High-Temperature Wire Joints and Terminals

### T&B® Fittings

- High-/Low-Temperature Liquidtight Fittings
- ATX High-/Low-Temperature Flexible Metallic Liquidtight Conduit
- XD Expansion/Deflection Couplings for Rigid Conduit

### Ty-Rap®

- Extra-High Temperature Nylon Cable Ties
- Flame-Retardant UL94V-0 Nylon Cable Ties
- Coated and Uncoated Stainless Steel Cable Ties





# Hazardous Locations

The National Electrical Code® (NEC®) defines hazardous locations as areas where the possibility of explosion and fire is created by the presence of flammable gases, vapors, dust, fibers or flyings. In food and beverage facilities, hazardous locations may be present due to gases or chemicals, which fall under NEC® Class I, or due to the presence of combustible dust, classified as NEC® Class II. Typical Hazardous Locations include:

- Grain elevators, flour and feed mills
- Producers of starch or candies
- Spice-grinding, sugar and cocoa plants
- Chemical storage areas
- Gas-fired ovens

To protect both your facility and your employees, Thomas & Betts offers a wide variety of high-performance explosion-proof solutions designed to prevent or contain explosion in classified Hazardous Locations.

National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Inc.



### Industrial UPS Systems

- Developed to UL standards and designed for a 20-year service life
- Ranges from 10 to 150 kVA, incorporating state-of-the-art system topology for higher online system efficiency and longer battery life
- Digital Static Transfer Switch design provides increased redundancy and reliability



Cyberex®  
Industrial UPS Systems



T&B® Fittings  
XP Explosion-Proof  
Flexible Couplings



### T&B® Fittings

#### XP Explosion-Proof Flexible Couplings

- Explosion proof and corrosion resistant for use in hazardous and wet locations
- Ideal for making tight bends in conduit systems or for applications subject to movement or vibration

### Russellstoll®

#### MaxGard® Explosion-Proof Interlocked Receptacles

- Copper-free, cast-aluminum, epoxy-coated housing
- O-ring-sealed interior components ensure watertight protection whether connections are mated or not
- Explosion-proof systems for 30A, 60A and 100A

### Hazlux®

#### Hazardous Location Lighting

- Explosion-proof fixtures for Class I, II and III hazardous locations
- Enclosed, gasketed and rated NEMA 4X, IP66 and UL1598 for wet and marine locations



Russellstoll®  
MaxGard® Explosion-Proof  
Interlocked Receptacles



Hazlux®  
Hazardous Location  
Lighting

## Thomas & Betts products for hazardous locations

### Cyberex®

- Industrial UPS Systems

### Emergi-Lite®

- Emergency Exit Lighting

### Hazlux®

- Explosion-Proof Lighting Fixtures for Hazardous Locations

### Kopex-Ex™

- Explosion-Proof Raceway Systems

### Russellstoll®

- MaxGard® Pin-and-Sleeve Connectors and Explosion-Proof Interlocked Receptacles

### T&B® Fittings

- Explosion-Proof, Dust-Ignition Proof Outlet Boxes, Elbows and Sealing Fittings for Rigid Conduit
- XP Explosion-Proof Flexible Couplings
- STAR TECK XP® Explosion-Proof Fittings for Jacketed Metal-Clad and Teck Cables

*Do you have explosion risks from grain, sugar dust, flammable gas or liquids?*



# T&B Engineered system solutions for food and beverage processing applications

When it comes to corrosion-resistant materials to support, connect and protect your electrical system, Thomas & Betts has you covered with a complete solution, whether you prefer aluminum, PVC-coated, non-metallic or stainless steel.

## Aluminum Solutions

Aluminum provides the advantages of high strength-to-weight ratio, superior resistance to certain corrosive environments and ease of installation. Aluminum typically weighs about 50% less than steel and requires no maintenance after installation.

- Conduit, cable and cord fittings
- Cable tray
- Framing channels, hardware and accessories

**T&B Fittings T&B Cable Tray Kindorf**



## Non-Metallic Solutions

The T&B® Fittings brand includes non-metallic cord and cable connectors, while the Carlon® brand from Thomas & Betts encompasses one of the most comprehensive lines of PVC conduit and fittings available in the industry.

- Cord and cable connectors
- Conduit outlet bodies and Schedule 40 and 80 elbows
- Couplings, adapters and accessories

**T&B Fittings Carlon**



## PVC-Coated Solutions

The comprehensive line of Ocal® products provides a systems solution for superior corrosion-resistant protection and ease of wiring in conduit applications. All Ocal® products meet or exceed applicable industry ratings or specifications. Look for the distinctive T&B blue color.

- Ocal-BLUE® Conduit, Couplings and Conduit Bodies
- Ocal-BLUE® FS/FD Device Boxes and Covers
- Ocal® Liquidtight Fittings
- Ocal® Large-Radius Elbows
- Ocal® XJG Expansion Couplings

**Ocal**

## Stainless Steel Solutions

For corrosion resistance combined with strength, durability and ease of installation, stainless steel offers performance that's hard to match. Thomas & Betts' complete line of stainless steel products is designed to safeguard your electrical system against corrosion to avoid costly downtime and repairs.

- Cable tray and cable ties
- Framing channels, hardware and accessories
- Conduit, cable and cord fittings

**T&B Fittings T&B Cable Tray Kindorf Ty-Rap**



## Wire and Cable Management Systems

Through its Ty-Rap® brand, Thomas & Betts offers a complete high-performance wire and cable management solution designed specifically to meet the needs of food and beverage processors in dealing with high-temperature areas and preventing product contamination.

- Extra-high temperature nylon cable ties
- Detectable nylon and polypropylene cable ties
- Ergonomic installation tools and Ty-Rap Tote® dispensers

**Ty-Rap**



## Grounding Systems

Thomas & Betts Blackburn® grounding connectors take a systems approach to reliable grounding — from the grounding grid to power equipment and machinery to instrumentation, providing dependable protection throughout the plant. Optional terminating methods accommodate varying application preferences or specifications. The Blackburn® product line includes:

- E-Z-Ground® Compression Connectors
- Mechanical Connectors
- Exothermic Connectors

**Blackburn**



High-quality products to address key issues in food and beverage processing

| Thomas & Betts Brands | Products   | Continuous Operation & Sustainability | Corrosive Environments | Washdown & Sanitation Areas | Safety & Contamination | Extreme Temps & Temp Cycling | Hazardous Locations |
|-----------------------|--|---------------------------------------|------------------------|-----------------------------|------------------------|------------------------------|---------------------|
| Blackburn®            | E-Z-Ground® Compression Connectors, Mechanical Grounding and Exothermic Grounding Systems            | •                                     |                        |                             | •                      |                              |                     |
| Carlton®              | PVC Conduit and Fittings   |                                       | •                      |                             |                        |                              |                     |
|                       | Polycarbonate NEMA and JIC Enclosures  |                                       | •                      | •                           |                        |                              |                     |
| Color-Keyed®          | Compression Lugs and Splices and Ergonomic Compression Tools   | •                                     |                        |                             | •                      |                              |                     |
|                       | KUBE® Power Connectors and Motor Lead Disconnects  | •                                     |                        |                             |                        |                              |                     |
| Cyberex®              | Industrial UPS Systems   | •                                     |                        |                             |                        |                              | •                   |
| Deltec®               | Outdoor Fastening System   |                                       |                        |                             |                        | •                            |                     |
| Elastimold®           | High-Voltage Separable Connectors and Solid-Dielectric Switchgear                                    | •                                     |                        |                             | •                      |                              |                     |
| Emergi-Lite®          | Emergency Exit Lighting  |                                       |                        |                             | •                      |                              | •                   |
| EZCODE®               | Danger and Warning Labels and Signs, Industrial Markers, Barricade and Burial Tapes and Wire Markers |                                       |                        |                             | •                      |                              |                     |
| Fisher Pierce®        | Faulted Circuit Indicators   | •                                     |                        |                             |                        |                              |                     |
| Hazlux®               | HazCote® Kynar-Coated Lighting Fixtures  |                                       | •                      |                             |                        |                              |                     |
|                       | Explosion-Proof Lighting Fixtures for Hazardous Locations  |                                       |                        |                             |                        |                              | •                   |
| Joslyn®               | Surge Protection Devices   | •                                     |                        |                             | •                      |                              |                     |
| Joslyn Hi-Voltage®    | Capacitor Switches and Air Disconnect Switches   | •                                     |                        |                             |                        |                              |                     |
| JT Packard®           | Electrical and Data System Installation, Inspection and Maintenance Services                         | •                                     |                        |                             | •                      |                              |                     |
| Kindorf®              | 316 Stainless, Aluminum, PVC-Coated or Non-Metallic Modular Framing Channel, Hangers and Clamps      | •                                     | •                      |                             |                        |                              |                     |
|                       | Seismic Bracing System   | •                                     |                        |                             | •                      |                              |                     |
| Kopex-Ex™             | Explosion-Proof Raceway Systems  |                                       |                        |                             |                        |                              | •                   |
| Ocal®                 | PVC-Coated Conduit and Fittings  | •                                     | •                      | •                           |                        |                              |                     |
|                       | OCAL-BLUE® NEMA Type 4X Form 8 Conduit Bodies  |                                       | •                      | •                           |                        |                              |                     |
| PMA®                  | Nylon Cable Protection Systems   | •                                     |                        | •                           | •                      | •                            |                     |
| Red•Dot®              | Code Keeper® Weatherproof While-in-Use Covers and Boxes  |                                       | •                      | •                           | •                      |                              |                     |
| Reznor®               | Washdown Unit Heater   | •                                     |                        | •                           |                        |                              |                     |
| Russellstoll®         | DuraGard® Non-Metallic Pin-and-Sleeve Plugs, Connectors and Receptacles                              | •                                     | •                      | •                           |                        |                              |                     |
|                       | MaxGard® Pin-and-Sleeve Connectors and Explosion-Proof Interlocked Receptacles                       |                                       |                        |                             |                        |                              | •                   |
| Shrink-Kon®           | Wire and Connector Insulation Products   | •                                     |                        | •                           | •                      |                              |                     |
| Sta-Kon®              | Nylon-, Vinyl- and Non-Insulated Wire Terminals  | •                                     |                        |                             |                        |                              |                     |
|                       | High-Temperature Wire Joints and Terminals   | •                                     |                        |                             |                        | •                            |                     |
|                       | Luminaire Disconnects  | •                                     |                        |                             | •                      |                              |                     |
|                       | Corrosion-Resistant, Nickel-Plated Wire Terminals  |                                       | •                      |                             |                        |                              |                     |
|                       | Heat-Shrink Terminals, Ergonomic Comfort Crimp® Tools and Disconnect Installation Tool               | •                                     |                        |                             | •                      |                              |                     |
| Steel City®           | Red Fire Alarm Boxes   |                                       |                        |                             | •                      |                              |                     |
| T&B® Cable Tray       | Aluminum, Stainless Steel and Fiberglass Support and Wire Management Systems                         | •                                     | •                      |                             |                        |                              |                     |
| T&B® Fittings         | Type A Liquidtight Flexible Conduit and Fittings   | •                                     |                        | •                           |                        |                              |                     |
|                       | ATX High-/Low-Temperature Liquidtight Conduit and Fittings   | •                                     |                        | •                           |                        | •                            |                     |
|                       | Stainless Steel Form 8 and BlueKote® Conduit Bodies  |                                       | •                      | •                           |                        |                              |                     |
|                       | XTRA FLEX® Non-Metallic Liquidtight Conduit, Tubing and BULLET® Fittings                             |                                       | •                      | •                           |                        |                              |                     |
|                       | Stainless Steel and Aluminum Hubs  |                                       | •                      |                             |                        |                              |                     |
|                       | Stainless Steel, Aluminum and Non-Metallic Liquidtight Conduit Fittings and Ranger® Cord Connectors  |                                       | •                      | •                           |                        |                              |                     |
|                       | Explosion-Proof Boxes, Elbows, Fittings and XP Explosion-Proof Flexible Couplings                    |                                       |                        |                             |                        |                              | •                   |
|                       | Silver Grip® Tray Cord Fittings  |                                       | •                      |                             | •                      |                              |                     |
|                       | Wire-Mesh Strain-Relief Cord and Conduit Grips   | •                                     |                        |                             | •                      |                              |                     |
|                       | CorroStall® Aluminum Conduit Boxes   |                                       | •                      | •                           |                        |                              |                     |
|                       | STAR TECK® and STAR TECK XP® Fittings for Jacketed Metal-Clad and Teck Cables                        |                                       | •                      |                             |                        |                              | •                   |
|                       | XD Expansion/Deflection Coupling for Rigid Conduit   | •                                     |                        |                             |                        | •                            |                     |
| Ty-Rap®               | Coated and Uncoated Stainless Steel Cable Ties   |                                       | •                      | •                           |                        | •                            |                     |
|                       | Extra-High Temperature and Flame-Retardant UL94V-0 Nylon Cable Ties                                  |                                       |                        |                             |                        | •                            |                     |
|                       | Detectable Cable Ties, Ty-Rap Tote® Cable Tie Dispensers and Ergonomic Installation Tools            |                                       |                        |                             | •                      |                              |                     |

Thomas & Betts Specification Guide

This Guide, designed to aid in the proper selection, use and specification of our products, is available as a bound copy or in Microsoft Word documents for easy editing. It follows the CSI three-part format, using section numbers from Master Format® 2010 Update. For the latest revisions, please visit [tnbelectricalworld.tnb.com](http://tnbelectricalworld.tnb.com). Following are products referenced in this brochure.

- 26 05 29.11 Modular Metal Framing System – Kindorf®
- 26 05 33.14 Corrosion-Resistant Conduit Systems
- 26 05 33.18 Weatherproof Boxes and Covers
- 26 05 33.22 Explosion-Proof Conduit Outlet Boxes
- 26 05 33.24 Liquidtight Conduit Fittings
- 26 05 33.32 Jacketed Metal-Clad Cable Fittings
- 26 05 33.54 Industrial-Grade Conduit Bodies
- 26 05 33.55 Industrial Grade Rigid Fittings
- 26 05 33.56 Explosion-Proof Conduit Outlet Bodies and Fittings
- 26 05 83.11 Wiring Connections: Solderless Crimp Terminals
- 26 05 84 Wire and Cable Fastening
- 26 54 00 Classified-Location Lighting
- 26 27 26.11 Wiring Devices: Metallic Pin and Sleeve
- 26 27 26.12 Wiring Devices: Non-Metallic Pin and Sleeve

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