

Electrical Solutions for Food and Beverage Processing Facilities



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 hosedown, 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 high-pressure hosedown 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.



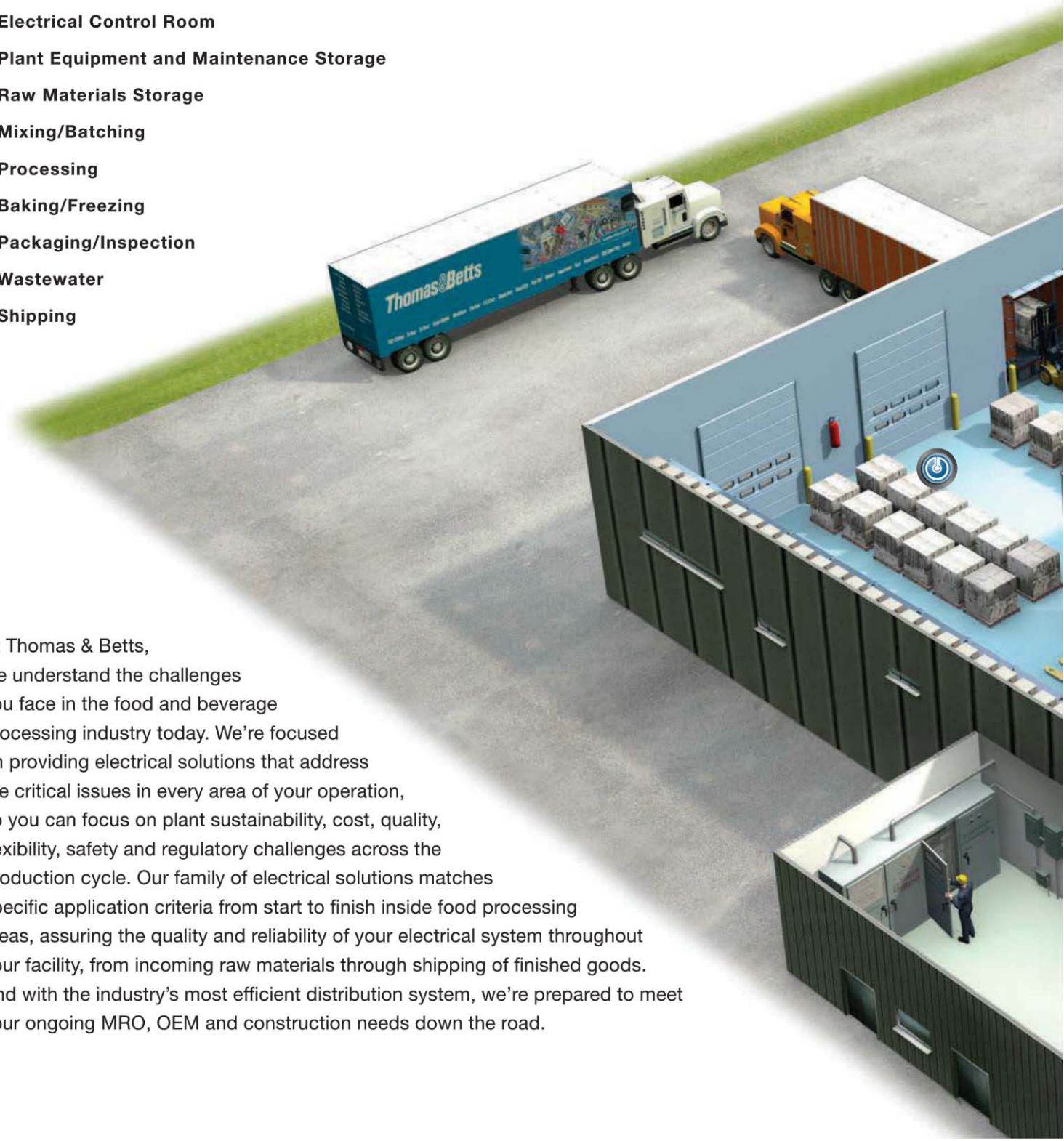
**Key Food and Beverage
Business Drivers**

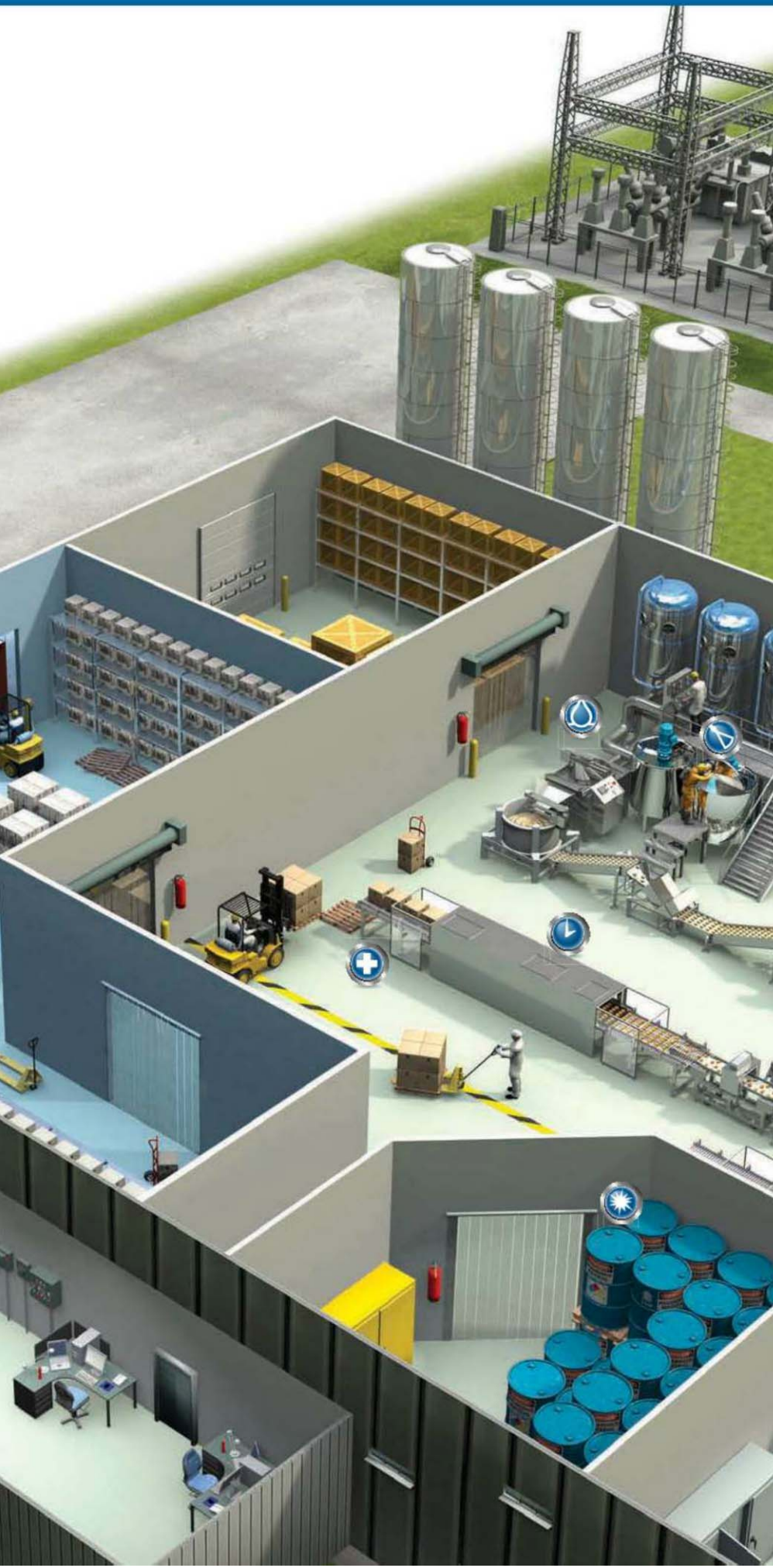
- ***Increase food and personnel safety***
- ***Increase revenues***
- ***Increase plant sustainability***
- ***Increase brand equity***

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
& Sustainability***



***Corrosion & Harsh
Environment
Protection***



***Liquid Ingress
Protection***



***Safety &
Contamination***



***Extreme Temperature
Protection***



***Hazardous Location
Protection***



Continuous Operation & 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
Conduit and Fittings



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

Blackburn® Compression

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
- Featuring the Color-Keyed® Compression System that ensures proper connections

ABB

AF Series Contactors


- Provides continuous reliable operation, even with voltage fluctuation
- Modular accessories for reduced downtime
- Full range up to 2,050A; NEMA, IEC and horsepower rated



Blackburn® Compression
Motor Lead Disconnects



ABB
AF Series Contactors



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 & sustainability

ABB

- AF Series Contactors and Tmax and Emax Circuit Breakers
- Terminal Blocks

Blackburn® Compression

- Compression Lugs and Splices
- KUBE® Power Connectors and Motor Lead Disconnects
- Ergonomic Compression Tools

Blackburn® Grounding

- EZGround™ Compression Connectors and Mechanical Grounding Systems

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

Sta-Kon®

- Nylon-, Vinyl- and Non-Insulated Wire Terminals
- Ergonomic Comfort Crimp® Tools
- High-Temperature Wire Joints and Luminaire Disconnects
- Shrink-Kon® Wire and Connector Insulation Products

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 and 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



Corrosion & Harsh Environment Protection

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®
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 corrosion & harsh environment protection

ABB

- Stainless Steel Disconnects and Safety Switches
- Jokab Safety Stainless Steel Safety Sensors, Switches, Rope Pulls and E-Stops

Carlson®

- 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
- Heat-Shrink Terminals
- Shrink-Kon® Wire and Connector Insulation Products

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

Kynar is a registered trademark of ARKEMA, Inc.



Liquid Ingress Protection

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 hosedown 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

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 hosedown 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

Sta-Kon®

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.)

ABB

Stainless Steel Disconnects and Safety Switches

- NEMA 4X protection
- OSHA Lock Out/Tag Out (LOTO) compliant
- Fusible and non-fused versions



T&B® Fittings

Stainless Steel Liquidtight Conduit and Cord Fittings

Ocal®

OCAL-BLUE® Type 4X Form 8 Conduit Bodies

Russellstoll®

DuraGard® Pin-and-Sleeve Connections

Sta-Kon®

Shrink-Kon® Self-Fusing Insulation Tape

ABB

Stainless Steel Disconnects



Thomas & Betts products for liquid ingress protection

ABB

- Stainless Steel Disconnects and Safety Switches
- IP69K Pilot Devices
- Jokab Safety Focus II Light Curtain/WETL Washdown Tubes
- Jokab Safety Switches, Rope Pulls and E-Stops

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

Sta-Kon®

- Heat-Shrink Terminals
- 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
- CorroStall® Aluminum Conduit Boxes

Ty-Rap®

- Coated and Uncoated Stainless Steel Cable Ties

What NEMA/IP ratings are required to withstand high-pressure hosedown 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.



Safety & 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 and Mounting Accessories

- 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
and Accessories



EZCODE®
Safety Labels, Tags, Signs
and Barricade Tapes



Sta-Kon®
Luminaire Disconnects
and Comfort Crimp® Tools



ABB
Arc Guard Arc Flash
Mitigation System



ABB
Jokab Safety
Products



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

Sta-Kon®

Luminaire Disconnects

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

Ergonomic Comfort Crimp® Tools

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

ABB

Arc Guard Arc Flash Mitigation System

- Non-contact arc flash detection
- Easily retrofitted to any electrical system
- Reduces energy during arc flash event

Jokab Safety Products

- Quick Guard Safety Fencing and Safety Light Curtains
- Safety Relays and PLCs
- Safety Sensors, Switches, Rope Pulls and E-Stops



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 & contamination

ABB

- Arc Guard Arc Flash Mitigation System
- Arc-Resistant Low Voltage Switchgear and Motor Control Centers
- Jokab Safety Quick Guard Safety Fencing and Safety Light Curtains
- Jokab Safety Relays and PLCs
- Jokab Safety Sensors, Switches, Rope Pulls and E-Stops

Blackburn® Compression

- Compression Lugs and Splices
- Ergonomic Compression Tools

Blackburn® Grounding

- EZGround™ Compression Connectors and Mechanical Grounding Systems

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

Sta-Kon®

- Luminaire Disconnects
- Disconnect Installation Tool
- Ergonomic Comfort Crimp® Tools
- Heat-Shrink Terminals
- Shrink-Kon® Wire and Connector Insulation Products

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 and Mounting Accessories
- 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 Temperature Protection

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 can become brittle and fail at low temperatures, particularly with frozen food processing
- 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
- 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

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



T&B® Fittings

ATX Liquidtight Flexible Metal Conduit and High-/Low-Temperature Fittings

- Suitable for operating temperatures from -60° to 150° C
- Flammability rating of UL94-HB and UL94V-2
- Conduit features 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

ABB

Tmax and Emax Circuit Breakers

- Electronic trip mechanism, unaffected by ambient temperature fluctuations
- 100% rated versions available
- 0-6,000A current range



Ty-Rap®

Extra-High Temperature and Stainless Steel Ties

Sta-Kon®

High-Temperature Wire Joints and Terminals

T&B® Fittings

ATX Liquidtight Flexible Metal Conduit and High-/Low-Temperature Fittings

T&B® Fittings

XD Expansion/Deflection Coupling

ABB

Tmax and Emax Circuit Breakers



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

Thomas & Betts products for extreme temperature protection

ABB

- Tmax and Emax Circuit Breakers
- AF Series Motor Control and Electronic Overload Relays

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
- Deltec® Outdoor Fastening System



Hazardous Location Protection

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.

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



T&B® Fittings
XP Explosion-Proof
Flexible Couplings



Russellstoll®
MaxGard® Explosion-Proof
Interlocked Receptacles



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



Hazlux®
Hazardous Location
Lighting

ABB

Jokab Safety Explosion-Proof Safety Switches, Sensors, Rope Pulls and E-Stops

- For use in hazardous locations: IECEx and ATEX EExd IIC T6 (Gas and Dust)
- Die-cast and Type 316 stainless steel housings



ABB
Jokab Safety Explosion-
Proof Sensors



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

Thomas & Betts products for hazardous location protection

ABB

- Jokab Safety Explosion-Proof Safety Switches and Sensors
- Jokab Safety Rope Pulls and E-Stops
- Jokab Safety Intrinsically Safe 3-Position Enabling Devices
- Explosive-Environment Terminal Blocks (UL® Class I, Zone 1, ATEX 95)

Cyberex®

- Industrial UPS Systems

Emergi-Lite®

- Emergency Exit Lighting

EZCODE®

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

Hazlux®

- Explosion-Proof Lighting Fixtures for Hazardous Locations

Kopex-Ex™

- Flame-Proof Cable Protection Systems for IEC Applications

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

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

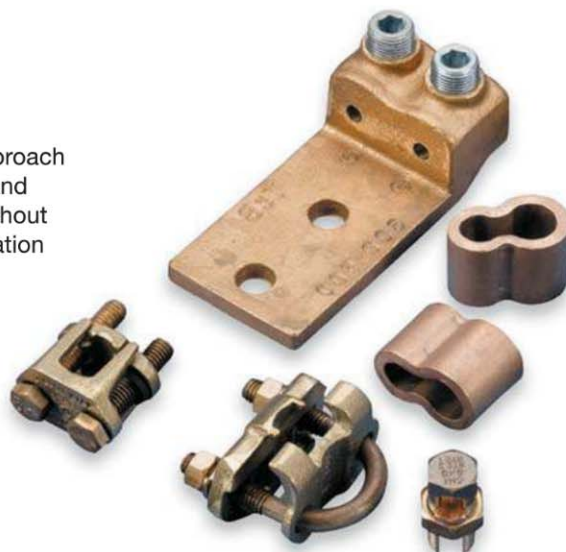
Ty-Rap®

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:

- EZGround™ Compression Connectors
- Mechanical Connectors

Blackburn® Grounding



High-quality products to address key issues in f

Thomas & Betts Brands	Products	Continuous Operation & Sustainability
ABB	AF Series Contactors, Motor Control and Electronic Overload Relays, Tmax and Emax Circuit Breakers	•
	Stainless Steel Disconnects and Safety Switches	
	IP69K Pilot Devices	
	Terminal Blocks — Standard and Explosive-Environment	•
	Arc Guard Arc Flash Mitigation System, Arc-Resistant Low Voltage Switchgear and Motor Control Centers	
	Jokab Safety Switches, Sensors, Rope Pulls and E-Stops — Standard and Stainless Steel	
	Jokab Safety Quick Guard Safety Fencing, Safety Relays and PLCs	
	Jokab Safety Light Curtains and Washdown Tubes	
Blackburn® Compression/ Blackburn® Grounding	Compression Lugs, Splices, Tools and EZGround™ Compression and Mechanical Grounding Systems	•
	KUBE® Power Connectors and Motor Lead Disconnects	•
Carlton®	PVC Conduit and Fittings	
	Polycarbonate NEMA and JIC Enclosures	
Cyberex®	Industrial UPS Systems	•
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®	Lighting Fixtures — HazCote® Kynar® Coated and Explosion-Proof 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™	Flame-Proof Cable Protection Systems for IEC Applications	
Ocal®	PVC-Coated Conduit and Fittings and 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	
Sta-Kon®	Nylon-, Vinyl- and Non-Insulated Wire Terminals	•
	High-Temperature Wire Joints and Terminals	•
	Corrosion-Resistant, Nickel-Plated Wire Terminals	
	Luminaire Disconnects, Comfort Crimp® Tools and Disconnect Installation Tool	•
	Heat-Shrink Terminals and Shrink-Kon® Wire and Connector Insulation Products	•
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 and BlueKote® Conduit Bodies and XTRA FLEX® Conduit 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	•
	Coated and Uncoated Stainless Steel Cable Ties	
Ty-Rap®	Extra-High Temp and Flame-Retardant UL94V-0 Nylon Cable Ties, Deltec® Outdoor Fastening System	
	Detectable Cable Ties, Ty-Rap Tote® Cable Tie Dispensers and Ergonomic Installation Tools	

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Thomas & Betts product guide specifications are available as Microsoft Word documents at **www.tnb.com**. They follow the CSI three-part format, using section numbers from Master Format® 2010 Update. This enables their simple and seamless incorporation into any CSI compliant electrical specification. 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

The image shows the front cover of the 'Specification Guide' and a CD-ROM. The cover has a blue background with a white curved border at the bottom. The title 'Specification Guide' is written in a stylized, italicized font. The Thomas & Betts logo and website address 'thomasbetts.com' are in the bottom right corner. The CD-ROM is blue with a white center and features the same title and logo.

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Visit the T&B world of electrical product solutions

Visit our web site for more information about Thomas & Betts solutions and our newest products. For a user-friendly catalog and competitive part number search, application and technical support and other useful information, go to: **www.tnb.com**

Industry codes and specifications

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**

American Recovery and Reinvestment Act (ARRA)



*Get certification letters for
compliant products online at:*

www.tnb.com/ARRA

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