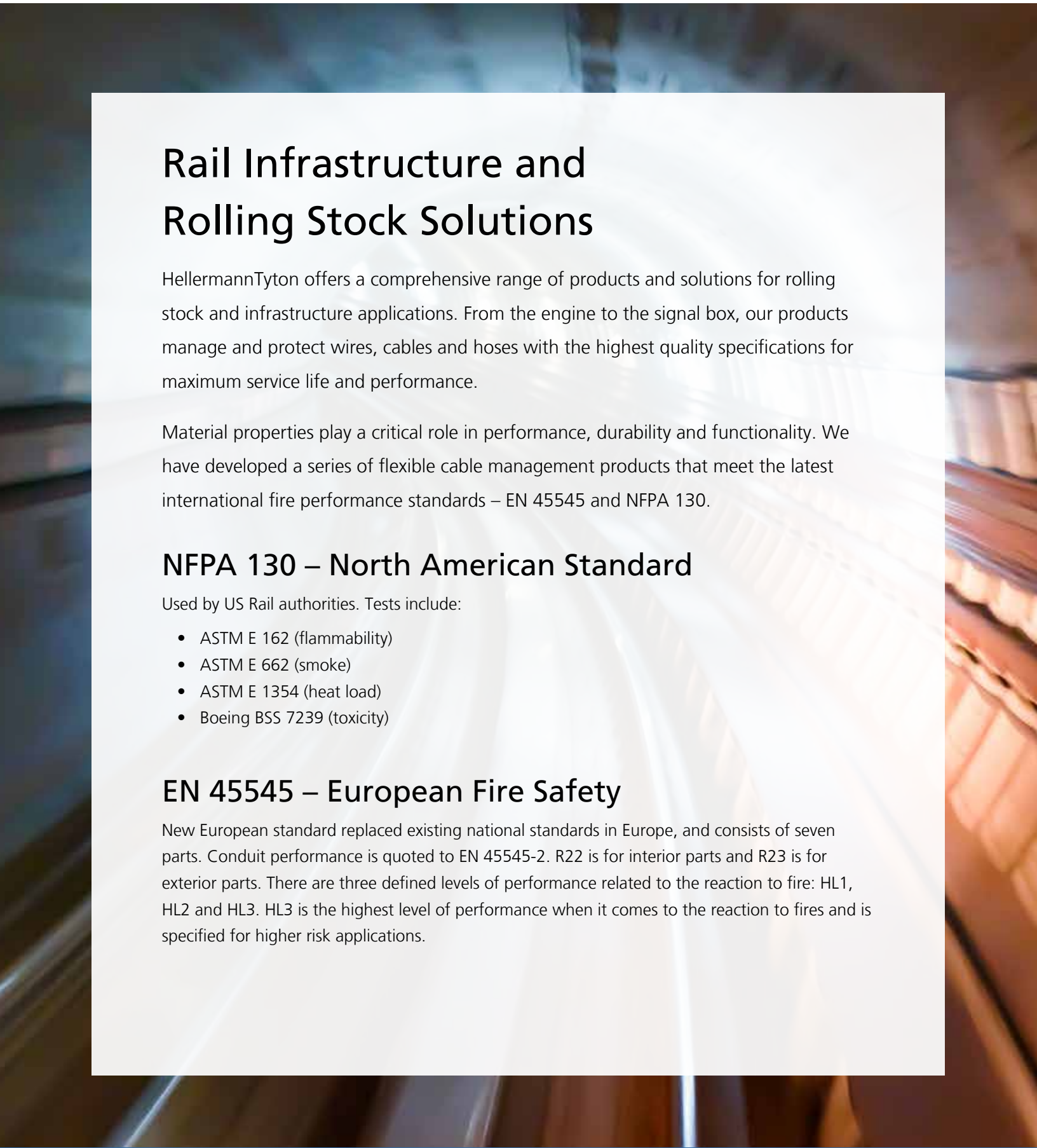
HellermannTyton

Rail Infrastructure & Rolling Stock Solutions



Rail Infrastructure and Rolling Stock Solutions

HellermannTyton offers a comprehensive range of products and solutions for rolling stock and infrastructure applications. From the engine to the signal box, our products manage and protect wires, cables and hoses with the highest quality specifications for maximum service life and performance.

Material properties play a critical role in performance, durability and functionality. We have developed a series of flexible cable management products that meet the latest international fire performance standards – EN 45545 and NFPA 130.

NFPA 130 – North American Standard

Used by US Rail authorities. Tests include:

- ASTM E 162 (flammability)
- ASTM E 662 (smoke)
- ASTM E 1354 (heat load)
- Boeing BSS 7239 (toxicity)

EN 45545 – European Fire Safety

New European standard replaced existing national standards in Europe, and consists of seven parts. Conduit performance is quoted to EN 45545-2. R22 is for interior parts and R23 is for exterior parts. There are three defined levels of performance related to the reaction to fire: HL1, HL2 and HL3. HL3 is the highest level of performance when it comes to the reaction to fires and is specified for higher risk applications.

HellermannTyton

Applications

Infrastructure

When exploring cable routing and protection solutions for your infrastucture applications, top-of-mind considerations may include product performance and the environment in which the installation resides. HellermannTyton can provide innovative solutions that ensure consistency and reliability, while also protecting your infrastructure investment.

Infrastructure

Key Considerations

- Safety
- Mechanical Duty
- Durability
- Environmental Conditions

Security and Monitoring

Trackside Signaling

Ticketing / Passenger Info

Tunnels

Rolling Stock

HellermannTyton offers a wide range of lightweight, durable products for rolling stock applications that ensure safety and reliability while helping to improve overall operational efficiencies.

Internal Rolling Stock

External Rolling Stock

Key Considerations

- Reliability
- Service Life & Performance
- Standards & Compliance
- Exposure & Maintenance

Intercity / Regional

Metro / Subway

Commuter Rail

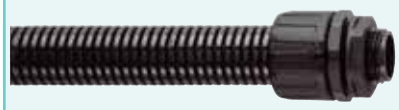
Streetcar / Trolley

FLEXIBLE NONMETALLIC CONDUIT

Flexible Nonmetallic Conduit for Internal Rolling Stock

HelaGuard HG-FR series is a highly flame retardant, low smoke / low toxic nylon conduit designed for use inside rail carriages and passenger zones. The modified PA6 nylon is lightweight and highly flexible with a high degree of tensile strength for durable performance. Use with Ultra Fittings for secure fit even under conditions that include vibration and movement.

HG-FR Series PA6 Flame Retardant Conduit



EN 45545-2

NFPA 130

Benefits

- Highly flexible
- Low fire hazard
- Lightweight

Applications

- Information panels & signage
- General routing of wires inside rail car or carriage

Passenger Areas

FLEXIBLE NONMETALLIC CONDUIT

Flexible Nonmetallic Conduit for External Rolling Stock

HelaGuard HG-HIR series is a modified heavyweight PA12 conduit that combines low fire hazard properties, high UV resistance and excellent fatigue life characteristics. The modifed PA12 material possesses high impact strength even at low temperatures, making it well suited for applications on the exterior of the rail carriages.

HG-HIR Series PA12 Nylon Conduit

EN 45545-2

NFPA 130

Benefits

- Excellent flexibility
- UV resistance
- High-impact strength
- High ingress protection
- Corrosion resistant
- High fatigue life
- Low fire hazard

Applications

- Low temperature environments
- General routing of wires above and below carrriages

Inter-Car Jumpers

Under Carriage Bogies

Internal Rolling Stock

External Rolling Stock

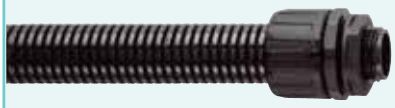
Infrastructure

FLEXIBLE NONMETALLIC CONDUIT

Flexible Nonmetallic Conduit for Infrastructure

HelaGuard HG-SW series conduit is an excellent general purpose nylon conduit that offers good UV and fire resistance along with high impact strength. This durable, yet highly flexible PA6 material is used in infrastructure applications such as ticketing counters, entry barriers, security systems, lighting and trackside signaling.

HG-SW Series PA6 Nylon Conduit



Benefits

- Excellent flexibility
- UV resistance
- High impact strength
- High ingress protection
- Corrosion resistance

Applications

- Information & ticketing
- Trackside signaling

Ticketing & Barriers

Trackside Signal & Roadway Crossings

FLEXIBLE METALLIC CONDUIT

Flexible Metallic Conduit

Flexible galvanized steel-core conduit with low fire hazard coatings offer excellent mechanical strength and ingress protection from the elements. The LFHUBRD series adds an outer layer of stainless steel overbraid for additional EMC screening.

Overbraided Metallic Conduit

EN 45545-2
NFPA 130

LFHU Jacketed Metallic Conduit

EN 45545-2
NFPA 130

Benefits

- Mechanical strength
- EMI / EMC screening
- Low fire hazard
- Ingress protection
- Corrosion resistance

Applications

- Security systems
- Passenger information stations
- Tunnels
- Escalators

Security Cameras

Escalators & Moving Walkways

Internal Rolling Stock
External Rolling Stock
Infrastructure

NONMETALLIC ULTRA FITTINGS

Nonmetallic Ultra Fittings for Flexible Nylon Corrugated Conduit

HelaGuard Nonmetallic snap-on Ultra Fittings feature integrated seal technology for a true one-piece component fitting. Fittings include a conduit seal which is preassembled in the fitting housing, along with face seal and locknut. Available in nylon metric or NPT thread in straight, 90- and 45-degree elbow styles. Also available in swivel, nickel-plated brass metric thread for secure fit and strain releif.

Straight, 90- and 45-Degree Elbows in Multiple Thread Options

Benefits

- Ingress ratings to IP66, IP67, IP68 and IP69.
- Fast fit, one-piece assembly.
- Vibration resistant.
- Nickel-plated brass threads swivel for strain relief.

Applications

- Suitable for internal or external rail carriage areas.
- Securely connects flexible conduit to panel walls.

NONMETALLIC FITTINGS

T-Fittings, Y-Fittings & Conduit Clips for Flexible Nylon Corrugated Conduit

Specialty fittings and mounting clips that reduce, reroute or affix conduit.

Ts and Ys

Clips

Benefits

- Ingress ratings to IP66, IP67, IP68 and IP69.
- High-degree pull-off strength enhances vibration resistance.

Applications

- Combine conduit runs with change of direction.
- Clips firmly secure conduit to surface.

METALLIC CONDUIT FITTINGS

Metallic Fittings for Braided Metallic Conduit

Multipart compresssion fitting locks braided layer between inner and outer compression nut. Compression-style fittings for jacketed LFHU series flexible metallic conduit are also available.

Machined Parts in Nickel-Plated Brass

Benefits

- Ingress rating of IP65.
- Provides EMC screening.
- Durable connection withstands vibration and movement.

Applications

- Used in conjunction with overbraided conduit.

Internal Rolling Stock External Rolling Stock Infrastructure

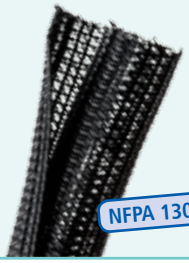
BRAIDED SLEEVING

Braided Sleeving

Flexible and lightweight, braided sleeving provides routing and abrasion protection to wires and bundles. Flame-retardant materials have been tested to NFPA 130 specifications. Available in traditional or wraparound styles. Fray-resistant material can be cut with ordinary scissors.

Flame-Retardant + Fray-Resistant Braided Sleeving

Split Wrap Flame-Retardant Braided Sleeving



Split Wrap Woven Flame-Retardant Sleeving

Benefits

- Overlapping wraparound desgin provides ease of access to wires post installation.
- Highly flame retardant.
- Lightweight & flexible.
- Temperature and moisture dissipation.
- Fray-resistant version can be cut with ordinary scissors without fraying ends.

Applications

- Flexible bundling of wire and cables in rolling stock and infrastructure.
- Abrasion protection for hoses and tubing; routing wires within control panel boxes and other tight spaces.

WIRING DUCT

Wiring Duct

A broad range of wall sizes in either standard PVC or halogen-free materials. Non-slip covers and smooth edges perform even in high-vibration applications.

PVC Slotted or Solid Wiring Duct

Halogen-Free Wiring Duct

Benefits

- Slip-resistant covers remain in place even during vibration and movement.
- Smooth edges reduce likelihood of fraying wires.
- Halogen-free material is nontoxic and will not release dangerous gases that could damage sensitive equipment.

Applications

- Routing and directing wires within trackside signaling control panels.
- Halogen-free control panels within rolling stock and tunnels.

Internal Rolling Stock

External Rolling Stock

Infrastructure

RATCHET P-CLAMP

Ratchet P-Clamp

Featuring an adjustable, ratchet-powered closure, the Ratchet P-Clamp custom fits bundles, cables and hoses without crushing or pinching. Convenient release feature allows adding wires to a bundle post installation. Available in straight (flat) and elbow configurations.

Releasable P-Clamps

EN 45545-2

Benefits

- One-piece ratchet closure design allows for easy installation during pre- or final assembly.
- Easy release feature allows for quick adjustments and maintenance.

Applications

- Heavy duty clamping of wires, cables and conduit.

NYLON CABLE TIES

Heavy Duty Cable Ties – Special Materials

Using high-performance materials, HellermannTyton Cable Ties and Mounts can accommodate a wide variety of applications both inside and outside carriage vehicles, as well as infrastructure.

High UV and Low Fire Hazard Nylon Cable Ties

EN 45545-2

Benefits

- UL 94 V-2 for low flammability performance.
- UV resistant for outdoor applications.

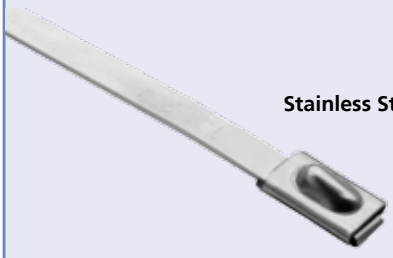
Applications

- Bundling and securing cables and hoses where low fire hazard properties are a requirement.

STAINLESS STEEL CABLE TIES

Stainless Steel Cable Ties

Rust and corrosion resistant stainless steel won't break down in extreme temperature applications.



Stainless Steel Cable Ties

Benefits

- Self-locking, ball bearing mechanism for easy installation by hand or tensioning tool.
- Fully enclosed head does not allow debris to interfere with locking mechanism.
- Halogen free and low fire hazard.

Applications

- Secure hoses and cables where harsh environments may affect the bundling application.

Internal Rolling Stock External Rolling Stock Infrastructure

HEAT SHRINK TUBING

TLFX Low Fire Hazard Heat Shrinkable Wire Identification

A halogen-free identification solution for rail vehicle marking and equipment cabinets due to low propagation of smoke and gas in the event of a fire.

Halogen-Free Identification

Benefits

- Flame retardant & low fire hazard properties
- Halogen free
- Printable

Applications

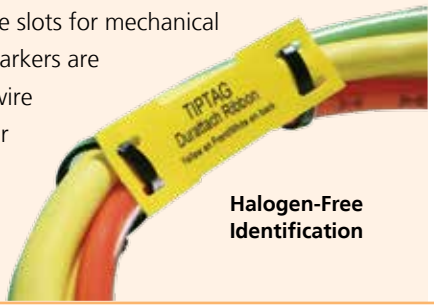
- Suitable for markings in vehicle wiring and equipment cabinets needing low propagation of smoke and gas in the event of a fire.

TIP TAGS

Tip Tags

TipTags are nonadhesive, cross-laminated polyolefin tags with die-cut cable tie slots for mechanical fastening. These cable markers are designed to mark large wire bundles or large diameter cables.

EN 45545-2



Halogen-Free Identification

Benefits

- Flame-retardant & low fire hazard properties
- Halogen free
- Printable
- Easy to install

Applications

- Ideal where exceptional print performance and long-term service life are critical.
- Marking large diameter cable bundles
- Tunnels and enclosed areas

M-BOSS

M-BOSS Stainless Steel Markers

M-BOSS Markers are used in areas where severe mechanical, chemical or weather conditions occur. The raised marking ensures text visibility even when covered in dust or debris.

Stainless Steel Embossed Markers

Benefits

- Raised marking ensures text visibility even when covered in dust, debris, grease or oil.
- Stainless steel grade SS316 is suited for use in harsh environments.

Applications

- Trackside lighting
- Signaling systems

Internal Rolling Stock External Rolling Stock Infrastructure

HEAT SHRINK TUBING

Flame Retardant Heat Shrink Tubing

TR27 is used for insulating wire and cables from dirt and moisture in conditions that require low toxic emissions in the event of fire.

EN 45545-2

TR27 Flame-Retardant and Halogen-Free

Benefits

- Thin walled for greater flexibility.
- Halogen free.
- Low fire hazard properties.

Applications

- Suitable where toxic emissions are prohibited such as tunnels and rail carriages.
- Trackside electrical boxes / sheds.

HEAT SHRINK TUBING

Flame-Retardant Adhesive-Lined Heat Shrink Tubing

TA37 heat shrink tubing has a low smoke index and excellent flame-retardant properties to meet strict fire security standards. TA37 has a unique combination of three product properties, which consist of halogen-free, adhesive-lined and flame-retardant materials.

EN 45545-2

TA37 Adhesive-Lined + Flame-Retardant + Halogen-Free

Benefits

- Thin wall for extra flexibility.
- Adhesive lined for greater insulation against moisture.
- Halogen free.
- Low fire hazard properties.

Applications

- Suitable where toxic emissions are prohibited such as tunnels and rail carriages.
- Trackside electrical boxes / sheds.

Internal Rolling Stock External Rolling Stock Infrastructure

Fire Hazard Performance

The European standard for fire safety performance is EN 45545, which categorizes risk based on the design type of railway vehicle and the operational situations the rolling stock will experience.

Cable routing and protection products fall under section two, or EN 45545-2. Within this section, R22 refers to interior parts and R23 is for exterior parts.

In addition, there are three different hazard levels assigned, ranging from HL1 (lowest risk) to HL3 (highest risk).

	DESIGN CATEGORY	N: Standard Vehicles	A: Automatic vehicles with no emergency trained staff on board	D: Double-deck vehicles	S: Vehicles with sleeping quarters
OPERATION CATEGORY	Vehicles not designed or equipped to run extensively underground, in tunnels or elevated structures.	HL1	HL1	HL1	HL2
	Vehicles designed for underground sections, tunnels and/or elevated structures (< 5km), with side evacuation and where there are stations or rescue points reachable within 4 minutes.	HL2	HL2	HL2	HL2
	Vehicles designed for underground sections, tunnels and/or elevated structures (> 5km), with side evacuation and where there are stations or rescue points reachable within 15 minutes.	HL2	HL2	HL2	HL3
	Vehicles designed for underground sections, tunnels and/or elevated structures, without side evacuation available.	HL3	HL3	HL3	HL3

Source: EN 45545-2:2013

EN 45545-2

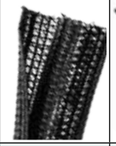
EN 45545-2 is mandatory in Europe for high-speed and conventional passenger trains. It is not, however, mandatory for light rail and trams, or within tunnels and other infrastructure applications.

Test certifications are required by an official fire laboratory.

NFPA 130

NFPA 130 North American Standards

- Flammability: Max Level: 35
- Smoke Density: Ds 1.5 Max 100; Ds 4.0 Max 200
- Toxicity: Measures several toxin levels against an established parts-per-million limit criterion. Measures carbon monoxide (CO), carbon dioxide (CO2), hydrogren cyanide (HCN), hydrogen flouride (HF), hydrogen chloride (HCI), hydrogren bromide (HBR), nitrogen oxide (NOX), and sulpher dioxide (SOZ).

	Nonmetallic Conduit			Flexible Metallic Conduit		Nylon Conduit Fittings	Abrasion Protection		
Product Type	HG-HIR	HG-FR	HG-SW	LFHU	LFHUBRD	HGU	BSSCFR	BSSWFR	BSSWVFR
Reference	FPIHR	FPR	FPAS	LFHU	LFHUBRD	FPAU	BSSCFR	BSSWFR	BSSWVFR
Image									
Material	PA12 Heavy Weight Nylon	PA6 Flame Retardant Nylon	PA6 Standard Weight Nylon	Galvanized Steel, Low Fire Hazard Jacket	Galvanized Steel, Low Fire Hazard Jacket, SS316 Overbraid	Polyamide 6.6	Polyester-FR	Polyester-FR	Polyester-FR
Compression Strength	60 kg 132 lbs	75kg 165 lbs	75kg 165 lbs	350 kg 770 lbs	350 kg 770 lbs	NA	NA	NA	NA
Temperature Range	-50°C to +110°C	-40°C to +120°C	-40°C to +120°C	-25°C to +90°C	-25°C to +90°C	-50°C to +135°C	-70°C to +125°C	-70°C to +125°C	-70°C to +125°C
Pull Off Strength (kg/100mm)	50 kg	75 kg	75 kg	350 kg	350 kg	70 kg	NA	NA	NA
Low Temp Impact	9.8J @ -40°C	3J @ -40°C	5J @ -40°C	NA	NA	NA	NA	NA	NA
NFPA 130	X	X		X	X	X	X	X	X
EN 45545-2	X	X		X	X	X			
Low Fire Hazard	X	X	UL 94 V-2	X	X	UL 94 V-2	UL 94 VW-1	UL 94 VW-1	UL 94 VW-1
EN 45545 Classification Interior (R22)	HL1, HL2 & HL3	HL1, HL2 & HL3		HL1, HL2 & HL3	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1 & HL2	HL1 & HL2	HL1 & HL2
EN 45545 Classification Exterior (R23)	HL1, HL2 & HL3	HL1, HL2 & HL3		HL1, HL2 & HL3	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1, HL2 & HL3
UV Resistance	High	Medium	Medium	Medium	High	High	High	High	High
EMC Performance					49dB				
Rolling Stock	X	X		X	X	X	X	X	X
Infrastructure	X	X	X	X	X	X	X	X	X

	Insulation		Wiring Duct	Nylon Cable Ties	Fastening & Clamping	Stainless Steel Solutions		Identification	
Product Type	TR27	TA37	HTWD-HF	T-Series	Ratcheting Clamps	Cable Ties	Embossed Markers	TLFX	TIPTAG-HF
Reference	TR27	TA37	HTWD-HF	T-Series	Ratcheting Clamps	MBT Series	M-Boss	TLFX	TIPTAG-HF
Image									
Material	Polyolefin	Polyolefin-Adhesive Lined	Polycarbonate/ ABS Styrene (PC/ABS)	Polyamide 6.6 UV Resistant PA66W	Polyamide 6.6 UV Resistant PA66W	SS304 Stainless or SS316 Stainless Steel	SS316 Stainless Steel Embossed	Polyolefin	Polyolefin
Compression Strength	NA	NA	NA					NA	NA
Temperature Range	-40°C to +105°C	-40°C to +105°C	-25°C to +90°C	-40°C to +85°C	-40°C to +85°C	-80°C to +538°C	-80°C to +538°C	-55°C to +105°C	-40°C to +90°C
Pull Off Strength (kg/100mm)	NA	NA	NA		NA			NA	NA
Low Temp Impact	NA	NA	NA	NA	NA	NA	NA	NA	NA
NFPA 130									
EN 45545-2	X	X	X	X	X	X	X	X	X
Low Fire Hazard	X	X	UL 94 V-0	UL 94 V-2	UL 94 V-2	Inherently Self-Extinguishing	Inherently Self-Extinguishing	X	X
EN 45545 Classification Interior (R22)	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1 & HL2	HL1 & HL2	HL1 & HL2			HL1, HL2 & HL3	HL1, HL2 & HL3
EN 45545 Classification Exterior (R23)	HL1, HL2 & HL3	HL1, HL2 & HL3	HL1 & HL2	HL1 & HL2	HL1 & HL2			HL1, HL2 & HL3	HL1, HL2 & HL3
UV Resistance	High	High	High	High	High	High	High	Low	Medium
EMC Performance									
Rolling Stock	X	X	X	X	X	X	X	X	X
Infrastructure	X	X	X	X	X	X	X	X	X

HellermannTyton

HellermannTyton North American Corporate Headquarters
7930 N. Faulkner Rd, PO Box 245017
Milwaukee, WI 53224-9517
Phone: (414) 355-1130, (800) 537-1512
Fax: (414) 355-7341, (800) 848-9866
email: corp@htamericas.com
www.hellermann.tyton.com
TS16949, AS9100, ISO 9001 and ISO14001 certified

HellermannTyton Canada
Unit #4, 205 Industrial Parkway North
Aurora, Ontario L4G 4C4 Canada
Phone: (800) 661-2461
Fax: (800) 390-3904
email: sales@hellermanntyton.ca

HellermannTyton Mexico
Anillo Periferico Sur 7980 Edificio 6A
Parque Industrial Tecnologico II
Santa María Tequepexpan
Tlaquepaque, Jalisco, Mexico 45601
Phone: 011-52-33-3-133-9880
Fax: 011-52-33-3-133-9861
email: info@htamericas.com.mx
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