

Adaptaflex
Flexible Conduit Systems

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Products & applications

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System's Weakest Link
Connections (Wire/cable/unrated conduit) subject to…

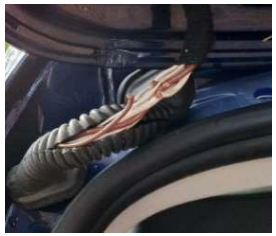


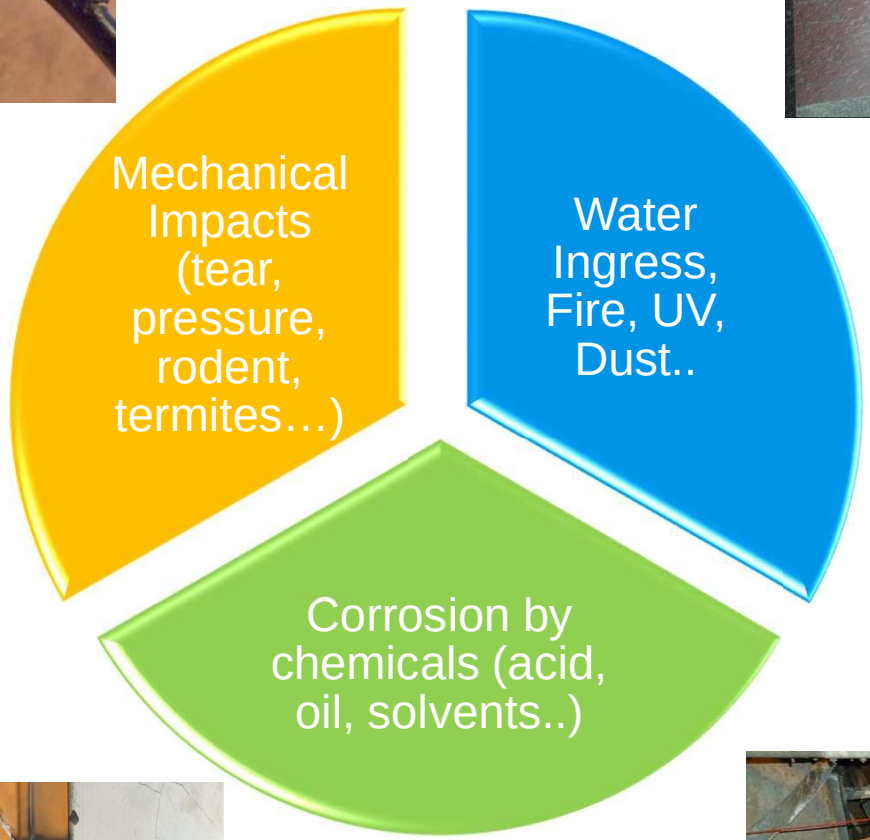










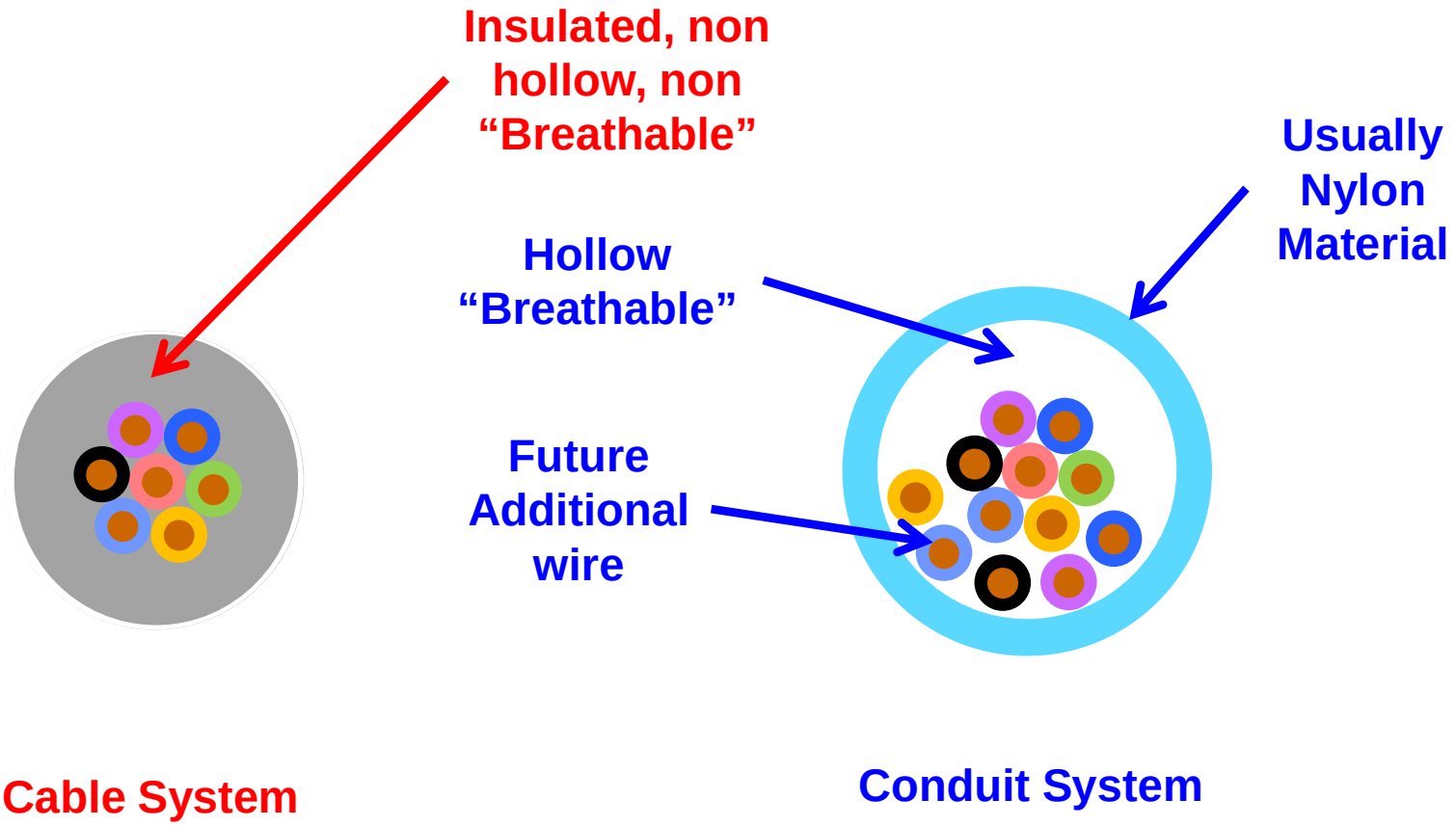






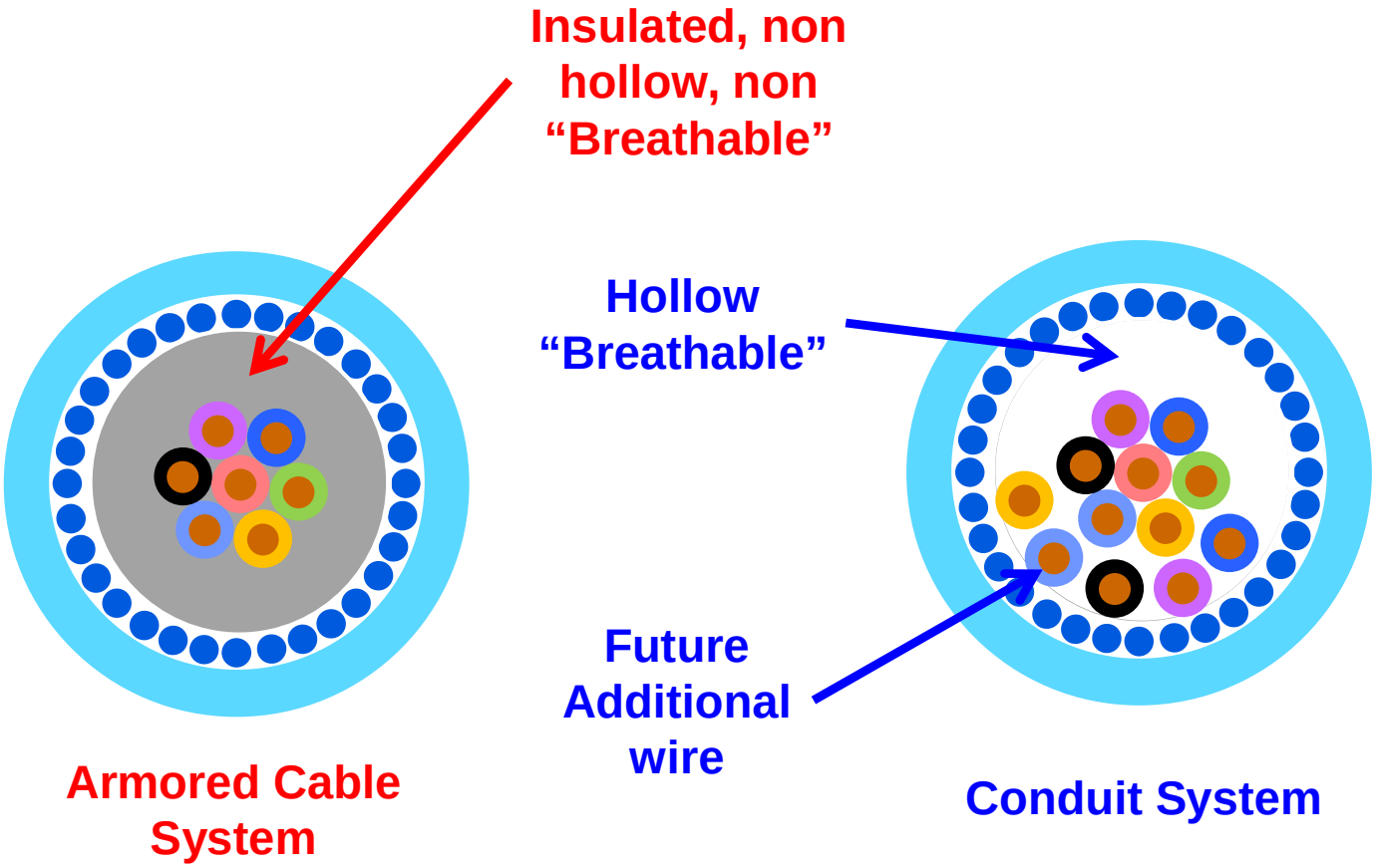
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Understand Cable Manufacturing Cost



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Understand Cable Manufacturing Cost



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Selection Criteria
Key questions to consider: Technical Issue



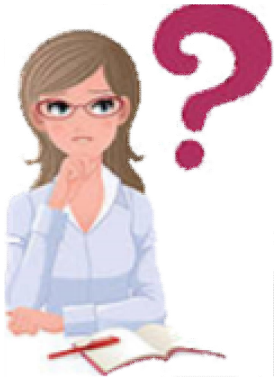
What is needed (compression, tensile strength)?

- Chemical Resistance
- Mechanical Protection
- Working Temperature

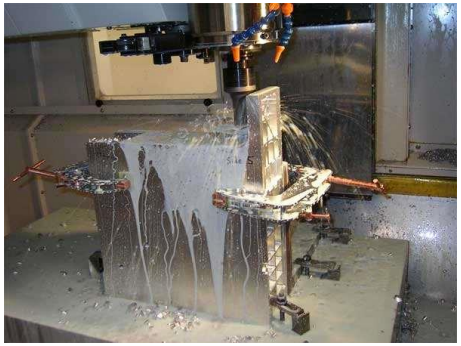




- Approvals



- Fire Resistance
- UV Resistance
- Static/ dynamic Application
- IP Rating





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Selection Criteria
Key questions to consider: Hidden Cost Issue:

Cost

Quality

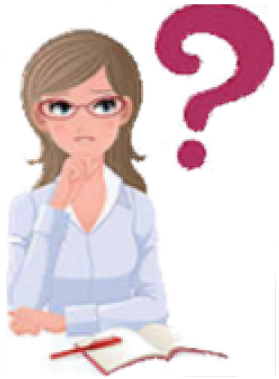


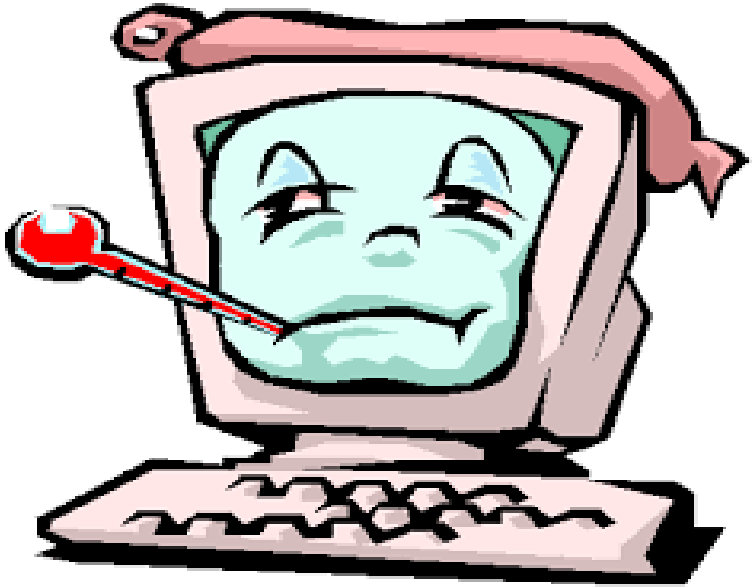
Pay higher insurance Premium

Short term benefits?



Money saved from compromising quality





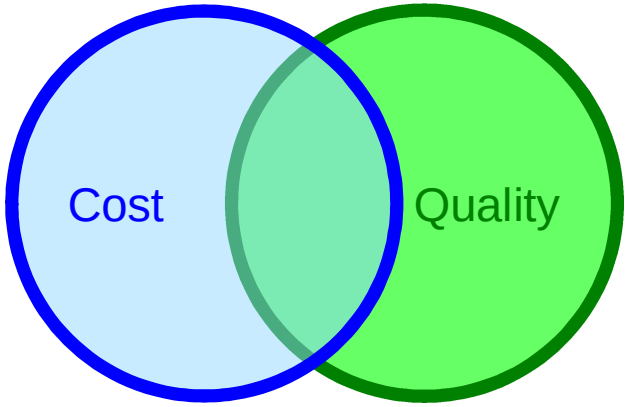
More Downtime

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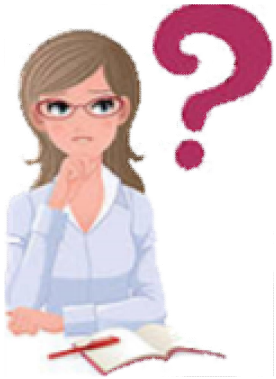
Selection Criteria
Key questions to consider: Hidden Cost Issue:



Pay Lower insurance Premium



Long term benefits?





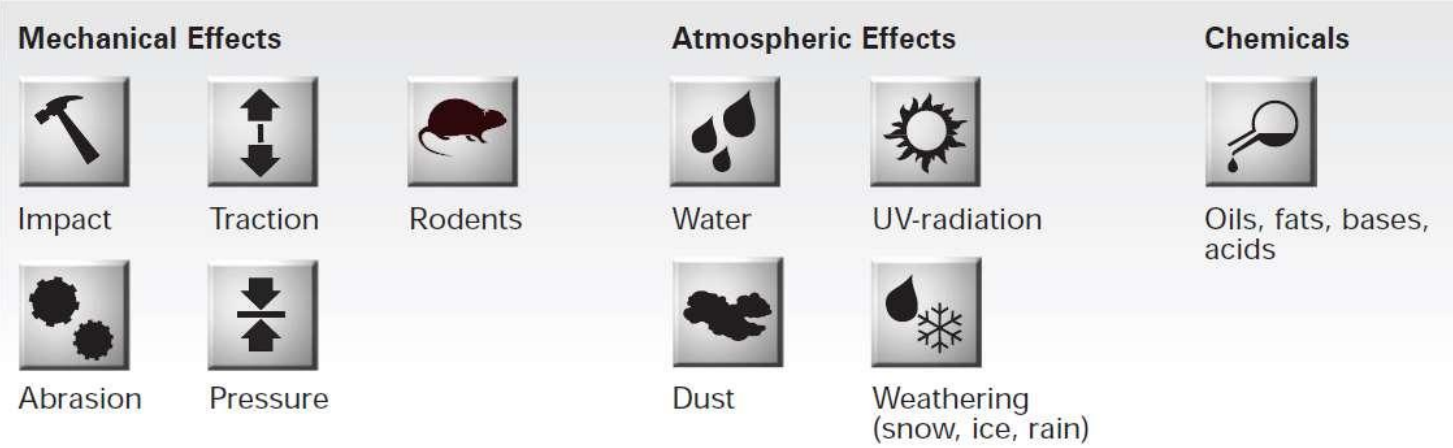
Less Money saved from quality products



Less Downtime

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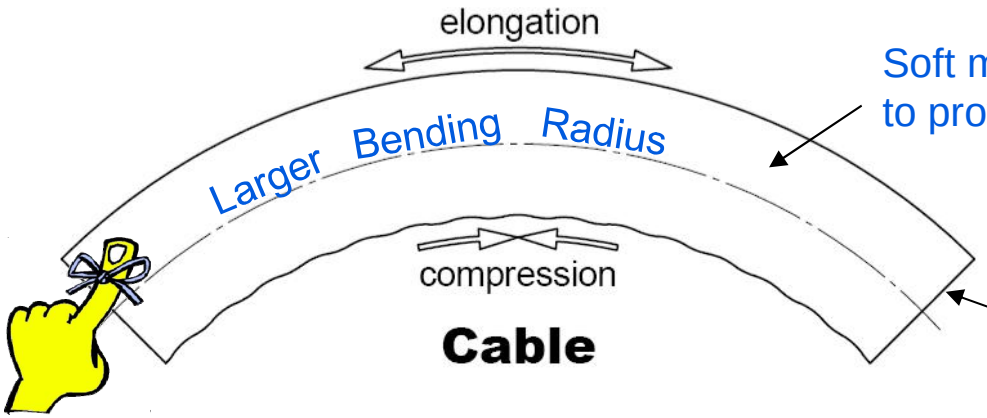
Flexible conduit systems
What is it?



- A system to provide the physical protection of electrical cables – power, data.
- Provides the effective and reliable functionality of an electrical or data system
- Conduit systems provide 3 single or combinations of protection type.

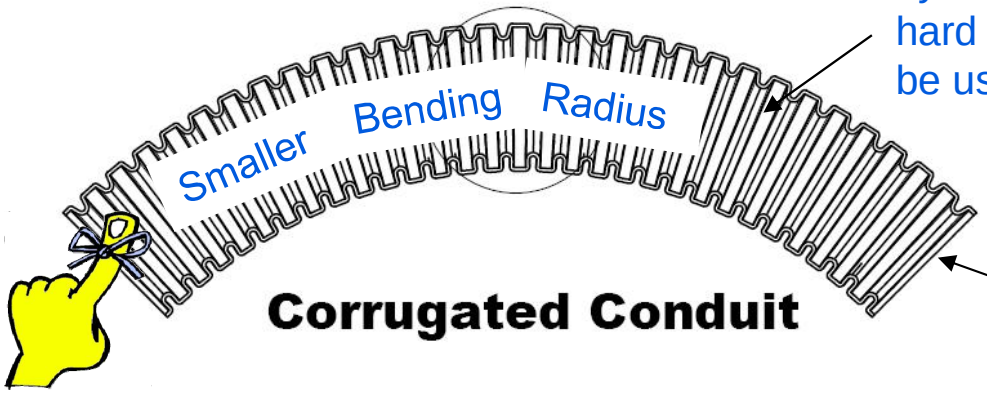
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Advantages of corrugated conduit
Compared to cable



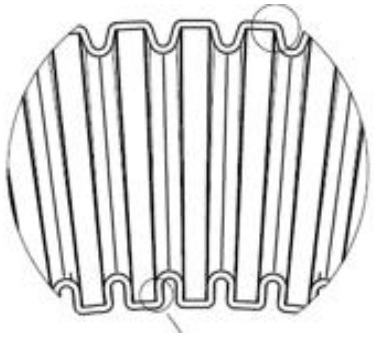
Soft material necessary to provide flexibility

Solid Core



Flexibility provided by the corrugation hard material can be used

Non Solid Core



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Material Comparation
PVC Vs Nylon 6

	PVC	Nylon
Elongation	High	Low
Oxygen Index	44%	24%
Melting Point Deg C	190	230
Ultimate Tensile Strength MPa	16	150

PVC (Polyvinyl Chloride) – is the most commonly used thermoplastic insulator for cables. It is cheap, durable and widely available. However, the chlorine in PVC (**a halogen**) **causes the production of thick, toxic, black smoke when burnt and can be a health hazard in areas where low smoke and toxicity are required** (e.g. confined areas such as tunnels). Normal operating temperatures are typically between 75C and 105C (depending on PVC type). Temperature limit is 160C (<300mm2) and 140C (>300mm2).

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The characteristic features of nylon 6,6

Better weathering properties; better sunlight resistance

High melting point (256 °C/492.8 °F)

Excellent abrasion resistance

greater elasticity and elastic recovery.

Durability strength : its high tenacity fibers are used for seatbelts, tire cords, ballistic cloth and other uses.

Low elongation

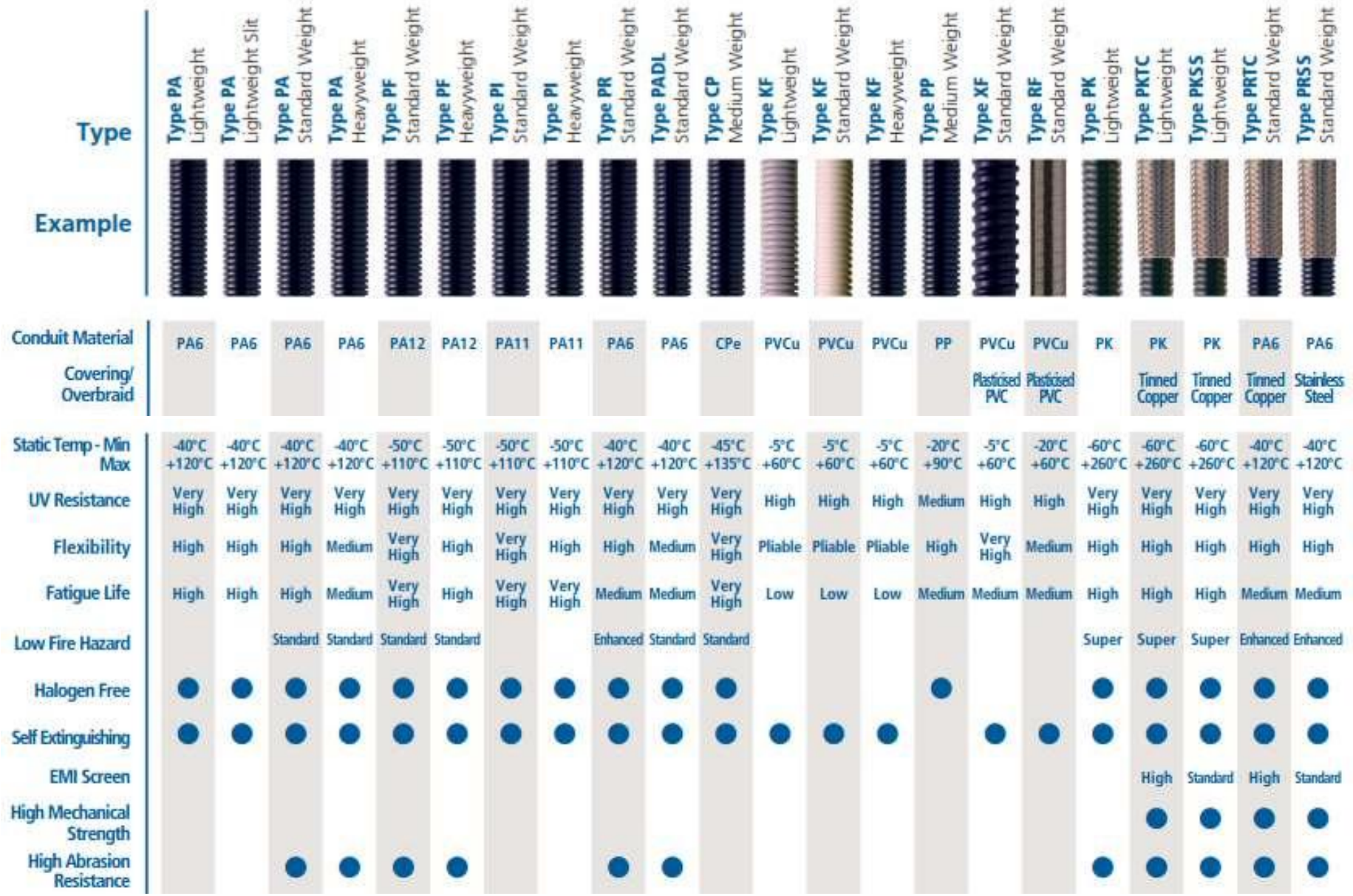
High resistance to insects, fungi, animals, as well as molds, mildew, rot and many chemicals

Melts instead of burning

Used in many military / Safety applications

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Non Metallic Conduit



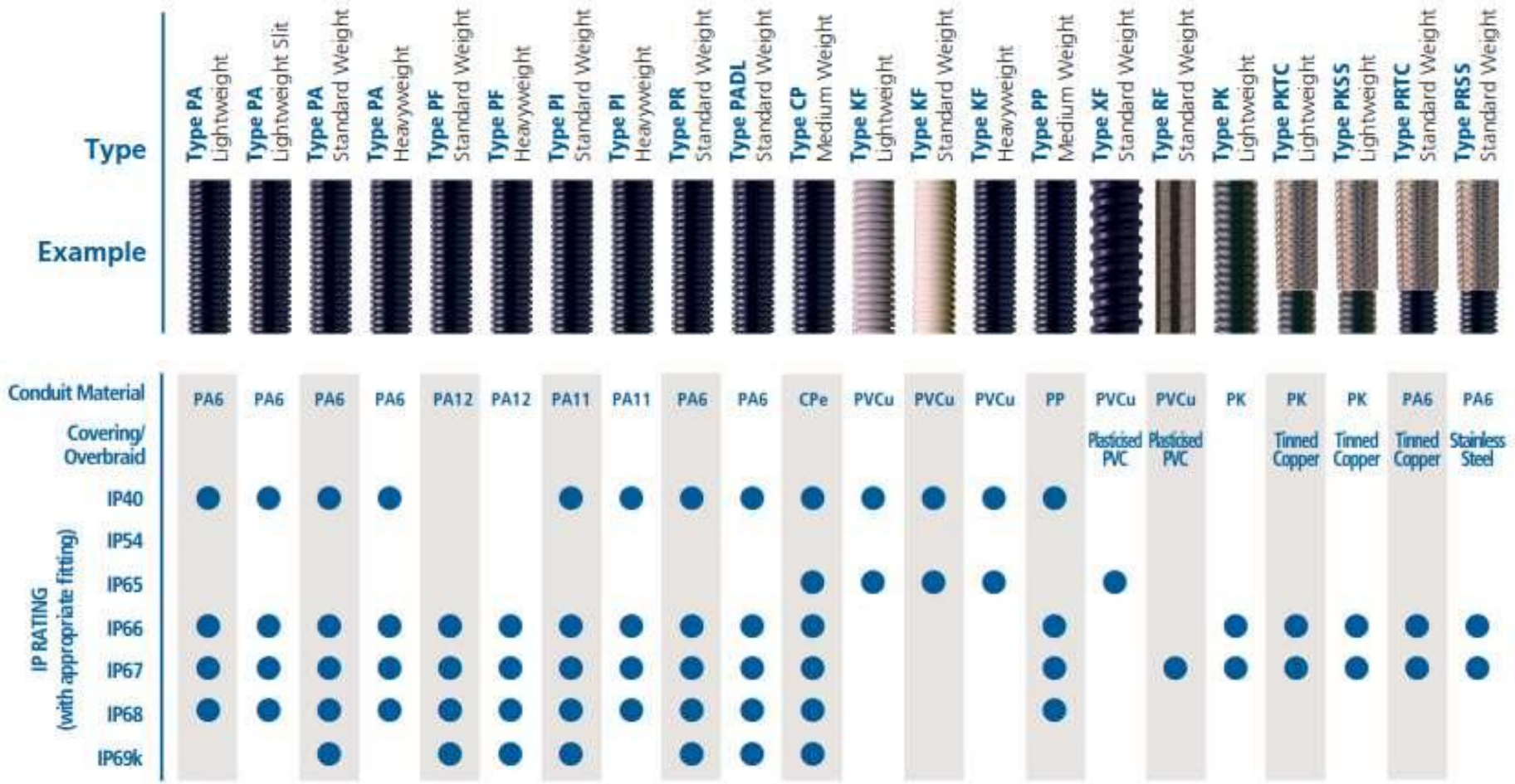
Type	Type PA Lightweight	Type PA Lightweight Slit	Type PA Standard Weight	Type PA Heavyweight	Type PF Standard Weight	Type PF Heavyweight	Type PI Standard Weight	Type PI Heavyweight	Type PR Standard Weight	Type PADL Standard Weight	Type CP Medium Weight	Type KF Lightweight	Type KF Standard Weight	Type KF Heavyweight	Type PP Medium Weight	Type XF Standard Weight	Type RF Standard Weight	Type PK Lightweight	Type PKTC Lightweight	Type PKSS Lightweight	Type PRTC Standard Weight	Type PRSS Standard Weight
Example																						
Conduit Material	PA6	PA6	PA6	PA6	PA12	PA12	PA11	PA11	PA6	PA6	CPe	PVCu	PVCu	PVCu	PP	PVCu	PVCu	PK	PK	PK	PA6	PA6
Covering/ Overbraid																Plasticised PVC	Plasticised PVC		Tinned Copper	Tinned Copper	Tinned Copper	Stainless Steel
Static Temp - Min Max	-40°C +120°C	-40°C +120°C	-40°C +120°C	-40°C +120°C	-50°C +110°C	-50°C +110°C	-50°C +110°C	-50°C +110°C	-40°C +120°C	-40°C +120°C	-45°C +135°C	-5°C +60°C	-5°C +60°C	-5°C +60°C	-20°C +90°C	-5°C +60°C	-20°C +60°C	-60°C +260°C	-60°C +260°C	-60°C +260°C	-40°C +120°C	-40°C +120°C
UV Resistance	Very High	Very High	Very High	Very High	Very High	Very High	Very High	Very High	Very High	Very High	Very High	High	High	High	Medium	High	High	Very High	Very High	Very High	Very High	Very High
Flexibility	High	High	High	Medium	Very High	High	Very High	High	High	Medium	Very High	Pliable	Pliable	Pliable	High	Very High	Medium	High	High	High	High	High
Fatigue Life	High	High	High	Medium	Very High	High	Very High	Very High	Medium	Medium	Very High	Low	Low	Low	Medium	Medium	Medium	High	High	High	Medium	Medium
Low Fire Hazard			Standard	Standard	Standard	Standard			Enhanced	Standard	Standard							Super	Super	Super	Enhanced	Enhanced
Halogen Free	●	●	●	●	●	●	●	●	●	●	●				●			●	●	●	●	●
Self Extinguishing	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●
EMI Screen																			High	Standard	High	Standard
High Mechanical Strength																			●	●	●	●
High Abrasion Resistance			●	●	●	●			●	●								●	●	●	●	●

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Non Metallic Conduit

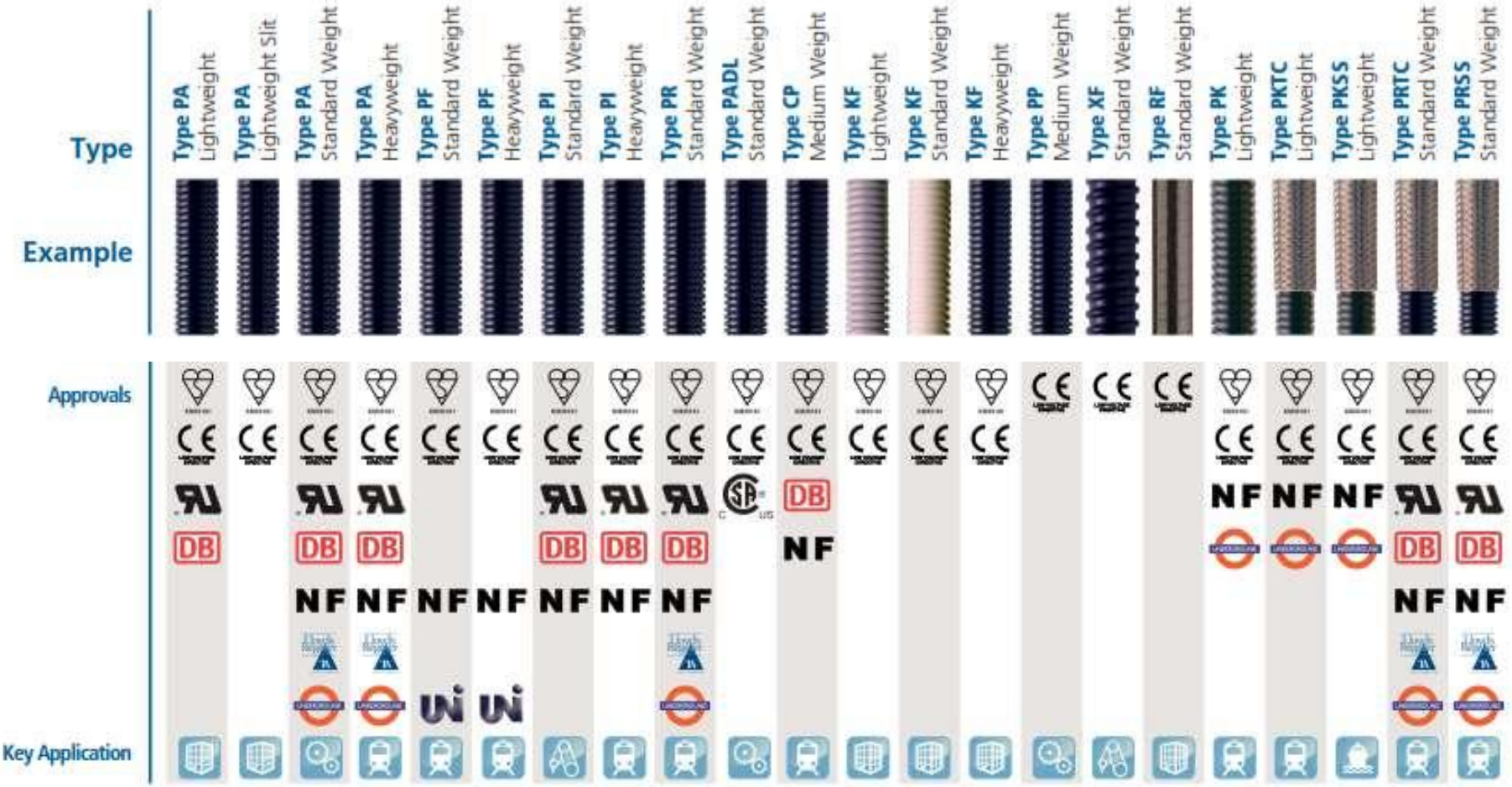


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Adaptalok
ATS System



- IP66, 67, 68 (4 bar for 30 minutes) & 69k to DIN40050
- Fit and Forget
- Easier selection
- Reliability & Integrity in application

1-piece manufactured component

- Rapid fit product - time saving
- Very easy to install
- No parts to lose
- Seal and washer permanently fitted
- Highly visible for inspections
- Safe installation - Tool required for disassembly
- Rapid disassembly with simple tool if required
- Low Smoke - Zero Halogen

ADAPTALOK ATS

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Adaptalok ATS System
Product range

	Straight	90° Elbow	90° Elbow
Nylon threads	A 	C90 	45 
Swivel Metallic Threads (Male)	SA 	CS90 	S45 
Swivel Metallic Threads (Female)	SFA 	CSF90 	SF45 
UNIEF Circular Connectors	U-SFA 	U-CSF90 	U-SF45 
Swivel Flanges	FLA 	FL-C90 	FL45 
Couplers	U 		
Specials	√	√	√

Thread type	Nylon	Swivel metal
Metric	√	√
NPT	√	√
PF	√	x
PG	x	√
'Big Bore' metric	√	√
UNEF	x	√

For conduit sizes:

13mm…54mm

NW10…NW48

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Adaptalok
PA, PF, PI, PR, CP & PADL Conduit Fittings

A = Straight fixed



C90 = 90° elbow fixed thread



45 = 45° elbow fixed thread



Y = 3 way coupler



U = swivel coupler



SA = Swivel straight Male Thread



CS90 = 90° elbow swivel Male Thread



S45 = 45° elbow swivel Male Thread



SFA = Swivel straight Female Thread



CSF90 = 90° elbow swivel Female Thread



SF45 = 45° elbow swivel Female Thread



FL/A = Straight swivel flange



FL/C90 = 90° elbow swivel fixed flange (larger sizes)



FL/45 = 45° elbow swivel flange



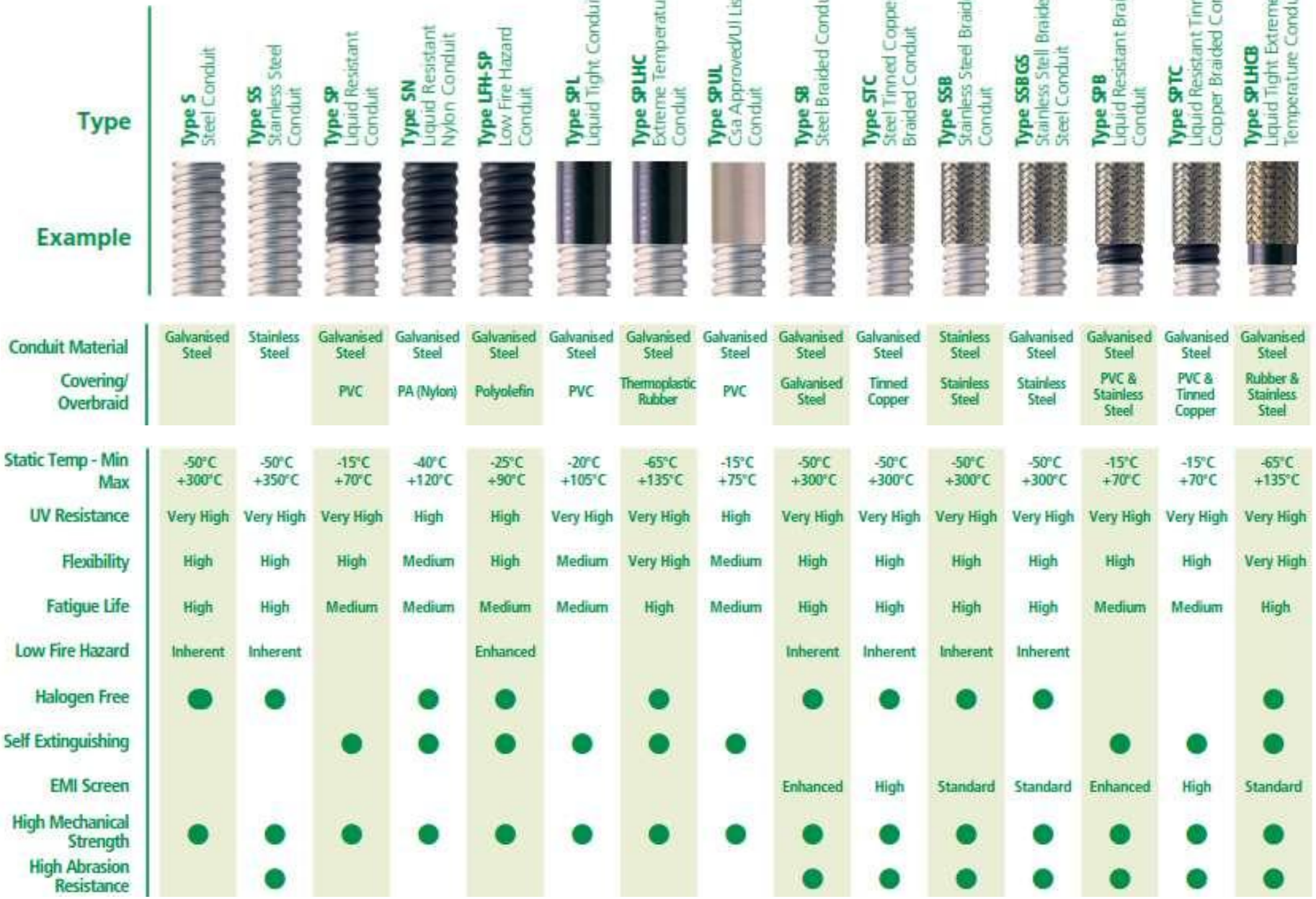
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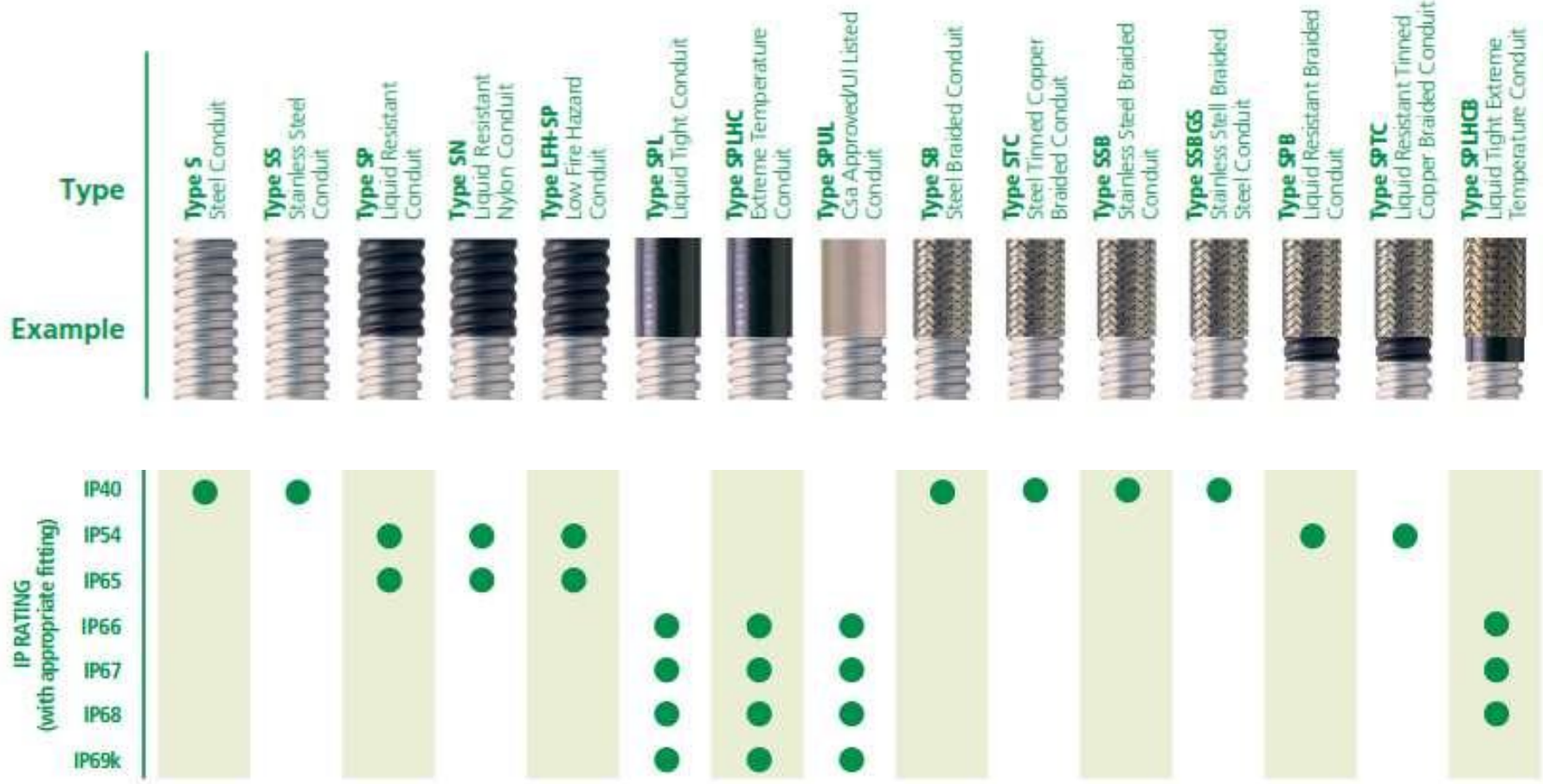
Metallic Conduit



Type	Type S Steel Conduit	Type SS Stainless Steel Conduit	Type SP Liquid Resistant Conduit	Type SN Liquid Resistant Nylon Conduit	Type LFH-SP Low Fire Hazard Conduit	Type SPL Liquid Tight Conduit	Type SPLHC Extreme Temperature Conduit	Type SPUL Csa Approved/Ul Listed Conduit	Type SB Steel Braided Conduit	Type STC Steel Tinned Copper Braided Conduit	Type SSB Stainless Steel Braided Conduit	Type SSBGS Stainless Steel Braided Steel Conduit	Type SPB Liquid Resistant Braided Conduit	Type SPTC Liquid Resistant Tinned Copper Braided Conduit	Type SPLHCB Liquid Tight Extreme Temperature Conduit
Example															
Conduit Material	Galvanised Steel	Stainless Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Stainless Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel	Galvanised Steel
Covering/ Overbraid			PVC	PA (Nylon)	Polyolefin	PVC	Thermoplastic Rubber	PVC	Galvanised Steel	Tinned Copper	Stainless Steel	Stainless Steel	PVC & Stainless Steel	PVC & Tinned Copper	Rubber & Stainless Steel
Static Temp - Min Max	-50°C +300°C	-50°C +350°C	-15°C +70°C	-40°C +120°C	-25°C +90°C	-20°C +105°C	-65°C +135°C	-15°C +75°C	-50°C +300°C	-50°C +300°C	-50°C +300°C	-50°C +300°C	-15°C +70°C	-15°C +70°C	-65°C +135°C
UV Resistance	Very High	Very High	Very High	High	High	Very High	Very High	High	Very High	Very High	Very High	Very High	Very High	Very High	Very High
Flexibility	High	High	High	Medium	High	Medium	Very High	Medium	High	High	High	High	High	High	Very High
Fatigue Life	High	High	Medium	Medium	Medium	Medium	High	Medium	High	High	High	High	Medium	Medium	High
Low Fire Hazard	Inherent	Inherent			Enhanced				Inherent	Inherent	Inherent	Inherent			
Halogen Free	●	●		●	●		●		●	●	●	●			●
Self Extinguishing			●	●	●	●	●	●					●	●	●
EMI Screen									Enhanced	High	Standard	Standard	Enhanced	High	Standard
High Mechanical Strength	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
High Abrasion Resistance		●							●	●	●	●	●	●	●

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Metallic Conduit



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Metallic conduit fittings
S, SS, SP(L), SN, LFH-SP, SPLHC(B), and SPUL

A = Straight fixed



B = Straight swivel



F = Female



C = Smooth entry No thread



A = Straight fixed



B = Straight swivel



M = Multipart



E = Conduit terminator



M = Multipart



C90° Elbow



F = Female



A = Straight



B = Straight



E = Conduit terminator



M = Multipart



C90° Elbow



SPLHCB



A = Straight fixed



B = Straight swivel

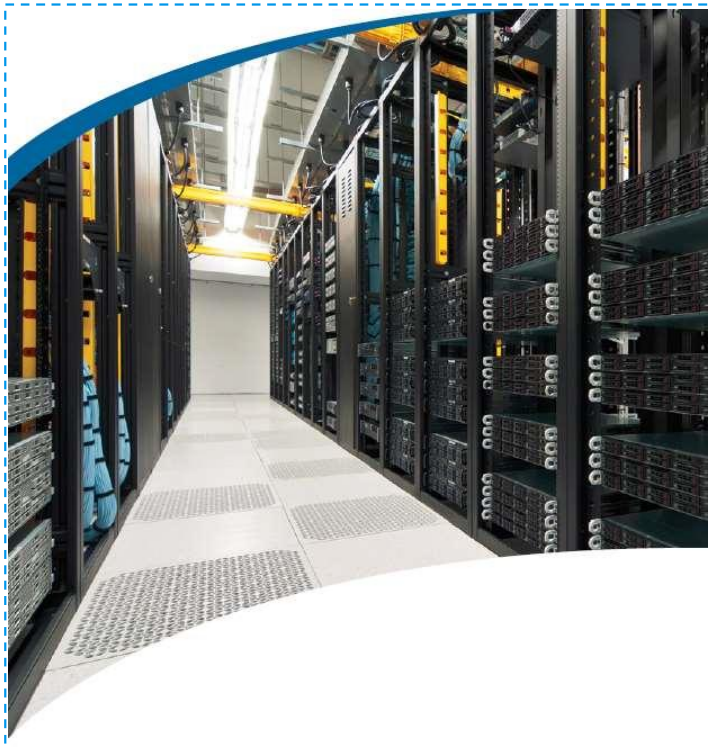
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Data Center Applications









- **Continuous Operation & Sustainability**
  - Flexible conduit system to support additional cable installations (scalability) for panel extensions
- **Power Quality, Efficiency & Reliability**
  - Mechanical cable protection against impacts, rodents, termites
- **Safety & Contamination**
  - Self extinguishing, flame retardant
  - Ingress protections (min IP65)
- **Space Savings**
  - Wires/cables packed neatly in conduit system
- **Total Project Cost Reduction**
  - Enhanced/compact wire/cable management
  - Quick installation (fittings + conduit)



Technology & standards

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International Approvals

- All product testing is conducted and verified by independent third parties

- As one of the world's leading flexible conduit system manufacturers, we are actively driving industry standards forward.

- With many International Approvals to our name and active participation on leading technical standards committees, we are able to use our technical experience and knowledge to ensure safety and quality levels are maintained both now and in the future.



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Certification
General

Quality System Approval
ISO 9001:2008

Environmental Approval
ISO14001

CE Marking
to Low Voltage Directive

Kitemark Approval
- BS EN IEC 61386 - Flexible conduit systems.
- Series of 12 tests carried out on all conduit systems Mechanical, Environmental and Fire
- BSI Approved – Type testing every 6 months.

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Certification
North America

UL1696 New Specifically for Corrugated systems

- Dual standard for Canada and USA carrying C US mark

UL360 Standard for Liquid tight conduit

- Full compliance requires copper Earthing wire fitted –
- only legal in US to use conduit as primary earth
- Recognition compliance available without copper Earthing wire

UL514b

- Liquid Tight Fittings

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Additional testing
Mechanical & Chemical

Product and Material Tests

- Chemical Resistances oils acids solvents and bases
- Vibration - BS EN 61373
- IP 66, 67, 68, to ISO 60529
- IP69k to DIN 40050-9
- Dynamic IP66 test (Siemens Specification)
- Sand Testing
- Mechanical Tests – Impact, Compression, Tensile

Legislation

- REACH & SVHC, RoHS & WEEE Fully Compliant Products

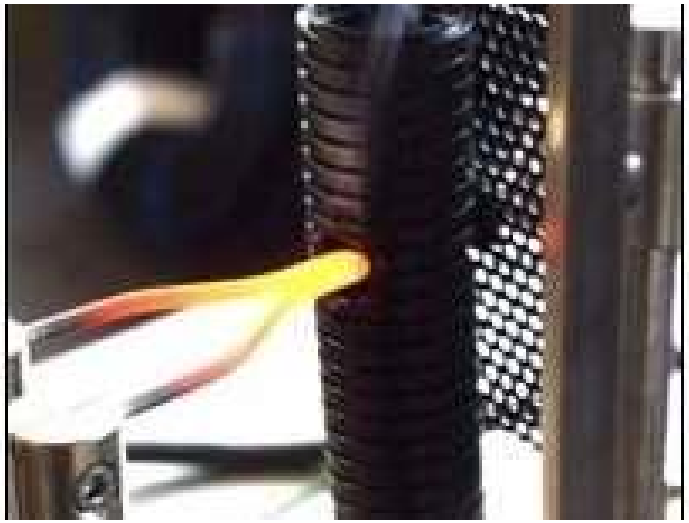
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Flammability Tests
Ignitability

Limiting Oxygen Index

To be classed as LFH it must be more than 28%





Glow wire on conduit

Flammability





UL94

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Mechanical Tests

All Tests to BS EN 61386 and 61373

Impact

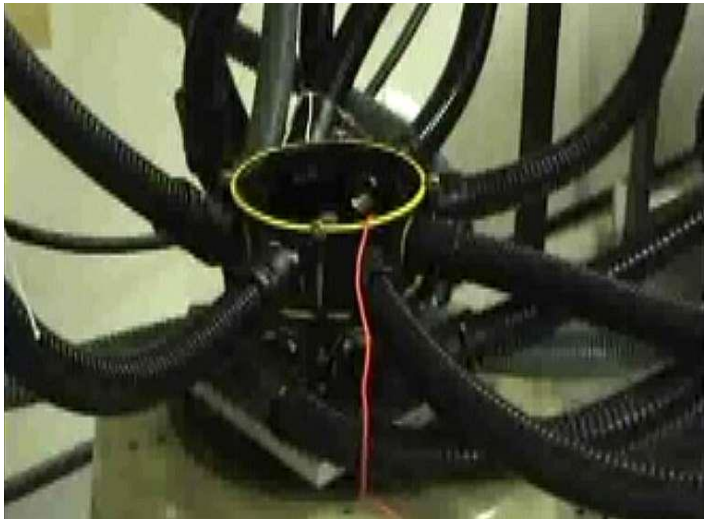




Compression

Tensile Strength





Vibration

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Chemical and Ingress (IP) Tests

IP69K



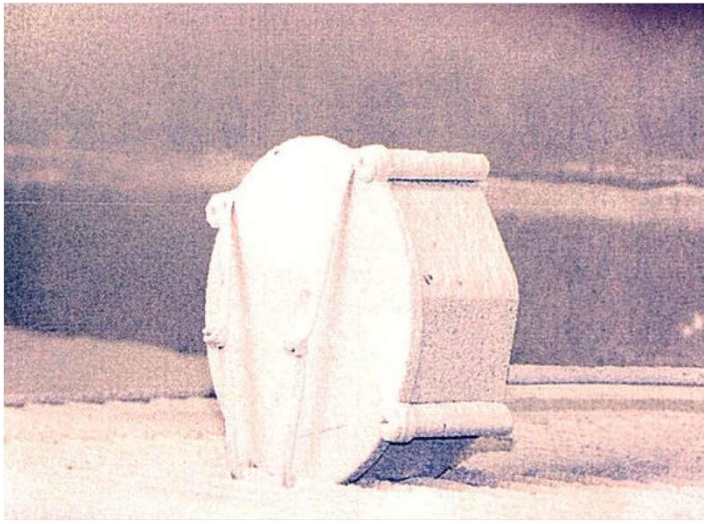


IP69K

Water Immersion Test

IPX7



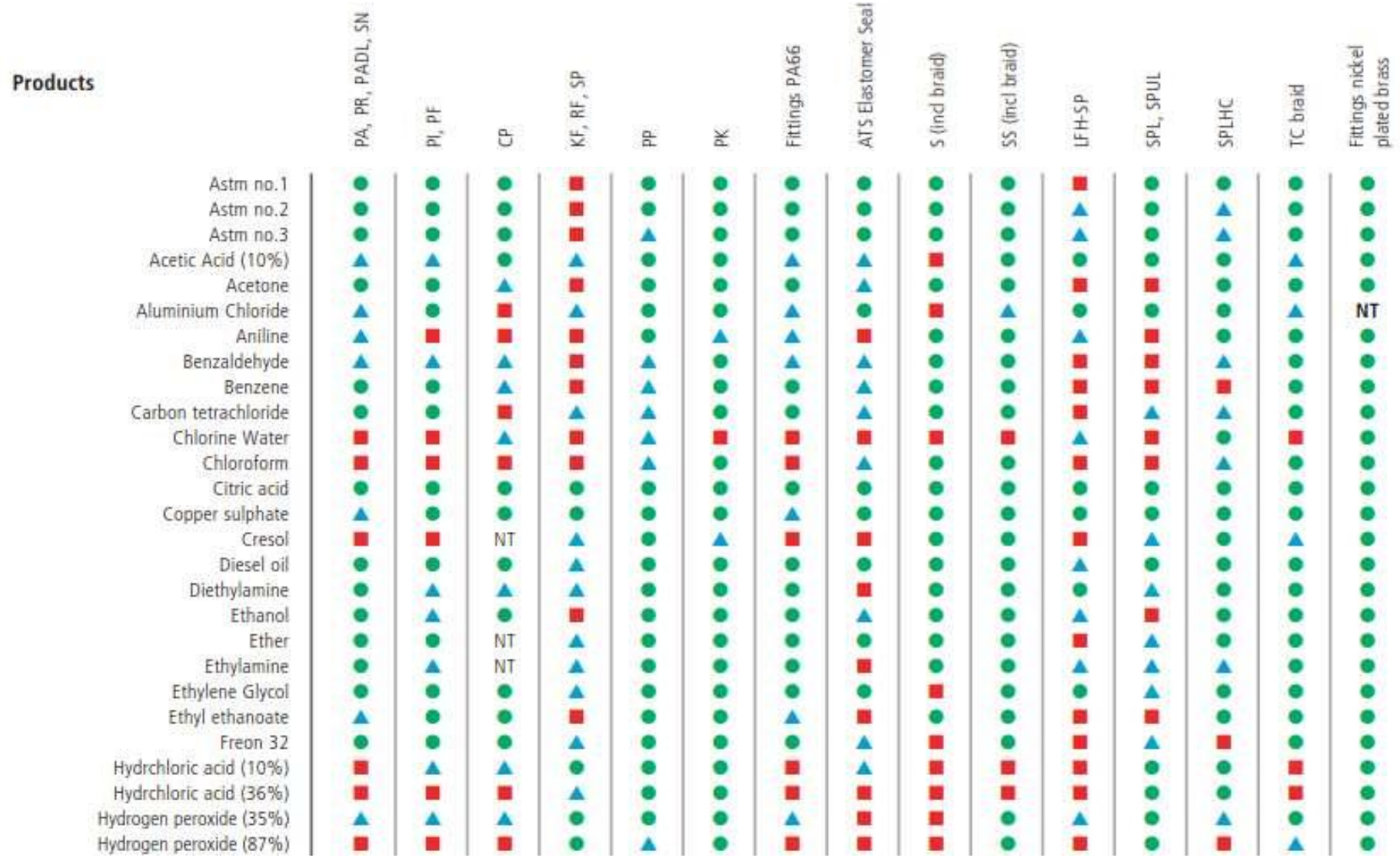


Dust Test Chamber

IP6X

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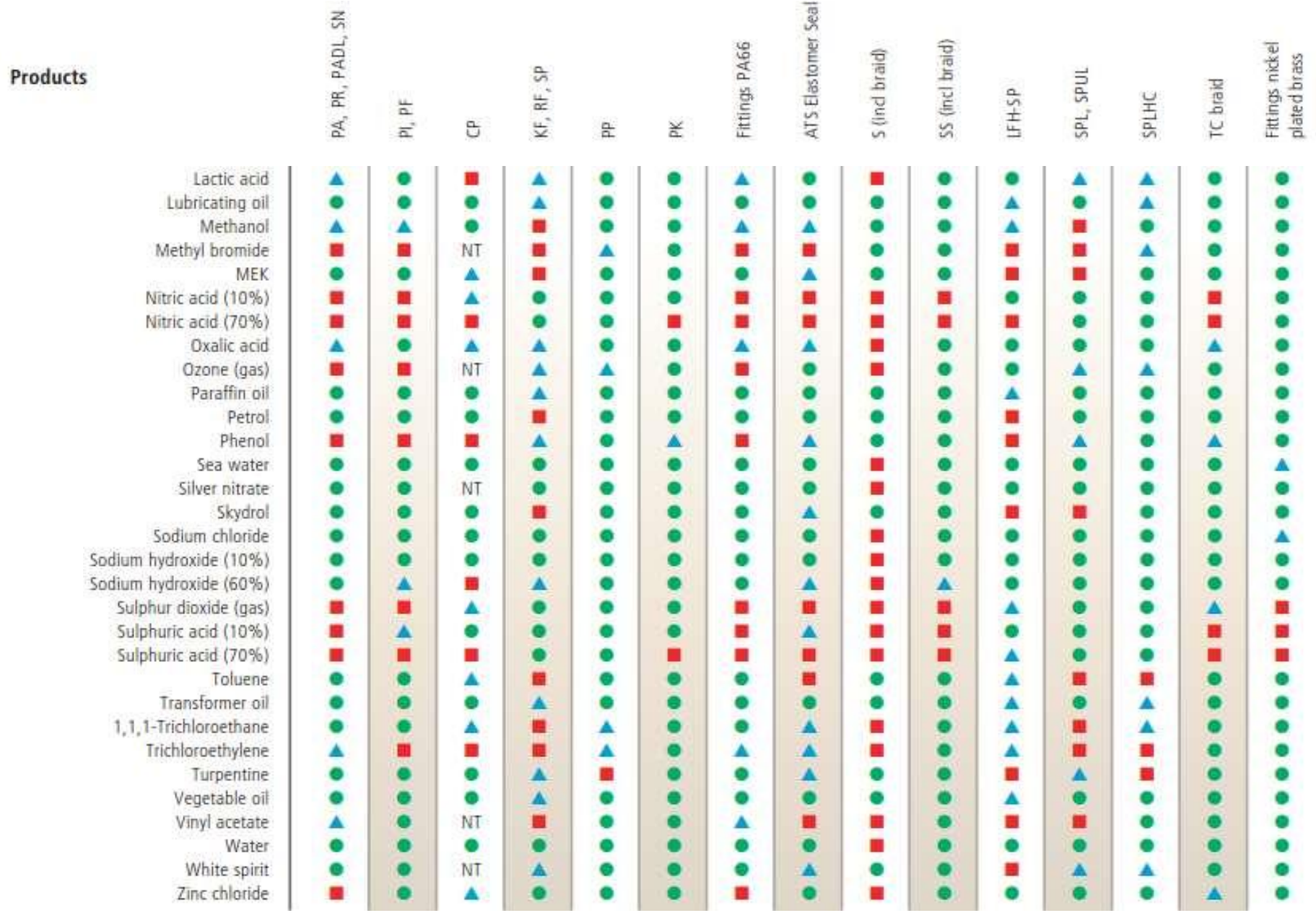
Chemical Resistance



Products	PA, PR, PADL, SN	PI, PF	CP	KF, RF, SP	PP	PK	Fittings PA66	ATS Elastomer Seal	S (incl braid)	SS (incl braid)	LFH-SP	SPL, SPUL	SPLHC	TC braid	Fittings nickel plated brass
Astm no.1	●	●	●	■	●	●	●	●	●	●	■	●	●	●	●
Astm no.2	●	●	●	■	●	●	●	●	●	●	▲	●	▲	●	●
Astm no.3	●	●	●	■	▲	●	●	●	●	●	▲	●	▲	●	●
Acetic Acid (10%)	▲	▲	●	▲	●	●	▲	▲	■	●	●	●	●	▲	●
Acetone	●	●	▲	■	●	●	●	▲	●	●	■	■	●	●	●
Aluminium Chloride	▲	●	■	▲	●	●	▲	●	■	▲	●	●	●	▲	NT
Aniline	▲	■	■	■	●	▲	▲	■	●	●	▲	■	●	●	●
Benzaldehyde	▲	▲	▲	■	▲	●	▲	▲	●	●	■	■	▲	●	●
Benzene	●	●	▲	■	▲	●	●	▲	●	●	■	■	■	●	●
Carbon tetrachloride	●	●	■	▲	▲	●	●	▲	●	●	■	▲	▲	●	●
Chlorine Water	■	■	▲	■	▲	■	■	■	■	■	▲	■	●	■	●
Chloroform	■	■	■	■	▲	●	■	▲	●	●	■	■	▲	●	●
Citric acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Copper sulphate	▲	●	●	●	●	●	▲	●	●	●	●	●	●	●	●
Cresol	■	■	NT	▲	●	▲	■	■	●	●	■	▲	●	▲	●
Diesel oil	●	●	●	▲	●	●	●	●	●	●	▲	●	●	●	●
Diethylamine	●	▲	▲	▲	●	●	●	■	●	●	●	▲	●	●	●
Ethanol	●	▲	●	■	●	●	●	▲	●	●	▲	■	●	●	●
Ether	●	●	NT	▲	●	●	●	●	●	●	■	▲	●	●	●
Ethylamine	●	▲	NT	▲	●	●	●	■	●	●	▲	▲	▲	●	●
Ethylene Glycol	●	●	●	▲	●	●	●	●	■	●	●	▲	●	●	●
Ethyl ethanoate	▲	●	●	■	●	●	▲	■	●	●	■	■	●	●	●
Freon 32	●	●	●	▲	●	●	●	▲	■	●	■	▲	■	●	●
Hydrchloric acid (10%)	■	▲	▲	●	●	●	■	▲	■	■	■	●	●	■	●
Hydrchloric acid (36%)	■	■	■	▲	●	●	■	■	■	■	■	●	●	■	●
Hydrogen peroxide (35%)	▲	▲	▲	●	●	●	▲	■	■	●	▲	●	▲	●	●
Hydrogen peroxide (87%)	■	■	■	●	▲	●	■	■	■	●	■	●	■	▲	●

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Chemical Resistance



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Global applications and projects

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Adaptaflex in
Construction projects across London

Shangri La restaurant
The Shard



▪Queen Elizabeth's
Olympic Park



Walkie Talkie
Building



Cheese Grater
Building



London Eye



St. Pancras
International



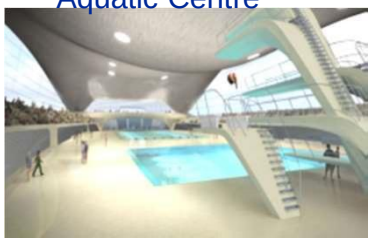
Arsenal Football Club



Docklands Light
Railway



Olympics 2012
Aquatic Centre



The Orbit



- Office Buildings
- Schools
- Hospitals (EMC)
- Retail Developments
- Leisure Complexes/Sports Stadiums

- Low fire hazard PA conduit systems
- BSI Kitemark to IEC61386
- CE marked to the Low Voltage Directive
- Fully compliant to BS7671 Wiring Regulations code of practice

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Adaptaflex in
Construction projects across the Middle East

Dubai Tram, Dubai



C4 Dubai International Airport, Dubai



Opera Grand, Dubai



Al Ghurair Centre (Refurbishment), Dubai



Emirates Tower, Dubai



Grand Hyatt, Dubai



Yas Mall, Abu Dhabi



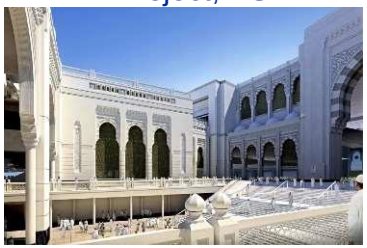
Mafraq Hospital, Abu Dhabi



Heart of Doha, Qatar



Mataf Expansion Project, KSA



- Office Buildings
- Schools
- Hospitals (EMC)
- Retail Developments
- Leisure Complexes/Sports Stadiums

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