# **DEKORON® WIRE & CABLE**

# DEKORON® UNITHERM™ PRE-INSULATED & TRACED TUBING

# **FIRE-RATED CABLE**





### **Marmon Electrical**

Marmon Electrical is part of Marmon Holdings, a Berkshire Hathaway company. Marmon Engineered Wire & Cable reorganized in 2019 and was rebranded as Marmon Electrical with five different platforms, each consisting of market-centric, customer-facing and product-oriented vertical segments. As such, several companies are now part of the Oil & Gas segment serving the Upstream, Midstream and Downstream Markets.

The Midstream and Downstream group consists of **Dekoron® Wire & Cable, Dekoron® Unitherm™** and the **Vitalink® & Dekaflame™** firerated products. Our breadth of products provides the customer with a one-stop shop to satisfy their wiring & tubing needs. From fire-rated cable to operate an emergency shut down valve in case of a fire, to an electric trace tubing to provide freeze protection or temperature maintenance of instrument lines, to instrumentation cable to monitor process conditions, we can meet all customer needs with quality products.









### Fire-Rated Cable

VitaLink® and Dekaflame™ fire-rated circuit-integrity cables offer superior fire endurance capabilities with a tiered-approach, along with the well-established benefits and features associated with NEC Type TC or MC-HL cable designs. These cables are suitable for use in circuits where the safeguarding of critical applications is an absolute necessity to allow the operation of systems or equipment vital to life or safety under emergency conditions. Applications in the petroleum industry include MOV's, fire pumps and other critical functions where fire survivability is essential.

### **Pre-Insulated & Traced Tubing**

Dekoron® Unitherm™ is the inventor of pre-insulated and heat traced tubing for heavy industry. We have been producing pre-insulated and heat traced tubing bundle since 1962. With over 50 years experience and in excess of 100 million feet of product installed, Dekoron® Unitherm™ is a world leader in the design and manufacture of pre-insulated and heat traced tubing and small bore pipe. Our products have been installed on every continent and in some of the harshest environments known to man.

### Wire & Cable

Dekoron® Wire & Cable is one of the most recognized industrial cable manufacturers in the world. Manufactured in the United States of America with rigorous attention to detail and quality standards, Dekoron's products are specified by many industry leaders for some of the most challenging projects. Our core strengths include the ability to design cables to meet the stringent requirements of our customers, fast delivery to meet on-site needs, and the capability to meet various regulatory standards.

### **Fire-Rated Cable**

VITALINK		Application	Conductor	Insulation	lacket	Armor	Approved Standards	Optional
Great Inagriy Cabl	Vitalink® 2000	2000F (1093C) for 60 minutes     US Patent 7,538,275     Power/Control/Instrumentation	16AWG-750KCMIL, Stranded, Nickel Coated, Copper	Inorganic Braid, Silicone & LSZH jacket system	Sunlight Resistant LSZH Jacket	N/A	UL 1709 (2000F) for 60 minutes UL 1707 Type TC Wet Rated 90C Insulation (RHW-2) cUL per CSA C22.2 No. 239 Type CIC cUL per CSA C22.2 No. 230 Type TC	Colored Jackets Insulated Ground TC-ER Foil Tape Shields
	Vitalink® TC/ER	2000F (1093C) for 30 minutes     Power/Control/Instrumentation	16AWG-750KCMIL, Stranded, Nickel Coated, Copper	Silicone & LSZH jacket system	Sunlight Resistant LSZH Jacket	N/A	Modified IEC 6033 I (2000F) for 30 minutes UL 1277 Type TC Wet Rated 90C Insulation (RHW-2) cUL per CSA C22.2 No. 239 Type CIC cUL per CSA C22.2 No. 230 Type TC	Colored Jackets available Insulated Ground TC-ER Foil Tape Shields
	Vitalink® MC/NCC	2000F (1093C) for 30 minutes     Power/Control/Instrumentation	I6AWG-750KCMIL, Stranded, Nickel Coated, Copper	Silicone & LSZH jacket system	Sunlight Resistant LSZH Jacket	Aluminum GARDEX®	Modified IEC 60331 (2000F) for 30 minutes UL 1569 Type MC Wet Rated 90C Insulation (RHW-2) cUL per CSA C22.2 No. 239 Type ACIC	Colored Jacket Arctic-Grade PVC Jacket MC-HL Foil Tape Shields
DEKAFIOTIO Crust bruggi clabs	Dekaflame® 300	1382F (750C) for 90 minutes     Instrumentation/Control	20AWG-10AWG, Stranded, Coated Copper	Silicone (300V)	Sunlight Resistant LSZH Jacket	Optional	IEC 60331 (750C/1382F) for 90 minutes BS 6387 Category CWZ. UL 13/2250 Type PLTC/ITC (300V) ICEA S-73-532: 300V, 600V BS EN 50288-7: 300V, 500V	Aluminum GARDEX® Interlocked Armor Served Wire Armor Metric Conductors Colored Jackets Segmented Grounds Foil Tape Shields
	Dekaflame® 600	1382F (750C) for 90 minutes     Instrumentation/Control	20AWG-10AWG, Stranded, Coated Copper	Silicone/Copolymer	Sunlight Resistant LSZH Jacket	Optional	IEC 60331 (750C/1382F) for 90 minutes BS 6387 Category CWZ UL 1277 Type TC (600V) UL 1569 Type MC ICEA S-73-532: 600V	Aluminum GARDEX® Interlocked Armor Served Wire Armor Metric Conductors MC-HL Colored Jackets Segmented Grounds Foil Tape Shields





TOOLS

Bndl-Bndr<sup>™</sup> bending tool Strip-Kwik<sup>™</sup> tool for preinsulated tubing **ACCESSORIES** 

Temperature Controllers Sensor Installation Kits

End Seal Boots Power Connection and Termination Kits Seal Patch Kits End Sealant Thermostats SERVICES
Site Audits
Installation Training
Trim-Back Services
Field Repair

THERMAL INSULATION

Fibrous Glass with leachable chloride content less than 30 ppm High Efficiency Aerogel Felted Fiberglass composite\*\*\*\* Felted Flexible polyester\*\*\*\* **OUTER JACKET** 

Low Temperature DSJM (Flame Retardant Vinyl Compound) Halogen-Free FR Urethane High Temperature FRTPE Polyester Braid\*\*\*\* Stainless Steel Braid\*\*\*\* Silicone Coated Firesleeve®

Steam		Application	Tubing sizes	Common Tube Materials	Number of Tubes	Maximum Operating Temperature	Options
	Instrument Tube	<ul><li>Corrosion protection (near shore / off shore sites)</li><li>Pneumatic or Hydraulic Control Lines</li></ul>	• 1/4", 3/8", 1/2", 3/4", 1"* • 6mm, 10mm, 12mm	<ul><li>316/316L, Seamless</li><li>#122DHP Copper</li></ul>	I-7**	• 140°F / 60°C	<ul><li>316 Welded Tubing</li><li>317 Seamless Tubing</li></ul>
	Pre-Insulated	Transport Steam from manifold to process or vessel Return spent steam (condensate) to boiler Reduce temperature drop in fluid transfer lines Protect Personnel from hot tubing	• 1/4", 3/8", 1/2", 3/4", 1"*, 1-1/2"* 2"* • 6mm, 10mm, 12mm, 20mm*, 25mm*	<ul><li>316/316L, Seamless or welded</li><li>#122DHP Copper</li><li>PFA Fluoropolymer</li></ul>	I	• 400°F / 204°C • 1100°F / 593°C	Stack, Grab & Go® 100 ft boxes High temperature designs to 1000°F Heavy, or Xtra Heavy walled tubing
	Steam Trace	Protect freezing in Instrument Lines Prevent degradation of process fluid Maintain Temperature of Heated fluids but prevent boil-off	• 1/4", 3/8", 1/2" • 6mm, 10mm, 12mm,	<ul><li>316/316L, Seamless or welded</li><li>#122DHP Copper</li><li>PFA Fluoropolymer</li></ul>	2-4	• 400°F / 204° • 1100°F / 593°C	Monel®, Incoloy®, Hastelloy®     SilcoNert® coatings,     Electropolished tubing
	Heavy Steam Trace	Temperature Maintenance     Viscosity Maintenance     Transfer of Heavy Waxes or Oils	• 1/4", 3/8", 1/2", 3/4" • 6mm, 10mm, 12mm	• 316/316L, Seamless or welded • #122DHP Copper	2-7**		
Electric Trace	e Tubing						
	Self Regulating	Freeze Protection of Instrument Lines     Low to Medium Temperature Maintenance     Viscosity Maintenance of oils/grease     Maintain proper fluid properties in automated equipment     Hazardous Location Approvals	• 1/4", 3/8", 1/2", 3/4", 1"*, 1-1/2"* 2"* • 6mm, 10mm, 12mm, 20mm*, 25mm*	• 316/316L , Seamless or welded • 304L, Seamless or welded • #122DHP Copper	•  -4**	<ul> <li>Low Temp SR 85°C/185°F</li> <li>High Temp SR 150°C/302°F</li> </ul>	Carrier Tube replaceable heater design Channel Trace large diameter tubing Multiple heating zones Buffered Heater Cables for high temperature applications to 1100°F / 593°C
	Power Limiting	Freeze Protection to Medium Temperature Maintenance     Hazardous Location Approvals		<ul><li>PFA Fluoropolymer</li><li>PTFE Fluoropolymer</li><li>FEP Fluoropolymer</li></ul>		Power Limiting 204°C/400°F	Solar-Powered Freeze Protection Bundles     Monel®, Incoloy®, Hastelloy®     SilcoNert® coatings,     Electropolished tubing
	Series Resistance	<ul><li>High Temperarure Maintenance</li><li>Where increased heater output is required</li></ul>				Series Resistance 204°C/400°F	
CEMS (Conti	nuous Emiss	ions Monitoring System)					
	High Temp SR	• NOx / SOx				<ul> <li>High Temp SR 150°C/302°F</li> </ul>	Special conditioning of Fluoropolymer
							tubing for low THC applications  • Electropolished stainless steel tubing
	Power Limiting	Ammonia     CO, CO2, O2	• 1/4", 3/8", 1/2", 3/4", 1"*, 1-1/2"* 2"* • 6mm, 10mm, 12mm, 20mm*, 25mm*	PFA Fluoropolymer     PTFE Fluoropolymer	I-8***	Power Limiting 204°C/400°F	
		Ammonia				Power Limiting 204°C/400°F      400°F / 204°     1100°F / 593°C	Electropolished stainless steel tubing     SilcoNert® coatings
	Limiting Series Resistance Probe Support	Ammonia     CO, CO2, O2      HCl     Total Hydrocarbons		PTFE Fluoropolymer		• 400°F / 204°	Electropolished stainless steel tubing     SilcoNert® coatings     Multiple heat zones     Monel®, Incoloy®, Hastelloy®     SilcoNert® coatings,
Heated Hose	Limiting Series Resistance Probe Support	Ammonia     CO, CO2, O2     HCI     Total Hydrocarbons     Scrubber     Monitoring     Monitoring     Temperature Maintenance     Viscosity Maintenance	• 6mm, 10mm, 12mm, 20mm*, 25mm*  • 1/16", 1/8", 1/4", 3/8", 1/2"	PTFE Fluoropolymer  PFA Fluoropolymer  PFE Fluoropolymer  THE Fluoropolymer  S16/316L, Seamless or welded	2-4 I-12** (Includes wires	• 400°F/204° • 1100°F/593°C	Electropolished stainless steel tubing  SilcoNert® coatings  Multiple heat zones  Monel®, Incoloy®, Hastelloy®  SilcoNert® coatings,  Electropolished tubing  Calibration Gas  Probe Power  Blowback Air  Fiberoptic cables  Vacuum Lines  Cat6 cables





The Instrumentation Cable Experts

### CONDUCTORS

Bare, tinned, or nickel-plated annealed copper and most thermocouple alloys, in solid 7-strand, or 19-strand configurations from 10AWG to 22 AWG are common in Dekoron's products. Metric conductors and alternate stranding options are available upon request

### INSULATIONS

Dekoron offers both thermoset and thermoplastic insulation compounds including PVC, PVC/Nylon, XI PF. XLPE-VW1, HD-XLPE, HDPE, Silicone, and Silicone/Copolymer. Specialty compounds are available upon request.

### **ARMOR**

lackets

PVC

CPF

TPU

NYLON

HDPE

LDPE

PVC

CPE

TPU

Nylon

HDPE

LDPE

Dekoron offers several armor options with various benefits to provide additional protection suited for different applications.

### **IACKETS**

lackets, sometimes known as sheaths. are provided in similar compounds as the insulation. These compounds include PVC, CPE, TPN (LSZH), LDPE, HDPE, Nylon, and TPU, some of which are available in low-temperature capable versions. Specialty compounds may also be available upon request.

### SHIFLDING\*

Optional

Dekoron, the innovator of EMI shielding, provides a variety of options in shielding to prevent noise and interference and helps to maintain signal quality. Typical shields are an aluminum tape with polyester backing. Drain wires are combined with the shield and are in contact with the conductive side of the tape, allowing for easy termination and grounding.

# Instrumentation

Instrumentation cables monitor process parameters such as pressure, flow rate, and temperature by transmitting high-quality, low voltage signals to the instrumentation and process control room. These cables are typically multiple twisted-pair configurations with each pair gathering one set of process data.

• Conductor: 22-12 AWG Bare and Plated Copper, PVC/Nylon Solid and Stranded XLPE-VW1 HD-XLPE HDPE

 Armors\*\* PVC SWA CPE TPN (LSZH) DEKABON® TPU GARDEX\* Nylon DUAL ARMOR (SWA/DEKABON®) HDPF LDPE

300V UL Type PLTC/ITC 300V UL Type ITC-HL 600V UL Type TC 600V UL Type MC or MC-HL 600/1000V AS/NZS 5000.1

Approval Standards\*\*\*

450/750V AS/NZS 5000.3 450/750V IEC 60227 300/500V BS 5308 ICEA S-73-532: 300V, 600V BS EN 50288-7: 300V, 500V

-40°C Arctic Grade PVC or TPN (LSZH) Jackets Direct Burial IEEE1202/FT4 Oil Res I & II Jackets 110/150V AS/NZS Type PLTC/ITC-ER, Type TC-ER, Type TC-LS

### Thermocouple Extension



Thermocouple Extension cables allow for the remote monitoring of thermocouples from a central location. These cables are available in several common thermocouple types.

Type KX, JX, EX, TX, NX, BX, VX and SX 20-16 AWG, Solid and Stranded

PVC/Nylon XLPE XI PE-V/V/I HD-XLPE HDPE

XLPE-VW1

HD-XLPE

HDPE

XI PF

HD-XLPE

• Insulation

· Armors\*\* TPN (LSZH) DEKABON<sup>®</sup> GARDEX\* DUAL ARMOR (SWA/DEKABON®)

 Approval Standards\*\*\* 300V UL Type PLTC/ITC 300V UL Type ITC-HL 600V UL Type TC 600/1000V AS/NZS 5000.1

450/750V AS/NZS 5000.3 450/750V IEC 60227 300/500V BS 5308 ICEA S-73-532: 300V, 600V BS EN 50288-7: 300V. 500V

 Optional -40°C Arctic Grade PVC or TPN (LSZH) Jackets Direct Burial Sun Res IEEE I 202/FT4 Oil Res I & II lackets 110/150V AS/NZS Type PLTC/ITC-ER, Type TC-LS

### Control



Control cables carry power to change process parameters from the control room to the remote equipment. Control cables are typically comprised of 14 AWG and larger conductors, with additional grounding conductors and shielding included as needed

### 22-10 AWG Bare and Plated Copper, PVC/Nylon Solid and Stranded XLPE

TPN (LSZH) DEKABON<sup>8</sup> GARDEX® DUAL ARMOR (SWA/DEKABON®)  Approval Standards\*\*\* 300V UL Type PLTC/ITC 300V UL Type ITC-HL 600V UL Type TC 600V UL Type MC or MC-HL 600/1000V IEC 60502 600/1000V BS 5467

600/1000V BS 6346 600/1000V AS/NZS 5000.1 450/750V AS/NZS 5000.3 450/750V IEC 60227 ICEA S-73-532: 300V, 600V, 1000V BS EN 50288-7: 300V, 500V Optional -40°C Arctic Grade PVC or TPN (LSZH) Jackets Direct Burial Sun Res IEEE I 202/FT4 Oil Res I & II lackets 110/150V AS/NZS

Type PLTC/ITC-ER, Type TC-ER, Type TC-LS

Specialty



**Fieldbus** Industrial Network Cable

### Conductor

16-18 AWG Bare and Plated Copper. Stranded

• Jackets • Armors\*\* PVC SWA CPE DEKARON<sup>8</sup> TPN (LSZH) GARDEX® NYLON DUAL ARMOR (SWA/ HDPE DEKABON®)

### · Approval Standards\*\*\*:

300V UL Type PLTC/ITC 300V UL Type ITC-HL 600V UL Type TC 600V UL Type MC or MC-HL

 Optional FF-844 H I IEC 61158-2 ICEA S-73-532: 300V 600V

BS FN 50288-7: 300V 500V

-40°C Arctic Grade PVC or TPN (LSZH) Jackets Direct Burial Sun Res IFFF1202/FT4

Oil Res I & II lackets Type PLTC/ITC-ER, Type TC-ER, Type TC-LS

### Types of Armor

### DEKABON®

Dekoron's innovative Dekabon® chemical and moisture barrier provides a gas and liquid-tight metallic seal around a cable, making it ideal for use in-ground and near gasses and liquids.



### GARDEX®

This continuously-corrugated, welded aluminum armor is the most common method used to provide additional protection to cables used in hazardous locations. It offers great strength and a hermetic seal, eliminating the need for conduit.



### SERVED WIRE ARMOR (SWA)

Consisting of numerous strands of galvanized steel wire which are wrapped (served) around the cable. SWA provides a low-cost method  $\,$ to greatly increase the cable's cut-through resistance without sacrificing



### INTERLOCK ARMOR

Metallic interlocked armor provides mechanical protection and crush resistance to the cable core. Armor is available in aluminum or galvanized steel.





\*Shield Options:

Individual and Overall Aluminum/Polyester Tapes Metal Braid Overall Copper/Polyester Tape

### \*\*Armor Designations:

SWA - Served Wire Armor (Galvanized Steel) ILA - Interlocked Armor (Galvanized Steel or Aluminum)

DEKARON® - Moisture/Chemical Barrier GARDEX® - Continuous Corrugated Welded Aluminum

### \*\*\*Approval Standards:

Not all approval standards are available for all conductor sizes and combinations of insulation, jacket, and armor types.

# Applications for Marmon Electrical Products in Oil Refineries



- MOV's
- Fire Pumps
- Fire Alarms
- PA Systems

# DEKORON<sup>®</sup> UNITHERM™

- Steam Transport & Condensate Lines
- Flare Gas Sampling Lines
- Heated Sample Lines
- CEMs

### Dekoron Wire & Cable

- Process Measurement
- Process Control
- Hazardous Locations
- Communications



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