

MOTION**CABLES** INDUSTRY FOCUS: **AERIAL PLATFORM CABLES**



SERIES MDN
PUR CABLES
HIGH PERFORMANCE





MOTION**CABLES**: LEADING THE WAY IN **SPECIAL CABLE** **SOLUTIONS**

MOTION**CABLES** specializes in the design, manufacturing, and qualification of high-performance special cables, particularly focusing on applications requiring constant movement, extreme environmental resistance, and maximum data integrity.

Our mission goes beyond mere compliance; we provide products validated to operate reliably under the most severe real-world conditions, including combined and extreme stress scenarios.

This commitment is rooted in MOTION**TECHCORE**, our dedicated Research & Test Center, where an engineering-driven approach ensures that every cable is tested and classified before shipment.

By subjecting our cables to over 60 rigorous tests, from dimensional checks and material analysis to dynamic movement (e.g., drag chain, torsion) and system-level validation, we guarantee a product that maintains its performance throughout its planned operational life.

MOTION**CABLES** thus acts as a technical partner, providing not just components, but verified solutions that directly enhance system reliability and reduce the overall total cost of ownership (TCO) for the customer.

KEY ADVANTAGES OF MOTIONCABLES

MOTION**CABLES** leverages its MOTION**TECHCORE** research center to deliver verified, high-performance special cables, offering the following key benefits:

GUARANTEED LONG-TERM RELIABILITY

Products are qualified through accelerated aging and dynamic testing (millions of cycles) to ensure stable performance over the full operational life, minimizing unscheduled downtime.

PERFORMANCE CLASSIFICATION

Cables are objectively categorized into four classes (Electrical, Dynamic, Environment, Safety) based on real-world test data, enabling quick and precise selection for specific application needs.

SYSTEM FUNCTIONALITY ASSURANCE

Validation includes the entire system (Drive–Cable–Motor), confirming reliable performance and compatibility within the customer's actual industrial environment.

SUPERIOR ENVIRONMENTAL RESISTANCE

Proven resistance to oils, chemicals, temperature extremes, UV, and salt fog, ensuring cable integrity in harsh and contaminated settings (e.g., machine tools, offshore).

REDUCED TOTAL COST OF OWNERSHIP (TCO)

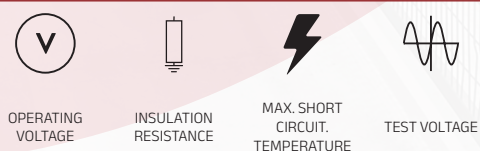
High durability, predictable life expectancy, and validated technical parameters simplify design and maintenance, leading to fewer failures and lower inventory costs.

ICONS

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS



ELECTRICAL PROPERTIES



Use the icons for a fast summary and a general idea of the related product features. More details on product characteristics are available in the proper sections of each product page.

PUR HIGH PERFORMANCE CABLES FOR AERIAL PLATFORMS

In aerial work platforms environments—whether industrial, offshore, or process—cabling systems are required to operate under extremely harsh conditions, significantly more severe than those typical of standard industrial installations.

In these contexts, cables can no longer be considered mere connection components; rather, they become critical assets for the safety, reliability, and operational continuity of the facility.

Typical operating conditions in these environments include continuous vibration, repetitive motion, tensile stress, tight bending radii, extreme thermal fluctuations, and the constant presence of aggressive chemical agents.

The combination of these factors generates a high and continuous level of stress that often leads to accelerated degradation and premature failure in traditional cables, which are not designed to withstand such simultaneous loads.

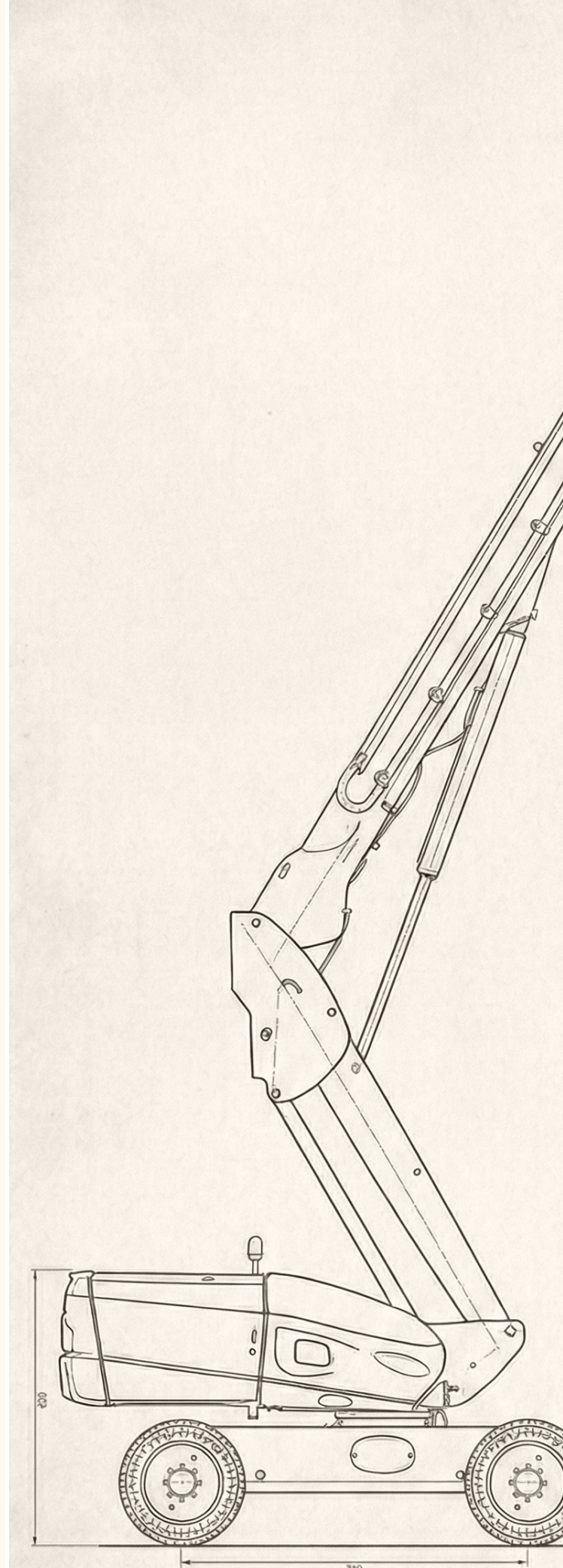
Temperature plays a particularly critical role.

Low temperatures tend to stiffen insulation and jacketing materials, reducing flexibility and significantly increasing the risk of cracking and conductor breakage, especially where movement is involved.

Conversely, high temperatures accelerate polymer aging processes, compromising the cable's mechanical strength and structural stability over time.

To effectively address these critical issues, a range of platform cables has been developed based on an advanced, modular design approach.

This approach is, tailored to match the actual operating conditions of the application and to ensure reliability, long service life, and service continuity, even in the most demanding environments.



APPLICATIONS AREA

WHERE DURABILITY IS ESSENTIAL

The **MDN** MOTION**MULTIWIRE** Series has been developed for mobile application where flexibility, resistance to oils and mechanical endurance are mandatory.

Our **MDN** Series can be used in the following applications:



MOBILE AERIAL PLATFORMS

- ⦿ MEWP & AWP.
- ⦿ Truck-mounted and self-propelled platforms.
- ⦿ Telescopic and articulated booms.
- ⦿ Aerial baskets (Buckets / Cherry pickers).



LIFTING AND MATERIAL HANDLING

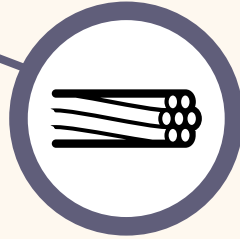
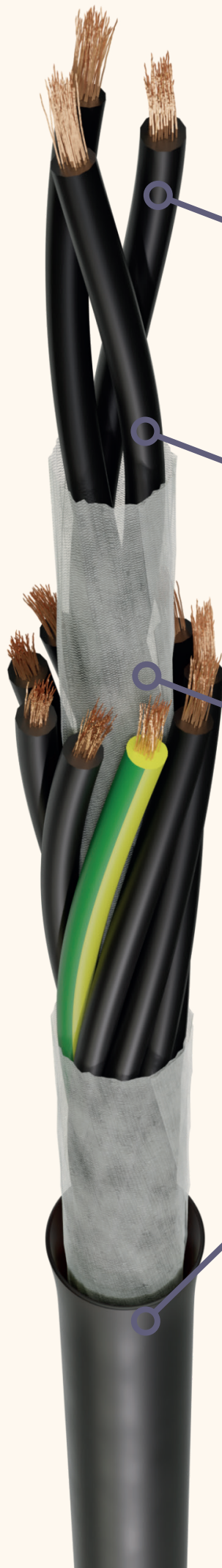
- ⦿ Mobile Hydraulic Systems.
- ⦿ Industrial Material Handling Machinery.
- ⦿ Industrial Moving Equipment.



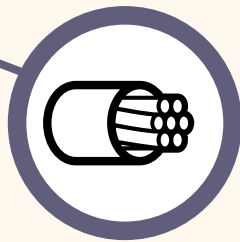
DYNAMIC INSTALLATIONS

- ⦿ Cable Carriers (Drag Chains).
- ⦿ Pulley Systems.
- ⦿ Compact routing with tight radii.

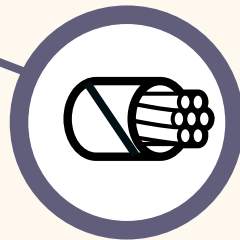
MOTIONCABLES' ANSWER



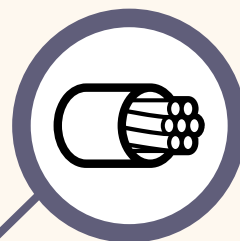
**EXTRA FLEXIBLE
BARE COPPER
CLASS 6
IEC 60228**



**POLYPROPYLENE
BLACK COLOUR WITH
WHITE NUMBERS AND
GROUND Y/G**



**FLEECE TAPING
FOR STRUCTURAL
INTEGRITY**



**PUR TPU
HIGH MECHANICAL
RESISTANCE**

- ⊙ **UV and ozone resistance for outdoor applications**
- ⊙ **Reliable dynamic performance in drag chains**
- ⊙ **Guaranteed operation down to -50°C**
- ⊙ **International approvals: UL, CSA, CE, UKCA**

COMPETITIVE EDGE FOR OEMS

1

RELIABILITY

Reduced machine downtime thanks to Class 6 (IEC 60228).

2

VERSATILITY

A single cable for indoor, outdoor, and arctic environments (-50°C).

3

COMPLIANCE

Streamlined machine certification thanks to cURus standards.

4

LONGEVITY

Materials tested for over 500,000 heavy-duty cycles and up to 10 million cycles in optimal conditions.

RESISTANCE WITHOUT COMPROMISE



OIL RESISTANT
ACCORDING TO
EN 50363-4-1



WEATHER PROOF
RESISTANT TO UV
(EN 50618) AND OZONE

LOW TEMPERATURE
OPERATIVE FROM
-50 °C TO + 90°C



ROBUSTNESS
TMPU JACKET
ABRASION AND HYDROLYSIS
RESISTANT



CROSS-SECTION AVAILABILITY & SCALABILITY

The **MDN** Series meets every power and signal need thanks to optimized insulation diameters.



0,50 mm² (21 AWG)
Ø Insulation 1.70 mm



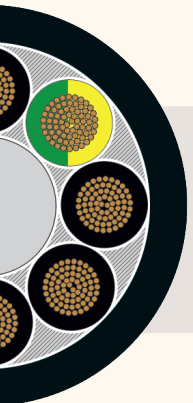
0,75 mm² (19 AWG)
Ø Insulation 1.90 mm



1,00 mm² (18 AWG)
Ø Insulation 2.10 mm



1,50 mm² (16 AWG)
Ø Insulation 2.40 mm



2,50 mm² (14 AWG)
Ø Insulation 3.00 mm

PARAMETERS

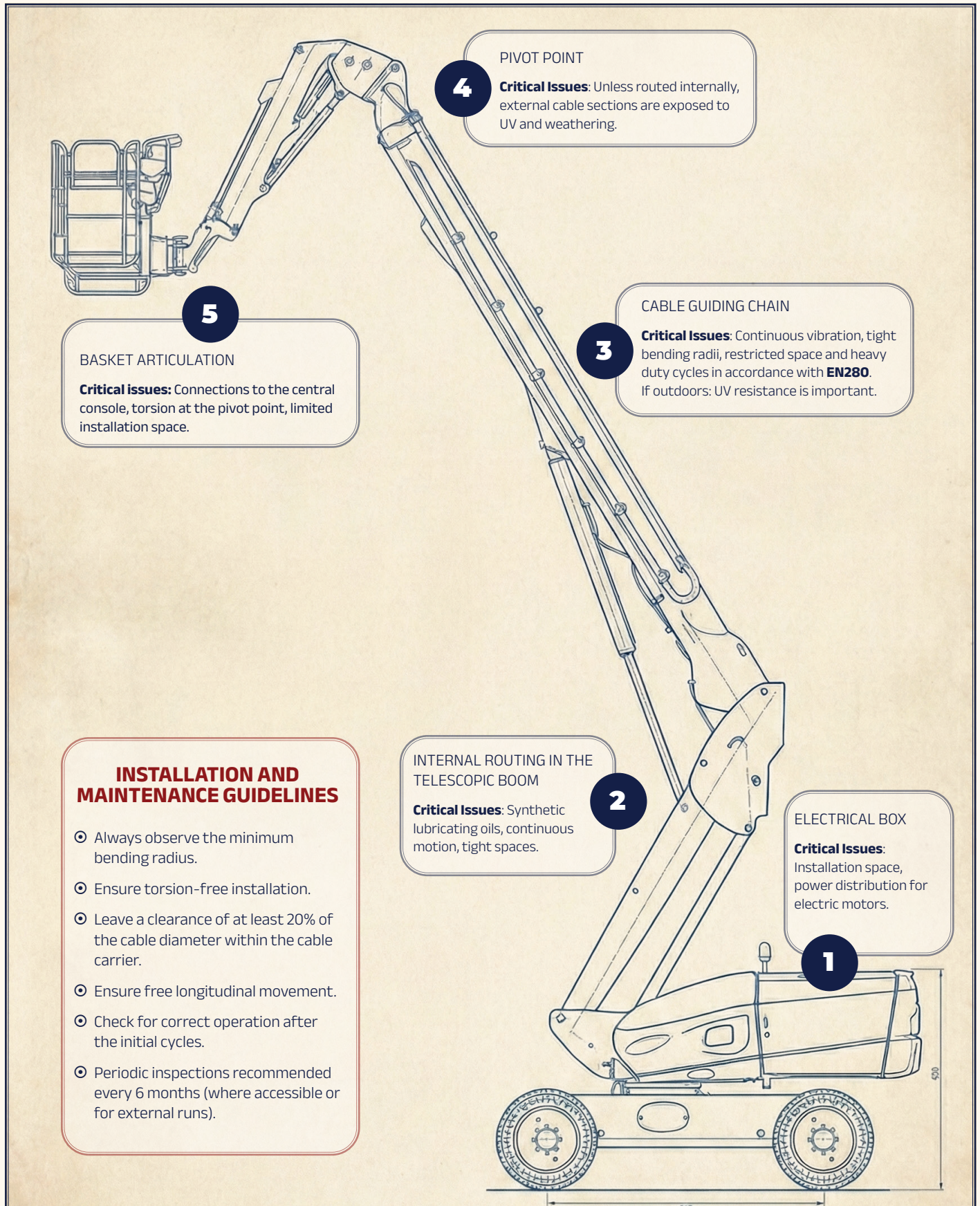
				
CLASSES	MIN. BENDING RADIUS	MAXIMUM SPEED	MAXIMUM ACCELERATION	MIN. CYCLES
	$\emptyset$	<i>m/min</i>	<i>m/sec²</i>	<i>nr</i>
A+	$5 \times \emptyset$	180	10	500.000
A	$6,5 \times \emptyset$	600	50	1.000.000
B	$7,5 \times \emptyset$	300	30	5.000.000
C	$10 \times \emptyset$	240	15	10.000.000

OUTERSHEATH CABLE'S PRINTING

Motion Multiwire – N° Conductors x Section mm² High Dynamic Performance PUR – Oil Resistant E356538 cURus – AWM Style 21209 90°C 1000V – FT1 – CE Meter Marking N° Conductors x Section AWG – YY/WW



INSTALLATION LAYOUT & BEST PRACTICE



ELECTRICAL, FEATURES SAFETY & APPROVALS

ELECTRICAL FEATURES

NOMINAL TENSION	Up to 1000 V
VOLTAGE TEST	4,0 kV x 5 min. (EN 50395)
CONDUCTOR RESISTANCE	Optimized for sections from 0.50 to 2.50 mm ² (EN 50395 Cl.5)
INSULATION RESISTANCE	≥ 1.0 G*km (@20 °C)
SHORT CIRCUIT	Temp. Max. 160 °C (≤ 1s)

SECURITY FEATURES

FLAME RETARDANT	IEC 60332-1 / UL FT1
HALOGEN FREE	EN 60754-1
OIL RESISTANT	EN 50363-4-1
HYDROLYSIS & OZONE RESISTANT	EN 50396
UV RESISTANT	EN 50618
LABS FREE	Silicon Free

APPROVALS



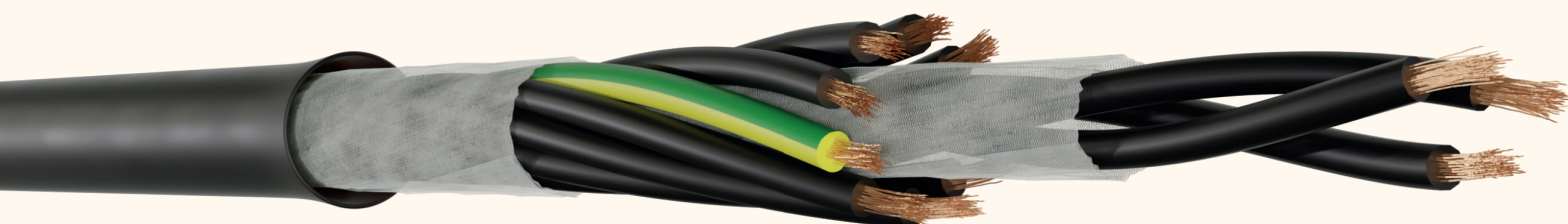
UL SUB. 758
STYLE 21209
90 °C - 1000V



CSA C22.2 N.210
AWM I/II A/B
90 °C - 1000V



CE DIRECTIVE
2014/35/UE

UL 21209
90 °C - 1000VAWM I/II A/B
90 °C - 1000VLABS
Free

UPON REQUEST



10 million

CYCLES



6,5 x O.D.

MIN. BENDING RADIUS



600 m / min

MAX. SPEED

60 m / s²

ACCELERATION

≤ 50 N / mm²

PULLING FORCE



50 m

MAX. HORIZ. TRAVEL

DURABILITY IN MECHANICAL & THERMAL CONDITIONS

ELECTRICAL PROPERTIES

		m.u.			
CLASSES		A+	A	B	C
CYCLES	MIL	0,5	1	5	10
MIN. BENDING RADIUS	x O.D.	5,0	6,5	7,5	10
MAXIMUM SPEED	m/min	180	600	300	240
MAX. ACCELERATION	m/s ²	10	50	30	15
PULLING FORCE	N/mm ²	≤ 20	≤ 20	≤ 20	≤ 20
MAX. HORIZ. TRAVEL	m	10	10	15	50
TEMPERATURE	°C	-50 / +90	-40 / +90	-40 / +90	-40 / +90

Test
Voltage4,0 kV x 5 min
acc.to EN 50395 Cl.
10.3Insulation
Resistance≥ 1.0 GΩ x km
@ 20 °C
acc.to EN 50395 Cl. 8.1Max. Short
Circuit
Temperature

160 °C (≤ 1s)

Operating
Voltage1000 V (UL/CSA)
U₀/U 0.6/1.0 kV (IEC)

RESISTANCE TO ENVIRONMENTAL AND AGGRESSIVE CHEMICAL THREATS

OIL
RESISTANTFLAME
RETARDANTCOLD
RESISTANTABRASION
RESISTANTEMC
PROTECTEDWATER
RESISTANTUV
RESISTANTMICROBE
RESISTANTOZONE
RESISTANTMUD
RESISTANTHALOGEN
FREE

MAIN ADVANTAGES

Extra-Flexible Copper Conductors (Class 6)	Ideal for intensive dynamic applications (robotics, cable carriers).
Polypropylene (PP) Insulation	Electrical stability even at high frequencies or distances.
RAL 9005 Black PUR FRHF Jacket	Exceptional resistance to oils, cutting, abrasion, and aggressive chemical agents.
No EMC Shielding	Superior flexibility where electromagnetic protection is not a priority.
Operating Voltage 1000 V (UL) / 0.6/1.0 kV (IEC)	Compatibility with advanced systems and power applications.
CE / UL / CSA Compliance	Guarantee of global quality and installability.
Metric Marking on Outer Jacket	Simplifies logistics and management of lengths in production.
Progressive Numbering + Y/G	Speed and reduced error risk in wiring.

Sez.	MotionCables code	EPLAN Code	Formation	AWG	Ø	Cu
mm²			mm²		mm	kg / km
0,50	MDN21X02UP-N	● MC.34022135	2 x 0.50	21	6.2	10
	MDN21G03UP-N	● MC.34032135	3 G 0.50	21	6.5	14
	MDN21G04UP-N	● MC.34042135	4 G 0.50	21	6.9	19
	MDN21G05UP-N	● MC.34052135	5 G 0.50	21	7.4	24
	MDN21G07UP-N	● MC.34072135	7 G 0.50	21	8.6	34
	MDN21G12UP-N	● MC.34122135	12 G 0.50	21	10.0	58
	MDN21G18UP-N	● MC.34182135	18 G 0.50	21	11.8	86
	MDN21G25UP-N	● MC.34252135	25 G 0.50	21	13.8	120
	MDN21G34UP-N	● MC.34342135	34 G 0.50	21	15.5	163
	MDN21G41UP-N	● MC.34412135	41 G 0.50	21	16.7	197
0,75	MDN19X02UP-N	● MC.34021935	2 x 0.75	19	6.6	14
	MDN19G03UP-N	● MC.34031935	3 G 0.75	19	6.9	22
	MDN19G04UP-N	● MC.34041935	4 G 0.75	19	7.4	29
	MDN19G05UP-N	● MC.34051935	5 G 0.75	19	8.0	36
	MDN19G07UP-N	● MC.34071935	7 G 0.75	19	9.3	50
	MDN19G12UP-N	● MC.34121935	12 G 0.75	19	10.8	86
	MDN19G18UP-N	● MC.34181935	18 G 0.75	19	12.8	130
	MDN19G25UP-N	● MC.34251935	25 G 0.75	19	14.5	180
	MDN19G34UP-N	● MC.34341935	34 G 0.75	19	16.9	245
	MDN19G41UP-N	● MC.34411935	41 G 0.75	19	18.2	295
1,0	MDN17X02UP-N	● MC.34021735	2 x 1.0	18	6.9	19
	MDN17G03UP-N	● MC.34031735	3 G 1.0	18	7.2	29
	MDN17G04UP-N	● MC.34041735	4 G 1.0	18	7.5	38
	MDN17G05UP-N	● MC.34051735	5 G 1.0	18	8.4	48
	MDN17G07UP-N	● MC.34071735	7 G 1.0	18	9.8	67
	MDN17G12UP-N	● MC.34121735	12 G 1.0	18	11.7	115
	MDN17G18UP-N	● MC.34181735	18 G 1.0	18	13.5	173
	MDN17G25UP-N	● MC.34251735	25 G 1.0	18	16.1	240
	MDN17G34UP-N	● MC.34341735	34 G 1.0	18	17.9	326
	MDN17G41UP-N	● MC.34411735	41 G 1.0	18	19.4	394
1,50	MDN15X02UP-N	● MC.34021535	2 x 1.5	16	7.5	29
	MDN15G03UP-N	● MC.34031535	3 G 1.5	16	7.9	43
	MDN15G04UP-N	● MC.34041535	4 G 1.5	16	8.5	58
	MDN15G05UP-N	● MC.34051535	5 G 1.5	16	9.2	72
	MDN15G07UP-N	● MC.34071535	7 G 1.5	16	11.0	101
	MDN15G12UP-N	● MC.34121535	12 G 1.5	16	12.7	173
	MDN15G18UP-N	● MC.34181535	18 G 1.5	16	14.7	259
	MDN15G25UP-N	● MC.34251535	25 G 1.5	16	18.0	360
	MDN15G34UP-N	● MC.34341535	34 G 1.5	16	20.0	490
	MDN15G41UP-N	● MC.34411535	41 G 1.5	16	21.9	590
2,50	MDN13X02UP-N	● MC.34021335	2 x 2.5	14	8.7	48
	MDN13G03UP-N	● MC.34031335	3 G 2.5	14	9.2	72
	MDN13G04UP-N	● MC.34041335	4 G 2.5	14	9.9	96
	MDN13G05UP-N	● MC.34051335	5 G 2.5	14	11.1	120
	MDN13G07UP-N	● MC.34071335	7 G 2.5	14	13.1	168
	MDN13G12UP-N	● MC.34121335	12 G 2.5	14	15.7	288
	MDN13G18UP-N	● MC.34181335	18 G 2.5	14	17.2	432
	MDN13G25UP-N	● MC.34251335	25 G 2.5	14	21.9	600
	MDN13G34UP-N	● MC.34341335	34 G 2.5	14	24.4	816
	MDN13G41UP-N	● MC.34411335	41 G 2.5	14	26.7	984



EPLAN

All the codes are available in the EPLAN PLAN8 System (use the EPLAN code in the relevant column).



SPAC CAVI

All the codes are available in the SPAC CAVI system (use MotionCables item code).

The names of trademarks and standards are provided for reference or information purposes only. These trademarks and standards are the exclusive property of their respective owners (see the complete list on the back cover).

ANNOTATIONS





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