

Specifying Environmental Requirements for Cabling Systems & Components with MICE



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ISO/IEC TR 29106

Introduction to MICE

- overview of MICE regime and requirements
- extracted from ISO/IEC 24702 Industrial Cabling
- currently being circulated as FPDAM (final draft)
- TIA also understood to be adopting MICE regime

	Class I (commercial)	Class II (light industrial)	Class III (heavy industrial)
Mechanical	M₁	M₂	M₃
Ingress	I₁	I₂	I₃
Climatic	C₁	C₂	C₃
Electromagnetic	E₁	E₂	E₃

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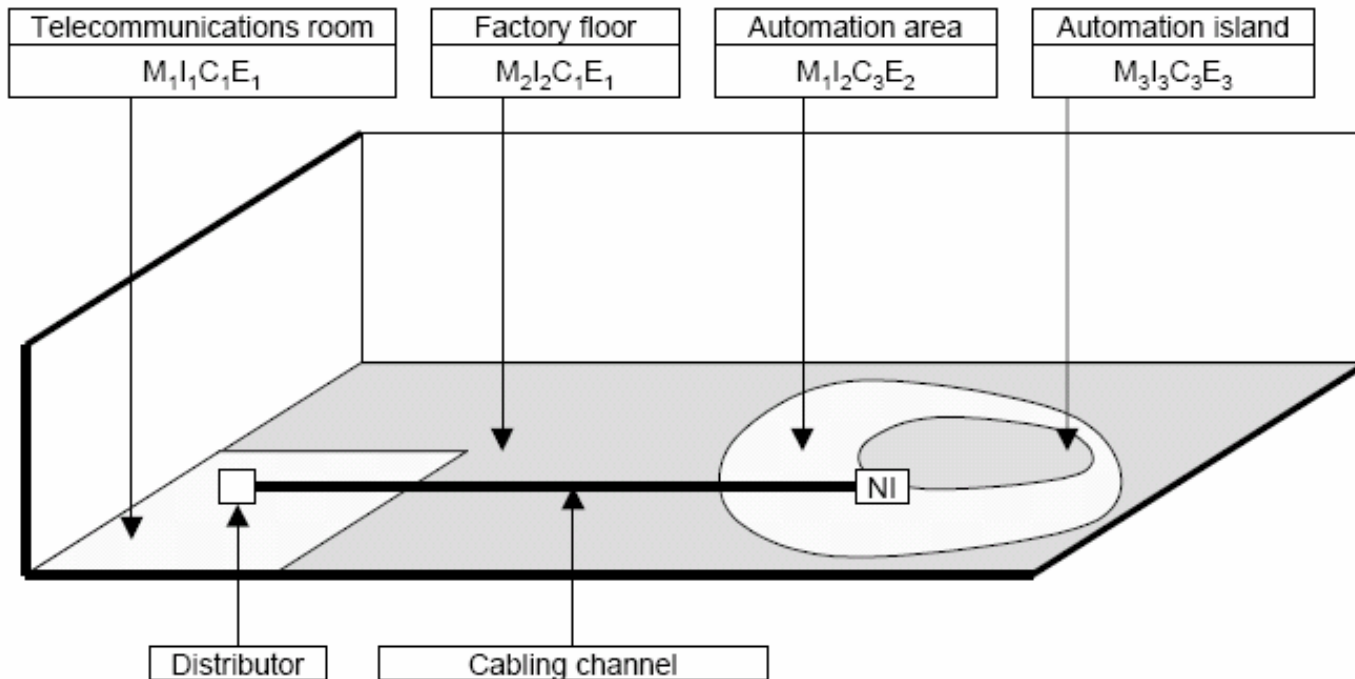


Figure 1 - Example of variation of the environment along a industrial premises cabling channel

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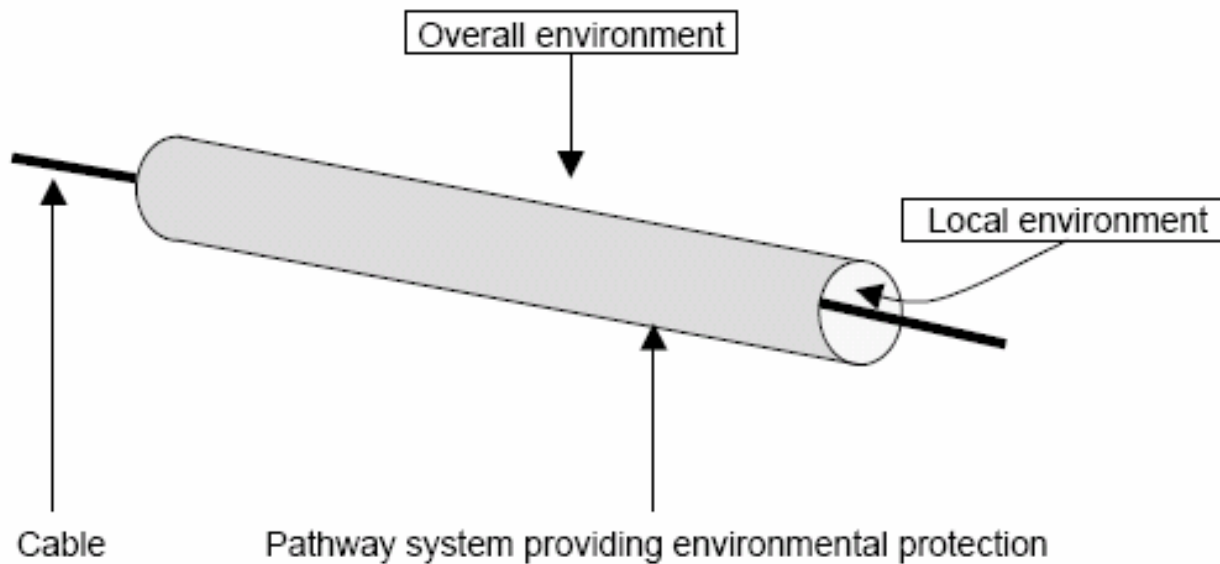


Figure 2 - The local environment

Environmental Requirements - Mechanical

Mechanical	M₁	M₂	M₃
Shock/Bump peak acceleration	40 ms ⁻²	100 ms ⁻²	250 ms ⁻²
Vibration displacement amplitude (2- 9 Hz)	1.5 mm	7.0 mm	15.0 mm
acceleration amplitude (9- 500 Hz)	5 ms ⁻²	20 ms ⁻²	50 ms ⁻²
Crush	45 N	1100 N	2200 N
Impact	1 J	10 J	30 J

Environmental Requirements - Ingress

Ingress	I ₁	I ₂	I ₃
Particulate Ingress (max diameter)	12 mm	50 micron	50 micron
Immersion	none	intermittent liquid jet ≤12.5 l/min ≥6.3mm jet >2.5m distance	intermittent liquid jet ≤12.5 l/min ≥6.3mm jet >2.5m distance & immersion ≤1 m for ≤30 min

Environmental Requirements - Climatic

Climatic	C ₁	C ₂	C ₃
Ambient temperature	-10°C to +60°C	-25°C to +70°C	-40°C to +70°C
Rate of temp change	0.1°C per min	1.0°C per min	3.0°C per min
Humidity	5% to 85% (non condensing)	5% to 95% (condensing)	5% to 95% (condensing)
Solar Radiation	700W/m ²	1120W/m ²	1120W/m ²
Liquid Pollution			
Gaseous Pollution			

Environmental Requirements - Electromagnetic

Electromagnetic	E ₁	E ₂	E ₃
ESD	8kV air 4kV contact	8kV air 4kV contact	8kV air 4kV contact
Radiated RF-AM	3V/m 80MHz-1GHz 3V/m 1.4-2.0GHz 1V/m 2.0-2.7GHz	3V/m 80MHz-1GHz 3V/m 1.4-2.0GHz 1V/m 2.0-2.7GHz	10V/m 80MHz-1GHz 3V/m 1.4-2.0GHz 1V/m 2.0-2.7GHz
Conducted RF	3V/m 150kHz-80MHz		10V/m 150kHz-80MHz
EFT/B (comms)	500V	1000V	1000V
Surge (transient ground potential)	500V	1000V	1000V
Magnetic Field (50Hz)	1 Am ⁻¹	3 Am ⁻¹	30 Am ⁻¹