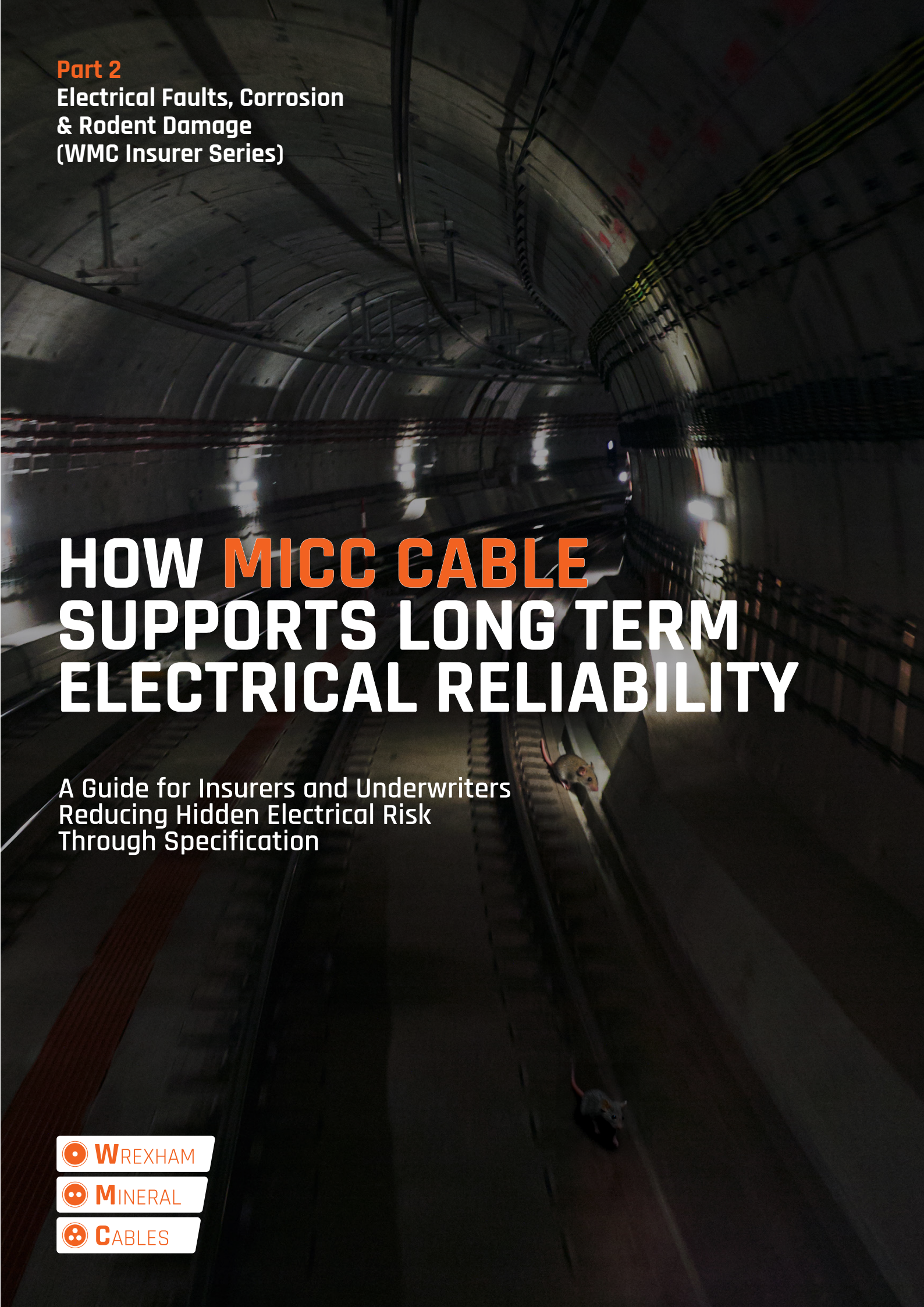


Part 2
Electrical Faults, Corrosion & Rodent Damage (WMC Insurer Series)

HOW MICC CABLE SUPPORTS LONG TERM ELECTRICAL RELIABILITY

A Guide for Insurers and Underwriters
Reducing Hidden Electrical Risk
Through Specification

Wrexham Mineral Cables

WREXHAM MINERAL CABLES

ABOUT THE WMC INSURER SERIES

Wrexham Mineral Cables (WMC) is a leading UK manufacturer of fire-survival mineral insulated cables headquartered in Wrexham, North Wales. At WMC, we recognise that the built environment supply chain is complex and multi-layered. As such, we believe it is our responsibility to provide evidence-based insight to support technical and non-technical stakeholders in making informed cable specification decisions and understanding the critical role electrical cabling plays in reducing circuit vulnerability.

In this spirit, we developed our Insurer Series of content and guides. Our goal is to support insurers, underwriters, and risk consultants in understanding how electrical infrastructure influences building resilience, claims exposure, and long-term risk predictability.

Part 1, published in November 2025, focused on fire resilience and life-safety integrity, examining how Mineral Insulated Copper Clad (MICC) cables support circuit survival under fire conditions and reduce catastrophic loss potential.

Part 2 expands this conversation beyond fire. This guide addresses non-fire electrical failure modes that contribute significantly to insurance claims, operational disruption, and longer-term exposure. These risks are often less visible, harder to model, and more difficult to manage through inspection alone.

This guide focuses on electrical faults, corrosion, and rodent damage, and examines how cable specification plays a decisive role in reliability over the full life of a building.

RELIABILITY IS NOT JUST A FIRE ISSUE. IT IS AN INSURANCE ISSUE

INTRODUCTION RELIABILITY BEYOND FIRE

Fire survival is a critical concern for insurers. However, a significant proportion of electrical-related claims arise from failures in buildings and infrastructure that occur without fire ever being present.

Electrical faults, environmental degradation, and physical damage to cabling can all result in system outages, safety incidents, equipment damage, and business interruption. These failures are frequently latent. They develop slowly over time and may remain undetected until they cause disruption or loss.

For insurers and underwriters, this presents a challenge. Compliance at the point of installation does not necessarily translate into predictable performance over decades of operation. Electrical systems that meet minimum standards at installation degrade over time in ways that increase claims frequency and severity.

Understanding how cable construction influences long-term reliability is therefore essential. This is not simply a technical issue. It is a question of risk predictability, exposure control, and asset protection.

HOW TO USE THIS GUIDE

We have structured this guide in a way that explains:

1. The root cause of electrical system failures
2. Why this matters (from an insurance perspective)
3. How cable construction influences long-term reliability and risk exposure

THE MOST COMMON CAUSES OF ELECTRICAL CIRCUIT FAILURE INCLUDE:

- **Electrical faults**, arising from insulation degradation and mechanical stress
- **Corrosion and environmental degradation**, affecting insulation and conductors
- **Rodent damage**, causing concealed faults, intermittent outages and safety risks

These issues may not trigger immediate alarm but can surface later as system failure, costly intervention, or equipment damage resulting in business interruption, stock loss or liability claims.

In the sections that follow, we have covered these areas in more detail to highlight the causes, the risks – and the ways in which the informed specification of MICC provides a proven solution to this problem.

ELECTRICAL FAULTS AS AN INSURANCE RISK

Electrical faults are one of the most common causes of unplanned outages and equipment damage in commercial buildings. They typically arise from a combination of factors rather than a single failure event.

Data from UK Fire and Rescue Services shows that electrical distribution and electrical equipment faults are the most common identifiable cause of workplace fires, accounting for around 18 % of such incidents in non-domestic buildings in the latest reporting period.

Common contributors include insulation degradation, mechanical stress, vibration, moisture ingress, thermal cycling, and ageing of polymeric materials. Over time, these factors can lead to short circuits, earth faults, arcing, or intermittent failures.

WHY DOES THIS MATTER?

1. They are often latent. The cable may appear compliant and intact at handover, yet degradation begins from day one. Early warning signs are limited, particularly where cables are concealed.
2. They are difficult to predict. Failure timing is uncertain, which complicates risk modelling and maintenance planning.
3. They can have disproportionate consequences. A single cable fault can disable critical systems, halt operations, or damage connected equipment.

MICC: THE INFORMED CHOICE.

MICC cable is constructed without reliance on organic materials that age, harden, crack, or soften over time. In contrast to polymer-insulated systems, the absence of ageing-sensitive materials reduces longer-term degradation.

MICC cable construction (a solid copper sheath with highly compressed, inert MgO insulation) provides a continuous metallic barrier to moisture ingress and capillary moisture penetration, when correctly terminated and installed, unlike polymer layers can.

- MICC cable resist electrical performance degradation due to moisture
- Corrosion and insulation compromise from environmental conditions are vastly reduced
- Long-term electrical fault risk from damp, condensation or aggressive environments is much lower

The copper sheath also provides excellent resilience against chemical exposure and damp conditions without secondary protective layers.

CORROSION AND ENVIRONMENTAL DEGRADATION

Corrosion is a major contributor to long-term electrical failure, particularly in environments that are damp, aggressive, or chemically active. Similarly, environmental degradation is rarely a sudden event. It is a slow erosion of reliability that challenges assumptions made at the underwriting stage.

Moisture ingress is one of the most common causes. It can enter through damaged sheathing, imperfect terminations, or capillary action along cable routes. Once present, moisture accelerates insulation breakdown and conductor corrosion, increasing the likelihood of fault development over time.

Certain environments present elevated risk. These include plant rooms, basements, car parks, food processing facilities, coastal locations, tunnels, and industrial sites. Airborne contaminants, cleaning chemicals, and temperature fluctuations further increase exposure.

Polymer-insulated cables are particularly vulnerable in these conditions. Their outer sheaths can be permeable to moisture and gases over time. Small defects or installation damage can allow slow ingress that remains undetected until failure occurs.

WHY DOES THIS MATTER?

For insurers, corrosion-driven failures often result in repeated intervention, partial reinstatement, and escalating maintenance costs. They can also increase the likelihood of secondary damage to connected systems and contribute to operational disruption.

MICC: THE INFORMED CHOICE.

Compared with polymer-insulated alternatives, MICC construction can reduce corrosion-related deterioration in challenging environments. This supports more predictable long-term performance and can reduce unplanned intervention over time.

- **Corrosion-resistant:** Solid copper sheath, together with the highly compressed MgO protects conductors from moisture, chemicals, and oxidation.
- **Long-term durable:** Mineral insulation and copper construction are not reliant on organic materials that degrade under heat, UV, or radiation.
- **Environmentally stable:** Fully inorganic, no need for plastics or polymers that degrade over time.

RODENT DAMAGE: A PERSISTENT AND UNDER-RECOGNISED THREAT

Rodent damage is a well-documented cause of electrical failure, yet it is often underestimated in risk assessments.

Rodents are attracted to cable routes for warmth, shelter, and access. Many polymer cable sheaths are vulnerable to gnawing, either due to their material composition or added plasticisers.

Damage is often concealed within voids, risers, or ceiling spaces. As a result, faults may only become apparent when a system fails, or a safety issue emerges. The consequences can be significant. Rodent-damaged cables can lead to short circuits, loss of power, fire initiation, or intermittent faults that are difficult to diagnose. Discovery is often delayed, increasing downtime and reinstatement costs.

WHY DOES THIS MATTER?

From an insurance standpoint, rodent damage creates uncertainty. It is not always addressed through standard maintenance or inspection regimes and can affect both new and existing buildings. Exclusions and sub-limits may apply, but claims still arise where damage results in wider loss.

MICC: THE INFORMED CHOICE.

Materials that rely on soft polymeric sheaths inherently increase exposure to rodent-related damage. In contrast, MICC cables offer inherent resistance to rodent damage, which means they do not attract rodent attention. This is because the solid copper sheath provides a hard, mechanically robust barrier that is highly resistant to gnawing.

- **Solid copper sheath:** Provides a hard, gnaw-resistant barrier that significantly reduces the likelihood of rodent penetration.
- **No polymer or plastic layers:** Eliminate reliance on polymer insulation layers that are more susceptible to gnawing damage.
- **Inherent mechanical protection:** The copper sheath provides built-in protection to conductors, without the need for additional conduit or armouring.
- **Maintains circuit integrity:** The robust construction means that even if physically stressed, the cable is less likely to suffer conductor exposure or insulation compromise, supporting continued circuit performance and reducing the risk of failure arising from rodent attack.
- **LSZH / bare copper clarification:** Where additional low-smoke zero-halogen (LSZH) coverings are applied, these provide further protection against surface corrosion, like rodent urine.

HOW MICC CHANGES THE RELIABILITY PROFILE

Mineral Insulated Copper Clad (MICC) cables such as the products manufactured by Wrexham Mineral Cables, fundamentally alter the reliability equation because their performance is defined by construction rather than additives or protective layers.

As previously explained, MICC cables consist of copper conductors insulated with highly compacted magnesium oxide and enclosed within a solid copper sheath. As such, the cable construction does not rely on organic materials that age, soften, or degrade.

The construction of MICC provides several reliability advantages that directly address the risks outlined in this paper.

Electrical faults caused by insulation degradation are minimised because magnesium oxide does not deteriorate in the same way as polymers. Mechanical robustness reduces the impact of vibration and physical stress.

Corrosion resistance is significantly improved. The copper sheath provides an effective barrier against moisture and environmental contaminants. When correctly terminated and installed, MICC cables are highly resistant to ingress, even in aggressive environments.
Crucially, these benefits are inherent. They do not rely on additional containment, coatings, or secondary protection measures. Risk is avoided through design rather than mitigated after the fact.

RISKS VERSUS MICC MITIGATION

Risk Category	MICC Feature	Why it Matters
Insulation Ageing	Mineral (MgO) insulation	Stable electrical performance over decades
Mechanical Fatigue	Solid copper sheath	Higher tolerance to vibration and stress
Moisture Ingress	Highly compressed MgO enclosed within a copper sheath	Reduces moisture-induced faults
Corrosion	Copper and MgO	Long life in harsh environments
Rodent Damage	Solid copper sheath	Significantly reduces gnawing failure risk
Fire Survival	Non-combustible materials	Continues operation in extreme heat

Technical Notes:

- The performance-critical construction of MICC cables does not rely on polymer insulation layers or ageing-sensitive materials, like plastics, polymers, resins or tapes.
- Continuous operating temperatures are significantly higher than polymer alternatives.
- The solid copper sheath provides high resistance to water, oil, and environmental exposure when correctly specified and terminated.

These attributes matter because they reduce the f**requency and severity of non-fire failure modes,** thus reducing claims and improving asset predictability

WHY DOES THIS MATTER?

For insurers, this translates into improved predictability. Failure modes are reduced, ageing effects are minimised, and long-term performance becomes more consistent.

IMPLICATIONS FOR INSURERS & UNDERWRITERS

The technical characteristics of MICC cables have clear insurance relevance.

Reduced failure frequency leads to fewer claims associated with electrical outages and equipment damage. Improved durability lowers the need for intervention, repair, and partial replacement.

Predictability of performance supports more confident underwriting decisions. Where reliability is built into the infrastructure, exposure is easier to assess and manage.

There is also an impact on reinstatement costs. MICC systems are less likely to require extensive replacement following localised failures or environmental exposure. This reduces claim severity and business interruption duration.

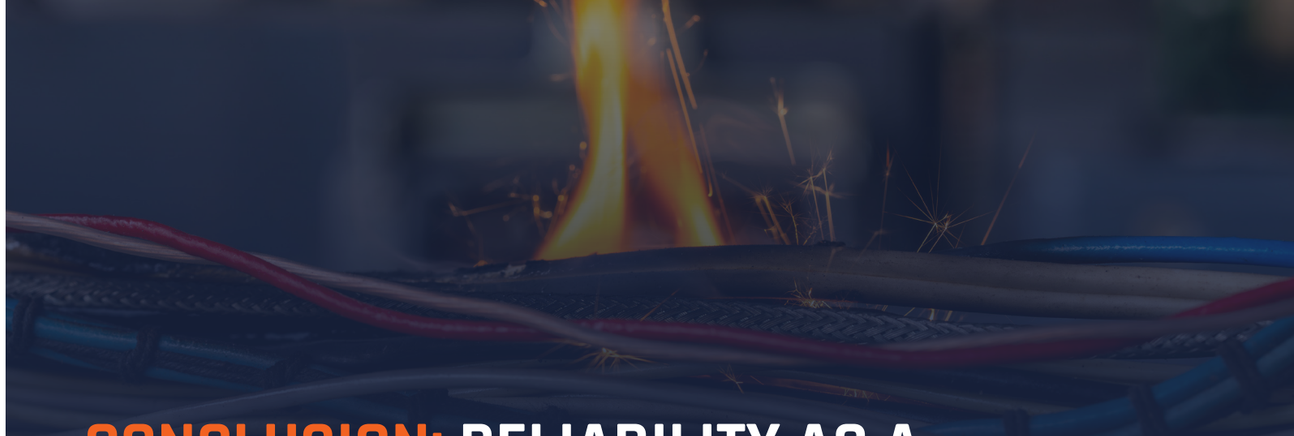
For risk consultants, MICC specification provides a tangible indicator of intent. It demonstrates that resilience has been designed into the building rather than achieved through minimum compliance.

RETROFIT AND EXISTING BUILDINGS

From an insurance perspective, retrofit specification can materially improve risk profiles and extend asset life. We covered this topic in detail in Part 1 of this guide. **Although MICC is often associated with new-build projects, it is also highly suitable for retrofit and upgrade work.**

Targeted replacement of critical circuits can significantly improve reliability without wholesale system replacement. This is particularly relevant for life-safety systems, essential services, and high-risk environments within existing buildings.

MICC's robustness and longevity, with many instances of MICC remaining in service and working well for over 50 years, make it well suited to legacy estates where access may be limited and future intervention costly.



CONCLUSION: RELIABILITY AS A SPECIFICATION DECISION

Electrical reliability is not achieved through compliance alone. It is the result of informed specification choices that consider performance over decades, not just at handover.

Electrical faults, corrosion, and rodent damage represent significant and often underestimated sources of insurance exposure. These risks are influenced directly by cable construction and material behaviour.

Mineral Insulated Copper Clad (MICC) cables offer a proven means of addressing these challenges at source. By reducing common failure mechanisms, MICC supports predictable performance, reduced intervention, and stronger protection for people and assets.

For insurers and underwriters, this represents an opportunity to move beyond surface compliance and towards more accurate assessment of long-term risk.

RELIABILITY, LIKE FIRE RESILIENCE, IS A DESIGN DECISION.

CABLE SPECIFICATION MATTERS.

WREXHAM MINERAL CABLES

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