

Enamelled / Magnet Wire Care & Precautions

Enamelled or magnet wires are conductors coated with a thin enamel insulation layer, typically between a few microns and around 100 microns thick. This insulation is delicate and can be damaged by sharp edges or exposure to harsh environments. Certain enamels, like polyesterimides, are moisture-sensitive and may degrade over time in high humidity. Additionally, these wires can elongate under tension, compromising adhesion between the enamel and conductor, which degrades insulation properties and may lead to winding failures.

To prevent insulation damage, it is essential to handle, store, and use enamelled wires with care.

Guidelines for Care

Transportation, Handling, and Storage

- **Cover Protection:** Keep enamelled wires covered to prevent contamination.
- **Avoid Sharp Contact:** Handle carefully to prevent contact with sharp objects or edges.
- **Environmental Protection:** Keep wires away from direct sunlight, moisture, dust, and acid/chemical vapours that could affect the enamel coating.

Coil Winding

- **Preparation:** Unwind a few rounds from the bobbin and check wire dimensions before use.
- **Equipment Check:** Ensure all pulleys, guide rolls, and machine components in contact with the wires are smooth, clean, and free of dust, oil, or metal particles. Avoid any sharp edges.
- **Tension Control:** Minimize wire tension and limit direction changes to reduce strain on the insulation.
- **Dimensional Check:** Measure conductor and overall wire sizes before and after winding to prevent elongation.

Stripping of Ends

- **Method Selection:** Use appropriate methods to strip wire ends, ensuring no damage to the bare conductor or adjacent enamel film.

Varnish Impregnation

- **Compatibility:** Verify that the enamel type is compatible with the varnish or resin used.
- **Pre-Heating:** Pre-heat windings to remove moisture, relieve insulation film stresses, and enhance varnish or resin penetration, ensuring better protection of the wires and windings.

By following these guidelines, you can maintain the integrity of enamelled wires and extend their lifespan, ensuring reliable insulation and winding performance.