Case Study:

Ensuring Safety in Refrigerated Containers

How Maersk Container Industry Reduced Fire Risks with Premix Conductive Concentrates

MAERSK

Background

As a global leader in shipping and logistics, **Maersk Container Industry** is committed to sustainability and innovation. In alignment with its carbon neutrality goals, the company introduced a new, environmentally friendly refrigerant in its refrigerated containers. While this transition enhanced sustainability, it also introduced new **safety risks**; specifically, the potential **build-up of static electricity** in confined, enclosed components such as the exhaust fan.

In refrigerated environments, electrostatic discharge (ESD) events can trigger sparks, which pose **serious fire hazards** especially near flammable refrigerants. To safeguard equipment and personnel, Maersk Container Industry needed a solution that could neutralize static effectively without compromising mechanical reliability in harsh maritime environments.

Challenge

The core challenge was to p**revent electrostatic discharge in the exhaust fan assembly** without compromising the mechanical durability required for long-term container performance.

The technical specifications were demanding and included:

- Use of a concentrate-grade material, allowing the customer to adjust surface resistivity (SR) to their specific application needs by dilution.
- **Stable conductivity over time** with minimal fluctuation under operational stress
- **High mechanical strength and toughness**, especially under maritime vibration and thermal cycling
- **Chemical resistance** to exposure from refrigerants and environmental elements

Solution

Premix provided a solution using its **PRE-ELEC® conductive polyamide 6 concentrate**, a high-performance material engineered for **dissipative and structural applications**. This concentrate met Maersk's dual requirements for safety and mechanical resilience:

☑ Key Material Properties:

- **Surface resistivity:** Can be adjusted to fall within the ESD-safe range by diluting the concentrate to suit specific application requirements
- **Mechanical robustness:** The final properties depend on the customer's base resin, as the concentrate is designed to be diluted. When properly formulated, the compound can deliver excellent impact resistance, dimensional stability, and abrasion durability suitable for demanding offshore applications.
- **Permanent conductivity** without the use of migrating antistatic additives – ensuring stable performance even in humid and corrosive maritime environments, unlike conventional antistatics that can be washed away over time.

Results / Benefits

By integrating **PRE-ELEC PA1411**, Maersk

Container Industry achieved:

- **Safe static discharge** performance inside the exhaust fan assembly
- **Reduced risk of fire** caused by ESD in refrigerated container units
- **Compliance with internal safety and sustainability standards**
- **Durable mechanical function**, enabling the
- fans to operate reliably through extended shipping cycles in harsh conditions

This collaboration showcases how **Premix conductive materials enable safety-driven innovation** in demanding industries like maritime logistics.

"The PRE-ELEC® concentrate delivered stable, permanent conductivity within our target ESD range, even under harsh maritime conditions. This allowed us to meet stringent safety requirements while ensuring mechanical reliability in a critical component of our refrigerated container units."

Tonny Gram, R&D Engineer at
Maersk Container Industry/MCI

Get in touch with us

Whether you have questions about our wide range of plastic compounds and materials or need assistance, our team is here to help.

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