High Temperature Resistance Solution for Integrated Container Racks



Overview

Our transport containers with integrated mounting frames in the standard 19 inch format are specially designed for the transport of electronics racks.

Key Takeaways

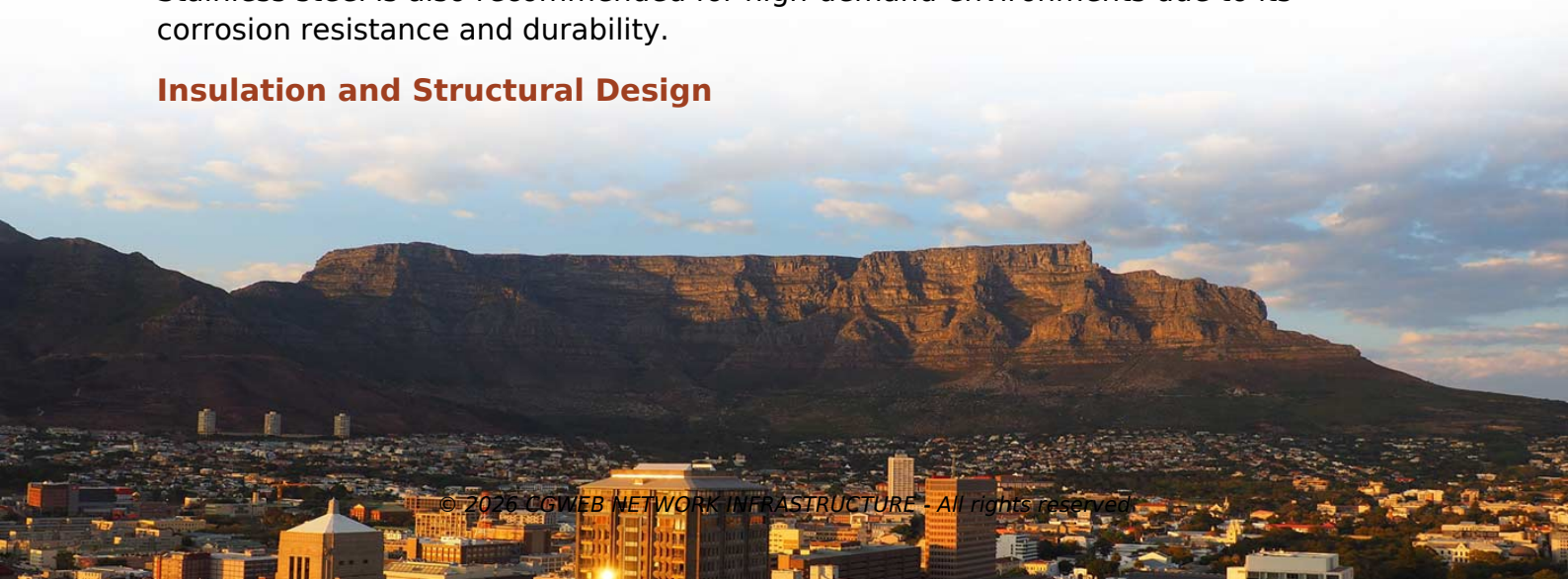
High-temperature resistance for container racks can be achieved through heat-resistant materials, advanced insulation, industrial-grade air conditioning, and structural design optimized for thermal stress.

Material Selection

For racks and containers exposed to high temperatures, heat-resistant steel and coatings are essential. Double-layer steel sandwich structures with heat-resistant coatings reduce internal temperature rise and protect structural integrity in environments exceeding 40°C, with peaks up to 55°C. For sensitive components like ICs, high-temperature-resistant plastics or composites can withstand temperatures up to 260°C while maintaining structural integrity and preventing deformation.

Stainless steel is also recommended for high-demand environments due to its corrosion resistance and durability.

Insulation and Structural Design



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Effective insulation is critical to minimize heat transfer. Containers can use double-layer walls with thermal insulation to maintain stable internal temperatures. Structural design should account for thermal expansion, using flexible fastening systems, high-quality welds, and bolts that absorb material movement without compromising stability.

Mesh shelves or optimized spacing can improve air circulation, preventing hot spots and ensuring uniform temperature distribution. Climate Control SystemsIndustrial-grade air conditioning units designed for high-temperature operation are necessary to protect critical equipment inside containers. Redundant ventilation systems, such as dual-fan designs with automatic switching, prevent sudden temperature spikes if one fan fails.

Hybrid cooling solutions, like the Rittal Blue e+ system, combine active and passive cooling circuits to dissipate heat efficiently, reducing energy consumption by up to 33% while maintaining safe operating temperatures.

Component Protection

For sensitive electronics or ICs stored in racks, high-temperature anti-static trays provide both thermal and electrostatic protection. These trays maintain structural integrity under high temperatures, prevent deformation, and include ESD protection with resistance levels from 10^6 to 10^9 ohms. Custom slot designs ensure stable placement of components, supporting automated handling systems.

Safety and Operational ConsiderationsHigh-temperature environments require attention to operator safety and equipment reliability. Containers should include explosion-proof AC units, durable anti-corrosion coatings, and positive-pressure airflow systems to maintain clean air and prevent overheating. Regular monitoring and maintenance of cooling systems and insulation are essential to prevent equipment failure and extend service life.

Summary

To achieve high-temperature resistance in integrated container racks, combine: Heat-resistant materials (steel, stainless steel, composites)Advanced insulation and double-layer wall structuresIndustrial-grade, redundant air conditioning and ventilationHigh-temperature anti-static trays for sensitive componentsDesign considerations for thermal expansion and airflow These strategies ensure structural integrity, protect sensitive equipment, and maintain operational efficiency in extreme heat conditions.

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Energy storage container with Blue e+

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2. Select the Right Coatings and Finishes In both low-temperature and high-humidity environments, coatings and finishes play a critical role in extending the life of your racking system.

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