Flame Retardant Polyurethane Wheels

Title	Flame Retardant Polyurethane Wheels
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Address	Anfeng Industrial Park, Dongtai City, Jiangsu, China
Website	https://www.poly-wheels.com/
Email	sale06@kfqizhongji.com

Description

In the modern industrial landscape, safety and durability are the two core dimensions used to measure equipment performance. With the rapid expansion of automated warehousing, rail transit, and high-risk manufacturing, Flame Retardant Polyurethane Wheels have transitioned from specialized components to a standard configuration across many sectors.



What is a Flame Retardant Polyurethane Wheel?

Flame retardant polyurethane wheels are engineered from specially formulated thermosetting polyurethane. During the production process, eco-friendly flame retardants—typically phosphorus or nitrogen-based—are integrated to provide the material with self-extinguishing properties. This ensures that once the fire source is removed, the wheel surface ceases to burn immediately, preventing the material from acting as fuel for fire spread.

Core Technical Advantages

1. Superior Fire Safety (UL 94 V-0 Standard)

High-performance flame retardant wheels typically comply with the UL 94 V-0 flammability rating. In vertical burn tests, this means the material stops burning within 10 seconds and does not produce flaming drips that could ignite surrounding materials. This layer of security is vital in confined spaces or warehouses storing flammable goods.

2. Intumescent Char Protection Mechanism

When exposed to high temperatures or open flames, this specialized polyurethane undergoes a chemical reaction to form a dense, insulating carbon char layer on its surface. This physical barrier blocks oxygen from reaching the interior, significantly reducing heat release, smoke density, and toxicity—buying critical time for evacuation and firefighting.

3. Preservation of Mechanical Properties

Unlike standard fire-resistant plastics, these wheels enhance fire safety while retaining the classic mechanical advantages of polyurethane:

High Load-Bearing Capacity: Capable of supporting several tons of static and dynamic pressure.

Superior Abrasion Resistance: High durability translates to longer replacement cycles and lower maintenance costs.

Silent Operation & Floor Protection: The elastic nature of the material effectively absorbs vibrations and prevents damage to facility flooring.

Key Application Scenarios

Automated Warehousing & AGV/AMR Robotics

In 24/7 automated logistics centers, lithium-battery-powered robots (AGV/AMR) carry a latent risk of electrical fires. Utilizing flame retardant wheels prevents a potential fire from spreading across racking systems via mobile equipment.

Mining & Underground Facilities

Underground environments demand extreme compliance regarding flame retardancy and anti-static properties. Flame retardant PU wheels effectively withstand harsh chemical exposures while eliminating fire hazards.

Aerospace & Rail Transit

Whether for aircraft towing equipment or rail maintenance vehicles, all materials must meet stringent airworthiness or railway safety regulations. Flame retardancy is the essential "entry ticket" for components in these sectors.

Conclusion

A flame retardant polyurethane wheel is more than just a mobile component; it is a critical link in the industrial safety chain. By merging robust physical performance with cutting-edge fire-suppression technology, it provides a reliable mobility solution for the world's most demanding work environments.

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