
Cast Polyurethane Wheels for Industrial Mobility

Title	Cast Polyurethane Wheels for Industrial Mobility
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Description

Unlike mass-produced thermoplastic alternatives, cast polyurethane wheels are formulated through an advanced chemical reaction and long-duration thermal curing. This precise manufacturing process creates a molecular structure with unmatched dynamic load capacity, extreme tear resistance, and an exceptionally long service life.



The Casting Advantage: Process vs. Performance

To appreciate the superiority of Cast Polyurethane Wheels, it is essential to understand the structural difference from common Molded (TPU) or rubber options:

1. **Thermoset Molecular Network:** Thermoplastic wheels (TPU) are made by melting solid plastic pellets under high pressure, meaning they can easily melt or deform again when subjected to operational friction heat. Cast polyurethane is a thermoset elastomer. It transitions from a liquid reactive chemical pre-polymer into a permanent, highly cross-linked molecular network during oven curing. It will not melt, soften, or creep under intense localized heat or heavy static loads.
2. **Superior Bonding Integrity (Anti-Debonding):** One of the most frequent points of failure in industrial wheels is tread separation (debonding from the metal core). Our advanced liquid-casting process involves meticulous chemical cleaning and bonding agent application to the steel, cast iron, or aluminum core. The liquid polyurethane reacts directly at the core interface, establishing an unbreakable chemical bond that resists severe lateral shear forces.
3. **Stress-Free Material Cure:** High-pressure injection molding forces material into molds, trapping internal mechanical stresses. Liquid-casting relies on gravity and low-pressure filling under controlled temperatures, ensuring a perfectly homogenous, defect-free elastomer tread with uniform density and properties throughout the entire wheel.

Core Technical Advantages

Our high-performance cast polyurethane compounds are tailored to deliver elite physical characteristics that outlast and outperform traditional industrial materials:

- 1. Exceptional Load-Bearing Capacity:** Cast polyurethane possesses a high modulus and tensile strength. It carries significantly heavier loads than rubber wheels of equivalent size while maintaining high elasticity, preventing the permanent flat-spotting that causes equipment vibration.
- 2. Ultra-Low Rolling Resistance (Energy Efficiency):** Thanks to low hysteresis loss, our cast PU wheels generate very little internal heat during continuous rolling. This translates into minimal rolling resistance, allowing manual carts to be pushed with ease and significantly reducing battery consumption for automated equipment.
- 3. Unrivaled Abrasion and Tear Resistance:** Floor joints, iron filings, concrete debris, and metal shavings pose constant threats in industrial plants. Our CPU compounds feature extreme resistance to "chunking," gouging, and tearing, outlasting standard rubber wheels by 3 to 5 times.
- 4. Floor Preservation & Noise Reduction:** Despite their immense weight-bearing rigidity, cast polyurethane wheels retain enough elastomer elasticity to protect expensive epoxy, concrete, or tiled floors from crushing or marking. They naturally dampen structural vibrations, reducing ambient facility noise by up to 15 dBA.

Application

Our cast polyurethane wheels are deployed worldwide across sectors where equipment failure is not an option:

- 1. Intralogistics & Electric Forklifts:** High-capacity drive wheels, load rollers, and support casters for reach trucks, electric pallet stackers, and VNA (Very Narrow Aisle) warehouse vehicles.
- 2. Smart Warehousing (AGVs & AMRs):** Precision-engineered drive and tracking wheels for Automated Guided Vehicles and Autonomous Mobile Robots, ensuring low startup torque, absolute concentricity, and reliable braking coefficients.
- 3. Heavy Manufacturing & Assembly Lines:** Rugged guide wheels and heavy-duty casters for automotive assembly lines, aerospace transport jigs, and overhead crane systems.

4. Extreme High-Speed Systems: High-dissipation rollers used in high-frequency airport sorting baggage lines, conveyor systems, and theme park amusement rides.

Whether you require a standard replacement batch or custom OEM/ODM designs tailored with integrated precision bearings for an automated system, our engineering team is ready to deliver. Contact us today to discuss your load, speed, and dimensional requirements for your next project.