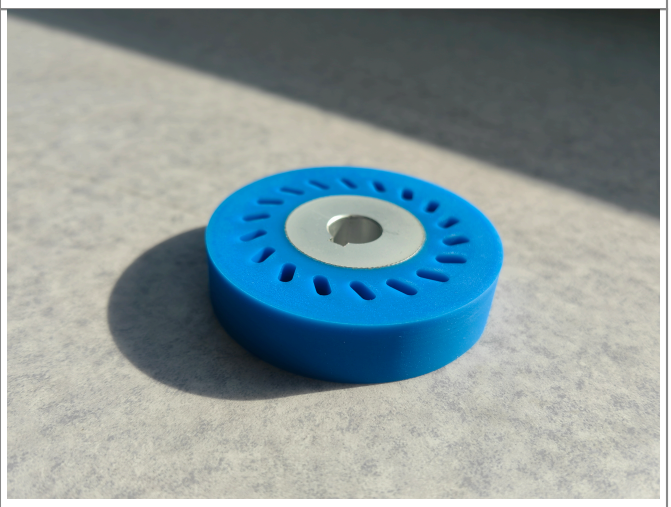
Zero-Slip Polyurethane Keyway Drive Wheels

Title	Zero-Slip Polyurethane Keyway Drive Wheels
Thumb	
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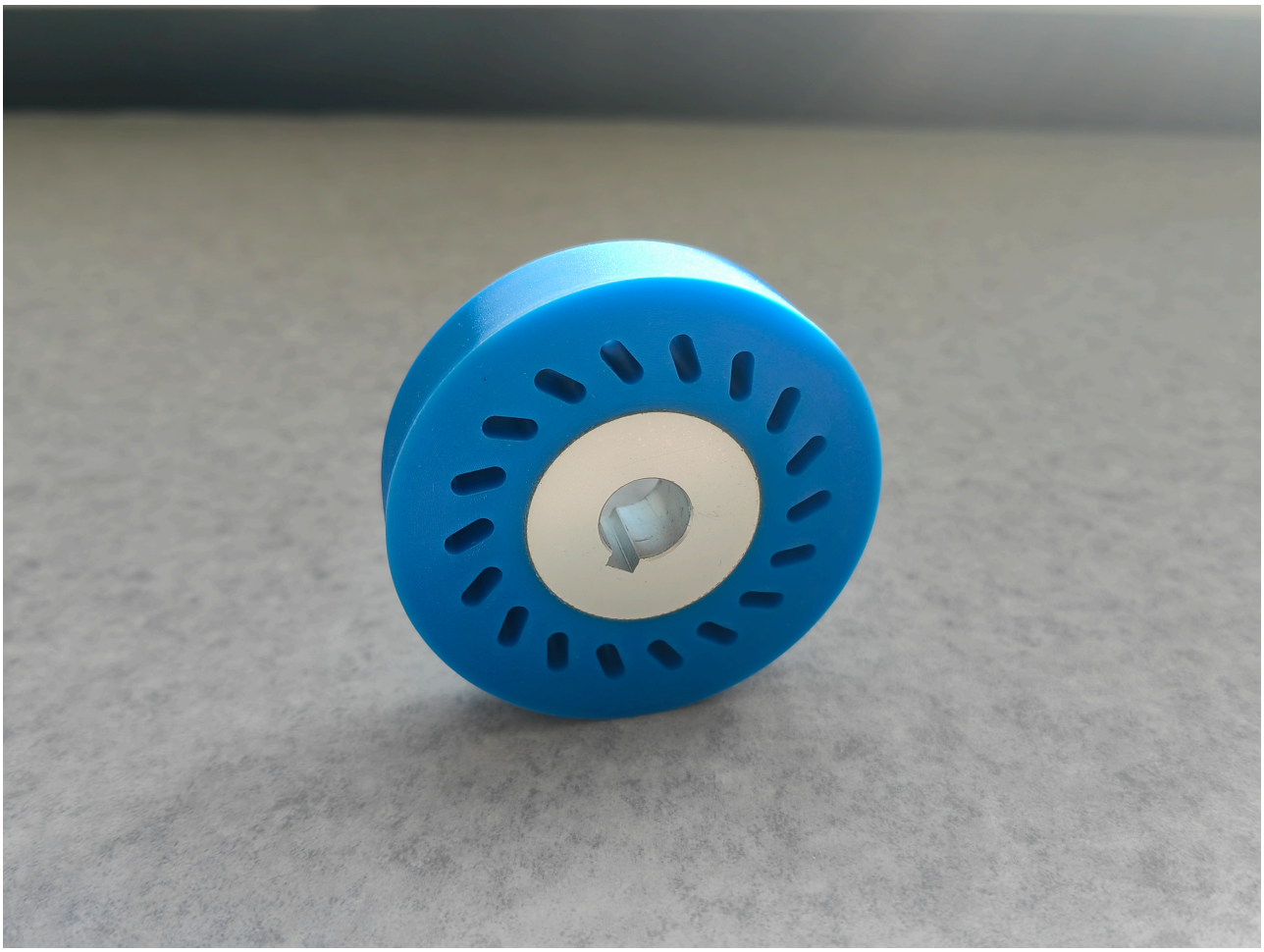
Description

Keyway polyurethane wheels combine the exceptional material properties of polyurethane with reliable mechanical locking connections to achieve efficient, high-torque power transmission. This design is the industry standard for applications where slippage is not an option.

What Are Polyurethane Drive Wheels with Keyways?



A drive wheel with a keyway features a precisely machined groove in its central bore. This aligns with a corresponding groove on the motor or drive shaft. A rectangular metal component, the key, is inserted into this assembly, creating a robust, anti-slip mechanical connection.

In high-performance versions, the wheel body is made from cast polyurethane elastomer, chemically bonded to a precision-machined metal hub (typically steel, aluminum, or stainless steel) that houses the keyway.

Comparison: Keyway vs. Other Mounting Methods

Understanding the difference between mechanical locking and friction-based mounting is crucial for system reliability.

Feature	Keyway Connection	Set Screws	Clamping Collars
Transmission Type	Rigid / Mechanical Locking	Friction-based	Friction-based

Feature	Keyway Connection	Set Screws	Clamping Collars
Torque Capacity	Extreme (High Loads)	Low (Light Loads)	Medium
Slip Resistance	100% Anti-slip	High risk of loosening	Moderate
Shaft Protection	Requires keyway machining	Can damage/scar shaft	Protects shaft surface
Best For	Heavy-duty, Precision Timing	Simple positioning	Frequent adjustments

Core Features and Advantages

1. Zero-Slip Synchronous Transmission

The physical fit between the key and keyway ensures absolute synchronization. This is critical for automated guided vehicles (AGVs), indexing conveyors, and applications requiring precise stop-start positioning.

2. Superior Material Properties

High Friction Coefficient: Polyurethane naturally provides better traction than rubber or plastic, reducing the energy lost during acceleration.

Abrasion Resistance: Outlasts rubber by up to 4x, significantly extending service life in harsh industrial environments.

Vibration Damping: The elastic nature of polyurethane absorbs shock loads, protecting the motor bearings and gearbox from premature wear.

Chemical Resistance: Maintains structural integrity when exposed to oils, greases, and industrial cleaning agents.

Engineering Selection: Shore Hardness Guide

Selecting the right durometer (hardness) is vital for performance:

80A - 85A Shore: High grip, low noise. Ideal for light-duty sorting and cleanroom environments.

90A - 95A Shore: The industry standard. Offers the best balance of load capacity, wear

resistance, and traction.

98A+ Shore: Maximum load-bearing. Used for heavy-duty industrial carts and AGVs where rolling resistance must be minimized.

Technical FAQ

Q1: Why is a metal hub necessary for keyway wheels?

A: Polyurethane is an elastomer; it is too flexible to hold a keyway under load. A metal hub (Steel or Aluminum) provides the structural integrity needed to handle the torsional stress, while the polyurethane coating provides the functional contact surface.

Q2: How do I prevent axial movement (sliding along the shaft)?

A: A keyway only prevents rotational slip. To prevent the wheel from sliding along the shaft, we recommend using a shaft shoulder, a snap ring (circlip), or adding a set screw over the keyway to lock the wheel axially.

Q3: Which standards do your keyways follow?

A: Our precision machining follows international standards including ISO 773. DIN 6885. and ANSI B17.1. ensuring a perfect fit with your existing motor shafts.

Need a Customized Solution?

Whether you require a specific bore diameter, a unique keyway size, or a specialized polyurethane formulation for extreme temperatures, our engineering team is ready to assist. Would you like us to provide a technical drawing or a quote for your specific shaft dimensions?