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Shock Load Casters: Spec for Impact & Dock Drops

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Quick answer. Shock loads from dock joints, forklift strikes, and dropped loads generate 3x-6x peak forces above steady-state load, which is why a caster that passes a 2,000 lb steady-state test can fail within months. Spec shock applications with spring-loaded rigs, resilient treads, and rated capacity sized from peak impact force, not average rolling load.

Where Shock Load Comes From

Shock Source	Typical Multiplier	Typical Duration	Damage Mode
Dock joint transition	2.5-4x	100-300 ms	Bearing + kingpin fatigue
Floor crack/spall (1"+)	3-5x	50-200 ms	Tread delamination, wheel core
Forklift strike on stored cart	5-10x	10-50 ms	Rig cracking, plate deformation
Dropped load into cart	3-6x	50-150 ms	Overall shock, rig yielding
Start-stop at speed	1.5-2x	500 ms	Acceleration stress, swivel bearing
Outdoor speed bump	3-5x	200-500 ms	Whole system shock

Wheel and Rig Combinations for Shock

Shock Severity	Wheel	Rig	Bearing	Typical Use
Low (smooth floors, 1.5x)	95A polyurethane	Stamped industrial	Sealed ball	Indoor warehouse carts
Medium (joints, 2.5-3.5x)	95A polyurethane, 6"+	Forged kingpinless	Sealed tapered roller	Dock handling, tow line
High (rough floors, 3.5-5x)	85A polyurethane or cushion rubber	Forged kingpinless	Sealed tapered roller	Outdoor yards, construction
Severe (drops/strikes, 5-10x)	Pneumatic or cushion	Spring-loaded shock rig	Heavy-duty tapered	Aerospace tooling, towline



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