

TECHNICAL REFERENCE · PRINT & KEEP

Rolling Resistance for Casters Sizing & Spec

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Quick answer. Caster rolling resistance is the horizontal force needed to push a loaded caster at steady speed, expressed as a coefficient of 0.01 to 0.08 lb of push per lb of load. Breakaway force runs 1.5 to 3 times higher than steady-state rolling. Larger diameters and harder wheel materials on smooth floors cut push force and support NIOSH ergonomic limits.

Rolling Coefficient by Wheel Material

Wheel Material	Rolling Coefficient	Push Force on 1,000 lb Load	Floor Protection	Shock Absorption
Forged steel	0.01 to 0.015	10 to 15 lb	Low	Low
Cast iron	0.015 to 0.02	15 to 20 lb	Low	Low
Phenolic	0.02 to 0.03	20 to 30 lb	Medium	Low
Polyurethane, hard (95A)	0.025 to 0.035	25 to 35 lb	High	Medium
Polyurethane, medium (85A)	0.035 to 0.05	35 to 50 lb	High	Medium-high
Pneumatic tire	0.04 to 0.06	40 to 60 lb	High	Very high
Soft rubber (70A)	0.06 to 0.08	60 to 80 lb	Medium-high	Very high

How Floor Type Changes Rolling Resistance

Floor Type	Coefficient Multiplier	Surface Notes	Best Wheel Response
Polished epoxy-coated concrete	x 1.0 (baseline)	Smooth, hard	Hard wheels
Steel plate	x 0.8	Very smooth	Any hard wheel
Unsealed concrete	x 1.2	Porous, dusty	Polyurethane
Concrete with expansion joints	x 1.5 to 2.0 at joint	Discontinuity shock	Larger diameter
Rough asphalt	x 1.8	Abrasive, irregular	Pneumatic, large wheel
Industrial carpet/anti-fatigue mat	x 2.5 to 3.5	Compressive, soft	Large hard wheel



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