

TECHNICAL REFERENCE · PRINT & KEEP

Caster Selection for Towing & Powered Equipment

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Quick answer. Tugger-towed carts run 2 to 4 times the duty cycle of manual carts, so standard casters fail in weeks. Four inputs drive tow-caster spec: pull speed (ICWM ratings assume 3 mph; 4 to 5 mph needs upgraded spec), train length, turn radius, and dock-impact frequency. Sustained 24/7 duty above 4 mph derates standard load ratings 30 to 50 percent.

Pull Speed and Wheel Diameter

Pull Speed	Wheel Diameter	Bearing Grade	Load De-rate vs 3 mph
Up to 3 mph	5-6 inch	Standard precision ball	Baseline
3-4 mph	6-8 inch	Precision ball (ABEC-3+)	-20-25%
4-5 mph	8-10 inch	Sealed precision (ABEC-5+)	-35-45%
5-7 mph (AGV/AMR)	8-12 inch	Forged precision bearing	-50-60%
7+ mph (industrial AGV)	Custom 10-14 inch	Hybrid ceramic bearing	-65-75%

Dock Impact and Shock Rating

Dock-Impact Frequency	Applicable Rating	Recommended Rig	Recommended Wheel
Less than 10/day	Momentary shock (3x static)	Kingpin OK	Urethane 85A-95A
10-50/day	Repeated shock (1.5x static, 10k cycles)	Kingpinless preferred	Urethane 95A or forged
50-200/day	Repeated shock + fatigue	Kingpinless mandatory	Forged steel wheel
200+/day (24/7 AGV dock)	Fatigue rating (1M+ cycles)	Forged kingpinless	Forged steel with shock absorber



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