TECHNICAL REFERENCE · PRINT & KEEP

Why Casters Flat-Spot Overnight and How to Stop It

One-page quick reference · Full engineering guide + live tools at the QR codes below

Quick answer. Casters flat-spot overnight because polyurethane, rubber, and TPR treads cold-flow under sustained static load, a mechanism called compound creep that begins above roughly 60% of rated capacity held for more than 12 hours. Fixes: park loads on jacks, add casters to cut per-wheel load, or switch to creep-resistant compounds such as phenolic or steel.

Load Percentage Math

Compound	% of Dynamic Rating	Flat-Spot Risk (12-hr park)	Recommended Max for Overnight
Thermoplastic rubber (TPR)	Any over 40%	High	40%
Soft rubber (Shore 60A)	Over 50%	High	50%
85A polyurethane	Over 55%	Moderate	55%
95A polyurethane on iron	Over 70%	Moderate	70%
Phenolic resin	Over 85%	Low	85%
Cast iron / forged steel	Any up to 100%	None (no creep)	100%
Glass-filled nylon	Over 80%	Low	80%

Parking Protocols That Prevent Flat Spots

Protocol	Effort	Typical Flat-Spot Reduction	Cost
Pre-park roll (3 to 5 ft)	Zero (policy)	15 to 25%	None
Weekly 1/4 turn rotation	Low (PM schedule)	60 to 80%	Labor only
Jack-down parking legs	Moderate (retrofit)	95%+	$120 to $400 per cart
Centered load standard	Low (training)	30 to 50%	None
Climate-controlled weekend park	Moderate	20 to 40%	Facility floor space
Quarterly runout inspection	Low (PM)	Detects early, prevents worsening	Labor only

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