



CASTER LOADINGS ON PLYWOOD

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Plywood is sometimes proposed by potential industrial or commercial users for use as a floor surface under caster-equipped trucks and other types of rolling equipment. Casters, or small wheels, are used extensively on portable equipment and on hand or tow-line-propelled trucks. Caster loads can be abusive to certain floor surfaces under certain caster-wheel-load conditions. This information describes the performance of plywood used as a wearing surface beneath caster loads.

The table is a guide for judging suitability of various caster-floor combinations. The values given are not absolute, and some are extrapolations from test observations. Wood, even within one species, varies in its ability to withstand wheel traffic.

Recommended maximum loadings are given for two conditions listed as "Intermittent Use" and "Repeat-Track." Intermittent use implies occasional travel of a hand truck or piece of wheeled equipment along a more-or-less confined path, or continual random travel of hand trucks or wheeled equipment where the

wheels are not likely to traverse identical paths. Repeat-track use would occur beneath wheels of trucks used on tow-line conveyors or where hand trucks or wheeled equipment must continually travel the same path due to confinement of the travel area, as in hallways or through doorways.

Use caution in developing specifications for floors where thousands of loading cycles will occur in a relatively short period of time. The recommendations in the table are based on observations of 1000 cycles of loading, while in some situations, a tow-line conveyor can give 1000 cycles of loading to the underlying floor surface in one 8-hour shift.

Information on the effects of different types and sizes of casters on different plywood surfaces was acquired by testing. Tests were performed in the laboratory by rolling load-carrying casters back and forth across plywood and plywood product specimens. Results are based on the observed effects of the load-carrying caster on the specimen surface after 2000 trips of the caster across the surface.

First, Plyron® proved to be very resistant to caster abuse. Plyron's hardboard surface has the capability of distributing concentrated wheel loadings, thus effectively

reducing the stress on the underlying wood fibers. Soft rubber-tired casters may be used at full rated capacity on Plyron. Steel, phenolic and other hard plastic casters may be used on Plyron but with caution and within the limits suggested in the table.

Bare Group 1 or Group 2 plywood is able to tolerate soft-rubber-tired casters at full rated loads on a random-track basis. Repeat-track situations, such as occur beneath tow-line conveyors, require reduced loading. A 50% reduction may enable bare plywood to have a reasonably long life. Hard plastic, phenolic or steel casters should be considered only for intermittent use on bare plywood.

The statements above on bare plywood as a floor under caster loads extend also to High Density Overlay (HDO), Medium Density Overlay (MDO) and fiberglass-reinforced plastic (FRP) plywood. The overlays transmit the wheel loadings directly to the first wood ply with little load distribution. HDO, MDO and FRP plywood products, therefore, should be considered for their other physical properties rather than as improvements on bare plywood for resisting caster abuse.

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The Engineered Wood Association

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Wheel Surface Material	Dia. – Width (inches)	Mfrs. Rated Caster Capacity (pounds)	Recommended Maximum Loading on Bare Group 1 or Group 2 Plywood ⁽¹⁾ (pounds)		Recommended Maximum Loading on Plyron® (pounds)	
			Intermittent Use	Repeat-Track	Intermittent Use	Repeat-Track
Steel	1.9x1/2 (Conveyor Skate Wheel)	100	N/R ⁽²⁾	N/R	100	50
Soft Rubber	2" Round Ball Furniture Caster	50	50	25	200	200
Polyurethane	4x1-3/8	400	100	50	300	200
Polyurethane	3-1/4x4	1500	400	200	800	600
Polyurethane	8x1-5/8	1125	200	100	400	200
Steel or Hard Plastic	4x1-1/2	425	50	N/R	200	100
Soft Rubber	4x1-3/8	300	300	150	300	300
Soft Rubber	6x2	400	400	200	400	400
Soft Rubber	8x2	500	500	250	500	500
Steel or Hard Plastic	8x2	1050	50	N/R	400	200
Steel (Conveyor Roller)	1-3/4x9	–	(4)	100	(4)	200

(1) Applies also to MDO, HDO, FRP plywood.

(2) N/R – Not recommended.

(3) Most of the caster-load-floor combinations shown in this table were tested to 1000 cycles of loading in the APA laboratory. A few values have been extrapolated from test data. Some values were limited by caster capacity rather than panel capacity.

(4) "Intermittent use" does not apply.

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