



Caster & Wheel Selection Tips

HAMILTON®

ACCESSORIES

Casters can often be made safer, more versatile, or more efficient for specific uses by equipping them with optional accessories. Catalog pages 18 and 19 show swivel locks, wheel brakes, swivel assembly seals, wheel bearing seals, and thread guards. Keyway machining of wheels is covered on page 18. Floor truck locks are shown on page 76.

SPECIAL LUBRICANTS

Swivel and wheel bearings are normally pre-lubricated at the factory with a good multi-purpose grease. Special lubricants are available at slight extra cost for unusual operating or environmental conditions such as high heat or sub-zero temperatures, moisture or humidity, solvents or chemicals. Special bearing types and/or seals may also be advisable in such applications (see pages 11 and 18).

FINISH

Most medium and light duty casters have zinc plated finish, as listed in the specifications for each series. Standard finish on unplated casters is Hamilton Red or Machine Gray enamel. Cast iron wheels and wheel centers are Hamilton Red, except that *Duralast®* centers are distinguished by Machine Gray which is also used to identify drop forged steel wheels and wheel centers, and Steeltest alloy wheels. Caster hardware is zinc plated on all standard models except stainless steel casters.

SPECIAL FINISHES

Some highly sophisticated processes are available today that can improve the following caster or wheel properties:

- Wear resistance
- Surface hardness
- Lubricity
- Abrasion resistance
- Corrosion resistance

Stainless steel casters (see catalog pages 35, 54 & 55) may or may not be the best answer. For some applications a carbon steel pad—or even a cast iron one—can be specially treated and protected with a high-tech coating that may solve the problem more economically. Such processes are usually not cost-effective in small quantities, but our engineering department will be happy to advise you.

MAINTENANCE AND SAFETY TIPS

Although Hamilton Casters and Wheels are painstakingly built from quality materials, their continued performance and life depend upon two essential maintenance routines:

- 1) Relubricate on a regular schedule;
- 2) Inspect regularly for loose bolts or nuts, caster damage or misalignment, and worn wheels or bearings.

REPLACEMENT WHEELS, ETC.

When replacement or repair eventually becomes necessary, Hamilton offers the correct wheels, bearings or parts originally supplied. Included in the caster specification charts in this catalog you will find the catalog number (including bearing size) of the wheel originally installed by the factory. Replacement bearings, axles and spanner bushings as used in Hamilton Casters will be found on page 77.



One of our company's oldest mottoes, "Put it on Wheels and Keep it Moving", retains as much meaning now as ever. As the oldest and most basic tool of material handling, the wheel still holds the key to productivity improvement in hosts of applications. And thanks to its modest cost and flexibility, it remains the most popular and most affordable answer to all kinds of handling problems. Consider just a few of the benefits provided by castered equipment:

- **Increased productivity and profits.** Non-productive handling time is slashed and in-process materials are kept "on the move"—without major capital outlays.
- **Improved space utilization.** Like manpower, space is an expense that must be utilized efficiently. Castered equipment goes anywhere... forward or backward... even up or down in some new stacking systems.
- **Safer working conditions.** Properly designed castered equipment is readily controlled, reducing hazards often associated with make-shift handling or even with certain highly engineered systems.
- **Flexibility.** Castered equipment surpasses the most expensive "fixed" systems in its ability to adapt to changing production methods, product mix, or even a complete change of plans or location.
- **Load protection.** By preventing unnecessary rehandling, and by keeping goods from being dragged or abused by the wrong kind of powered equipment, castered equipment can lessen the incidence of damage.

SELECTING THE RIGHT CASTER

If providing flexible-path mobility is what non-powered equipment does so well, it's important to select the casters and wheels that will do your job best. In this way you can be sure of getting top performance without excessive investment.

Wheels and casters are offered in a variety of types and sizes—not to confuse you, but because differences in applications can create big differences in what will perform best. And equally important, selecting the right wheel or caster will save money in the long run by heading off downtime, excessive maintenance costs, and premature replacement. For original equipment manufacturers, it can mean the difference between enhancing the mobility and life of a product... or inviting complaints with every sale.

FACTORS TO CONSIDER

The following pages will describe what's available in different types of wheels and bearings, and their characteristics. But in order to know what to look for in the convenient charts and nomenclature presented there, you first need to ask certain questions about the application, such as:

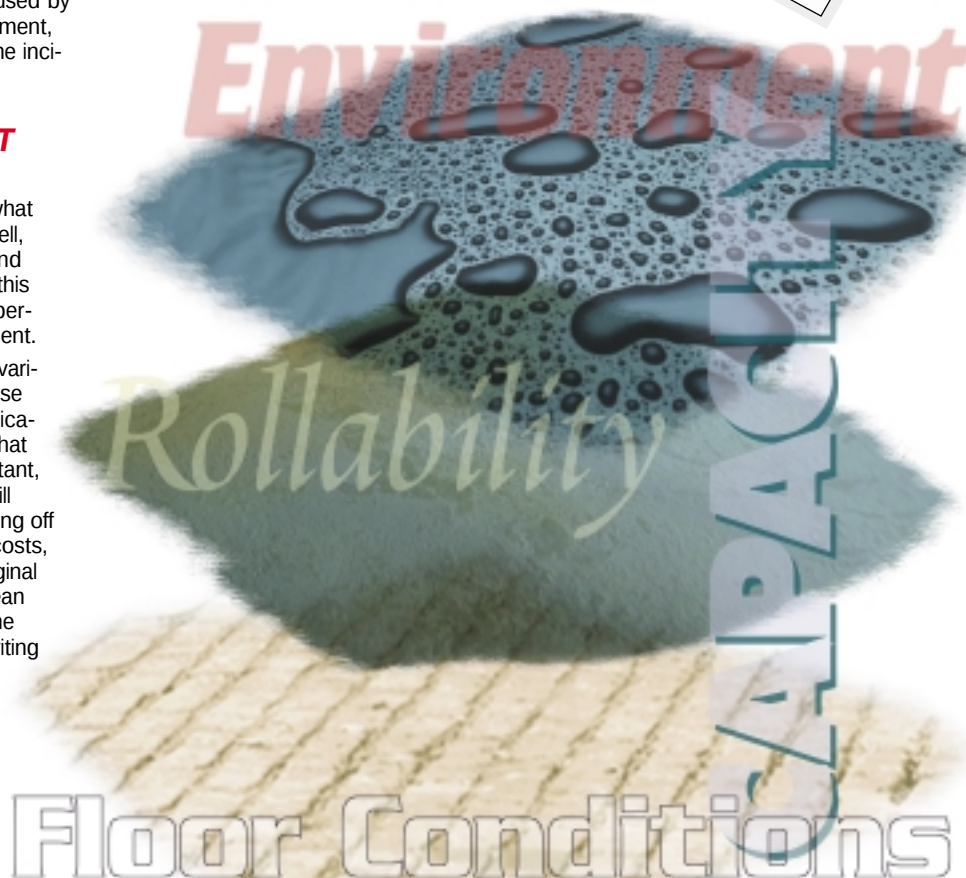
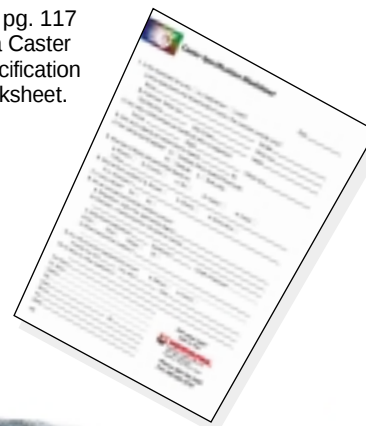
Capacity: What will the maximum load be? Don't forget the weight of the vehicle itself! Does the possibility of overload, shock loading, abuse or poor floors call for a safety factor? Capacities shown in this catalog are based on 3 m.p.h. intermittent operation over smooth floors. Because of varying conditions and differing corporate philosophies, capacity ratings may differ from one manufacturer to the other and should never be used in place of specifications for making comparisons. (For example, some makers require reducing their ratings by 50% for power towing, which is not the case with Hamilton's.)

Floor Conditions: Are they smooth? Must elevator sills, railroad tracks or dock plates be traversed? Are there chips or harmful substances on the floor? And don't forget about floor protection. In general, resilient wheels are required for rough floors or power-towed equipment—see the wheel selection data on pp. 12-13.

Operating Environment: Is noise a factor? Water, oil, grease, chemicals or temperature extremes present? Special lubricants can be provided by the factory, as well as special bearings or sealed bearings (pg. 11). Frequent movement demands longer-wearing components than occasional movement.

Rollability: If loads are to be pushed manually, select the largest practical wheel diameter, anti-friction bearings, and the kind of wheel that will start and roll easiest over the surface in question. On smooth floors, the harder the tread the easier it will roll. Conversely, soft tread wheels—desirable for rough floors, outdoor use, or for cushioning loads—can be difficult to push manually under heavy loads.

See pg. 117 for a Caster Specification Worksheet.



WHEEL BEARINGS



Precision Tapered Roller Bearings. Ideal for heavy duty and power-towed caster applications because their tapered faces will handle the most severe combination of downward and side forces. Used in various Hamilton swivel assemblies as well as in wheels.

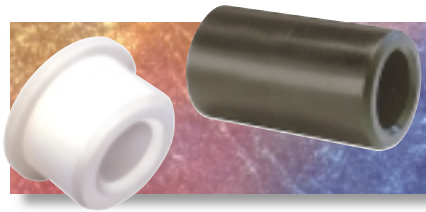
Two bearings are installed per wheel, one in each side of the hub, consisting of a cup (hardened and ground outer raceway) and cone (roller assembly). Tapered bearings extend overall hub length of the wheel itself by approximately $\frac{1}{4}$ ". (Shown above with optional seal.)



Precision Ball Bearings. Best suited when rollability is important and side thrust is not a critical factor. (Tapered bearings are best suited where side thrust is critical). The bearings are pre-lubricated and sealed at the factory so greasing is not required, reducing maintenance costs. Double-sealed precision ball bearings (shown on left) incorporate steel reinforced rubber seals securely fastened to a groove on the ring of both sides of the bearing. They now replace straight roller bearings in the majority of our casters using polyurethane tread and solid urethane wheels and can be provided optionally on many other wheel types. Shielded stainless steel ball bearings (shown on right) are used in our stainless steel and solid urethane wheels to prevent rust and improve rollability. On special order, we can supply additional sizes and configurations including flanged, sealed square bores, extended inner raceways, and wide inner raceways with self-locking collars.



Straight Roller Bearings. Traditional anti-friction bearing for industrial equipment. Consists of a cage-type roller assembly, and an outer race that may be separate or integral. (Note: plastic retaining washers or other components may be used unless we are advised of a high-heat application.)



Plastic Bearings. For environments detrimental to metal bearings, acetyl resin bearings offer chemical and corrosion resistance. Delrin® (registered DuPont trademark) is a standard offering in certain wheels, as either a sleeve or flange type bearing. Plastic bearings can be custom machined and installed in most other Hamilton Wheels on request. Note: flange type bearings extend actual hub length of wheel approximately $\frac{3}{16}$ ".



Oilless Sleeve Bearings. A sleeve, usually of sintered iron or oil-impregnated bronze, is press-fit into the wheel bore. Lacks the ease of movement anti-friction bearings provide, but practical for light loads or where re-lubrication is a problem. (A light application of oil or graphite improves rollability and extends bearing life.)



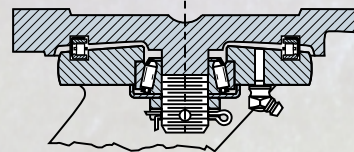
Non-Precision Ball Bearings. These ball bearings are the unground radial type, intended for only light-to-medium duty service.

Plain Bore. The term applied to running machine-bored wheels directly on an axle; hence, the absence of a bearing. Suitable for light or seldom moved loads, where ease of starting and rolling is not too important or where price is a dominant factor. Except for roller bearing bores, Hamilton normally machines "plain bore" wheels $\frac{1}{64}$ " oversize for good running fit. Closer tolerance machining available at extra cost.

Special Bearings. For most applications, the bearings discussed above work quite effectively. However, there is an occasional requirement for bearings with special features and characteristics.

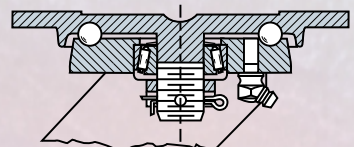
For example, alloy bronze bearings and ferrous alloy bearings are designed for high heat applications. Teflon® impregnated bronze bearings eliminate the need for lubrication and operate effectively in hostile environments. Roller clutch bearings permit a wheel to roll in only one direction and square bearings allow wheels to roll on a square shaft. Ask for a Product Engineer to help you with any unusual requirements.

SWIVEL BEARINGS



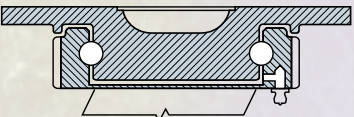
Precision Unit Load and Thrust Bearing.

Ideal choice for continuous or extra demanding service. A replaceable unit bearing carries the direct thrust (main load), while a precision tapered roller bearing counteracts component thrust. In addition, Hamilton's famous integrally forged kingpin—which can't bend, break or come apart—makes this a herculean combination. Series PSD (pg. 24).



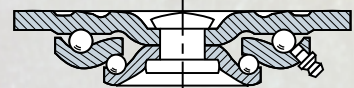
Commercial Load and Precision Thrust Bearing.

A set of hardened and polished steel balls rotates in a machined raceway (flame hardening recommended for continuous service). Radial thrust is absorbed by a precision tapered roller bearing. To get the most out of this combination, Hamilton also gives you our unbeatable integrally forged kingpin. Series MD (pg. 22), MDD (pg. 23), EHD (pg. 26-27), CH (pg. 28), A (pg. 30), ES (pg. 31), FM (pg. 32), HS (pg. 33), WH (pg. 34), 7000 (pg. 48), 7200 (pg. 49), and 8000 (some models, pg. 52). Heat treated raceways standard on Series MD, MDD and ES, optional at extra cost on all others.



Kingpinless-Style Design

The top plate and inner raceway are formed from one piece, providing a superior raceway for shock conditions. The inner and outer raceways are CNC-machined and then induction hardened to ensure a uniform depth in hardness. A sealing cap welded to outer race assures protection from foreign material and keeps grease in the raceway. Series SEC (pg. 25) and Series EC (pgs. 36-37).



Double Ball Race.

Two sets of hardened and polished steel balls rotate in machined or pressure-coined raceways. The upper raceway absorbs direct thrust, while the lower raceway surrounds the kingpin to absorb side forces (component thrust). Raceways are hardened as required by the load ratings, and kingpins may be of the bolt or rivet type. Series MS (pg. 38), GS (pg. 39), 52 (pg. 40-41), WW (pg. 42), HL (pg. 43), 300 (pg. 45), 5000 (pg. 50), 4000 (pg. 53), STA (pg. 54), STL (pg. 55), TG (pg. 56), and TX (pg. 57).