

# CATALOG INDEX

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### CATEGORY 01 – LIGHT DUTY CASTERS

**For Loads: Up to 150 lbs.**

**Category:** Institutional

**Types:** Kingpin



### CATEGORY 02 – LIGHT DUTY CASTERS

**For Loads: Up to 300 lbs.**

**Category:** Institutional

**Types:** Kingpin / Stainless Steel



### CATEGORY 03 – MEDIUM DUTY CASTERS

**For Loads: Up to 600 lbs.**

**Category:** Institutional / Industrial

**Types:** Kingpin / Stainless Steel



### CATEGORY 04 – MEDIUM DUTY CASTERS

**For Loads: Up to 900 lbs.**

**Category:** Institutional / Industrial

**Types:** Kingpin / Kingpinless /  
Stainless Steel



### CATEGORY 05 – HEAVY DUTY CASTERS

**For Loads: Up to 1400 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless /  
Stainless Steel



### CATEGORY 06 – HEAVY DUTY CASTERS

**For Loads: Up to 2000 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless /  
Stainless Steel /  
Spring Loaded Rigs



### CATEGORY 07 – HEAVY DUTY CASTERS

**For Loads: Up to 3500 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless /  
Spring Loaded Rigs



### CATEGORY 08 – EXTRA HEAVY DUTY CASTERS

**For Loads: 5,000 – 10,000 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless /  
Spring Loaded Rigs



### CATEGORY 09 – EXTRA HEAVY DUTY CASTERS

**For Loads: 10,000 – 20,000 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless /  
Spring Loaded Rigs



### CATEGORY 10 – EXTRA HEAVY DUTY CASTERS

**For Loads: 20,000 – 100,000 lbs.**

**Category:** Industrial

**Types:** Kingpin / Kingpinless



(CONTINUED ON NEXT PAGE...)

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## Overview of Caster Industry – Category Breakdown

<b>INSTITUTIONAL</b>		<b>INDUSTRIAL</b>									
<b>Light Duty</b>		<b>Medium Duty</b>			<b>Heavy Duty</b>			<b>Extra Heavy Duty</b>			
Category 01	Category 02	Category 03	Category 04	Category 05	Category 06	Category 07	Category 08	Category 09	Category 10		
Loads To 150 lb	Loads To 300 lb	Loads To 600 lb	Loads To 900 lb	Loads To 1,400 lb	Loads To 2,000 lb	Loads To 3,500 lb	Loads To 10,000 lb	Loads To 20,000 lb	Loads To 100,000 lb		
Caster Types	Caster Types	Caster Types	Caster Types	Caster Types	Caster Types	Caster Types	Caster Types	Caster Types	Caster Types		
Pressed Steel	Pressed Steel	Pressed Steel	Pressed Steel								
		Cold Forged	Cold Forged	Cold Forged	Cold Forged						
			Hot Forged	Hot Forged	Hot Forged	Hot Forged	Hot Forged	Hot Forged	Hot Forged		
Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless	Kingpinless		
Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance	Zero Tolerance		
Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel					
	Shock Absorbing		Shock Absorbing	Shock Absorbing	Shock Absorbing	Shock Absorbing	Shock Absorbing	Shock Absorbing	Shock Absorbing		
	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel	Dual Wheel		

Note: Actual manufacturer load ratings in each product category may vary based on their testing.

# Precision Ball Bearing Wheels (Section 11)



## Steel / Stainless Steel

Continuous Cast Iron (Tensile 100,000 PSI), Continuous Cast Ductile Iron (Tensile 65,000 PSI) and Stainless Steel, CNC machined in-house. Performance far exceeds standard Cast Iron and Ductile Iron. All available with any size Standard or Stainless Steel Precision bearings. Made to fit any Caster Rig Hub Length.

**Available in:** Flat Tread, Crowned, Flanged, Double Flanged, V-Grooved. Custom Designs for any type bearing.

**Sizes to:** 36"



## Nylacron Wheels™ (NY)

**With Precision Ball Bearings for Any Application (NY/MD, NY/HSB, NY/MC, NY/GF)**

Nylacron™ wheels with proper sized precision bearings are made to fit in any rig hub length and axle size. Nylacron™ wheels have greater load capacity ratings with better rollability while requiring less maintenance and have longer life.



## Solid Elastomer (SE)

Cast Solid Straight Sided Polyurethane Elastomer with much stronger cores and hubs have higher performance characteristics and load capacities than injection molded solid elastomers. Resists corrosion and many hazardous chemicals. Low heat build up in continuous use (power towing) and lower maintenance. Available in all sizes with Standard and Stainless Steel Precision Bearings. **Available in all sizes with precision bearings.** **Available in:** Anti Static Green, Yellow or other colors.



## Kryptonite™ (KR)

Polyether Polyurethane with excellent load capacities to 1500 lbs. Easy rolling, quiet operation and excellent for normal and moderate high temperature washdown conditions up to 230 degrees F. Extensive use in Bakeries, Food Service, Pharmaceutical, Health Care Industries.

**Available with:** Standard and Stainless Steel bearings.



## Nylon (NN)

Molded Nylon 6 wheels, with and without urethane tread have low rolling resistance and excellent corrosive resistance to many substances. Under normal conditions, they are maintenance free with dual sealed precision bearings. Extensive use in Food Service, Bakeries, Meat packing.

**Available with:** Standard and Stainless Steel bearings.



## Super Elastic Tires

Super elastic rubber tires can be used to replace foam filled pneumatic tires. They are puncture proof (no-flat tires) and maintenance free and have precision ball bearings.

# Precision Ball Bearing Wheels (Section 11)



## Vulkollan™ (VU) Tractothan®

Vulkollan™, Besthane® and Besthane® Soft are the best of the urethane wheels (600% plus elongation to rupture) with dual sealed, pre-loaded precision ball bearings for heavy duty and speeds above 8 mph. AGV's, HD Power Towing, Lift Trucks, Pallet trucks, Press-ons, Drive Wheels.

**Available in:** Electrically Conductive Black.

**Sizes to:** 36"

**Capacities:** to 20,000 lbs



## Premium Urethanes Pevothan®, Pevopur®, Pevosoft®

Premium Urethanes up to 550% elongation, with dual sealed precision ball bearings for use on equipment where speed is less than 8 mph. Cast Iron, Steel, Nylacron™, or Aluminum Cores. Premium Urethane Soft (70A) replaces rubber in many industrial applications.

**Sizes to:** 36"

**Durometers:** 70A (Black), 80A (Red), 95A (Blue), 60D (Gray)

**Capacities:** to 20,000 lbs.



## Swivel-EAZ™ / Dual-in-One (SWE) Premium Urethane Integrated Twin Wheels

Eliminates the need for costly dual-wheel casters and provides dual-wheel operation in a single wheel rig. Premium Urethane crown or flat tread. All wheels with dual sealed precision ball bearings.

**Fits Hub Lengths:** 2-1/2", 3", 3-1/2" and 4-1/2"

**Durometers:** 70A (Black), 80A (Red), 95A (Blue), 60D (Gray)

**Standard Sizes:** 3", 4", 5", 6", 8", 10", 12"

**Capacities:** to 4550 lbs

**Ideal for Manual or Power Towing up to 8 mph**



## Elastic Rubber Aluminum / Nylon Core

Super elastic rubber tread wheels with precision ball bearings are rapidly replacing moldon rubber tread wheels. They allow higher loading, smoother riding, higher wear resistance, very low rolling resistance and are non-marking.

**Available in:** Blue (Standard), Black, Green or Gray Treads.



## Premium Urethane Donut Tread Wheels

Effortless rolling, very low push-pull efforts. Excellent performance for manual / power towing. Non-marking and floor protective.

**Sizes:** 4" - 16"

**Durometers:** 93° ± 3° Shore A, Softer 83° ± 3° shore A, and harder 73° ± 3° Shore D

**Capacities:** to 3,520 lbs.

**Available in:** Cast Iron and Aluminum cores



## Elastic Rubber Wheels Cast Iron / Steel Core

For power towing applications by suitably de-rating the load capacity. Sealed precision ball bearings.

**Tread Options:** Anti-static; conductive and oil resistant wheels are available.

**Sizes:** 4" - 16"

**Durometers:** 75° ± 5° Shore A

**Capacities:** to 3,300 lbs.

# Custom Precision Ball Bearing Wheels

## STEEL



**Made In-House on CNC's**

Any size or shape to print or  
for use in any series caster rig.

Nylacron™ MOS2 (NY/MD)  
Nylacron™ Heat Stabilized Blue (NY/HSB)  
Nylacron™ Monocast (NY/MC)  
Now Available: \*Nylacron™ Glass Filled (NY/GF)  
\*Not Shown



**Made In-House on CNC's**

Any size diameter (up to 51"), or shape to print or  
for use in any series caster rig,  
2", 2-1/2", 3", 3-1/2", 4-1/2" Hub Length.

## STAINLESS STEEL



**Made In-House on CNC's**

Any size or shape to print or  
for use in any series caster rig.

**VULKOLLAN®**, **TRACTOTHAN®**,  
**PEVOPUR®**, **PEVOSOFT®**, **PEVOLON®**,  
**PEVOTHAN®**. **PEVOLASTIC®**



**Made the Hot-Cast Way**

Any size or shape to print or  
for use in any series caster rig.

**Vulkollan® Is Ideal For:**

**Drive wheels and High Speed applications.**

# Swivel-EAZ™ (Dual-in One) / Urethane Precision Ball Bearing Wheels

## MANUAL OR TOWING APPLICATIONS

Made to Fit 2-1/2", 3", 3-1/2" Hub Lengths

The Swivel-EAZ™ (Dual-in-One) wheel easily turns a single wheel caster rig into a dual wheel premium urethane tread caster. The Swivel-EAZ™ (Dual-in-One) wheels, designed originally for the automotive industry, is now a best value solution for manual or towing applications (Up to 8 mph) in many other industries.



Choice of Four Durometers:

70A (Black), 80A (Red), 95A (Blue) and 60D (Gray)

Tread Types: CR: Crown or FT: Flat Tread

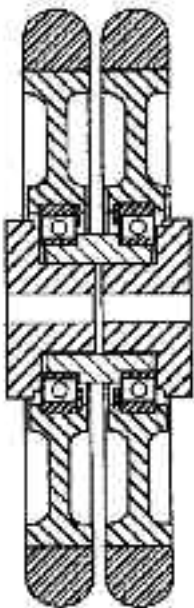
Diameter Sizes: 3", 4", 5", 6", 8", 10"

Axles Sizes: 1/2", 3/4", 1" and 1-1/4"



8" Kingpinless HD Swivel Caster with (80A) 8 X 2" CROWN TREAD SWIVEL-EAZ™ (Dual-in-One) Wheel

**SWIVEL-EAZ™**  
U.S. Patent 6,880,203 B1

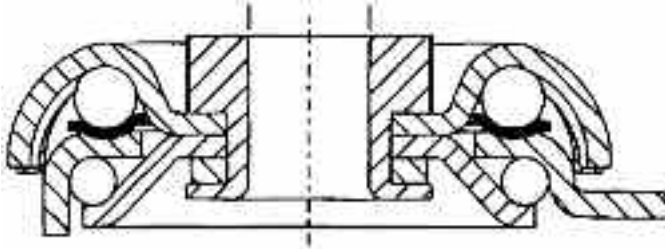


The ability of the wheels to rotate at differing rates or in opposite directions at the same time greatly enhances the ability to turn about the vertical pivot axis, making a change in overall direction much smoother.



10" Kingpinless™ Swivel Caster with 95A FT 10" X 3" SWIVEL-EAZ™ (Dual-in-One) Wheel

# 02C Hardened Shims in Main Ball Raceway (Category 02)



## Hardened Shims in Main Ball Raceway

Unique pressed steel double ball race swivel with hardened raceway shims functions as kingpinless construction to give longer life.



Plate Type  
w/  
Total Lock Brake

## 02C SERIES POLISHED CHROME STEEL and POLISHED STAINLESS STEEL

Plate, Swivel, Rigid, Stem and Hole Types

TOTAL LOCK METAL WHEEL BRAKES

Precision Ball Bearing Wheels



Rigid Type



Hole Type  
w/  
Total Lock Brake



Stem Type  
w/  
Total Lock Brake

# Swivel / Swivel Lock / Total Lock Precision Caster (Section 15)

## BB-TEK TWO-IN-ONE BI-BRAKE PRESSED STEEL CASTERS

BB-Tek Casters are recommended for medium duty applications on equipment such as portable computers, instruments, test or equipment stations and were designed for frequent portability. Precision Bearings in both the swivel and wheels, ease of rollability and maneuvering are its main features.

- Swivel can be locked in steering direction, while wheel remains free to roll, allowing straight line tracking

**OR**

- Both swivel and wheel can be simultaneously locked for no movement.

## KEY FEATURES

- Swivel Head and Wheel are fitted with precision ball bearings to ensure maximum swiveling, ease and rollability with maximum quietness.
- Unique, patented BB-TEK Bi-Braking System provides two kinds of braking systems, Dual Locking and/or Directional Locking Brakes, in same caster.

## 03C SERIES

- Ergonomic
- Maintenance Free
- Ease of Rollability
- Available without Schroud
- 5, 6 and 8 inch sizes

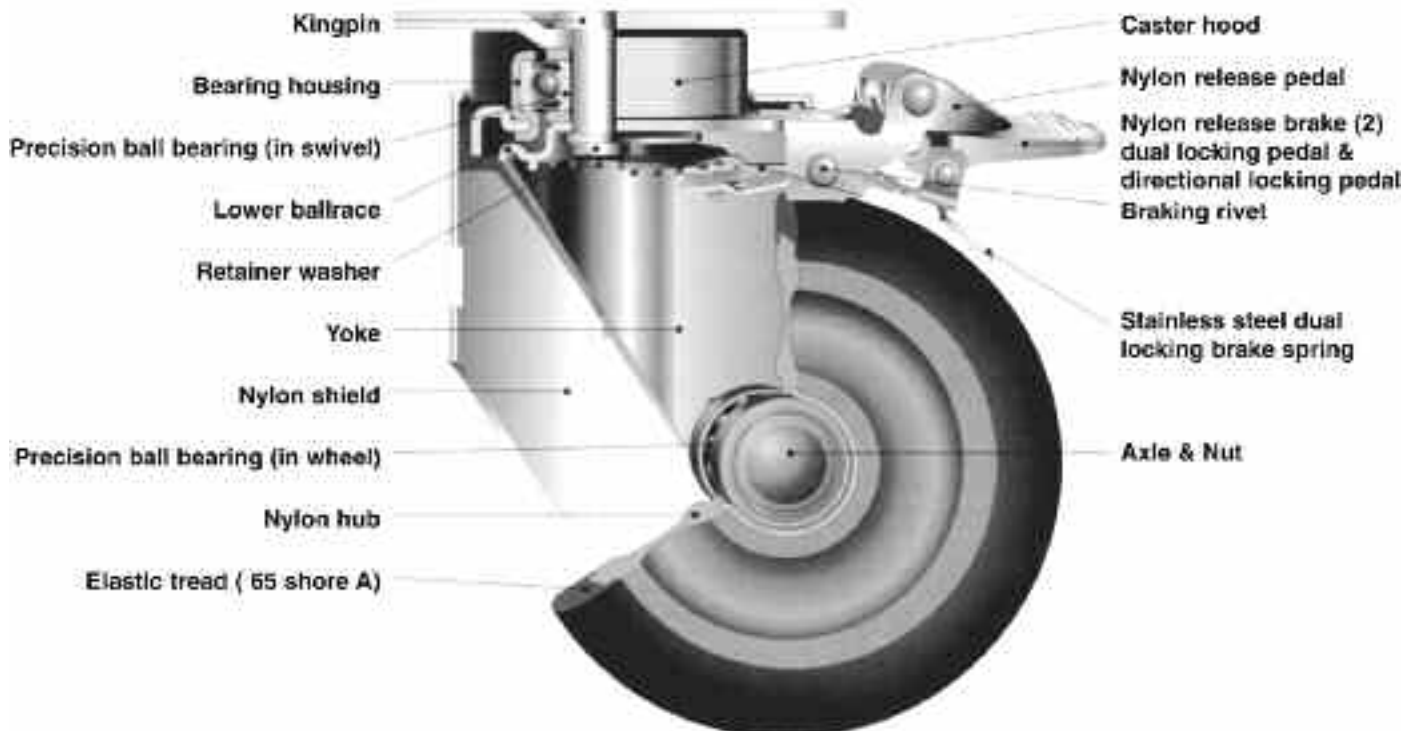


### Bi-Brake Casters

1. Swivel only
2. Directional Lock (Wheel only free to turn)
3. Total Lock Brake (Both wheel and swivel locked)
4. Release Pedal reverts caster back to swivel only.

**Pedal 1:** Locks the swivel in the steering direction but wheel remains free for straight line tracking.

**Pedal 2:** Locks the wheel only



# Kingpinless™ Offset Ball Race

**Kingpinless™ Best Value Casters with Dual Sealed Precision Bearing Wheels are rapidly replacing all other type of casters in Industrial Medium and Heavy Duty Manual or Towing applications.**

## KINGPINLESS™ OFFSET BALL RACE SWIVEL SECTION



Figure #1

The swivel section in figure #1 is of the **Offset Precision Full Contact Ball Race Design** and surface-hardened to reduce premature wear and brinelling.

In direct static loading, as a load is placed on the caster, the forces are initially transmitted to the rearward balls. Due to the fact that the balls ride on an incline, they tend to climb up the incline. This pulls the yoke to the rear of the caster. As this occurs, part of the load is transmitted around the bearing to the front of the caster. This gives distribution of the load over the entire swivel bearing instead of just the rear balls.

When thrust forces occur, as when the caster is swiveled or it hits an obstruction, these forces will push the yoke backwards in an attempt to rotate the yoke. The yoke is pulled down on the front part of the bearing and pushed up in the back. In this way, the thrust is distributed over the entire bearing.

### KINGPINLESS™ DESIGN BENEFITS

- 1. Reduction in caster failures**
- 2. Greater caster service life**
- 3. Easier swivel motion**
- 4. Eliminates kingpin tightening and maintenance**
- 5. Reduced caster shimmy and shake**
- 6. OPTIONAL TOP PLATES, OAH, HUB LENGTHS AND SWIVEL RADIUS, IN BOTH USA AND EURO STANDARDS.**

### KINGPINLESS™ RACEWAY DESIGN DIAMETERS AND BALL BEARINGS SIZES

#### CATEGORY 04

#### 4-71K™ SERIES

Load Capacity to: 1,800 lb

Raceway: 2-3/8" diameter with 3/8" ball bearings

#### CATEGORY 05

#### 5-72K™ SERIES

Load Capacity to: 4,000 lb

Raceway: 2-3/4" diameter with 1/2" ball bearings

#### CATEGORY 06

#### 6-81K™ SERIES

Load Capacity to: 6,000 lb

Raceway: 3" diameter with 1/2" ball bearings

#### CATEGORY 07

#### 7-90K™ SERIES

Load Capacity to: 6,000 lb

Raceway: 4-1/4" diameter with 5/8" ball bearings

#### CATEGORY 08

#### 8-94K™ SERIES

Load Capacity to: 10,000 lb

Raceway: 4-1/2" diameter with 5/8" ball bearings

#### CATEGORY 09

#### 9-95K™ SERIES

Load Capacity to: 20,000 lb

Raceway: 4-1/2" diameter with 3/4" ball bearings

#### CATEGORY 10

#### 10-98K™ SERIES

Load Capacity to: 40,000 lb

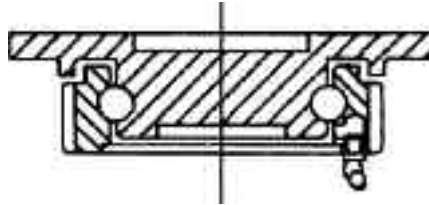
Raceway: 7" diameter with 3/4" ball bearings

# Kingpinless HD Casters

Kingpinless HD Type Casters are the best value choice for performance ergonomics, safety and less cost in use for AGV Stabilizing Casters, Gantry Crane Casters, Dual Wheel Casters, Swivel-Eaz™ Casters, Nylacron™ Casters or Pneumatic Casters.



**Swivel-Eaz™  
(Dual-in-One)  
80A Durometer**



**Pneumatic**



**Vulkollan™ Tread  
Dual Wheel  
AGV Precision**



**Swivel-Eaz™  
(Dual-in-One)  
95A Durometer**



**Nylacron™  
NY/MD, NY/MC, NY/HSB, NY/GF**

## DUAL SEALED PRECISION BEARING WHEELS FOR ALL TYPE KINGPINLESS CASTERS

All precision bearing wheels are equipped with end caps to fit hub length and axle sizes.



**Nylacron™  
(NY/MD)**



**Vulkollan™  
(VU)**



**Urethane 93A  
UR/CA**



**Urethane Soft 80A  
URS/CA**



**SWIVEL-EAZ™  
(SWE)**



**Elastic Rubber  
(SF)**

## Hospital / Pharmaceutical / Health Research

### Stainless Steel Kingpinless Casters

### Stainless Steel Total Lock Brakes LEADING or TRAILING Edge

### Stainless Steel Precision Ball Bearings Wheels:

- Kryptonite™ (KR)
- Nylon Fiberglass (NF)
- Nylon / Pevolon (NN)
- Nylacron™ Heat Stabilized Blue (NY/HSB)
- Nylacron™ Monocast (NY/MC)
- Nylacron™ MOS<sub>2</sub> (NY/MD)
- Solid Elastomer (SE)
- Stainless Steel (SS)



Pressed Stainless Steel Caster with Heavy Duty Nylon Wheel and SS Trailing Edge and Total Lock Brake (Wheel Bootie shown above)



Pressed Steel Kingpinless Stainless Steel Caster with Heavy Duty Nylon Wheel and Adjustable Total Lock Brake



Kingpinless HD Stainless Steel Caster with Kryptonite™ Wheel and SS Leading Edge Adjustable Total Lock Brake



Kingpin Stainless Steel Caster with Kryptonite™ Wheel and SS Trailing Edge Total Lock Brake

## Epoxy Coated Caster Rigs (Category 04)

Independent laboratory testing shows EPOXY COATED caster forks virtually unaffected after 500 hours of ASTM B 117-85 Salt Spray Test. EPOXY COATING is an attractive alternative to Stainless Steel Casters in some wet applications.



Zinc Plating  
failed after 48 hours.



Dichromate Zinc Plating  
failed after 72 hours.



Epoxy Powder Coating  
virtually unaffected after 500 hours.

**Category 04 Swivel Section  
04F-YA-08201-S Epoxy Coated  
Swivel Rig Shown**

### FINISHES – TECHNICAL FACTS

No one likes rust or corrosion. How can we effectively eliminate or control this condition? Methods of dealing with the problem include the proper application of paint, plating or use of powder coating. Stainless Steel can also be employed.

**Following are some alternatives and their related benefits.**

#### Stainless Steel

1. Stainless steel is resistant to nitric acid and sulphuric acid.
2. Stainless steel is resistant to many organic acids, including practically all food acids.
3. Stainless steel is not resistant to seawater or photographic solutions.

#### Zinc Plating or Yellow Zinc

1. Zinc is used as a protective coating on steel because it is resistant to attack in many environments.
2. Zinc coatings are inexpensive and easy to apply.
3. Zinc plating provides protection against rusting and pitting.
4. In sea water, zinc plating effectively resists rusting in steel.
5. Zinc plating is applied for corrosive industrial service in a thickness not less than .0002 inches.

#### Chromium Plating

1. Chromium plating is for objects which must not only be protected from corrosion, but also must present a bright and pleasing appearance.
2. Appearance is maintained both indoors and outdoors, and when in contact with precipitation, soap and other cleaning solutions, food products and beverages.

#### Powder Coating

1. Epoxy Powder coating is a metallic finishing process where thermo setting powders (epoxy) are heat bonded to a metal surface.
2. Powder coating is more corrosion resistant than zinc plating.
3. Epoxy powders provide moderate cost, low maintenance and long lasting protection against most chemically aggressive environments.

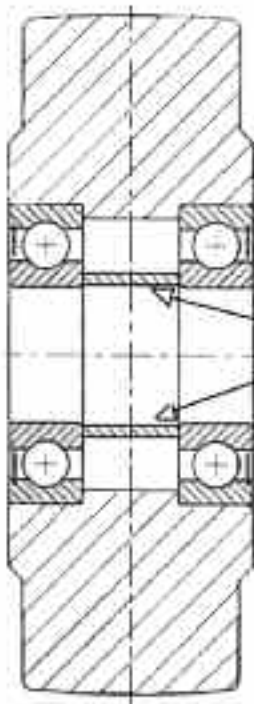
# Nylacron™ Wheels w/ Precision Sealed Ball Bearings



Nylacron™ MOS2 (NY/MD)  
 Nylacron™ Heat Stabilized Blue (NY/HSB)  
 Nylacron™ Monocast (NY/MC)  
 Now Available: \*Nylacron™ Glass Filled (NY/GF)  
 \*Not Shown



Dual Seal Precision Ball Bearings with Center piece



**PRECISION BALL BEARINGS** are best used for rollability and moderate side thrust. When larger side thrusts are encountered, double row precision ball bearings can be applied in the hub or larger precision bearings can be utilized. The Bearings are pre-lubricated and sealed, thus reducing maintenance costs.

**PRECISION BALL BEARING WHEELS ARE MUCH EASIER TO INSTALL THAN TAPERED BEARINGS AND REQUIRE NO MAINTENANCE WHILE IN USE.**

They are replacing Roller Bearings and Tapered bearings today in the majority of Vulkollan™, Premium Urethanes, Solid Elastomer, Elastic Rubber, Pneumatic, Nylacron™, Monocast, Steel and Stainless Steel Wheels when less maintenance, less downtime and ease of rollability is sought.

**THE BIGGER THE PRECISION BEARING THE GREATER THE BEARING LIFE FOR THE SAME LOAD.**

**SMALL DIAMETER CASTER WHEELS** should have large diameter bearings, similar to pallet wheels for easier rolling under load. Sealed precision bearings are shielded to retain the grease and to exclude grit and dust, etc.

**PRECISION BEARING WHEELS ARE MUCH EASIER TO PUSH OR PULL** and have very low resistance, even under heavy loads. That is, running conditions are excellent right up to the maximum load limit of the wheels.

**AN INNER SPACER BUSHING** is used to pre-load the inner races of each bearing and is done on assembly, so further adjustment is not necessary. **END CAPS ARE PROVIDED WITH ALL WHEELS WITH BEARING ID AND AXLE SIZE TO MATCH RIG HUB LENGTH.**

**THE WEAR OF THE PRECISION BALL BEARINGS** is so slight, that even under continuous use, they do not require replacement.

**PRECISION STAINLESS STEEL BALL BEARINGS AVAILABLE IN ALL SIZES NYLACRON™ MD & / MC WHEELS**

# Heavy Duty Towing Criteria

**POWER TOWING CASTERS** are designed on the assumption that the power towing will take place at speeds up to 7 kph (4.35 mph) and under good working conditions. Above this call Acorn™.

**OBSTRUCTIONS, SUCH AS CURBS AND GULLIES** and even relatively small steps, can exert enormous impact loads which can destroy a caster.

**STEPS SUCH AS LIFT SILLS, DRAIN COVERS AND JOINTS** in concrete slabs present a particular problem if they are not approached squarely. An oblique approach will almost certainly result in the caster turning at right angles to the obstruction instead of turning in such a way as to climb over it. In these situations the destruction of the caster is inevitable.

Towing trailers in train compounds the problem as only one caster may have to withstand the force generated by the mass of the whole train including the tractor.

**AS POWER TOWING BECOMES MORE COMMON**, it is often desirable to tow a number of trucks or trailers one behind another.

**TURNTABLE AXLES** have often been used for this purpose, but in addition to being costly, they have two disadvantages:

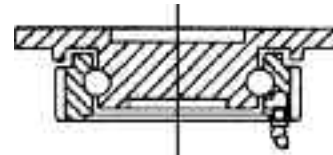
1. If the turntable is at right angles to the axis of the trucks, the stability is greatly reduced.
2. There is a risk of jack-knifing if the trailer stops on a sharp corner.

**CASTERS ARE BECOMING VERY POPULAR FOR POWER TOWING AND WORK SATISFACTORILY** provided suitable precautions are taken. It is essential to obviate "cutting-in" as this would prevent the use of the truck trains in narrow gangways.

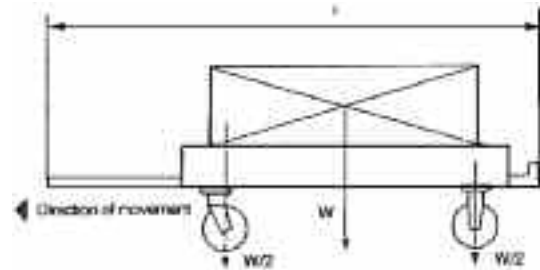
Experience has shown that if trucks are rigidly coupled together by means of pin couplings at each end they will follow the track most accurately, if the distance from the rigid caster center line to the rear coupling pin is 25%-33% of the total length of the truck from front to rear coupling pins.

This can be achieved by moving the fixed casters forward as shown in figure (ii) but this incurs a penalty in that it reduces the wheelbase of the truck and also causes the total weight to be shared disproportionately between the swivel and rigid casters. In order to distribute the weight of the truck and its contents evenly between the front and rear rigid casters, it is advisable to extend the drawbar at the rear of the truck as shown in fig (iii)

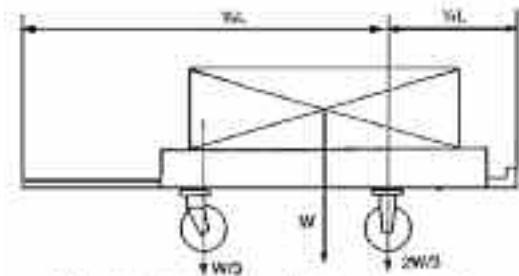
Specifically designed power towing casters have tapered roller bearings in both the swivel head and the wheel and will operate satisfactorily at speeds up to 7kph (4.35 mph). Vulkollan™ tread wheels are recommended for this application



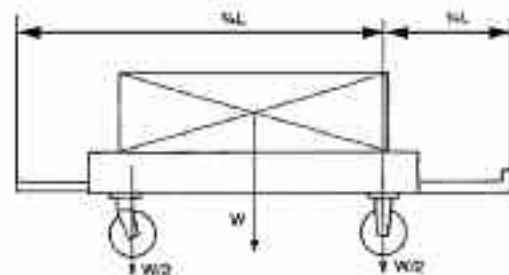
or category 10 kingpinless swivel section



(i) Poor tracking but even distribution of total weight between front swivel and rear fixed casters.



(ii) Good tracking but uneven distribution of total weight between front swivel and rear fixed casters.



(iii) Good tracking and even distribution of load between front swivel and rear fixed casters.

# Caster Application Considerations

## LOAD WEIGHT

The first consideration of caster selection is to determine the combined weight of the load and equipment. Allowance should be made for uneven distribution of weight, since this can result in one wheel carrying more load than the rest. Mechanical loading can also impose severe shock loading, which adds to the loading factor. Two charts to aid in this selection are:

**CASTER MOUNTING COMBINATIONS** and **DETERMINING LOAD RATINGS PER WHEEL**. Please note in the load rating chart for extreme conditions, ratings take into consideration uneven floors, curbs and holes in the floor which cause severe impact loads.

## TIPS ON WHEEL SELECTION

**In general, the greater the load, the larger the wheel diameter should be for better weight distribution and easier rolling.**

- Larger wheels roll easier than small wheels.
- Hard treads roll easier than soft treads.
- Resilient treads roll over rough surfaces more easily than hard treads.
- Larger wheels with larger bearings give longer life and easier rolling.

## ELECTRIC CONDUCTIVITY

Insulant materials with a resistivity greater than  $10^{15}$  ohms, such as plastics, build up a charge by friction. The electrostatic charge is discharged through the body when the object is touched. This can be prevented by the use of electrically conductive (anti-static) wheels, which conduct the charge away or prevent it from building up. Electric conductive wheels have a leakage resistance equal to or less than  $10^4$  ohms. Electric conductive rubber tires are subject to 100% quality control inspection, each being tested at 500v DC.

## FLOOR CONSIDERATIONS

All metal wheels will damage floors if the load is heavy. Resilient wheels are not so easy to move, but are floor protective. Remember, it costs more to repair the floor than the wheel running on it. Make sure the wheels selected are large enough to pass over the cracks in the floor, tracks, dock plates, grates, moldings or other obstructions. In some cases, dual wheels are the best for the application. The larger the wheel and the more resilient the wheel, the greater the ability to move over rails and other similar objects.

**RUBBER & URETHANES** give maximum quiet and floor protection. Steel is the hardest on floors, thus Nylacron™ is a great compromise - giving moderate floor protection with high weight capacity. For floor protection on linoleum, tile, etc. use cushion neoprene or polyurethane. For carpeted floors, use donut or hi-modulus neoprene or polyurethane.

### Other Considerations:

- Noise
- Dirt, chips, threads or other detrimental substances
- Grease, oil, water or chemicals.
- Temperature extremes

## TYPE SERVICE

**Intermittent:** Occasionally moved loads, short travel distances or for dollies used to move materials in storage or warehouse operations.

**Continuous:** For continuous service, either manually or mechanically powered, a heavier duty caster with anti-friction bearings is necessary.

## MECHANICALLY POWERED TRAILER-TYPE

This type operation requires special heavy duty construction with large swivel bearings to withstand the high impact and shocks encountered. Large Precision Ball Bearings should be considered in the swivel for main load bearing and a tapered thrust bearing for side thrusts. Large Precision Ball Bearings are recommended for wheel bearings to take the side thrust loads and higher speeds, as well as being maintenance free.

## INSTITUTIONAL

Most institutional application require medium duty casters. In wet applications or for excessive washings, cart washables or stainless steel casters may be required. A lower cost alternative to stainless steel casters could be epoxy-coated rigs with Nylacron™, Nylon, Solid Elastomer or Kryptonite™ Wheels having Stainless Steel Sealed Precision Ball Bearings.

# Starting and Rolling Resistance

**STARTING RESISTANCE** is the force required to set the wheel in motion from a stationary position.

**ROLLING RESISTANCE** is the force required to keep the wheel in constant motion. This resistance is dependent upon the load, wheel diameter, tread material, bearing type, caster offset and floor surface and temperature.

**SWIVEL RESISTANCE** is determined by the swivel bearing sizes, ball diameters and ball race diameters.

**HARD WHEELS** will not flatten under load, thus better rollability. However, the hard wheel has difficulty starting with particles, holes or obstacles in or on the floor.

**RESILIENT WHEELS** move more easily over obstruction as they deform and roll over the obstructions. On the other hand a flat area, instead of a line, is in contact with the floor and thus the resistance to rolling is greater.

In general, the larger the wheel, the easier it rolls. Wheels with Precision Ball Bearings carry greater loads and are the easiest to roll. Roller bearing wheels carry heavy loads, but do not roll as easy. When possible, use the largest precision wheel for the best rollability. Any of these factors have an impact on the mobility and easy handling of the equipment or machine. Listed below is a comparative chart regarding rolling resistance of different type treads

**TRACTIVE RESISTANCE** is the effort required to either push or pull a cart or truck along in a straight line or to maneuver it in confined spaces.

**The following table should be an aid to determine how many people are required to move and control a cart or truck in normal workshop conditions.**

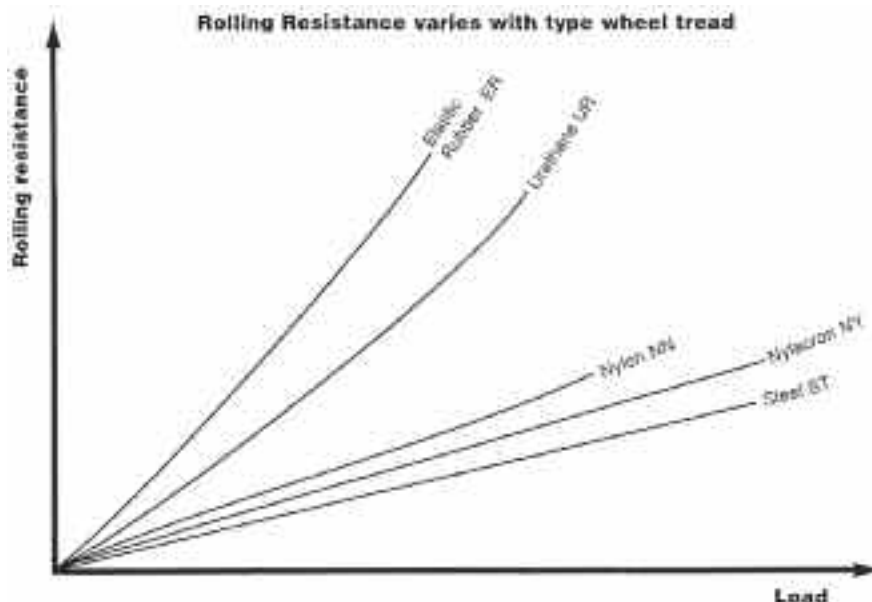
Wheel Type	Tractive Resistance
Steel or Nylacron™	Less than 1%
Urethane	Less than 2%
Elastic Rubber	Less than 3%

**The above figures are based on roller bearing wheels 8" diameter. Wheels with proper size precision bearing wheels have lower tractive resistance, since they have better rollability.**

Tractive Resistance will vary approximately in inverse proportion to the diameter, down to a minimum of 5".

It should be noted that a typical person is capable of maintaining a horizontal force of 26 lbs increasing to about 40 lbs from a standing start.

Urethane wheels if left standing for a long time, could require at least twice the force to initiate movement and its tractive resistance will increase momentarily up to about seven times the figure given above.





# Wheel Selection Criteria

## WHEEL SELECTION CRITERIA

Choosing the type of wheel that best suits your application is an important requirement. Each wheel type may have characteristics that make it excellent for one job but unworkable for another. This chart provides general information you may find useful in choosing a wheel. If further guidance is required, please consult the factory.

### Other factors to consider in choosing a wheel type include:

- Type of bearings can have a major impact on rollability, durability, maintenance schedules, and capacity.
- Floor conditions: The presence of obstacles, debris, oil and/or chemicals can have a significant impact on the life and performance of a wheel. A general rule is that softer treads are better for obstacle laden floors, floor protection and quiet operation. Harder treads are best for rollability on smooth floors but offer less floor protection and cushioning.
- Maintenance: The expectation that wheels will or will not be properly maintained is another factor in choosing wheels/bearings.
- Manual vs Power Tow: Generally, power tow requires durability and quiet operation, whereas manual operation requires rollability and ease of swiveling.
- Properly matching wheels to specific applications can involve factors too numerous to list completely. Please consult Acorn™ for further information.

## WHEEL SELECTION GUIDE

Wheel Type	Ease of Rolling	Quiet Operation	Floor Protection	Impact Resistance	Abrasion Resistance	Temperature Range °F
Urethane on Iron	Good	Good	Excellent	Good	Excellent	0° to 180°
Urethane on Heavy Duty Iron	Fair	Excellent	Excellent	Excellent	Excellent	0° to 180°
Urethane on Forged Steel	Fair	Excellent	Excellent	Excellent	Excellent	0° to 180°
Soft Urethane on Iron	Good	Excellent	Excellent	Excellent	Excellent	0° to 180°
Urethane on Aluminum	Good	Good	Excellent	Good	Excellent	0° to 180°
Rubber on Iron, Standard	Fair	Excellent	Excellent	Good	Fair	-40° to 160°
Rubber on Iron, Extra Hard	Good	Good	Excellent	Good	Fair	-40° to 200°
Rubber on Iron, Neoprene	Fair	Excellent	Excellent	Good	Fair	-40° to 200°
Rubber on Iron, Low Profile	Good	Good	Excellent	Fair	Fair	-40° to 160°
Semi Steel	Excellent	Poor	Poor	Fair	Excellent	-40° to 600°
Forged Steel	Excellent	Poor	Poor	Excellent	Excellent	-40° to 600°
Solid Premium Urethane	Excellent	Fair	Good	Excellent	Excellent	0° to 180°
Phenolic (Texite)	Excellent	Fair	Fair	Good	Good	-40° to 260°
Nylacron™	Excellent	Good	Good	Excellent	Excellent	-40° to 400°

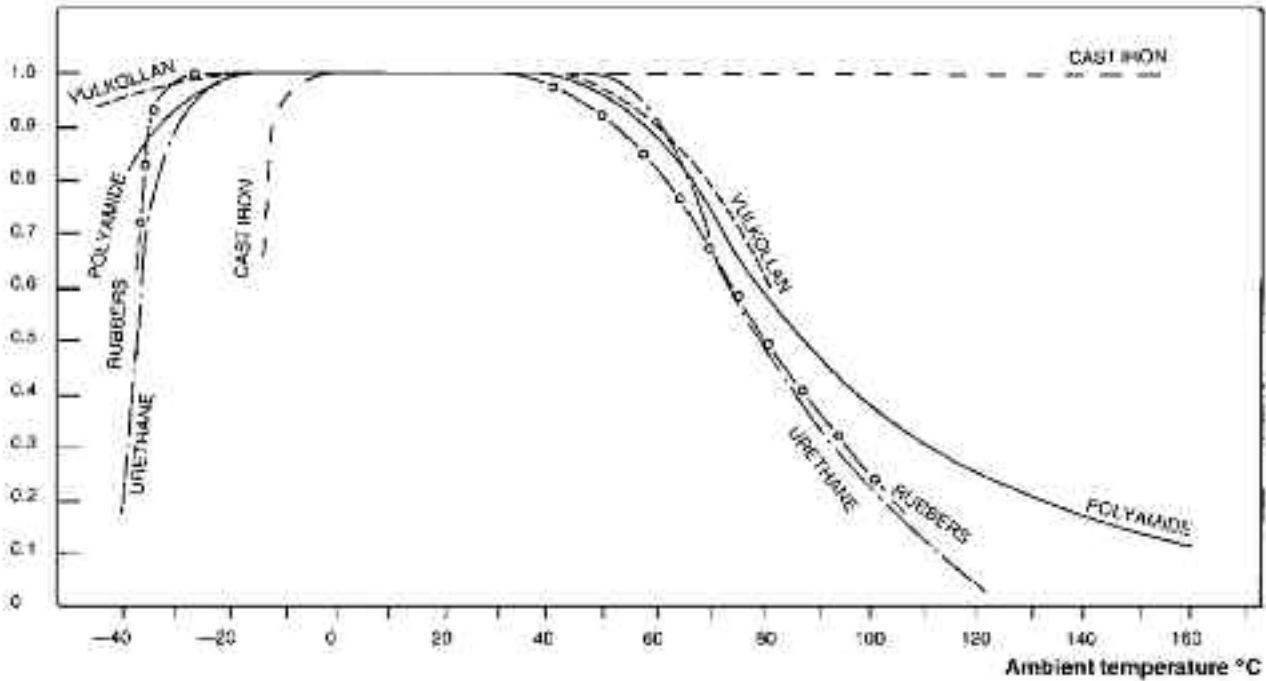
# Wheel Selection Correction Criteria

①

TEMPERATURE CORRECTION FACTOR (T%)

(F deg = 9/5 C + 32)

T%

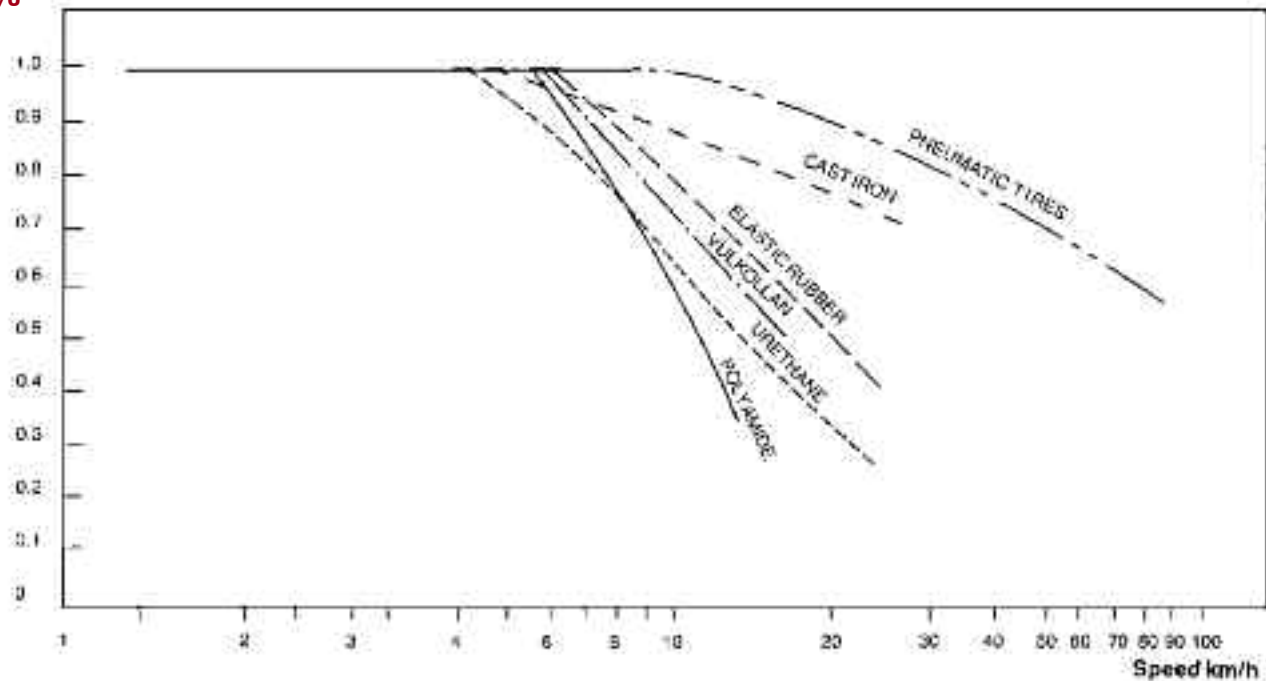


②

SPEED CORRECTION FACTOR (V%)

(M.p.h. = 0.6214 x KM/H)

V%



# Wheel Selection Correction Criteria

3

## OPERATING ENVIRONMENT FACTOR (E%)

E%

	Ideal	Normal	Rough	Extreme	
	1.1	1.0	0.9	0.8	Vulkollan™ with cast iron core
	1.05	1.0	0.95	0.85	Elastic rubber aluminum core
	1.05	1.0	0.9	0.8	Elastic rubber polyamide core
	1.0	1.0	0.85	0.75	Polyurethane tread with polyamide core
	1.1	1.0	0.8	0.65	Nylacron™ wheels
	1.1	1.0	0.85	0.7	Cast iron wheels

## OPERATING CONDITIONS:

### IDEAL:

good, flat floors without holes thresholds or grooves; manually driven to approx. 4 km/h; no differences in height due to loading platforms etc.: careful handling during loading and unloading.

### NORMAL:

reasonable good floors with an occasional obstacle that is no higher than 2.5% of the wheel diameter; manual or mechanical propulsion e.g. by means of pulley or chain; wheel tread wider than grooves in the floor, speeds up to 6 km/h, loading and unloading by means of forklift trucks.

### ROUGH:

uneven floors with obstacles up to 5% of the wheel: mainly propulsion driven by means of pulleys or chains; frequent use on loading platforms; rough handling.

### EXTREME:

all floor types, unequal levels large sharp obstacles (rails, chain grooves); mechanically driven by means of pulleys or chains; moving with the aid of a forklift truck scoop; shock exposure due to loading by means of e.g. cranes or forklift trucks; regular transportation by road or rail; or continuous duty applications.

① ② ③

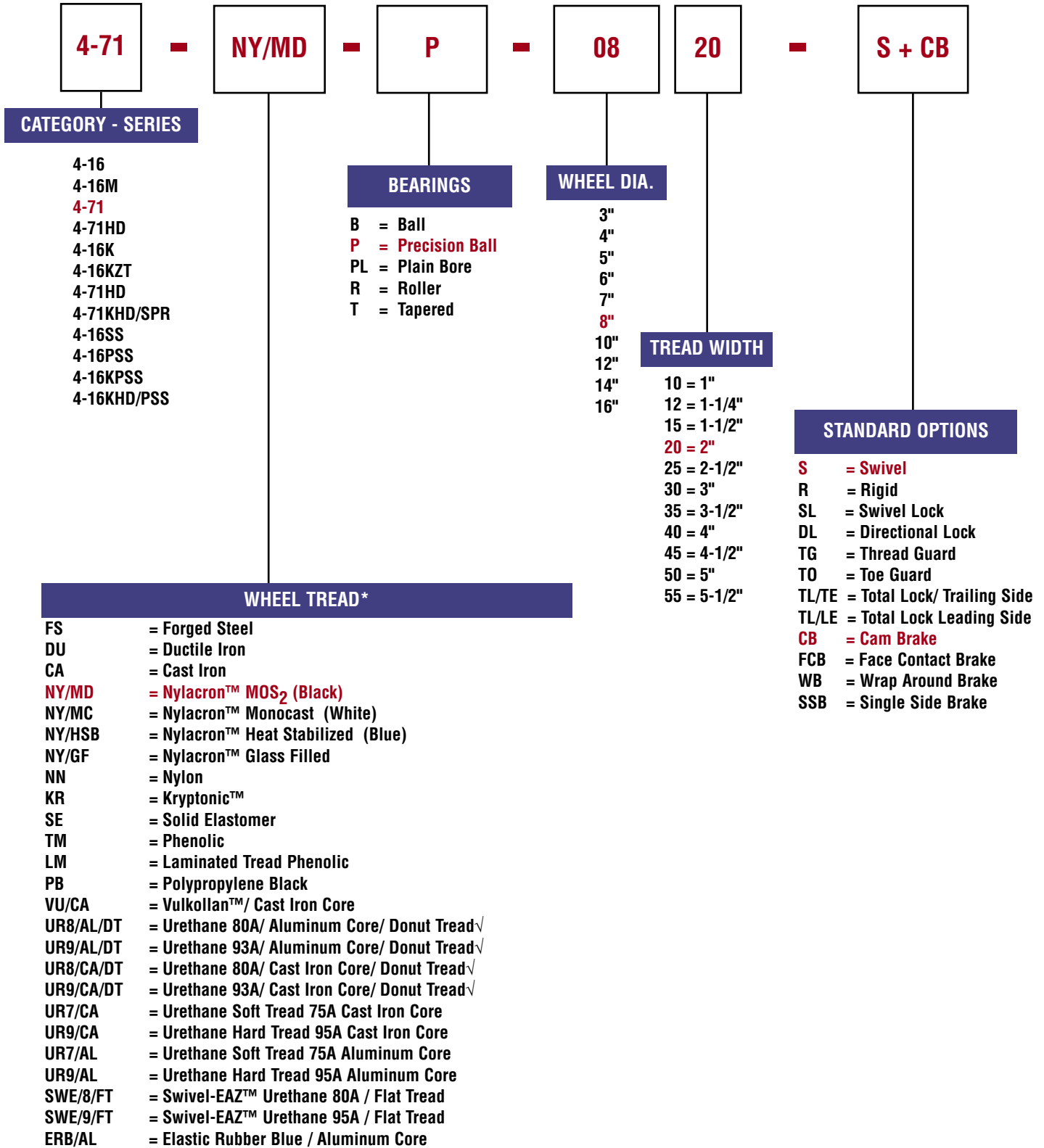
**ADJUSTED WHEEL LOAD CAPACITY = T% x V% x E% x NORMAL LOAD** which means wheel load capacity has to be derated accordingly

## GUIDELINES FOR SELECTING WHEEL DIAMETERS WITH PRECISION BEARINGS

Total Load Including Cart (lbs)	50 to 250 #	250 to 500 #	500 to 1000 #	1000 to 1500 #	1500 to 2000 #	2000 to 3000 #
Wheel Diameters (in)	3" - 4"	4" - 6"	5" - 8"	6" - 10"	8" - 12"	10" - 12"

The larger the wheel diameter and wheel bearing, the easier it is to roll under the same load.

# ACORN™ CASTER Numbering System



**CATEGORY - SERIES**

- 4-16
- 4-16M
- 4-71
- 4-71HD
- 4-16K
- 4-16KZT
- 4-71HD
- 4-71KHD/SPR
- 4-16SS
- 4-16PSS
- 4-16KPSS
- 4-16KHD/PSS

**BEARINGS**

- B = Ball
- P = Precision Ball
- PL = Plain Bore
- R = Roller
- T = Tapered

**WHEEL DIA.**

- 3"
- 4"
- 5"
- 6"
- 7"
- 8"
- 10"
- 12"
- 14"
- 16"

**TREAD WIDTH**

- 10 = 1"
- 12 = 1-1/4"
- 15 = 1-1/2"
- 20 = 2"
- 25 = 2-1/2"
- 30 = 3"
- 35 = 3-1/2"
- 40 = 4"
- 45 = 4-1/2"
- 50 = 5"
- 55 = 5-1/2"

**STANDARD OPTIONS**

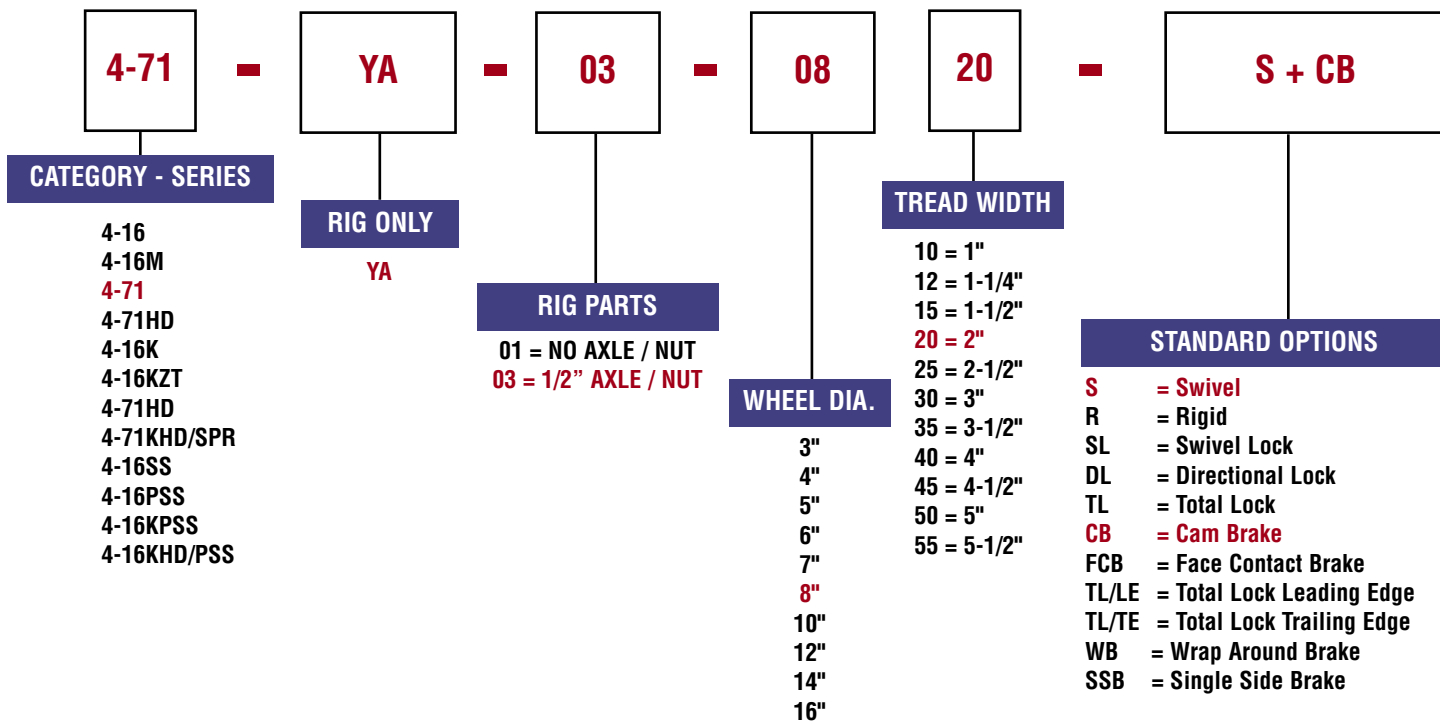
- S = Swivel
- R = Rigid
- SL = Swivel Lock
- DL = Directional Lock
- TG = Thread Guard
- TO = Toe Guard
- TL/TE = Total Lock/ Trailing Side
- TL/LE = Total Lock Leading Side
- CB = Cam Brake
- FCB = Face Contact Brake
- WB = Wrap Around Brake
- SSB = Single Side Brake

**WHEEL TREAD\***

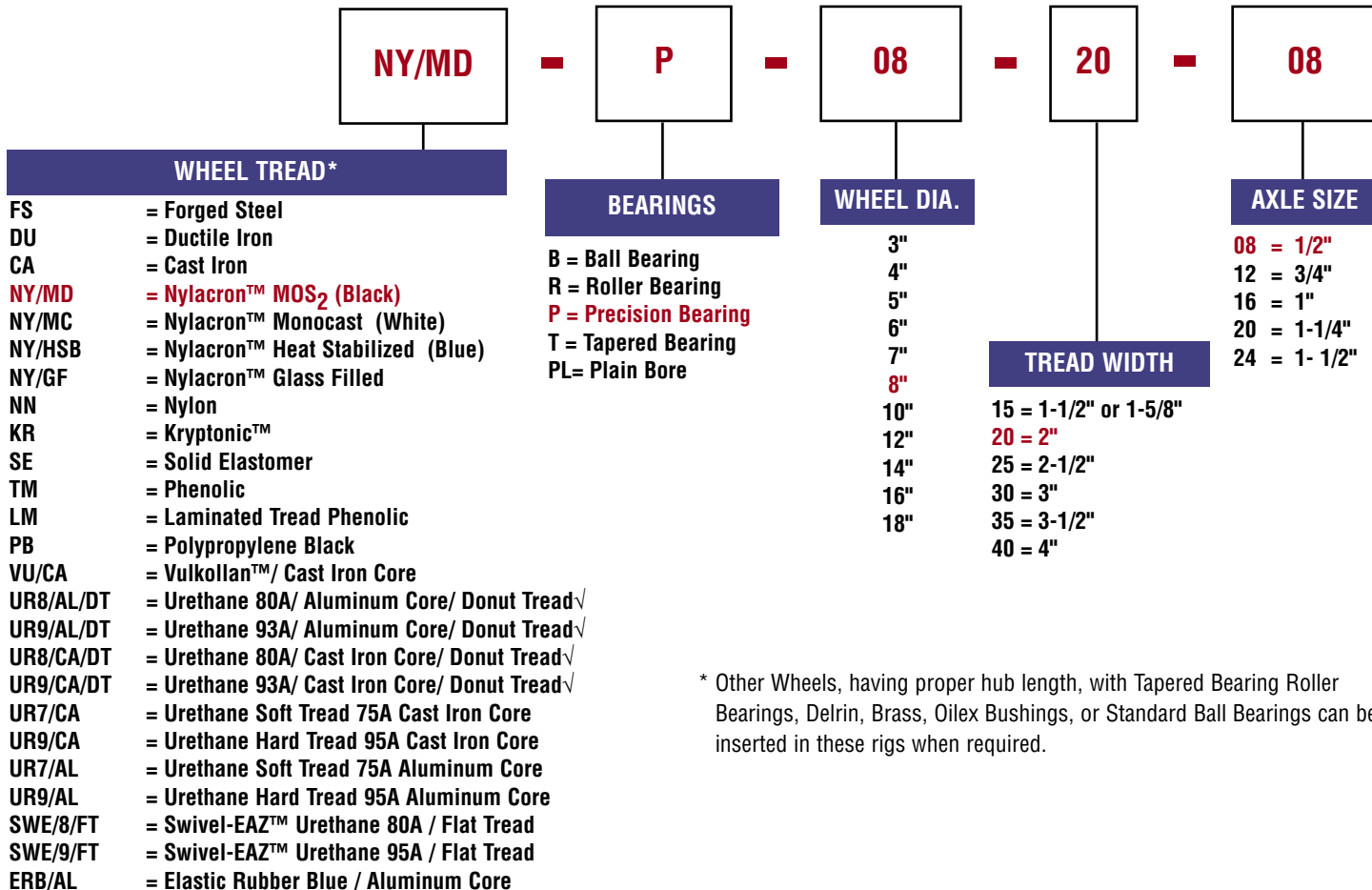
- FS = Forged Steel
- DU = Ductile Iron
- CA = Cast Iron
- NY/MD = Nylacron™ MOS<sub>2</sub> (Black)
- NY/MC = Nylacron™ Monocast (White)
- NY/HSB = Nylacron™ Heat Stabilized (Blue)
- NY/GF = Nylacron™ Glass Filled
- NN = Nylon
- KR = Kryptonite™
- SE = Solid Elastomer
- TM = Phenolic
- LM = Laminated Tread Phenolic
- PB = Polypropylene Black
- VU/CA = Vulkollan™ / Cast Iron Core
- UR8/AL/DT = Urethane 80A/ Aluminum Core/ Donut Tread✓
- UR9/AL/DT = Urethane 93A/ Aluminum Core/ Donut Tread✓
- UR8/CA/DT = Urethane 80A/ Cast Iron Core/ Donut Tread✓
- UR9/CA/DT = Urethane 93A/ Cast Iron Core/ Donut Tread✓
- UR7/CA = Urethane Soft Tread 75A Cast Iron Core
- UR9/CA = Urethane Hard Tread 95A Cast Iron Core
- UR7/AL = Urethane Soft Tread 75A Aluminum Core
- UR9/AL = Urethane Hard Tread 95A Aluminum Core
- SWE/8/FT = Swivel-EAZ™ Urethane 80A / Flat Tread
- SWE/9/FT = Swivel-EAZ™ Urethane 95A / Flat Tread
- ERB/AL = Elastic Rubber Blue / Aluminum Core

\* Other Wheels, having proper hub length, with Tapered Bearing Roller Bearings, Delrin, Brass, Oilex Bushings, or Standard Ball Bearings can be inserted in these rigs when required.

# ACORN™ RIG ONLY Numbering System

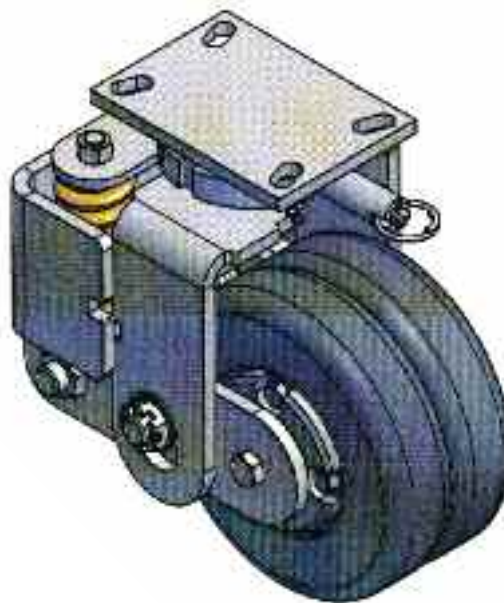
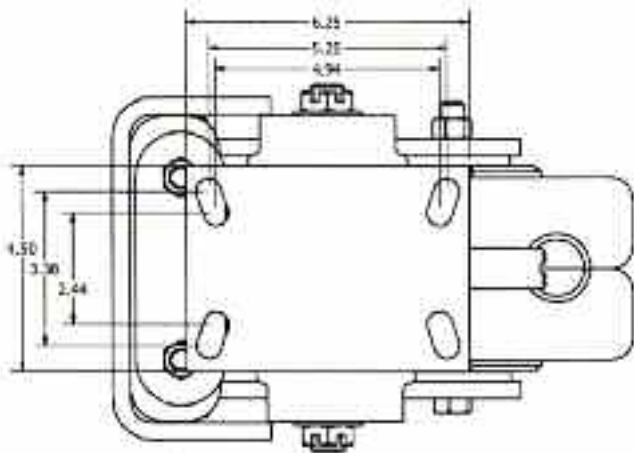


# ACORN™ WHEEL ONLY Numbering System



## 2-D and 3-D Cad Drawings Available From Acorn™

Call toll free **800-523-5474** or e-mail us at **acorn@acornindprod.com** to obtain specific CAD drawings of the casters, wheels or other products that interest you.



**Dual Shock Absorbing Caster  
with High-Temp Nylatron™ Wheel**

