Rollway Bearings
Outline

• Overview
• Features & Benefits
• Competition
• Product Selection
• Markets & Applications
• Summary
• Key Contacts
Overview – Products

Aerospace Valparaiso, IN
Small Radials(<6 inch OD) Valparaiso, IN
Small Journals(<6 inch OD) Monticello, IN
Large Radials & Journals(>6 inch OD) Ithaca, NY
Thrust Bearings Ithaca, NY

Cylindrical

Thrust

Journal
Radial (Cylindrical) Roller Bearings

- Metric series standard
- Extra capacity design available
- Size range
  - Bore diameters from 15 to 736mm (29”)
  - Outside diameters from 40 to 1,016mm (40”)
- Several retainer types available
Radial (Cylindrical) Roller Bearings

**Races** - manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are precision ground to RBEC 1 tolerances.

**Unmounted Internal Clearances** - Standard C3 Additional internal clearances available

**3 Standard Retainer options**
- Segmented steel retainer
- 2 piece machined brass retainer
- 1 piece Stamped Steel

**Crowned rollers.** Extra capacity bearing designs have larger rollers, maximizing the load carrying potential of the bearing’s cross sectional area.
Crowned Rollers

- Crowned rollers yield a more evenly distributed load pattern on the races, resulting in longer life.
- All Rollway cylindrical and tapered bearings feature crowned rollers.
Cylindrical Roller Retainers

• The retainer separates & holds the rollers in a determined location to evenly distribute the load.

• 4 Types:
  - None - Full Compliment - Low speed, high load.
  - Steel (stamped or segment type) - standard retainer type.
  - Brass (bronze) - Higher speed than steel, may have lower load rating due to the number of rollers in the brass retainer.
  - Land Riding (brass or steel) - Very high speed applications / special design required.
Retainers

- Low Carbon Stamped Steel
- Rides below pitch circle
- Low Speed
- Used only with Outer Race or Retaining
- Rollers guided by raceway flanges
- Well suited for volume production
- Most widely used

One Piece Stamped Steel
Retainers

- Formed steel segments held between two steel end plates
- Good roller guidance with minimizing friction
- Flexible – accommodates different widths
- Retainer design is well adapted for volume production
Retainers

- Accurate roller guidance
- Machined Pockets to minimize skewing
- Typically made of brass, cast iron is available for applications where brass cannot be used
- Higher speed applications
- Available with most radial roller bearing designs
Retainers

- High speed applications.
- Made of brass or silver plated steel
- Land riding, minimizing friction between the rollers & the retainer
- MTO only
Journal Bearings

- The Journal Roller Bearing is a needle roller bearing defined by the construction of the roller assembly.

- The roller assembly is constructed such that the rollers are held in the steel cage by trunions machined on the end of the rollers.
Journal Bearings

- Needle roller bearing
- Metric Bore/OD
- Sizes
  - Bore diameters from 25mm to 220mm (8.661”)
  - Outside diameters from 62mm to 380mm (14.960”)
- Sold complete or as components
- Trunion style rollers
- Steel cage
Journal Bearings

- Sold as components or as complete assemblies:
  - Outer race only
  - Inner race only
  - Roller assembly only
  - Outer race with roller assembly
  - Complete bearing assembly
- Interchangeable with other manufacturers parts
- For a given size, multiple lengths are available
- Special inner races are available:
  - With locating notches
  - Extra wide
Construction

- Cage
- Oil Hole
- Rollers
- Races
Roller Thrust Bearing

- The Rollway Options - we have one of the broadest thrust bearing offerings.
- Specializing in heavy duty types.
- Types, styles & series differ
  - Cylindrical Thrust
  - Tapered Thrust
  - Tandem Thrust
**Cylindrical Thrust**

- **Medium Duty - 600 Series**
  - 1” to 3” Bore (26 sizes)
  - One row of rollers

- **Heavy Duty - 700 Series**
  - Over 3” Bore (48 sizes)
  - Sizes in 1 inch increments
  - Multiple OD sizes for a given bore diameter

- **Styles include:** Aligning, Crane Hook, Double Act
**Shaft Plates** manufactured to conform to ABMA size & tolerance specifications. Bore is ground to easily accept the shaft while the outside diameter will typically have a turned finish & be smaller than the outside diameter of the housing plate.

**Rollers** manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are ground and superfinished. Outside diameters are crowned. Ends have a large machined radius designed to reduce friction between the roller & the retaining ring. Larger bearings use multiple rollers per pocket to minimize slippage.

**Housing Plates** manufactured to conform to ABMA size & tolerance specifications. Outside diameter is ground to easily fit into the housing while the bore will typically have a turned finish & be larger than the bore of the shaft plate.

**Plates** manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are ground & superfinished.

**Retainers** manufactured from centrifugally cast brass/bronze. Roller slots are accurately machined to provide smooth operation of the roller assembly. Rollers are retained by a steel band placed over the outside diameter of the retainer.
Aligning Thrust Bearings

- Accommodate static misalignment
Double Acting Thrust Bearings

• Carry thrust loads in both directions
Simplified Double Acting Thrust Bearings

- Carry thrust loads in both directions
Cylindrical Thrust Bearings

- Self aligning, double acting, cylindrical thrust
  - Allows for static misalignment of up to 3°
Crane Hook Cylindrical Thrust

- Crane hook applications
- “Weathershed” shield
- With or without grease fittings
Cylindrical Thrust

- 3” bore

<table>
<thead>
<tr>
<th>Model</th>
<th>Dynamic Capacity (kN)</th>
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<tbody>
<tr>
<td>T624</td>
<td>40.5K</td>
</tr>
<tr>
<td>T730</td>
<td>82.2K</td>
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<tr>
<td>T731</td>
<td>98.8K</td>
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<tr>
<td>T732</td>
<td>126.2K</td>
</tr>
<tr>
<td>T733</td>
<td>147.5K</td>
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</table>
**Tapered Thrust**

- TTHD and TTVF styles
- Tapered roller produce true rolling motion
- Carburized components
- Sizes
  - Bore diameters from 4” to 16”
  - Outside diameters from 8.5 to 34”
Rollers manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground & crowned to ensure evenly distributed stresses on the plates.

Outboard ends of the rollers have precision ground & superfinished contours to reduce friction.

Plates manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground to ABMA standards. Unlike the cylindrical thrust, these plates can be used as either the shaft or housing plate.

Retainers are machined from a single piece of centrifugally cast brass.
Tapered Thrust

Tapered Thrust TTHD Style

Tapered Thrust TTVF Style

T-Flat Thrust
Cylindrical Vs Tapered Thrust

- For a given inch bore size the tapered thrust offer a high capacity option
- Tapered thrust have other inherent advantages
  - Tapered rollers travel with true rolling motion, no skidding
  - Superior in horizontal shaft applications, no roller assembly slippage
- For a given envelope the tapered thrust can cost 2X more than a cylindrical thrust
**Cylindrical vs. Tapered Thrust**

**700 Series**

**Cylindrical Thrust**

T-753  
8” x 16” x 3”  
Dyn.Cap. = 516,400 lbs.  
$1873.30 – Dist Cost

**Tapered Thrust**

T-811  
8” x 16.5” x 3.625”  
Dyn.Cap. = 752,120 lbs.  
$3069.53 – Dist Cost

Source: STATS
**Tandem Thrust**

- Inch and Metric design
- Provide high load carrying capability in small OD envelope
- Sizes
  - Bore diameters from under 1” to 22”
  - Outside diameters from 3” to 42”
- Number of stages - 2 to 8
- Applications include; Extruder Drives, Down Hole Drills
**Tandem Thrust**

*Rollers* manufactured from Vacuum Degassed Carburized Bearing Grade Steel. Surfaces are ground & superfinished. Outside diameters are heavily crowned. Ends have large machined radius designed to reduce friction between the roller & the retaining ring. Larger bearings use multiple rollers per pocket to minimize slippage.

*Compression Sleeves* manufactured from various materials designed to provide controlled deflection. Components are match ground with the plates.

*Retainers* manufactured from centrifugally cast brass. Roller slots are accurately machined to provide smooth operation of the roller assembly. Rollers are retained by a steel band placed over the outside diameter of the retainer.

*Plates* manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground & superfinished.
Maximizing Envelope

- Rollway’s Tandem thrust bearing is a problem solver
- Provides for very high thrust carrying capability in a small radial space
- Applied into
  - twin screw extruders
  - oilfield swivels
Maximizing Envelope

T752 Cylindrical
Dyn Cap = 374,500 lb
OD = 14”

T-511 Tapered
Dyn Cap = 322,500 lb
OD = 10.5”

TMF-030127-201
6 stage Tandem
Dyn Cap = 329,900 lb
OD = 5”
Spherical Bearings

- Rollway Sphericals are Romanian sourced from ISO certified facilities
- RBNV is ISO Certified
- Series available: 22200, 22300, 23000, 23100, 23200, 23900, 24000 and 24100
- RBEC 1 / PO tolerances standard
- W33 standard
- Machined brass cages
- Shaker screen style
## Journal Bearing Competitors

<table>
<thead>
<tr>
<th></th>
<th>Manufactured in Past</th>
<th>Current Manufacture</th>
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<td>Rollway</td>
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<td>RBC</td>
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<td></td>
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<tr>
<td>Hyatt</td>
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<td></td>
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</tbody>
</table>

RBC & Hyatt interchange opportunities still exist
Rollway Radial “Product Line”

- 39 Bore sizes cataloged
- 12 different dimensional series available
Cylindrical Numbering Systems

• Rollway uses 3 different number systems for radial roller bearings:
  – “MAX” numbering system
  – “Tru-Rol” numbering system
  – “ISO” numbering system
Rollway Radial Race Configurations

Many Possible Design Configurations
**Separable**

Inner or outer race is separable, both directions. Rollers are retained in the non-separable race.

| E ---- U | E ---- B | U ---- E | __________ | “Tru-Rol” |
| MUC --- | MCS --- | N ---    | __________ | “MAX”     |
| NU ---  |        |          | __________ | “ISO”     |
Separable One Direction

Inner or outer race is separable in one direction, the rollers are retained in the non-separable race.

L ---- U
MUL ---
NJ ---

U ---- L
ML ---

“Tru-Rol”
“MAX”
“ISO”
Inner or outer race is 2 pieces, creating a double flanged race. The rollers are retained by the other race.
The bearing is non-separable. Snaprings hold the assembly together.

---

“Tru-Rol”
“MAX”
“ISO”
“Tru-Rol” Numbering System

E-1212-U-199

Prefix

Size Designator

Suffix

Variation Code
Bearing Size Designators

Dimension Series

- 300
- 5200
- 5220
- 320

Bore Size

20 × 5 = 100mm
“Max” Numbering System

MCS-5222-103

- Variation Code
- Size Designator
- Prefix
“ISO” Numbering System

**NU-320-VAB**

**Variation Code**

V = Variation
AA = 1\(^{st}\) variation
AB = 2\(^{nd}\) variation
AC = 3\(^{rd}\) variation, etc.

**Size Designator**

**Prefix**

E = Extra Capacity
M = Machined Ret.

**NU-320-EMC3**
Retainer Option Codes

**E-1212-U**
“Tru-Rol” (and “Max-Rol”) Numbering:
- Steel - no code applied, standard
- Brass - “MR” added to suffix
- No-Retainer - “M” added to suffix

**E-1212-UMR**

**E-1212-UM**

**MUL-5222**
“Max” Numbering:
- Brass - “M” 1st letter in prefix
- Cast Iron - “R” 1st letter in prefix

**RUL-5222**

**NU-320-EM**
“ISO” Numbering:
- Brass - “M” added to Suffix
Internal Clearance Code

Tru-Rol:
E-1212-U-005

MAX:
MCS-5222-007

“Tru-Rol” and “MAX” Numbering Systems:
• Standard clearance “006” has no code
• Special clearance is specified by adding a clearance code
  • Tighter: 003, 005
  • Looser: 007, 009
• Rollway standard clearances differ from competitors and ABMA standard.

ISO:
NU-320-EMC3

“ISO” Numbering System:
• No suffix indicates “C0” clearance.
• Tighter: C2
• Looser: C3, C4
• Rollway “standard” is “C3”
Journal Bearing Nomenclature

- Journal Bearings are sold as complete units or as components.
## Journal Bearing Nomenclature

### Component Codes

<table>
<thead>
<tr>
<th>Complete Assembly</th>
<th>Outer Race and Roller Assembly</th>
<th>Outer Race</th>
<th>Roller Assembly</th>
<th>Inner Race</th>
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</thead>
<tbody>
<tr>
<td>D-#####</td>
<td>B-#####</td>
<td>B-#####-70</td>
<td>WS-#####</td>
<td>E-#####-60</td>
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</tbody>
</table>

*Note: The diagram illustrates the various components and their corresponding codes.*
Journal Bearing Nomenclature

Bearing Size Designators

D-211-29

Length variation code
length in 1/16”
29 X 1/16 = 1-13/16”

11 X 5 = 55mm
Bore Size

Series Codes
• 200
• 300
Cylindrical Thrust Nomenclature

T622-201

Variation Code
Indicates non standard features present

Size Designator
600 or 700 series codes
• Second 2 digits indicate the size

Prefix
Prefix identifies the bearing configuration
**Cylindrical Thrust Nomenclature**

- **T** – Standard Cylindrical thrust.
- **AT** – Aligning thrust.
- **DT** – Standard double acting thrust
- **DAT** – Double acting, aligning thrust
- **SDT** – Simplified double acting thrust
- **CT** – Crane Hook, no fitting
- **WCT** – Crane Hook, with fitting
Tapered Thrust Nomenclature

T-811-201

Variation Code

2 types of variation codes
• Standard variations
• Special MTO variations from standard use sequential numbers starting from 201

Size Designator

Series and size code
• 1st (1st & 2nd) digit is bore size in inches
• other digits are space holders

Prefix

Prefix identifies the bearing design.
Note the hyphen “-” is significant.

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**Tapered Thrust Nomenclature**

**TAB-120240-201**

**Variation Code**
- 2 types of variation codes
  - Standard variations
  - Special MTO variations from standard use sequential numbers starting from 201

**Size Designator**
- Series and size code
  - 1st 3 digits is bore size in inches or mm
  - 2nd 3 digits is the OD size in inches or mm

**Prefix**
- Prefix identifies the bearing design
  - TAB, TAC, TAD, TAF - Inch sizes where “B” is 2 stage, “C” is 3 stage, etc.
  - TMB, TMC, TMD, TMF, TMH - metric sizes where “B” is 2 stage, “C” is 3 stage, etc.
Caution

There is an overlap in part numbers between the Cylindrical & Tapered thrust bearings:

T611 = 600 series cylindrical

T-611 = Tapered thrust
Markets & Applications

- Extruders
- Overhead Cranes
- Motors
- Pumps / Compressors
- Machine Tools
- Corrugators
- Coal Pulverizers
Overhead Cranes

- Radial roller bearings
- Journal roller bearings
Overhead Cranes

- Crane hook bearings
- Cylindrical thrust bearings
Axial Piston Pumps

- Engineered radial roller bearings
- Engineered cylindrical thrust bearings
Rotary Compressors

- 400 series radial roller bearings
DC Electric Motors

- Radial roller bearings
- Journal bearings
AC Electric Motors

- Radial roller bearings
Gear Drives

- Radial roller bearings
- 5200 series radial roller bearings
**Single Screw Extruders**

- Cylindrical roller thrust bearings
- Tapered roller thrust bearings
- Tandem thrust bearings
- Radial roller bearings
Twin Screw Extruders
Power Generation

- Radial roller bearings
- Cylindrical thrust bearings
- Tapered thrust bearings

Counter-Rotating Ball Type Pulverizer
Draglines & Shovels

- Large diameter radial roller bearings
Haul Trucks

- Radial roller bearings
Shaker Screens

- Engineered radial roller bearings
Rock Crushers

- Large diameter radial roller bearings
- Large diameter cylindrical thrust bearings
- Large diameter tapered thrust bearings
Rolling Mills

- Mill Stands
- Runout table rolls
- Furnace cars
- Mill motors
- Over head cranes
Mill Stands

- Engineered / large diameter radial roller bearings
- Engineered thrust bearings
- Engineered / high speed radial roller bearings
Transfer & Runout Tables

- 5200 series radial roller bearings
- Journal roller bearings
Support Applications

- Cranes
- Mill motors
- Furnace cars
Oil & Gas Discovery

The Rotary Rig

Drawworks

Mud Pump

Hook Swivel

Shale Shaker
Swivels

- Tapered thrust bearings
Hooks

- Cylindrical thrust bear
Mud Pumps

- Engineered / large diameter radial roller bearings
Drawworks

- Radial roller bearings
Pumping Units

Gear Drive

Crank Pin
Well Servicing

Cementing & Fracturing trucks
Summary

• Rollway manufactures a complete line of standard and special order roller bearings
• Sizes range from 2” to 42” and through precision class RBEC 5
• Product Summary
  – Cylindrical Roller
  – Journal Roller
  – Thrust
    • Cylindrical
    • Tapered
    • Tandem
  – Specials
Key Contacts

- Visit us at www.emerson-ept.com
- EPT Customer Service (800-626-2120)
  - Price
  - Availability
  - ATO Eligibility
  - Order Entry
- Technical Customer Service (219-465-2211)
  - Technical product questions
  - Application & interchange assistance