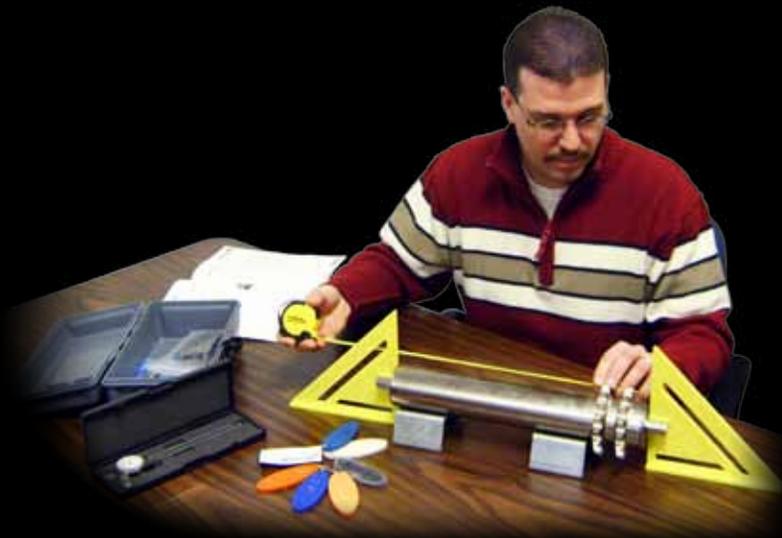




## THE PROGRAM

Omni Metalcraft Corp.'s Roller Ordering and Optimization program is an innovative way to help you save time and money. It starts by Omni working together with you to create an efficient system of **cataloging your customer's rollers** and **evaluating your usage**. We can train you to utilize our **Roller Measurement Kits**, **Roller Quote Sheet**, and quick reference **Bearing Selection Guide** or you can send the rollers to us and our engineers will measure the rollers for you. We will then review your **application**, **maintenance schedule** and **roller design** to ensure that you're using the most **cost effective rollers** to suit your needs. After we've helped you select your ideal roller we will look at **quantity breaks**, **shipping costs** and **ordering costs** to help you determine your **optimal ordering quantities**. Finally, we will **label the rollers** with **your part numbers** and **ship directly** to their final destination. Call your customer service representative today to start guiding you through our program. We want to help you make your business successful by going beyond simply selling rollers.

## MEASURING FOR SUCCESS



P.O. Box 352 ■ Alpena, Michigan 49707  
Phone 989.358.7000  
Fax 989.358.7020  
info@omni.com  
www.omni.com

## ROLLER SERVICES DETAILED

### ■ Proposal Drawings at the Point of Quote

Do you have questions about the design or dimensions of your roller? Omni will provide a proposal drawing along with any roller quote to provide basic dimensions and design concept verification.

### ■ Approval Drawings

Do you require more details about your rollers to make sure they will work in your application? Omni will provide more detailed drawings, with specific information you require, after receipt of a purchase order.

### ■ Shipping Method Review for Best Price

Are you unsure of the best shipping method? We can review your order and help you find the best option to suit your needs. Omni has experience shipping equipment around the country and we can put that experience to work for you.

### ■ In-House Roller Sample Measurement

Are you looking to replace a roller but are unsure of exactly what you need? Send it to Omni and our engineers will measure the roller and help you find exactly what you're looking for.

### ■ Roller Failure/Engineer Review

Are you looking for more durable, longer lasting rollers? Omni engineers will review your application, examine damaged rollers and recommend options for roller replacement that will hold up better.

### ■ New Design/Engineer Review

Are you designing new equipment and unsure of whether your roller design will hold up? Omni engineers are available to get on the phone and review your application to help you find the best solution.

### ■ Roller Measurement Kits

Don't have time to send Omni a sample roller? Omni offers tool kits and user guides to help you measure your own rollers in the field. Our customer service staff can guide you through using the tools to find the information you'll need for a roller quote.

### ■ Roller Measurement Training Via the Web

Do you have a large group that you'd like to train on using Omni Roller Measurement Kits? Omni can help you conduct training with groups of people via the web. It's a great way to get your entire sales staff up to speed on quoting rollers.

### ■ Develop Customer Part Numbers

Tired of having to cross reference your part numbers with vendor's part numbers? Omni will save your part numbers in our system so you can request quotes with your own part numbers.

### ■ Quote Layout Customization

Are vendor quotes confusing or inconvenient? Omni will customize the layout of your quotes to suit your needs. If you're looking for more detail, less detail or just a different document format, we will modify your quotes to your preferences.

### ■ Roller Labeling Options

Tired of having to sort through your order after you receive it? We'll do it for you! Whether you need them sorted by style, size or just grouped together for your specific assembly purposes, Omni will sort and tag your rollers before we ship them to you.

### ■ Competition Cross Reference

Looking to buy from Omni but only know your current vendor's part numbers? In many cases Omni can cross reference our competitor's part numbers with our own so you get what you're looking for.

### ■ Direct Shipping

Don't have the room to receive products before they are shipped to your customers? Omni will ship products directly to your customers for you.



## ROLLER QUOTATION WORKSHEET

Company: \_\_\_\_\_ Date: \_\_\_\_\_  
 Contact: \_\_\_\_\_ Quote Due: \_\_\_\_\_ Desired Delivery: \_\_\_\_\_  
 Phone No.: \_\_\_\_\_ Contact Email: \_\_\_\_\_ State: \_\_\_\_\_  
 Omni Sales Contact: \_\_\_\_\_ Quote #: \_\_\_\_\_

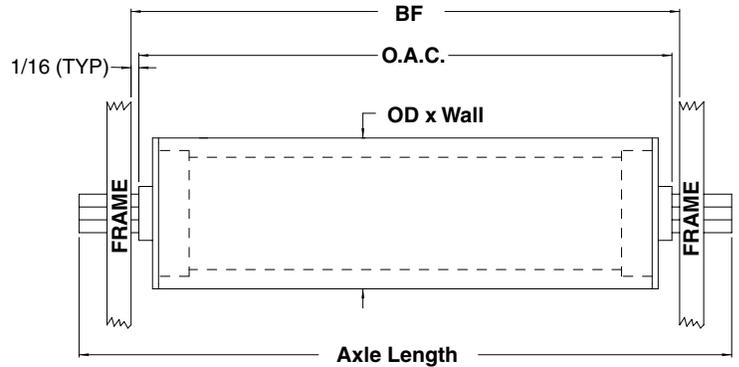
**Application:** \_\_\_\_\_  
 Tag No: \_\_\_\_\_ Quantity: \_\_\_\_\_  
 Monthly Usage: \_\_\_\_\_  
 Load Capacity Required: \_\_\_\_\_  
 Distributed or Point Contact Load

Note: Between Frame (BF) is the distance between the frames of the conveyor. The BF measurement is needed to ensure proper fit into the conveyor. If the roller is not in the conveyor provide the Overall Cone, the length of the roller from bearing tip to bearing tip. (See our Roller Measurement Guide for more information) Utilize the drawing below to depict more detailed specifications.

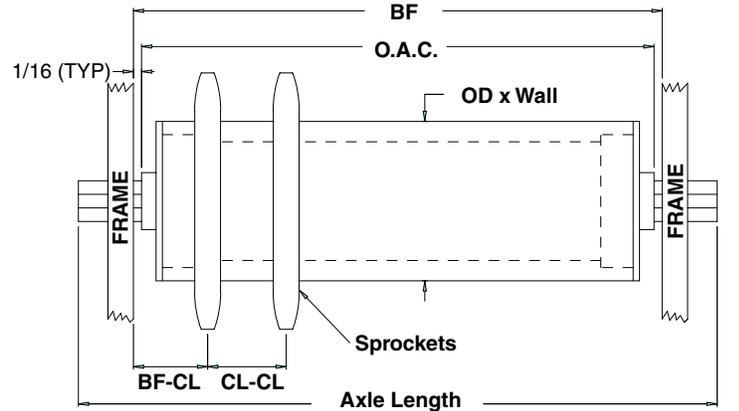
### Reference Page

- 5** Roller Style:  Crimped  Press Fit
- 6** Axle retaining:  
 Plain  Pin  Spring  Hog Ring  Fixed
- 6** Axle Spring Location:  
 Groove  Sprocket end or opposite
- 6** Axle Pin Hole Dia: \_\_\_\_\_ Location: \_\_\_\_\_
- 7** Between Frame Width (BF): \_\_\_\_\_
- 7** Overall Cone (OAC): \_\_\_\_\_
- 7** Roller Diameter: \_\_\_\_\_
- 8** Wall Thickness (Gauge): \_\_\_\_\_
- 8** Tube Material:  
 Steel  Galv  Alum  SS  PVC
- 9** Axle Length: \_\_\_\_\_ (or Standard)
- 9** Axle Extension: Left \_\_\_\_\_ Right \_\_\_\_\_
- 9** Axle Size: \_\_\_\_\_ (Hex or Round)
- 10** Axle Material:  Mild Steel  Stainless Steel
- 10** Axle Machining Configuration:  
 Drill and Tap  Milled Slots  
 Threaded  Milled Flats  
 Turned Down Ends  Snap Ring Groove
- 12** Sprocket Size: \_\_\_\_\_
- 14** BF-CL: \_\_\_\_\_ CL-CL: \_\_\_\_\_
- 15** Groove Size: Width \_\_\_\_\_ Depth \_\_\_\_\_
- 15** BF-CL: \_\_\_\_\_ CL-CL: \_\_\_\_\_
- 16** Coatings:  
 Sleeve  Cast  Vulcanized Other \_\_\_\_\_  
 Thickness: \_\_\_\_\_ Finish OD: \_\_\_\_\_  
 Hardness: \_\_\_\_\_ Length: \_\_\_\_\_  
 Color: \_\_\_\_\_
- 16** Finish:  
 Heat Treat  Zinc Other \_\_\_\_\_
- 17** Bearing Information:  
 Type:  Non  Semi  Precision  
 Sealed  Shielded  
 Grease Packed  Oiled  
 Regreasable  Flanged  
 Bushing  Framesaver

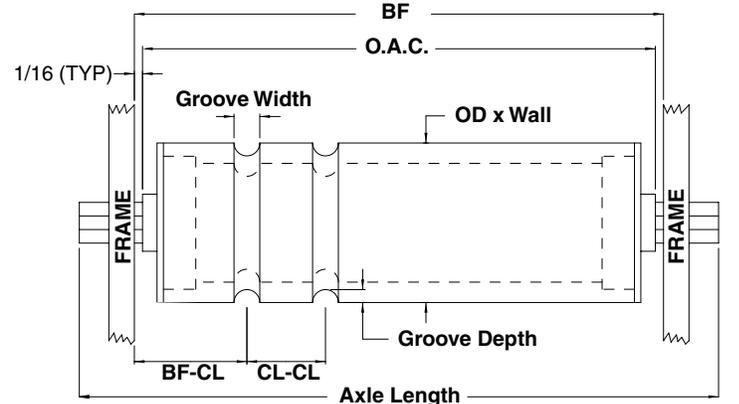
### GRAVITY ROLLER



### SPROCKETED ROLLER



### GROOVED ROLLER



# TABLE OF CONTENTS

<b>The Tools Needed</b>	<b>2</b>
<b>Guidelines</b>	<b>3</b>
<b>Getting Started</b>	<b>5</b>
<b>Measurements</b>	<b>7</b>
<b>Tubes</b>	<b>7</b>
<b>Axles</b>	<b>9</b>
<b>Sprockets</b>	<b>12</b>
<b>Grooves</b>	<b>15</b>
<b>Coatings &amp; Finishes</b>	<b>16</b>
<b>Bearings</b>	<b>17</b>
<b>Bosses</b>	<b>21</b>
<b>Additional Information</b>	<b>22</b>
<b>Roller Cataloging Sheet</b>	<b>23</b>
<b>Notes</b>	<b>24</b>

## THE TOOLS NEEDED



**Chocks**



**Thread Gauge**



**Angles**



**Calipers**



**Omni Metalcraft Corp.  
Tape Measure**



**Chain Samples**



**Magnet**



**Coating Samples**

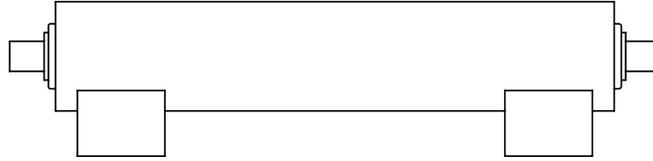
### About This Guide

This guide introduces the tools needed to measure a roller and will walk you through the process.

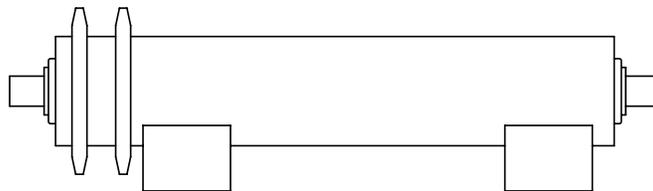
If at any time through the measurement process you are unsure of a dimension or specification please contact an Omni Metalcraft Corp. Customer Service Representative at (989) 358-7000 to ensure the accuracy of your order.

## Using the Roller Chocks

Set the roller chocks under the roller tube, close to the ends. Allow the ends of the roller to overhang the chocks.



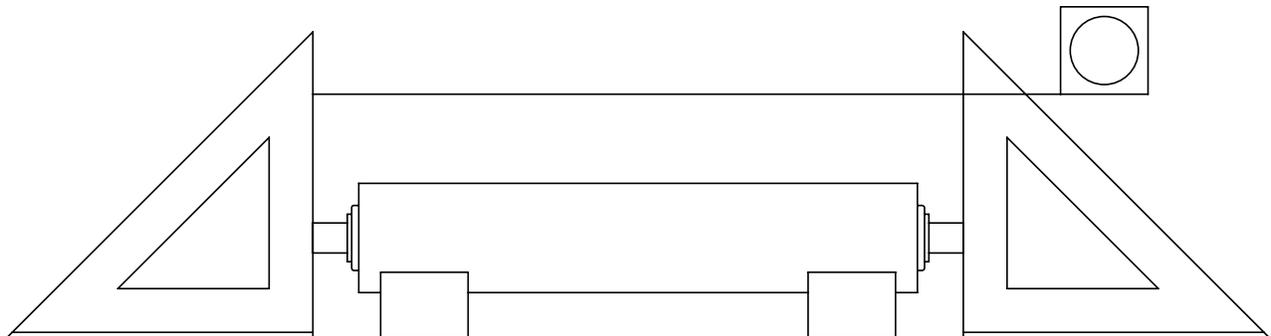
If the roller has sprockets, allow the sprockets to overhang the chocks as well.



- Additional spacers may be needed under the chocks if the sprockets are too large to allow the roller to sit level.
- Short rollers may only require a single chock for support.
  - Rollers less than 6" in length can be measured using only the calipers and do not necessarily require being supported by the chocks.

## Using the Angles

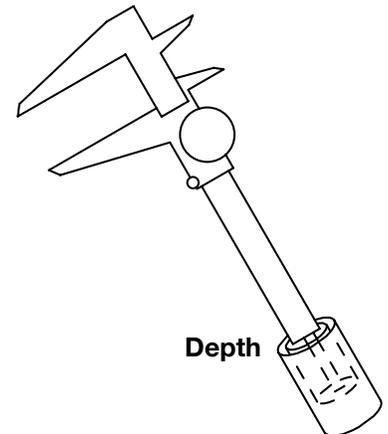
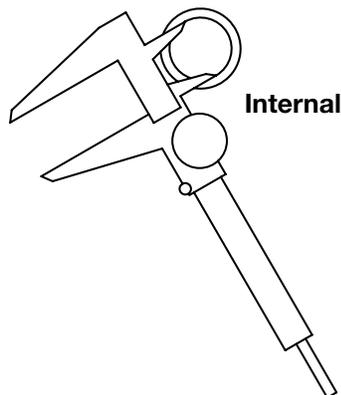
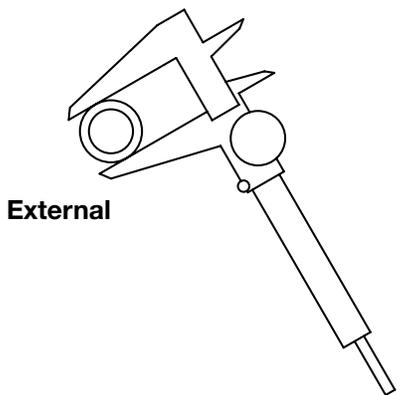
- The Angles are used to provide a straight vertical edge to measure from.
  - They are placed on either side of the roller like book ends.
  - The vertical edge is placed against the desired surface to be measured.
  - When both angles are in place the tape measure can be used to measure between them.
  - This method provides a very simple yet accurate measurement between hard to reach surfaces.



# GUIDELINES

## Using the Calipers

- The dial calipers measure items shorter than 6".
- There are three types of measurements that can be taken by using different parts of the calipers: external, internal, and depth.



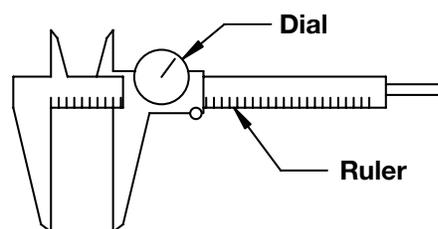
- The calipers are read by first looking at the ruler along the neck.
  - The ruler is marked in increments of  $1/10"$  or  $0.1"$ .
  - Read the ruler measure to the  $0.1"$ . Example:  $1.3"$

- Next, read the dial.
  - The dial is marked in increments of  $1/1000"$  or  $.001"$ .
  - Read the dial number. Example: Dial reads 75, it is  $.075"$ .



- Add these two readings together for the measurement.

- Example:
  - The ruler reads  $1.3"$ .
  - The dial reads  $.075"$ .
  - The measurement is then:  $1.3" + .075" = 1.375"$
  - \*Hold the calipers snug, but not too tight.



## A Note on Accuracy

The tape measure is capable of taking measurements that are accurate to the nearest  $1/32"$ . To ensure the consistency between your measurements and ours, measure to the nearest  $1/32"$ .

The calipers can provide measurements that are accurate to the nearest  $1/1000"$ . At this level of accuracy, tolerances in the components can be a factor. For instance, a hex axle may measure as being  $.4370"$ . The axle is actually a  $7/16"$  hex axle but, due to the manufacturing tolerances of the material, the measurement may not be exactly  $.4375"$ .

## Metric Measurements

Both the tape measure and calipers use English standard units (inches). It is important to keep in mind that a roller may be built with metric components. If your measurements are coming out with strange numbers then remember to compare them to metric units.  $1.00" = 25.4$  mm

## To Begin

Use the quote sheet attached at the end of the manual to identify the roller style and guide you through the measurement process.

- Do not limit the specifications to the quote sheets only; these sheets are only a guide for some of our most basic rollers and components.
- For specials that do not fit one of the quote sheets, draw out the roller in detail with dimensions.

## Identifying Roller Style

- Gravity Rollers are rollers without a drive option.



- Grooved Rollers have one or more grooves formed into the tube and are driven with urethane bands.



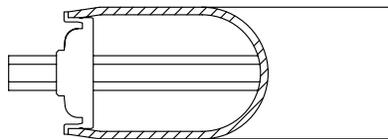
- Sprocketed Rollers have one or more sprockets welded to the tube and are driven with chain.



## Identifying Roller Assembly

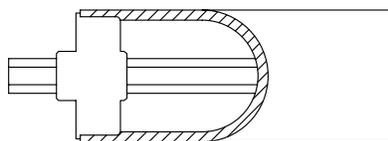
- Crimped

- A crimped roller has a tube which is crimped down over the bearing to hold it in place. Bearings installed in this manner are non-replaceable.
- Edges of tube are bent towards the center.



- Press Fit

- A press fit roller has a tube which is counter bored to the correct inside diameter for the bearing to be press fit into place or slip fit for large diameter rollers.



# GETTING STARTED

## Identifying Axle Retention

### Spring Retained

- Determine the axle retention by pressing one end of the axle in; if the axle pushes in, it is spring retained on the opposite end.
- Repeat this process on the other end of the axle, if the axle reacts the same it is dual spring retained.
- If the roller has sprockets or grooves it is important to identify which end the spring is on.

### Pin Retained

- Pin retained axles will have holes in the ends of the axles to insert the pins. When the pins are removed the axle can be removed.
  - Measure the location and the diameter of the pin hole with the calipers.
  - Identify the type of pin. Our standard options include:



Cotter Pin



Hog Ring

### Not Retained

A plain axle will not have any type of retention. No pins or springs will be holding the axle in place.

### Specials

- Fixed or staked axles can be identified when neither end pushes in, but axle cannot be removed.
- Other special axles can be referred to in the axle machining section on page 10.

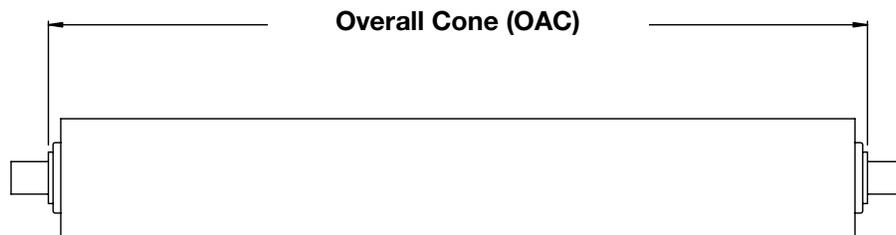
## Between Frame (BF)

- Between Frame (BF) is the distance between the side frames of a conveyor and it is the preferred dimension.
  - Sometimes referred to as between rail, inner rail or inner frame.
- It is sometimes best to measure the conveyor equipment itself to get the BF.
  - Keep in mind there are some instances, such as a deep frame, or the way the rollers are set, where the OAC is a better measurement. (explained below)
- Use the tape measure to measure the distance between the two side frames to get the BF. Measure to the nearest 1/32".



## OverAll Cone (OAC)

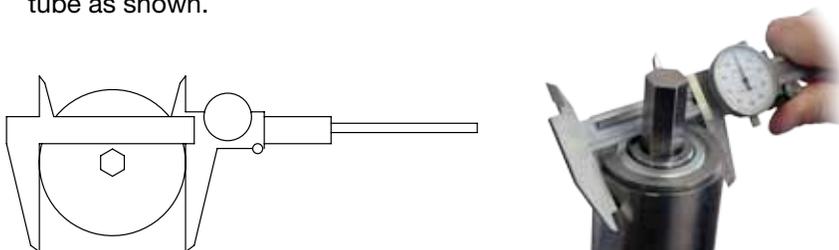
- Overall Cone (OAC) is the distance between the two outermost bearing extensions.
- Place the angles against the cone of the bearings — the very outside of the bearing.
- Use the tape measure to measure between the angles. Measure to the nearest 1/32".
- Add 1/8" to the total OAC to get the Between Frame width (BF), if it is not specified by the customer.
- Some situations when this should not be done include:
  - Rollers with welded axles. They do not have an OAC.
- If bearings are missing from the roller an accurate OAC cannot be measured. Make note which bearing(s) are missing.
  - If one bearing is good, measure from the edge of the tube to where the bearing meets the axle (the very outside of the bearing) and add it to the other side for an approximate measurement.



## Tube

### Tube Outer Diameter (OD)

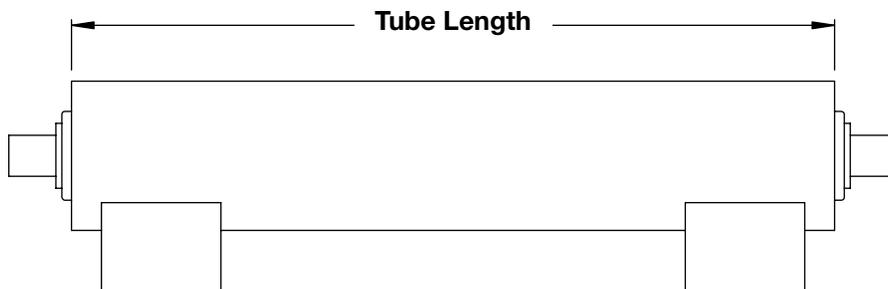
- Use the calipers to measure the diameter of the tube. Measure to the nearest .001".
  - For larger tubes, place the neck of the calipers close to the axle with the forks swung at an angle out over the tube as shown.



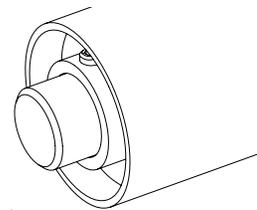
# MEASUREMENTS

## Tube Length

- Use the tape measure to obtain the tube length. Measure to the nearest 1/32".
  - Be sure not to include the width of the bearing flange.
- Tube length is not a critical dimension for rollers with bearings that fit directly into the tube.
  - In this case, the OAC and the bearing extension will dictate the tube length.
- The tube length is a critical dimension for rollers with bosses or welded axles.



- If the bearing is unflanged and the tube extends past the body of the bearing then the bearing is recessed into the tube.
  - In this case the OAC and tube length can be used to determine exactly how far the bearings are recessed.



## Tube Thickness

- If the bearing is in the tube the thickness cannot be measured.
- If the bearing has been removed or is missing use the forks of the calipers to measure the tube thickness. Measure to the nearest .001".
  - This will measure the bored tube thickness if the tube has been bored.
- If the customer allows the roller to be cut open, the forks of the calipers can be used to measure the thickness of the tube.

## Tube Material

- Use a magnet on the tube to identify if the material is steel. If the tube is magnetic it is steel.
  - High quality 420 Stainless Steel can sometimes have magnetic properties but this is not a common stainless steel grade tubing used for rollers.
- Use the pictures below to aide in identifying the material by it's visual properties.

- Stainless Steel has a bright, silver, usually smooth finish.
- Most stainless tube will have a weld seam.



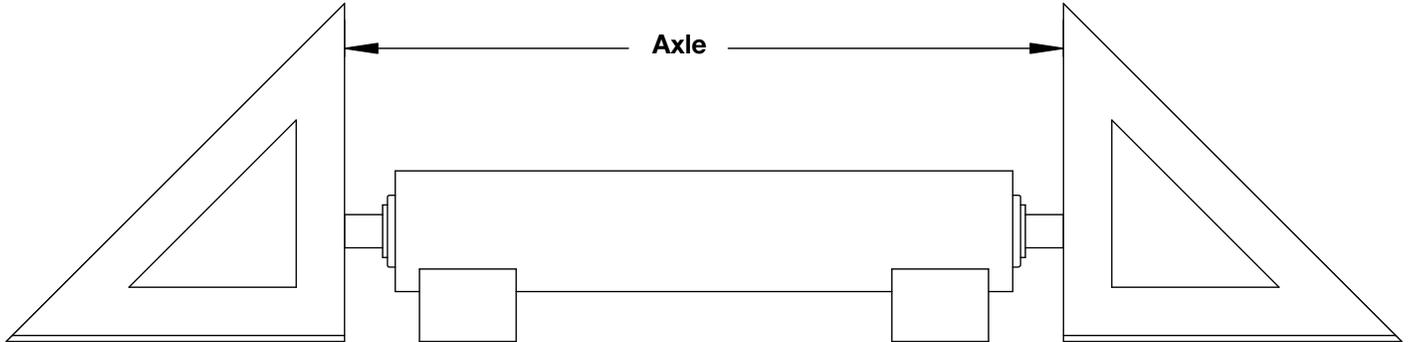
- Aluminum has a dull, gray appearance.
- Aluminum tends to have very fine, longitudinal lines that run the length of the tube.
- Aluminum is lightweight and soft compared to other metal materials.

- Galvanized steel is steel tube coated with a thin layer of zinc coating giving it a shiny appearance.
- Galvanized steel has a scaly or textured look to it.



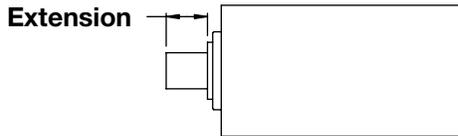
## Axle Length

- Place the angles against the ends of the axle.
- Use the tape measure to measure between the angles. Measure to the nearest 1/32".



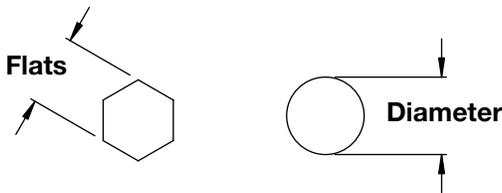
## Axle Extensions

- Use the tape measure to measure from the front face of each bearing to the end of the axle. Measure to the nearest 1/32".
  - This must be done for both sides of the roller as the axle extension might be different on each side.



## Axle Size

- Use the calipers to measure the axle. Measure to the nearest .001".
  - For round axles measure the diameter.
  - For hex axles measure the distance across the flats.



To the right is a chart to convert fractions of an inch to decimals to assist in converting axle size measurements.

Fractions - Decimals					
Fractions of an Inch	Decimals of an Inch	Fractions of an Inch	Decimals of an Inch	Fractions of an Inch	Decimals of an Inch
	1/64	0.015625		33/64	0.515625
1/32		0.03125	17/32		0.53125
	3/64	0.046875		35/64	0.546875
1/16		0.0625	9/16		0.5625
	5/64	0.078125		37/64	0.578125
3/32		0.09375	19/32		0.59375
	7/64	0.109375		39/64	0.609375
1/8		0.125	5/8		0.625
	9/64	0.140625		41/64	0.640625
5/32		0.15625	21/32		0.65625
	11/64	0.171875		43/64	0.671875
3/16		0.1875	11/16		0.6875
	13/64	0.203125		45/64	0.703125
7/32		0.21875	23/32		0.71875
	15/64	0.234375		47/64	0.734375
1/4		0.25	3/4		0.75
	17/64	0.265625		49/64	0.765625
9/32		0.28125	25/32		0.78125
	19/64	0.296875		51/64	0.796875
5/16		0.3125	13/16		0.8125
	21/64	0.328125		53/64	0.828125
11/32		0.34375	27/32		0.84375
	23/64	0.359375		55/64	0.859375
3/8		0.375	7/8		0.875
	25/64	0.390625		57/64	0.890625
13/32		0.40625	29/32		0.90625
	27/64	0.421875		59/64	0.921875
7/16		0.4375	15/16		0.9375
	29/64	0.453125		61/64	0.953125
15/32		0.46875	31/32		0.96875
	31/64	0.484375		61/64	0.984375
1/2		0.5	1		1

**Axle Material**

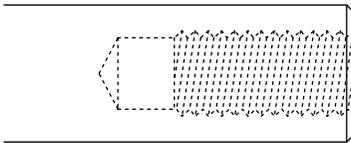
- Use a magnet on the axle to identify if the material is steel. If the axle is magnetic it is steel.
  - High quality 420 Stainless Steel can sometimes have magnetic properties but this is not a common stainless steel grade used to make roller axles.
- Use the pictures in the Tube Material section to aide in identifying the material through visual properties. (page 8)
  - Keep in mind we do not provide axles in aluminum or galvanized steel.

\*See the Identifying Finishes section to determine if the axle has any type of finish. (page 16)

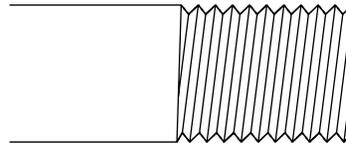
**Axle Machining**

Identify if the axle has been machined. Reference the drawings below to identify some common machining options:

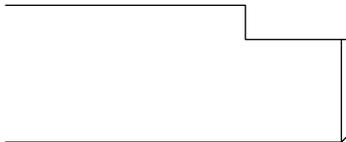
Drill and Tap (Female Thread)



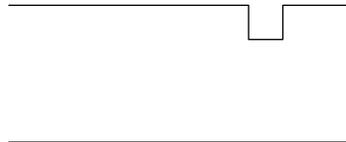
Threaded (Male Thread)



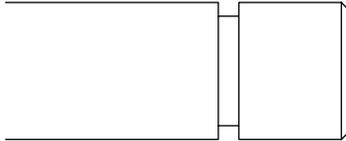
Milled Flat



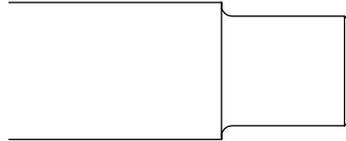
Milled Slot



Snap Ring Groove



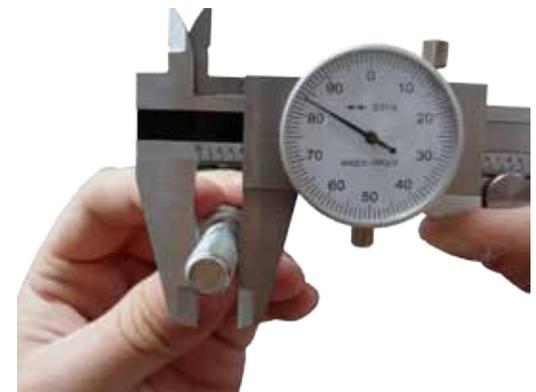
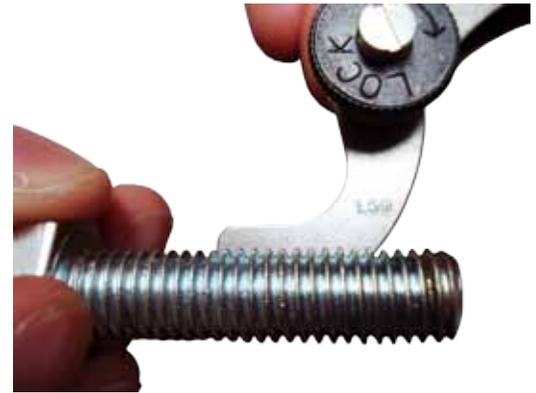
Turn Down



- Use the calipers to measure any of the machined dimensions. Measure to the nearest .001".
  - Tip: Draw the dimensions at the same time as taking the measurements to ensure every dimension is recorded.
  - It is critical to record every dimension to measure the axle correctly.
  - In addition to the dimensions of the axle, measure from the end of the axle to the machined feature.

## Drilled and Tapped or Threaded Axle

- Use the thread gauge to match the pitch of the screw threads.
  - The thread gauge contains two sets of gauges, metric and English.
    - The metric gauges are labeled .5 through 6 threads per millimeter, all decimals.
    - The English gauges are labeled 4 through 56 threads per inch, all whole numbers.
  - Use the appropriate set of thread blades to measure the screw pitch.
- Use the calipers to measure the outer diameter of the bolt for a drilled and tapped axle or the machined section of the threaded axle to determine if it is metric or English. Using a metric conversion chart, find the closest measurement. Measure to the nearest .001".
  - If a bolt is not included with the drilled and tapped axle use the calipers to measure the inner diameter of the machined axle.
- Use the thread gauge measurement to match the numbers to the right of the hyphen of the tap size.
  - Example: Thread gauge measurement is 1.25 mm.
- Use the outer diameter measurement to match the numbers to the left of the hyphen of the tap size.
  - Example: OD is .385", converts to approximately 10 mm.
- The two numbers combined 10 & 1.25 match up with the tap size M10-1.25.



If the measurements do not match exactly find the closest one to give a general size.

English

Tap Size	Min. Hex	Min. Round	Max. Depth
#8-32	5/16 H	5/16 Ø	.6
#10-24	3/8 H	3/8 Ø	.7
#10-32			
1/4-20	7/16 H	1/2 Ø	.8
1/4-28			
5/16-18	5/8 H	1/2 Ø	1.0
5/16-24			
3/8-16	11/16 H	5/8 Ø	1.1
3/8-24			
7/16-14			1.6
1/2-13	3/4 H	3/4 Ø	1.6
1/2-20			
9/16-12	7/8 H	7/8 Ø	1.8
5/8-18			2.0
3/4-10	1 H	1 Ø	2.0
7/8-14	1 1/4 H	1 3/16 Ø	2.0
1-14	1 1/2 H	1 3/8 Ø	2.5
1-18			
1 1/4-7	1 5/8 H	1 11/16 Ø	2.5

Metric

Tap Size	Min. Hex	Min. Round	Max. Depth
M5-0.8	7/16 H	1/2 Ø	.7
M6-1.0			.8
M8-1.25	5/8 H	1/2 Ø	1.0
M10-1.25	11/16 H	5/8 Ø	1.0
M12-1.25	3/4 H	3/4 Ø	1.6
M14-1.5			
M16-1.5	7/8 H	7/8 Ø	2.0
M16-2.0			
M18-2.0	1 H	1 Ø	2.0
M20-1.5			
M20-2.0			

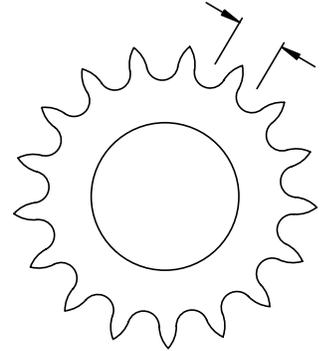
# SPROCKETS

## Chain Size

- Use the chain samples to determine the chain size of the sprocket(s).
  - Place sample chain over the sprocket teeth to determine if it is a standard chain size.
  - Omni's most common chain sizes are 40, 50, 60 and 80. (provided in the Omni Roller Measurement Kit)

## Chain Pitch

- If you do not have the sample size chain available to measure the sprocket chain size, use the calipers to measure between the teeth.
  - Measure from center to center of where the chain roller would set between the teeth. (see picture at right) Measure to the nearest .001".



## Sprocket Width

- Use the calipers to measure the sprocket width to determine if it is metric or English. Measure to the nearest .001".
  - Measure the thickness of the sprocket by using the caliper forks.

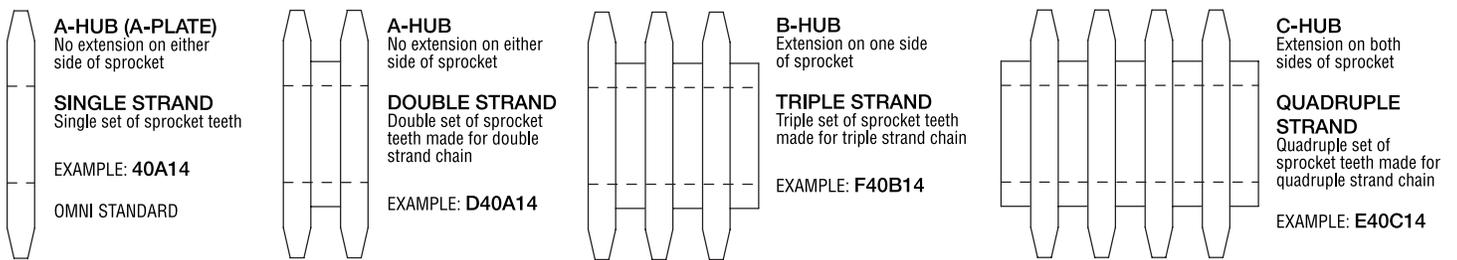
Reference the chart below to determine the sprocket size using the chain pitch and sprocket width measurements if the sprocket size is unknown.

Sprocket Size	Pitch	English Width	Metric Width
35	3/8	0.168"	5.31 mm/ .209"
40	1/2	0.284"	7.37 mm/ .290"
41	1/2	0.227"	N/A
50	5/8	0.343"	9.17 mm/ .361"
60	3/4	0.459"	11.10 mm/ .437"
80	1	0.575"	16.18 mm/ .637"
100	1-1/4	0.692"	18.59 mm/ .732"

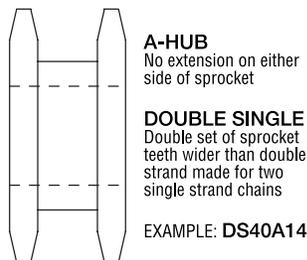


## Chain Designation

- The sprocket size represents the first two digits in the chain designation.
  - Example: 40A14 is size 40.
- The number of teeth represents the last two digits in the chain designation.
  - Count the number of teeth.
    - Example: 40A14 – 14 teeth
- Determine the sprocket type:
  - **A-Hub** – No extension on either side of sprocket (A)
  - **B-Hub** – Extension on one side of sprocket (B)
  - **C-Hub** – Extensions on both sides of sprocket (C)
  - The sprocket can be **single**, **double (D)**, **triple (F)**, and **quadruple (E)** strand sprockets, each respectively having single, double, triple, and quadruple sets of teeth.



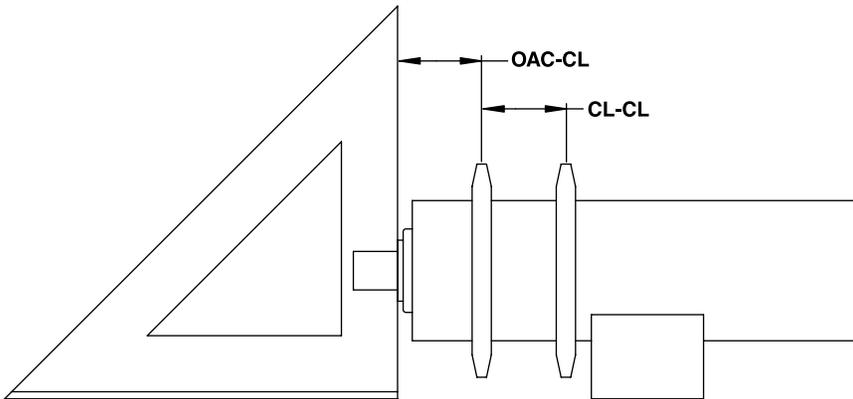
- The sprocket can be **double single (DS)**, which has a double set of teeth made for two single strands of chain.



- Determine the sprocket type for the chain designation by assigning the respective letter or numbers.
  - The hub style represents the middle letter.
    - Example: 40**A**14 - A-Hub.
  - The strand style represents the first letters.
    - Example: **DS**40A14 - double strand.

# SPROCKET LOCATIONS

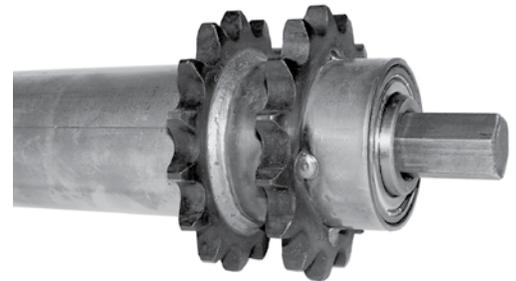
- Place an angle against the face of the bearing closest to the sprocket(s).
- Use the tape measure to measure from the angle to the center of the closest sprocket. Measure to the nearest 1/32".
- For each additional sprocket use the tape measure to measure from the center of one sprocket to the center of the next.



- The centerline dimension of sprockets is critical as the sprocket width can change.
  - For reference, measure from the angle to the face of the first sprocket.
  - For each additional sprocket, measure the distance between the sprockets.

## Sprocket Material

- Use a magnet on the sprocket to identify if the material is steel. If the sprocket is magnetic it is steel.
- Our standard sprockets have a dull, black appearance because of the black oxide finish.
  - Identify any finishes using the Coatings & Finishes section (page 16) or material types using the Tube Material section. (page 8)

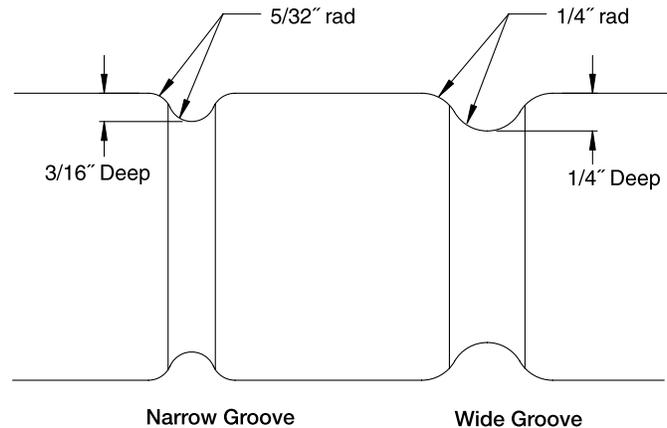


## Measuring Accessories

- Use the calipers to measure welded flanges. Measure to the nearest .001".
  - Measure the flange OD and thickness.
  - Draw a detailed profile including the orientation of the flange and the approximate degree of its angle.
- Use the calipers to measure other accessories. Measure to the nearest .001".
  - Draw the dimensions to ensure that every dimension is recorded.

## Measuring Grooves

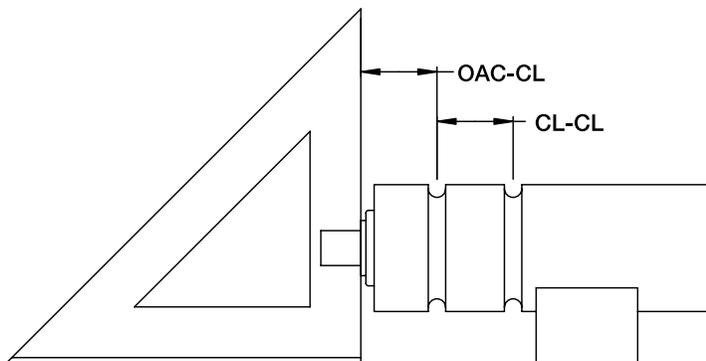
- If possible, it is best to know exactly what size O-rings are being used in the groove.
  - Omni has two standard groove sizes, narrow and wide:
    - Narrow grooves are 5/16" wide, made for 3/16" dia. belt.
    - Wide grooves are 1/2" wide, made for 1/4" dia. belt.



- Use calipers to measure the width of each groove. Measure to the nearest .001".
  - Measure the depth of the groove by measuring the smallest diameter in the center of the groove.
  - Subtract the measurement from the tube OD and divide by 2 to get the groove depth.
  - Use the groove width and depth measurements to identify which size O-ring will fit the grooves.
- Use the same method to measure machined grooves.
  - If it cannot be determined whether the groove is machined or formed provide all dimensions to help determine the best solution.

## Groove Locations

- Place an angle against the face of the bearing closest to the groove(s).
- Use the tape measure to obtain the distance from bearing extension to the center of the closest groove. Measure to the nearest 1/32".
  - For each additional groove use the tape measure to find the distance from the center of one groove to the center of the next.
  - It is important to measure from the center of the groove, not where the groove starts.



# COATINGS & FINISHES

## Coatings or Sleeves

- Use the tape measure to measure the coating or sleeve length.
  - Measure to the nearest 1/32".
- Place the angles against the front face of the bearings.
  - Use the tape measure to measure from the angle and where the coating starts.
- Use calipers to measure the coating diameter, similar to tube diameter. Measure to the nearest .001".
- Use the material samples provided to determine the material type and durometer.
  - If a match cannot be found, describe the softness or hardness of the material.
    - Include the purpose of the coating to help us determine the best solution.
- Specify the color of the material.



## Identifying Finishes

Identify any type of finishes or tube coloring. Omni's most common finishes include:

### Zinc

- Omni offers two standard colors in zinc plating:
  - Gold
  - Silver/Clear
- Zinc plating looks like galvanized tubing, without the textured appearance, or a shiny mild steel.

### Chrome

- Chrome finish has a shiny, bright, smooth, mirror-like appearance.

### Nickel

- Nickel finish has a dull, medium gray finish.

### Heat Treat

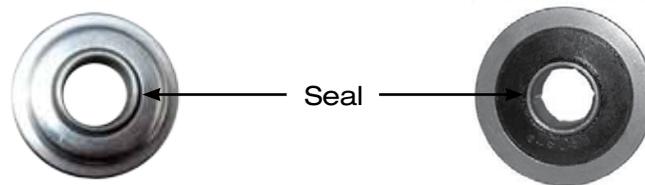
- Typically dark, black appearance.

## Identifying Bearings

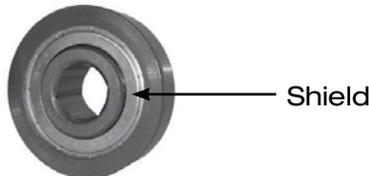
- Before identifying the bearing in the roller make note if the customer wants to use the exact bearing.
- Identify and copy any markings on bearing.
- If there is not a name or identifying number, use the category descriptions below to assist in identifying the type of bearing.
- If a feature is unknown, provide detailed application information and/or the customer's preferences.

## Bearing Options

- Sealed
  - On non-precision bearings, a seal can be detected if the balls are covered and a plastic/rubber "wall" can be seen through the inner and outer races.
  - Semi-Precision and Precision bearings with seals will have a plastic/rubber cover over the balls between the inner and outer races.



- Shielded
  - A bearing with shields will have a metal cover over the balls between the inner and outer races.



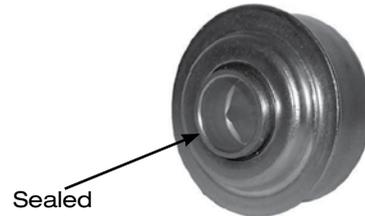
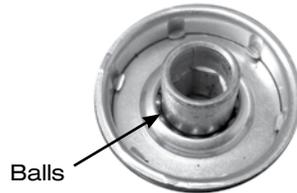
- Grease Packed
  - Often times grease packed bearings can be identified by the grease coming out between the races.
  - Grease Packed bearings do not rotate as easily as a free-spinning oiled bearings because of the increased rolling resistance the grease creates.
- Oiled
  - An oiled bearing, when spun, will spin for an extended amount of time compared to a grease packed bearing.
  - Oiled bearings are typically used in gravity applications because they require less energy to move than grease packed bearings.
- Regreasable Bearings
  - If the axle is missing, regreasable bearings can be identified by the holes through the inner race, that allows grease to be directed into the bearing.
  - If the axle is intact, it will have a regrease zerk fitting on the end.
  - If the roller contains regreasable bearings, it is important to note the frame thickness of the conveyor in order to line up the regreasing holes on the axle.
- Use the calipers to measure the frame thickness if the gauge is unknown. Measure to the nearest .001".



# BEARING TYPES

## Unground (Non-Precision) Bearings

- Stamped metal housing with very loose tolerances.
- If the bearing is not shielded or sealed, sometimes the balls can be seen between the inner and outer races.
- Unground bearings can be crimped or press fit. If crimped, they are non-replaceable.



## Semi-Precision Bearings

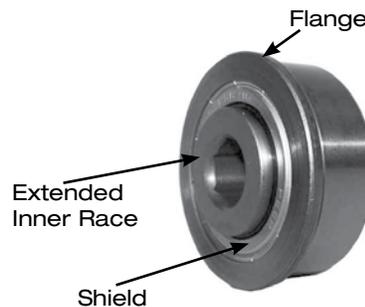


- The machined metal raceways have tighter tolerances than unground bearings.
- The raceways can be made from mild steel, stainless steel, or polypropylene.
- All bearings in this category are pressed into tubes and can be replaced.

## ABEC Precision Bearings

- Precision ground and polished raceways made from hardened chrome steel.
- ABEC bearings have many styles, these are the most common that Omni uses:
  - Polypropylene Housed Bearings
    - Consist of a radial ABEC bearing inside a polypropylene housing assembly, typically black.
    - The housing must be crimped into the tube which means they are not replaceable.

- "All Metal" ABEC Bearings
  - Feature hex bores, extended inner races, and flanges.
  - Metal shields and rubber contact seals on both sides of the bearing.



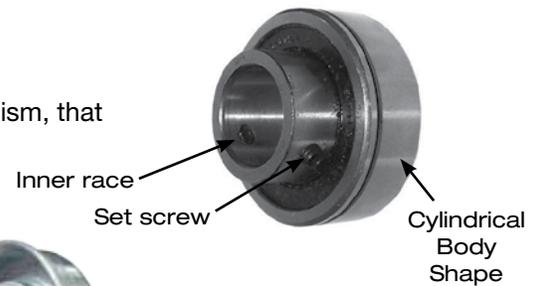
- Agricultural Bearings
  - Heavily sealed ABEC bearings designed for use in agricultural equipment.
  - Available with hex bores and square bores.
  - Available with both spherical and cylindrical body shapes.



# BEARING TYPES

## ■ Insert (Set screw) Bearings

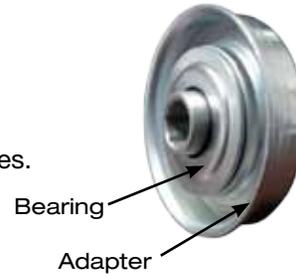
- Oversized round bores.
- The inner race is extended and features set-screws, or some other mechanism, that locks the inner race to the axle.
- Available with both spherical and cylindrical body shapes.



## Assemblies

### ■ Adapter Bearings

- Pressed into a stamped metal adapter.
- Standard adapter assemblies must all be crimped into tubes.



### ■ Sleeve Bearings

- Large ABEC bearings, either Insert bearings or Agricultural bearings, with spherical body shapes that cannot be installed directly into a tube alone.
- The sleeve is a machined piece of steel with a spherical inner diameter that the bearing can be installed into.



## Plastic Bearings

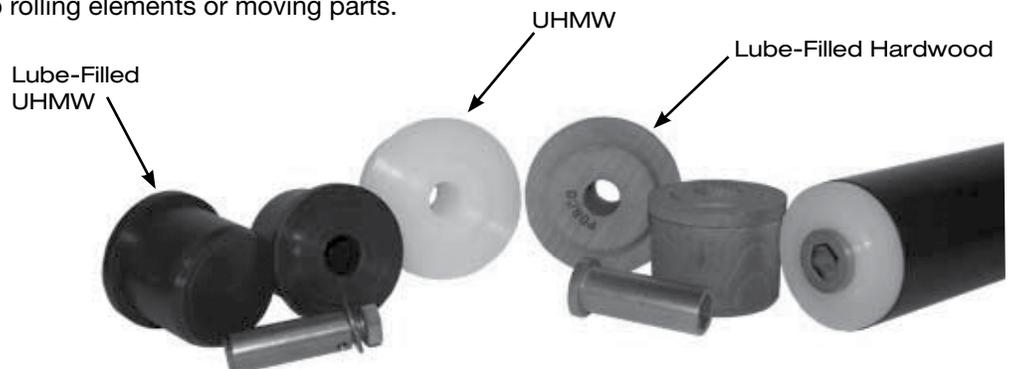
- The bodies are molded plastic, usually Acetal (Delrin).
- The balls are 420 stainless steel.
- Available in various colors.



## Bushings (Roll End Bearings)

- Solid pieces of material with no rolling elements or moving parts.
- Common materials:

- UHMW
- Hardwood
- Teflon
- Nylon
- Polypropylene
- Acetal (Delrin)



# BEARING TYPES

- Framesaver
  - Framesaver Cartridges consist of two radial ABEC bearings and a spring loaded stub axle in a polypropylene housing.
  - When installed in a roller they do not require a thru axle.
  - Use the picture to help identify framesavers, it can be difficult otherwise to know for sure it is a framesaver unless the roller is cut to show no thru axle.
  - As shown in the picture, it is also available with a plastic hex sleeve.



## Measuring Bearing Dimensions

If unable to identify the bearing, measure the appropriate dimensions.

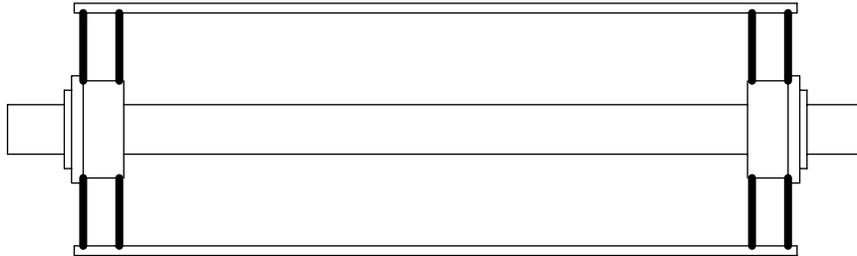
- Place the angles against the front face of the bearings.
- Using the calipers, measure between the angle and edge of tube to determine the bearing extension. Measure to the nearest .001".
- If the roller can be taken apart and the bearing can be removed from the tube, use the calipers to measure the outer body diameter (OD), similar to the tube OD.
- Use the calipers to measure the flange OD, similar to the tube and bearing body OD.
- Use the caliper depth gauge to measure the length of the bearing through the bore.
- Identify the bore shape to determine if it is a hex or round axle bore. Measure the bore to determine the axle size for that bearing.
  - For round axles, measure the diameter.
  - For hex axles, measure the distance across the flats.

## Bearing Material

- Use a magnet on the bearings to identify if the material is steel. If the bearing is magnetic it is steel.
  - Hold the magnet by the face of the bearing to stay as far away from the bearing balls as possible to ensure the magnet is not attracted to the balls.
    - Bearing balls can sometimes be made from high quality 420 Stainless Steel which can have magnetic properties.
- Use the pictures in the Tube Material section to aid in identifying the material through visual properties. (page 8)

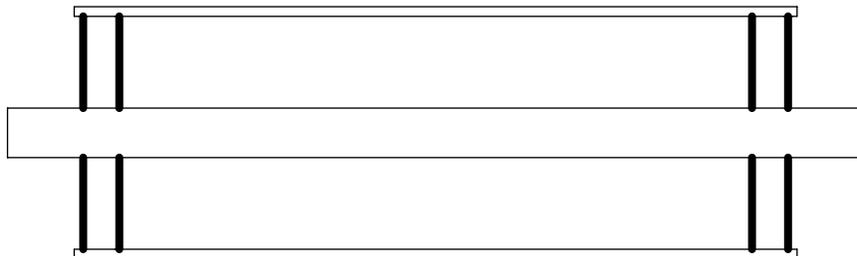
## Identifying Bosses

- Identify if the roller has bosses.
  - A roller with bosses has steel slugs welded inside the ends of the tube.
    - Bearings that are too small to fit into the tube can be press fit into the bosses.



## Identifying Welded Axle with Bosses

- Identify if the roller has a welded axle.
  - A roller with welded axles will have bosses that are welded directly to the axle, it will not have internal bearings.



## Measuring Bosses

- If the boss is recessed, use the tape measure to find the distance the boss is recessed inside the tube. Measure to the nearest 1/32".
- If the boss is extruded, use the tape measure to find the distance the boss is extruding past the tube. Measure to the nearest 1/32".
- The tube length is also an important piece of information for rollers with a boss.
  - See Tube Length section for more details. (page 8)
- Based on the tube OD and bearing OD, Omni can determine the appropriate boss size.

# IDENTIFY

## Identifying Cause of Failure

- Identify any spots of rust
- Identify any damage to the tube
  - Common types of tube damage:
    - Dents
    - Belt Wear
    - Scratches
    - Any other damage that would prohibit complete measurements
- Identify any damage to the bearings
  - Common types of bearing damage:
    - Wear
    - Dents
    - Scratches
    - Contamination
    - Locking-up
    - Any other damage that would prohibit identification of bearing or complete measurements

## Identifying Application

- Can we get pictures of the roller?
- Can we get pictures of where the roller is used?
- What is the product?
- What size product is being transported?
- What weight product is being transported?
- How much load capacity does the roller need?
- How fast will the roller be turning?
- How many hours per day will the roller be in operation?
- Is the area around the roller clean?
- What kind of contamination is around the roller?
- Is the roller exposed to any chemicals?
- Is the roller exposed to extreme temperatures?





# BEARING SELECTION GUIDE

## WHY THIS BEARING?

		Capacity	Speeds	Conveyor Types	Environment	Noise Level
	<b>Plastic</b> <ul style="list-style-type: none"> <li>Lowest capacity</li> <li>No lubrication required</li> <li>Capable of operating submerged in liquid</li> <li>Not for use with high speeds or powered conveyor</li> <li>Ideal for washdown with harsh detergents</li> <li>Molded plastic bodies and stainless steel balls</li> </ul>	Low	Low	Light Duty Gravity Conveyor	Corrosive Wet	High
	<b>Unground Crimped (Non-Precision)</b> <ul style="list-style-type: none"> <li>Most cost effective</li> <li>Lowest coefficient of friction, easiest to turn</li> <li>Zinc plated for mild corrosion resistance</li> <li>Not for use with high speeds</li> <li>Stamped metal housing with very loose tolerances</li> <li>Full complement of balls which are not separated</li> </ul>	Low	Low	Gravity and Lineshaft Conveyor	Mild	High
	<b>Unground Press Fit (Non-Precision)</b> <ul style="list-style-type: none"> <li>More capacity than crimped</li> <li>Can be replaced for longer roller life</li> <li>More sealing options available</li> <li>Zinc plated for mild corrosion resistance</li> <li>Stamped metal housing with very loose tolerances</li> <li>Full complement of balls which are not separated</li> </ul>	Medium	Medium	Gravity and Powered Conveyor	Mild	High
	<b>Semi-Precision</b> <ul style="list-style-type: none"> <li>More capacity than unground</li> <li>Capable of higher speeds than unground</li> <li>Superior seals over unground</li> <li>Can be replaced for longer roller life</li> <li>Machined metal housings with tighter tolerances</li> <li>Ball retainer keeps the balls separated and evenly spaced</li> </ul>	Medium High	Medium High	Heavy Duty Gravity and Powered Conveyor	Dirty	Medium
	<b>Poly Housed ABEC style (Precision)</b> <ul style="list-style-type: none"> <li>Most common ABEC style</li> <li>Most cost effective ABEC style</li> <li>Highest possible speeds</li> <li>Long service life</li> <li>Better seals than semi-precision</li> </ul>	Medium	Highest	High Speed Powered Conveyor	Mild	Low
	<b>All Metal and Insert ABEC style (Precision)</b> <ul style="list-style-type: none"> <li>All metal parts</li> <li>Best seals and shields available</li> <li>Highest capacity possible</li> <li>Can be replaced for longer roller life</li> <li>Insert bearings feature set-screws to lock onto axle and prevent side-to-side movement</li> <li>High quality steel, heat treated to uniform hardness and ground to a micro finish</li> <li>Tightest tolerances available</li> </ul>	Highest	High	Heavy Duty Powered and Gravity Conveyor	Very Dirty	Low
	<b>Framesaver (Precision)</b> <ul style="list-style-type: none"> <li>Same benefits as Poly Housed ABEC</li> <li>Uses tapered hex stub axle design</li> <li>Axle fits tightly in worn frame holes</li> <li>Prevents additional frame wear</li> <li>Metal or plastic axles available</li> </ul>	Medium	High	High Speed Powered Conveyor	Mild	Lowest
	<b>Bushings</b> <ul style="list-style-type: none"> <li>No moving parts to wear out</li> <li>Uncommon sizes available</li> <li>Long service life</li> <li>Heavy duty capacity at slow speeds</li> <li>High temp materials available</li> <li>Abrasion resistant material available</li> <li>Food grade materials available</li> </ul>	High	Low	Powered Conveyor	All	Medium

\*The information provided on this bearing guide is for general reference only. There are many exceptions and we encourage you to contact our qualified staff to answer any questions you may have.

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