

## SINTERED STEEL FRICTION ROLLERS

Welker's friction rollers are powdered metal components designed for economy, long life and maintenance-free performance. Two configurations are available: 3-piece roller assembly and a one-piece roller.

The one-piece system runs the hardened roller on a hardened shaft. The roller is generally positioned on the shaft with set collars or spacers.

The 3-piece design eliminates the roller riding directly on the shaft, allowing the use of soft shafting. The roller is positioned by pinning the flange and collar to the shaft. The larger roller I.D. provides greater driving force than a one-piece roller. The 3-piece roller maintains a more constant drive force throughout its life. 3-piece rollers are specifically recommended for inclined sections and areas where pallet acceleration from stops is critical.

3-piece and one-piece rollers can be used on the same line where different amounts of drive force are needed.

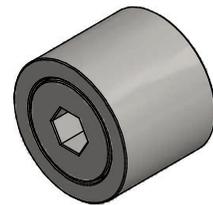
### 3-PIECE ROLLER ASSEMBLIES



**ROLLER ASSEMBLY  
WITH FLANGE BUSHING  
& COLLAR**



**ROLLER ASSEMBLY  
WITH FLANGE BUSHING,  
COLLAR & SPRING**



**ROLLER ASSEMBLY  
WITH DOUBLE  
FLANGE BUSHINGS**

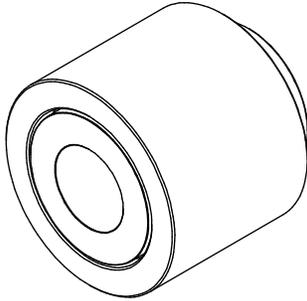
### ONE-PIECE ROLLER



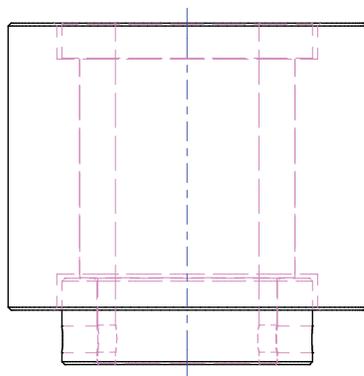
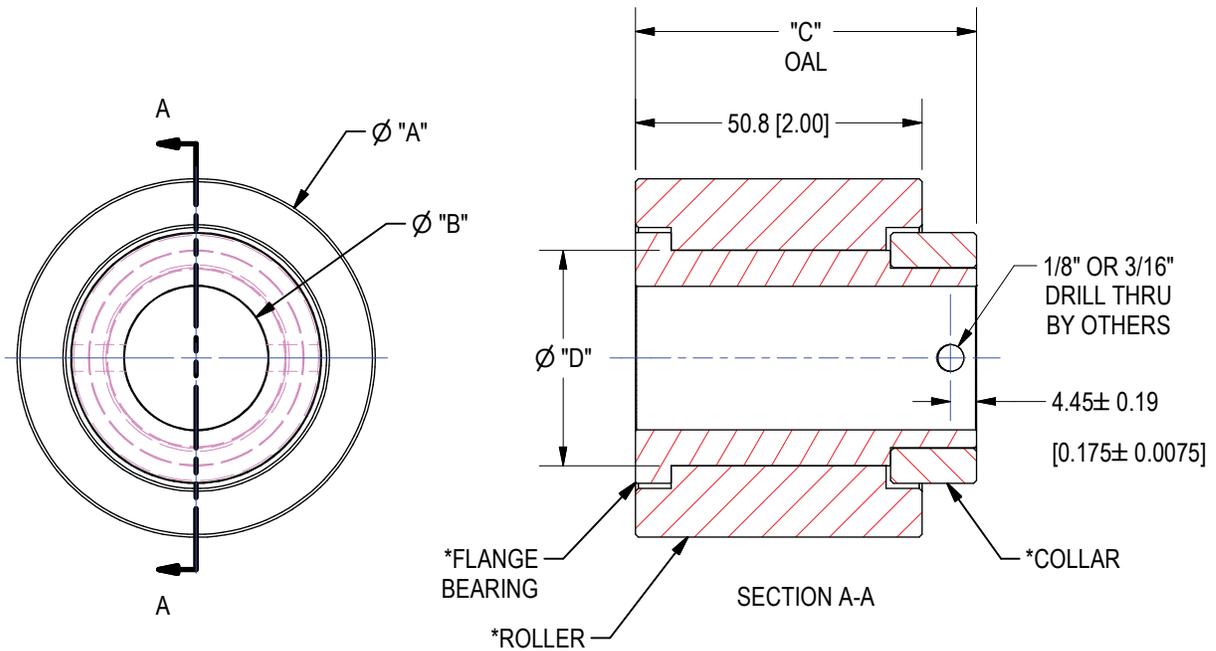
RELEASED 3/16/20

# WFR-XXX-X ORDERING INFORMATION

## ROLLER ASSEMBLY WITH FLANGE BUSHING & COLLAR

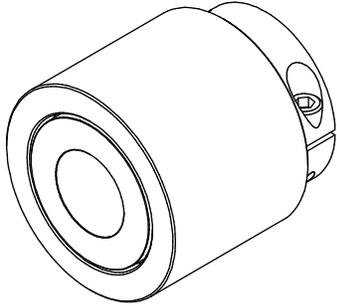


ROLLER ASSEMBLY				
PART NO.	"A"	"B"	"C"	"D"
WFR-250-1	2.50	1.001/1.006	2.38	1.50
WFR-275-1	2.75	1.001/1.006	2.38	1.50
WFR-300-1	3.00	1.001/1.006	2.38	1.50
WFR-325-1	3.25	1.251/1.256	2.38	1.75
WFR-325-1A	3.25	1.001/1.006	2.38	1.75
WFR-350-1	3.50	1.251/1.256	2.38	1.75
WFR-350-1A	350	1.001/1.006	2.38	1.75
WFR-250-3	2.50	7/8 HEX	2.38	1.50
WFR-275-3	2.75	7/8 HEX	2.38	1.50
WFR-300-3	3.00	7/8 HEX	2.38	1.50

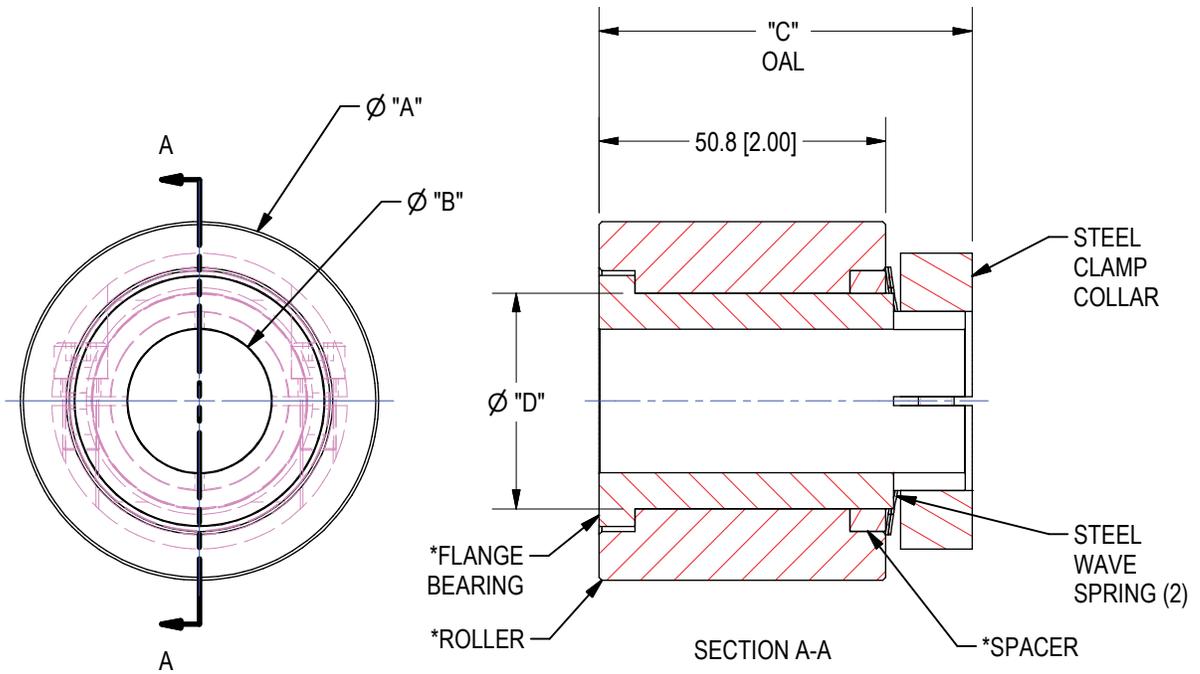


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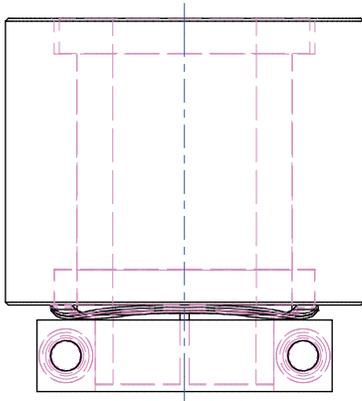
## ROLLER ASSEMBLY WITH FLANGE BUSHING, COLLAR & SPRING



ROLLER ASSEMBLY				
PART NO.	"A"	"B"	"C"	"D"
WFR-250-2	2.50	1.001/1.006	2.56	1.50
WFR-275-2	2.75	1.001/1.006	2.56	1.50
WFR-300-2	3.00	1.001/1.006	2.56	1.50



\* SINTERED STEEL



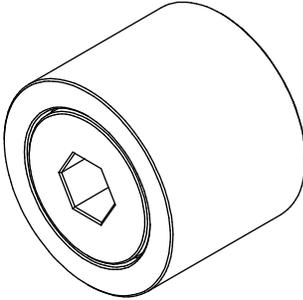
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**ENGINEERED PRODUCTS**

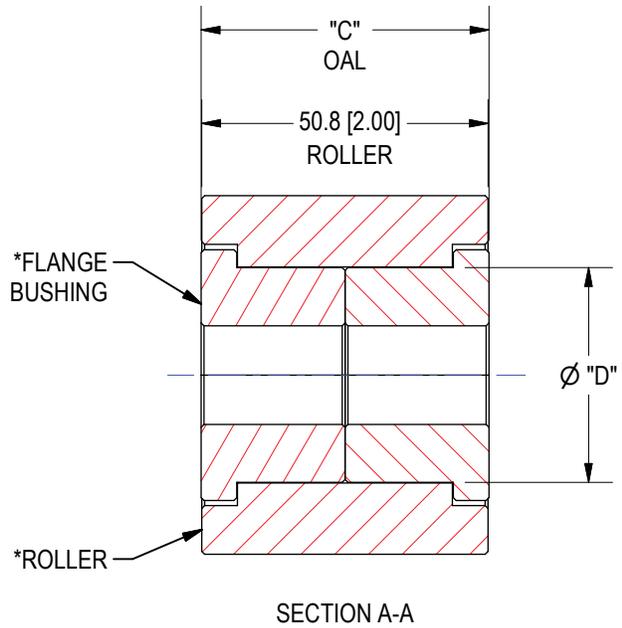
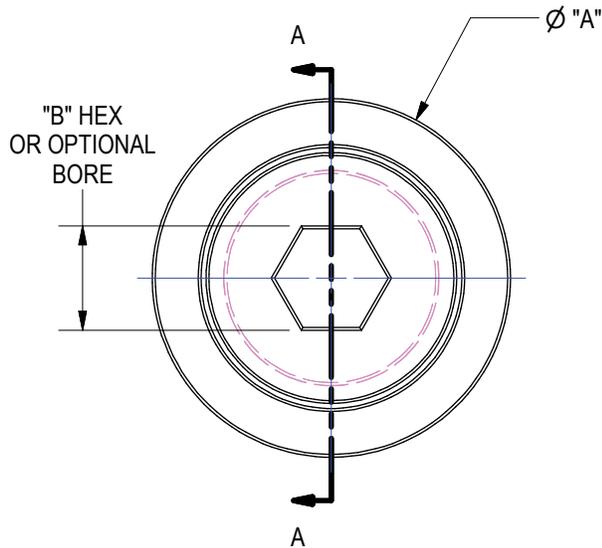
800-229-0890 [www.welkerproducts.com](http://www.welkerproducts.com)

## WFR-XXX-3 ORDERING INFORMATION

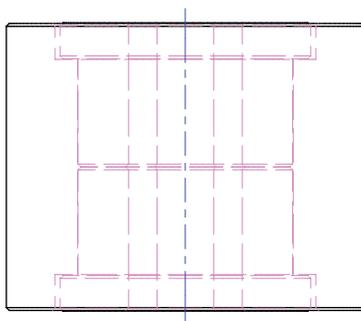
### ROLLER ASSEMBLY WITH DOUBLE FLANGE BUSHINGS



ROLLER ASSEMBLY				
PART NO.	"A"	"B"	"C"	"D"
WFR-250-3A	2.50	11/16 HEX	2.00	1.50
WFR-250-3B	2.50	7/8 HEX	2.00	1.50
WFR-250-3C	2.50	1" with 1/4" KEY WAY	2.00	1.50
WFR-275-3A	2.75	11/16 HEX	2.00	1.50
WFR-275-3B	2.75	7/8 HEX	2.00	1.50
WFR-275-3C	2.75	1" with 1/4" KEY WAY	2.00	1.50
WFR-300-3A	3.00	11/16 HEX	2.00	1.50
WFR-300-3B	3.00	7/8 HEX	2.00	1.50
WFR-300-3C	3.00	1" with 1/4" KEY WAY	2.00	1.50
WFR-325-3	3.25	1" HEX	2.00	1.75
WFR-350-3	3.50	1" HEX	2.00	1.75

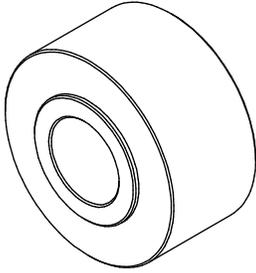


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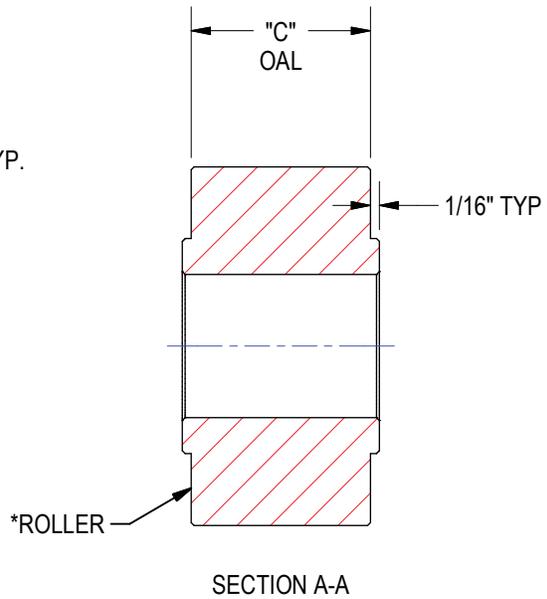
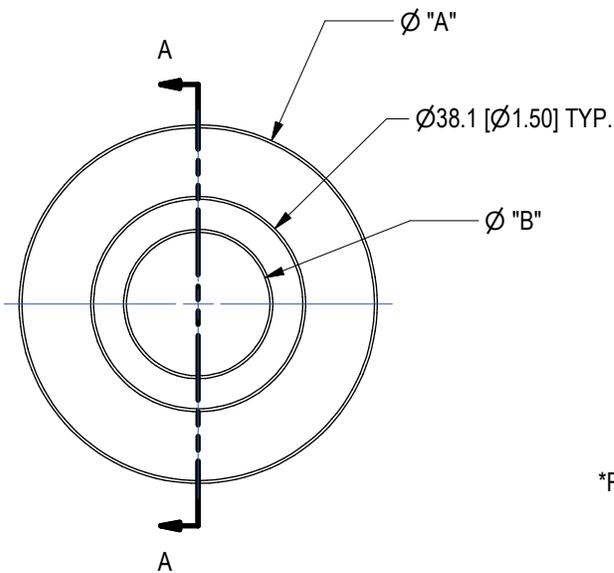


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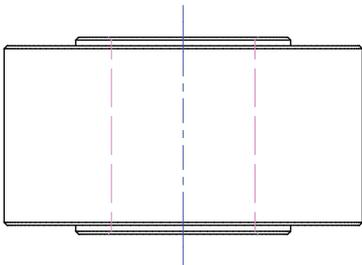
# WR-XXX ORDERING INFORMATION ONE-PIECE ROLLER



ONE-PIECE ROLLER			
PART NO.	"A"	"B"	"C"
WR-250	2.50	1.001/1.006	1-1/4"
WR-275	2.75	1.001/1.006	1-1/4"
WR-300	3.00	1.001/1.006	1-1/4"
WR-275-30mm	70mm	30mm	42mm
WR-275-30mmX2	70mm	30mm	51mm



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**ENGINEERED PRODUCTS**

800-229-0890 [www.welkerproducts.com](http://www.welkerproducts.com)

## TECHNICAL INFORMATION

Protection from marking of machined surfaces can be addressed in two ways:

1. Urethane can be cast to the O.D. of any roller for handling sensitive parts, unless chips are present to embed in the urethane.
2. Centerless grinding the O.D. has been very effective where machining chips are present.

The rule-of-thumb friction formula was determined by empirical testing. It is useful for comparing rollers, although Welker does not guarantee its accuracy for any specific application.

The following assumptions apply:

1. Environmental dependence of coefficient of friction " $\mu$ ".

$\mu$  wet = .06 (includes washers, machining coolant, transmission fluid, honing oil, etc.)

$\mu$  dry = .18 (applies where no additional liquids are present.)

2. The formula is considered independent of roller length.

3. The number of active rollers = 1/2 the rollers under the pallet.

4. Weight per roller =  $\frac{\text{Weight of pallet and part}}{\text{Number of active rollers}}$

5. Force F (lbs) = Horizontal driving force per roller =  $\frac{[\text{Weight per roller}] \times \mu \times [\text{Roller I.D.}]}{\text{Roller O.D.}}$

**EXAMPLE:** 300 lb pallet, dry conditions, eight rollers under pallet  
Compare relative drive force between WFR-250 and WR-250-1

**For WFR-250-1 3-piece assembly:**

$$F = \frac{W \times \mu \times \text{I.D.}}{\text{O.D.}} = \frac{75 \text{ lb} \times .18 \times 1.5 \text{ in}}{2.5 \text{ in}} = \frac{8.1 \text{ lb}}{\text{Roller}}$$

**For WR-250 one-piece roller:**

$$F = \frac{W \times \mu \times \text{I.D.}}{\text{O.D.}} = \frac{75 \text{ lb} \times .18 \times 1.0 \text{ in}}{2.5 \text{ in}} = \frac{5.4 \text{ lb}}{\text{Roller}}$$

Drive force on pallet assuming 1/2 rollers are actively driving:

**WFR-250-1: 4 Rollers x 8.1 lbs = 32.4 lbs.**

**WR-250: 4 Rollers x 5.4 lbs = 21.6 lbs.**

(DO NOT SCALE DRAWING)

