



# **Symmco**

**Inc.**  
*Engineering PM Solutions*

- **Stock Bearing Products**
- **Solid & Core Bar Stock**
- **Rectangular Plate Stock**



**AVAILABLE FROM STOCK**  
**SHIPPED IN 24 HOURS**

**ISO 9001:2015**  
REGISTERED



**Dear Symmco Customer:**

***Thank you for choosing Symmco for your stock product requirements. We understand that responding quickly to customers' needs is essential in today's market, and that's why we are committed to carrying and maintaining a full line of sintered, oil impregnated bushings, bars and plates. In fact, all of the parts included in this catalog are available for shipment within 24 hours.***

***Since we carry the largest inventory of sintered bronze in North America, you can be assured that delivery of your order will be fast and trouble-free... meaning you will have exactly what you need, when you need it!***

***Total customer satisfaction has been our top priority since Symmco was founded in 1952, so please feel free to contact any of our representatives with your questions or comments regarding our products and their applications. We will be happy to assist you!***

***With gratitude,***

***The Symmco "Team"***

#### Our Mission Statement

Symmco partners with customers that value delivery, service, inventory investment and custom-engineered value solutions.



# S Y M M C O

your key to quality & savings



See our  
online catalog at  
[www.symmco.com](http://www.symmco.com)

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## **Symmco: The Smart Choice In Powder Metallurgy Since 1952**

Post World War II was a time when the PM industry needed to refocus as it transitioned from a war effort that was primarily based on the production of self-lubricating bearings. Symmco “was born” at the time when producers were looking for both product and market expansion. Perhaps that is why Symmco quickly grew to become a pacesetter in the growing PM industry. Dedicated to the cost-effective fabrication of PM parts that range from plain to complex, Symmco is an international company that sells only products of the highest quality that are manufactured in its 100,000-square-foot facility in the heart of the industrial northeast.



Devoted to surpassing its own rigorous standards, Symmco’s customer-oriented business philosophy emphasizes quality, service and design ingenuity. Through precise, skillful engineering and manufacturing, Symmco transforms raw materials (in the form of powder) into sintered bronze bearings, solid and cored bars, rectangular plate, as well as ferrous and nonferrous structural parts, such as gears, pulleys and sprockets. The manufacturer’s diverse capabilities allow for the execution of long and short runs along with assembly solutions.

**Symmco possesses the largest inventory of sintered bronze bearings in North America (over 1,500 stock sizes are available for immediate shipment) and sells its products through distributors and direct OEM sales.**

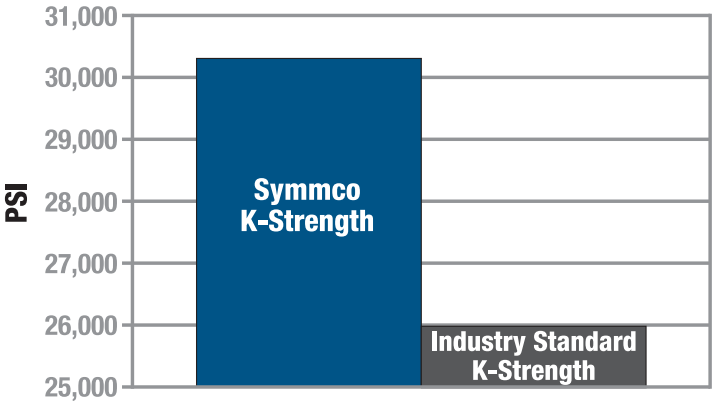
### **Why Symmco Is Unique**

For the highest quality powder metal products in the world, turn to Symmco. Customers looking to save both money and resources know that Symmco parts offer superior performance and reliable consistency, two factors that help to reduce downtime and operating costs. The most cost-effective and innovative solutions to your unique PM applications can be discovered by collaborating with the company’s experienced engineering staff who are ready to assist you with your needs. And with an unyielding commitment to outstanding service, Symmco works hard to ensure that the delivery is quick and trouble-free, meaning your parts will be available when you need them (stock products will be en route in 24 hours or less).

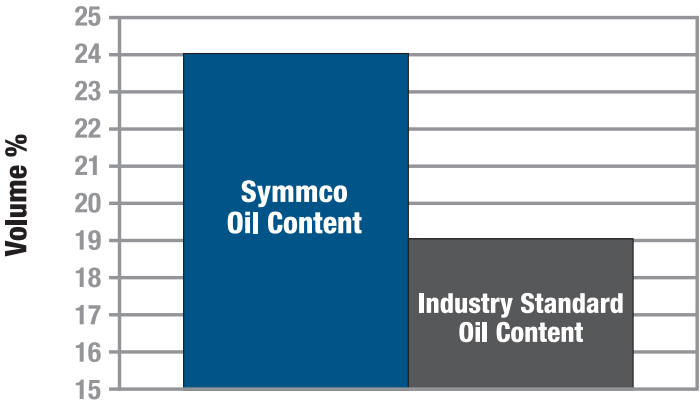
### **The Symmco Advantage**

- **Largest Inventory Of Oil Impregnated Bronze Bearings And Bars In North America (with 99% fill rate)**
- **24-Hour Shipping For In-Stock Items**
- **Superior Customer Service**
- **Longer-Lasting Products That Result In Less Downtime And Lower Operating Costs**
- **Cost-Effective, Engineered Solutions**
- **Assembly Solutions**
- **In-house tool capabilities and tool design**

### K-STRENGTH COMPARISON SYMMCO VS THE INDUSTRY STANDARD



### OIL CONTENT COMPARISON SYMMCO VS THE INDUSTRY STANDARD



## Symmco Bearing Products

Over the years, Symmco has built a reputation for manufacturing the finest powder metal bearings in the market. Weekly testing has proven that Symmco bearings consistently exceed industry standards with respect to K-strength and porosity. Our proprietary blending and sintering process advancements in grain structure and porosity promote high strength while supporting the proper interconnected pores to provide above standard oil flow to the bearing shaft, resulting in:

- Superior Strength
- Reduced Coefficient Of Friction
- Uniform Oil Coating Of The Mating Shaft During Operation

To increase the life and improve the performance of your PM bearing products, choose Symmco bearings.



**QUOTES**

**PROTOTYPES**

**TOOLING**

**PRODUCTION PARTS**

**TECHNICAL ASSISTANCE**

**Fast,  
Efficient Service**

## **Industries Served**

Symmco manufactures a myriad of complex parts in a wide variety of materials for industries such as agriculture, lawn and garden, marine, heavy truck, electric motors, linear actuators, office machines, appliances, medical equipment, transportation equipment, pumps, compressors, conveyors, food processing machinery and power tools, to name a few.

Cost conscious customers often ask whether or not a material they are now using can be matched with a PM part. Although this can usually be accomplished, identical properties often are not necessary. In a vast majority of cases, powder metal parts can greatly reduce costs while maintaining or improving quality. Our engineering department is available to determine whether or not your particular part can be manufactured through the PM process.

## **ISO 9001:2015 Registered**

Registered through SRI Quality System Registrar. (A copy of the registration is available on the Symmco website.) Symmco standard oil impregnated bearings are all ROHS compliant and manufactured in the USA at our facility in Sykesville, PA.

## **Cost-Effective Parts Manufacturing**

Designers and engineers are turning to the powder metal process with increasing frequency because of its cost-effectiveness and versatility. Powder metallurgy permits the combining of elemental powder metals which cannot be accomplished by other manufacturing processes.

PM affords a wide range of possible applications for use in the manufacture of gears, cams, sprockets and many types of component parts that can result in substantial savings. For instance, intricate parts that are currently cast and machined can often be converted to PM and produced to finished or near net shape, resulting in the elimination of the machining process. Thus the PM process assures a quality, lower cost, high precision part and, in fact, can generate savings up to 90% over other manufacturing methods. Additionally, powder metal parts have a proven record of unexcelled wear resistance and long life.

## **Custom Component Parts And Assemblies**

Technical advancements in powder metallurgy enable the production of a wide variety of PM component parts, including even those with demanding design characteristics. Symmco offers secondary machining as well, when required, and even offers complete assemblies that involve multiple parts.

Symmco engineers can offer design solutions that result in higher precision parts at a lower cost.

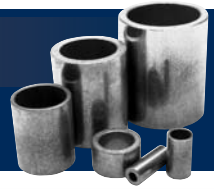
## **Ask Us About PM 101**

PM 101 is a seminar conducted by Symmco engineers that will help you to determine which parts are good candidates for conversion to PM. The result: parts faster and more cost-effectively. Let us show you how easy PM can be.

# Sintered Bronze Oil-Impregnated

SAE 841

## Sleeve Bearings



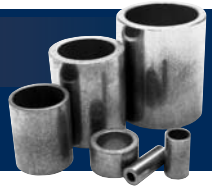
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/8 .127	3/16 .1895	1/4	SS- 46- 4
		1/2	- 8
1/8 .127	1/4 .252	1/8	SS- 48- 2
		1/4	- 4
		3/8	- 6
		1/2	- 8
		1/4	SS- 410- 4
1/8 .127	5/16 .3145	3/8	- 6
		1/2	- 8
3/16 .189	1/4 .252	1/4	SS- 68- 4
		3/8	- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		1/4	SS- 610- 4
3/16 .190	5/16 .3145	3/8	- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		1	-16
		3/8	SS- 612- 6
3/16 .190	3/8 .377	1/2	- 8
		5/8	-10
		3/4	-12
		1/4	SS- 810- 4
1/4 .252	5/16 .315	3/8	- 6
		1/2	- 8
1/4 .252	3/8 .377	3/4	-12
		5/8	-10
		7/8	-14
		1	-16
		1-1/4	-20
1/4 .252	7/16 .439	3/8	SS- 814- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/4 .252	1/2 .503	1/2	SS- 816- 8
		3/4	- 12
		1	- 16
		1-1/4	-20
		1/4	SS-1012- 4
5/16 .3145	3/8 .378	3/8	- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1	-16
		1-1/4	-20
5/16 .3145	7/16 .440	1/4	SS-1014- 4
		3/8	- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		3/8	SS-1016- 6
5/16 .3145	1/2 .503	1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		1-1/2	-24
		1/2	SS-1214- 8
3/8 .377	7/16 .440	5/8	-10
		3/4	-12
		1	-16
		1/4	SS-1216- 4
		3/8	- 6
		1/2	- 8
3/8 .378	1/2 .503	5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20

# Sintered Bronze Oil-Impregnated

SAE 841

## Sleeve Bearings



Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
3/8 .378	9/16 .565	3/8	SS-1218- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
3/8 .378	5/8 .628	3/8	SS-1220- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
3/8 .378	3/4 .753	3/8	SS-1224- 6
		1/2	- 8
		3/4	-12
		1	-16
7/16 .440	9/16 .565	3/8	SS-1418- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
7/16 .440	5/8 .628	3/8	SS-1420- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
7/16 .4395	11/16 .6905	1/2	SS-1422- 8
		1	-16
		1-1/2	-24

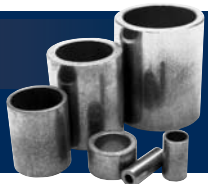
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/2 .502	5/8 .628	3/8	SS-1620- 6
		1/2	- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
1/2 .503	11/16 .690	1-1/4	-20
		1-1/2	-24
		1/2	SS-1622- 8
		5/8	-10
		3/4	-12
1/2 .503	3/4 .753	7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
1/2 .503	13/16 .815	1/2	SS-1626- 8
		3/4	-12
		1	-16
		1-1/2	-24
1/2 .503	7/8 .878	1/2	SS-1628- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
1/2 .503	1 1.004	1-1/4	-20
		1-1/2	-24
		3/4	SS-1632-12
1/2 .503	1 1.004	1	-16
		1-1/2	-24
		2	-32



# Sintered Bronze Oil-Impregnated

SAE 841

## Sleeve Bearings



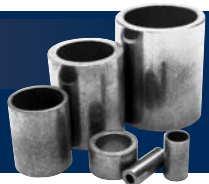
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
9/16 .565	11/16 .690	1/2	SS-1822- 8
		3/4	-12
		1	-16
		1-1/4	-20
		1-1/2	-24
9/16 .565	3/4 .753	1/2	SS-1824- 8
		3/4	-12
		1	-16
		1-1/4	-20
		1-1/2	-24
9/16 .565	13/16 .815	1/2	SS-1826- 8
		3/4	-12
		1	-16
		1-1/4	-20
		1-1/2	-24
5/8 .628	3/4 .753	1/2	SS-2024- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
5/8 .628	13/16 .815	1/2	SS-2026- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
5/8 .628	7/8 .878	1/2	SS-2028- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
5/8 .628	15/16 .941	5/8	SS-2030-10
		3/4	-12
		1	-16

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
5/8 .628	1 1.003	1/2	SS-2032- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
11/16 .690	7/8 .878	2	-32
		3/4	SS-2228-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
		3/4 .753	7/8 .878
5/8	-10		
3/4	-12		
7/8	-14		
1	-16		
1-1/8	-18		
1-1/4	-20		
1-1/2	-24		
3/4 .753	15/16 .941	1-5/8	-26
		1-3/4	-28
		1-7/8	-30
		2	-32
		1/2	SS-2430- 8
		5/8	-10
		3/4	-12
		7/8	-14
3/4 .753	1 1.003	1	-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
		1-5/8	-26
		1-3/4	-28
		1-7/8	-30
		2	-32
3/4 .753	1 1.003	1/2	SS-2432- 8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
5/8 .628	15/16 .941	1-3/4	-28
		2	-32
		2-1/2	-40

# Sintered Bronze Oil-Impregnated

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## Sleeve Bearings



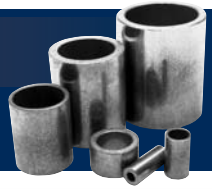
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
3/4 .753	1-1/8 1.128	1/2	SS-2436-8
		3/4	-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4 2	-28 -32
3/4 .753	1-1/4 1.253	3/4	SS-2440-12
		1	-16
		1-1/4	-20
		1-1/2	-24
13/16 .815	1 1.003	3/4	SS-2632-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4 2	-28 -32
.815	1.065	1-1/4	SS-2634-20
7/8 .878	1 1.003	1/2	SS-2832-8
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		1-1/2 1-3/4	-24 -28
7/8 .878	1-1/16 1.0655	1 1-1/4	SS-2834-16 -20
7/8 .878	1-1/8 1.128	3/4	SS-2836-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-3/8	-22
		1-1/2	-24
		1-3/4	-28
		2	-32
		2-1/4 2-1/2	-36 -40
7/8 .878	1-1/4 1.253	3/4	SS-2840-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		2	-32

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
15/16 .940	1-3/16 1.190	1	SS-3038-16
		1-1/4	-20
		1-1/2	-24
		2	-32
15/16 .940	1-1/4 1.254	3/4	SS-3040-12
		1	-16
		1-1/4	-20
		1-1/2 1-3/4 2	-24 -28 -32
1 1.004	1-1/8 1.128	3/4	SS-3236-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4 2	-28 -32
1 1.004	1-3/16 1.190	3/4	SS-3238-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4 2	-28 -32
1 1.004	1-1/4 1.254	1/2	SS-3240-8
		3/4	-12
		7/8	-14
		1	-16
		1-1/4	-20
		1-3/8	-22
		1-1/2	-24
		1-3/4	-28
		2	-32
		2-1/4 2-1/2 3	-36 -40 -48
1 1.004	1-5/16 1.316	1	SS-3242-16
		1-1/4	-20
		1-1/2	-24
		2	-32
		2-1/2 3	-40 -48

# Sintered Bronze Oil-Impregnated

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## Sleeve Bearings



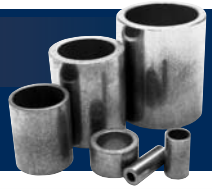
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1 1.004	1-3/8 1.379	3/4	SS-3244-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
1 1.004	1-1/2 1.504	2-1/2	-40
		1	SS-3248-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
1 1/16 1.065	1-5/16 1.316	2-1/2	-40
		1	SS-3442-16
		1-1/2	-24
		2	-32
1 1/8 1.129	1-1/4 1.254	2-1/2	-40
		1	SS-3640-16
		1-1/4	-20
1 1/8 1.129	1-5/16 1.316	1-1/2	-24
		1-3/4	-28
		2	-32
		1	SS-3642-16
		1-1/4	-20
1 1/8 1.129	1-3/8 1.379	1-1/2	-24
		3/4	SS-3644-12
		1	-16
		1-1/4	-20
		1-3/4	-28
		2	-32
1 1/8 1.129	1-1/2 1.504	2-1/2	-40
		3	-48
		1	SS-3648-16
		1-1/4	-20
		1-1/2	-24
1 1/8 1.129	1-3/4 1.754	1-3/4	-28
		2	-32
		2-1/2	-40

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1 3/16	1-7/16	1-1/4	SS-3846-20
		1-1/2	-24
		2	-32
		3	-48
1 3/16 1.192	1-1/2 1.504	1	SS-3848-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
1 1/4 1.254	1-1/2 1.504	2-1/2	-40
		3	-48
		1/2	SS-4048-8
		5/8	-10
		3/4	-12
		7/8	-14
		1	-16
		1-1/8	-18
		1-1/4	-20
		1-3/8	-22
		1-1/2	-24
1 1/4 1.254	1-9/16 1.566	1-5/8	-26
		1-3/4	-28
		1-7/8	-30
		2	-32
		2-1/4	-36
		2-1/2	-40
		3	-48
		1-1/2	SS-4050-24
2	-32		
1 1/4 1.254	1-5/8 1.629	1	SS-4052-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
		2-1/2	-40
1 1/4 1.254	1-3/4 1.754	3	-48
		1-1/2	SS-4056-24
		1-3/4	-28
		2	-32
		2-1/2	-40
1 1/4 1.254	1-7/8 1.875	3	-48

# Sintered Bronze Oil-Impregnated

SAE 841

## Sleeve Bearings



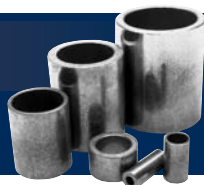
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1.316	1.566	1	SS-4250-16
		2	-32
1-5/16 1.316	1-5/8 1.629	1-1/4	SS-4252-20
		1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
		1	SS-4452-16
		1-1/8	-18
		1-1/4	-20
		1-1/2	-24
1-3/8 1.379	1-5/8 1.629	2	-32
		2-1/2	-40
		3	-48
		1	SS-4456-16
1-3/8 1.379	1-3/4 1.754	1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
1-7/16 1.442	1-5/8 1.629	1	SS-4652-16
		1-1/2	-24
1-7/16 1.442	1- 3/4 1.754	2	-32
		3/4	SS-4656-12
		1	-16
		1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
2-1/2	-40		
1-1/2 1.504	1-3/4 1.754	3	-48
		1/2	SS-4856- 8
		3/4	-12
		1	-16
		1-1/4	-20
		1-3/8	-22
		1-1/2	-24
1-3/4	-28		
2	-32		
2-1/4	-36		
2-1/2	-40		
3	-48		

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1-1/2 1.504	1-13/16 1.816	1	SS-4858-16
		1-1/2	-24
		1-5/8	-26
		2	-32
		3	-48
		1-1/2	SS-4860-24
		2	-32
1-1/2 1.504	1-7/8 1.879	2-1/2	-40
		3	-48
1-1/2 1.504	2 2.004	1	SS-4864-16
		1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
		3-1/2	-56
1.629	1.879	1-1/4	SS-5260-20
		1-1/2	-24
		2	-32
		2-1/4	-36
		2-1/2	-40
1-5/8 1.629	2 2.004	3	-48
		1	SS-5264-16
		1 1/2	-24
		1-3/4	-28
		2	-32
1-7/16 1.442	1- 3/4 1.754	2-1/2	-40
		3	-48
		1-3/4	SS-5470-28
		2	-32
1-11/16 1.6915	2-3/16 2.1925	3	-48
		4	-64
		1	SS-5664-16
1-3/4 1.754	2 2.004	1-1/4	-20
		1-1/2	-24
		1-3/4	-28
		2	-32
		2-1/2	-40
		3	-48

# Sintered Bronze Oil-Impregnated

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## Sleeve Bearings



Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1-3/4 1.754	2-1/8 2.129	1-3/8	SS-5668-22
		1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
1-15/16 1.940	2-1/8 2.1285	2-1/2	SS-6268-40
1-15/16 1.9405	2-5/16 2.3165	2	SS-6274-32
		2-1/2	-40
		3	-48
		4	-64
2 2.004	2-1/4 2.254	1	SS-6472-16
		1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
2 2.004	2-3/8 2.380	1-1/2	SS-6476-24
		1-3/4	-28
		2	-32
		2-1/2	-40
		2-3/4	-44
		3	-48
		3-1/2	-56
4	-64		
2 2.004	2-1/2 2.505	1	SS-6480-16
		1-1/2	-24
		2	-32
		2-1/2	-40
		3	-48
		3-1/2	-56
		4	-64
2-1/4 2.254	2-5/8 2.630	2	SS-7284-32
		2-1/2	-40
		3	-48
2-1/4 2.254	2-3/4 2.755	2	SS-7288-32
		3	-48
2-3/8 2.379	2-3/4 2.755	2	SS-7688-32
		2-1/2	-40
		3	-48

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
2-1/2 2.504	2-3/4 2.754	2	SS-8088-32
		2-1/2	-40
		3	-48
		4	-64
2-1/2 2.504	2-7/8 2.880	2-1/4	SS-8092-36
		2-1/2	-40
		3	-48
2-1/2 2.504	3	2	SS-8096-32
		3	-48
		4	-64
2-3/4 2.754	3	1-1/2	SS-8896-24
		2-1/2	-40
2-3/4 2.754	3-1/4 3.255	2	SS-88104-32
		3	-48
		4	-64
2-15/16 2.940	3-5/16 3.315	3	SS-94106-48
3 3.005	3-1/4 3.255	2	SS-96104-32
		3	-48
3 3.005	3-1/2 3.505	2	SS-96112-32
		2-1/2	-40
		3	-48
		4	-64
3-1/4 3.253	3-5/8 3.628	4	SS-104116-64
3-1/2 3.505	4	3	SS-112128-48
		3-1/2	-56
		4	-64
4 4.0035	4 1/2 4.504	4	SS-128144-64
		6	-96
4 4.003	4 5/8 4.628	4	SS-128148-64
4-1/2	5-1/4	5	SS-144168-80
5 5.004	5-3/4 5.755	2	SS-160184-32

*If you do not see exactly what you need, please contact our sales department.*

# Sintered Bronze Oil-Impregnated

SAE 841

## Flanged Bearings



### Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
3/16 .1895	5/16 .314	3/16	7/16	1/16	SF- 610- 3
		1/4			- 4
		5/16			- 5
		3/8			- 6
		1/2			- 8
1/4 .252	3/8 .377	3/16	15/32	1/16	SF- 812- 3
		1/4			- 4
		5/16			- 5
		3/8			- 6
		7/16			- 7
		1/2			- 8
		5/8			-10
3/4	-12				
1/4 .252	3/8 .378	1/4	1/2	1/16	BSF- 812- 4
		3/8			- 6
		1/2			- 8
		5/8			-10
		3/4			-12
1/4 .252	1/2 .503	5/8	5/8	1/16	SF- 816-10
		3/4			-12
5/16 .315	7/16 .440	3/8	9/16	1/16	SF-1014- 6
		1/2			- 8
		5/8			-10
		3/4			-12
		7/8			-14
1	-16				
5/16 .3145	1/2 .503	3/8	11/16	1/16	SF-1016- 6
3/8 .377	1/2 .502	1/4	5/8	1/16	SF-1216- 4
		5/16			- 5
		3/8			- 6
		1/2			- 8
		5/8			-10
		3/4			-12
1	-16				
3/8 .377	1/2 .503	1/2	11/16	1/16	BSF-1216- 8
		3/4			-12
		1			-16
3/8 .377	9/16 .5655	1/2	11/16	1/16	SF-1218- 8
		3/4			-12

# Sintered Bronze Oil-Impregnated

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# Flanged Bearings



## Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
3/8 .377	5/8 .627	1/2 3/4 1 1-1/4	7/8	1/16	SF-1220- 8 -12 -16 -20
7/16 .439	9/16 .565	1/2 5/8 3/4	11/16	1/16	SF-1418- 8 - 10 -12
7/16 .439	5/8 .628	5/8 3/4 1 1-1/4	7/8	1/8	SF-1420-10 -12 -16 -20
1/2 .502	5/8 .627	1/4 3/8 1/2 9/16 5/8 11/16 3/4 1 1-1/4 1-1/2	7/8	1/16	SF-1620- 4 -6 - 8 - 9 -10 -11 -12 -16 -20 -24
1/2 .502	5/8 .628	3/8 1/2 3/4 1 1-1/4 1-1/2	7/8	1/8	BSF-1620- 6 - 8 -12 -16 -20 -24
1/2 .502	11/16 .6905	5/16 1/2 3/4 7/8	7/8	1/8	SF-1622- 5 - 8 -12 -14
1/2 .502	3/4 .753	3/8 1/2 5/8 3/4 1 1-1/4 1-1/2	15/16	1/8	SF-1624- 6 -8 - 10 -12 -16 -20 -24
1/2 .502	3/4 .753	1/2 5/8 3/4 1 1-1/4	1	1/8	BSF-1624- 8 -10 -12 -16 -20

# Sintered Bronze Oil-Impregnated

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# Flanged Bearings



## Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
5/8 .627	3/4 .753	1/2	1	3/32	SF-2024- 8
		5/8			-10
		3/4			-12
		1			-16
		1-1/8			-18
		1-1/4			-20
1-1/2	-24				
5/8 .627	3/4 .753	5/8	1	1/8	BSF-2024-10
		3/4			-12
		1			-16
		1-1/8			-18
5/8 .628	13/16 .815	3/4	1	1/8	SF-2026-12
		1			-16
		1-1/4			-20
		1-1/2			-24
5/8 .628	7/8 .878	5/8	1	1/8	SF-2028-10
		3/4			-12
		1			-16
		1-1/4			-20
1-1/2	-24				
5/8 .627	7/8 .879	1/2	1-1/8	1/8	BSF-2028- 8
		3/4			-12
		1			-16
		1-1/4			-20
5/8 .627	1 1.003	1	1-1/4	3/16	SF-2032-16
3/4 .753	7/8 .878	1/2	1-1/8	1/8	SF-2428- 8
		3/4			-12
		1			-16
		1-1/2			-24
3/4 .753	15/16 .940	3/4	1-1/4	1/8	SF-2430-12
		1			-16
		1-1/8			-18
		1-1/4			-20
1-1/2	-24				
3/4 .753	1 1.003	1/2	1-1/8	1/8	SF-2432- 8
		5/8			-10
		3/4			-12
		1			-16
		1-1/8			-18
		1-1/4			-20
1-1/2	-24				



# Sintered Bronze Oil-Impregnated

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# Flanged Bearings



## Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
3/4 .752	1 1.004	1/2 5/8 3/4 1 1-1/8 1-1/4 1-1/2	1-1/4	3/16	BSF-2432- 8 -10 -12 -16 -18 -20 -24
7/8 .877	1 1.003	1/2 3/4 1 1-1/4 1-1/2	1-1/4	1/8	SF-2832- 8 -12 -16 -20 -24
7/8 .877	1 1.004	1/2 3/4 1	1-1/4	3/16	BSF-2832- 8 -12 -16
7/8 .878	1-1/8 1.128	5/8 3/4 1 1-1/4 1-1/2 1-3/4	1-1/2	1/8	SF-2836-10 -12 -16 -20 -24 -28
1 1.003	1-1/4 1.253	3/4 1 1-1/4 1-1/2 1-3/4 2	1-5/8	1/8	SF-3240-12 -16 -20 -24 -28 -32
1 1.003	1-1/4 1.254	3/4 1 1-1/4 1-1/2	1-1/2	1/8	BSF-3240-12 -16 -20 -24
1 1.003	1-3/8 1.378	3/4 1 1-1/2 1-3/4 2	1-5/8	3/16	SF-3244-12 -16 -24 -28 -32
1-1/8 1.127	1-3/8 1.377	3/4 1 1-1/4	1-3/4	1/8	SF-3644-12 -16 -20
1-1/4 1.252	1-1/2 1.503	1/2 3/4 1 1-1/4 1-1/2 1-3/4	1-11/16	1/8	SF-4048- 8 -12 -16 -20 -24 -28

# Sintered Bronze Oil-Impregnated

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## Flanged Bearings



### Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
1-1/4 1.2535	1-1/2 1.504	1 1-1/4 1-1/2 1-3/4	1-3/4	3/16	BSF-4048-16 -20 -24 -28
1-3/8 1.377	1-5/8 1.628	3/4 1	2	1/8	SF-4452-12 -16
1-1/2 1.503	1-3/4 1.752	1-1/2	2	3/32	SF-4856-24
1-1/2 1.504	1-3/4 1.755	1-1/2	2	3/16	BSF-4856-24
1-5/8 1.6265	2 2.004	2	2-1/4	3/16	SF-5264-32
1-3/4 1.753	2-1/4 2.254	2-1/2	3	1/4	SF-5672-40
2 2.003	2-1/4 2.254	3/4 1 1-1/4 2	2-1/2	1/8	SF-6472-12 -16 -20 -32
2 2.002	2-1/2 2.501	2-3/8	3	3/8	SF-6480-38
2-3/4 2.752	3-1/4 3.255	1-1/2	4	3/16	SF-88104-24
3 3.002	3-1/2 3.502	2-3/8	4	3/8	SF-96112-38

# Sintered Bronze Oil-Impregnated

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## Flanged Bearings



Dimensions					
I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
1/8 .127	5/16 .315	1/4 3/8	3/8	3/64	FFB-25- 2 - 3
3/16 .189	5/16 .3145	1/8 1/4 3/8	3/8	3/64	FFB-35- 1 - 2 - 3
1/4 .252	3/8 .377	1/4 3/8 1/2 5/8 3/4	1/2	3/64	FFB-46- 2 - 3 - 4 - 5 - 6
5/16 .314	3/8 .377	3/8	1/2	3/64	FFB-56- 3
5/16 .314	7/16 .439	3/8 1/2 5/8 3/4 7/8	5/8	3/32	FFB-57- 3 - 4 - 5 - 6 - 7
5/16 .314	1/2 .502	3/8 1/2 5/8	11/16	3/32	FFB-58- 3 - 4 - 5
3/8 .377	1/2 .502	3/8 13/32 1/2 5/8 3/4 7/8 1 1-1/4	11/16	3/32	FFB-68- 3 - 3-1/4 - 4 - 5 - 6 - 7 - 8 -10
3/8 .377	9/16 .5645	1/2 3/4 1-1/4	3/4	1/8	FFB-69- 4 - 6 -10
3/8 .377	5/8 .627	3/8 1/2 5/8 3/4 1 1-1/4	7/8	1/8	FFB-610- 3 - 4 - 5 - 6 - 8 -10

# Sintered Bronze Oil-Impregnated

SAE 841

## Flanged Bearings



### Dimensions

I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
3/8 .377	3/4 .753	1/2	1	1/8	FFB-612- 4
7/16 .439	5/8 .628	5/8 3/4 1-1/4	7/8	1/8	FFB-710- 5 -6 -10
1/2 .502	5/8 .628	3/8 1/2 5/8 3/4 7/8 1 1-1/4 1-1/2 1-3/4	7/8	1/8	FFB-810- 3 -4 -5 -6 -7 -8 -10 -12 -14
1/2 .502	11/16 .690	1/2 5/8 3/4	15/16	1/8	FFB-811- 4 -5 -6
1/2 .502	3/4 .753	1/2 5/8 3/4 7/8 1 1-1/4 1-1/2	1	1/8	FFB-812- 4 -5 -6 -7 -8 -10 -12
9/16 .565	3/4 .753	1/2 3/4 1	1	1/8	FFB-912- 4 -6 -8
5/8 .626	3/4 .753	1/2 5/8 3/4 1 1-1/4	1	1/8	FFB-1012- 4 -5 -6 -8 -10
5/8 .627	13/16 .815	5/8 3/4 1 1-1/4 1-7/16 1-1/2 2	1-1/16	5/32	FB-1013- 5 -6 -8 -10 -11-1/2 -12 -16
5/8 .627	7/8 .878	5/8 3/4 1 1-3/4	1 1/8	5/32	FFB-1014- 5 -6 -8 -14
5/8 .627	1 1.003	3/4 1	1-1/4	5/32	FFB-1016- 6 -8
3/4 .752	7/8 .878	3/4 1 1-1/4	1-1/8	5/32	FFB-1214- 6 -8 -10
3/4 .752	15/16 .940	1 1-1/4 1-1/2	1-3/16	5/32	FFB-1215- 8 -10 -12

**Sintered Bronze  
Oil-Impregnated**

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**Flanged Bearings**

<b>Dimensions</b>					
I.D.	O.D.	LENGTH	FLANGE O.D.	FLANGE THICKNESS	SYMMCO NO.
3/4 .752	1 1.003	5/8	1-1/4	5/32	FFB-1216- 5
		3/4			- 6
		1			- 8
		1-1/4			-10
		1-1/2			-12
2	-16				
7/8 .877	1 1.003	3/4	1-1/4	5/32	FFB-1416- 6
		1			- 8
		1-1/4			-10
7/8 .877	1-1/8 1.128	1	1-3/8	5/32	FFB-1418- 8
		1-1/2			-12
1 1.002	1-1/4 1.253	3/4	1-1/2	3/16	FFB-1620- 6
		1			- 8
		1-1/4			-10
		1-1/2			-12
		2			-16
1 1.002	1-3/8 1.378	1	1-5/8	3/16	FFB-1622- 8
		1-1/2			-12
		1-3/4			-14
1-1/4 1.252	1-1/2 1.503	1	1-3/4	3/16	FFB-2024- 8
		1-1/4			-10
		1-1/2			-12
1-1/2 1.503	1-3/4 1.754	1-1/2	2-1/16	3/16	FFB-2428-12

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# Sintered Bronze Oil-Impregnated

SAE 841

## Thrust Washers



Dimensions			
I.D.	O.D.	THICKNESS	SYMMCO NO.
1/4 .255	7/16 .4375	1/16	ST- 814- 2
1/4 .255	1/2 .500	1/16	ST- 816- 2
1/4 .255	5/8 .625	1/16	ST- 820- 2
5/16 .315	5/8 .625	1/16	ST-1020- 2
5/16 .315	3/4 .750	1/16	ST-1024- 2
3/8 .385	5/8 .625	1/16	ST-1220- 2
3/8 .380	3/4 .750	1/32 1/16 1/8	ST-1224- 1 - 2 - 4
7/16 .440	3/4 .750	1/16 1/8	ST-1424- 2 - 4
1/2 .505	3/4 .750	1/16	ST-1624- 2
1/2 .505	7/8 .875	3/16	ST-1628- 6
1/2 .510	1 1.000	1/16 3/32 1/8	ST-1632- 2 - 3 - 4
9/16 .565	1-1/4 1.250	1/16 1/8	ST-1840- 2 - 4
5/8 .628	1 1.000	1/16 1/8	ST-2032- 2 - 4
5/8 .628	1-3/16 1.1875	1/16 3/32 1/8	ST-2038- 2 - 3 - 4
5/8 .628	1-1/4 1.250	1/16 1/8	ST-2040- 2 - 4
21/32 .656	1-1/2 1.500	1/16 1/8	ST-2148- 2 - 4

Dimensions			
I.D.	O.D.	THICKNESS	SYMMCO NO.
3/4 .753	1-1/4 1.250	1/16 1/8	ST-2440- 2 - 4
3/4 .753	1-3/8 1.375	1/16 1/8 1/4	ST-2444- 2 - 4 - 8
3/4 .765	1-9/16 1.5625	3/32	ST-2450- 3
3/4 .765	1-3/4 1.750	1/8	ST-2456- 4
7/8 .8905	1-1/2 1.500	1/16 1/8	ST-2848- 2 - 4
7/8 .880	2 2.000	1/8	ST-2864- 4
7/8 .8905	2-1/8 2.125	1/8	ST-2868- 4
1 1.003	1-1/2 1.500	1/16 1/8 3/16	ST-3248- 2 - 4 - 6
1 1.0155	1-5/8 1.625	1/16 1/8 1/4	ST-3252- 2 - 4 - 8
1 1.012	1-3/4 1.750	1/16 1/8	ST-3256- 2 - 4
1 1.016	2 2.000	1/8 3/16	ST-3264- 4 - 6
1 1.0155	2-7/8 2.875	1/8	ST-3292- 4
1-1/16 1.0625	2-3/8 2.375	1/16 1/8	ST-3476- 2 - 4
1-1/8 1.140	1-7/8 1.875	1/8	ST-3660- 4
1-1/4 1.253	1-11/16 1.690	1/8	ST-4054- 4
1-1/4 1.265	2 2.000	1/16 1/8	ST-4064- 2 - 4

**Sintered Bronze  
Oil-Impregnated**

SAE 841

**Thrust Washers**

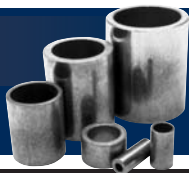
<b>Dimensions</b>			
I.D.	O.D.	THICKNESS	SYMMCO NO.
1-1/4 1.265	2-3/8 2.375	1/16 1/8	ST-4076- 2 - 4
1-1/4 1.255	3-5/16 3.312	1/16 1/8	ST-40106- 2 - 4
1-3/8 1.379	1-15/16 1.940	1/8	ST-4462- 4
1-1/2 1.503	2 2.000	1/8	ST-4864- 4
1-1/2 1.505	2-1/2 2.505	1/8	ST-4880- 4
1-1/2 1.510	3-1/2 3.500	3/16	ST-48112- 6
1-9/16 1.578	2-7/16 2.4375	1/8	ST-5078- 4
1-3/4 1.755	2-7/16 2.440	1/8	ST-5678- 4
1-3/4 1.765	2-5/8 2.625	1/8	ST-5684- 4
1-15/16 1.953	2-5/8 2.625	1/8	ST-6284- 4
2 2.011	3 3.000	1/8 3/16 1/4	ST-6496 - 4 - 6 - 8
2 2.031	3-5/8 3.625	3/16	ST-64116- 6
2-1/16 2.062	4 4.000	1/8 1/4	ST-66128- 4 - 8
2-1/2 2.502	3-1/4 3.250	1/8	ST-80104- 4
2-3/4 2.766	3-7/8 3.875	1/4	ST-88124- 8

*If you do not see exactly what you need, please contact our sales department.*

# Sintered Bronze Oil-Impregnated

SAE 841

## Metric Sleeve Bearings



### Dimensions

SYMMCO'S P/N	ID	OD	OAL
SSM-4X6X12	4	6	12
SSM-6X12X8	6	12	8
SSM-10X13X10	10	13	10
SSM-12X15X12	12	15	12
SSM-12X15X16	12	15	16
SSM-12X15X20	12	15	20
SSM-12X16X12	12	16	12
SSM-12X16X16	12	16	16
SSM-12X18X16	12	18	16
SSM-16X20X16	16	20	16
SSM-16X20X20	16	20	20
SSM-20X24X20	20	24	20
SSM-20X26X20	20	26	20
SSM-20X28X20	20	28	20
SSM-25X30X30	25	30	30
SSM-50X60X75	50	60	75

## Metric Flanged Bearings



### Dimensions

SYMMCO'S P/N	ID	OD	OAL	FL OD	FLG THK
SFM-12X15X12X18X1.5	12	15	12	18	1.5
SFM-12X15X16X18X1.5	12	15	16	18	1.5
SFM-12X15X20X18X1.5	12	15	20	18	1.5
SFM-12X17X12X22X2.5	12	17	12	22	2.5
SFM-12X17X20X22X2.5	12	17	20	22	2.5
SFM-14X18X14X22X2	14	18	14	22	2
SFM-16X20X16X24X2	16	20	16	24	2
SFM-18X22X18X26X2	18	22	18	26	2
SFM-20X24X16X28X2	20	24	16	28	2
SFM-20X24X20X28X2	20	24	20	28	2
SFM-20X26X20X32X3	20	26	20	32	3
SFM-25X32X20X39X3.5	25	32	20	39	3.5

## Tolerances

### Sleeved Bushings

NOMINAL SIZE		TOLERANCES (in 0.001mm)	
Over	To	ID	OD
3	6	+0.020 +0.000	- -
6	10	+0.030 +0.010	+0.040 +0.020
10	18	+0.030 +0.010	+0.050 +0.030
18	30	+0.030 +0.010	+0.060 +0.040
30	50	+0.040 +0.010	+0.070 +0.040
50	65	- -	+0.080 +0.050

### Flanged Bushings

NOMINAL SIZE		TOLERANCES		
Over	To	ID	OD	FOD
3	6	+0.020 +0.000	- -	-
6	10	+0.030 +0.010	+0.040 +0.020	±.130
10	18	+0.035 +0.010	+0.050 +0.030	±.130
18	30	+0.040 +0.010	+0.070 +0.040	±.160
30	50	+0.050 +0.010	+0.080 +0.040	±.200
50	65	- -	+0.100 +0.50	±.240

### TOLERANCES

Length	To 25 mm	+/- .12 mm
	Over 25 mm	+/- .5%
Flange Thickness	To 3 mm	+/- .07 mm
	Over 3 mm	+/- .13 mm
Concentricity	ID to 40 mm	0.075 mm Max.
	ID over 40 mm	10 mm Max

*Other sizes available, please contact our sales department.*



# Sleeve Bearings/Flange Bearings/Thrust Washers

## Sleeve Bearings

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/4	3/8	1/4	FESS-812-4
1/4	3/8	1	FESS-812-16
5/16	7/16	1/4	FESS-1014-4
5/16	7/16	1/2	FESS-1014-8
3/8	1/2	1/2	FESS-1216-8
3/8	1/2	1	FESS-1216-16
1/2	5/8	1/2	FESS-1620-8
1/2	5/8	1	FESS-1620-16
5/8	3/4	1/2	FESS-2024-8
5/8	3/4	3/4	FESS-2024-12
5/8	3/4	1	FESS-2024-16
3/4	7/8	3/4	FESS-2428-12
3/4	15/16	1/2	FESS-2430-8
3/4	1	3/4	FESS-2432-12
1	1-1/4	1/2	FESS-3240-8
1	1-1/4	1	FESS-3240-16
1	1-1/4	1-1/4	FESS-3240-20
1-1/4	1-1/2	1	FESS-4048-16
1-1/4	1-5/8	1-1/2	FESS-4052-24
1-1/2	1-3/4	1	FESS-4856-16
1-3/4	2	1	FESS-5664-16

## Thrust Washers

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/4	5/8	1/16	FEST-820-2
3/8	3/4	1/16	FEST-1224-2
1/2	3/4	1/16	FEST-1624-2
1/2	1	1/16	FEST-1632-2
1/2	1	1/8	FEST-1632-4
5/8	1	1/8	FEST-2032-4
3/4	1-1/4	1/8	FEST-2440-4
1	1-1/2	1/8	FEST-3248-4
1	1-3/4	1/8	FEST-3256-4
1	2	1/8	FEST-3264-4
1-1/4	2	1/8	FEST-4064-4
1-1/2	2-1/2	1/8	FEST-4880-4
2	3	1/8	FEST-6496-4

### General Characteristics

- A material that combines strength with good bearing properties, making it a popular grade for applications requiring high strength
- Harder, stronger, and more economical than some bronze materials
- Good shock loading ability, wear resistance, and durability
- Rated for lower speeds but can handle higher loads

## Flange Bearings

Dimensions					
I.D.	O.D.	LENGTH	FL. OD.	FLG. THK.	SYMMCO NO.
1/4	3/8	1/4	1/2	1/16	FESBF-812-4
1/4	3/8	1/2	1/2	1/16	FESBF-812-8
5/16	7/16	3/8	9/16	1/16	FESF-1014-6
3/8	1/2	1/2	11/16	1/16	FESBF-1216-8
3/8	1/2	3/4	11/16	1/16	FESBF-1216-12
3/8	5/8	1/2	7/8	1/16	FESF-1220-8
1/2	5/8	1/4	7/8	1/16	FESF-1620-4
1/2	5/8	1/2	7/8	1/16	FESF-1620-8
1/2	3/4	1/2	1	1/8	FESBF-1624-8
5/8	3/4	1/2	1	3/32	FESF-2024-8
5/8	3/4	3/4	1	3/32	FESF-2024-12
3/4	7/8	1/2	1-1/8	1/8	FESF-2428-8
3/4	7/8	3/4	1-1/8	1/8	FESF-2428-12
3/4	1	1/2	1-1/8	1/8	FESF-2432-8
1	1-1/4	1	1-5/8	1/8	FESF-3240-16
1-1/4	1-1/2	1/2	1-11/16	1/8	FESF-4048-8

*If you do not see exactly what you need, please contact our sales department.*

### Common Applications

- Farm machinery
- Off-road equipment
- Sheaves
- Pulleys
- Conveyors
- Wheel Bearings
- Machine Tools

**PV Factor:** The normal load carrying capacity of a bearing material and is expressed as a factor.

(Pressure or bearing load in pounds per square inch x Surface Velocity as in feet per minute.)

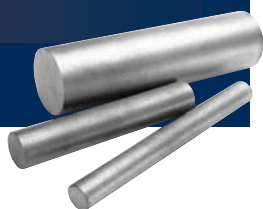
*Calculating the PV factor, see page 33*

*For material specs, see page 29*

**Sintered Bronze  
Oil-Impregnated**

**SAE 841**

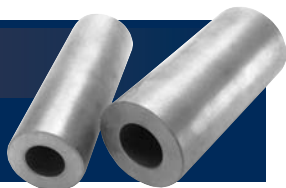
## Sintered Bronze Solid Bar Stock



*\*All Symmco bars will finish to dimensions shown.*

### Dimensions

O.D.	LENGTH	SYMMCO NO.
1/4	2	SBS- 2- 2
3/8	3	SBS- 3- 3
1/2	6-1/2	SBS- 4- 6
5/8	6-1/2	SBS- 5- 6
3/4	6-1/2	SBS- 6- 6
7/8	6-1/2	SBS- 7- 6
1	6-1/2	SBS- 8- 6
1-1/8	6-1/2	SBS- 9- 6
1-1/4	6-1/2	SBS-10- 6
1-3/8	6-1/2	SBS-11- 6
1-1/2	6-1/2	SBS-12- 6
1-5/8	6-1/2	SBS-13- 6
1-3/4	6-1/2	SBS-14- 6
2	6-1/2	SBS-16- 6
2-1/4	6-1/2	SBS-18- 6
2-1/2	6-1/2	SBS-20- 6
2-3/4	6-1/2	SBS-22- 6
3	6-1/2	SBS-24- 6
3-1/4	6-1/2	SBS-26- 6
3-1/2	6-1/2	SBS-28- 6
4	6-1/2	SBS-32- 6
4-1/2	6-1/2	SBS-36- 6
5	6-1/2	SBS-40- 6
5-1/2	6-1/2	SBS-44- 6
6	6-1/2	SBS-48- 6
7	6-1/2	SBS-56- 6
8	6-1/2	SBS-64- 6

**Sintered Bronze  
Oil-Impregnated****SAE 841****Sintered Bronze Cored Bar Stock***\*All Symmco bars will finish to dimensions shown.*

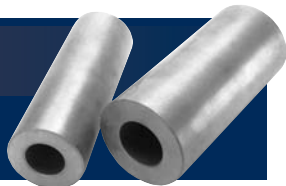
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1/2	1	6-1/2	SCS-48-6
1/2	1-1/8	6-1/2	SCS-49-6
1/2	1-1/4	6-1/2	SCS-410-6
1/2	1-1/2	6-1/2	SCS-412-6
1/2	2	6-1/2	SCS-416-6
5/8	1	6-1/2	SCS-58-6
5/8	1-1/8	6-1/2	SCS-59-6
5/8	1-1/4	6-1/2	SCS-510-6
5/8	1-3/8	6-1/2	SCS-511-6
5/8	1-1/2	6-1/2	SCS-512-6
5/8	1-3/4	6-1/2	SCS-514-6
5/8	2	6-1/2	SCS-516-6
3/4	1-1/4	6-1/2	SCS-610-6
3/4	1-1/2	6-1/2	SCS-612-6
3/4	1-3/4	6-1/2	SCS-614-6
3/4	2	6-1/2	SCS-616-6
3/4	2-1/4	6-1/2	SCS-618-6
3/4	2-1/2	6-1/2	SCS-620-6
3/4	2-3/4	6-1/2	SCS-622-6
7/8	1-3/8	6-1/2	SCS-711-6
7/8	1-1/2	6-1/2	SCS-712-6
7/8	2	6-1/2	SCS-716-6
7/8	2-1/4	6-1/2	SCS-718-6
1	1-1/2	6-1/2	SCS-812-6
1	1-5/8	6-1/2	SCS-813-6
1	1-3/4	6-1/2	SCS-814-6
1	2	6-1/2	SCS-816-6

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1	2-1/4	6-1/2	SCS-818-6
1	2-1/2	6-1/2	SCS-820-6
1	3	6-1/2	SCS-824-6
1	3-1/2	6-1/2	SCS-828-6
1	4	6-1/2	SCS-832-6
1-1/8	2-1/8	6-1/2	SCS-917-6
1-1/4	1-3/4	6-1/2	SCS-1014-6
1-1/4	2	6-1/2	SCS-1016-6
1-1/4	2-1/4	6-1/2	SCS-1018-6
1-1/4	2-1/2	6-1/2	SCS-1020-6
1-1/4	3	6-1/2	SCS-1024-6
1-1/4	3-1/2	6-1/2	SCS-1028-6
1-3/8	2	6-1/2	SCS-1116-6
1-3/8	2-3/4	6-1/2	SCS-1122-6
1-1/2	2	6-1/2	SCS-1216-6
1-1/2	2-1/4	6-1/2	SCS-1218-6
1-1/2	2-1/2	6-1/2	SCS-1220-6
1-1/2	2-3/4	6-1/2	SCS-1222-6
1-1/2	3	6-1/2	SCS-1224-6
1-1/2	3-1/2	6-1/2	SCS-1228-6
1-1/2	4	6-1/2	SCS-1232-6
1-3/4	2-1/4	6-1/2	SCS-1418-6
1-3/4	2-1/2	6-1/2	SCS-1420-6
1-3/4	2-5/8	6-1/2	SCS-1421-6
1-3/4	2-3/4	6-1/2	SCS-1422-6
1-3/4	3	6-1/2	SCS-1424-6
1-3/4	3-1/2	6-1/2	SCS-1428-6

**Sintered Bronze  
Oil-Impregnated**

**SAE 841**

**Sintered Bronze Cored Bar Stock**



*\*All Symmco bars will finish to dimensions shown.*

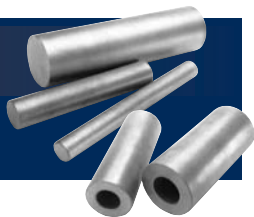
Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
1-3/4	4-1/4	6-1/2	SCS-1434-6
2	2-3/4	6-1/2	SCS-1622-6
2	3	6-1/2	SCS-1624-6
2	3-1/4	6-1/2	SCS-1626-6
2	4	6-1/2	SCS-1632-6
2	4-1/2	6-1/2	SCS-1636-6
2	5	6-1/2	SCS-1640-6
2	5-1/2	6-1/2	SCS-1644-6
2-1/4	3	6-1/2	SCS-1824-6
2-1/4	3-1/4	6-1/2	SCS-1826-6
2-1/4	3-1/2	6-1/2	SCS-1828-6
2-1/4	3-3/4	6-1/2	SCS-1830-6
2-1/4	4	6-1/2	SCS-1832-6
2-1/4	4-1/2	6-1/2	SCS-1836-6
2-3/8	3	6-1/2	SCS-1924-6
2-3/8	3-1/2	6-1/2	SCS-1928-6
2-3/8	4	6-1/2	SCS-1932-6
2-1/2	3-1/2	6-1/2	SCS-2028-6
2-1/2	3-3/4	6-1/2	SCS-2030-6
2-1/2	4	6-1/2	SCS-2032-6
2-1/2	4-1/4	6-1/2	SCS-2034-6
2-1/2	4-1/2	6-1/2	SCS-2036-6
2-1/2	5	6-1/2	SCS-2040-6
2-3/4	3-3/4	6-1/2	SCS-2230-6

Dimensions			
I.D.	O.D.	LENGTH	SYMMCO NO.
3	3-3/4	6-1/2	SCS-2430-6
3	4	6-1/2	SCS-2432-6
3	4-1/2	6-1/2	SCS-2436-6
3	5	6-1/2	SCS-2440-6
3	6	6-1/2	SCS-2448-6
3	9	6-1/2	SCS-2472-6
3-1/4	4-1/4	6-1/2	SCS-2634-6
3-1/2	4-3/4	6-1/2	SCS-2838-6
3-1/2	5	6-1/2	SCS-2840-6
3-1/2	6	6-1/2	SCS-2848-6
3-3/4	5	6-1/2	SCS-3040-6
4	5-1/2	6-1/2	SCS-3244-6
4	6	6-1/2	SCS-3248-6
4	7	6-1/2	SCS-3256-6
4	8	6-1/2	SCS-3264-6
4-1/2	6	6-1/2	SCS-3648-6
5	7	6-1/2	SCS-4056-6
6	8	6-1/2	SCS-4864-6
6	9	6-1/2	SCS-4872-6
7	9	6-1/2	SCS-5672-6

*If you do not see exactly what you need,  
please contact our sales department.*

**18-22% Copper  
Balance Iron** SAE 863

**Sintered Iron-Copper Cored &  
Solid Bar Stock**



*\*All Symmco bars will finish to dimensions shown.*

**CORED**

**Dimensions**

SYMMCO'S P/N	I.D.	O.D.	LENGTH
FCCS-1000	1/2	1	5
FCCS-1402	1/2	1-7/16	5
FCCS-1102	3/4	1 3/16	5
FCCS-1500	3/4	1-9/16	5
FCCS-1900	3/4	1-15/16	5
FCCS-1601	1	1-11/16	5
FCCS-2100	1	2-3/16	5
FCCS-1602	1-1/4	1-11/16	5
FCCS-2103	1-1/4	2-3/16	5
FCCS-2803	1-1/4	2-7/8	5
FCCS-1904	1-1/2	1-15/16	5
FCCS-3805	1-1/2	3-7/8	5
FCCS-2504	1-3/4	2-1/2	5
FCCS-3004	1-3/4	3	5
FCCS-2600	2	2-5/8	5
FCCS-3005	2	3	5
FCCS-3301	2-1/2	3-3/8	5
FCCS-4102	2-1/2	4-1/8	5
FCCS-4802	3	4-7/8	5

**SOLID**

**Dimensions**

SYMMCO'S P/N	O.D.	LENGTH
FCSS-300	3/8	3
FCSS-500	1/2	6 1/2
FCSS-600	5/8	5
FCSS-700	3/4	5
FCSS-800	7/8	5
FCSS-1000	1	5
FCSS-1100	1-3/16	5
FCSS-1300	1-5/16	5
FCSS-1400	1-7/16	5
FCSS-1500	1-9/16	5
FCSS-1800	1-13/16	5
FCSS-2000	2	5
FCSS-2800	2-7/8	5

**Sintered Bronze  
Oil-Impregnated** SAE 841  
**Cored Disc**

**Sintered Bronze  
Oil-Impregnated** SAE 841  
**Solid Disc**

**DIMENSIONS**

SYMMCO'S P/N	I.D.	O.D.	LENGTH
SCD-9001	3	9	5/16 (*)

**DIMENSIONS**

SYMMCO'S P/N	O.D.	THICK
SDD-8000	8	5/16 (*)
SDD-8000-3	8	3/8 (*)

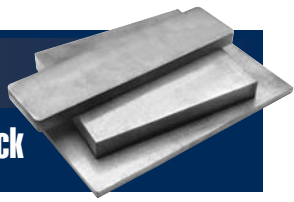
*Will finish to size shown (\*) + .0035*

*If you do not see exactly what you need, please contact our sales department.*

**Sintered Bronze  
Oil-Impregnated**

**SAE 841**

## Sintered Bronze Rectangular Plate Stock



<b>Dimensions</b>			
<b>SYMMCO'S P/N</b>	<b>WIDTH</b>	<b>LENGTH</b>	<b>THICKNESS</b>
SP-0.5 - 2.5 x 4	.50"	2.50"	.250"
SP-2 - 8.125 x 4	2.00"	8.125"	.250"
SP-2 - 8.125 x 8	2.00"	8.125"	.500"
SP-3 - 12 x 4	3.00"	12.00"	.250"
SP-3 - 12 x 8	3.00"	12.00"	.500"
SP-3 - 12 x 12	3.00"	12.00"	.750"
SP-3 - 12 x 16	3.00"	12.00"	1.000"
SP-5 - 6 x 2	5.00"	6.00"	.125"
SP-5 - 6 x 3	5.00"	6.00"	.1875"
SP-5 - 6 x 4	5.00"	6.00"	.250"
SP-5 - 6 x 6	5.00"	6.00"	.375"
SP-5 - 6 x 8	5.00"	6.00"	.500"
SP-5 - 6 x 10	5.00"	6.00"	.625"
SP-5 - 6 x 12	5.00"	6.00"	.750"
SP-5 - 6 x 16	5.00"	6.00"	1.000"
SP-5 - 8 x 2	5.00"	8.00"	.125"
SP-5 - 8 x 3	5.00"	8.00"	.1875"
SP-5 - 8 x 4	5.00"	8.00"	.250"
SP-5 - 8 x 8	5.00"	8.00"	.500"
SP-5 - 8 x 12	5.00"	8.00"	.750"
SP-5 - 8 x 16	5.00"	8.00"	1.000"
SP-6 - 12 x 2	6.00"	12.00"	.125"
SP-6 - 12 x 3	6.00"	12.00"	.1875"
SP-6 - 12 x 4	6.00"	12.00"	.250"
SP-6 - 12 x 6	6.00"	12.00"	.375"
SP-6 - 12 x 8	6.00"	12.00"	.500"
SP-6 - 12 x 10	6.00"	12.00"	.625"
SP-6 - 12 x 12	6.00"	12.00"	.750"
SP-6 - 12 x 16	6.00"	12.00"	1.000"

*Plate stock will finish to sizes shown. Thickness tolerance is (+) plus .010, (-) minus .005.*

*If you do not see exactly what you need, please contact our sales department.*

## Symmco Typical Properties

### Material Composition %

MATERIAL COMPOSITION	SINTERED BRONZE	SINTERED IRON-COPPER
<b>Copper</b>	<b>Balance</b>	<b>18 - 22</b>
<b>Iron</b>	<b>1.0 Max</b>	<b>Balance</b>
<b>Tin</b>	<b>9.5 - 10.5</b>	
<b>Carbon/Graphite</b>	<b>0.3 Max</b>	<b>0.3 Max</b>
<b>Other elements</b>	<b>1.0 Max</b>	<b>2.0 Max</b>

### Physical & Mechanical Properties

MATERIAL COMPOSITION	SINTERED BRONZE	SINTERED IRON-COPPER
<b>Density (g/cm<sup>3</sup>)</b>	<b>6.4 - 6.8</b>	<b>5.8 - 6.2</b>
<b>Porosity (% by volume)</b>	<b>19 Min.</b>	<b>19 Min.</b>
<b>App. Rockwell Hardness as Sintered (Ref. Only)</b>	<b>H-45</b>	<b>F-35</b>
<b>K-Strength Constant</b>	<b>26,500</b>	<b>30,000</b>

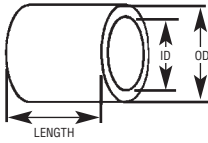
### Comparable Specifications

MATERIAL COMPOSITION	SINTERED BRONZE	SINTERED IRON-COPPER
<b>ASTM</b>	<b>B438-13 CT-1000-K26 Previously Grade 1; Type 2</b>	<b>B-439-12 FC-2000-K30 Previously Grade 4</b>
<b>MPIF</b>	<b>CT-1000-K26</b>	<b>FC-2000-K30</b>
<b>SAE</b>	<b>AMS-4805-E Previously 841</b>	<b>Previously 863</b>
<b>Military</b>	<b>MIL-B-5687D Type 1; Grade 1</b>	<b>MIL-B-5687D Type 2; Grade 4</b>
<b>Symmco Designation</b>	<b>Sym 1</b>	<b>Sym 77</b>
<b>Overview</b>	Standard high quality bearing material. Stocked in standard bearing sizes as well as bar and plate stock. Highly wear resistant, ductile and corrosion resistant.	More economical than bronze. Moderately higher strength rating. Lower PV value. Stocked in cored and solid bar stock.
<b>Applications</b>	Business machines, lawn & garden, home appliances, conveyors, water pumps, industrial motors, tool & hobby, motion controls, hydraulics, farm machinery, mining equipment	Farm machinery, ATV's, pulleys, sheaves, wheel bearings, machine tools

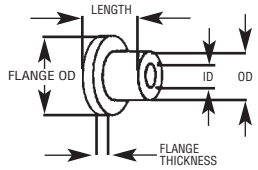
**NOTE: This data is based on parts as manufactured by Symmco.**

# Tolerances

Plain Bearings:



Flanged Bearings:



## PLAIN & FLANGED BEARINGS

### Inside & Outside Diameters (Inches)

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1/2	+ .000 - .001
1/2	1	+ .000 - .001
1	1-1/2	+ .000 - .001
1-1/2	2-1/2	+ .000 - .0015
2-1/2	3-1/2	+ .000 - .002
3-1/2	4-1/2	+ .000 - .0025
4-1/2	5-1/2	+ .000 - .0035
5-1/2	6-1/2	+ .000 - .004

### Length (Inches)

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/2	± .005
1-1/2	3	± .0075
3	4-1/2	± .010
4-1/2	6	± .015

### Flange Diameter - Based on Flange OD

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/4	± .005
1-1/4	2-1/2	± .010
2-1/2	4	± .015
4	4-1/2	± .025

### Flange Thickness - Based on Flange OD

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/4	± .0025
1-1/4	2-1/2	± .005

### Flange Fillets, Radii - Based on Body OD

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE MAX. TYPICAL
-	1	1/32
1	2	3/64
2	2-1/2	1/16
2-1/2	4	3/32

### Concentricity, ID with respect to OD (Maximum Total Dial Indicator Reading) - Based on ID

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1	.003
1	1-1/2	.003
1-1/2	3	.004
3	4-1/2	.005
4-1/2	6	.006



# Tolerances



## Thrust Bearings

### Inside Diameter

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/4	± .005
1-1/4	2-1/2	± .010
2-1/2	4	± .015
THICKNESS		± .0025

### Outside Diameter

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/2	± .010
1-1/2	3	± .015
3	4-1/2	± .020

### Parallelism of Faces - Based on OD

OVER (INCHES)	UP TO & INCLUDING	TOLERANCE
-	1-1/2	.003
1-1/2	3-1/2	.004
3-1/2	4	.005

## Running Clearance

Proper running clearance for bearings depends to a great extent on the particular application. Only minimum recommended clearances for oil impregnated bearings used with the ground steel shafting are listed.

### Clearance, Min. In.

SHAFT SIZE, IN.	BRONZE BASE	IRON BASE
Up to 0.760	0.0005	0.001
0.761 to 1.510	0.001	0.0015
1.511 to 2.510	0.0015	0.002
Over 2.510	0.002	0.0025

## Press Fits

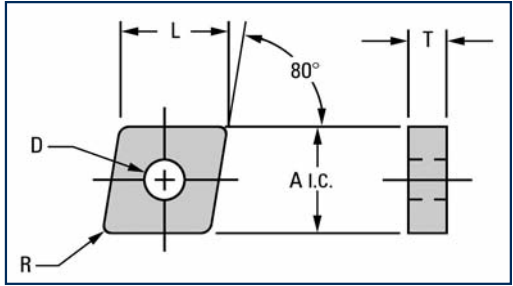
Plain cylindrical journal bearings are commonly installed by press fitting the bearing into a housing with an insertion arbor. For housings rigid enough to withstand the press fit without appreciable distortion and for bearings with thickness approximately one-eighth of the bearing outside diameter, the press fits shown are recommended.

### Press Fit In.

OUTSIDE DIAMETER IN.	MINIMUM	MAXIMUM
Up to 0.760	0.001	0.003
0.761 to 1.510	0.0015	0.004
1.511 to 2.510	0.002	0.005
2.511 to 3.010	0.002	0.006
Over 3.010	0.002	0.007

# Machining

Recommendations for machining self-lubricating bushings are predicated on maintaining the porosity of the overall part by avoiding closure of the surface microporosity during the machining process. Minimizing the loss of microporosity can be achieved by utilizing sharp tooling and proper feed rates.



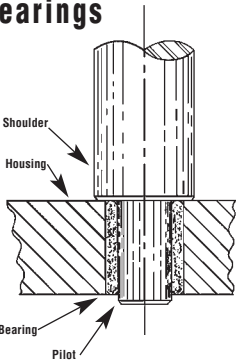
Material	Speed (SFM)	Feed rate (IPM)	Tool Nose Radius (Dim "R")
Bronze	500	.002"-.006	.003-.015
Iron-Copper	500	.002"-.006	.003-.015

**Notes:**

CNGG style inserts are recommended for general turning and boring. Tool nose radius can be .003" - .015", cutting edges must be "dead sharp."

- Where ID tolerance are to be held within 0.0005", roller-type burnishing tools may be used for large volumes. This operation will maintain porosity. (Amount rolled must not exceed .001".)
- Reaming is more susceptible to destroying surface microporosity versus single point tooling, and when used, sharp tooling is critical. Stock removal should be limited to (0.003" - 0.005") on the diameter.
- Boring - Carbide inserted tooling with "dead sharp" edges will produce quality finishes and maintain porosity.
- Oil impregnated parts should be re-oiled after machining.
- For additional information or technical assistance, please contact Symmco engineering support.

## PILOTED DRIVER for proper insertion of sintered bearings



Suggestions for inserting sintered bronze bearings using a piloted driver:

1. Shoulder diameter should be larger than bearing.
2. Pilot length should exceed bearing length.
3. Pilot diameter should be approximately .0003 larger than desired bearing ID after insertion.
4. Edge of housing bore should be broken to prevent shearing of bearing OD after insertion.

REF:

- Housing Bore -----1.2495/1.2505
- Shaft Diameter -----.9995/1.0000
- Bearing size-----1.003/1.004 ID x 1.253/1.254 OD
- Pilot Diameter -----1.0013 - 1.0015

Even though your available bearings may vary slightly in bore size, the proper use of a piloted driver for insertion will assure correct shaft clearance after assembly.

Depending on the bore size, bearings having dimensional differences of up to .003" can be interchanged.

## General Guidelines for Calculating PV Factor

Material	PV	P (psi)		V (sfm)
		Static	Dynamic	
Sym 1	50,000	8,000	2,000	1,200
Sym 77	35,000	20,000	4,000	225

**Calculating the PV factor:**

**P** = the load in (psi) on the bearing area (Bearing ID x Length)

**V** = surface velocity of the shaft in feet per minute (sfm)

**PV** =  $W/LD \times \pi DS/12 = 3.14WS/12L$

**W** = bearing load (pounds)

**L** = length of bearing (inches)

**D** = inside diameter of bearing (inches)

**S** = shaft speed (rpm)

The PV factor lists the working value upper limits and should not be exceeded. Exceeding the limits may cause premature failure of the bearing.

**PV Factor:** the normal load carrying capacity of a bearing material and is expressed as a factor (Pressure or bearing load in pounds per square inch x Surface Velocity as in feet per minute.)

## General Information About Symmco Products

**Lubrication:** Symmco's standard lubrication is a high grade 100 viscosity, non-detergent, turbine oil with an effective operating range: (-10°F to + 200°F). Symmco offers additional specialty lubricants for high temperature applications (up to 300°F), as well as custom specifications such as food grade and military specifications (i.e. Mil-PRF-6085D, MIL-PRF-7808H and MIL-PRF-17331-H).

**Storage:** Oil-impregnated bushings must be stored in non-absorbing containers. Paper, cloth and cardboard are not appropriate for storing bushings, as they will wick oil out of the bushing. Metal or plastic re-sealable bags are preferred. Machined parts or parts that have been sitting in stock for long periods of time should be re-oiled as needed.

**Shaft Material:** SAE 1137 or SAE 1141 are recommended shaft materials. Other steels containing at least 0.4% carbon may be used. Hard chromium plating is recommended when corrosion is a factor. Shaft finish should be 4RMS to 10RMS. Stainless steel should not be used with bronze bushings unless used in conjunction with a specialty or synthetic lubricant.

**Surface Finish:** Symmco finished bushings as measured by a chisel stylus indicate 125 RMS with the appearance of 63 RMS.

**Wall Thickness:** General rule of thumb to determine maximum acceptable length:

Bronze base:  $(OD-ID)/2 \times 24$

Iron base:  $(OD-ID)/2 \times 20$

When dealing with the "maximum limits" for thin wall tolerance, contact Symmco technical sales for clarification.



## **Symmco Also Produces Custom Fabricated Parts.**

Regardless of your unique requirements, Symmco can produce custom component parts that will produce unexcelled wear resistance and a longer life. By converting to powder metal (PM), you can significantly decrease production costs by eliminating material waste and by incurring little or no machining costs.

*With Powder Metallurgy,  
The Possibilities Are Virtually Endless.*



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