

# SEPOR ROLL DRIVE

## 2 Inch Diameter Drive Roll Series

SEPOR's bench or floor type jar mill drives are used for turning laboratory size jar mills used for wet or dry grinding, blending, dispersing, and other conditioning. This SEPOR series of drive rolls is rugged in design, use 2" diameter neoprene rollers with a jar stop to prevent jars from overrunning the roll. AC electric input is converted to DC for speed control in a 20 to 320 RPM range. The distance between rolls is also variable. A wide variety of jar sizes can be used. All units are operable on 50 or 60 Hz. 110 V/1 Ph/60 Hz or 220 V/1 Ph/50 Hz. Optional accessories include: revolution counters, automatic timers, jar positoners, and special application motors. To determine the size of mill drive required, factors such as the diameter and weight of the jar mill should be considered (the largest diameter jar that could be used on this series of roll drives is a 10" diameter jar), the length of the jar and the number of grinding jars to be used simultaneously. If it were desired to grind four 5" diameter by 8" long jars at one time,  $(4 \times (8" + 2" (\text{Space Between Jars})) = 40$  inches of roll length required. Either a two tiered 24" long roll drive (4 - 24 inch long rolls) or a single tier, 48" long roll drive would be sufficient.

SEPOR offers many configurations of roll drive units to meet customer requirements. Our jars come in a wide variety of materials and in many sizes. Grinding media in many sizes and materials is normally stocked by for immediate delivery.



**2-1/2" Diameter, 24" Long Rolls,  
3 Tier Drive**



**2" Diameter, 13" Long Rolls  
1 Tier Drive**

CATALOG NUMBER	NUMBER OF TIERS	ROLL LENGTH	NUMBER OF ROLLS	MAX NO. OF JARS*	WEIGHT (LBS)
010E-027	1	13 Inches	2	1	70
010E-030	3	13 Inches	6	3	170
010E-028	1	24 Inches	2	2	90
010E-031	2	24 Inches	4	4	205
010E-033	1	48 Inches	2	6	300
010E-035	2	48 Inches	4	8	460
010E-038	2	72 Inches	6	30 - 50	640

\*Depends Upon Jar Size

Web Site - <http://www.sepor.com>

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## Table of Grinding Jar, Roll Speeds for 2" Diameter Roll Drive

GRINDING JAR DIAMETER (INCHES)	JAR GRINDING SPEED, @ 75% CRITICAL SPEED (RPM'S)	DRIVE ROLL SPEED REQUIRED TO OBTAIN JAR GRINDING SPEED (RPM'S)
3.0	115	172
4.0	100	199
5.0	89	223
6.0	81	244
7.0	75	263
8.0	70	282
9.0	66	299

### Grinding Media

Generally, steel grinding balls are used with steel mills, ceramic balls are used with porcelain or ceramic lined mills and steel, ceramic, or other high density media is used with elastomer lined mills. Porcelain balls have a SG of 2.3 and have a average weight/volume of 12.8 pounds per gallon. High density alumina (ceramic) balls have a SG of 3.2 and have an average weight/volume of 17.5 pounds per gallon. Steel balls have a SG of 7.7 and have an average weight/volume of 40 pounds/gallon.

Higher density grinding media generally results in faster grinding in a ball mill. An optimum grinding charge for a ball mill may be experimentally determined, however generally the range is from 20% to 50% of the mill volume, or to the center line. Approximately 30-40% of the ball charge will be void space.

### Dry Grinding

Material loads for ball mill dry grinding generally fall into the 25% to 50% of the mill volume range. If the mill is loaded with a 50% grinding charge and a 50% ball charge, it will not be 100% full, since approximately 30% of the ball volume is **void** space. Some experimentation will be required to obtain the proper mill charge for the most efficient grinding for various materials. If the mill is overloaded, it may not be possible to obtain fine particle sizes by grinding and the mill grinding efficiency decreases exponentially, as the grinding time increases exponentially. Therefore, mill overloading should be avoided.

### Wet Grinding

Material loads for ball mill wet grinding generally fall into the 30% to 50% of the mill volume range. The slurry could range from 30% to 60% solids by weight.. Some experimentation will be required to obtain the proper mill charge for the most efficient grinding for various materials. If the mill is overloaded, it may not be possible to obtain fine particle sizes by grinding and the mill grinding efficiency decreases exponential, as the grinding time increases exponentially. Therefore, mill overloading should be avoided.

Sepor has laboratory size grinding ball mills in a variety of materials of construction, including carbon steel, stainless steel, urethane lined, porcelain, and ceramic. Our grinding media includes balls, cylinders and rods (for rod mills). Materials of construction include carbon steel, stainless steel, chrome steel, flint pebbles, porcelain, ceramic, and zirconia. Most grinding media is available in a variety of sizes to suit many grinding applications.

## **TABLE OF GRINDING JAR, ROLL SPEEDS FOR 2-1/2" DIAMETER ROLL DRIVE**

GRINDING JAR DIAMETER (INCHES)	JAR GRINDING SPEED @ 75% CRITICAL SPEED (RPM'S)	DRIVE ROLL SPEED REQUIRED TO OBTAIN JAR GRINDING SPEED (RPM'S)
3.0	115	138
4.0	100	160
5.0	89	178
6.0	81	194
7.0	75	210
8.0	70	224
9.0	66	238
10.0	63	252

For Sepor's Jar Drives 48" long or longer, the roll diameter is 2-1/2", to provide some added stability for heavier loads that may be placed on the drive.

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