FLSMIDTH CEMENT

O-SEPA™ SEPARATOR

High efficiency separation for ball mills

HIGH EFFICIENCY, LOW-MAINTENANCE SEPARATION FOR NEW AND EXISTING BALL MILLS

With its innovative, but compact, design, the O-Sepa separator sets the standard for high-efficiency separation for both cement and non-cement applications.

KEY BENEFITS

High-efficiency separation

Low OPEX and maintenance

Compact, versatile design

Simple installation

Flexible application

The standard in separation

With over 500 units installed worldwide in the 40+ years we've supplied the O-Sepa separator, it remains at the top of industry lists for both performance and mechanical integrity. It enables more sustainable mill operations, while lowering operating costs, bringing tangible benefits to plant operations.

Meanwhile, its compact and versatile design requires minimum space for installation, and it can be applied to a variety of systems to fit any new or existing process requirement. Installation time is minimised by its bolted flanged design.

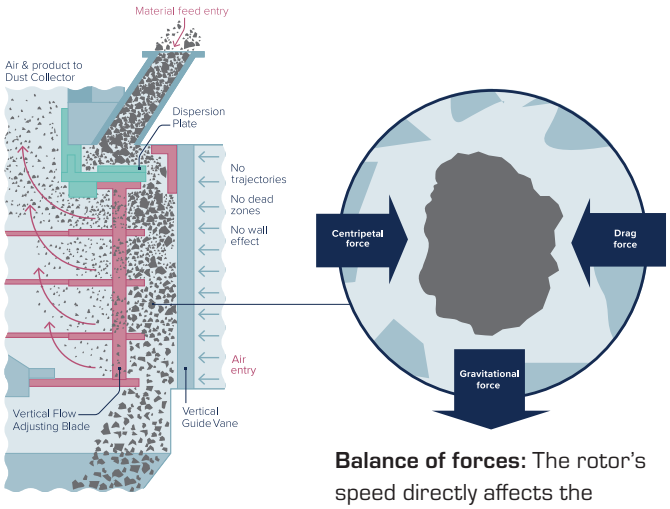
High efficiency separation

Compared to other separator designs, the O-Sepa separator offers improved separation efficiency. This means less fine material is returned to the mill; which in turn reduces mill power consumption at a given product fineness.

The superior grinding efficiency – coupled with better product size distribution – also maximises system capacity. While the precise, uniform separation achieved by the O-Sepa makes stable operation easier to achieve through simple system control.

This benefits of superior efficiency and stable operation are clear: increased cement strength and lower amounts of coarse material in the final product.

Classification Zone



Balance of forces: The rotor's speed directly affects the centripetal force. The amount of airflow affects the drag force

THE O-SEPA SEPARATOR AT A GLANCE

VERSATILE DESIGN

- ✓ New and retrofit installations
- ✓ Raw and cement grinding
- ✓ High Blaine operation
- ✓ Standard and mixed products
- ✓ Compatible with semi-finish grinding
- ✓ Full gas recirculation optional
- ✓ Full size range

LOW MAINTENANCE

- ✓ Wear protection targets specific abrasion mechanisms for each separator component
- ✓ Circulating oil lubrication system ensures long bearing life

BETTER PRODUCT QUALITY

- ✓ High separator efficiency
- ✓ Improved product particle size distribution than first and second-generation separators
- ✓ Increased cement quality
- ✓ Reduced coarse bypass in the product

REDUCED CAPITOL COSTS

- ✓ Compact design
- ✓ Simple layout
- ✓ Short installation time

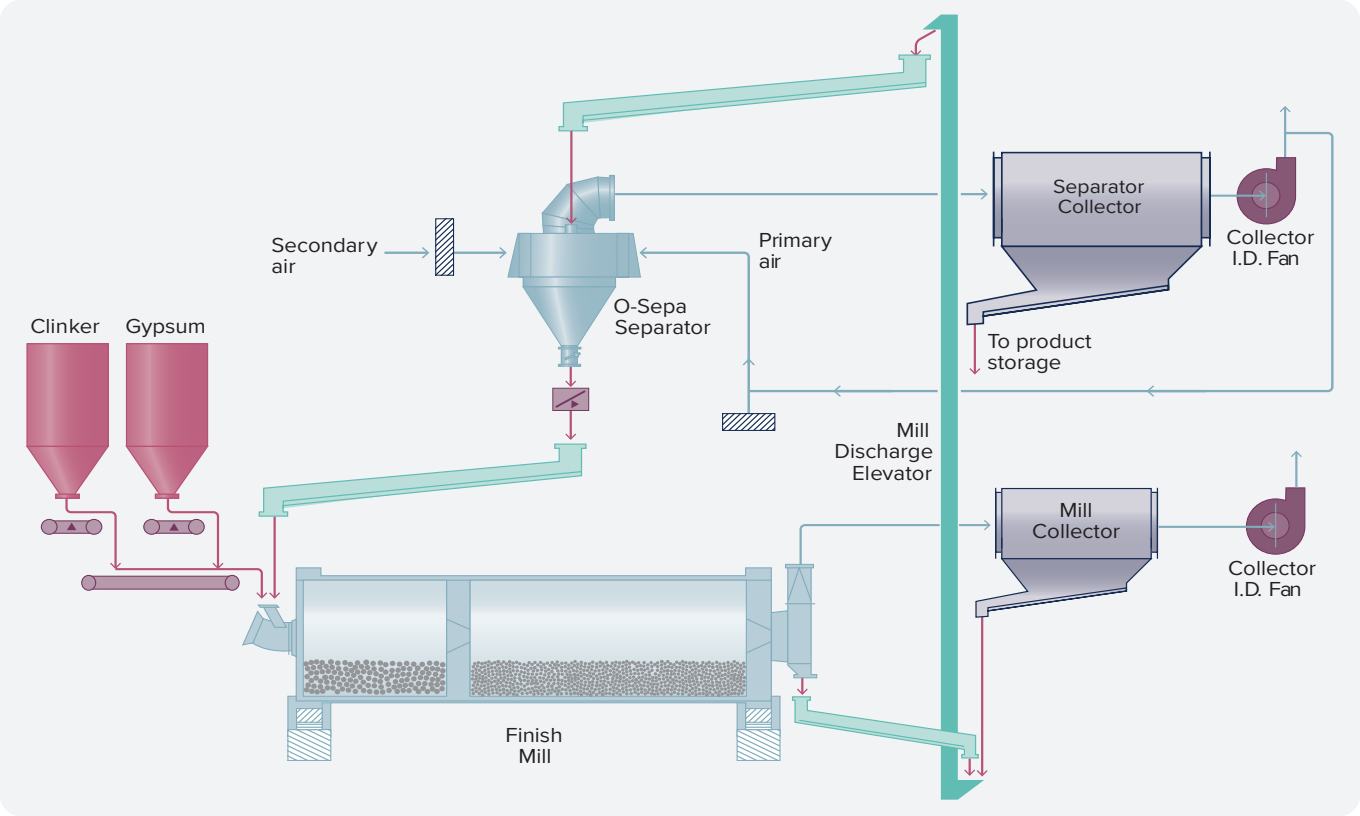
STABLE OPERATION

- ✓ Simple system control
- ✓ Precise, uniform separation
- ✓ Less fine returns to the mill

LOW OPERATING COSTS

- ✓ Reduced specific power consumption
- ✓ Increased grinding efficiency
- ✓ Low maintenance
- ✓ Integral cooling capability

Full vent system



Alternate arrangement:
The mill vent gases can be taken through the O-Sepa separator with either system design, thus eliminating one collector and fan.

Available for a range of applications

Interested in bringing these benefits to your operation – but wondering if the O-Sepa can be fitted to your ball mill circuit. It's a great question! And we are glad you asked.

The O-Sepa can be installed for both cement and non-cement applications, as a retrofit to existing grinding circuits or on new mill systems.

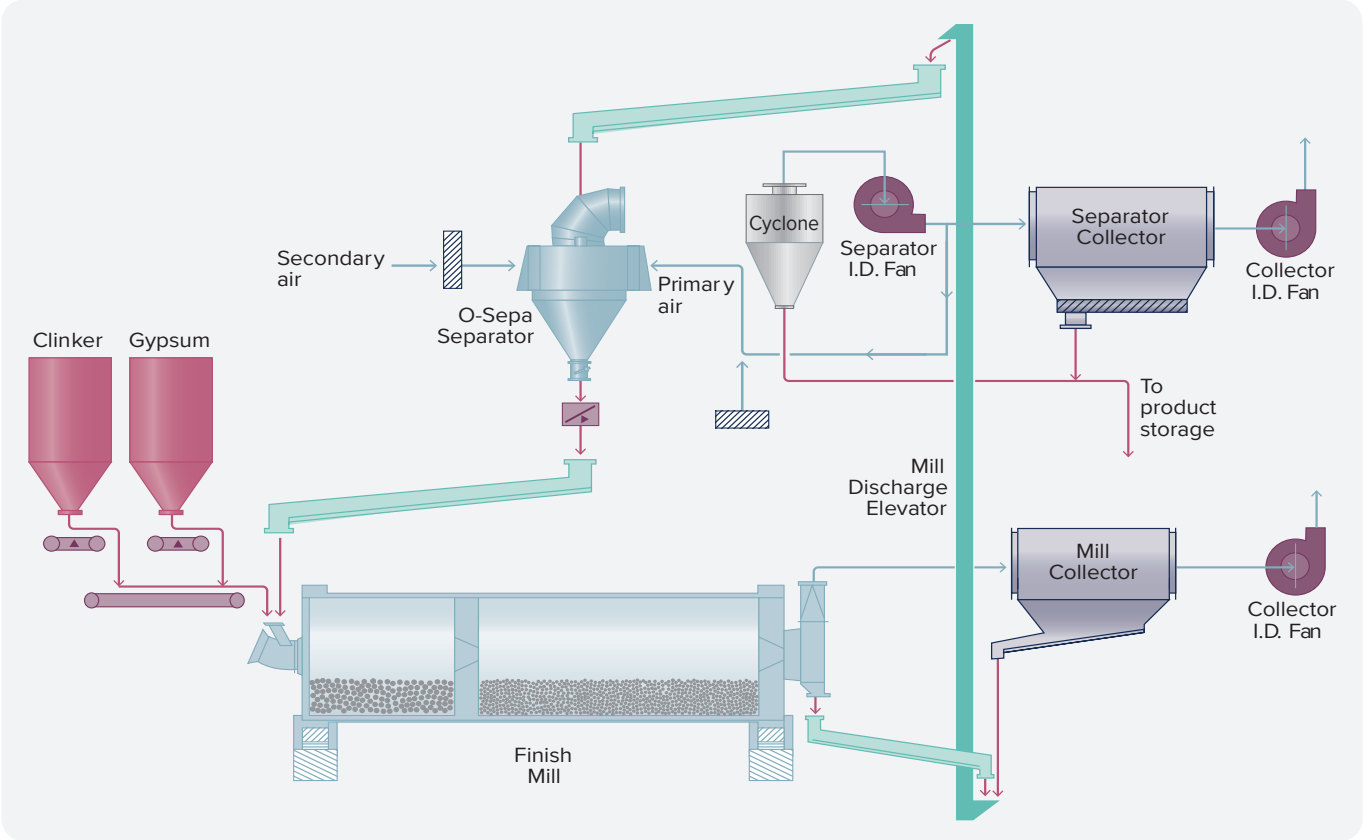
For retrofits, a system with dedusting cyclones on the outlet (product) end can be beneficial. In this arrangement, there is less exhaust gas – which is an advantage when it comes to obtaining environmental permits. Meanwhile, the compactness of the O-Sepa (which also requires a smaller dust collector than other separators) means that it is often easier to fit within existing plant layouts.

For new installations that want a simpler system with less equipment and fewer drives, a full vent arrangement is possible. The separator fan handles clean gas, reducing maintenance and allowing for a higher-efficiency fan design. Any recycled air is clean – which means the duct arrangement is not limited. And although the dust loading it higher, it is coarser, increasing collection efficiency. Last but not least, this arrangement provides the maximum air cooling or maximum system temperature for controlling product quality.

Whatever arrangement you choose, it's possible to draw fresh air for classifying: the basis for superior cooling capability. This means better control of recirculating material temperatures. Which reduces the chance of ball coating and pack set problems in the silo.

Finally, it's possible to take the mill vent gases through the separator, eliminating the need for a separate dust collector and fan.

Cyclone system



Designed to reduce maintenance

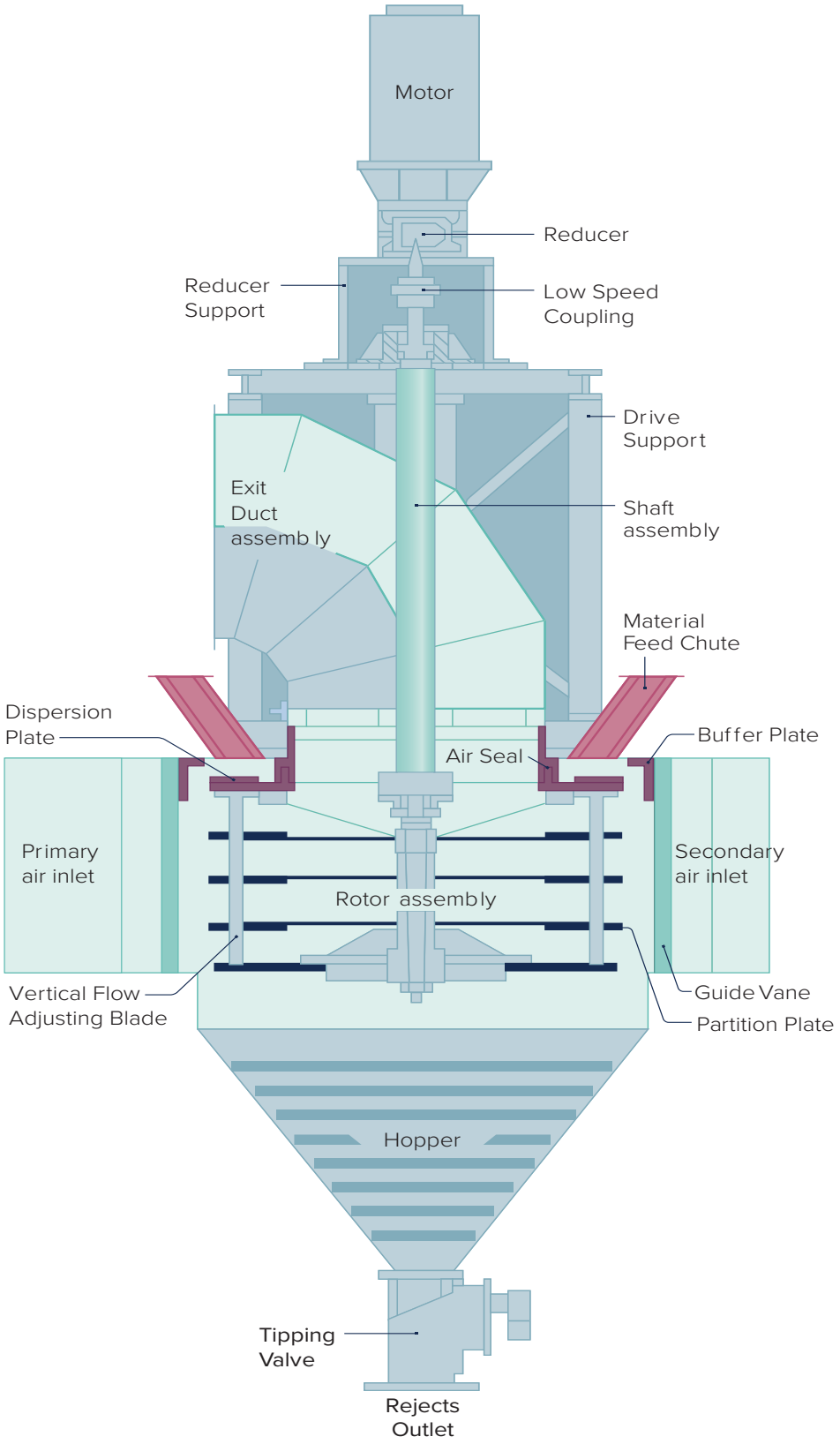
With our longstanding expertise with O-Sepa installations and operations, we understand where and how wear happens. Based on this experience, we've designed the O-Sepa's wear protection specifically to address the various wear challenges in the most effective was possible.

This means ceramic tiles to line the separator inlet and exit ducts, as well as the rotor shaft, to protect against jet abrasion from dust entrained in the gas streams.

It means coating the rotor vanes with ceramic spray for the same reason. While the guide vanes are made from chromium carbide bulk-welded plate to resist the impact of oversized reject materials from the rotor.

And it means feed chutes made from abrasion-resistant plate. While the air seal and material distribution plate are made from abrasion-resistant NiHard castings.

This tailoring of wear materials to the specific wear location and mechanism reduces maintenance requirements and ultimately helps further lower overall operating costs.



Wear Protection Components

- Ceramic tile on inlet ducts, outlet ducts, and shaft assembly
- Spray ceramic coating on rotor
- Chromium carbide bulk-welded plate for guide vanes
- NiHard castings for air seal, distribution plate, and buffer ring
- Abrasion-resistant plate in feed chutes
- Autogenous hopper lining

How to size an O-Sepa™ Separator

1. Predict circulation factor:

CIRCULATION FACTOR = _____

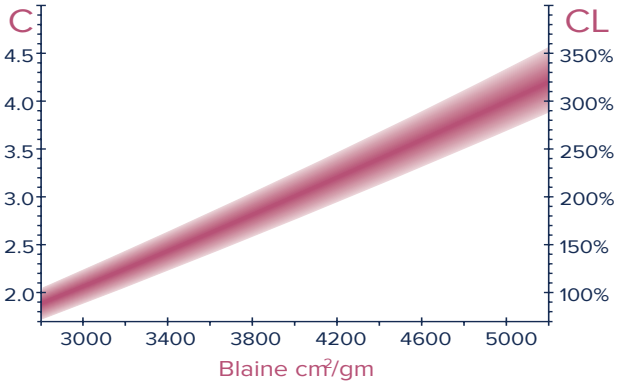
2. Determine expected system production and feed rate to separator:

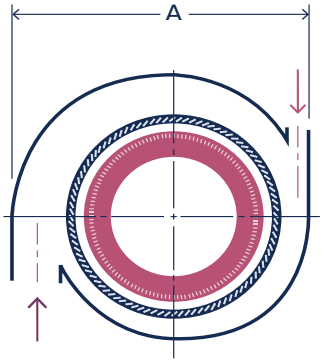
_____ **MTPH PRODUCTION**

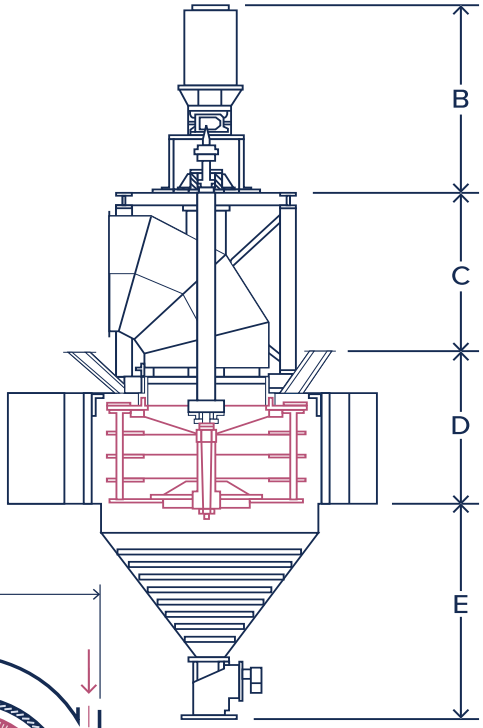
X _____ **CIRCULATION FACTOR**

= _____ **MTPH FEED**

3. Pick the separator size (from the chart below) that has rated feed and production which are greater than those expected. If separator will produce several types of cements, use maximum feed and production.







Size	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Typical Drive Type	Rotor Diameter (mm)	Rotor Height (mm)	Speed (rpm)	Motor (kW)	Air (m3/ min)	Feed (mtph)	Production (mtph)
N-250	1522	*2550	–	673	1604	V-belt	940	550	250-550	25	250	37.5	13
N-350	1757	1350	1190	798	1510	Vertical	1040	518	170-370	35	350	52.5	18
N-500	2109	1470	1396	956	1993	Vertical	1220	580	190-420	55	500	75	26
N-750	2517	1650	1676	1107	2310	Vertical	1460	730	170-360	75	750	112.5	38
N-1000	2714	1890	1693	1387	2505	Vertical	1660	850	150-320	90	1000	150	51
N-1500	3294	2220	2281	1434	2931	Vertical	2000	1060	120-260	110	1500	225	77
N-2000	3804	2500	2541	1643	2878	Vertical	2270	1240	105-230	150	2000	300	102
N-2500	4194	2590	2894	1791	3275	Vertical	2530	1390	95-205	185	2500	375	128
N-3000	4689	2610	3087	1933	3616	Horizontal	2760	1530	85-190	225	3000	450	153
N-3500	5154	2780	3408	2077	3861	Horizontal	2970	1660	80-175	260	3500	525	179
N-4000	5459	2880	3363	2515	4118	Horizontal	3150	1780	75-165	300	4000	600	204
N-4500	5750	2890	3744	2331	4171	Horizontal	3330	1900	70-155	335	4500	675	230
N-5000	6074	2900	3458	2806	4596	Horizontal	3480	2000	65-150	375	5000	750	255
N-5500	6300	3000	3454	3330	4900	Horizontal	3640	2100	60-145	410	5500	825	281
N-6000	6613	3010	3453	3607	5100	Horizontal	3850	2200	54-135	450	6000	900	306
N-7000	6991	3020	4736	3237	5500	Horizontal	4159	2371	50-125	525	7000	1050	357

* with V-belt drive, value is B+C

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