Bulletin K-03

kason
CORPORATION

Vibroscreen® Circular Screen Separators

Kason Vibroscreen® Circular Screen Separators

Kason Screen Separators are self-contained, compact, production machines which make precise mechanical separations according to particle size through efficient use of multiplane inertial vibration techniques. They are designed and built to solve the most difficult classifying, separating and dewatering problems.

One to five screen surfaces are superimposed to yield up to six predetermined fractions. Kason Separators are being used to make accurate separations ranging from 2" (51 mm) to 0.0014" (.03556 mm) (400 mesh). Standard models, sized from 18" diameter to 100" diameter and equipped with the finest quality screens, are built of mild or stainless steel. Other construction materials as well as a variety of protective coatings can be supplied if required.

Safety first All Kason equipment is designed with an emphasis on prevention of injury to operators and maintenance personnel. One of the most significant areas is the gyrator access door. A unique safety interlock mechanism automatically cuts the power to the gyrator motor as the door opens, preventing any possibility of worker injury. The safety switch is molded in red industrial grade plastic and complies with United States Occupational, Safety and Health Administration and international standards.

Highly visible Kason warning labels which are always placed on new Vibroscreen circular screen separators conform to American National Standards Institute standards. If these warning labels are not visible on your Vibroscreen® or other vibrating screen separators, call Kason and ask for new labels. There is no charge for these labels. The part numbers are 044-09 for the label that warns of the dangers of rotating equipment, and 044-04 cautions people not to locate a circular screen separator on a combustible surface.

Kason…Where Innovative Solutions Are Standard

Since 1967 Kason has maintained an overriding commitment: to combine personalized, creative engineering services with the design and manufacture of process equipment and systems that improve productivity, quality, safety and profitability.

Our line of Vibroscreen® circular separators is the most extensive in the industry. The standard design with its numerous modifications is presented in this bulletin. Separate bulletins are available which describe specialized models such as Pneumati-Sifter separators for low density pneumatic conveying systems, recycling systems for high capacity flows of materials requiring double the screening area in the same size unit, and ultra-high capacity scalping designs that fit easily into spaces where headroom is severely limited.

In addition, Kason is proud of its reputation for helping its customers customize when standard equipment can't do the job efficiently. Innovative engineering is our middle name.

Typical Applications

Dry separation

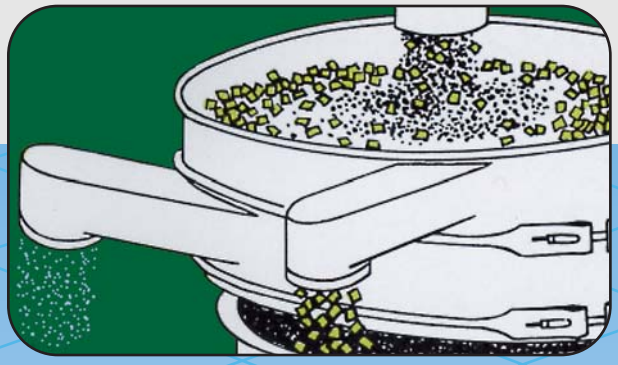
Foods - recovery of rice from hulls, coffee beans from chaff, and tea from bags.

Chemicals and Petrochemicals - catalyst beds are classified into alundum balls, scale, clean catalyst pellets, and dust.

Minerals - separation of rock dust from asbestos shorts, alumina from rotary kiln brick impurities, and stones from pit sand.

Animal Feeds - scalping of foreign material from mash; removal of bone chips from meat meal.

Grains - separation of dockage (wheat, wild oats, etc.) from flax seeds; cleaning of agricultural seeds and grains.



Dry classification

Foods - pea grading, instant coffee powders, ground coffees, dried milk, sugars, salts, cereals, starches, spices, nuts, rebolting flour, potato powder and flakes, powdered eggs, candies, powdered cheese, and bread crumbs.

Chemicals - polyvinyl chloride, polyethylene pellets, melamine, phenolics, cellulose acetate, polystyrene, sodium carbonate, calcium carbide, copper sulfate, detergents, adipic acid, iron oxide, caustic soda flake, di-calcium phosphate, stearic acid, titanium dioxide, zinc oxide, sodium sulfate, potassium iodide, sodium alginate, borax, calcium carbonate, silicon carbide, monosodium glutamate, alum, calcium chloride, and sodium cyanide.

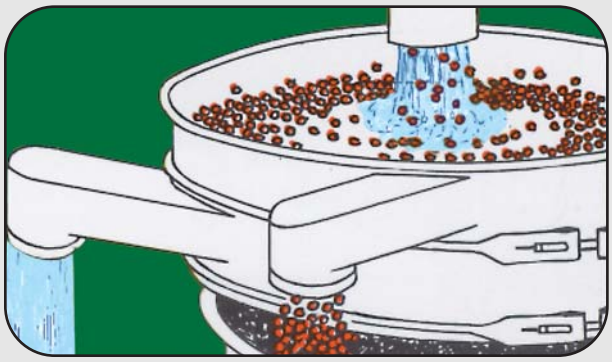
Minerals and Metals - metal powders (aluminum, copper, bronze, nickel, iron, magnesium, etc.), barytes, silica, bauxite, cement, brick clay, coke, fluorspar, limestone, mica, perlite, talc, antimony, dolomite, feldspar, diatomaceous earth, rock salt, and nepheline syenite.

Pulp and Wood Products - wood chips, particle board, sawdust, and wood flour.

Pharmaceuticals - aspirin, boric acid, epsom salts, sodium bicarbonate, tablet de-dusting, and granulations.

Fertilizers - granulated mixes, potash, phosphate rock, urea, and ammonium nitrate, sulfates, and phosphates.

Abrasives - carborundum, aluminum oxide, and blasting silica.



Solids/liquid separation

Foods - separation of bagasse from sugar melt, casein curd from whey, protein particles from yeast slurry, corn fiber from starch slurry, and gluten from wheat starch; dewatering of fruits and vegetables, spent coffee grounds, potato slices, instant rice, and tuna; clarifying of chocolate liquor, French fry oil, molasses, caustic bottle wash, and apple or citrus juices prior to filtration.

Chemicals - separation of salt from glycerine, polyethylene from extruder water, coagulum from latex, and algins from digestion liquor; dewatering of digested reclaim rubber and T.N.T.; clarifying of polyvinyl acetate emulsions, paints, and enamels.

Pulp - dewatering of rejects before refining; dewatering of knots.

Solids classification in liquid medium

Chemicals - clarify aluminum paint suspension, remove oversize particles from suspensions fed to nozzle centrifuges, dewater Glaubers salt while removing silt, and classify pigments.

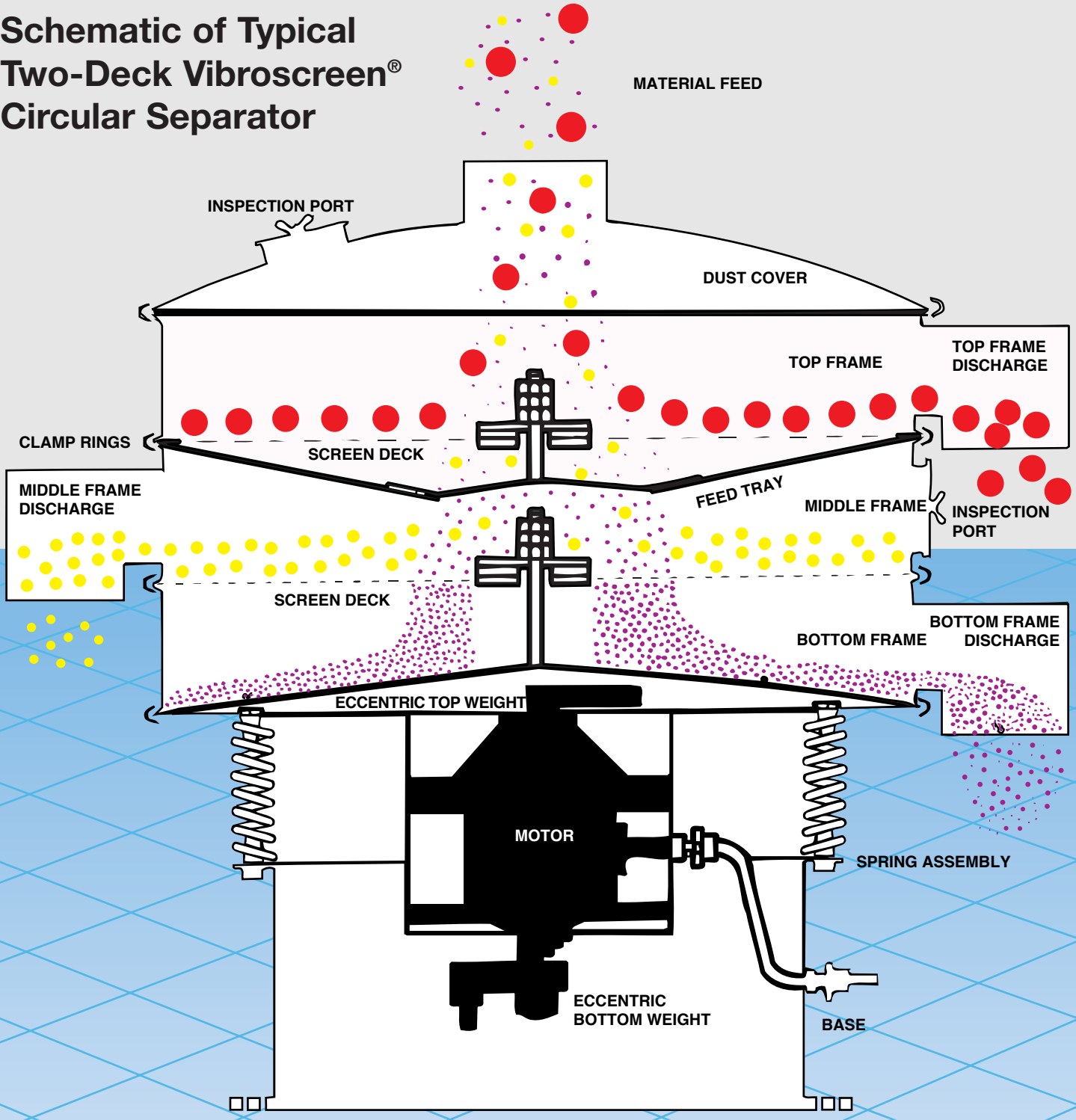
Minerals - separate impurities from kaolin slurry prior to centrifuging; classification of silica to remove iron impurities, columbium ore in closed circuit grinding, and cement slurry following ball mills.

Pulp and Paper - recovering usable fiber from mill effluent; classification of starch and coating suspensions, mill and white water to eliminate shower blocking, and barker effluent.

Ceramics - clarify body and glaze slips for whiteware.

Waste Disposal - Clarification of white water from pulp mills, cannery wastes, paunch manure from meat packing, distillery slop.

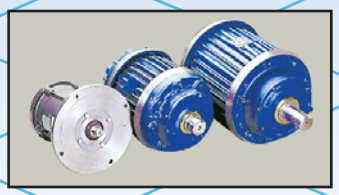
Schematic of Typical Two-Deck Vibroscreen® Circular Separator



Kason Screen Separators are unitized machines which impart adjustable, multiplane, mechanical, inertial vibrations to material being processed. The basic assembly consists of a number of interchangeable frames for retention of screen mesh decks and for provision of discharge outlets.

A high torque, low power consuming, unbalanced weight gyratory motor with a double extension shaft, fitted at each end with variable eccentric weights, is rigidly mounted to the main screening assembly.

This assembly is supported on the circular base by rugged springs which allow the screen assembly to vibrate freely while completely preventing vibration transmission to the floor supporting the machine. All parts above the spring level, including the motor, are integrated as a rigid structure. The spring isolation from the support base results in a self-balancing system which requires minimum power and avoids mechanical stress.



How It Works

Material to be screened is fed to the center of the top screen. Oversize particles are moved by the multiplane motion to the screen periphery where they are discharged. Undersize particles or liquid passes rapidly through the screen. Kason Screen Separators are equipped to handle up to five superimposed screens and, in the case of multiple frame units, each screen is equipped with a feed tray to redirect the undersize to the center of the screen beneath. This greatly increases screening efficiency by forcing material to pass over a maximum amount of screen surface.

The three dimensional inertial vibration motion of Kason Separators was originally discovered and developed by G. H. Meinzer. It is based on a principle in which motor rotation imparts vibration to an entire screen assembly in both vertical and horizontal planes. As proven in Kason Screen Separators, the system allows multiple deck construction, which conserves operating space, and makes maximum use of available screen. In addition, there is no flexing of wire in the screen cloth, and screen life is greatly prolonged.

The top eccentric weight of the double extension shaft motor operates in a plane which is close to the center of the mass of the assembly. This generates a horizontal throw to the screen assembly. The bottom eccentric weight rotates below the center of mass, which creates a high frequency tilt on the screen. The third dimension is a tangential component produced by the combination of the horizontal and vertical movements. The tangential component moves oversize material laterally across the screen while encouraging undersize particles to flow through the screen.

Both top and bottom eccentric weights of Kason Screen Separators are independently variable for mass and angular relationship, giving a great degree of control over all vibration components. This results in the ability to obtain optimum conditions for screening nearly any material.

ADJUSTING FOR OPERATION

Top Eccentric Mass — If the mass of the top eccentric weight is increased, the horizontal throw of the screen will also increase, causing oversize material to discharge at a faster rate. This is especially useful for applications such as dewatering in which the quantity of solids is extremely high.

Bottom Eccentric Mass — Increasing the bottom eccentric weight increases the vertical component of motion. This promotes turn-over of material at the screen surface, encouraging a maximum quantity of undersize material to flow through the screen. The vertical motion also inhibits blinding of the screen by "near-size" particles. When processing light or fragile solids, it is sometimes desirable to reduce the weight of the bottom eccentric to provide minimum vertical motion to avoid particle breakage and attrition.

Bottom Eccentric Lead — The tangential component of the motion imparted to material on the screen is controlled by the relative angular position of the top and bottom eccentric motor weights. The screening pattern is controlled, therefore, by altering the relative angle of the bottom eccentric to the top eccentric.

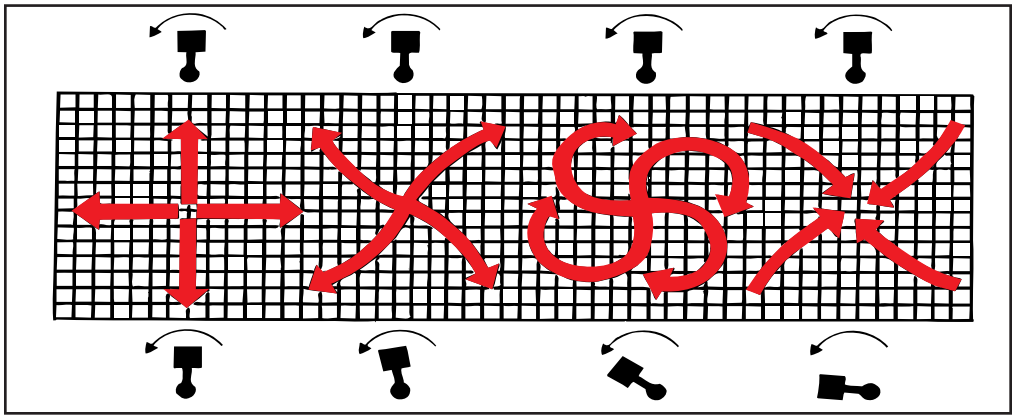
When the two eccentrics are lined up and in phase, the tangential component is at a minimum, and there will be virtually no tendency for the material to spiral; it will simply discharge radially from the center to the periphery. When the bottom eccentric is positioned to lead the top eccentric, a spiral motion is imparted to solids on the screen and, under some conditions, it is possible to prevent discharge of oversize particles from the screen surface.

Adjustment of these three components in Kason Screen Separators can be made in a few minutes by the operator. This complete control allows Kason Separators to be adjusted to give maximum efficiency on the material being screened.

Kason controlled discharge patterns

typical flow patterns

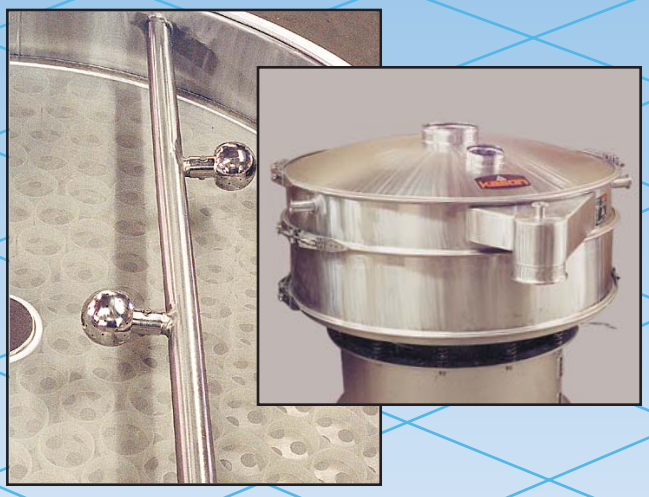
Chart shows solids distribution on the screen from a central feed,with typical bottom weight positions. Black arrows show direction of rotation



Kason features improve productivity and quality

Clamshell Quick Screen Change Assembly

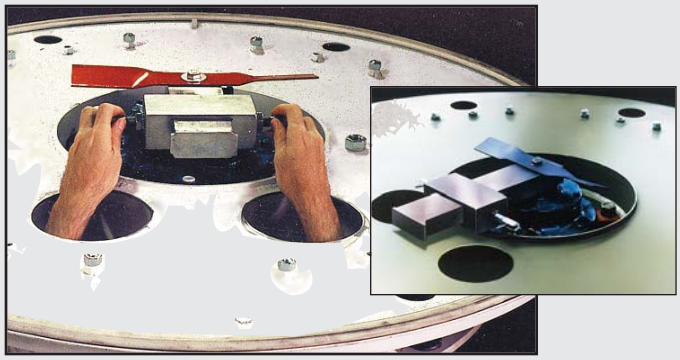
- Permits fast and easy changing of screens. The entire screen changing operation takes only a few minutes, at most, and reduces the number of people required.
- Accommodates mounted screens with or without center tensioning construction.
- Permits screen changing on single- or multi-deck circular vibratory screeners.
- Allows for screen decks with or without anti-blinding devices.
- The Kason Quick Screen Change Assembly is the only deck opening device supporting all these standard options.



Clean-In-Place (CIP) Spray Heads

These perforated, ball-shaped, stainless steel spray nozzles, positioned at the end of stainless steel pipes, provide multidirectional spraying of cleaning and rinsing fluids, simplifying the cleaning of circular separator interiors.

E-Z Force Eccentric Weight Adjusting System



By positioning the eccentric between the access ports, an operator can reach up, pull out the retractable pins and slide the weight, and allow the pins to re-enter the holes, fastening the weight along the shaft.

The eccentric weight slides backwards or forwards on the shaft permitting adjustment of the unbalanced weight. Retractable pins hold the weight in position along the shaft.

High Capacity Multi-stage Kascade Screening Decks

Adding an internal recycle Kascade deck to new or existing screeners boosts capacity 60 to 80%. When the upper deck is fed with more material than it can screen, the overflow of on-size and oversize material cascades over the upper screen's 360˚ periphery onto a larger screen of equal mesh that scalps the balance of material in normal fashion. Available with numerous accessories, in diameters from 40 to 100 inches (1016 to 2540mm) to scalp up to 70 tons of free-flowing material per hour.

Flexible, See-Through Dust Cover

Our dust cover makes the upper screen visible for inspection, permits the user to witness the material flow pattern on the screen, and provides easy access to the top deck.

Screening Efficiency Enhancements

Auto-Lubrication System

The Auto-Lube pressure-feeds lubricant into motor bearings for 6 to 12 months between reservoir replacements. Continuous lubricant flow flushes the race of wear materials, broken-down lubricant and contaminants, and minimizes dead spots of unused lubricant. Optional on Vibroscreen separators of 48+ inch diameters. Can be retrofit in one hour to any circular vibratory screener.

Ultrasonic anti-blinding

The patented Kasonic® anti-blinding device allows sifting as fine as 25 microns (500 mesh) on any circular vibratory screener of 18 to 100 inch diameter. It transmits ultrasonic frequencies (adjustable) to the screen, adjusting power automatically according to screen loads. It operates with standard screens, reducing cost, and is supported independent of screen, prolonging screen life.

Ball Tray anti-blinding

The Ball Tray assembly prevents near-size, dry materials from blinding the screen. It consists of an "operating screen" and a coarse-mesh "ball screen," between which elastomeric balls are captive. Multi-plane inertial vibration of the separator causes the balls to bounce continuously against the downstream side of the operating screen, flexing the screen surface and dislodging near-size particles.

Kleen Screen Rings

Kleen-Screen Rings are effective at preventing screen blinding by fibrous, stringy and sticky materials. Multi-plane inertial vibration of the separator causes plastic rings to move continuously across a perforated stainless steel plate, shearing fibers and scraping away gummy materials. Hollow rings promote product flow over the entire screen surface.

Four-finger Flex Wiper

A top-side cleaner used to prevent blinding of the operating screen by slimes, pitch and other soft, gummy materials, the Four-Finger Flex Wipe consists of four radial arms of durable neoprene. Multi-plane inertial vibration of the separator causes the wipers to rotate continuously. Specially designed units are available for especially difficult materials.

Wiper Blade Assembly

The Wiper Blade Assembly prevents screen blinding and boosts capacity by breaking down lumps and agglomerates. The independently mounted assembly allows adjustment of wiper blade height above or at the screen surface and adjustment of blade speed from 1 to 15 RPM. Rubber wiper blades or bristle brushes can be affixed to agitator shaft arms.

Test Laboratory

The Kason test laboratory controls and monitors all processing variables, optimizing equipment configurations according to customers' materials and application parameters. Kason can evaluate the effect of controlled variations in flow rates, deck designs, temperatures, mesh sizes, and a variety of screening accessories offered. Laboratory testing of customer-supplied materials is held in strict confidence and is offered without charge.

A. Pigment manufacturer

B. Polyolefin pellets

C. Pharmaceutical waste

D. Industrial laundry

A. To ensure top quality production, a pigment manufacturer installed a Vibroscreen. It ensured that the pigment and water formulation was free of lumps and all extraneous material over 200 mesh. The 48-inch diameter Vibroscreen units operate continuously on a 24-hour-per-day schedule. Several Vibroscreen units handle about 2000 pounds per hour.

B. Engineers of a polyolefin facility encountered a production bottleneck when they increased pellet output by 50%. A 360° discharge deck was then installed in the Vibroscreen. It provides an unobstructed discharge onto the inclined ramp for rapid discharge to the oversized product outlet. These changes and others increased capacity from 18,000 pounds per hour to more than 50,000 pounds per hour.

C. Medical waste slurry that had been autoclaved and ground was fed into the Vibroscreen unit for dewatering. The water passing through the screen was discharged into a sanitary sewer. Because the solid waste had been sterilized and made unrecognizable, the solid waste was no longer considered medical waste and thus was suitable for landfilling.

D. To remove fibers, insoluble organic matter, lint, sand and pumice stone chips…and to meet EPA regulations, industrial laundries install Vibroscreen units. They help keep TSS and BOD_5 levels low, and the clarified water helps keep heat exchanger walls free of build-up that would lower thermal efficiency. A 60-inch diameter Vibroscreen handles 300 gallons per minute.

Kason Vibroscreen® Separators Help

E. Injection molder

F. Lime slurry

G. Feed mill

H. Fused white alumina

E. Reground sprues and flash from molding can be recycled if plastic dust and strands are first removed. A Vibroscreen classifier was selected because of its space savings and efficiency. The molder found that 90% of the total regrind is readily molded into high quality products.

F. The U.S. Bureau of Reclamation relies on a Vibroscreen to ensure that only creamy, pebble-free slaked lime reaches solids contact reactors used to remove fine suspended solids from salty river water. Nozzles inside the Vibroscreen units allow for water sprays to clean usable lime particles off the pebbles on the screens. One hundred tons per day of slaked lime passes through the screens.

G. Because Kascade decks discharge freely from the full 360° periphery, there is no “rope” accumulation on the screen to impede discharge. Effective screen area is greatly increased and screen wear reduced. The 72-inch diameter unit operating at this feed mill handles 7.5 metric tons per hour.

H. Five Vibroscreen separators equipped with high capacity discharge decks provide top efficiency. Ball decks and scrapers contribute to high efficiency through their anti-blinding abilities. In addition to controlling size distributions, the Vibroscreen units help prevent contaminants from getting into the fused white alumina which is 99.5% Al_2O_3.

Solve Processing Problems

Kason VIBROSCREEN® Circular Vibratory Screeners Meet Sanitary Standards

Kason circular screen separators have been designed to meet various regulations established by the FDA, 3A Dairy Sanitary, BISSC, EEC and other governmental and industry groups. You can specify Kason separator finishes to all commercial specifications. In addition, we offer separator models that meet all pharmaceutical and FDA requirements for welds. Whatever the specification or requirement, you can rely on Kason equipment to meet it.

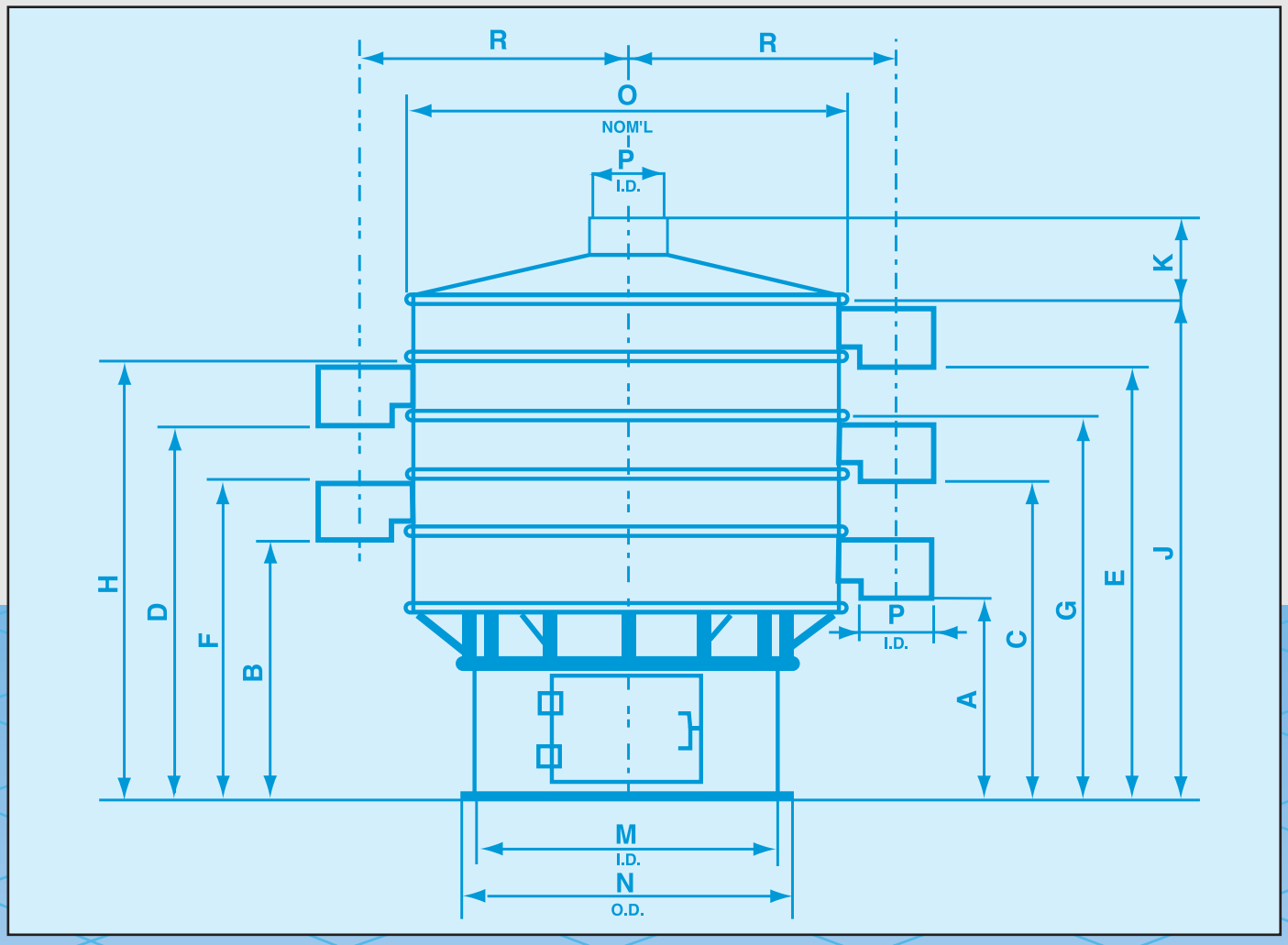
This compact 'Flo-Thru' circular screen separator serves well for processing lines with limited vertical space. Stainless steel construction meets FDA and other standards.

Single deck Vibroscreen® unit equipped with lockable casters. Both Kason separators shown above and below meet 3A specifications.

This Kason Pneumati-Sifter vibratory screener was designed for elevated temperatures and pressure, and has a sanitary finish.

VIBROSCREEN® vibratory separator for pharmaceutical and other contamination-sensitive applications features clean-in-place (C.I.P.) spray heads for hands-free wash down.

Nominal Dimensions — Kason Vibroscreen® Separator



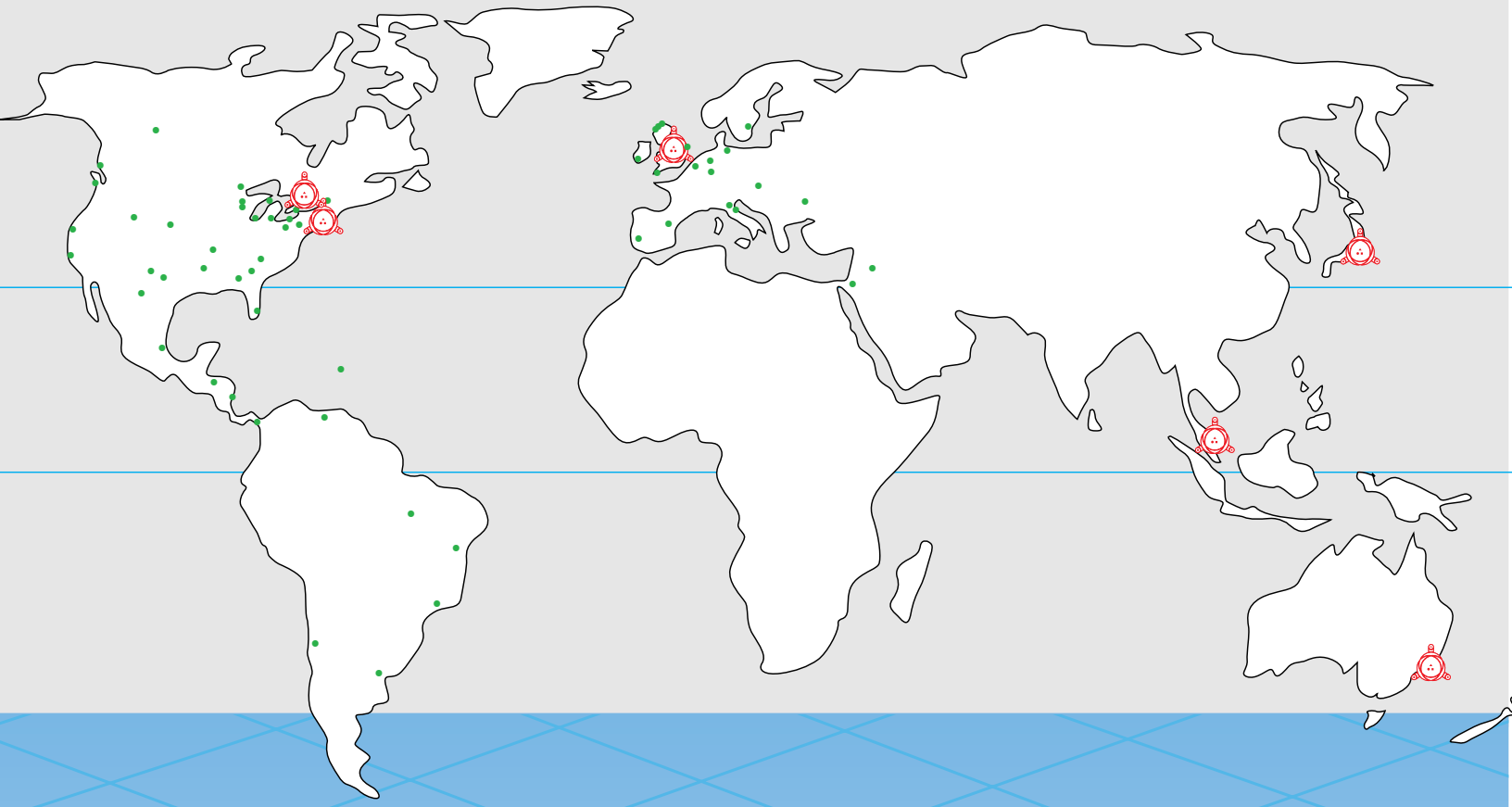
Dimensions (inch)

Model	A	B	C	D	E	F	G	H	J	K	M	N	O	P	R
K-18	15-7/8	20	23-1/2	27	30-1/2	23-7/8	27-3/8	30-7/8	34-3/8	4-1/8	14-7/8	17-1/2	18	4	12
K-24	14-5/8	19-3/4	24-1/4	28-3/4	33-1/4	24-7/8	29-3/8	33-7/8	38-3/8	3-7/8	17-3/8	20	24	6	16-1/4
K-30	15-1/4	20-3/4	25-1/4	29-3/4	34-1/4	25-7/8	30-3/8	34-7/8	39-3/8	4-5/8	20-3/8	23-1/2	32	6	20
K-40	15-7/8	22-1/4	28-3/4	35-1/4	41-3/4	29-7/8	36-3/8	42-7/8	49-3/8	6-1/8	25-7/8	29-1/2	40	8	26
K-48	19-7/8	26-1/4	32-3/4	39-1/4	45-3/4	33-7/8	40-3/8	46-7/8	53-3/8	6-1/4	31-3/4	36-1/4	48	8	29-3/4
K-60	20-3/8	28-1/4	36-3/4	45-1/4	53-3/4	37-7/8	46-3/8	54-7/8	63-3/8	7-1/8	39-3/4	44	60	8	36
K-72	30	40-7/8	50-3/8	59-7/8	69-3/8	51-5/8	61-1/8	70-5/8	80-1/8	9-1/4	46	49-3/4	72	8	40-3/4
K-84	29-1/2	39	49-1/2	60	70-1/2	50-1/2	61	71-1/2	82	10-3/4	58	61-3/4	84	10	49
K-100	32	42-1/2	53	63-1/4	74	54	64-1/2	75	85-1/2	9	78-3/8	82-3/4	100	10	56

Dimensions (mm)

Model	A	B	C	D	E	F	G	H	J	K	M	N	O	P	R
K-18	403	508	597	686	775	607	695	784	873	105	378	445	457	102	305
K-24	371	502	616	730	845	632	746	861	975	100	441	508	610	152	413
K-30	387	527	641	756	870	657	772	886	1000	117	518	597	813	152	508
K-40	403	565	730	895	1060	759	924	1089	1254	155	657	749	1016	203	660
K-48	505	667	832	997	1162	860	1026	1191	1356	159	806	921	1220	203	756
K-60	518	718	933	1149	1365	962	1178	1394	1610	181	1010	1118	1524	203	914
K-72	762	1038	1280	1521	1762	1311	1553	1794	2035	235	1168	1264	1829	203	1035
K-84	749	990	1257	1524	1791	1283	1549	1816	2083	273	1473	1568	2133	254	1245
K-100	813	1080	1346	1606	1880	1372	1638	1905	2172	229	1991	2102	2540	254	1422

Design features and dimensions are subject to change without notice. Certified prints are available on request.



Representative Locations
Manufacturing Facilities

Kason vibratory screen separators are manufactured, sold and serviced on 5 continents, in 44 countries, through 6 manufacturing facilities and more than 100 highly trained separation specialists.

ISO 9001
KEMA CERT
Accredited by the Dutch Council for Accreditation (RvA)
Accredited by the Registrar Accreditation Board (RAB)

Kason CORPORATION

67-71 E. Willow St., Millburn, NJ 07041-1416 • Tel: 973-467-8140 • Fax: 973-258-9533
Web: www.kason.com • E-mail: info@kason.com
Manufacturing, sales and service worldwide

Canada:
Separator Engineering Ltd.
2220 Midland Avenue, #85, Scarborough, Ontario M1P 3E6
Telephone: 416-292-8822 • Fax: 416-292-3882
info@separatorengineering.com

Europe:
Kason Corporation, Europe
Units 12 & 13, Park Hall Business Village, Park Hall Road
Longton, Stoke On Trent ST3 5XA, UK
Telephone: +44 (0)1782 597540 • Fax +44 (0)1782 597549
sales@kasoneurope.co.uk

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