

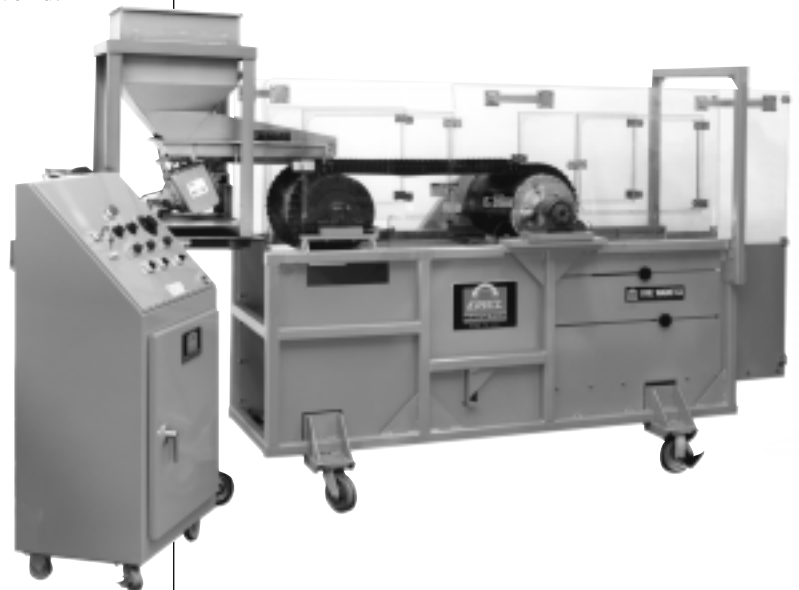
Laboratory Equipment

...Only from Eriez.

Magnetic, Vibratory and Screening

Efficient, advanced design, proved-in-operation laboratory and pilot plant equipment for wide variety of materials and applications.

The equipment briefly described on the following pages is used routinely in Eriez' own Test Laboratory, where hundreds of tests of customers' samples are conducted yearly. Many other units are at work in universities, commercial testing laboratories and industrial installations throughout the world.



RE ROLL SEPARATORS



High gradient permanent magnetic separators for the separation of paramagnetic materials.

Eriez Rare Earth Roll Separators utilize high energy rare earth magnets to form an extremely powerful high gradient magnetic circuit. Two varieties of rare earth materials and numerous belt material options are available, which gives this unit the flexibility to handle a wide variety of applications. In addition to the standard design which is optimized for separation of paramagnetic materials, the RE Roll radial circuit design can be produced with various ferrite magnetic materials, giving a

lower cost option for separation of ferromagnetic materials.

The RE Roll utilizes a rare earth magnetic head pulley in widths up to 60-inches (1016 mm). Product is fed to the belt by an Eriez electromagnetic vibratory feeder.

The Eriez control, stepless from 0 to 100% of capacity, provides precise adjustment of material flow.

Depending upon the application, one, two or three rolls may be required in the separator. Feeds from 1/2-inch (13 mm) down to very fine material can be handled and capacities range up to 10 tph.

DRY VIBRATING FILTERS

High intensity electromagnetic filter to remove fine, ferrous contaminants from dry powder. Developed for the pharmaceutical, cosmetic, abrasives, specialty glass, specialty metallic powder and industrial minerals markets.

Eriez' Vibrating Magnetic Filter now provides a method of effectively purifying fine dry powder. Ferrous contaminants are typically reduced to the ppm level when treating materials such as alumina, talc, and silica and zircon flours.

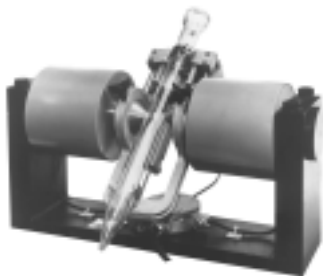
The electromagnet consists of a solenoid coil encased in a steel housing. A high intensity uniform magnetic field is generated in the bore of the coil. A canister passing through the bore is packed with filter elements, referred to as the matrix. The matrix consists of a stack of expanded steel plates arranged with staggered openings to accommodate the material flow. The matrix amplifies the externally applied magnetic field, produces regions of extremely high gradient, and provides collection sites for the capture of ferrous contaminants. A dual vibratory drive system, mounted on the canister, imparts a high frequency, low amplitude vibration to the matrix. When feed



material flows through the magnetized matrix, the iron-bearing contaminants are captured and held, resulting in a high purity product.

DAVIS TUBE TESTER

Model EDT



Determine magnetic separation characteristics of ores and check plant concentrate and tailing quality.

Eriez' Davis Tube Tester Model EDT is an indispensable laboratory unit for determining the ferromagnetic and nonmagnetic fractions of small samples of crushed magnetic iron ore, magnetite, pyrrhotite, etc. It is helpful in determining mesh of liberation, selectivity index, grade and recovery of ferromagnetic compounds. In operating plants, it serves as a control device by

determining plant concentrate and tailing quality.

A field intensity of 4000 gauss in the center of the gap of the model EDT Tester guarantees superior performance and consistent results. Variable speed of oscillation from one to 90 cycles per minute and adjustable angle of operation from horizontal to 45° provide flexibility to suit established laboratory procedures and personal preference. Tube rotation of 120° and stroke of 2 inches (51 mm) are fixed standards.

RE DRUM SEPARATORS AND STANDARD DRUM SEPARATORS



Strong, 15-inch (381 mm) diameter drums operate at 42 rpm for superior magnetic protection in applications requiring a high degree of product purity.

Eriez Rare Earth Drum Separators effectively collect fine ferromagnetic and paramagnetic materials in ore treatment operations. Powerful permanent magnets make possible more efficient separation performance for a broader range of applications than ever before.

As material reaches the drum, the magnetic field attracts and holds ferrous particles to the drum shell. As the drum

revolves, it carries the material through the stationary magnetic field. The nonmagnetic material falls freely from the shell, while ferrous particles are held firmly until they are carried out of the magnetic field.

Type RE (Rare Earth), Model HF (drum in Housing with feed hopper) and Model HFP (drum in housing with feed hopper and discharge chutes) Permanent Magnetic Drum Separators provide efficient separation and years of trouble-free automatic removal of magnetics from rock products, minerals and ores.

WET HIGH INTENSITY SEPARATORS



Series L Model 4

Eriez Series L Model 4 Laboratory Separator consists of two electromagnetic coils with a stainless steel box containing a flux-converging element located between magnetic poles. This pole box is 8 inches high x 2 inches wide x 1-inch deep (200 x 50 x 25 mm) with inlet and outlet valves. A funnel is supplied.

The standard elements of expanded metal sheet have many sharp edges to which the feed material is exposed. Each edge becomes highly induced

during operation and provides the necessary high intensity, high-gradient field to remove the weakly magnetic particles. When stacked, the element plates form vertically running grooves which assure clean discharge of nonmagnetics.

This laboratory separator has a capacity of 4 gpm (15 lpm) of feed pulp at approximately 20% solids with particles in the -30 mesh size range. It is completely controllable by hand so that all factors are independently variable for maximum flexibility of operation.

The overall dimensions of the L-4 separator are 46 inches high, 30 inches wide and 20 inches deep (1170 x 762 x 508 mm). Control input is 115/230V dc at a cold amperage of 26.3 and a cold wattage of 3000.

Model L-4-20

The Model L-4-20 WHIMS is a 20,000 gauss (in the open air gap) batch separator for laboratory work with very feeble magnetic materials. Its construction and capacity are essentially the same as that of the Model L-4 separator.

In both units, tests are run by pouring or pumping a pulped sample into the separator with the magnet energized.

Magnetic particles collect in the magnetic element during operation and nonmagnetics are carried through the magnetic zone by drag forces. Magnetics are flushed out by feeding water through the pole box with the magnet turned off. Feeding and wash cycles can easily be timed and products weighted and assayed for separation efficiency calculations.

The Model L-4-20 is 68-3/4 inches high overall, 28-5/8 inches wide and 28 inches deep (1746 x 727 x 711 mm), not including the control cabinet. Because of improved design it operates on 70V dc at a cold amperage of 27.1 and a cold wattage of 1900.



WET HIGH INTENSITY SEPARATORS

Series CF Model 5-MM



High intensity wet magnetic separators for the separation of weakly magnetic materials.

The CF-5-MM Separator is designed primarily for use as a pilot plant unit but is of such size and portability that it can also function suitably as a laboratory machine. As a laboratory device, it can be utilized to predict the operation and performance of larger models.

Slurried feed containing magnetics and nonmagnetic fractions is passed through the magnetic zone. The magnetic particles are retained by the magnetic field, while the nonmagnetics are carried along by the drag force of the slurry water. As the revolving element holding trapped magnetics moves out of the magnetic field, the separated magnetic materials are released. The element passes through a washing

station, where four adjustable nozzles (more can be added if required) flush the magnetics into a compartmented discharge tray. Adjustable dividers keep the magnetic, the nonmagnetic and the middling fractions separate.

Capacity varies with types of feed and separation requirements, but ranges from 500 to 1500 lb/hr (255 to 675 kg/hr) on most materials.

Overall dimension of this machine are 87 inches high, 55 inches long and 41 inches wide (2210 x 1400 x 1040 mm). Control input is 230/460V ac, 3 ph, 60 Hz. The magnet operates on 115V dc at a cold amperage of 34.5 and a cold wattage of 3970.

ELECTROSTATIC SEPARATOR

A 50,000V machine for the separation of conductive and nonconductive materials.

The Eriez High Tension Electrostatic Separator is used to test and analyze separation efficiency for a wide variety of conductive and non conductive materials. Test data can be directly projected for plant operation.

The standard 10-inch (254 mm) drum will handle products in a size range from 8 to 250 mesh. Optional drums are also available in 6-inch (152 mm) and 14-inch (356 mm) diameters. Drum rotation speed is variable using a standard SCR motor drive.

Up to three dc electrodes of two different types (dry tube and wire or

arcless wet tube with needle points) can be used, assuring maximum lifting and pinning effect over a broad area of the drum surface.

Two splitter assemblies, both fully adjustable, keep the conductive, non-conductive and middling fractions separate.

The power supply is 50 kv dc, unregulated. A variable power supply is available as an option. Input is 115V ac, 50/60 Hz. Overall Separator dimensions are approximately 48 inches wide x 54 inches long x 48 inches high (1219 x 1372 x 1219 mm). The rectifier is approximately 21 inches wide x 25-1/2 inches long x 14 inches high (533 x 647 x 356 mm).



HYDROFLOAT CELL



A unique system for the separation/concentration of coal, iron ore and industrial minerals using a modified density approach.

Using a novel aeration system, the Eriez HydroFloat separator significantly increases the efficiency of the gravity concentration method by enhancing the density difference between various types of particles.

The HydroFloat separator is especially suited to applications where the feed material has a broad particle size distribution or a narrow range of densities.

In the Eriez HydroFloat separator, fine air bubbles are introduced with the water supply by means of a novel aeration system. The bubbles rise with the upward water current, meet the

suspended particles and selectively attach to the surface of a particular species. Surface characteristics generally determine spontaneous particle/bubble attachment, though chemical activation can be used to promote bubble attachment to specific minerals. Selective attachment of an air bubble to the coarse, low-density particles reduces the settling velocity of this material. As a result, the effect of particle size on separation efficiency is greatly reduced; thus improving process performance.

The Eriez HydroFloat separator consists of a main housing (separation zone and dewatering cone), product collection launder, water/air injection system and process control system.

CROSSFLOW

A system for sizing and/or concentrating minerals in slurry form having various particle size and density distributions.

The hindered-bed concentration method used in the CrossFlow Separator provides an economical and efficient means of sizing material such as sand and phosphate. Additionally, ores containing a mixture of high- and low-density components can be readily upgraded based on the difference in specific gravity. Examples include iron ore and heavy mineral sands with silica contamination and run-of-mine coal containing various ash-forming components such as rock and pyrite.

The Eriez CrossFlow Separator uses a unique tangential feed system to introduce a mineral slurry that contains particles of various size and density into the top of the separation chamber. This

novel approach provides capacities up to three times that of a conventional hydrosizer and eliminates errors associated with the introduction of excess feed water.

Particle size and/or density cut-point is controlled by adjustment of the water flow rate and the level of the teeter bed. The teeter water addition and level control systems are fully instrumented. The underflow discharge rate is regulated using an automated electronic control system consisting of a pressure gauge, PID loop controller and pneumatically-actuated control valve.

The Eriez CrossFlow Separator consists of a tangential feed system, main housing (separation zone and dewatering cone), product collection launder, water injection system and process control system.



WET DRUM SEPARATOR



For ore concentration and beneficiation, heavy media recovery, and purification of liquids and slurries containing ferrous contaminants.

Eriez' Wet Drum Magnetic Separator is designed for use in laboratories, small pilot plants and low-capacity wet separation applications.

The basic unit consists of a stationary electromagnet mounted on a shaft with an outer stainless steel shell completely enclosing the magnetic element. The drum shell and heads rotate on bearings around the fixed magnet and shaft.

The entire drum assembly is supported in a stainless steel tank with a water level and a discharge control. One side of this tank is transparent so the separation action and water level can be observed.

The Laboratory Model Wet Drum Separator has a capacity of up to eight gpm and can be used in either concurrent or counter-rotation operation.

Because an electromagnetic element is used, field intensity can be regulated to determine optimum separation conditions.

In addition, the magnetic attractive force can be regulated to simulate cobbing, roughing and finishing applications by adjusting the dc voltage input and gap between the drum and tank.

The control supplied with the unit is an Eriez Model LWD incorporating a variable dc power supply with ammeter, voltmeter and drum motor starter-reversing switch. The magnet requires approximately 370 watts at 115 V dc.

HIGH SPEED DRUM SEPARATOR

Model DF-A25

Continuous concentration or separation of finely ground dry magnetic materials.

DF permanent magnetic high speed Drum Separators are used to concentrate iron ore, remove magnetite from fly ash, purify ground slag, foundry sand and cement, and process other dry materials containing valuable or contaminating ferrous particles.

Powerful magnetic circuits permit high rotational speeds for the drum shell. The Laboratory Model DF-A25 operates at peripheral speeds ranging from 500 to 1500 fpm (152 to 457 mpm). The combination of shell speed carefully balanced with magnetic attraction and field depth achieves an efficient, high

capacity machine which effectively throws out fine nonmagnetics and retains the magnetics.

Capacity depends largely upon feed particle size, magnetic permeability and drum speed; the 6 inches (152 mm) wide Laboratory Model will handle from 5 to 17 tph.

Different magnetic elements are indicated for materials of various sizes and permeabilities. The DF Drum can also be supplied in models 10 and 50 in an axial (agitating) field design to produce high grade magnetic concentrates. A high strength Rare Earth (Note: this is NOT a radial design) design is also available where the cleanest nonmagnetic product is desired. All these assemblies are interchangeable.

The laboratory unit is generally operated with a vibratory feeder. A variable speed TEFC 7.5 hp (5.59 kw) motor is standard.



EDDY CURRENT SEPARATOR

Model ECS-12



Portable rare earth permanent magnetic eddy current separator for feasibility testing.

The Eriez Model ECS-12 nonferrous metallic separator consists of an external drum, an internal permanent magnetic rotor, a drive and 12-inch (305 mm) wide belt conveyor, all mounted on a portable steel frame. A freestanding control enclosure is also included.

The external drum shell of nonmetallic composite material rotates at conventional belt conveyor speed. The internal rotor turns at much higher rpm than the external shell. The surface of this rotor carries rows of Erium® Rare Earth permanent magnets, arranged with alternating polarity around the circumference of the rotor.

Through the induction of eddy currents and the resulting repelling forces, the alternating magnetic field selectively repels the nonferrous metals and physically separates them from other materials with minimum product loss. Aluminum, copper and zinc are separated from nonconductors including plastic, rubber, glass, trash, ash and electronic scrap.

The lab model ECS operates on 230 or 460V ac, three phase, 60 Hz, at 11 amperes. Lab or pilot plant testing can confirm performance and scale up sizing for 12, 24, 36, 48 and 60-inch (305, 610, 914, 1219 mm) feed width commercial machines.

VOLUMATIC FEEDER MACHINES

A compact combination of vibratory hopper, vibratory feeder and controls provides accurately controlled movement of dry bulk materials.

Eriez Hi-Vi Volumatic Feeder Machines provide dual vibratory action to assure the proper flow of dry bulk material for measured discharge rates. Models are available in three sizes, with variable feed rates ranging from a few ounces to 15 tons per hour.

Positive control of feed is assured by a drive and tray that optimize material flow. They provide instant starts and stops with a minimum of product carry-over. The rugged steel hopper with adjustable discharge spout is easily removed from the frame for cleaning.

All models are furnished with variable transformer type ac controls. The box can be installed on the frame of the unit or remotely in any convenient location. The controller can include a dual control for “fast” and “dribble” feed rates where necessary. Various timers are available for any number of timed or intermittent feeding phases.

Hoppers, hopper discharge spouts and feeder trays are available in mild or stainless steel.

Capacities of the hoppers on the three standard modes are 1.25, 3 and 4 cu ft (.035, .085 and .114 cu m).

Overall dimensions are 15-3/4 inches side x 33-3/8 inches high (400 x 850 mm); 26-5/8 x 42-3/4 inches (676 x 1086 mm); and 28-5/8 x 49-1/2 inches (727 x 1257 mm).

All three models are available for operation on 115, 230, 460, or 575 volt, 50 or 60 cycle, ac.



METAL DETECTORS

Eriez Metal Detector lab provides customers with a range of metal detector sizes for customer product testing.



Single surface style metal detectors are available to test woven and non-woven textiles.

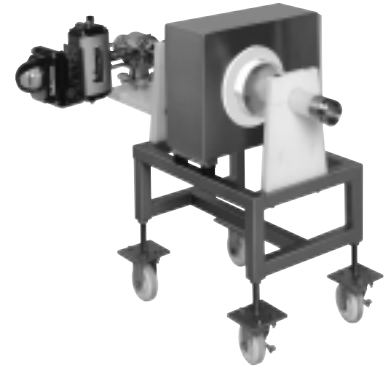


Eriez lab conveyors are a modular design that will accept metal detectors with a range of aperture heights and

widths to accommodate the range of customer product samples. Several types of reject devices are available on the lab conveyors, including variable speed drives to adjust product speeds to match the customer requirements.



A 6-inch diameter Low profile vertical reject system is available to test free fall products such as powders, granules, flakes or pellets. Expected sensitivities for larger or smaller flow requirements can be interpolated from the 6-inch (150mm) diameter system.



A liquid line metal detection system is available for evaluating liquids and slurries, temperature requirements can be duplicated up to 200 degrees F (93°C).

Each Laboratory report will outline the expected sensitivity for all metals and the recommended metal detector size for the customer application.

Dimensions and specifications are subject to change without notice.

