# PERMANENT Magnetic Drum Separators



REMOVE IRON CONTAMINANTS FROM MATERIAL PROCESSING LINES AND CONCENTRATE MAGNETIC MATERIALS AND IRON ORE



#### PERMANENT MAGNETIC

### Drum Separators

Eriez' Magnetic Drum Separators are designed for material flows with high levels of iron content. Drums have two common applications. They provide continuous removal of tramp iron from heavy flows of bulk materials, and they are used to concentrate iron ore and ferromagnetic materials in mining and industrial mineral applications.

Drum magnets offer efficient separation on volumes up to 25,600 cubic feet (725 cubic meters) per hour. Magnetic drums are often incorporated into modular systems complete with vibratory feeders and nonferrous magnetic separators.

#### **FEATURES:**

- · Available in Alnico, Ceramic or Rare Earth
- Multiple magnet circuit designs to match the application
- Housing assemblies with integrated feed hopper/gate or vibratory feeder available
- · Easily retrofits into existing plants
- Optional heavy duty shells are available to minimize wear
- Sizes range from
  - Diameters 12" to 36" (305 to 915 mm)
  - Widths 12" to 72" (305 to 1525 mm)



# TRAMP METAL REMOVAL APPLICATIONS:

- Glass Batch and Cullet
- · Slags Industrial Minerals
- · Abrasives & Refractories
- Chemical Processing
- Plastics Compounding
- Food Processing

# FERROUS RECOVERY & CONCENTRATION APPLICATIONS:

- Industrial Minerals
- Iron Ores
- Slag
- Recycling





### DRUM MAGNET DESIGN & OPERATION

A magnetic drum separator consists of a stationary, shaft-mounted magnetic circuit enclosed by a durable rotating drum. The magnetic circuit is typically comprised of several magnetic poles that span an arc of 120 degrees or more. The magnetic material and circuit design varies based on the application.

A drum magnet has an outer rotating shell and internal stationary permanent magnets. As material is presented to the drum, the rotating outer shell carries the material through the stationary magnetic field, which then attracts and holds ferrous particles to the drum shell. The nonmagnetic material falls freely from the shell, while ferrous particles are held firmly until they are carried out of the magnetic field completing the separation. (See Figure 1)

A typical example of a drum separator's magnetic element is shown in Figure 2. The magnetic circuit consists of axial magnetic poles of alternating polarity. The magnetic poles run the complete width of the drum.

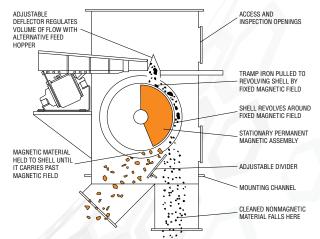


Figure 1. Permanent Magnetic Drum Separators



Figure 2. A cross-sectional view of an Axial Pole magnetic circuit

Туре	Magnetic Element	Features
45A	Alnico	Low-intensity magnetic field strength 1400 gauss     Agitating drum used in high temperature applications up to 1,100°F (593°C)
СС	Criss-Cross Circuit	High ferrous recovery Uniform magnetic field covers the entire drum width Smooth stainless steel shell with single wiper assures positive tramp iron discharge Minimum product carryover on powdery or cohesive materials
A	Agitating Style Circuit	High ferrous grade     An agitating magnetic circuit improves separation of difficult—to—separate materials     Magnetic circuit with alternating polarity flips the ferrous freeing entangled material
SS	Super Strength Rare Earth	Low-intensity magnetic field strength of 2400 gauss improves performance over ceramic     Lower end of the Rare earth magnetic strength range to protect downstream equipment from tramp metal     Applications: food, plastics and chemical
SP	Salient Pole Rare Earth	Medium-intensity magnetic field strength of 6,000 to 7,000 gauss on the surface     Maximum separation efficiency when treating high purity products and industrial minerals     Applications: silica/quartzite, feldspar, aluminum, garnet, ilmenite, and zircon
DFA	Dry Fast Agitating (Concentration)	<ul> <li>DFA High Speed Drums employ high strength magnetic elements and high speed shell rotation. This makes it possible to introduce a third factor in the separation of materials – inertia.</li> <li>Dry Low Intensity Magnetic Separators (DLIMS) for automatic continuous concentration of magnetic ores, removal of magnetite from fly ash, purification of ground slag, foundry sand, cement and minerals.</li> <li>Capacity, grade and recovery are directly related to the peripheral speed of the drum.</li> </ul>
DFA-10		<ul> <li>Relatively slow peripheral shell speed for cobbing or roughing concentration</li> <li>High recovery of magnetics or purification of non-magnetics coarser than 1/8" (3mm)</li> </ul>
DFA-25		Moderate to high speeds for cleaning and intermediate stages
DFA-50		High shell speed when a very high grade finished magnetic concentrate is desired     High level of concentration with strategic dust collection in separation zone
DF-RE		2400-2600 gauss and low speed range     Effective for concentration of steel from slag      Drum Sabarators 3

### Magnetic Circuits for removing tramp metal contaminants

#### CERAMIC DRUM SEPARATORS

Ceramic Drum Magnets offer excellent value for the separation of both tramp and fine iron contaminants in most applications. They continue to be the magnets most frequently used to improve the product purity of dry bulk materials.

### TYPE CC - CRISS-CROSS CIRCUIT

Type CC model drum separators have a unique "criss-cross" magnetic circuit. A powerful permanent magnetic field uniformly covers the entire drum width to ensure maximum tramp iron removal. The smooth stainless steel shell with single wiper strip assures positive tramp iron discharge and a minimum of product carryover on powdery or cohesive materials.

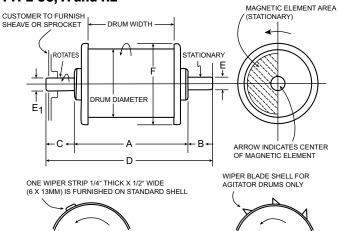
### TYPE A - AGITATING STYLE CIRCUIT

Type A model drums have an "agitating" magnetic circuit to improve removal of difficult-to-separate magnetic and nonmagnetic materials. This drum's magnetic elements are arranged with an alternating polarity below the rotating shell. As material passes over it, the change in polarity will flip or shake the ferrous, helping to free any trapped or entangled nonferrous material.



#### **SPECIFICATIONS**





Drum Diameter	Drum Width		Drum Width A		В С		D		E		Ε,		F		Approx. Weight			
in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
12 (305 mm) 45 rpm	12 18 24 36	305 457 610 915	15-3/4 21-3/4 27-3/4 39-3/4	400 552 705 1010	4-1/4 4-1/4 4-1/4 4-1/4	108 108 108 108	7-7/8 7-7/8 7-7/8 7-7/8	200 200 200 200	27-7/8 33-7/8 38-7/8 51-7/8	708 860 1013 1318	1-15/16 1-15/16 1-15/16 1-15/16	49 49 49 49	1-15/16 1-15/16 1-15/16 1-15/16	49 49 49 49	14 14 14 14	356 356 356 356	180 260 310 390	82 118 141 177
15 (381 mm) 40 rpm	12 18 24 36 48	305 457 610 915 1219	15-3/4 21-3/4 27-3/4 39-3/4 51-3/4	400 552 705 1010 1314	4-9/16 4-9/16 4-9/16 4-9/16 4-9/16	116 116 116 116 116	9 9 9 9	229 229 229 229 229	29-5/16 35-5/16 41-5/16 53-5/16 65-5/16	745 897 1049 1354 1659	2-7/16 2-7/16 2-7/16 2-7/16 2-7/16	62 62 62 62 62	2-7/16 2-7/16 2-7/16 2-7/16 2-7/16	62 62 62 62 62	16-3/4 16-3/4 16-3/4 16-3/4 16-3/4	425 425 425 425 425	205 265 350 520 715	95 120 160 235 325
18 (457 mm) 35 rpm	12 18 24 36 48	305 457 610 915 1219	15-3/4 21-3/4 27-3/4 39-3/4 51-3/4	400 552 705 1010 1314	4-9/16 4-9/16 4-9/16 4-9/16 4-9/16	116 116 116 116 116	9 9 9 9	229 229 229 229 229	29-5/16 35-5/16 41-5/16 53-5/16 65-5/16	745 897 1049 1354 1659	2-7/16 2-7/16 2-7/16 2-7/16 2-7/16	62 62 62 62 62	2-7/16 2-7/16 2-7/16 2-7/16 2-7/16	62 62 62 62 62	20-1/2 20-1/2 20-1/2 20-1/2 20-1/2	521 521 521 521 521	240 330 410 610 810	110 150 185 275 365
24 (610 mm) 30 rpm	18 24 36 48 60	457 610 915 1219 1524	23-1/2 29-1/2 41-1/2 53-1/2 65-1/2	597 749 1054 1359 1664	9 9 9	229 229 229 229 229	11 11 11 11 11	279 279 279 279 279	43-1/2 49-1/2 61-1/2 73-1/2 85-1/2	1105 1257 1562 1867 2172	2-15/16 2-15/16 2-15/16 2-15/16 2-15/16	75 75 75 75 75	2-7/16 2-7/16 2-7/16 2-7/16 2-7/16	62 62 62 62 62	28 28 28 28 28	711 711 711 711 711	940 1020 1380 1810 2330	425 465 625 820 1055

Dimensions and specifications subject to change without notice. Contact your Eriez representative for assistance in selecting the right Magnetic Drum for your specific application. NOTES: 1. Data on 36" (915 mm) drums are available on request. 2. Salient Pole drum is not available in 12" drum.



#### RARE EARTH DRUM SEPARATORS

Rare Earth develops magnetic fields up to 25 times stronger than conventional ceramic units, with no increase in size. The additional strength helps in removing weakly magnetic or very fine iron contaminants. The increased strength at a greater distance, high gradients, and greater holding force of the Rare Earth drums virtually eliminates any ferrous wipe-off by product flow.

Rare Earth Drums treat or purify large quantities of bulk materials such as foods, plastics, abrasives, metal powders, ceramic material, paper, glass cullet, soda ash, kaolin clay, chemicals, gypsum, and quartz powder.

#### TYPE SS -SUPER STRENGTH RARE EARTH

Super Strength circuits generate a peak magnetic field strength of 2400 gauss on the drum surface. The SS drum will magnetically collect all ferrous materials ranging down to fine iron of abrasion, and provides excellent protection from dangerous tramp metals.

#### TYPE SP -SALIENT POLE RARE EARTH

Salient Pole circuits generate a peak magnetic field strength of 7000 gauss on its surface. These drums produce the highest possible magnetic field strength for maximum separation efficiency for treating high-purity products and industrial minerals. This separator is effective in collecting most paramagnetic constituents when treating high purity mineral feedstocks such as silica/quartzite, feldspar and aluminum. This unit is also effective at removing weakly magnetic stainless steel from recycled materials.

Effectively separates ilmenite, garnet and zircon in a single stage. Multiple splitters are utilized to segregate various minerals in the rougher stage of heavy mineral sands. Further concentration can be performed with salient pole RE drums and RE rolls.

#### **MAGNETIC CIRCUITS** & FIELD STRENGTH

Eriez designs magnetic circuits using finite element analysis modeling techniques shown below. The Salient Pole magnetic element is comprised of segments of alternating rare earth magnets and steel pole pieces. The steel poles are induced and project a high-intensity, high-gradient magnetic field. The change in the magnetic field is shown as it passes from one magnetic pole to another. This is shown at various distances from the surface of the drum shell.

The magnetic field configuration of the RE magnetic circuits are illustrated in Figure 3.

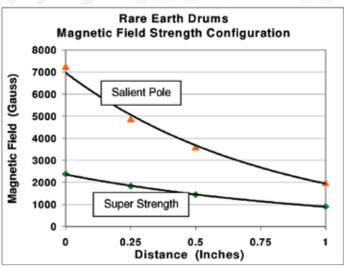


Figure 3. Magnetic Field Configuration of Rare Earth Drum Magnetic Separators

Drum-in-Housing

#### MODEL HFP DRUM-IN-HOUSING WITH FEED CONTROL

Hopper fed pant-leg discharge chutes (HFP) Drums provide exceptional controlled feed and discharge features. The steel hopper has a nonmagnetic stainless steel portion near the drum to prevent the hopper from being magnetically induced. The chute-type feed hopper is designed to provide increased efficiency of separation by more effectively directing the material flow to the face of the drum. It also prevents material from plunging directly onto the drum shell, to reduce the possibility of physical damage to the shell caused by impinging heavy material or heavy tramp iron.

#### **Dust-Tight Housings are Standard**

The housing of Model HFP is continuously welded at all joints. Inspection panels are located at both front and back of housings. Bolted–on drum support panels and inspection panels are sealed with 1/8" (3 mm) thick neoprene gaskets. All input and output openings are flanged for ease of connection to ductwork.

There is a drum removal opening on the drive side of the housing. Drums can be removed from housings without removing the housing from flowline. A heavy steel drum support panel bolted to the housing covers the opening and supports the drum.

#### **Totally Enclosed Motor Drives**

The motor drive includes the gear motor, motor mounting brackets, motor sheave and drum sheave. These are totally enclosed right- angle gear motors, 230/460V, 3-phase, 60 cycle. Explosion–proof motors are available at an additional cost.

#### **Heavy Duty Construction**

Model HFP in 18" and 24" (457-610 mm) diameters are also available specially constructed heavy duty drum shell and end flanges and components where required.

#### **Special Circuit Designs**

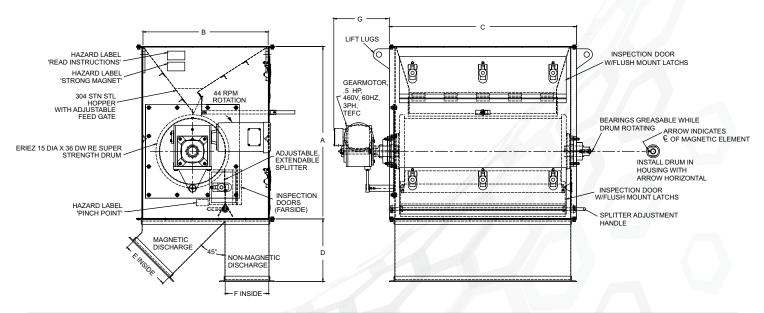
Designs are available for high temperature applications or special separation requirements.

#### **Vibratory Feeder**

Feeder introduces difficult to flow materials to the magnetic drum, meters the feed and improves material presentation from the drum magnet. Eriez offers vibratory feeders in a range of sizes.



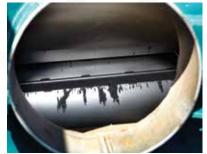




Drum Diameter		um dth	A		ı	В	C		D		E		F		G		App Wei		Mo CC Dru	/A	Mo RE Dru	SS	Sali	E ient ole
in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg	hp	kw	hp	kw	hp	kw
	12	305	34-3/4	883	22	559	16-1/8	410	11-3/4	298	7-15/16	202	8	203	7-1/4	184	340	155	1/3	.25	1/3	.25		
12 (305 mm)	18	457	34-3/4	883	22	559	22-1/8	562	11-3/4	298	7-15/16	202	8	203	7-1/4	184	520	235	1/3	.25	1/3	.25		
45 rpm	24	610	34-3/4	883	22	559	28-1/8	714	11-3/4		7-15/16	202	8	203	7-1/4	184	620	280	1/3	.25	1/3	.25		
	36	915	34-3/4	883	22	559	40-1/8	1019			7-15/16	202	8	203	7-1/4	184	730	330	1/2	.38	1/2	.38		
	12	305	39-1/2	1003	29	737	16-1/8	410	14-3/8		11-5/8	295	10	254	8-3/8	213	425	195	1/3	.25			3/4	.56
15	18	457	39-1/2	1003	29	737	22-1/8	562	14-3/8		11-5/8	295	10	254	8-3/8	213	660	300	1/3	.25			3/4	.56
(381 mm)	24	610	39-1/2	1003	29	737	28-1/8	714	14-3/8		11-5/8	295	10	254	8-3/8	213	775	350	1/3	.25			3/4	.56
40 rpm	36	915	39-1/2	1003	29	737	40-1/8	1019		365	11-5/8	295	10	254	8-3/8	213	900	410	1/2	.38			1-1/2	
	48	1219	39-1/2	1003	29	737	52-1/8	1324			11-5/8	295	10	254	8-3/8	213	1015	460	3/4	.56			5	3.8
	12	305	45-1/4	1149	28	711	16-1/8	410	14-3/8	365	10-7/8		10-1/8	257	8-3/8	213	530	240	1/3	.25				
18	18	457	45-1/4	1149	28	711	22-1/8	562	14-3/8	365	10-7/8		10-1/8	257	8-3/8	213	825	375	1/2	.38				
(457 mm) 35 rpm	24	610	45-1/4	1149	28	711	28-1/8	714	14-3/8		10-7/8		10-1/8	257	8-3/8	213	930	420	1/2	.38				
oo ipiii	36	915	45-1/4	1149	28	711	40-1/8	1019			10-7/8		10-1/8	257	8-3/8	213	1070	485	3/4	.56				1
	48	1219	45-1/4	1149	28	711	52-1/8	1324			10-7/8		10-1/8	257	8-3/8	213	1290	585	3/4	.56				
	18	457	59	1500	38	965	25	635	19-1/2		18-7/8	479	9	229	9-7/8	251	1425	645	3/4	.56				
(010)	24	610	59	1500	38	965	31	787	19-1/2		18-7/8	479	9	229	9-7/8	251	1555	705	3/4	.56				
(610 mm) 30 rpm	36 48	915	59 59	1500	38 38	965	43 55	1092	19-1/2		18-7/8	479	9 9	229 229	9-7/8	251	2010	910	1 2/4	.75				
oo ipiii		1219		1500		965			19-1/2		18-7/8	479	9 9			251	2540	1150		1.1				
Di	60	1524	59	1500	38	965	67	1702	19-1/2		18-7/8	479		229	9-7/8	251	3170	1440		1.1				

Dimensions and specifications subject to change without notice. Contact your Eriez representative for assistance in selecting the right magnetic drum for your specific applications. NOTES: 1. Model HFP is available without the discharge chute adapter and as such is designated Model HF. 2. Data on 36" (915 mm) drums are available on request.





# Magnetic Circuits for concentration of magnetic materials & ores

### DRY FAST AGITATING (DFA) MAGNETIC DRUMS

Dry Low Intensity Magnetic Separators are used in the automatic continuous concentration of magnetic ores, removal of magnetite from fly ash, purification of ground slag, foundry sand, cement and minerals.

DFA Magnetic drums have a high peripheral shell speed making them capable of processing large volumes of relatively fine ferromagnetic materials (-1") (-25mm) to producing high-grade magnetic concentrates or removing very fine, highly magnetic particles for purification.

Traditional slow, agitating or radial field drums employ only magnetic attraction and gravity as separating forces. The DFA High Speed Drums employ highstrength magnetic elements and high-speed shell rotation to introduce a third factor in the separation of materials – inertia. To maximize this advantage, Eriez engineered powerful magnetic circuits which permit high rotational speeds for the drum shell.

Eriez provides elements with a varying number of poles in axial (agitating) field design to produce high grade magnetic concentrates plus a high strength radial (nonagitating) field design for use where a clean, non–magnetic product is the most important consideration. Drum shell speeds vary from 300 to 1500 fpm (91 to 457 mpm), and the capacity per unit of magnetic width varies from approximately 5 to 40 tph per foot (14.7 to 119.0 mtph per meter), depending on feed particle size, magnetic permeability and drum speed.

All DFA Separator models require that the magnetic fraction to be separated is ferromagnetic and dry, and the feed size should be –1" (–25 mm). Selectivity increases when the products to be separated are within four Tyler mesh sizes. Moisture adversely affects separator performance but can be tolerated as long as the feed is free–flowing.

#### MODEL OPTIONS

Capacity, grade and recovery are directly related to the peripheral speed of the drum. For high recovery of magnetics or purification of non-magnetics coarser than 1/8" (3mm), the Model DFA-10 at a relatively slow peripheral shell speed is used. This includes automatic continuous concentration of magnetic ores, removal of magnetite from fly ash, purification of ground slag, foundry sand, cement and minerals. The DFA-25 is used at moderate speeds for cobbing or roughing concentration jobs. When a very high grade, finished magnetic concentrate is desired, the DFA-50 is used at a high shell speed.

#### ORE PROCESSING

Some operations require the use of multiple stage treatment. For example, in iron ore benefication a first stage cobbing provides a high recovery, low grade concentrate with minimum loss of magnetics in the tailings. The magnetic concentrate from the first drum is recleaned on the second stage to produce a finished high grade concentrate and a middling product. The middlings can be sent back for further grinding or can be recirculated without grinding.









#### **DFA SPECIFICATIONS**

		Magnetics	Particle S	Size Range	Drum	Speed	Capacity		
Model	Description of Feed	in Feed	In	mm	fpm	mpm	tph/ft	mtph/m	
DF-A10	1st Stage concentration of average grade magnetite ore	50%	-1+ <sup>1</sup> /4 inch	-25 mm+6 mm	400	122	15 – 40	45 – 120	
DF-A25		50%	- <sup>1</sup> /4 inch	-6 mm	700	213	10 – 35	30 – 105	
DF-A50		50%	-100 mesh	-149 micron	1,000	305	5 – 15	15 – 45	
DF-A10	2nd Stage concentration of magnetite rough concentrate	90%	-1+ <sup>1</sup> /4 inch	-25 mm+6 mm	800	244	10 – 30	30 - 90	
DF-A25		90%	- <sup>1</sup> /4 inch	-6 mm	1,200	366	10 – 15	30 - 45	
DF-A50		90%	-100 mesh	-149 micron	1,500	457	5 – 10	15 - 30	
DF-R	Cobbing Stage		-1+ <sup>1</sup> /4 inch	-25 mm+6 mm	300	91	15 – 30	45 – 90	
DF-R	Purification of primarily		- <sup>1</sup> /4 inch	-6 mm	500	152	10 – 25	30 – 75	
DF-R	nonmagnetic material		-100 mesh	-149 micron	700	213	5 – 10	15 – 30	

## Separation Variables

The magnetic attractive force generated by a drum type separator is opposed by centrifugal force. The primary variables affecting separation efficiency are the magnetic field strength, feed rate, linear speed of the separator surface, and particle size. An effective separation requires an equilibrium among these variables.

#### FEED RATE

In assessing the feed rate, a balance must be struck between an economic feed rate, product specifications, and recovery. As the feed rate increases, the layered particle bed on the separator surface increases in height and the collection of magnetics decreases.

How material is presented to the drum affects separation quality. Material must be presented at the top or 12 o'clock position of the drum and at a consistent flow rate, spread evenly across the face of the drum. There are a number of feeding systems available to match the application. Eriez offers both electromagnetic and mechanical vibratory feeders as well as roll feeders.

#### LINEAR SPEED

The linear speed of the drum is also a primary variable related to the feed rate. As the linear speed is increased, the layered particle bed decreases in height responding with an improved collection of the magnetic particles.

The centrifugal force exerted by the drum or roll surface is the critical factor in providing separation. Beyond the critical speed, the centrifugal force overcomes the magnetic attractive force and the separation efficiency deteriorates.

#### PARTICLE SIZE

Particle size will also effect separation efficiency independent of all other variables. Coarse particles provide a relatively high burden depth on the separator surface and respond with a relatively high magnetic attractive force. Coarse particles typically provide high unit capacities with high separation efficiencies. Fine particles with a relatively low mass respond detrimentally to electrostatic forces. As a consequence, precise magnetic separations balancing magnetic forces against centrifugal forces deteriorates.

#### SEPARATOR SIZING

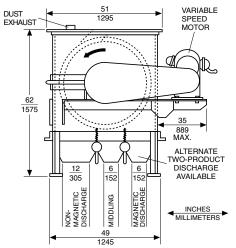
Eriez Rare Earth Drum magnetic separators are available in various sizes to match specific applications and capacity requirements. General guidelines for the unit capacity of the Rare Earth drum magnetic separators are provided in Table 2.

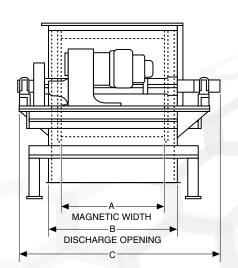
		Unit Capacity (	TPH/Foot of Dru	ım Width)
Drum Diameter	Drum Width	Fine/Light Material Plastics, Pharmaceuticals, Resins, or Grains	Fine Industrial Minerals –35 Mesh Silica or Alumina	Coarse Heavy Material –1 inch Slags, Iron Ore, or Cullet
12"				
15"	12" — 60"	3	5	
18"	12" — 60"	4	6	
24"	24" — 96"	5	8	10 – 12
DFA				
36"	48" — 120"		12	15 – 18
48"	48" — 120"			20 – 24

Table 2. Unit Capacity of Rare Earth Drums. General Guidelines.

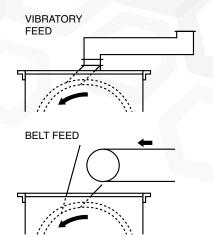


#### **SPECIFICATIONS**





#### FEED OPTIONS



Name										Drive Hp					
No.   No.							\-10	А	-10		\-10	*Shir	ppina		
In   mm   in   mm   in   mm   in   mm   hp   kw   hp		1	A		3	1	C								
Column		in	mm	in	mm	in	mm								kg
12   305   22.5   572   46   1168   5   3.72   7.5   5.59   15   11.18   3100     18   457   28.5   724   52   1321   5   3.72   7.5   5.59   15   11.18   3800     24   610   34.5   876   58   1473   5   3.72   10   7.46   20   14.90   4200     48   1219   58.5   1486   82   2083   5   3.72   15   11.18   25   18.64   5100     48   1219   58.5   1486   82   2083   5   3.72   15   11.18   30   22.37   5800     60   1524   70.5   1791   94   2388   5   3.72   20   14.90   40   29.82   6600     72   1829   82.5   2096   106   2692   5   3.72   25   18.64   40   29.82   7600     96   2438   106.5   2705   30   3020   7.5   5.59   30   22.37   50   37.28   8000     120   3048   136.5   3467   154   3912   7.5   5.59   40   29.82   60   44.74   9700     120   3048   33.5   572   46   1168   3   2.23   5   3.72   7.5   5.59   2700     121   305   22.5   572   46   168   3   2.23   5   3.72   7.5   5.59   300     124   610   34.5   876   58   1473   5   3.72   7.5   5.59   10   7.46   4200     36   914   46.5   1811   70   1778   5   3.72   7.5   5.59   15   11.18   5100     48   1219   58.5   1486   82   2083   5   3.72   7.5   5.59   15   11.18   5100     125   3048   136.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   136.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   336.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   8600     120   3048   306.5   2705   30   3022   5   3.72   7.5   5.59   10   7.46	_										/ //	_			1225
18		-													1406
Record   Section   Secti						-									1724
Second   S						-									1905
Record   R		36				70				1 1/1/					2313
The color   The			-							///					2631
The color of the						-									2994
Page   2438   106.5   2705   130   3302   7.5   5.59   30   22.37   50   37.28   8600						-									3447
Name								-	10.000						3901
A								- //							4400
No.   No.															
In   mm   in   mm   in   mm   hp   kw   hp		A A		-	C							1			
6   152   16.5   419   40   1016   3   2.23   5   3.72   7.5   5.59   2700   12   305   22.5   572   46   1168   3   2.23   5   3.72   7.5   5.59   3100   18   457   28.5   724   52   1321   3   2.23   5   3.72   7.5   5.59   3800   24   610   34.5   876   58   1473   5   3.72   7.5   5.59   10   7.46   4200   36   914   46.5   1181   70   1778   5   3.72   7.5   5.59   15   11.18   5100   48   1219   58.5   1486   82   2083   5   3.72   7.5   5.59   15   11.18   5800   60   1524   70.5   1791   94   2388   5   3.72   10   7.46   20   14.90   6600   72   1829   82.5   2096   106   2692   5   3.72   10   7.46   25   18.64   7600   96   2438   106.5   2705   130   3302   5   3.72   15   11.18   30   22.37   8600   120   3048   136.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   9700    A B B C	_	. 1								-					
12   305   22.5   572   46   1168   3   2.23   5   3.72   7.5   5.59   3100     18   457   28.5   724   52   1321   3   2.23   5   3.72   7.5   5.59   3800     24   610   34.5   876   58   1473   5   3.72   7.5   5.59   10   7.46   4200     36   914   46.5   1181   70   1778   5   3.72   7.5   5.59   15   11.18   5100     48   1219   58.5   1486   82   2083   5   3.72   7.5   5.59   15   11.18   5800     60   1524   70.5   1791   94   2388   5   3.72   10   7.46   20   14.90   6600     72   1829   82.5   2096   106   2692   5   3.72   10   7.46   25   18.64   7600     96   2438   106.5   2705   130   3302   5   3.72   15   11.18   30   22.37   8600     120   3048   136.5   3467   154   3912   7.5   5.59   20   14.90   30   22.37   9700      A	_														kg
18		-													1225
24       610       34.5       876       58       1473       5       3.72       7.5       5.59       10       7.46       4200         36       914       46.5       1181       70       1778       5       3.72       7.5       5.59       15       11.18       5100         48       1219       58.5       1486       82       2083       5       3.72       7.5       5.59       15       11.18       5800         60       1524       70.5       1791       94       2388       5       3.72       10       7.46       20       14.90       6600         72       1829       82.5       2096       106       2692       5       3.72       10       7.46       25       18.64       7600         96       2438       106.5       2705       130       3302       5       3.72       15       11.18       30       22.37       8600         120       3048       136.5       3467       154       3912       7.5       5.59       20       14.90       30       22.37       9700         12       305       22.5       572       46       1168       3						-									1406
36		-	-			-									1724
Heat   1219   58.5   1486   82   2083   5   3.72   7.5   5.59   15   11.18   5800															1905
60       1524       70.5       1791       94       2388       5       3.72       10       7.46       20       14.90       6600         72       1829       82.5       2096       106       2692       5       3.72       10       7.46       25       18.64       7600         96       2438       106.5       2705       130       3302       5       3.72       15       11.18       30       22.37       8600         120       3048       136.5       3467       154       3912       7.5       5.59       20       14.90       30       22.37       9700         A -50       A -50       A -50       A -50       **Ship         We         in mm in mm in mm hp       hp       kw       hp       kw <td></td> <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2313</td>			-			-									2313
72       1829       82.5       2096       106       2692       5       3.72       10       7.46       25       18.64       7600         96       2438       106.5       2705       130       3302       5       3.72       15       11.18       30       22.37       8600         120       3048       136.5       3467       154       3912       7.5       5.59       20       14.90       30       22.37       9700         A B       C       A-50       A-50       A-50       A-50       A-50       M-50       M-50 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2631</td>						-									2631
96															2994
Table   Tabl															3447
A B C A-50 A-50 A-50 *Ship (457mpm) 1000fpm (305mpm) 1500fpm (457mpm) Wein mm in mm in mm hp kw hp kw hp kw hp kw lb (457mpm) 12 305 22.5 572 46 1168 3 2.23 5 3.72 7.5 5.59 3100 18 457 28.5 724 52 1321 3 2.23 5 3.72 7.5 5.59 3800 18 457 28.5 724 52 1321 3 2.23 5 3.72 7.5 5.59 3800 18 457 28.5 724 52 1321 3 2.23 5 3.72 7.5 5.59 3800 18 457 28.5 724 52 1321 3 2.23 5 3.72 7.5 5.59 3800 18 46.5 1181 70 1778 5 3.72 7.5 5.59 10 7.46 5100 18 1219 58.5 1486 82 2083 5 3.72 7.5 5.59 10 7.46 5800 1524 70.5 1791 94 2388 5 3.72 7.5 5.59 15 11.18 6600 1524 70.5 1791 94 2388 5 3.72 7.5 5.59 15 11.18 6600 1524 70.5 1791 94 2388 5 3.72 7.5 5.59 15 11.18 6600 1524 70.5 1791 94 2388 5 3.72 7.5 5.59 15 11.18 7000 120 3048 136.5 3467 154 3912 5 3.72 10 7.46 20 14.90 8600 120 3048 136.5 3467 154 3912 5 3.72 15 11.18 25 18.64 9700		-4													3901
No.   No.	1	20	3048	136.5	3467	154	3912								4400
in         mm         in         mm         in         mm         in         mm         in         mm         hp         kw         hp         kw         hp         kw         lb           6         152         16.5         419         40         1016         3         2.23         5         3.72         5         3.72         2700           12         305         22.5         572         46         1168         3         2.23         5         3.72         7.5         5.59         3100           18         457         28.5         724         52         1321         3         2.23         5         3.72         7.5         5.59         3800           24         610         34.5         876         58         1473         3         2.23         5         3.72         7.5         5.59         3800           36         914         46.5         1181         70         1778         5         3.72         7.5         5.59         4200           48         1219         58.5         1486         82         2083         5         3.72         7.5         5.59         10         7.46			A	:	3		C	A	\-50						
6       152       16.5       419       40       1016       3       2.23       5       3.72       5       3.72       2700         12       305       22.5       572       46       1168       3       2.23       5       3.72       7.5       5.59       3100         18       457       28.5       724       52       1321       3       2.23       5       3.72       7.5       5.59       3800         24       610       34.5       876       58       1473       3       2.23       5       3.72       7.5       5.59       4200         36       914       46.5       1181       70       1778       5       3.72       7.5       5.59       10       7.46       5100         48       1219       58.5       1486       82       2083       5       3.72       7.5       5.59       10       7.46       5800         60       1524       70.5       1791       94       2388       5       3.72       7.5       5.59       15       11.18       6600         72       1829       82.5       2096       106       2692       5       3.72															_
12     305     22.5     572     46     1168     3     2.23     5     3.72     7.5     5.59     3100       18     457     28.5     724     52     1321     3     2.23     5     3.72     7.5     5.59     3800       24     610     34.5     876     58     1473     3     2.23     5     3.72     7.5     5.59     4200       36     914     46.5     1181     70     1778     5     3.72     7.5     5.59     10     7.46     5100       48     1219     58.5     1486     82     2083     5     3.72     7.5     5.59     10     7.46     5800       60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5	_							_					1		kg
18     457     28.5     724     52     1321     3     2.23     5     3.72     7.5     5.59     3800       24     610     34.5     876     58     1473     3     2.23     5     3.72     7.5     5.59     4200       36     914     46.5     1181     70     1778     5     3.72     7.5     5.59     10     7.46     5100       48     1219     58.5     1486     82     2083     5     3.72     7.5     5.59     10     7.46     5800       60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5     3.72     15     11.18     25     18.64     9700						-									1225
24     610     34.5     876     58     1473     3     2.23     5     3.72     7.5     5.59     4200       36     914     46.5     1181     70     1778     5     3.72     7.5     5.59     10     7.46     5100       48     1219     58.5     1486     82     2083     5     3.72     7.5     5.59     10     7.46     5800       60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5     3.72     15     11.18     25     18.64     9700						-									1406 1724
36     914     46.5     1181     70     1778     5     3.72     7.5     5.59     10     7.46     5100       48     1219     58.5     1486     82     2083     5     3.72     7.5     5.59     10     7.46     5800       60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5     3.72     15     11.18     25     18.64     9700						-									1905
48     1219     58.5     1486     82     2083     5     3.72     7.5     5.59     10     7.46     5800       60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5     3.72     15     11.18     25     18.64     9700    R  *Ship							-								2313
60     1524     70.5     1791     94     2388     5     3.72     7.5     5.59     15     11.18     6600       72     1829     82.5     2096     106     2692     5     3.72     7.5     5.59     15     11.18     7600       96     2438     106.5     2705     130     3302     5     3.72     10     7.46     20     14.90     8600       120     3048     136.5     3467     154     3912     5     3.72     15     11.18     25     18.64     9700    R  *Ship						-									2631
72   1829   82.5   2096   106   2692   5   3.72   7.5   5.59   15   11.18   7600   96   2438   106.5   2705   130   3302   5   3.72   10   7.46   20   14.90   8600   120   3048   136.5   3467   154   3912   5   3.72   15   11.18   25   18.64   9700   R   R   *Ship						-									2994
96   2438   106.5   2705   130   3302   5   3.72   10   7.46   20   14.90   8600   120   3048   136.5   3467   154   3912   5   3.72   15   11.18   25   18.64   9700   R   R   R   *Ship						-									3447
120 3048 136.5 3467 154 3912 5 3.72 15 11.18 25 18.64 9700  R  R  R  *Ship															3901
A B C R R *Ship															4400
A B C				100.0	0.07		00.12	3			11110		10.01		
				E	3		C			2mnm)	1000fp.m		(OEmpm)		ight
200 pm (300 pm)		:_		:-		:		<u> </u>	II (18	•		1 (-			_
in mm in mm in mm hp kw hp kw lb 6 152 16.5 419 40 1016 3 2.23 5 3.72 2700															kg 1225
12   305   22.5   572   46   1168   3   2.23   5   3.72   3100						-									1406
18 457 28.5 724 52 1321 3 2.23 5 3.72 3800															1724
24 610 34.5 876 58 1473 5 3.72 7.5 5.59 4200															1905
36 914 46.5 1181 70 1778 5 3.72 7.5 5.59 5100															2313
48   1219   58.5   1486   82   2083   5   3.72   7.5   5.59   5800															2631
60   1524   70.5   1791   94   2388   5   3.72   10   7.46   6600															2994
72   1829   82.5   2096   106   2692   5   3.72   10   7.46   7600						106									3447
96 2438 106.5 2705 130 3302 5 3.72 15 11.18 8600	ç	96	2438	106.5	2705	130	3302	5		3.72	15				3901
		20	3048	136.5	3467	154	3912	7.5		5.59	20		14.90		4400

Shipping weights include largest motor. Dimensions and specifications are subject to change without notice.



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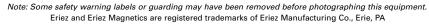












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