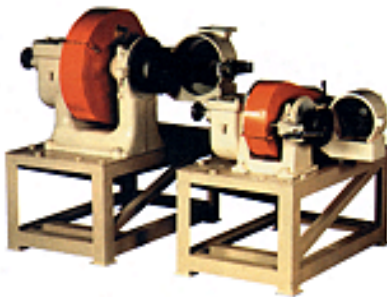


MARCY®

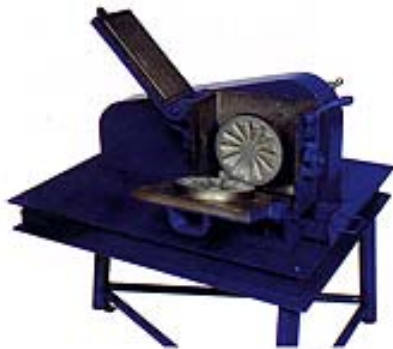
We stock the most complete line of high quality laboratory and pilot plant products for sample preparation and size reduction. Available immediately for mining and industrial applications.



Marcy® Cone Crushers. Reduces 1/2" feed to -10 mesh in a single pass.



Marcy® Disc Pulverizers. Compact in design. Capable of grinding virtually any material.

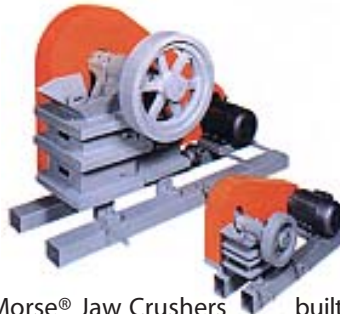


Morse® Disc Pulverizers. Compact in design. Capable of grinding virtually any material.

MORSE®



Marcy® Pulp Density and Specific Gravity Scale. Direct reading scale determines specific gravities of pulps, liquides and dry solids.



Morse® Jaw Crushers built to meet the demands of pilot plant operation. Available in 4 sizes.



Marcy® Jaw Crushers built to meet the demands of pilot plant operation.

Nordberg®



Marcy® Double Roll Crushers for intermediate crushing of virtually any material



Nordberg Laboratory Jaw Crushers. Heavy duty for demanding and precise crushing in rock laboratories and sample processing plants.



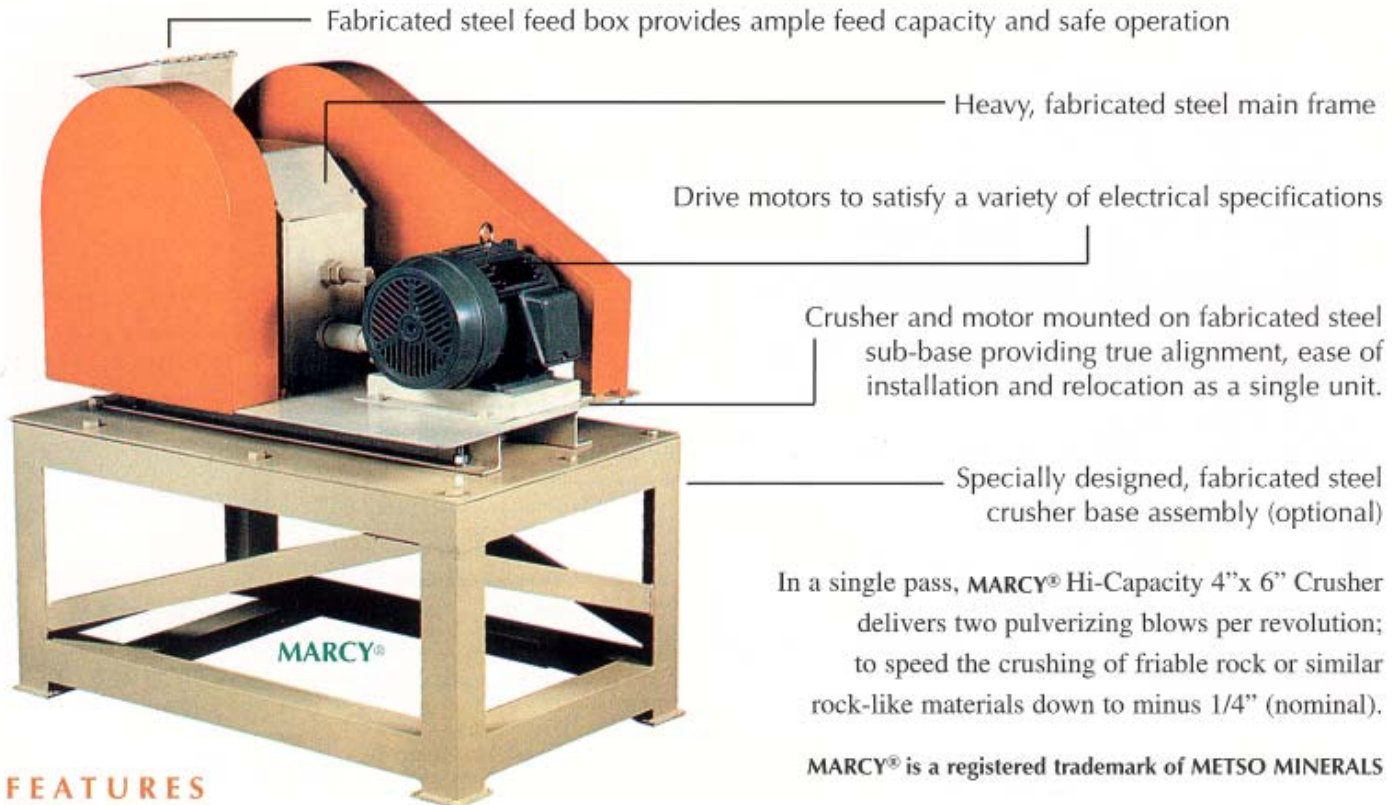
Nordberg Laboratory Cone Crushers. Suitable as intermediate crusher in laboratories and sample processing plants.

Metso Minerals is proud to introduce the Nordberg Crushers to our complete line of Laboratory Mineral Processing Equipment.



4"x 6" Laboratory Jaw Crusher

MARCY®



Fabricated steel feed box provides ample feed capacity and safe operation

Heavy, fabricated steel main frame

Drive motors to satisfy a variety of electrical specifications

Crusher and motor mounted on fabricated steel sub-base providing true alignment, ease of installation and relocation as a single unit.

Specially designed, fabricated steel crusher base assembly (optional)

In a single pass, MARCY® Hi-Capacity 4"x 6" Crusher delivers two pulverizing blows per revolution; to speed the crushing of friable rock or similar rock-like materials down to minus 1/4" (nominal).

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FEATURES

- ▲ A swinging jaw delivers a double impact due to a single toggle design providing a forward and downward stroke. It permits finished materials to pass through the jaws, while exerting crushing pressure on coarser material.
- ▲ Heavy duty spherical roller shaft bearings provide smooth and consistent operation.
- ▲ Reversible cast manganese steel jaw plates last twice as long!
- ▲ Convenient handwheels adjust toggle tension rod and jaw opening.

APPLICATIONS

Designed for crushing virtually any material, the MARCY® Jaw Crusher is especially recommended for assay offices, metallurgical, soil and chemical/industrial laboratories. Rigorous demands of a pilot plant operation require tough equipment, quickly and easily adjusted. All MARCY® Laboratory Equipment is constructed to meet and exceed these demands. Small scale continuous production runs can be handled with confidence.

SPECIFICATIONS

Model	Capacity	Drive Description	Shipping Information	
			Weight	Dimensions
3340 MARCY® 4" x 6" Jaw Crusher	1200 lbs. per hour Max. Feed Size = 3"	V-belt drive: 5 H.P. TEFC motor	735 lbs.	44" x 34" x 28"

ACCESSORIES & OPTIONS

- ▲ Specially designed, fabricated steel pulverizer base assembly
- ▲ Hardened steel alloy discs (500BHN) ▲ Variety of drive motors available

Metso Minerals Industries, Inc.

Mineral Processing-Pyro

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FEATURES

- GREATER SENSITIVITY:** Circular dial is equivalent to a 47" beam balance for greater sensitivity
SOLID CONSTRUCTION: Entire unit is supported by a top ring. Scale is accurately set at the factory
ACCURACY: Cylindrical containers with slotted overflow holes, permit accurate filling to exactly 1000 cc.
EASE OF OPERATION: Samples do not have to be weighed separately; refer to tables or make calculations.
COMPATIBILITY: Interchangeable dials make weighing applicable for any range of solids of light or heavy density.

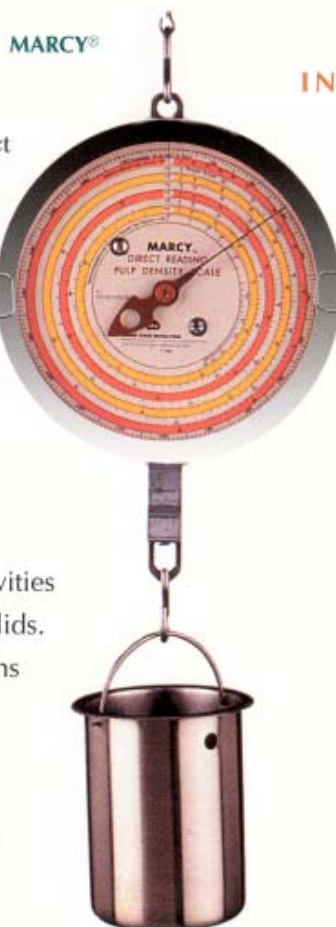
APPLICATIONS

Use MARCY® Scales to obtain the following direct readings:

- Weight of sample in grams or kilograms
- Specific gravity of liquid or pulp
- Percent solids contained in the pulp of any given specific gravity
- Specific gravity of dry solids

MARCY® Direct Reading Pulp Density and Specific Gravity Scale speeds up the determination of pulp densities; specific gravities of pulps or liquids; specific gravity of dry solids. It eliminates errors in reading charts or graphs and prevents errors in calculations.

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INTERCHANGEABLE DIAL FACES

Each scale includes 12 interchangeable dial faces with a specific gravity range of dry solids from 1.2 through 7.8.

A permanently attached #1 dial on each scale has the following specific gravity range of dry solids:

#1 2.2 2.6 2.8 3.2 3.6 4.0 4.4

Interchangeable dial faces, furnished with each scale as follows:

#1	2.2	2.6	2.8	3.2	3.6	4.0	4.4
#2	1.2	1.3	1.4	1.5	1.6	1.7	1.8
#3	1.7	1.8	1.9	2.0	2.1	2.2	2.3
#4	2.2	2.3	2.4	2.5	2.6	2.7	2.8
#5	2.6	2.7	2.8	2.9	3.0	3.1	3.2
#6	3.0	3.1	3.2	3.3	3.4	3.5	3.6
#7	3.4	3.5	3.6	3.7	3.8	3.9	4.0
#8	3.8	3.9	4.0	4.1	4.2	4.3	4.4
#9	4.2	4.3	4.4	4.5	4.6	4.7	4.8
#10	4.6	4.8	5.0	5.2	5.4	5.6	5.8
#11	5.6	5.8	6.0	6.2	6.4	6.6	6.8
#12	6.6	6.8	7.0	7.2	7.4	7.6	7.8

SPECIFICATIONS

- Complete with scale and 12 interchangeable dial faces
- 10" outside diameter of scale
- 10lbs. shipping weight, approximate
- 3-1/2"x 12"x 12" shipping dimensions

Optional Containers:

- 1lb. each shipping weight
- 4"x 4"x10" shipping dimensions
- Stainless steel, clear plastic or aluminum flask

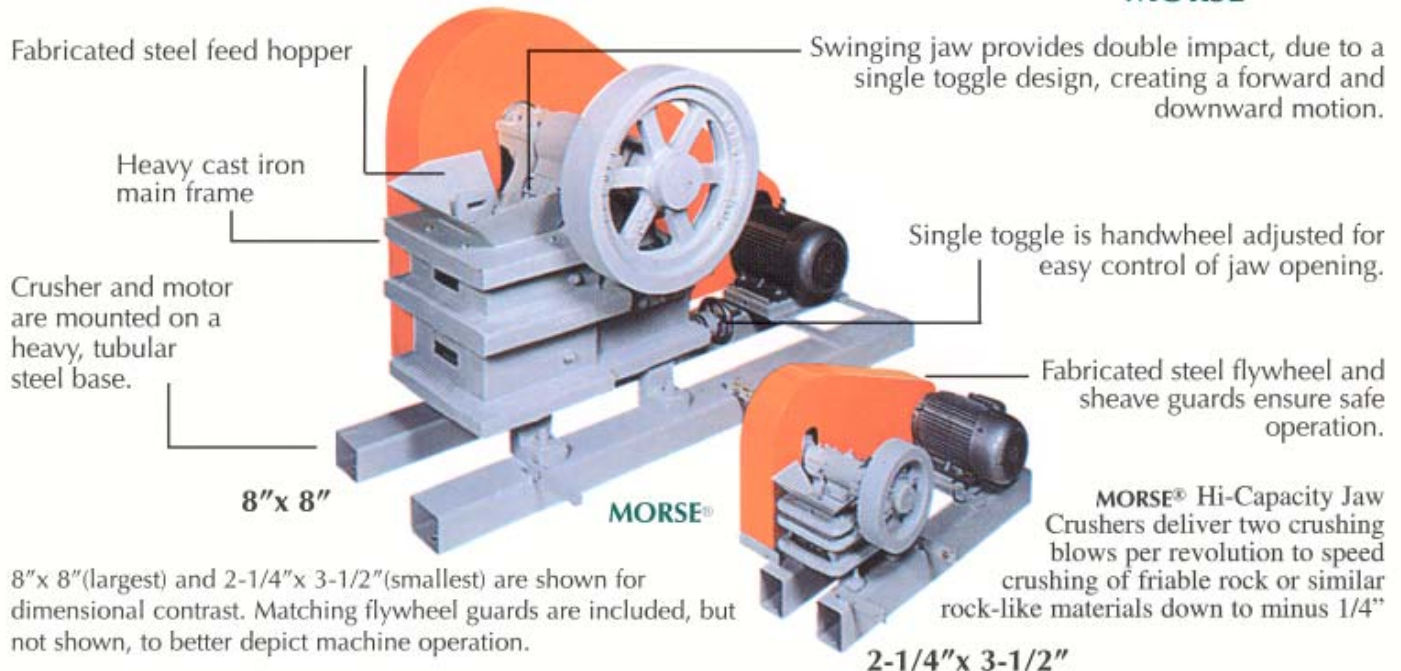
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Mineral Processing-Pyro

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Laboratory/Pilot Plant Jaw Crushers

MORSE®



8" x 8" (largest) and 2-1/4" x 3-1/2" (smallest) are shown for dimensional contrast. Matching flywheel guards are included, but not shown, to better depict machine operation.

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APPLICATIONS

Designed for grinding virtually any material, the MORSE® Jaw Crusher is especially recommended for metallurgical, assay offices, soil and commercial/industrial laboratories. Rigorous demands of a pilot plant operation require tough equipment, quickly and easily adjusted. All MORSE® Laboratory Equipment is constructed to meet and exceed these demands. Small scale continuous production runs can be handled with confidence.

SPECIFICATIONS

Model	Capacity	Drive Description	Shipping Information	
			Weight	Dimensions
1000 MORSE® 2-1/4" x 3-1/2" Jaw Crusher	500 lbs. per hr. Max. feed size=1-1/2"	V-belt drive; 1 H.P TEFC motor	340 lbs.	36" x 18" x 23"
2000 MORSE® 4" x 6" Jaw Crusher	1200 lbs. per hr. Max. feed size=3"	V-belt drive; 3 H.P TEFC motor	600 lbs.	44" x 25" x 28"
3000 MORSE® 5" x 6" Jaw Crusher	2500 lbs. per hr. Max. feed size=4"	V-belt drive; 5 H.P TEFC motor	1300 lbs.	56" x 30" x 41"
4000 MORSE® 8" x 8" Jaw Crusher	4000 lbs. per hr. Max. feed size=6-1/2"	V-belt drive; 10 HP TEFC motor	3200 lbs.	75" x 41" x 52"

ACCESSORIES & OPTIONS

- ▲ Custom, fabricated steel base assembly
- ▲ Drive motors to meet a variety of available electrical specifications

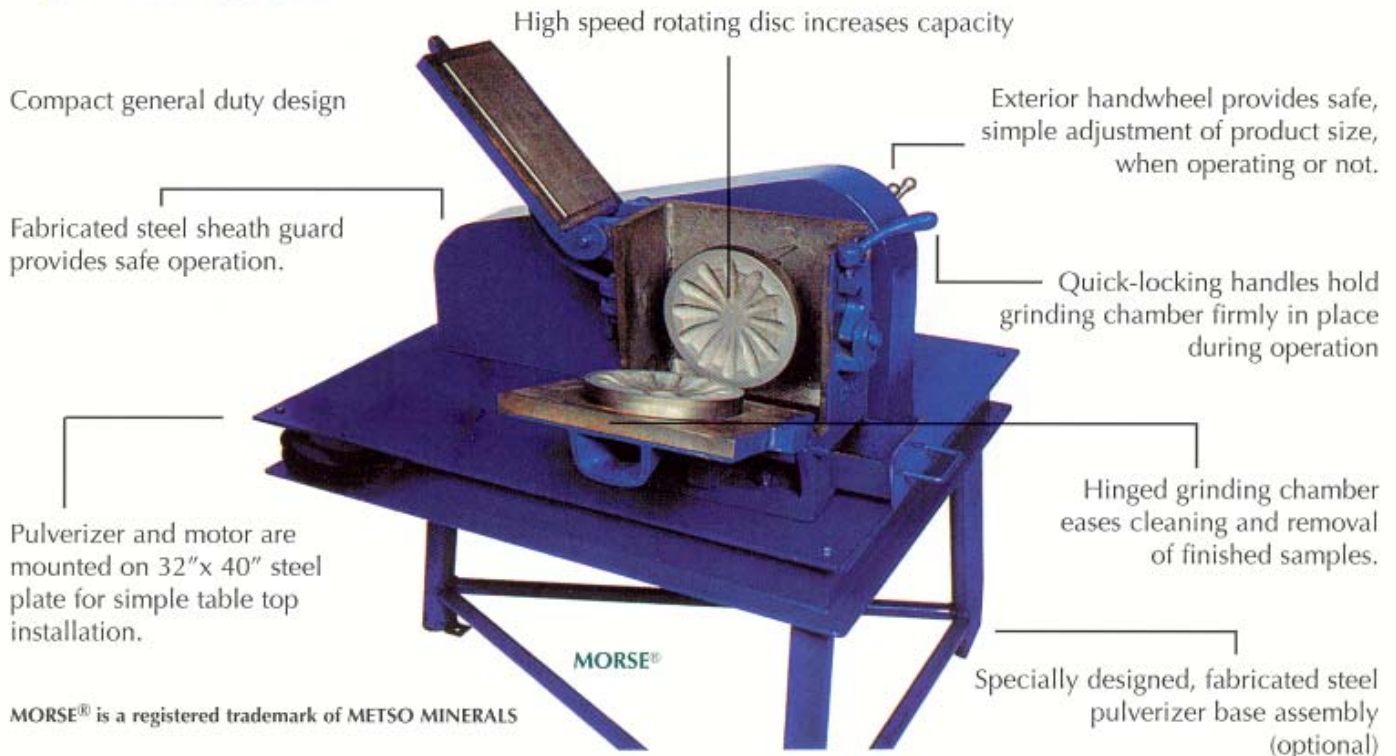
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8" Laboratory Disc Pulverizer

MORSE®



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MORSE® 8" Disc Pulverizer (shown with optional base assembly) can reduce 90 lbs. of quartz-type material from 1/4" feed to minus 100 mesh (nominal) in one hour.

APPLICATIONS

Designed for grinding virtually any material, MORSE® 8" Disc Pulverizer is especially recommended for assay offices, metallurgical, soil and other commercial / industrial laboratories. Rigorous demands of a pilot plant operation call for tough, easy to operate equipment. All Morse Laboratory / Pilot Plant Equipment is constructed to meet or exceed these demands.

SPECIFICATIONS

Model	Capacity	Drive Description	Shipping Information	
			Weight	Dimensions
5000 MORSE®-8" Disc Pulverizer	90 lbs. per hour 1/4" feed 100 mesh product	V-belt drive: 3 H.P. TEFC motor	640 lbs.	42"x 34"x 20"

ACCESSORIES & OPTIONS

- ▲ Drive motors meet a variety of electrical specifications.
- ▲ Special heat treated alloy steel grinding discs (500 BHN)

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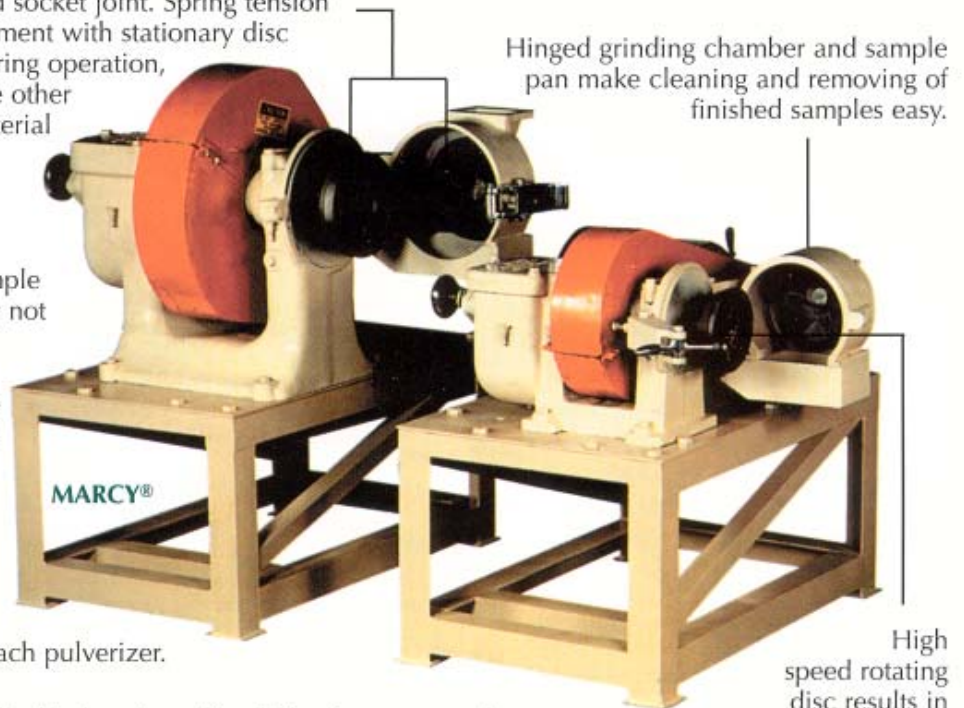


Laboratory Disc Pulverizers

MARCY®

Grinding is performed between two heat-treated, cast iron discs. Revolving disc is attached by ball and socket joint. Spring tension provides continuous, automatic alignment with stationary disc and increases grinding efficiency. During operation, one disc remains stationary, while the other revolves eccentrically as the feed material passes between the discs.

Exterior handwheel provides safe, simple adjustment of product size, whether or not machine is operating (not shown). Relationship of disc wear surfaces is constantly altered by eccentric movement, therefore discs will not groove regardless of how fine or coarse the product.



Hinged grinding chamber and sample pan make cleaning and removing of finished samples easy.

High speed rotating disc results in increased capacity.

Disc removal tool is furnished with each pulverizer.

Available in two sizes, MARCY®-McCool Laboratory Disc Pulverizers can reduce 60-120 lbs. of quartz-type material from 1/4" feed to 100 mesh in one hour.

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APPLICATIONS

Designed for grinding virtually any material, MARCY®-McCool Laboratory Disc Pulverizers are especially recommended for metallurgical, assay offices, soil and commercial/industrial laboratories. Rigorous demands of a pilot plant operation require tough equipment, quickly and easily adjusted. All MARCY® Laboratory Equipment is constructed to meet and exceed these demands. Small scale continuous production runs can be handled with confidence.

SPECIFICATIONS

Model	Capacity	Drive Description	Shipping Information	
2891 MARCY®-Mc Cool 6 1/2" F Disc Pulverizer	60 lbs. per hour 1/4" feed Reduced to 100 mesh product	V-belt drive: 3 H.P. TEFC motor	Weight 620 lbs.	Dimensions 46" x 28" x 25"
3182 MARCY®-Mc Cool 9 1/2" K Disc Pulverizer	120 lbs. per hour 1/4" feed Reduced to 100 mesh product	V-belt drive: 5 H.P. TEFC motor	1080 lbs.	48" x 36" x 37"

ACCESSORIES & OPTIONS

- ▲ Specially designed, fabricated steel pulverizer base assembly
- ▲ Hardened steel alloy discs (500BHN) ▲ Variety of drive motors available

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Laboratory Reduction Cone Crushers

MARCY®

FEATURES



Inner cylinder and lower main frame are cast iron with coincidental axis held in a fixed relationship.

Upper main frame includes a threaded cap which houses the precision manganese steel concave and provides accuracy in adjusting the crusher setting.

A pan-shaped precision manganese steel mantle is bolted to the cast metal machine head.

A forged steel eccentric shaft rotates on heavy-duty, anti-friction bearings.

The metal feed chute assembly handles large feed samples automatically.

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Optional base assemblies are available as shown

The table below is composed of data obtained from actual crushing tests with a 6" unit. Capacity of the 10" unit is twice that of the 6" crusher; while power consumption is slightly less than twice as much.

PERFORMANCE DATA

TEST NUMBER	1	2	3	4	5	6
Minus .470" Plus 10 Mesh Feed	Specular Hematite	Quartz		Magnesite		
Crusher Set	1/16"	1/16"	1/16"	7/64"	5/32"	3/16"
Sample Crushed (lbs)	10.09	5.51	7.85	8.16	7.77	7.64
Crush Time (Sec)	113	54.5	96.5	47	25	15.5
Pounds per hour Capacity	321.48	363.84	293.70	624.45	1117.90	1773.00

SCREEN ANALYSIS OF CRUSHED PRODUCTS (WEIGHT %)

TEST NUMBER:	1	2	3	4	5	6
Size (Mesh)	Hematite 1/16" Set	Quartz 1/16" Set	1/16" Set	Magnesite 7/64" Set	5/32" Set	3/16" Set
+ 3	0.00	0.00	0.00	0.00	0.00	1.74
+ 4	0.00	0.00	0.00	0.00	16.35	23.20
+ 6	0.00	0.68	0.00	2.14	4.35	9.19
+ 8	0.76	0.82	0.05	13.45	28.45	27.84
+ 10	12.32	9.90	1.98	28.43	25.41	23.43
+ 14	30.08	28.50	14.01	16.07	10.72	8.28
+ 20	15.88	18.09	13.75	7.92	3.44	1.94
+ 28	10.60	13.63	13.65	7.92	3.02	1.25
+ 35	6.42	8.61	12.82	7.38	2.75	1.15
+ 48	4.44	6.13	11.42	5.24	1.92	0.74
+ 65	3.61	5.25	12.20	3.93	1.46	0.50
+ 100	3.26	2.52	4.84	2.79	1.10	0.55
+ 150	2.15	1.91	5.33	1.70	0.55	0.29
+ 200	2.61	1.71	3.82	1.35	0.49	0.10
- 200	7.80	2.93	6.53	1.83	0.59	0.20

APPLICATIONS

MARCY® Gyrotory Reduction Cone Crushers reduce 1/2" feed as fine as minus ten mesh (nominal) in a single pass. The finished product is ideal feed to ball or rod mills, laboratory pulverizers, gravity concentration tests, such as; tables, sink/float or spiral concentration, sizing analysis and sampling.

Exact and rigorous demands of a pilot plant operation call for equipment that is tough, yet easily adjusted.

All MARCY® Laboratory Equipment is constructed to meet and exceed these demands.

Small scale continuous production runs can be handled with confidence.

SPECIFICATIONS

Model	Drive Description	Shipping Information	
		Weight	Dimensions
3149 MARCY® 6" Cone Crusher	V-belt drive: 1/2 H.P. TEFC motor	220 lbs.	21"x20"x15"
4100 MARCY® 10" Cone Crusher	V-belt drive: 2 H.P. TEFC motor	460 lbs.	31"x27"x19"

ACCESSORIES AND OPTIONS

- ▲ Custom fabricated steel crusher base assembly
- ▲ Variety of drive motors available

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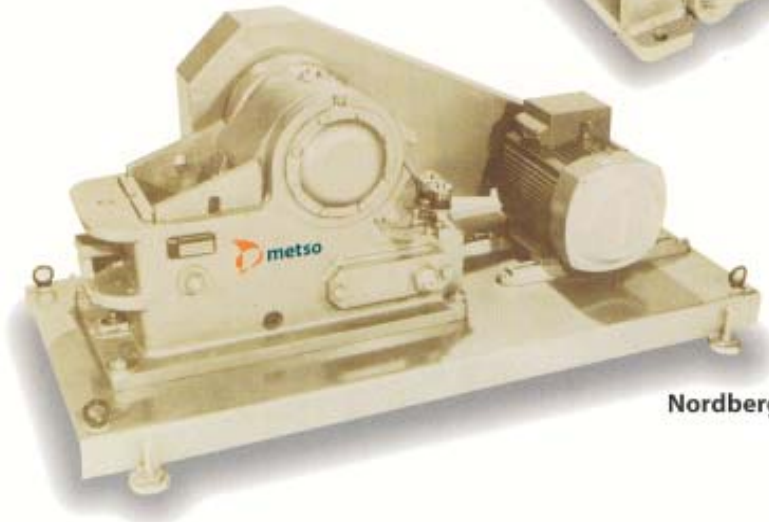
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Nordberg B90



Nordberg AR12



Nordberg AR25

Nordberg Laboratory Crushers

The new Nordberg Laboratory Crusher Series consists of two heavy-duty jaw crushers and one cone crusher. Based on Metso Minerals' proven crushing technology, these laboratory crushers are suitable for demanding and precise crushing in rock laboratories and sample processing plants.

The Nordberg AR jaw crusher series consists of the AR12 and AR25 models. These models differ both in size and construction. For intermediate crushing in laboratories and sample processing plants, Metso Minerals offers the B90 laboratory cone crusher

Nordberg AR12 laboratory jaw crusher

The Nordberg AR12 laboratory jaw crusher is a single toggle jaw crusher that is designed for laboratories where there is a need for crushing small quantities of ore and other rock materials.

The jaw crusher's frame is of a welded construction. The steel front frame has an upper axle and a lower positioning eccentric with a handle for setting adjustments. An eccentric shaft that is supported by four grease-lubricated roller

The crusher is powered by three V-belts that are driven by an electric motor that is mounted directly to the rear frame of the crusher. A guard protects the V-belts. The toggle plate is non-lubricated and is, as are the toggle seats, of tempered steel. The jaws are of manganese steel and the cheek plates of wear-resistant steel.

Nordberg AR25 laboratory jaw crusher

The Nordberg AR25 laboratory crusher is a single toggle jaw crusher designed for continuous operation, and is therefore not confined to pure laboratory work only and can thus also be used as a primary crusher in sample processing plants.

The jaw crusher's frame is of cast steel and is very robust. The swing jaw is also of cast steel and is supported by an eccentric shaft that is supported by four grease-lubricated roller bearings. Labyrinth seals protect the bearings from dust contamination. A single cast iron flywheel drives the eccentric shaft.

The crusher is powered by five V-belts that are driven by an electric motor that is moun

The jaws have smooth working surfaces and are made of austenitic manganese steel. The fixed jaw is adjustable in the vertical direction. The cheek plates are of wear-resistant steel.

The crusher is mounted on a base that is equipped with vibration dampers and motor slide rails.

Nordberg B90 laboratory cone crusher

The Nordberg B90 laboratory cone crusher is particularly suitable as an intermediate crusher in laboratories and sample processing plants, and is designed for continuous operation.

Crushing takes place between the bowl liner that is fixed to a threaded bowl and the mantle liner that is fixed to the

upper and lower eccentric portion of the main shaft. The non-eccentric portion of the main shaft is supported by 1 additional roller bearings. These bearings are protected from the ingress of dust by labyrinth seals and cup seals, and greased through individual nipples.

A conical feed hopper with a vertically adjustable feed pipe inserted into the bowl and is fitted at the top of the crusher shaft in order to facilitate feeding and to evenly distribute feed material.

The shaft is driven through three V-belts by an electric motor mounted on a base that is attached to the crusher's frame. A guard protects the V-belts.

The replaceable liners are made of austenitic manganese steel.

Technical Specifications

		AR12	AR25	B90
Feed Opening	mm	80 x 120	250 x 150	30
	in	4.7 x 3.1	5.9 x 10	1.2
Maximum Feed Size	mm	65	125	25
	in	2.6	4.9	1.0
Setting Range	mm	1-10	7-20	1-12
	in	0.04-0.4	0.3-0.8	0.04-0.47
Crusher Speed	rpm	400	400	475
Motor Size	kW	4	7.5	2.2
	HP	5.4	10	3

Maximum Dimensions & Weights

		AR12	AR25	B90
Length	mm	940	1800	765
	in	37	71	30
Width	mm	480	750	765
	in	19	30	30
Height	mm	530	820	720
	in	21	32	29
Weight (complete)	kg	265	1025	260
	lbs	584	2260	573

Indicative Production Capacities

		AR12	AR25	B90
With Minimum Setting	mtph	0.20	1.90	0.16
	stph	0.22	2.10	0.18



Laboratory/Pilot Plant Double Roll Crushers

MARCY®

MARCY® Double Roll Crushers meet your requirements for intermediate crushing of friable rock or similar rock-like materials down to minus 10 mesh (nominal) in a single pass. The 6-1/2" x 6" model 6000 machine is shown with feed hopper in open position.

Fabricated steel, high capacity tilt- design feed hopper provides ample feed capacity and simplifies clean-up between samples. An electrical safety interlock shuts down the unit when feed hopper is lifted.

Cast Ni-hard roll facings provide long life.

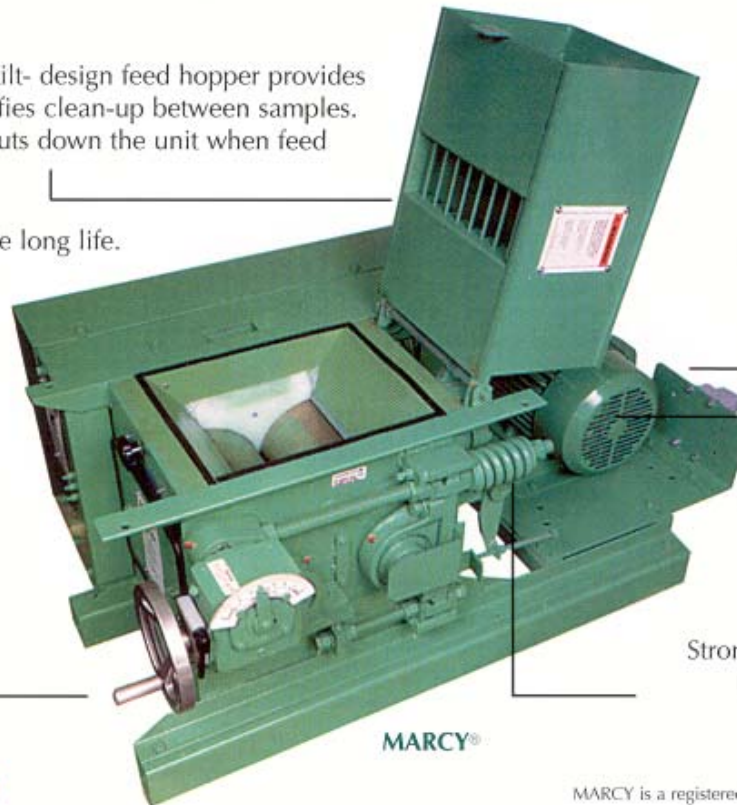
Heavy duty pillow block bearings provide smooth and consistent roll operation..

A single hand lever makes roll adjustment easy.

Fabricated steel drive guard provides for safe operation.

Crusher and motor are mounted on a heavy steel base.

Strong relief springs protect rolls by allowing tramp materials to pass.



MARCY®

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APPLICATIONS

Designed for intermediate crushing of virtually any material. Especially recommended for assay offices, metallurgical, soil and other commercial/industrial laboratories. The rigorous demands of a pilot plant operation call for equipment which is tough, yet easily operated. All MARCY® Laboratory/Pilot Plant Equipment is constructed to meet and exceed these demands.

SPECIFICATIONS

Model	Capacity	Drive Description	Shipping Information	
			Weight	Dimensions
6000 MARCY® 6-1/2" x 6" Double Roll Crusher	3000 lbs. per hour 1/2" feed minus 10 mesh product	V-belt drive; 2 H.P TEFC motor	680 lbs.	50" x 38" x 32"
8000 MARCY® 9" x 12" Double Roll Crusher	8000 lbs. per hour 1/2" feed minus 10 mesh product	V-belt drive; 5 H.P TEFC motor	1600 lbs.	64" x 48" x 46"

ACCESSORIES & OPTIONS

- ▲ Custom fabricated steel crusher base assembly
- ▲ Drive motors to meet a variety of available electrical characteristics
- ▲ Crushing rolls manufactured from #304 stainless steel

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