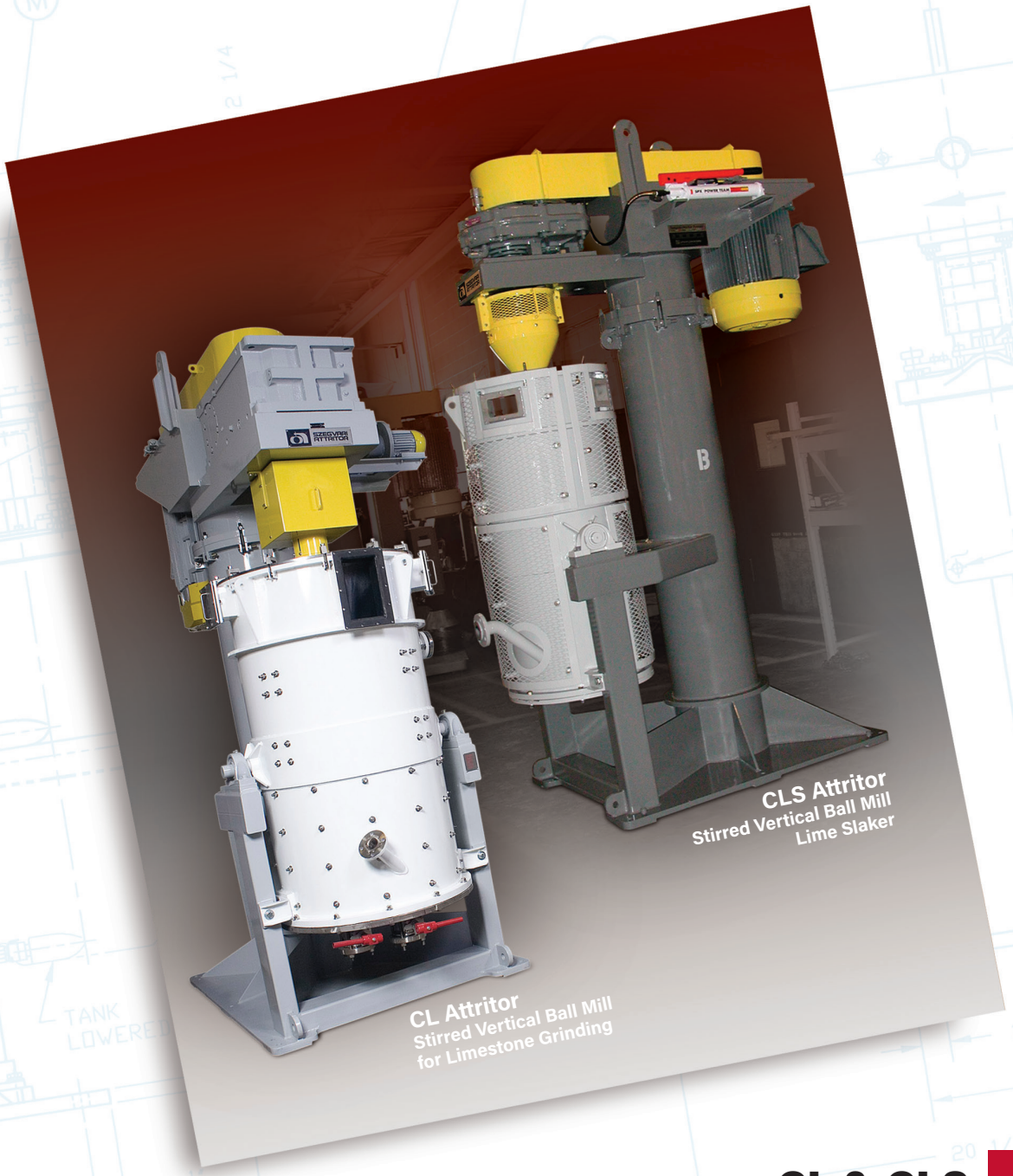
Union Process®



CL & CLS SPECIALTY ATTRITORS

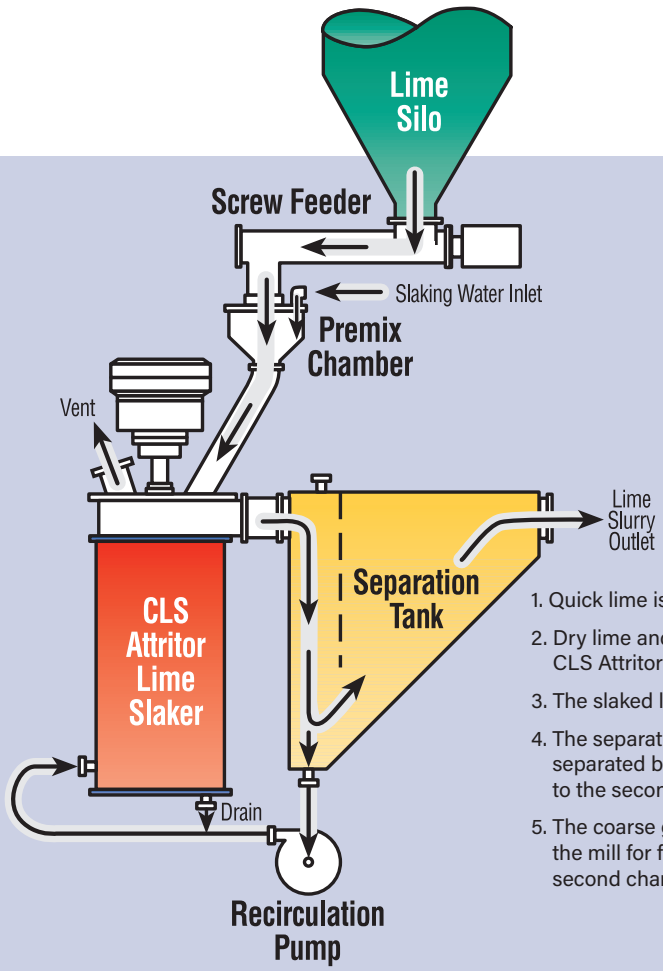
ATTRITOR®

The Union Process
CLS Attritor

Stirred Vertical Ball Mill Lime Slaker

The patented CLS Attritor Stirred Vertical Ball Mill Lime Slaker operates in continuous processing mode and has been used successfully in power generating plants for flue gas desulphurization (FGD). The Attritor will slake the lime as well as grind the inert grit, eliminating grit separation and disposal problems.

Because of its compact size, the CLS Attritor Stirred Vertical Ball Mill Lime Slaker will readily fit under the skirt of the lime silo making it unnecessary to have an additional building to house the mill. This results in substantial savings in space and cost.

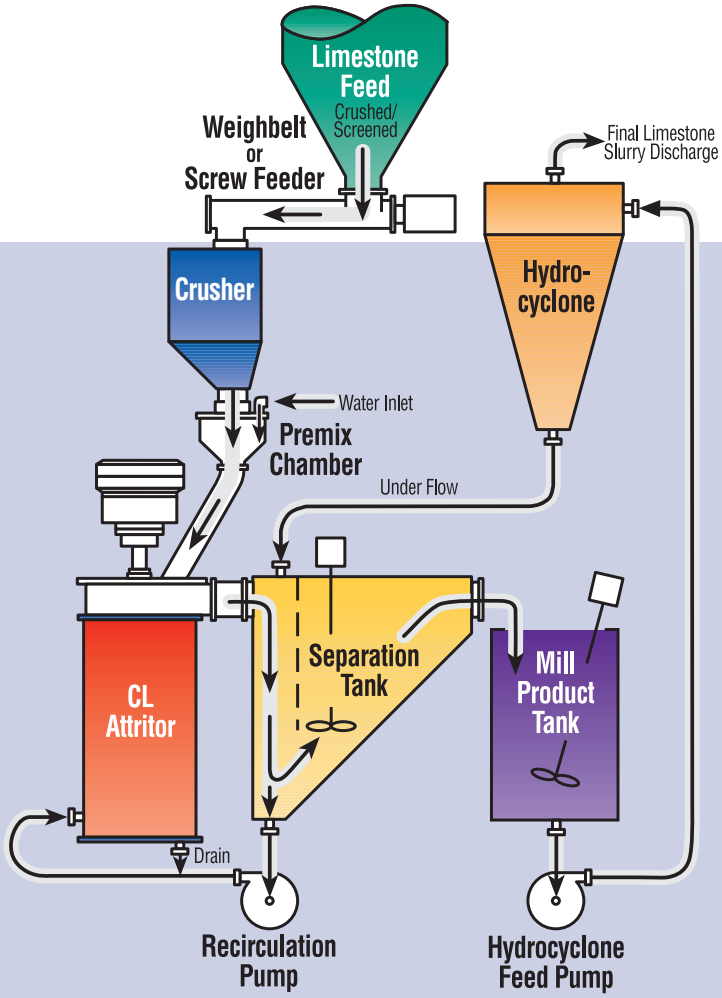


1. Quick lime is withdrawn from the lime silo via a screw feeder.
2. Dry lime and proportional water are mixed in the premix chamber and fed to the CLS Attritor Lime Slaker.
3. The slaked lime and grit discharge from the slaking mill into the separation tank.
4. The separation tank is comprised of two chambers (primary and secondary) that are separated by a wall which allows slurry to flow from the bottom of the first chamber to the second chamber.
5. The coarse grit settles to the bottom of the first chamber and is pumped back to the mill for further grinding. The finer particles of hydrated lime flow upward in the second chamber and exit the separation tank to the lime slurry storage tank.

The Union Process
CL Attritor

Stirred Vertical Ball Mill Limestone Grinding System

The economical CL Attritor Stirred Vertical Ball Mill is used for wet grinding limestone for flue gas desulphurization. The process uses limestone feed stock of approximately 6mm in size and wet grinds the limestone to 95% minus 325 mesh. The CL Attritor operates in continuous processing mode. The CL Attritor is the primary component of a grinding circuit which typically includes the separation tank, mill recirculating pump, mill product tank, hydrocyclone, hydrocyclone feed pump and all necessary controls. Due to the CL Attritor's high efficiency, the power consumption for this mill is 50% less compared to conventional ball mills of a similar size. This results in substantially lower operating costs.



1. The process begins with 1-1/2" limestone, which is fed from the silo to the crusher.
2. The limestone is reduced to 6mm pieces in the crusher.
3. The crushed limestone is then mixed with water in the Premix Chamber and fed into the CL Attritor Mill.
4. The limestone slurry exits the CL Attritor Mill and enters the Separation Tank.
5. Any oversized particles are pumped back into the Mill while finer slurry overflows into the Mill Product Tank.
6. The slurry is then fed through a hydrocyclone with the under flow returned to the separation tank.

Model CL-5 Laboratory Attritor

The CL-5 Laboratory Attritor Stirred Vertical Ball Mill for Limestone Grinding is a smaller version of the production-sized CL Series Mills. It is ideal for research, scale-up and small-scale production. This mill will process in the range of 200-400 pounds of limestone per hour and is equipped with a variable frequency drive (VFD) and a 15 horsepower inverter duty motor. The CL-5 uses 2.5 gallons of grinding media.

SPECIFICATIONS

CL-5 LABORATORY ATTRITOR

Model	HP	Working Media Volume (gallons)	Maximum thru-put (solids) (lbs./hour)	Dimensions (Inches) *W x D x H	Operating Weight Lbs.
CL-5	15	2.5	400	34 x 51 x 82	1600

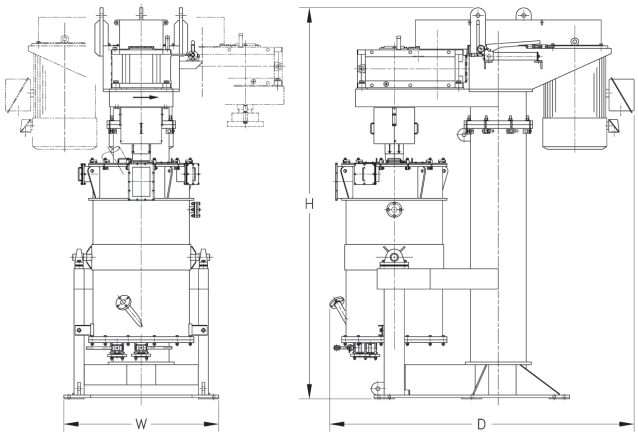
CLS ATTRITORS FOR LIME SLAKING

Model	HP	Working Media Volume (gallons)	Maximum thru-put (solids) (lbs./hour)	Dimensions (Inches) *W x D x H	Operating Weight Lbs.
CLS20	40	10	2700	43 x 70 x 110	7000
CLS25	40	12.5	3375	44 x 70 x 114	7000
CLS30	50	15	4050	45 x 72 x 119	8000
CLS40	50	20	5400	47 x 74 x 122	9000
CLS60	75	30	8100	50 x 76 x 132	10500
CLS75	75	37.5	10125	52 x 86 x 138	12000
CLS100	100	50	13500	54 x 96 x 149	14000
CLS150	125	75	20250	58 x 101 x 158	18000
CLS200	150	100	27000	63 x 106 x 170	23000
CLS250	200	125	33750	65 x 114 x 179	27000
CLS300	200	150	40500	68 x 122 x 185	30000

CL ATTRITORS FOR LIMESTONE GRINDING

Model	HP	Working Media Volume (gallons)	Maximum thru-put (solids) (lbs./hour)	Dimensions (Inches) *W x D x H	Operating Weight Lbs.
CL25	50	12.5	2000	45 x 80 x 106	8000
CL50	75	25	4000	50 x 94 x 116	10000
CL100	100	50	8000	56 x 106 x 132	14000
CL200	150	100	16000	65 x 116 x 151	20000
CL300	200	150	24000	70 x 125 x 163	28000

* Width dimension does not include room for drive head rotation.



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