

 UNION PROCESS<sup>®</sup>



CONTINUOUS  
ATTRITORS



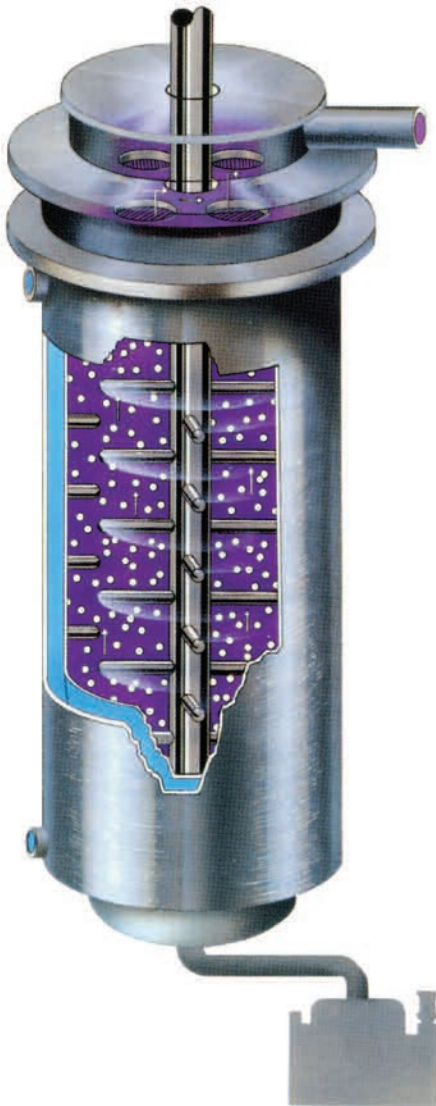
# Union Process C/H Attritors Produce Large Quantities of Material Quickly and Efficiently

## History

From a revolutionary idea proposed and developed by Dr. Andrew Szegvari in 1945, Attritor technology became the basis for Union Process, Inc. Today, Attritors are considered to be the most efficient grinding/dispersing systems and are used in hundreds of industries and research laboratories worldwide.

## How Attritors Work

The Attritor is often referred to generically as an “internally agitated high energy media mill.” The operation of an Attritor is simple and effective. The material to be ground is placed in a stationary tank with the grinding media. The materials and media are then agitated by a shaft with arms, rotating at high speed. This causes the media to exert both shearing and impact forces on the material. The final result of this remarkably efficient process is extremely fine material, measured in microns or fractions of microns, distributed on a very narrow curve.



## The Continuous Attritor

The continuous Attritor is a compact vertical design suitable for continuous production of large quantities of materials. Premixed slurry is pumped through the bottom and discharged at the top of a tall, narrow jacketed tank with internally agitated grinding media. The fineness of the processed material depends on the time the material stays in the grinding chamber (“dwell” time).

Dwell time is controlled by the pumping rate. The slower the pumping rate, the longer the dwell time and the finer the grind.

The grinding media used in continuous Attritors range in size from 2mm to 10mm in diameter. Carbon steel, stainless steel, chrome steel and ceramic balls are commonly used media.

Continuous Attritors can also be set up in series. This can be accomplished by using larger media in the first unit which is equipped with grids having larger openings for accepting a coarse feed size. Subsequent units then utilize smaller media, resulting in a finer grind.

## The Union Process Advantage

From years of experience in designing and building thousands of Attritors for use all over the world, Union Process people have developed the “know how” to custom design the Attritor to specifically meet your requirements — whether in the lab or in the field. Union Process maintains a very well equipped laboratory and pilot plant in order to simulate actual production conditions. Skilled technical service representatives are always available for consultation. When required, a representative will visit the customer’s facility.

## Advantages of Using a Continuous Attritor

- Continuous large production
- Fastest grinding and processing
- Excellent temperature control
- Simple and safe to operate
- Low maintenance and power consumption

## Common Applications for Attritors

- Minerals, ores, coal
- Paints, toners, inks
- Ceramics
- Food products
- Chocolate, confectionery
- Paper coatings, calcium carbonate, clay
- Ferrites
- Metal oxides
- Agricultural flowables
- Chemicals

# C/H SERIES

## CONTINUOUS ATTRITOR

Continuous Attritors are best suited for the continuous production and fast grinding of large quantities of material. They are designed to deliver hours of low-cost, maintenance-free operation. The basic model features a system that does not require an expensive shaft seal.

Continuous Attritors come in two basic types, "C" and "H" series. The "C" series runs at lower RPMs and generally uses a larger grinding media of 5mm – 10mm diameter. The "H" series runs at higher RPMs and utilizes smaller media of 1mm – 3mm.

Both C and H type Attritors are available in sizes ranging from the large scale production model C/H-100 to the laboratory size C/H-3 and C/H-5 models.

The laboratory size continuous Attritor models are designed to reliably test and scale-up to production-size continuous Attritors. They can also be used to produce small quantities for developmental purposes.

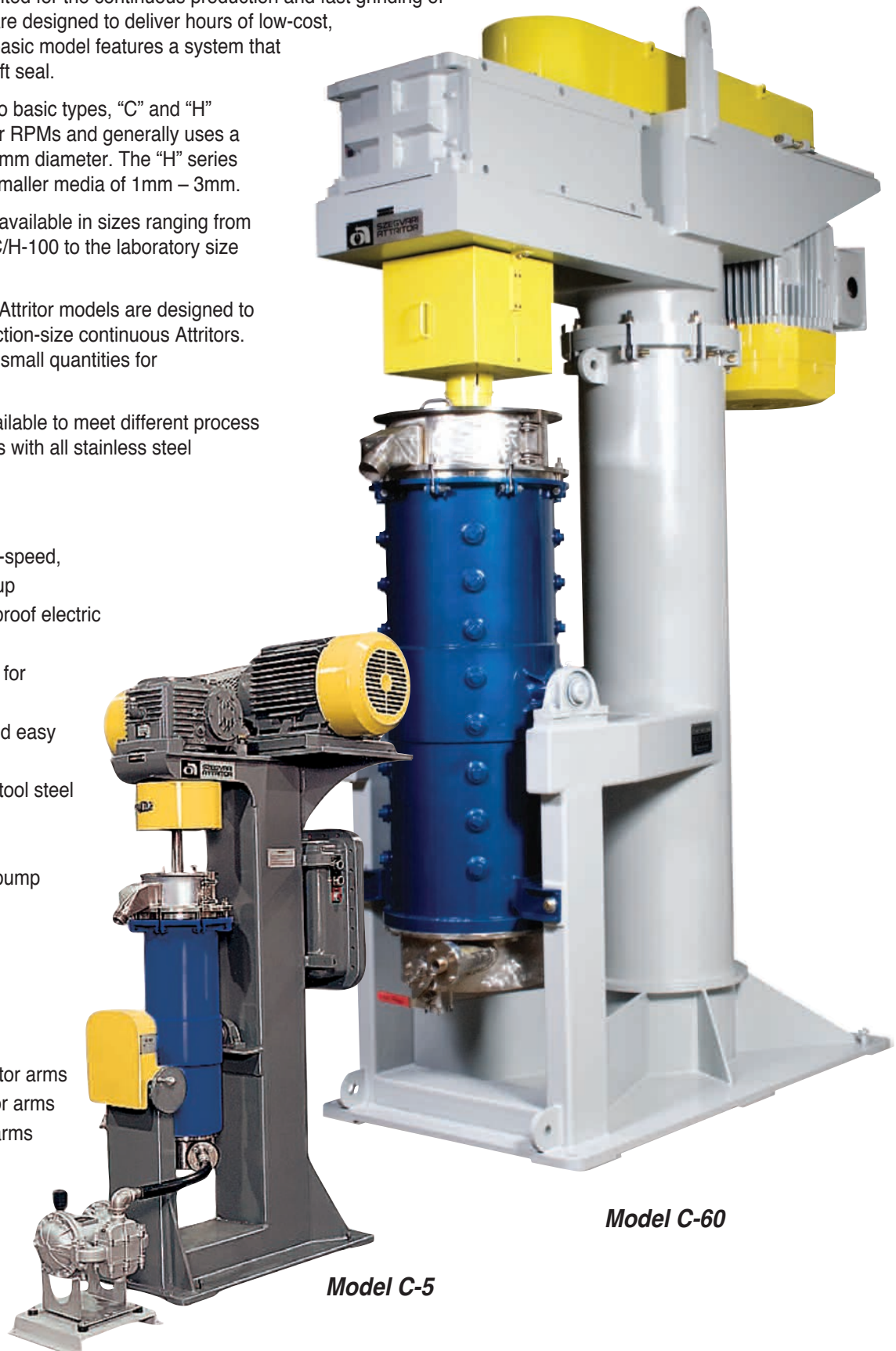
A variety of accessories are available to meet different process conditions including special models with all stainless steel wetted parts.

### Standard Features

- Special 450% starting torque, 2-speed, 2-winding motors for easy startup
- Standard (TEFC) or explosion-proof electric motor and controls
- Grinding tank (304SS) jacketed for heating or cooling
- 90° tank tilt for shaft removal and easy cleaning
- 4140 steel shaft with hardened tool steel agitator arms
- Media discharge valve
- Choice of variable-speed gear pump or air diaphragm pump

### Tank and Arm Options

- Alumina-lined grinding tank
- Rubber-lined grinding tank
- Tungsten carbide sleeved agitator arms
- Zirconium oxide sleeved agitator arms
- Polyurethane sleeved agitator arms
- 440C stainless steel arms



*Model C-60*

*Model C-5*

## ENGINEERING DATA

ATTRITOR MODEL	C-3/H-3	C-5/H-5	C-10/H-10	C-20/H-20	C-40/H-40	C-60/H-60	C-100/H-100	C-200/H-200
Grinding Tank (gals)	3.7	6.0	14	27	49	79	133	257
Media Volume (gals)	3.3	5.5	11	22	44	66	110	220
HP	3 – 5	5 – 7.5	10 – 15	20 – 30	40 – 60	60 – 100	100 – 150	350 – 400
Total Height (A)	88"	88"	104"	114"	129"	149"	166"	203"
Intake Height (B)	12"	12"	12"	17"	17"	17"	18"	24"
Discharge Height (C)	42"	48"	57"/54"	71"/72"	83"/81"	90"	96"/91"	115"
Floor Space (W x D)	20" x 40"	29" x 48"	50" x 40"	52" x 52"	58" x 60"	62" x 62"	66" x 66"	72" x 100"
Weight (lbs) w/o media	1600	1900	3600	4000	6500	9500	14,500	33,000

C-150, C-200 and CLS Series available on request.  
(DIMENSIONS AND WEIGHTS ARE APPROXIMATE)

### Special Options

- All models can be equipped with a torque meter to precisely measure energy expended in the grinding chamber.
- Stationary arms can optionally be fitted into the tank wall in configurations best suited for your specific application. These arms are removable/interchangeable.
- Baffles and special linings can be fitted or coated on the tank walls to increase the life of the tank in applications such as power plants and mining when maintenance must be kept to a minimum.
- Variable speed drive motor systems.
- Cover and shaft seals for grinding in a closed (pressurized) system.

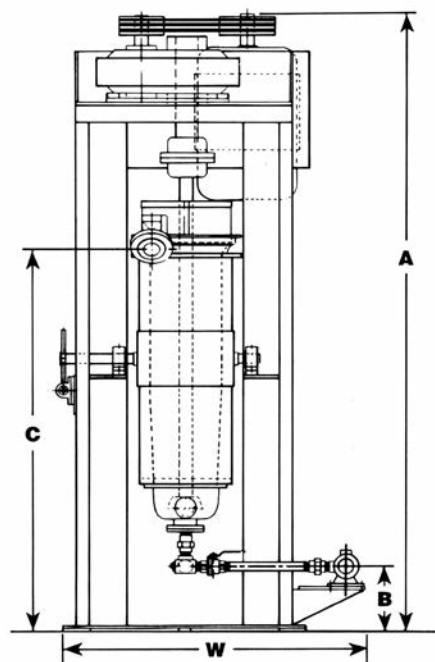
### CL and CLS Series



**CL & CLS series can be equipped with top-loading mechanism for adding solids directly into the mill, such as lime slaking applications.**

\*Apparatus, Process and/or Product protected under one or more of the following U.S. Patents: 4,979,686; 5,080,293; 5,199,656; and other pending patent applications as well as corresponding and related foreign patent rights.\*

Union Process, Inc. reserves the right to make improvements or change machine and equipment designs at any time without notice. Information contained herein is accurate and reliable to the best of our knowledge, but our suggestions and recommendations cannot be guaranteed because the conditions of use are beyond our control.



### Grinding Media

Union Process offers a large selection of highest quality grinding media. Materials range from steel to various ceramics to glass. A Union Process representative can advise you about which grinding media is best for your application.

For more information on our complete line of production and laboratory mills for grinding and dispersing, request a copy of our literature or download a copy from our website at [www.unionprocess.com](http://www.unionprocess.com).



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