

1-S SERIES

LABORATORY ATTRITOR

MODELS 1-S, 1-SC and 1-SD

The 1-S Batch Attritor is a versatile, reliable, rugged laboratory-size machine designed to meet virtually all lab grinding and dispersing needs—either wet or dry. It allows easy and precise scale-up to production size equipment with reproducible results from batch to batch. It is also suitable for small production or pilot plant work.

The 1-S also is available in two additional configurations for specific applications.

- 1-SC — designed for use with tungsten carbide media and supplied with tungsten carbide arm sleeves.
- 1-SD — equipped for dry grinding, includes a metering valve or ball valve and stainless steel cover with floating brush seal for dust control. For continuous operation, disks are added to the shaft.

The Models 1-S, 1-SC, and 1-SD are designed for media ranging from 1/8" to 3/8" and run at rpms of 100 to 500. All share the following features:

- Variable shaft rpm.
- Adjustable agitator shaft height to accommodate different size grinding media.
- Bottom discharge grid with valve for easy sampling and discharge.
- Tank slides forward and tips 90° for media discharge and fast cleaning.
- Jacketed for cooling (and heating).
- Quick disconnects for cooling water.

MODEL 1-SDM

The Model 1-SDM is designed for grinding media ranging from 0.25mm to 2mm. The 1-SDM has a shaft with special UP Delta Discs and runs at rpms of 300 to 2000. It has its own frame, and its tanks are not interchangeable with 1-S, 1-SC or 1-SD models. It has a side discharge screen and valve, and the tank tilts for ease of cleaning. The 1-SDM comes with a special stainless steel one-piece cover with charging port. It does not require a shaft seal.

The Model 1-SDM is available with either a stainless steel, alumina- or zirconium-lined tank. Agitator disks are available in tool steel, stainless steel, plastic or zirconium oxide.

CHOICE OF TWO DRIVE SYSTEMS

All models in the 1-S Series are available with either of the following two drives:

1. An explosion-proof **mechanical** variable speed drive system with tachometer.
2. A non-explosion-proof **electronic** variable drive system with read-out showing rpm and percent torque.
This can be made explosion proof if the drive controls can be installed in a safe area away from the machine.
On the machine is an ON/OFF button, speed potentiometer, and a window to see rpm and percent torque.



1-S ATTRITOR
with electronic variable speed drive and optional cover seal

1-S SERIES MODELS	1-S/1-SC/1-SD <i>mechanical</i>		1-S/1-SC/1-SD <i>electronic</i>		1-SDM <i>mechanical</i>	1-SDM <i>electronic</i>
Tank Capacity (gal./liters)	1.5/5.7	2.5/9.5	1.5/5.7	2.5/9.5	2.9/11.0	2.9/11.0
Working Capacity (gal./liters)	0.8/3.0	1.1/4.2	0.8/3.0	1.1/4.2	0.8/3.0	0.8/3.0
Media Volume (gal./liters)	1.0/3.8	1.5/5.7	1.0/3.8	1.5/5.7	1.25/4.7	1.25/4.7
HP-standard use	2	2	3	3	5	5
HP-(SC) for tungsten carbide media	2	3	3	5	—	—
HP-(SD) for dry grinding	2	3	3	5	—	—
HP-(SD) for mechanical alloying	3	5	5	5	—	—
Voltage*	230/460v 3 phase	230/460v 3 phase	230/460v 3 phase	230/460v 3 phase	230/460v 3 phase	230/460v 3 phase
Height (in./mm)	47/1194	47/1194	41/1041	41/1041	60/1524	60/1524
Bench Space (in./mm)	28x50/711x1270	28x50/711x1270	24x40/610x1016	26x44/660x1118	29x52/737x1321	29x46/737x1168
Weight (lbs./kg)	750/340	850/386	600/272	650/295	1600/726	1400/635

Dimensions and weights are approximate.
*60 Hz standard. 50 Hz/380 V, 3 phase available.

Model 1-SDG Attritor

with feeder system and ammeter—explosion-proof



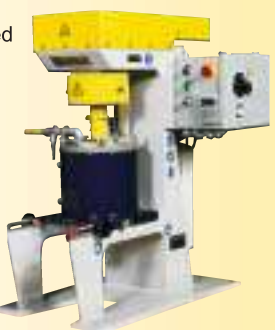
Model 1-S

with VFD (variable frequency drive) mounted remotely with explosion-proof controls on the machine. Also shown with electrically driven pump for circulation.



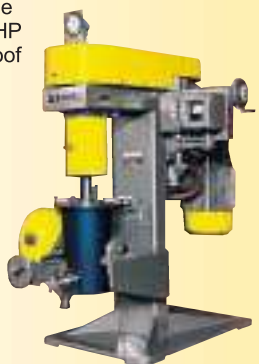
Model 1-S

with variable frequency drive, sealed cover and CE marked for Europe



Model 1-SDM Attritor

with discharge valve and 5 HP explosion-proof mechanical variable speed drive motor



1-S Series Accessories

Union Process Laboratory Attritors can be equipped with a torque sensor and a read-out displaying torque, horsepower, and RPM. This sensor can also be tied into a recording device if desired. The torque meter measures the exact energy that is being used in the grinding chamber. This information is valuable for studying energy consumption and production machine scale-up. Also from variation of the torque readings, one can monitor the condition changes in the grinding chamber during the process. Hence, the proper viscosity and material loading can be adjusted.

One-piece aluminum or stainless steel covers with a simplified, mechanical shaft seal, and gas inlet and outlet for grinding under inert gases, are available for grinding in an oxygen-free atmosphere. Also available is a sealed sample vessel for discharging material from the Attritor directly into an oxygen-free container.

For those who want to use a pump for circulation during the grind, small peristaltic "tube" pumps are available in both regular and explosion-proof models.

Example of Accessories



Complete assemblies are available for metal-free grinding. Cover seals available for grinding under inert gases.

- | | | |
|---|---|--|
| A. Tungsten carbide-sleeved arm | F. Stainless steel discharge grid with 1/32" openings | I. Plastic-sleeved shaft/zirconium oxide arms |
| B. Zirconium oxide-sleeved arm | G. Plastic discharge grid | J. 1-1/2 gal. stainless steel tank with stationary arms |
| C. Plastic-sleeved arm | H. Stainless steel discharge grid with 1/8" openings | K. Stainless steel sample vessel for discharging under inert gas |
| D. Polyurethane-sleeved arm | | |
| E. Stainless steel cover with shaft seal for grinding under inert gas | | |

COMPLETE LIST OF ACCESSORIES

Tank Options

- Stainless steel—1/2 gal., 1 gal., 1-1/2 gal., 2-1/2 gal.
- Stainless steel with stationary arms—1-1/2 gal., 2-1/2 gal.
- Alumina-lined—1-1/2 gal.
- Silicon carbide-lined—1-1/2 gal.
- Silicon nitride-lined—1-1/2 gal.
- Rubber-lined—1/2 gal., 1 gal., 1-1/2 gal., 2-1/2 gal.
- Tefzel®-lined—1-1/2 gal., 2-1/2 gal.
- Polyurethane-lined—1/2 gal., 1 gal., 1-1/2 gal., 2-1/2 gal.

Working capacity for 1/2 gal. tank is 1 quart.
Working capacity for 1 gal. tank is 1/2 gal.

Agitator Arms:

Following arms can be installed in either stainless steel or plastic-coated agitator shafts:

- Colmonoy®-faced stainless steel
- Tool steel (hardened)
- Plastic sleeved, steel reinforced
- Transformation toughened alumina sleeved
- Polyurethane coated
- Silicon nitride sleeved
- Tungsten carbide sleeved
- Stainless steel (440C)
- Zirconium oxide sleeved

Covers:

- 2-piece aluminum
- 2-piece plastic
- 1-piece stainless steel with simplified, mechanical shaft seal, with gas inlet, outlet and charging port
- 2-piece stainless steel with floating teflon seal and charging port access

Bottom Valves:

- Stainless steel ball valve (standard)
- Dry grind metering valve (cannot seal for inert gas use) (standard for dry grind)

Discharge Grids:

- Plastic
- Stainless steel
- Zirconium oxide
- Tungsten carbide-faced stainless steel

Special:

- Ammeter (T.E.F.C. or explosion-proof)
- Stainless steel sample vessel for discharge under inert gases complete with site glasses
- Adapter for 1-S to hold 01-HD 750 cc or 1400 cc tanks (includes shaft reducer to enable standard 01-HD shafts to fit 1-S coupling)

Pumps For Circulation: Same as 01 SERIES

Torque Meter: Same as 01 SERIES