

Evolutionary Engineering

R
ROSS



Soon after nightfall in a Central American rain forest, a thousand frogs return to a small pond where they have spawned for years. The males sing in choruses of twos and threes, alternating their calls, each in ancient counterpoint to his partners...

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ROSS

GENERAL



The water is serene, but the air is a tempest of whistles, barks, clicks, trills and perhaps a croak. A female red-eyed tree frog crouches on the shore. She listens, motionless on the bank, filtering and studying the sound. And in that din she is miraculously able to detect her own species and find her mate in the darkness.

One of the greatest stories told on earth during the last 365 million years stars a creature that is more often considered an evolutionary loser than a hero. The frog is small and slimy. He is ugly and even clownish, especially when he is caught off guard in the flash of a strobe light. People have said that one touch can give you warts or infertility, or trigger a witch's spell – or worse.

But if you look more closely, you will see that he is actually one of the great miracle workers of all time. When all the creatures on this planet were confined to the Devonian ocean, his amphibian ancestors climbed onto the shore and gave life to all the reptiles, birds and mammals who would later be born above the surface of the sea.

Since then no other creature in history has shown greater ability to adapt creatively to diverse environments and challenges. He has colonized nearly every corner of the world and developed variations of incredible abundance. He was the first vertebrate born with true ears, a tongue and eyelids. The first to experience the wonder of metamorphosis from a tiny swimming herbivore to a hunting carnivore ashore. And he was the first given a real voice and the ability to converse with others of his kind in the open air.

Ross products have evolved, too, challenged the limits of productivity and dominated processing markets worldwide for more than 150 years. Today we offer more choices, greater value and better performance than ever before.

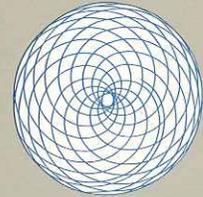
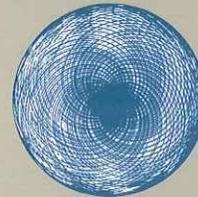
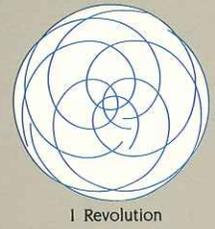
DOUBLE PLANETARY



Thousands of Ross Double Planetary Mixers are on process lines around the world producing a wide variety of high viscosity products in countless applications – from simple mixtures to sophisticated reactions involving vacuum, internal pressure, close blade to bowl clearance and controlled mix temperatures. Stirrer design and rotation are highly evolved for optimal mixing efficiency. There are no packing glands or bearings in the product zone and contamination is virtually eliminated. With the Ross Change Can, the mix vessel can easily be rolled away for remote discharge when the mix cycle is complete.

MIXING PATTERNS

The orbital mixing pattern of the Ross Double Planetary Mixer ensures homogeneity of the mix within a few minutes.



POWERMIX



The Ross PowerMix takes you far beyond the limits of ordinary planetary mixing. By combining a single planetary blade with a high speed disperser, the patented PowerMix can handle materials over an enormous range of viscosities – and probably accomplish the work of two mixers on your present process line. The PowerMix delivers greater productivity for a broad range of applications:

- Higher shear rates
- Dispersing low density solids
- Liquid-solids dispersions



Optional chopper blade for powder processing and granulating.



A Ross High Speed Disperser orbits the mix vessel.

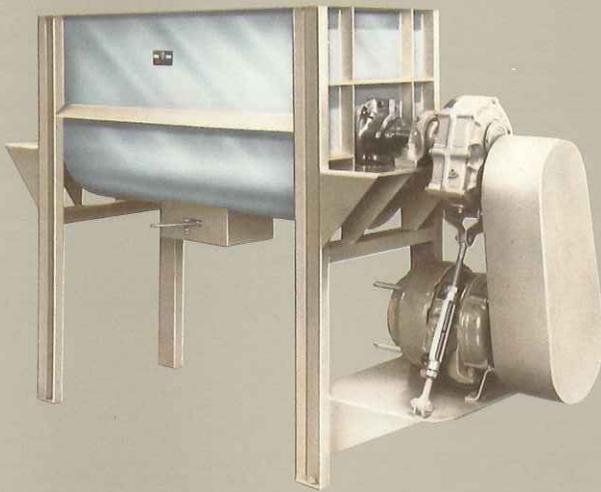


The planetary blade continuously sweeps the side-wall and carries material to the disperser.



Combined, the planetary blade and disperser can give you access to a much higher level of mixing productivity.

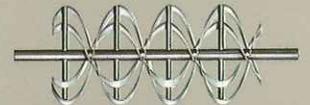
RIBBON BLENDER



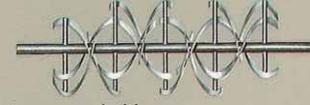
Ross is a leading supplier of Ribbon Blenders. Many products, including pharmaceuticals, foods, chemicals, fertilizers, plastics, pigments and cosmetics are manufactured in Ross Blenders. These range in capacity from 1/2 cu. ft. laboratory models to 515 cu. ft. production units. A wide variety of horsepower and speed combinations satisfy the most demanding applications. Optional features can be provided to fine tune the machine to your process. These include vacuum, jackets for heating or cooling, a choice of materials of construction, center or end discharge, choppers and various stuffing box options.



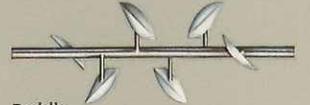
Continuous ribbon, arranged for center discharge.



Continuous ribbon, arranged for end discharge.

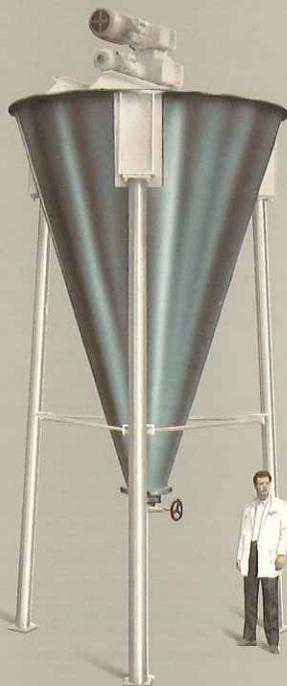


Interrupted ribbon.



Paddle.

VERTICAL BLENDER



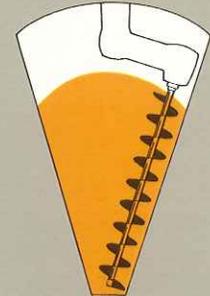
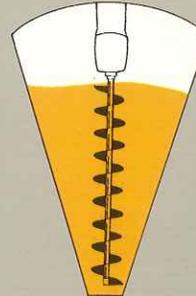
Ross Vertical Blenders are used for simple dry blends to complex vacuum drying operations. Their ability to mix thoroughly within short cycle times is achieved as a result of the unique tri-blend action of these units. Ross Vertical Blenders are available in many sizes from the popular 1 cu. ft. laboratory unit to 500 cu. ft. production models. They

are available for non-vacuum and vacuum operation with many optional features to suit the needs for which they will be used. These versatile mixers are used for diverse requirements in the adhesive, chemical, coating, cosmetic, food, pharmaceutical and plastics industries.

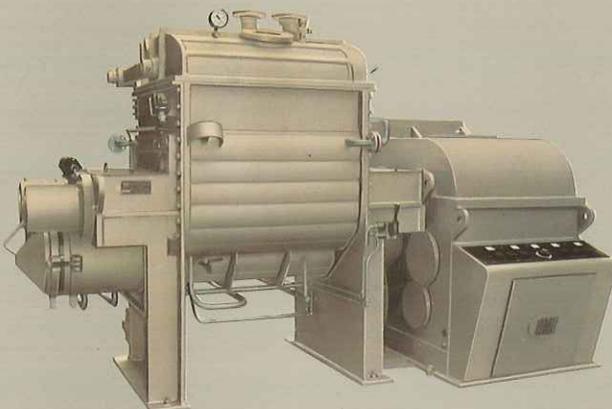
The mixing screw rotates on its own axis.

The mixing screw moves slowly around the cone.

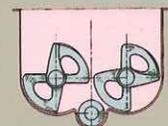
Materials are cascaded off the screw to the opposite side of the vessel.



KNEADER EXTRUDER



Overhead view showing sigma blades and extrusion screw.



Side view showing tangential relationship of sigma blades and extrusion screw.

The Ross/AMK Kneader Extruder uniquely combines the efficiency of a double-arm mixer with the convenience of an extrusion screw for compounding and discharging of heavy, viscous materials. A wide range of sizes from 1 to 1000 gallons capacity is available. With the selection of horsepower combinations and optional features in each size, your equipment can be tailored to individual processing requirements. Successful installations cover a diversity of process industries including applications such as color masterbatching, hot melts, butyl sealants, silicones, polyester pre-mix, polyurethanes, foods, pharmaceuticals, etc.

THREE ROLL MILL

Ross Three Roll Mills are among the most popular for research and development and laboratory purposes. Three standard sizes are available, Models 52M 2½ x 5", 4 x 8" and 5 x 12". The rolls of each unit are precision ground and are

available in both steel and stainless steel construction. Rolls are cored and can be supplied with optional rotary pressure joints for heating or cooling purposes. Mills are usually available from stock. Larger mills available upon request.

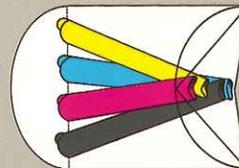


MOTIONLESS MIXER



Ross manufactures two unique Motionless Mixers. The LPD, which is used for low viscosity turbulent flow mixing, and the ISG, which is primarily used for high viscosity laminar flow mixing.

The LPD Mixer consists of a series of semielliptical plates which are discriminately positioned in a tubular housing. The mixing operation is based on splitting and then diverting input streams. In turbulent flow, the elements enhance the random dispersion of substreams thus an LPD with six elements



Flow paths through ISG element

is sufficient for most low viscosity mixing requirements.

The ISG Mixer consists of mixing elements shaped such that adjacent elements form a tetrahedral chamber.

Four holes bored through each element provide the flow paths. If two input streams enter an ISG mixer, the number of layers emerging from the first, second, and third elements are 8, 32, 128. This exponential progression generates over two million layers in just 10 elements.

TURBOEMULSIFIER



The Ross/Pressindustria Turboemulsifier is a highly specialized multi-agitator mixer with many applications in the Cosmetic and Pharmaceutical Industries.

The Turboemulsifier consists of three top-entering coaxial agitators including an anchor-agitator with self-adjusting Teflon scrapers, internal counter-rotating blades, and a central toothed rotor/stator type homogenizing turbine.

The thorough mixing action of the counter-rotating blades combined with the extremely high shear rate of the turbine, have made the Turboemulsifier highly successful in producing cosmetics and pharmaceuticals such as toothpaste, mascara, suppositories and emulsion-based creams and ointments.

Turboemulsifiers are available with vacuum and heating/cooling systems installed, in sizes from 10 to 4000 liters capacity.

VERSAMIX



The Ross VersaMix is a proven multi agitator mixer designed to meet the rapidly changing requirements of today's major process industries. VersaMix units are tailored to suit the individual process demands of customers manufacturing products that range from low to high viscosity consistencies. This is possible by selecting the best combination of the three agitation systems offered with this unit. Standard sizes are available from a 2 gallon laboratory size through a large 4000 gallon production model. A wide selection of drives for the various component mixers and many optional

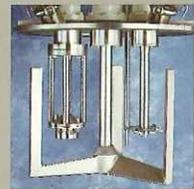
features are offered for each machine. Applications are extensive in the adhesives, cosmetics, chemical, food, pharmaceutical and plastics industries. The Ross change can design also multiplies productivity, by allowing you to simply roll a second vessel into position for mixing while the first vessel is being discharged. Equipment utilization and production throughput both go up dramatically. Ross production units generally range from 10 to 4000 gallon capacity, with larger sizes available in special applications. Single speed, two speed and variable speed drives are available.



The high speed rotor and stator provide high shear to all materials being passed through the rotor/stator gap.



The dispersion blade is used to disperse solids into viscous liquid vehicles.



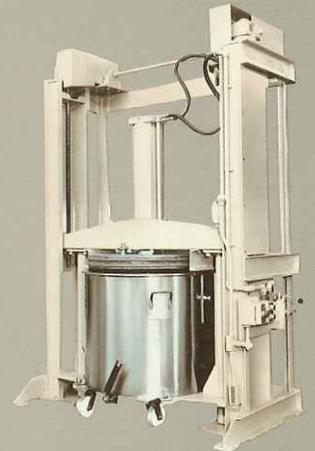
The anchor agitator moves materials in a radial and axial direction.

DISCHARGE SYSTEM

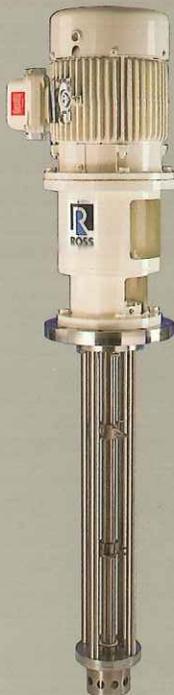
Ross Discharge Systems provide an ideal method of discharging difficult to handle materials. These are manufactured in floor mounted or elevated designs and can be provided with a convenient cartridge filling device. The major benefits of a Ross Discharge System are:

- Time savings
- Reduction in labor
- Less cross contamination
- Safer work place
- Added process control

These units are manufactured for use with vessels from 1 quart to 500 gallons and can be tailored to meet the needs of the individual user.



MIXER EMULSIFIER



Ross Mixer Emulsifiers are accepted world-wide as a proven alternative to high speed dispersers, slow speed impellers or high pressure homogenizers for a wide range of processing requirements. The versatility built into this rugged machine provides its users with new and more efficient approaches to traditional processing techniques. High speed mechanical and hydraulic shear forces are the real key to its success. The close

clearance between the rotor and stator generates a shearing action which insures that materials being processed are subjected to thousands of shearing actions each minute. Designs are available in both batch or continuous in-line models from 1/2 through 200 HP. Batch models handle from 1 quart to over 6000 gallons. The largest production in-line models have a pumping capacity exceeding 2600 gallons per minute.



The disintegrating head is best applied for general purpose mixing or for particle size reduction.



The slotted head is used for emulsions and other medium viscosity solutions.



A fine screen head provides the highest possible shear rates.



The circulation propeller is used to increase overall vessel circulation.



Downthrust propellers may be attached to the rotor shaft to create a vortex.

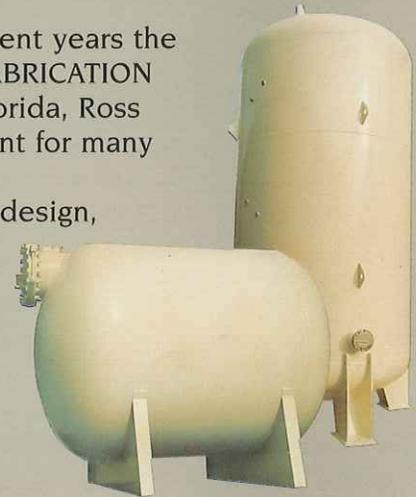
CUSTOM FABRICATION



Ross is best known for its mixers, blenders and mills, but in recent years the company has also built a national reputation for its CUSTOM FABRICATION operations. With fabrication plants in New York, Georgia and Florida, Ross is building storage tanks, reaction vessels and related equipment for many markets, serving industry both regionally and nationally.

The Breadth of our capabilities is unique. We offer complete design, machining and fabrication in each of our facilities. With comprehensive support and a total of more than 150,000 square feet of production space, we can handle jobs of virtually any size with great efficiency Ross can meet the demands of nearly any application.

Our engineering and production teams are certified experts in ABS, ASME, API and structural codes. Ross is familiar with the special demands of the FDA, USDA and specific industry codes such as BISC in the bakery industry. We are also experienced in working with a wide variety of materials, including carbon and stainless steel, monel, hastelloy, titanium, inconel and aluminum.



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Savannah, GA 31405-1475

Ross Metal Fabricators, Inc.
225 Marcus Blvd.
Deer Park, NY 11729-4593

Ross Mixing, Inc.
1249 S.E. Industrial Blvd.
Port St. Lucie, FL 34952