

Introducing the Ross Technical Services Group

The mark of a world class equipment manufacturer is leadership – a company's ability to develop innovative technology, new equipment, and new techniques for making familiar equipment more productive.

That requires a solid commitment to research & development and a clear vision of what process engineers really need to boost production and product quality. The company's R&D effort must be dedicated to development that can lead quickly to significant gains in process-line efficiency.

This is the mission that drives the team of engineers who comprise the new Technical Services Group at Ross.

"We believe that Ross is really in both the mixing equipment business and the information business," says Doug Cohen, Ross VP Technical Services. "The goal of our Technical Services Group is to manage the information and expertise that Ross has accumulated over the years. No

other company has been in the specialty mixer business longer. No other company has acquired so much frontline experience in such a wide range of industries. Our goal is to make all of that knowledge work harder for Ross and its customers.

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Today, most process engineers consider quantitative testing a critical step in selecting and optimizing mixing equipment. The Ross Analytical Laboratory is equipped with sophisticated instrumentation, such as this laser diffraction particle size analyzer, to measure particle/droplet size as well as size distribution.

Ross X-Series Mixer Emulsifier called "...the newest generation of rotor-stator mixers..."* in Chemical Engineering magazine.

Process engineers in industries around the world are finding that the X-Series Mixer Emulsifier can produce sub-micron emulsions faster than any other rotor/stator mixer – and far more efficiently than a high pressure homogenizer.

As the recent article in Chemical Engineering explains, the throughput rates that you would expect using a colloid mill or homogenizer are far lower than the throughput possible with a similarly powered low profile (X-Series) rotor-stator mixer. By replacing a 3-5 gal/min homogenizer with an X-Series Mixer Emulsifier, for example, you can generally increase throughput to 30-50 gal/min.

The X-Series Mixer Emulsifier also demands much less maintenance, and it is more versatile on the process line (see

box, "X-Series Mixer Emulsifier Wins Worldwide Approval").

** To read the discussion that appeared in Chemical Engineering, contact Ross for a reprint. Call Bogard Lagman, VP Sales, 800-243-ROSS.*

X-Series Mixer Emulsifier Wins Worldwide Approval

In applications like these, the X-Series Mixer Emulsifier is now the world's No. 1 choice for superior product quality and fast production.

Salad dressings	Fruit Juices
Paper coatings	Resins
Mayonnaise	Hand lotions
Detergents	Tomato sauce
Emulsions	Herbicides
Cosmetic creams	Agri-chemicals
Pharmaceutical creams	Flavor emulsions...

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Visit Ross on the World Wide Web! Answer your processing questions... fast.

www.rossmixing.com



Look for these icons. They will guide you to the answers you need ASAP. Specific literature, technical bulletins, Ross personnel, web resources... it's all there.



The innovative X-Series rotor/stator generator applies intense shear and produces sub-micron emulsions in a single pass – much faster than any other rotor/stator mixer.

Introducing the Ross Technical Services Group

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The Ross Test and Development Center

We are now conducting more tests in the Ross Test & Development Center than ever before. Already the best-equipped laboratory in the specialty mixer business, our Test and Development Center was recently expanded. New equipment provides an even broader range of options for testing.

These process-line simulations are invaluable, because they enable our customers to identify the best possible equipment before making a purchase. It also allows us to help them perfect their mixing *technique* – to guarantee that our equipment will deliver the best possible results in their plant.

Analytical Laboratory

Quantitative measurement is a critical step in testing. With an advanced laser diffraction particle size analyzer and other specialized instruments, Ross offers its customers excellent accuracy in assessing test results. Especially when the process requires sub-micron emulsification or dispersion, this degree of accuracy ensures that customers are buying the best possible equipment.

"Developing new test methods is a key element in our plan to improve the resources we can offer our customers," says Mr. Cohen. "By quantifying the mixing process, we can apply our experience much more effectively. Innovation and meaningful progress in equipment design requires a combination of imagination and rigorous analysis."



Ross TSG engineers, seen here preparing to machine a new-generation rotor, have a complete machine shop at their disposal. This guarantees fast development and uninterrupted production in Ross's NY plant.

Research and Development

New product development is moving faster than ever at Ross, and the program is already paying dividends.

- Recent breakthroughs in rotor/stator generator design have yielded the "X-Series" family of Mixer Emulsifiers, which produce sub-micron emulsions faster than any other mixer – and much less expensively than high pressure homogenizers or colloid mills.

- The new PreMax has achieved a similar advance in pigment dispersions. These new mixers can drastically reduce the number of passes needed in a media mill, or eliminate the mill completely.

- Numerous new devices, like the SLIM Solid/Liquid Manifold and the SISAL vacuum injection system, are accelerating the mixing process and improving operator safety in many industries.

A dedicated design and fabrication shop gives the R&D team the resources necessary to keep the program rolling in high gear. The R&D shop is fully equipped with lathes, mills, and equipment for grinding and polishing. This is where the Technical Services Group develops prototypes for testing new mixers and blenders, and for improving Ross's current line of equipment.

Technical publications

Technology in mixing, blending, emulsification and dispersion is advancing quickly at Ross. With internal TSG newsletters, we are making that knowledge available to the entire community of Ross engineers, sales and support personnel.

As new application data emerges from our testing program, we are using application data sheets to share insights with our customers. Although these analyses are strictly limited to information that is not proprietary, they often spotlight processing techniques that are valuable in many industries.

Put our resources to work

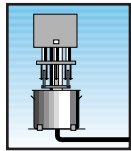
If you are not already taking advantage of all the experience and expertise Ross can offer, call the Ross Technical Services Group right away. We will be glad to give you more details on our testing program. We can also provide application information to help make your operation more efficient, and to improve the quality of your products.



In the Ross Test & Development Center, customers work with highly-trained lab professionals to simulate their process, test a variety of equipment, and optimize its performance before a purchase is finalized.

ON THE PROCESS LINE

By Bill Purse, Senior Engineer



Mixing and blending abrasive materials

When the going gets tough, the equipment gets tougher!

The presence of abrasive materials poses a critical challenge in the design of mixing, blending and dispersion equipment. In many industries

today, the mixing process is intensifying – as our customers move toward new product formulations that include more abrasive solids, and as we build equipment that applies greater shear in order to shorten the mixing cycle and produce a better end-product. This trend can present a serious threat to your equipment. Agitators, vessels, valves, drive components, seals, bearings, bushings...they are all vulnerable to abrasive wear.

Excessive abrasive action in a mixer or blender generally produces excessive downtime and premature parts replacement. In some cases the consequences are even more serious and costly. Abrasive wear can cause leaks, product contamination, longer mixing cycles, and rising operating expenses. In applications that rely on close tolerances, uncontrolled wear can also produce a loss in process accuracy and an increase in off-spec product.

When we discuss wear with customers, we inevitably consider such options as high performance steel and high-tech surface treatments. But of all the tools we have to prevent excessive wear, the most powerful one is actually communication.

Early warning – identifying abrasives in the mix.

Many materials – such as silicon dioxide, fumed silica, ceramic and metal powders, pigments and tungsten carbide – are well known to be abrasive. Others are not so obvious. We rely on our sales engineers and our customers to define all the parameters of the process – including the relevant properties of each ingredient.



This is why close collaboration with a sales engineer who is highly experienced and well trained is always a critical step in the purchase of mixing equipment. Otherwise, you may wind up with equipment that is well engineered, but not engineered to handle your application efficiently!

Special materials, surface treatments and coatings.

Many varieties of steel are available today for vessels, shafts and agitators. By switching to a high-performance steel, we can often satisfy our need for increased wear resistance. In other cases we may turn to a surface treatment or coating to protect the equipment from abrasives. Tungsten carbide and various ceramic coatings are reliable choices. Treatments such as ion implantation can also be effective, for both increasing the steel's wear resistance and lowering friction.

Sealing systems.

Optimal seal selection is crucial for preventing lubricants from contaminating the product and for excluding abrasive dusts from the drive system in certain types of equipment. Although mechanical seals are common, they are not always necessary. Shaft sleeves, combined with single- or double-lip seals, can often provide a dependable seal, even in severe conditions.

The future – greater production, less maintenance.

Worldwide competitive pressure is driving process engineers to find new equipment and develop new processing techniques to accelerate production and improve product quality. Mixer manufacturers must respond with more efficient equipment. Often this means higher shear rates, higher speeds, higher levels of viscosity and bulk density. But as we intensify the mixing process, even materials that we used to consider only marginally abrasive can cause serious wear.

To guarantee a long working life and low maintenance requirements, the new generation of mixing and blending equipment will have to be well protected from undue wear. The subject must be addressed early and thoroughly – when discussing your next application with your equipment sales engineer, and later on, with the engineer who will design your equipment.



INPUT/OUTPUT

Control System News

By Rob Lanham,
General Manager

Hard-wired vs. Soft-wired Control Systems

Today's stand-alone control systems can be divided into two broad categories, hard-wired and soft-wired systems. (See Fig.1) On the day they are installed, they perform identical functions. But in six months or a year, the difference between the two usually becomes painfully clear.

Besides the obvious contrast in their appearance, the key difference between the two is the ease of logic modification and expandability offered by the "soft-wired" control. The hard-wired system must have every button, light and display present at all times. This adds to the time required for operator training and actual production. It can also create confusion – and cause mistakes – in rush situations.

In the soft-wired control, multiple displays, controllers, pushbuttons and selector switches can all be replaced by a single GUI (Graphical User Interface), which can display as much or as little information as you desire.

For example –

In this application, the operator must mix a three-step batch.

- Step 1 ➔ Add 200 gals of liquid A and heat to 100°F
- Step 2 ➔ Add 100 lbs of powder B and mix for 2 hours
- Step 3 ➔ Cool batch to 70°F and mix for 1 hour

For Step 1, the operator would manually meter the liquid into the vessel, turn on the agitators and set the agitator speeds, set the temperature controller, and wait until the batch reached the desired temperature. He would then add powder B and wait for two hours before beginning Step 3.

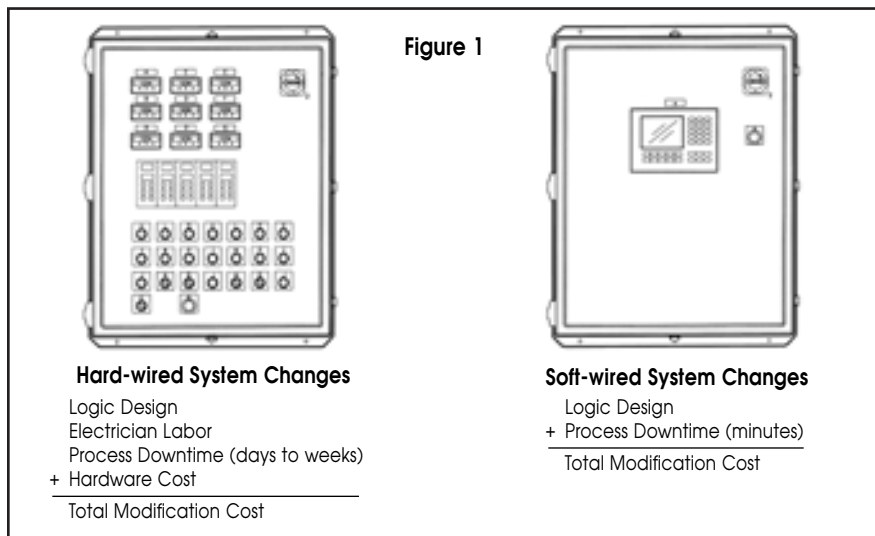
Your primary concerns are:

- How critical is each step in the batch?
- How consistent is the operator in performing each function?

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Hard-wired vs. Soft-wired Control Systems

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- If the operator momentarily turns his attention away from the process, the batch could easily go past its target points. The results can include increased batch time, increased waste, and higher costs.

The soft-wired alternative

Automation with a GUI-based control system can prevent these failures, and you can select the level of protection you prefer. In other words, the mix can be as automated or as manual as you wish.

Let's say you don't have any sophisticated metering equipment. The same batch would proceed as follows:

- ➔ For Step 1 the operator would manually meter the liquid into the vessel, and press the *Start* key.
- ➔ The system would count down to the next step and signal the operator when ready.
- ➔ Next, the operator would add powder B and press the *Continue* key, and so on.

By simplifying the operator's tasks, he could easily run multiple batches at one time. Each batch would be consistent with the previous batch, and cycle time would be minimized.

System cost

Initial price –

Imagine that you have a triple agitator mixer with three speed meters, three load meters, three cycle timers, and agitator speed control. Instead of hard-wiring the control for this mixer, you could equip it with a soft-wired system that offers the same functionality – for about the same initial price.

Hard-wired system modification –

A hard-wired system combines mechanical relays, switches and contactors, all interconnected with traditional wiring. Before constructing the system, the logic must be completely understood and explicitly defined. Once placed in service, adding one line of logic takes a minimum of four hours. During this time, the system must be taken out of service.

The overall cost of changes to a hard-wired system are often hard to predict exactly. But they are always high. In fact, it is sometimes cheaper to build a new system than to modify an old hard-wired system!

Soft-wired system modification –

How many times have you wished that you could modify a project after it was completed (to add or modify a step in the process)? But the capital cost was too high, and the turnaround time was too long. With a soft-wired system, modification is easy. So, you don't have to fully automate your process from the start. Instead, you can automate one step at a time and make additional changes whenever necessary. Each update involves a simple programming change and as little as five minutes of downtime.

With a soft-wired system, even substantial changes are cost-effective. They can be developed away from the process line, downloaded and tested in the evening. The process equipment can then be returned to its original configuration to resume production the following day. When the software update is ready, installation requires only a few minutes.



WORLDWIDE NEWS BRIEFS

Mixing, Blending and Dispersion

New Ross PreMax revolutionizes pigment dispersion. The new 'Delta' generator creates high shear and vigorous flow. When a media mill has been used to finish a product in a single pass, the PreMax can usually replace the mill. Ross guarantees that it will at least reduce the number of passes needed... *Contact John Paterson, Product Manager, 561-337-0900.*

New Ross-Olsa Model G2 Sanitary Vacuum Mixer-Homogenizer now available in the Ross Test and Development Center.

Constructed of stainless steel and completely polished, the Model G2 combines counter-rotating agitation with a bottom-mounted homogenizing turbine... *Contact Doug Cohen, VP of Technical Services, 800-243-ROSS.*

Jetpharma Jetmill is ideal for laboratory micronization of high value products.

The Jetpharma Model MC50 Portable Jetmill™ is a complete laboratory micronization device for the size-reduction of high-value powdered ingredients... *Contact Doug Cohen, VP of Technical Services, 800-243-ROSS.*

With ingenious technology, the new Pressdisperger mixes and discharges high-viscosity materials in one step.

After a variable-speed blade has finished the mixing cycle, a platen inside the Pressdisperger descends and pushes the mixture out to packaging or to processing operations downstream... *Contact Doug Cohen, VP of Technical Services, 800-243-ROSS.*



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