

The logo for SPX, with 'SP' in dark grey and 'X' in green, followed by a registered trademark symbol.

SPX®

A green arrow icon pointing to the right.

Where Ideas Meet Industry

LIGHTNIN

AN SPX BRAND

**San★Star
Mixers**

LIGHTNIN SanStar Line of Sanitary Mixers

Mixing In The Sanitary World



SPX®

A Spectrum of Impellers for Every Process Requirement

At LIGHTNIN we match the impeller to your process, thus ensuring 100% confidence in process results. When you bring your product to our mixing lab we optimize the impeller selection during scaled-down testing. You'll actually observe what happens as we simulate your process in our mixing lab. LIGHTNIN's full line of impellers solves all sanitary and biotech process applications - these include applications requiring gas liquid, blending, and solid suspension with repeatable results. Here are a few of our most popular models.



A510 High Efficiency Hydrofoil Impeller

For low viscosity, flow controlled applications. Combines performance

and high flow efficiency not found in other axial flow impellers. It reduces power requirements by 40% over the older technology of pitch blade turbines.



A340 Up-Pumping Impeller

Three-blade hydrofoil combines the best features of LIGHTNIN's laser-designed impellers and

LIGHTNIN's state-of-the-art up-pumping technology for gas dispersion. A340 impellers can handle the requirements of a variety of bioreactor and gas/liquid processing needs.

Lab Scale Impellers

As the world leader in mixing technology, LIGHTNIN recognizes the need for geometrically accurate lab scale impellers. LIGHTNIN has developed a process where exact duplicates of LIGHTNIN patented high efficiency axial flow and other commonly used impellers (Rushton, Marine, PBT, etc.) are produced in very small diameters.

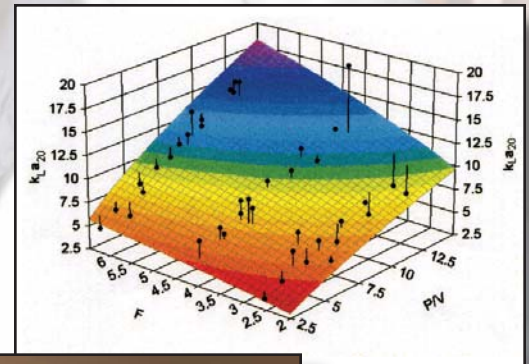
The use of these geometrically accurate impellers provides lab data that can be used for precise scale-up. Process parameters proven in the lab are used to develop pilot plant and production scale equipment. Using detailed models of these impellers increases the scaling confidence factor. Tried and proven scale-up procedures are used to develop larger scale pilot and/or production processes, shortening development time and minimizing sizing uncertainties.

Impellers as small as 3/4" have been developed as shown in the photo below. Using these impellers, accurate scale-up and process detail was obtained on a very expensive product, minimizing the number of trial runs required, resulting in significant monetary savings. This data coupled with LIGHTNIN computer modeling and consulting can reduce your lab test time significantly.

LIGHTNIN Offers More...

In addition to the comprehensive SanStar Line, LIGHTNIN also has unparalleled application experience in larger, more demanding process requirements such as large scale fermenters, large scale BioReactors, media prep, product hold, and more. *LIGHTNIN offers a process guarantee unparalleled in the mixing world.*

Experimental Data Analysis



Geometrically Accurate Lab Scale Impeller

Sanitary Couplings

LIGHTNIN threaded couplings and ASME BPE designed couplings are proven 100% cleanable and sterilizable.

Polish

LIGHTNIN will provide any finish required for your process application, (e.g.) 10 Ra. LIGHTNIN does not allow the use of any rouge, using only mechanical methods to achieve the desired result.

Products are delivered with full documentation and certification of the finish provided in LIGHTNIN QAD (Quality Assurance Documentation) package.

Create Your Own Solution From Our Complete Family of Sanitary Mixers

The answer for today's stringent cGMP facilities.

Utilizing our experience and technical expertise, we engineer products to meet your demands. For virtually any pharmaceutical, biotech, personal care, animal science, medical, or food and beverage processing application, we will deliver results.



LIGHTNIN SR Series Mixer

The Sanitary Right-Angle Mixers (SR) are designed for a variety of processing applications in locations

with a small footprint and minimum available headroom, for use on vessels ranging up to 20,000 liters.

- For media and/or buffer suspension, storage, make down, plasma extraction, fermentation, including bacteria, cell culture and general media processing
- Low profile and small footprint allows use in restricted spaces
- Processing tanks can easily be moved from one location to another with the mixer in place
- Aseptic dry running seal can be supplied with sterilizable sanitary gland
- All stainless steel construction available

LIGHTNIN Stainless Steel Enhanced Classic Line (ECL)

Designed for services demanding a paint-free, non-plated mixer, where chipping/flaking cannot be tolerated.

- Lightweight, stainless steel mixer
- Up to 3 HP
- Patented clamp design
- Long shaft length
- Direct drive and gear drive units
- Full complement of LIGHTNIN impellers



LIGHTNIN SSV Mixer

The Stainless Sanitary Vertical (SSV) Mixers are suitable for buffer and media preparation, fermenters, bioreactors, product recovery, and bulk pharmaceutical processing.

- Polished all stainless steel exterior
- Modular construction for ease of service, repair and retrofit
- Minimum footprint for vessels up to 30,000 liters in a vertical, in-line design for closed vessel applications
- Standard designs from 1/4 to 2 HP, with output speeds from 100 to 290 rpm
- Custom selections available for higher power or alternate speeds
- Full clean-in-place, sterilize-in-place (CIP/SIP) features



LIGHTNIN SVM Mixers

The Sanitary Vertical Mini (SVM) mixers have been engineered for your most critical processes, collectively providing superior performance and clean operation.

- Minimum footprint for vessels from 10 to 500 liters
- 300 series stainless steel seal housing and pedestal; epoxy-painted drive
- Designed for use in sterilizable environments
- Vertical, in line design for closed tank applications.
- Mixer mounts on standard 3" tri-clamp flange
- Full clean-in-place, sterilize-in-place (CIP/SIP) features





LIGHTNIN MBI Bottom-Entry Magnetic Mixers

The MBI Series Mixers set the standard for cleanability, durability and performance in food, pharmaceutical, biotech and personal care applications.

- Magnetic-coupled impeller and one-piece tank plate
- NEW! Rugged all-ceramic ball bearing design for long life, dry-running capability
- Suitable for up to 30,000 liters and mildly viscous solutions (viscosity limits depend on tank volume)
- Advanced three-blade impeller design increases flow by 30% for improved mixing
- Bottom-mounted design provides low center of gravity on mobile tanks for increased stability during transport

LIGHTNIN MiniCIP MagMixersTM

The MiniCIP is designated for smaller lab, pilot, and production vessels. This new mixer is perfect for the laboratory environment where cleanliness and ease of use is mandatory. The new design will allow the user to easily remove the drive and either sterilize and/or autoclave the entire tank without removing the mixer. This small mixer offers a variety of features for the BioPharm market due to its unique design.

- One MiniCIP drive can be used for multiple vessels
- Simple Design
- Washdown duty motor assembly, 1 1/2" Triclover connection
- Small foot print, 3" diameter x 11" tall
- Seal-less design, magnetic coupling
- Patented USP Class VI certified, dry-running bearings
- 316L construction, 15Ra electro polished wetted parts standard
- Optional materials of construction
- Non-flushed, autoclavable design available
- Removable drive, lightweight <10 lbs; use with multiple lower assemblies
- Sanitary or flange mount
- LIGHTNIN's spectrum of impellers compatible
- Speed variable 0-500 RPM with panel controller
- Gear motor - 24 VDC



LIGHTNIN BioCIP Top-Entry Mag Drive Mixers

The BioCIP Top-Entry MagMixers were specifically designed and developed to meet the industry demand for seal-less Bioreactor mixers.

- Elimination of mechanical seals and associated maintenance
- SIP/CIP in situ cleanable with standard industry-accepted protocols
- Hermetically sealed
- 100% dry running
- No steam condensate barrier required
- Variety of materials of construction



LIGHTNIN LabMaster Mixers

The LabMaster combines microprocessor technology, robust power and advanced laser designed impellers. Custom software produces consistent results and accurately records data that is critical to both validation and scale-up.

- Largest mixing capacity in the industry
- Reversible rotation for up- or down-pumping experiments
- Repeatable digital data entry via splash proof keypad
- NEW! MixWare computer controlled software www.mixwaresupport.com



LIGHTNIN BioMixers

The BioMixer is ideally suited for biological and pharmaceutical processes, sanitary duties, and mobile vessel applications. This modular mixing system addresses the mixing needs of sterile environments. Custom software produces consistent results and accurately records data that is critical to both validation and scale-up.

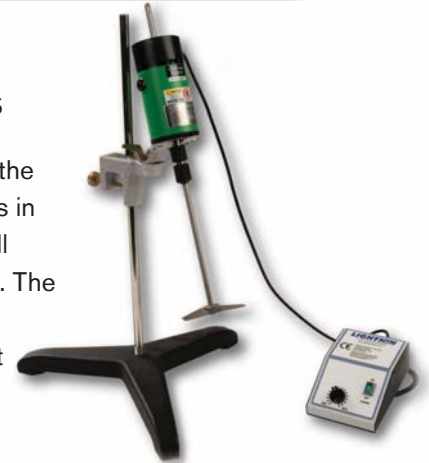
- Autoclave-in-place (lower assembly)
- FDA grade, non-cytotoxic materials
- Easy to install on sanitary flanged vessels
- NEW! MixWare computer controlled software www.mixwaresupport.com



LIGHTNIN G-Series Mixers

The G-Series provides the required process results in laboratory, pilot, or small production applications. The NEW Controller can be supplied with or without a digital rpm display.

- NEW! Reversible rotation for up or down pumping experiments
- Patented impellers provide maximum efficiency, with scalable results
- Displays speed, 50 - 2,200 RPM \pm 10 RPM
- Splash-resistant, wipe-down design for cleanability
- Worldwide design, single phase 50 or 60 Hz



Technology is the Key to Successful Process Development

The heart of LIGHTNIN's research and design effort is its Rochester, NY-based Knowledge and Technology Center. This laboratory was specifically designed for a complete range of experimental and computational data generation. It features our integrated Laser Doppler Velocimeter (LDV), full Computational Fluid Dynamic (CFD) capa-



bility and a large complement of test vessels ranging from 12" diameter through 8' and 10' diameter in-ground tanks. Our two large-scale test tanks include an indoor 49' x 49' and an outdoor 80' diameter aeration test tank.

We fabricate custom test apparatus to match client vessel geometry and internals. This allows LIGHTNIN to precisely measure process performance data such as mass and heat transfer coefficient, flow and power numbers, solid suspension behavior, blending, and fluid force characterization. This laboratory network allows us to offer a full process and mechanical warranty unmatched in the industry.

Quality Assurance Documentation (QAD) Ensures Good Manufacturing Practices

To help ensure that FDA-mandated cGMP guidelines have been met, many pharmaceutical, biotechnology and specialty chemical customers require extensive supporting documentation when they purchase mixers. In addition to product specs, drawings and operating and maintenance manuals that are delivered with every LIGHTNIN mixer, customers may also order Quality Assurance Documentation (QAD) to fulfill their cGMP validation requirements.

To order a QAD, talk to your LIGHTNIN Sales Representative or authorized LIGHTNIN Service Center.



LIGHTNIN Aftermarket Services: Fastest Route to Uptime

Expertise: Experienced technicians are the backbone of our dedicated service organization. They're uniquely qualified to keep your LIGHTNIN mixers running right.

LIGHTNIN Certified Technicians: Aftermarket technicians are certified via training courses to ensure that the work they do meets the highest standards for consistency and reliability.

Genuine LIGHTNIN Parts: All repairs follow original design specs and use only factory-authorized replacement parts.

Full LIGHTNIN Factory Warranty: We're so confident we'll do the job right that all authorized repair and service work is covered by a full factory warranty.

- Factory Service Program
- Exchange Program = Minimal Downtime
- Quick Turnaround

SPX®

PROCESS EQUIPMENT

Your local contact:



SPX Process Equipment, LIGHTNIN Operation
135 Mt. Read Blvd., Rochester, NY 14611
Phone: (888) 649-2378 (MIX-BEST), (U.S. and Canada) or +1 (585) 436-5550
E-mail: LIGHTNIN@spx.com

For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.spxpe.com.

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