

## Lab Series

HOMOGENIZERS



Now you can achieve fully reproducible results for emulsions, dispersions, or cell disruption that can be applied to full-scale production with complete confidence.

Plus, you can test sample sizes as small as 3.4 oz (100 ml) at adjustable pressures up to 29,008 psi (2,000 bar) – the highest pressure of any lab unit available – for unmatched research flexibility and cost efficiencies.

Lab Series Homogenizers provide the desired mean particle size and narrow, uniform distribution you need to help you improve existing products and develop new ones.

SPX FLOW, Inc. (NYSE:FLOW) is a leading manufacturer of innovative flow technologies, many of which help define the industry standard in the market segments they serve. From its headquarters in Charlotte, North Carolina, it operates a sales and support network, centers of manufacturing excellence, and advanced engineering facilities, throughout the world. Its cutting-edge flow components and process equipment portfolio includes a wide range of pumps, valves, heat exchangers, mixers, homogenizers, separators, filters, UHT, and drying technology that meet many application needs. Its expert engineering capability also makes it a premium supplier of customized solutions and complete, turn-key packages to meet the most exacting of installation demands.

Incorporating many leading brands, SPX FLOW has a long history of serving the food and beverage, power and energy, and industrial market sectors. Its designs and engineered solutions help customers drive efficiency and productivity, increase quality and reliability, and meet the latest regulatory demands. In-depth understanding of applications and processes, state-of-the-art Innovation Centers, and advanced pilot/testing technology further assist in optimizing processes and reducing timescales to reliably meet production targets.

To learn more about SPX FLOW capabilities, its latest technology innovations and complete service offerings, please visit [www.spxflow.com](http://www.spxflow.com).

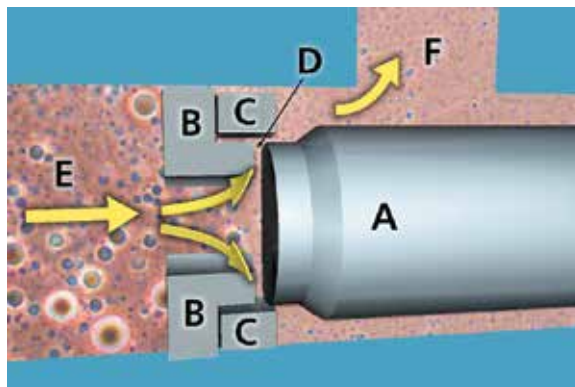
## Compact, versatile design specifically developed for R&D laboratories within the dairy, food, chemical, pharmaceutical, cosmetic and biotech industries

### LAB SERIES HOMOGENIZERS

- Unique, knife-edge dual function homogenizing and cell disruption valve helps deliver superior emulsions, dispersions or harvest of intracellular products
- Available two-stage homogenizing valve can be specified in either tungsten carbide or ceramics
- Features an easy-to-read digital pressure display and electronic pressure safety system
- Small footprint – suitable for benchtop location
- Field-replaceable and reversible tungsten carbide pump valve seats
- Smooth, quiet and reliable operation
- Two units available to meet your laboratory requirements; operating pressures of 14,504 psi (1,000 bar) and 29,008 psi (2,000 bar) with nominal capacities of 6 gal/h (22 l/h) and 3 gal/h (11 l/h) respectively. Ideal for a wide variety of emulsions and dispersions and exits at a pressure sufficient for movement to the next processing stage.

### Optional Equipment

- Air operated pressure feeder assembly
- Explosion proof design
- Two-stage homogenizing valve assembly
- Aseptic cylinder design
- Digital gauge and gauge adapter for second stage pressure readout
- Elastomers and wettables available in alternative material



THE THEORY OF HOMOGENIZATION

## THE THEORY OF HOMOGENIZATION

The unhomogenized product (E) enters the valve seat (B) at high pressure and low velocity. As the product flows through the adjustable, close clearance area between the valve (A) and seat (B), there is a rapid increase in velocity with a corresponding decrease in pressure.

This intense energy transition, occurring in microseconds, produces turbulent three-dimensional mixing layers that disrupt the particles at the discharge from the gap (D). The homogenized product (F) impinges on the impact ring (C) and exits at a pressure sufficient for movement to the next processing stage.

## HOMOGENIZING TECHNIQUES

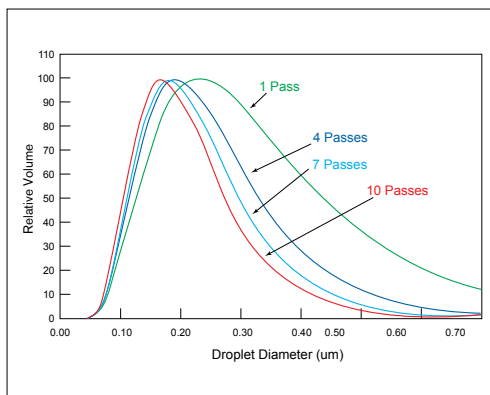
### Single-stage or two-stage homogenization:

For processing of emulsions, a single-stage valve assembly may be used; however, the use of a two-stage assembly, where approximately 10% of the total pressure is applied to the second stage, will improve the droplet size reduction of most emulsions.

For processing dispersions, a single-stage valve assembly is usually preferred.

### Multiple-pass homogenization:

If an extremely narrow particle size distribution is required, it may be necessary to homogenize the product more than once. This can be done by two or more homogenizers in series or by repeating a pass through the same homogenizer. Using discrete passes through the homogenizer is the preferred procedure for multiple-passing a product. Some examples of multiple-pass products are intravenous emulsions, blood substitutes and preteral emulsions.



ABOVE: THE EFFECT OF UP TO 10 DISCRETE PASSES AT 14504 psi (1000 bar) ON AN OIL-IN-WATER INTRAVENOUS EMULSION. EACH PASS RESULTS IN A SHIFT OF THE PARTICLE SIZE DISTRIBUTION TOWARDS SMALLER DROPLET SIZES.

## Typical product applications

### Food/Benerage

Beverage emulsion  
Fat substitutes  
Milk  
Sauces



### Personal care/Cosmetics

Hair products  
Liposome emulsions  
Nail polish  
Skin creams



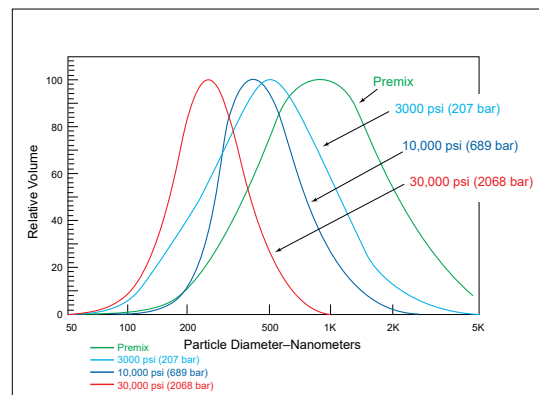
### Pharmaceutical/Biotech

Cell disruption  
Intravenous emulsions  
Nutritional supplements  
Ointments



### Chemicals

Inks  
Pigment dispersions  
Silicone emulsions  
Specialty paints and coatings

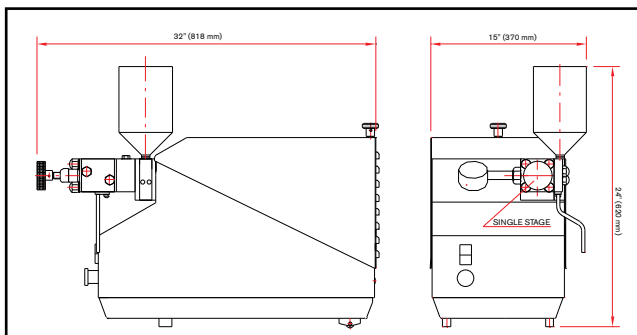


ABOVE: THE REDUCTION IN AVERAGE PARTICLE SIZE RESULTING FROM HOMOGENISATION AT VARIOUS PRESSURES.

# SPXFLOW

STANDARD FEATURES / EQUIPMENT	MODEL 1000	MODEL 2000
CAPACITY	6 gal/h (22 l/h)	3 gal/h (11 l/h)
MINIMUM TEST SAMPLE	5 oz (150 ml)	3.4 oz (100 ml)
MAXIMUM OPERATING PRESSURE	14,504 psi (1000 bar)	29,008 psi (2000 bar)
PLUNGER DIAMETER/MATERIAL	0.6" (14 mm) / Ceramic	0.4" (10 mm) / Ceramic
PLUNGER PACKING *	PVDF/EPDM	PVDF/EPDM
O-RINGS/BACKUP RING *	EPDM/POM	EPDM/POM
PUMP VALVE SEAT MATERIAL *	Tungsten Carbide	Tungsten Carbide
PUMP VALVE	Cobalt Based Alloy	Cobalt Based Alloy
HOMOGENISING VALVE/SEAT *	Ceramic	Ceramic
DIGITAL PRESSURE DISPLAY	Yes	Yes
OVER CURRENT PRESSURE SAFETY SYSTEM	Yes	Yes
MOTOR	TEFC. 3kW, three-phase/50-60 Hz / 200, 230, 380, 400, 460, 575 Volts	TEFC. 3kW, three-phase/50-60 Hz / 200, 230, 380, 400, 460, 575 Volts

\*PVDF - POLYVINYLIDENE FLUORIDE, EPDM - ETHYLENE PROPYLENE DIENE MONOMER, POM - ACETAL POLYMER



**NET WEIGHT 231 lb (105 kg) · GROSS WEIGHT 287 lb (130 kg) · VOLUME 18 ft<sup>3</sup> (0,5 M<sup>3</sup>)**

Based in Charlotte, North Carolina, SPX FLOW, Inc. (NYSE: FLOW) is a multi-industry manufacturing leader. For more information, please visit [www.spxflow.com](http://www.spxflow.com)

## SPX FLOW

611 Sugar Creek Road

Delavan, WI 53115

P: (262) 728-1900 or (800) 252-5200

E: [answers.us@spxflow.com](mailto:answers.us@spxflow.com)

SPX FLOW, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing. Please contact your local sales representative for product availability in your region. For more information visit [www.spxflow.com](http://www.spxflow.com).

The green "S" and "X" are trademarks of SPX FLOW, Inc.

ISSUED 10/2016 3003-03-08-2008-US

COPYRIGHT © 2016 SPX FLOW, Inc.