

APV LAB SERIES HOMOGENISERS



*Improving Process Profitability...Continuously<sup>sm</sup>*

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

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 100 ml at adjustable pressures up to 30,000 psi/2000 bar – the highest pressure of any lab unit available – for unmatched research flexibility and cost efficiencies.

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

- Unique, knife-edge dual function homogenizing and cell disruption valve helps deliver superior emulsions, dispersions or harvest of intracellular products.
- Available two-stage homogenising valve can be specified in either tungsten carbide or ceramic.
- 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.

## **APV Lab Series Homogenisers**

*Two units available to meet your laboratory requirements; operating pressures of 15,000 psi and 30,000 psi with nominal capacities of 6 gph/22 lph and 3 gph/11 lph respectively. Ideal for a wide variety of emulsions and dispersions.*



## **Typical Applications**



### **Food/Beverage:**

- Beverage Emulsions
- Fat Substitutes
- Milk
- Sauces



### **Healthcare/Cosmetics:**

- Hair Products
- Liposome Emulsions
- Nail Polish
- Skin Creams



### **Pharmaceutical /Biotech:**

- Cell Disruption
- Intravenous Emulsions
- Nutritional Supplements
- Ointments



### **Chemical:**

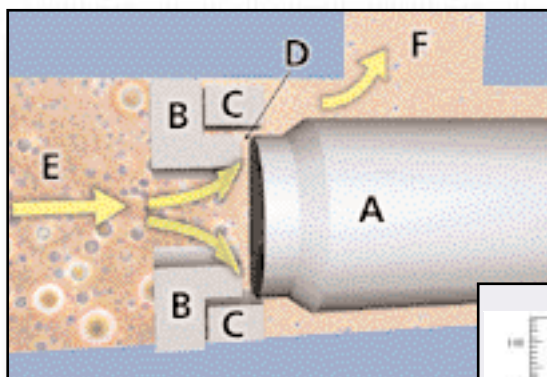
- Inks
- Pigment Dispersions
- Silicone Emulsions
- Specialty Paints and Coatings



# A closer look at the homogenisation process

## The theory of homogenisation

The unhomogenised 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.

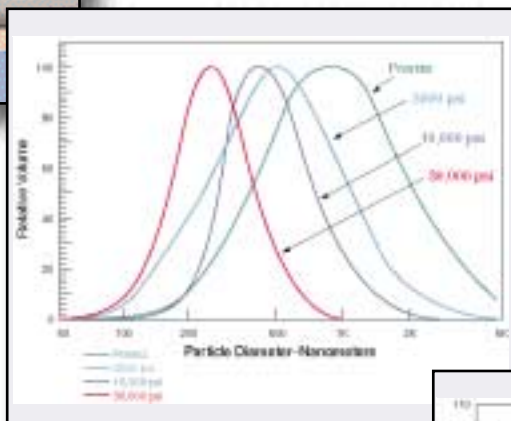
## Homogenising techniques

### Single-stage or two-stage homogenisation:

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.

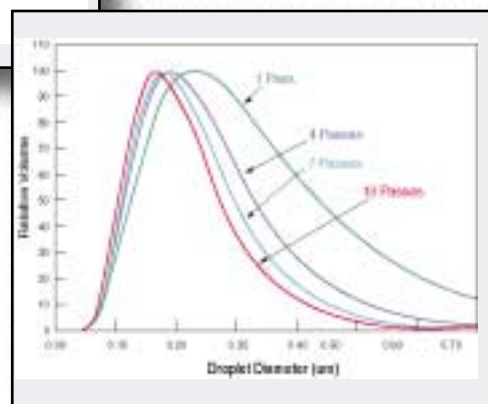
### Multiple-pass homogenisation:

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



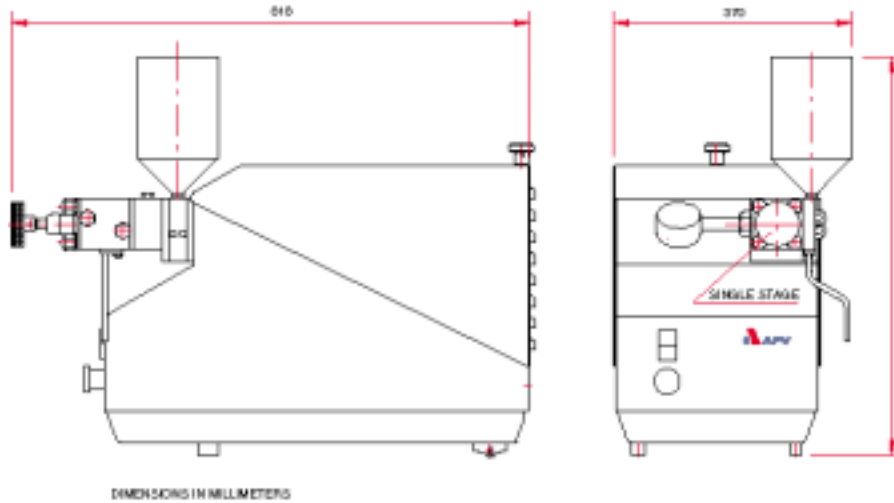
Above: The reduction in average particle size resulting from homogenisation at various pressures.

Below: The effect of up to 10 discrete passes at 1000 bar on an oil-in-water intravenous emulsion. Each pass results in a shift of the particle-size distribution toward smaller droplet sizes.





# Technical specifications



DIMENSIONS IN MILLIMETERS

Standard Features / Equipment	Model 1000	Model 2000
Capacity	6 gph / 22 lph	3 gph / 11 lph
Minimum Test Sample	150 ml	100 ml
Maximum Operating Pressure	1000 bar / 15,000 psi	2000 bar / 30,000 psi
Plunger Diameter/Material	14mm / Ceramic	10mm / 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
Homogenizing Valve/Seat*	Tungsten Carbide	Ceramic
Digital Pressure Display	Yes	Yes
Over Current Pressure Safety System	Yes	Yes
Motor	TEFC, 4 hp, three-phase / 50-60 Hz / 200, 230, 380, 400, 460, 575 Volts	TEFC, 4 hp, three-phase / 50-60 Hz / 200, 230, 380, 400, 460, 575 Volts

PVDF - Polyvinylidene Fluoride, EPDM - Ethylene Propylene Diene Monomer, POM - Acetal Polymer

## Optional equipment:

- Air operated pressure feeder assembly
- Explosion proof design
- Two-stage homogenising valve assembly
- Aseptic cylinder design
- Digital gauge and gauge adapter for second stage pressure readout

\* Elastomers and wettables available in alternative material.

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