



## Pall Laparoshield® Laparoscopic Smoke Filters



### *Filtration for Health and Safety in the Operating Room*

Surgical smoke filters providing excellent filtration performance.

- ▶ Highest level of protection for healthcare workers and patients
- ▶ Flexible housing design
- ▶ Ultra Low Penetration Air Filter (ULPA) filtration rating
- ▶ Easy attachment directly to the trocar
- ▶ Light weight\*
- ▶ Minimal amount of PVC tubing\*
- ▶ Non-obstructive design\*
- ▶ Less condensate formation\*
- ▶ Compact design\*

\*Applicable to the LSF2 only



*Filtration. Separation. Solution.<sup>SM</sup>*

## Surgical Smoke is Harmful

Surgical smoke is a mix of volatile liquids and gaseous compounds derived from the degradation of tissue during laser and electrocautery surgeries. Among the substances found in surgical smoke are noxious, toxic, teratogenic, carcinogenic bio-hazardous chemicals.<sup>1</sup> Chronic exposure to surgical smoke is a concern for healthcare professionals working in a confined space of the OR where toxic constituents of the smoke can be inhaled and absorbed through the lungs.<sup>2</sup> Health and safety regulations, as well as recommendations from professional organizations, require that healthcare workers and patients are protected against the risks associated with breathing surgical smoke.<sup>3-6</sup>

## Pall Surgical Smoke Filters

Filtration is a key element of cleansing gases from the surgical field by removing harmful substances. In order to protect healthcare workers and patients against the hazards of inhaling surgical smoke, filtration must meet a number of criteria:

- ▶ Retain solid particles down to nano-size at highest efficiencies,
- ▶ Remove biohazardous contaminants,
- ▶ Retain aerosol droplets in liquid phase, and
- ▶ Retain volatile substances in the gas phase.

The Pall Laparoshield range of smoke filters is designed to meet these challenging filtration requirements. The LSF2 is small and unobtrusive, attaching directly to the trocar, avoiding extra tubing close to the surgical field. The filter is driven by the pressure of the pneumoperitoneum and does not require any electrical power or pump force.

Pall Laparoshield smoke products incorporate a highly efficient filter which:

- ▶ Has an ULPA rating, i.e. even at its weakest point of filtration (determined by the most penetrating particle size) it still has a retention rate of >99.9999%. Or in other words, only one in a million particles will not be trapped by the filter, when it is tested with this size of particles.
- ▶ Retains inorganic particles, bacteria, viruses, and cells efficiently.
- ▶ Possesses hydrophobic filtration media, retaining any contaminants in the liquid phase.
- ▶ Contains media for the retention of volatile chemicals.

## Ordering Information

Part Number	Description	Pkg	Qty
LSF1	Laparoshield Laparoscopic Smoke Filtration System with extension tubing, roller clamp & Luer connector	Individually packaged, sterile	10/case
LSF2	Laparoshield Laparoscopic Smoke Filter with Luer Connector	Individually packaged, sterile	10/case

## Specifications

### Filtration Efficiency

Airborne Particle Removal Efficiency: >99.9999% in accordance with EN1822  
Airborne Cellular/ Bacterial Removal Efficiency: >99.9999%  
Airborne Viral Removal Efficiency: >99.9999%  
Organic Volatile Reduction: Significant reduction of index substances

### Effective Filtration Area:

Approximately 50 cm<sup>2</sup>

### Connector

ISO male luer connector with a rotating locking collar

### Materials of Construction

Outer cover: Polyester  
Filtration element: Polytetrafluoroethylene, Polyester laminate with acrylic binder, Glass fiber, activated carbon  
Connectors, tubing: PVC, EVA, ABS  
Roller clamp (LSF1): ABS

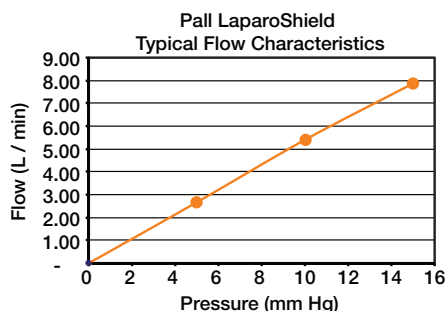
### Weight

LSF1: Approximately 50 grams (including clamp)  
LSF2: Approximately 16 grams

### Packaging, Sterility

ETO- sterilized, double pouch

## Performance



## References

1. Alp E. *et al.* Surgical smoke and infection control. *J Hosp. Infection* (2006); 62: 1-5
2. Brüske-Hohlfeld I. *et al.* Surgical smoke and ultrafine particles. *Journal of Occupational Medicine and Toxicology* (2008) 3:31
3. AORN Position Statement Surgical Smoke and Bio-Aerosols (2008). [www.aorn.org/WorkArea/DownloadAsset.aspx?id=21932](http://www.aorn.org/WorkArea/DownloadAsset.aspx?id=21932).
4. EU-Guideline 98/24/EWG Art.6,1.-1998
5. MHRA – UK. Guidance on the safe use of lasers in medical & dental practice (1994)
6. OSHA Respiratory Protection:1910, Part 134



**United States**  
25 Harbor Park Drive  
Port Washington, NY 11050  
  
1.877.367.7255 phone  
hospitalfilters@pall.com email

**Europe**  
Pall International Sàrl  
Avenue de Tivoli 3  
1700 Fribourg, Switzerland  
  
+41 (0)26 350 53 00 phone  
LifeSciences.EU@pall.com email

**Asia Pacific**  
1 Science Park Road, #05-09/15  
East Wing, The Capricorn  
Singapore Science Park II, Singapore  
117528  
  
+65 6388 8688 phone  
sgcustomerservice@pall.com e-mail

Visit us on the Web at [www.pall.com/medical](http://www.pall.com/medical)

### International Offices

Pall Corporation has offices and plants throughout the world in locations such as: Argentina, Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, India, Indonesia, Ireland, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Poland, Puerto Rico, Russia, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, the United Kingdom, the United States and Venezuela. Distributors in all major industrial areas of the world. To locate the Pall office or distributor nearest you, visit [www.pall.com/contact](http://www.pall.com/contact).

The information provided in this literature was reviewed for accuracy at the time of publication. Product data may be subject to change without notice. For current information consult your local Pall distributor or contact Pall directly.

© 2016, Pall Corporation. Pall, and Laparoshield are trademarks of Pall Corporation. ® indicates a registered trademark in the USA. **Filtration.Separation.Solution.** is a service mark of Pall Corporation.