

AtmoSafe

# Smoke evacuation system



**MOST  
POWERFUL**

## AtmoSafe

### The smoke evacuation system for a clear view in the OT

ATMOS has introduced a smoke evacuation system for the OT – the AtmoSafe – a device which is used mainly in the laser and electro surgery.

Electrosurgical cutting and coagulation develop toxic fumes and build up unpleasant smells in the operating field - an obscured view and health risks are the result. The smoke evacuation system AtmoSafe protects both staff and patients from these toxic fumes, to the extent that doctors have a clear view in the OT, it prevents unpleasant smells, eliminates airborne viruses and carcinogenic substances.

This cannot be done by a usual surgical suction device. The advantage of the AtmoSafe is, that it is almost noiseless and very economical to run due to the special ULPA filters.

Suction can be made available as and when required with the automatic activation of the device. Thanks to the unique combination of the special gas filter with the ULPA filter, staff and patients are also protected from papilloma viruses, ammoniac emissions and hydrogen cyanide vapours. ATMOS also offers a wide range of consumables for the AtmoSafe e.g. suction funnel, suction cannulae, prefilter and a standard rail with the relevant pivot mounted arm.

### Suction performance

With 650 l/min noxious smoke gas is sucked off

### Pre-adjustments

The value for operation suction, basic suction and the follow-up time are individually adjustable. By pressing the scroll button the requested parameter to be adjusted, is selected

### Filter life indication

- The indication of the filter life gives an overview on the actual filter status.
- The airflow rate of the filter is measured and determines its service life which is normally 35 hours.

### Manual start and stop button

The device offers different possibilities for activation and deactivation:

- Manual start and stop button
- Foot switch
- Synchronisation with cutting device



### Main filter unit

- It consists of ULPA filter, three activated carbon filter layers and a gas filter.
- It cleans the air at 99.9995 % from all particles  $>0.009\mu\text{m}$ .

### Pre-filter (HEPA)

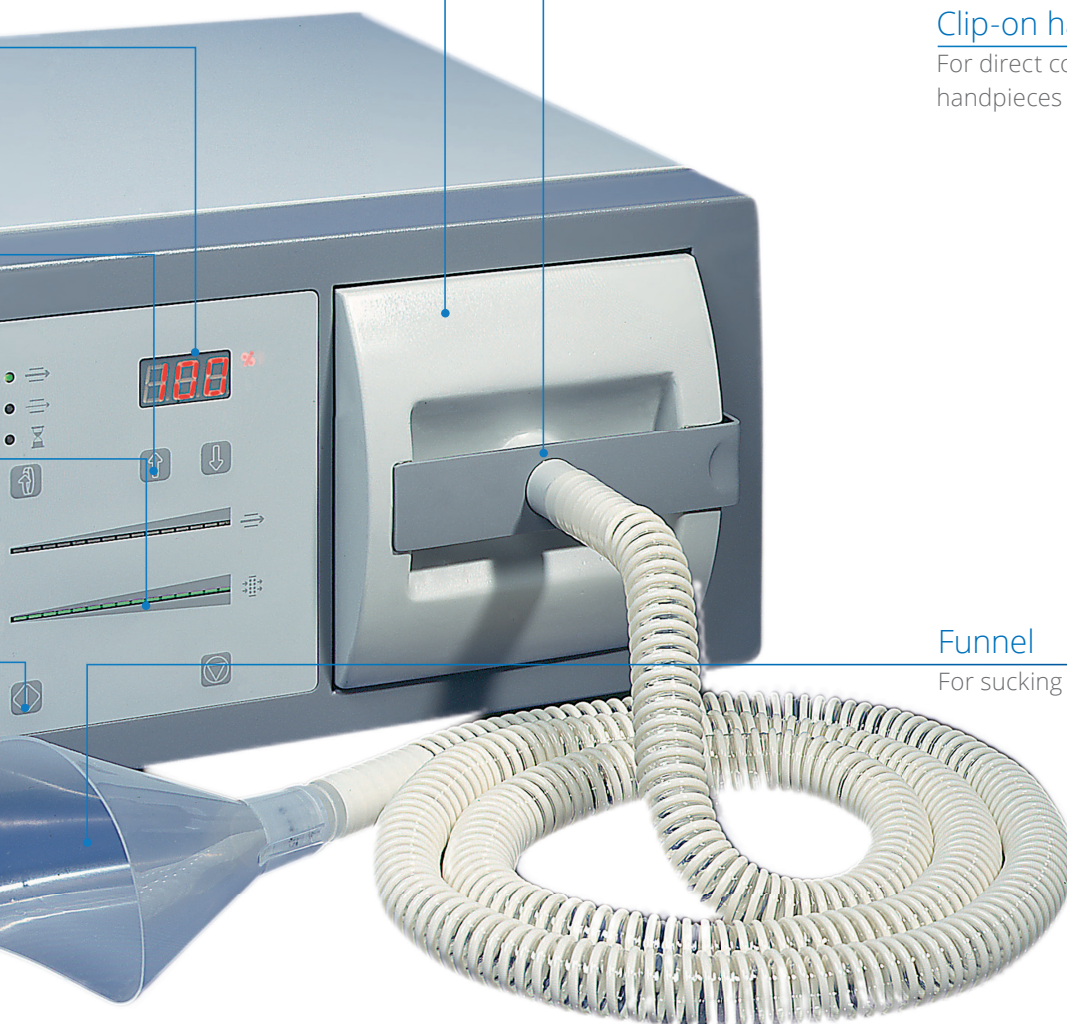
- Stops aerosols and large particles
- For a longer service life of the main filter

### Clip-on handle

For direct connection to slim-line handpieces

### Funnel

For sucking off smoke gas from the operating field.



## Information brochure smoke by-products



1. Is normal operating theatre ventilation adequate for evacuating smoke?

No, the rate of air circulation in the room - up to 24 x volume/hour - is not sufficient to evacuate locally generated aerosols and gases; the user is still exposed to dangerous laser smoke.

2. Is a normal room suction system (a central vacuum) not good enough?

No, the rate of room suction in an operating theatre is too low, at 30-40 l/min. Research has shown that a minimum of 400-600 l/min. is required in the operating field.

3. How high is the risk of becoming infected from biological substances during an operation?

Research is currently being undertaken to ascertain the degree of danger that exists from using different lasers and electrosurgical instruments. It has been proven that infectious particles can reach theatre staff and thereby create an acute risk of infection via the mucous membranes and respiratory tracts.

4. Are the particles generated during an operation really dangerous?

Airborne viruses such as papilloma viruses, proteins such as prions (BSE pathogens) and other airborne bacteria and fungi are dangerous substances which can lead to direct infection.

5. Do surgical face masks help protect the operating staff?

No, surgical face masks offer theatre staff no protection against airborne particles. These masks were designed to protect patients from droplet infections emanating from the operating team. Up to 25 % of the air inhaled in gets through the mask.

6. Are there other reasons for carrying out localised smoke evacuation, apart from the risk of infection?

The use of local smoke evacuation, when carried out during endoscopies, minimally invasive surgery and partially open and closed body cavities, gives optimum visibility.

7. What effects do particles and gases have on the patient?

During laparoscopies in particular, toxic gases diffuse into the patient's bloodstream. Small airborne particles in this smoke (measuring from 0.1 to 0.5  $\mu\text{m}$ ) cause ocular and upper respiratory tract irritation.

8. Is there a risk to the patient?

Medical staff should be aware of the risks to the patient from laser use and diathermic smoke generation during an operation. Some of the smoke inside a closed abdominal cavity can lead to an increase in methaemoglobin content, which reduces the capacity of body tissue to absorb oxygen.

9. How high are the running costs of local smoke evacuation?

The operating costs of the filter system are less than 1 Euro per surgical procedure and the filter unit has a life of up to 52 hours, depending on flow.

10. Do lasers deactivate dangerous airborne viruses?

No, research on retroviruses has shown that infectious viruses and constituents of virus DNA are carried in laser smoke. So it is possible to be infected, for example, by papilloma viruses in the laser smoke.

Extracted by:

„Smoke-by products in the laser and HF surgery“

An information brochure for staff and patients.

Tel.: +49 7653 689-374

ApplicationSolutions@atmosmed.de



## For the electrical (HF laser) incision



macrophotograph of the filter surface  
showing deposited contaminants

### The situation:

Electrosurgical devices and lasers for the coagulation of tissue are nowadays part of the standard procedure and operating processes can no longer be imagined without these instruments.

### Arising problems:

Unfortunately these surgical inventions are often accompanied by considerable disadvantages. The application of electrosurgery leads to the formation of toxic gases, harmful aerosols and transmission of human viruses to the endangering of health of both patients and operating personnel. The formation of smoke also leads to sight obstruction in connection with unpleasant odours.

The press even reported that, for the first time, laryngeal papillomatosis has been recognised as an occupational disease of nurses working in operating theatres. A high risk of disease transmission has been proven several times during the removal of papilloma and condyloma and the resulting infectiousness due to laser fumes.

Hence laser fume extraction is indispensable for the protection of the operating personnel.

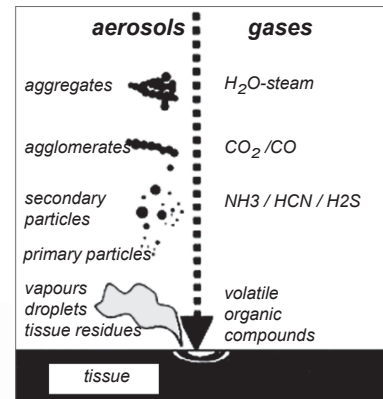
(Source: Laryngo-Rhino-Otology 2003; 82: page 790-793 – Georg Thieme Verlag Stuttgart)

To meet these requirements, the implementation of smoke suction extraction systems during treatment involving lasers or electrosurgical instruments is now prescribed in the USA and in many parts of Europe. This trend is proceeding around the world.

### ATMOS provides the solution:

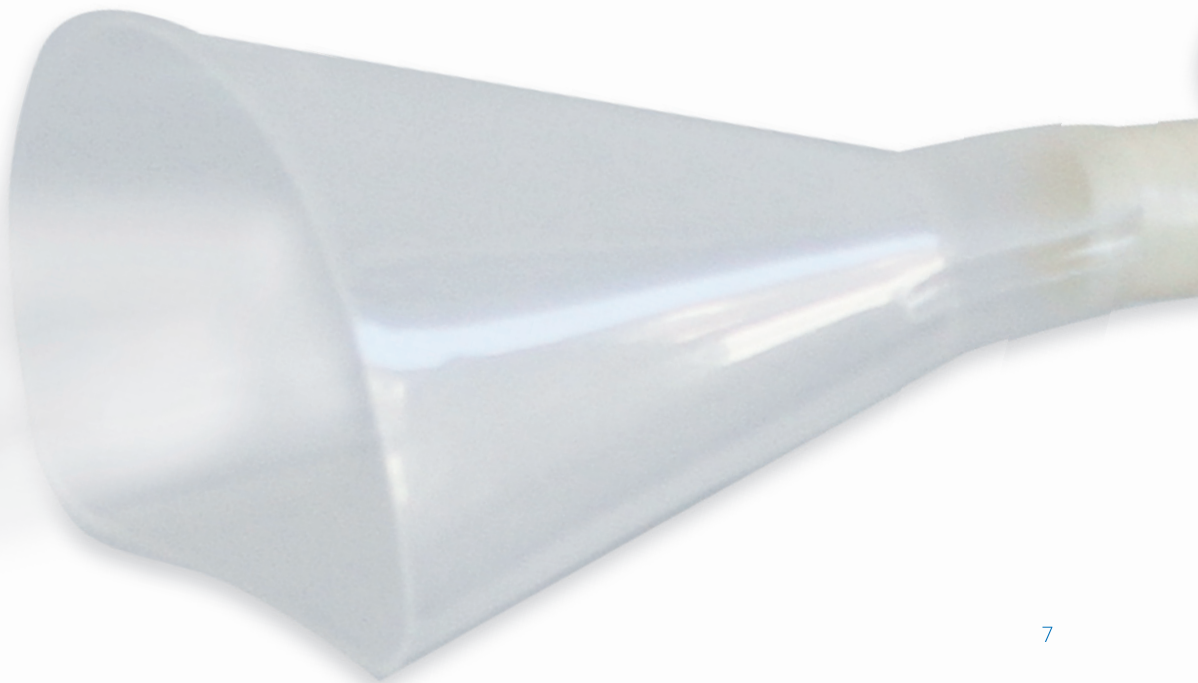
With application of the AtmoSafe the operating personnel are supplied and protected with an effective, economic and medically reliable smoke extraction unit. Unrestricted safety for patients and personnel in the operating theatre is now guaranteed! This is accomplished by means of the flow rate of 650 l/min – equivalent to 10 times the capacity of the most powerful surgical suction extraction.

## pyrolysis products with the medical use of laser



The use of a smoke evacuation system to prevent damage to health is an international standard of the health and safety at work guidelines and is urgently recommended for your safety by:

- NBOSH National Board of Occupational Safety and Health, Sweden
- NIOSH National Institute for Occupational Safety and Health, USA
- OSHA Occupational Safety and Health Administration, USA
- ANSI American National Standard for the Safe Use of Lasers in Health Care facilities, USA



## AtmoSafe & Accessories

Hereafter you will find the ordering data for our products.

For any further questions, please contact our sales department.

Phone: +49 7653 689-374

AtmoSafe	REF
<p>AtmoSafe OT set</p> <p>Microprocessor-controlled suction unit for removing and filtering surgical smoke, including internal synchronous activation (ISA), automatic shut-down, filter control, and electronically controlled, brushless blower.</p> <p>Included in delivery:</p> <p>[1] basic unit, operating instructions, mains cable, Main filter device (ULPA), Prefilter set (HEPA), Hose Ø 22 mm, L = 2.10 m (not autoclavable), Hose Ø 22 mm, L = 2.10 m (temperature-resistant up to 200 °C), suction pipe, suction funnel, hose connector Ø 22 mm to Ø 22 mm, hose connector Ø 22 mm (M) to Ø 10 mm (M), hose connector Ø 22 mm (F) to Ø 10 mm (M), Joint arm (with 3 joints, stretched length approx. 1.3 m), 5 hose holders (hose Ø 22 mm), standard rail set (25 x 10 mm / 315 mm for lateral fixation)</p>	445.0075.0
<p>AtmoSafe - Basic unit</p> <p>Included in delivery:</p> <p>[2] basic unit, operating instructions, mains cable, Main filter device (ULPA), Prefilter set (HEPA), Hose Ø 22 mm, L = 2.10 m (not autoclavable), Hose Ø 22 mm, L = 2.10 m (temperature-resistant up to 200 °C), suction pipe, suction funnel, hose connector Ø 22 mm to Ø 22 mm, hose connector Ø 22 mm (M) to Ø 10 mm (M), hose connector Ø 22 mm (F) to Ø 10 mm (M)</p>	445.0000.0
Accessories	REF
<p>[3] Hose support for air hose</p> <p>Inserted in standard rail (stainless steel), Ø 22 mm</p>	445.0066.0
<p>[4] Foot switch</p>	445.0061.0
<p>[5] Foot switch (explosion-proof for OT) IPX8, with holding plate</p>	445.0068.0
<p>[6] Joint arm with 3 joints for fixation to standard rail</p> <p>Autoclavable, stretched length approx. 1.3 m, with 5 hose supports for hose Ø 22 mm</p>	445.0060.0
<p>[7] Standard rail set</p> <p>Dimensions: 25 x 10 mm / 315 mm for internal fixation to AtmoSafe</p>	445.0064.0
<p>[8] ISA-power cord 2 m</p> <p>With non-heating plug and non-heating socket for device coupling</p>	008.0800.0
<p>[9] ISA-power cord 40 cm</p> <p>With non-heating plug and non-heating socket for device coupling</p>	008.0806.0
<p>[10] Interlink cable</p> <p>Interface to laser- or HF-surgery</p>	445.0073.0



1 REF 444.0075.0



2 REF 445.0000.0



3 REF 445.0066.0



4 REF 445.0061.0



5 REF 445.0068.0



6 REF 445.0060.0



7 REF 445.0064.0



8 REF 008.0800.0



9 REF 008.0806.0

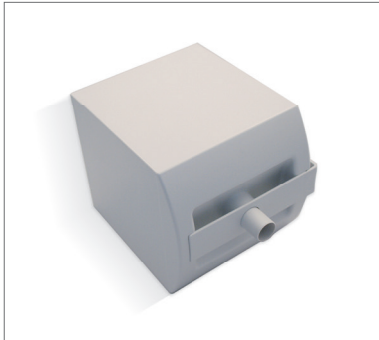


10 REF 445.0073.0

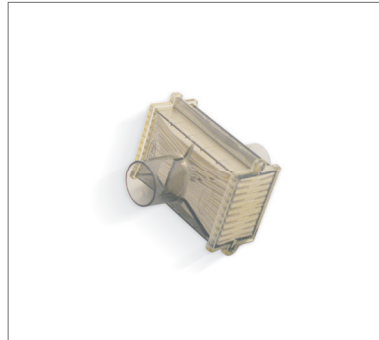
## Consumables

Hereafter you will find the ordering data for our products.  
For any further questions, please contact our sales department.  
Phone: +49 7653 689-374

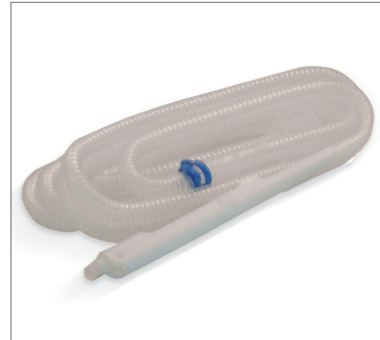
Consumables for AtmoSafe	REF
<p>1 Main filter device (ULPA 99,9995% @0,01m / 3-steps gas filter) Change: after approx. 150 patients</p>	445.0040.0
<p>2 Pre-filter (HEPA) With connections Ø 22 mm (M/W), sterile, not autoclavable, 50 pcs. to be used for laser ablations Change: 1 x per patient</p>	445.0044.0
<p>3 Air suction handle for smoke-evacuation Surgery handles, clip-on handle, air hose Ø 10 mm, L = 2,5 m, 25 pcs., Change: 1 x per patient</p>	445.0063.0
<p>4 Funnel Flattened on one side, made of PP with connection for Ø 22 mm, temperature-resistant up to 200 °C</p>	000.0687.0
<p>5 Suction pipe For suction hose Ø 22 mm, temperature-resistant up to 200 °C</p>	445.0055.0
<p>6 Air hose Ø 22 mm, L = 2.10 m Disposable, not autoclavable, made of E.V.A. Change: 1 x per patient</p>	005.0200.0
<p>7 Air hose Ø 22 mm, L = 2.10 m Temperature-resistant up to 200 °C</p>	005.0203.0
<p>8 Air hose Ø 22 mm, L = 2.70 m Made of Hytrel, connecting sockets made of silicone temperature-resistant up to 200 °C</p>	005.0201.0
<p>9 Air hose, internal Ø = 10 mm, L = 1.8 m Temperature-resistant up to 200 °C, made of hytrel, connecting sockets made of silicone</p>	005.0204.0
<p>10 Hose connector, straight, Ø 22 mm (m) to Ø 22 mm (m)</p>	000.0683.0
<p>11 Hose connector, straight, Ø 22 mm (m) to Ø 10 mm (m)</p>	000.0689.0
<p>12 Hose connector, straight Ø 22 mm (f) to Ø 10 mm (m)</p>	000.0688.0



1 REF 445.0040.0



2 REF 445.0044.0



3 445.0063.0



4 REF 000.0687.0



5 REF 445.0055.0



6 REF 005.0200.0



7 REF 005.0203.0



8 REF 005.0201.0



9 REF 005.0204.0



10 REF 000.0683.0



11 REF 000.0689.0



12 REF 000.0688.0



**MedizinTechnik**

ATMOS MedizinTechnik GmbH & Co. KG

Ludwig-Kegel-Str. 16

79853 Lenzkirch / Germany

Tel: +49 7653 689-374

ApplicationSolutions@atmosmed.com

**[www.atmosmed.com](http://www.atmosmed.com)**