

Tolmed



For a smoke-free OT!

# ATMOS<sup>®</sup> Smoke Evacuation



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## Dangers of surgical smoke!

During cutting and coagulating with HF, RF, ultrasonic or laser, biological tissue, blood and fluids are stimulated to the point of pyrolysis. A total of 41 different chemical substances have been verified in surgical smoke, some of which are highly toxic. Toxicological examinations identified erythrocytes and living cell material, as well as biological contaminants such as viruses, bacteria, mycobacteria and fungi. Even viral DNA and HIV DNA have been found in hoses used for smoke evacuation. In addition, inorganic and organic substances, such as carbon monoxide, benzene, formaldehyde, toluene and carcinogenic toxins have been detected.

Inhaling the particles contained in the surgical smoke can lead to irritation of the throat and nose, as well as respiratory problems or allergic reactions. The particles penetrate deep into the alveoli of the operating team, from where they can be absorbed by blood. This can result in pulmonary inflammations and has been proven to be carcinogenic.

The smoke that develops during operations is associated with unpleasant odours. This results in a drop in the air quality in the operating theatre that can lead to headaches and nausea in the OT team. The organic components of the surgical smoke are well-known to cause tiredness and a feelings of faintness, as well as cardiac arrhythmia and breathing difficulties.

Classic protection methods such as surgical masks and laminar flow provide only insufficient protection against surgical smoke. For this reason, the International Section of the ISSA recommends in its latest working paper from 2011 that, in order to prevent work accidents and occupational illness in the healthcare sector, a „smoke evacuation should be set up for surgical smoke at the point of development. This measure ensures that a majority of the vapour, gases or particles never even reaches the breathing zone of employees“.





### Protection for the OT team

- Targeted evacuation of surgical smoke before it reaches the breathing zone of the OT team
- Prevention of health risks caused by surgical smoke

### Improvement of the air quality

- Significant improvement of unpleasant odours thanks to activated carbon filter
- Prevention of health problems such as headaches, nausea, tiredness, feelings of faintness, cardiac arrhythmia and breathing difficulties

### No impairment of vision

- Improved view of the operating area, particularly in laparoscopy

### Improvement of patient recovery

- Preventing the absorption of individual gas components in the patient's bloodstream during laparoscopy



# FUMOVAC 700

The powerful, compact smoke evacuation device FUMOVAC 700 is designed for continuous operation in surgery and offers an exceptionally low-noise suction capacity of 700 l/min. It fulfils the requirements of modern HF, RF, ultrasonic and laser surgery.

The four-stage high-performance filter is fitted with three different sizes of inputs, tailoring it to suction hoses with a diameter of 22 mm (7/8"), 9.5 mm (3/8") and 6.4 mm (1/4"). The inputs are secured by means of magnetic flaps.



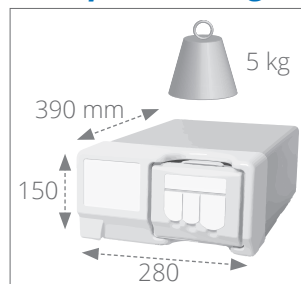
Universally usable thanks to extra-compact dimensions

Intuitive and secure operation

Excellent contamination protection

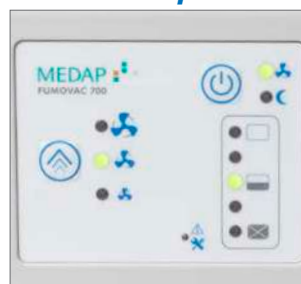
**Compact and light**

Dimensions and weight are 50% smaller than the predecessor model, ensuring exceptionally easy and space-saving integration into the surgical environment.



**Control panel**

It is operated using just two buttons. LEDs indicate the operating status, the suction capacity selected, the remaining filter life time and possible need for servicing.



**High-performance filter**

The filter is particularly efficient thanks to its four filter stages, three inputs with magnetic flaps, and a filter life time of up to 35 hours.




FUMOVAC 700 

Accessories 

Hose sets 

Overview / Studies 

Hose systems 

# Accessories for a perfect in

To ensure an optimum workflow, there is a remote control available that only activates the smoke evacuation device when surgical smoke develops. A comprehensive range of suction hoses rounds out the product line for smoke evacuation.

To ensure an optimum workflow, the FUMOVAC 700 can be integrated into all conventional HF towers or it can be placed on the platforms for ceiling supply units. If space is at a premium, an individually adjustable suspension option guarantees that the FUMOVAC 700 can be fitted stably to the platforms of ceiling supply units. A special trolley enables optimum positioning inside the OR workflow.



# tegration

Automatic evacuation of surgical smoke

Individual positioning

Optimum hose guide

The automatic HF remote control detects currents when the HF pencils are switched on and off and switches the smoke evacuation device on and off at the same time. On request a lag time can be set.

### Remote control



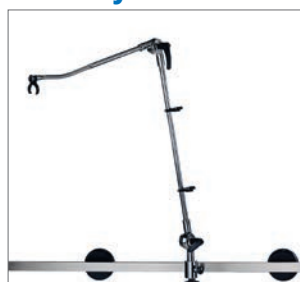
A platform is available for adapting the FUMOVAC 700 to a ceiling units having lateral equipment rails.

### Platform



The pin-joint arm supports the optimum hose guidance of the FUMOVAC 700 in the OR.

### Pin-joint arm



FUMOVAC 700



Accessories



Hose sets



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Hose systems



# Hose sets for a large numb

Optimized hose sets allow the best possible smoke evacuation for almost all indications, laser,- HF-surgery or for the laparoscopy. For laser surgery flow optimized hoses with a large inner diameter ensure the greatest possible flow.

Whether existing disposable or reusable electro-surgical pencils should be used or a hose set with built-in disposable electro-surgical pencils - ATMOS offers a comprehensive range of hoses. For gynaecology and ENT a special hose set offers the possibility of direct connection to a speculum-forceps. A special hose set for the laparoscopy with a Luer-connection for trocars and a flow controller for minimal gas loss complete the ATMOS product range.





# er of indications

Optimised pencil with built-in smoke evacuation

Special hose set for gynaecology and ENT

Laparoscopy-hose set with flow controller

The hose set contains three blade electrodes with non-stick coating and 3 m connection cable with 3-pin plug.

### *Disposable pencil*



The speculum-hose set has a special connection for a speculum forceps.

### *Speculum-hose set*



The laparoscopic hose set has a special flow limiter to ensure minimum gas losses.

### *Laparoscopic hose set*



FUMOVAC 700



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# Overview

Basic device	FUMOVAC 700
Max. flow rate	700 l/min
Flow rate adjustment	3 stages
Display	LEDs
Adjustable lag time	0 – 10 sec; adjusted on the remote control
Volume	max. 55 dB(A)
Dimensions (H x W x D)	150 x 280 x 390 mm
Weight	5.0 kg (with filter) 4.0 kg (without filter)
Foot switch	✓
Remote control for HF devices	optional
Filter	
Number of inputs	3
∅ 22 mm (7/8")	✓
∅ 9.5 mm (3/8")	✓
∅ 6.4 mm (1/4")	✓
Contamination protection of filter inputs	Magnetic flaps
Number of filter stages	4
Pre-filter	integrated
Filter life time	18 / 24 / 35 hours

# Studies

## As dangerous as cigarette smoke <sup>1</sup>

- On average, the smoke produced each day in an operation room is equivalent to 27 to 30 cigarettes! This data was collected over a period of two months. The average daily activation time of the diathermic equipment amounted to 12 minutes and 43 seconds.

## Surgical smoke inhalation is an occupational hazard <sup>2</sup>

- A 53-year-old male gynaecologist presented with HPV 16 (human papillomavirus) positive tonsillar squamous cell carcinoma. After more than 20 years of working with more than 3,000 dysplastic cervical and vulvar lesions using laser or loop electrodes.
- A 62-year-old male gynaecologist with HPV 16 positive base of tongue cancer. After 30 years of working, also with dysplastic cervical and vulvar lesions using laser or loop electrodes.

## Potential health hazards due to surgical smoke <sup>3</sup>

- |   |  |                                      |                                |
|---|--|--------------------------------------|--------------------------------|
| ▪ Eye irritation                            | ▪ Acute and chronic bronchitis             | ▪ Hypoxia/dizziness, lightheadedness | ▪ Human immunodeficiency virus |
| ▪ Lacrimation                               | ▪ chronic inflammatory changes             | ▪ Colic                              | ▪ Dermatitis                   |
| ▪ Sneezing                                  | ▪ in respiratory tract (emphysema, asthma, | ▪ Cardiovascular dysfunction         | ▪ Anaemia                      |
| ▪ Throat irritation, nasopharyngeal lesions |  | ▪ Hepatitis                          | ▪ Leukaemia                    |
|   |  |                                      | ▪ Carcinoma                    |

## Chemicals identified within electrosurgical smoke <sup>4</sup>

- |                   |                                   |                       |                                |                            |
|-------------------|-----------------------------------|-----------------------|--------------------------------|----------------------------|
| ▪ Acetonitrile    | ▪ Carbon monoxide                 | ▪ Ethyl benzene       | ▪ Methane                      | ▪ Propene                  |
| ▪ Acetylene       | ▪ Creosol                         | ▪ Ethynyl benzene     | ▪ 3-Methyl butenal (aldehyde)  | ▪ 2-Propylene nitrile      |
| ▪ Acrolin         | ▪ 1-Decene (hydrocarbon)          | ▪ Formaldehyde        | ▪ 6-Methyl indole (amine)      | ▪ Pyridine                 |
| ▪ Acrylonitrile   | ▪ 2,3-Dihydroindene (hydrocarbon) | ▪ Furfural (aldehyde) | ▪ 4-Methyl phenol              | ▪ Pyrrole (amine)          |
| ▪ Alkyl benzene   | ▪ Ethane                          | ▪ Hexadecanoic acid   | ▪ 2-Methyl propanol (aldehyde) | ▪ Styrene                  |
| ▪ Benzaldehyde    | ▪ Ethene                          | ▪ Hydrogen cyanide    | ▪ Methyl pyrazine              | ▪ Toluene (hydrocarbon)    |
| ▪ Benzene         | ▪ Ethylene                        | ▪ Indole (amine)      | ▪ Phenol                       | ▪ 1-Undecene (hydrocarbon) |
| ▪ Benzotrile      |                                   | ▪ Isobutene           |                                | ▪ Xylene                   |
| ▪ Butadiene       |                                   |                       |                                |                            |
| ▪ Butene          |                                   |                       |                                |                            |
| ▪ 3-Butenenitrile |                                   |                       |                                |                            |

## Literature

- Hill, D.S. et al.: Surgical smoke – A health hazard in the operating theatre: A study to qualify exposure and a survey of the use of smoke extractor systems in UK plastic surgery units, *Journal of Plastic, Reconstructive & Aesthetic Surgery* (2012) 65, pages 911–916
- Rioux, M. et al.: HPV positive tonsillar cancer in two laser surgeons: case report, *Journal of Otolaryngology -Head and Neck Surgery* 2013, 42:54
- See Alp E., Bijl D, Bleichrodt R.P., Hansson B., Voss A.: Surgical smoke and infection control, *Journal of Hospital Infection*, 2006, 62: pages 1–5
- Barrett, Dr. William I and Garber, Shawn M: "Surgical smoke – a review of the literature", *Business Briefing: Global Surgery* 2004, page 1 et seq.

# Hose systems



REF 5752 5328



REF 5752 5331



REF 5752 5332



REF 5752 5334



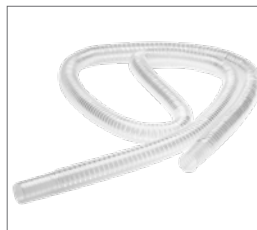
REF 5752 5424



REF 5752 5646



REF 445.0063.0



REF 005.0200.0



REF 005.0203.0



REF 005.0201.0



REF 005.0204.0

REF	Package size	Hose length	Hose connection Ø
<b>Disposable hose sets, sterile</b>			
5752 5328	24 pcs.	3.05 m	22 mm
5752 5331	10 pcs.	3.05 m	22 mm
5752 5332	10 pcs.	3.05 m	22 mm
5752 5334	5 pcs.	2.44 m	22 mm
5752 5424	12 pcs.	3.05 m	22 mm
5752 5646	40 pcs.	3.00 m	22 mm
445.0063.0	25 pcs.	2.50 m	22 mm
<b>Disposable hose sets, unsterile</b>			
005.0200.0	1 pcs.	2.10 m	22 mm
<b>Reusable hose sets</b>			
005.0203.0	1 pcs.	2.10 m	22 mm
005.0201.0	1 pcs.	2.70 m	22 mm
005.0204.0	1 pcs.	1.80 m	10 mm



	Hose diameter	Special features	Indications		
			Laser surgery	HF surgery	Laparo- scopy
	22 mm	<ul style="list-style-type: none"> <li>Reinforced guide for simple positioning</li> <li>Sponge guard</li> </ul>	✓	✓	
	9.5 mm to 1.22 m; 22 mm to 1.83 m	<ul style="list-style-type: none"> <li>Silicone adapter for disposable pencils</li> </ul>		✓	
	9.5 mm to 1.22 m; 22 mm to 1.83 m	<ul style="list-style-type: none"> <li>Silicone adapter for reusable pencils</li> </ul>		✓	
	6.5 mm to 61 cm; 22 mm to 1.83 m	<ul style="list-style-type: none"> <li>6.5 mm speculum connection</li> </ul>		✓	
	6.5 mm	<ul style="list-style-type: none"> <li>Specially for laparoscopy</li> <li>Luer Lock connection for connection to trocar</li> <li>Limitation of flow to &lt;10 l/min</li> </ul>			✓
	9.5 mm	<ul style="list-style-type: none"> <li>Disposable pencil with 3 blade electrodes in 70, 100 and 152 mm length and matching covers</li> <li>Optimised suction around electrode between pencil and suction hose</li> <li>International 3-pin plug</li> <li>Cable guide inside the suction hose</li> </ul>		✓	
	10 mm	<ul style="list-style-type: none"> <li>Clip-on adapter for Slimline pencils</li> </ul>		✓	
	22 mm		✓		
	22 mm	<ul style="list-style-type: none"> <li>Temperature resistant up to 200 °C</li> </ul>	✓	✓	
	22 mm	<ul style="list-style-type: none"> <li>Temperature resistant up to 200 °C</li> </ul>	✓	✓	
	10 mm	<ul style="list-style-type: none"> <li>Temperature resistant up to 200 °C</li> </ul>		✓	



***Vacuum Extraction***



***Surgical Suction***



***Wound Drainage***

**ATMOS®**



***Cardiothoracic Drainage***



***Oxygen Supply***



***Bronchial Suction***



***Smoke Evacuation***

Product Range



***Mobile Oxygen Supply***



***Suction with CGS***

***For more information on  
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