GIBECK AIR BREATHING FILTERS

Scientific information on how to select air filters and protect patients, staff and equipment from nosocomial infections

Teleflex

ASK US IF A BREATHING FILTER WITH A DOCUMENTED EFFICIENCY OF 99.999999% IS BETTER THAN ONE THAT'S ONLY 99.99% EFFICIENT. WE'LL GIVE YOU A 100.0000% RELEVANT ANSWER.*

Built on a solid tradition of innovation, Teleflex is committed to helping providers minimise risk and maximise outcomes for their patients. It is with pride that we present to you Gibeck's experienced solutions to efficiently and effectively meet the ever growing challenges of anaesthesia and intensive care in today's hospitals.

Most manufacturers of breathing filters take their work very seriously. After all, everyone relies on the integrity of their products.
However, information on the results of filtration tests can be confusing. It's easy to drown in a sea of decimal points, especially when every figure is a nine. The size of bacteria and viruses can also lead to misunderstandings. Surely the smallest are the hardest to trap? You may even have seen demonstrations that compare different filters by forcing cigarette smoke or pressurized water through them. Both "tests" give impressive results, but neither has any clinical relevance.

The only information that matters is information that helps you choose the breathing filter that best protects your patients, staff and machines.

So with all manufacturers offering around 99.9999% efficiency, it pays to choose the one that gives just 0.0001% more – 100.0000% relevant information.

It's a small but important difference. Because when you want assurance about the quality and safety of breathing filters, you know you can trust Teleflex's GIBECK 100.0000%.

*It's not always the case. More 9s do not automatically mean that a filter is more efficient. Reported filtration efficiency figures are specific only to a particular test in a particular laboratory. The number of nines reported is an outcome of the test procedure and thus cannot be compared with a filter tested in any other way.
Note also that even when tests show that no particles at all pass through, for example, our Humid-Vent Filter Compact, the statistical uncertainty associated with all test methods means that we can never report 100% efficiency, even though this was the experimental value obtained.
In this case, we convey the efficiency in terms of nines, e.g. 99.9999%. Microbiology is never a 100% exact science!

TABLE OF CONTENTS

latex-free — All products in this catalogue are free of latex.

PVC-free — All products in this catalogue are free of PVC.

phtalate-free — All products in this catalogue are free of phtalates.

eco-friendly

BASIC INFORMATION – NOSOCOMIAL INFECTIONS AND THE PROTECTIVE EFFECT OF AIRWAY FILTRATION

INFECTION RISKS IN HOSPITALS

Infections acquired during a hospital stay are called nosocomial infections, and the special dangers associated with them are now receiving increasing attention.
The incidence of nosocomial infections reflects their means of transmission. As bacteria and viruses are spread in airborne droplets (aerosols) and in particles, inhalation of room air and especially exposure to contaminated gas ventilators and anaesthesia equipment can cause infection. In fact, the incidence of nosocomial infections in patients admitted to intensive care units (ICU) and thus exposed to such gas flows is 5 to 10-fold higher than those in general wards.
Without effective protection, patients in ICU thus run a greater risk of infection due to Gram-negative bacteria and to viruses. Furthermore, ICU staff are exposed to the same risks as their patients. Nosocomial infections can therefore be very costly for hospitals and significantly increase their budgets.

AIRWAY FILTRATION PROTECTS AGAINST THE SPREAD OF DISEASE

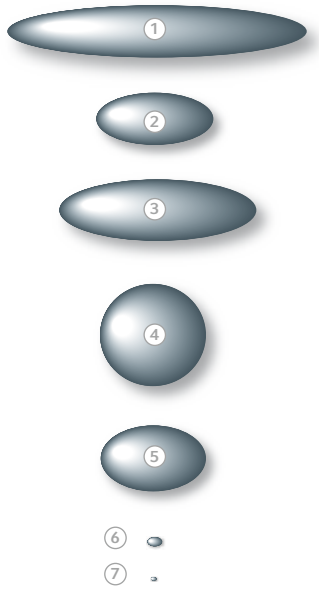
General hygienic and aseptic routines will help curtail nosocomial infections. However, one very effective protection mechanism is to capture airborne organisms with filters fitted to patients' breathing systems.
Breathing filters prevent the spread of bacteria and viruses to patients and staff, and they protect breathing circuits and equipment. They are simple to use and, combined with an effective heat and moisture exchanger (HME), they keep the airway's mucuscilia system in good order, which also helps prevent disease.

SIZE AND TRANSPORT OF MICROORGANISMS

While all microorganisms are naturally very small, their comparative size varies significantly, as shown opposite. Despite what you may imagine, the smallest organisms are not always the hardest to capture. The smaller a particle is, the more the gas molecules in the air affect it.

As these molecules are in continuous motion, the movement of small particles increases and the probability that they will collide with a filter fiber and be trapped is greater.
Bacteria and viruses are mainly transported in tiny airborne droplets or particles and rarely in isolated form.

Comparative shapes and sizes (in µm) of selected microorganisms involved in nosocomial infections.



1. Mycobacterium tuberculosis (0.4 x 3.0 µm)
2. Serratia marcescens (0.5 x 1.0 µm)
3. Pseudomonas aueruginosa (0.6 x 2.0 µm)
4. Staphylococcus aureus (1.0 µm)
5. Bacillus subtilis (0.7 x 1.0 µm)
6. Hepatitis B virus (0.06 x 0.1 µm)
7. Phage oX-174 (0.027 µm)

FILTRATION PRINCIPLES AND TYPES OF FILTER

All breathing filters are based on the depth filter model, which comprises an open matrix of fibers through which the patient can breathe easily and safely. In addition, all depth filters used in clinical situations should be hydrophobic, which means that water-borne microorganisms are not sucked into the filter, but instead remain on the surface. This also makes it virtually impossible for patient liquid secretions to contaminate the system.
Today, two types of hydrophobic depth filters dominate; mechanical and electrostatic.

A B

FILTRATION PRINCIPLES AND TYPES OF FILTER

A) Mechanical depth filters capture particles by direct interception following collision.

B) Electrostatic depth filters enhance this mechanical capture by using small positive and negative charges to attract particles.

As both types are hydrophobic, microorganisms borne on water droplets are retained on the surface of the filter.

With a mechanical filter, particles in the airflow enter the matrix of fibers and collide with them, bouncing from one to another before losing momentum and then attaching to one of them. The most effective mechanical filters are HEPA (High Efficiency Particular Air) filters. True HEPA filters can easily remove sub-micron-sized particles from air. To achieve a large surface area in a low volume housing, the filter membrane is pleated. HEPA filters are tested according to an independent industrial standard and efficiencies are reported in classes; the higher the class, the better the filter (see pages 9-10).
Electrostatic filters add surface charges to the collision capture mechanism of a mechanical filter. Here the fibers carry small positive and negative charges.
When particles enter the filter and hit these “bipolar” fibers, they become polarized and attracted to their surfaces, sticking to them as if they were glued. As fewer collisions are needed compared with non-charged fibers, electrostatic filters have a more open structure. They are, nevertheless, just as clinically effective as mechanical filters in trapping bacteria and viruses. In addition, they can be made smaller, which results in lower deadspace and allows them to be placed close to the patient's ET-tube. They are ideal for combination with an HME.

BREATHING FILTERS COMBINED WITH HUMIDIFIERS

The air expired by intubated patients contains heat and moisture, both of which are needed to maintain the homeostasis of the airway. Retaining this heat and humidity is normally the task of the upper airway. However, as this may now be by-passed, an HME is often fitted to the patient's ET-tube to extract heat and moisture which is then returned to the patient in the supplied breathing gases. Furthermore, by retaining humidity the breathing circuit and ventilator are kept dry and cold and thus less favourable for micro-organisms. In other words, an HME will provide additional protection against infection.
However, combining a dedicated HME with a dedicated breathing filter is the ideal solution, giving optimum levels of humidification plus efficient protection against bacteria and viruses.

PLACEMENT OF BREATHING FILTERS

Breathing filters are either placed close to the patient (patient side) where they protect the patient, the staff, breathing circuits and the machine, or on the machine side where they protect the capital equipment.

TELEFLEX'S GIBECK RANGE OF BREATHING FILTERS

GIBECK supplies a range of mechanical (HEPA) and electrostatic breathing filters, as well as filters with a combined heat and moisture exchanger. Their well-documented quality provides hospital staff with a safe and secure choice of breathing filters for all respiratory needs.

PRODUCT INFORMATION

NEW!

HUMID-VENT FILTER – COMBINED HME AND BACTERIAL/ VIRAL BREATHING FILTER

- humidifies and filters at the same time
- filtration efficiency 99.9999%
- low dead space
- small and paediatric versions available
- lightweight and comfortable design
- angled unit eliminates need for extra elbow
- ISO standard connectors

The Humid-Vent filter is a high-performance heat and moisture exchanger (HME) coupled with a hydrophobic bacterial/viral breathing filter. The HME has a bacteriostatic effect, which is supplemented by the high level of protection provided by the hydrophobic, electrostatic filter. The Humid-Vent filter range comprises Light, Compact, Small and Pedi versions. The Humid-Vent Filter Small is particularly versatile; it offers adult performance in a child-sized format (dead space 27 ml) with a tidal volume extending up to 1000 ml.

HUMID-VENT HEPA FILTER – COMBINED HME AND PLEATED HEPA BREATHING FILTER

combined HEPA/HME

- true hydrophobic HEPA filtration
- humidification over 30 mg/l
- >99.99999 % filtration
- media validated for tuberculosis, HIV & Hep C
- clear housing for visualisation
- ideal for long-term use in ICU

The new GIBECK Humid-Vent HEPA combines an advanced hydrophobic filtration performance with a high efficiency heat and moisture exchanger. The HME medium used is the well tested double corrugated hygroscopic paper from GIBECK.
To improve the humidification properties this medium has additionally been treated with natural calcium chloride, which provides a bacteriostatic effect as well.

ISO-GARD HEPA LIGHT – HIGHLY EFFICIENT MECHANICAL FILTER/HME

- a true hydrophobic HEPA filter with HME properties
- exceeds HEPA Class 13 standard
- filtration efficiency 99.99999%
- lightweight (reduced drag)
- rounded corners for patient/staff comfort
- ISO standard connectors

HEPA stands for High Efficiency Particulate Air, which also provides a clue as to how effective this hydrophobic pleated filter is. The GIBECK Iso-Gard HEPA Light even exceeds the HEPA Class 13 filter standard, while the Iso-Gard HEPA Light also functions as an HME. It is available with and without CO_2 port and for use on the machine side.

ISO-GARD HEPA SMALL – HIGHLY EFFICIENT MECHANICAL FILTER/HME

- a compact version of the Iso-Gard HEPA Light Filter
- a true hydrophobic HEPA filter with HME properties
- exceeds HEPA Class 13 standard
- filtration efficiency 99.9999%
- lightweight – only 23 grams – (reduced drag)
- angled model eliminates need for extra connectors
- rounded corners for patient/staff comfort
- ISO standard connectors

This smaller version of the well-proven and successful Gibeck Iso-Gard HEPA Light filter can be used for anaesthesia in both adults and children. It is a truly hydrophobic pleated bacterial/viral filter which has proven to be just as efficient as the larger model. Independent tests have confirmed that Iso-Gard HEPA Small exceeds the performance of the HEPA Class 13 filter and is the ideal filter when low-flow anaesthesia is required.

ISO-GARD – ELECTROSTATIC HYDROPHOBIC DEPTH FILTER

- small and lightweight
- smooth, rounded shape for extra comfort
- straight version or angled to eliminate need for extra elbow
- easily accessible gas monitoring port
- transparent for easy vision
- ISO standard connectors

Iso-Gard bacterial/viral filters protect patients, staff, anaesthesia machines and ventilators. Two sizes are available: Iso-Gard Filter and the Iso-Gard Filter Small. The latter is a lightweight filter suitable for both children and adults. Iso-Gard filters comply with all relevant quality standards and can be used for patient and machine side applications in anaesthesia and ICU (only machine side). Extensive independent tests have demonstrated their high efficiency. Anest-Guard, a similar filter, protects the anaesthesia machine and ventilator. Its square housing is easy to grasp, even with gloves or wet hands.

Anest-Guard is used on the machine side only.

INTERESTING INFORMATION – COMMON QUESTIONS AND ANSWERS ABOUT FILTRATION

▶ HOW IS BACTERIAL/VIRAL FILTER EFFICIENCY MEASURED?

There are many different methods. To obtain reliable results, it is important that the measurement takes place in an environment that is as close as possible to a clinical situation. The most common method is to nebulise (create a fine mist) a liquid containing a bacterial/viral suspension, expose it to filtration, and measure the numbers of organisms that pass through the filter. You should be aware, however, that results from different tests should not be compared. Gibeck filters are assessed by several different independent laboratories, a policy we intend to continue. (See page 8 for further details of test methods.)

▶ SHOULD I USE AN ELECTROSTATIC FILTER, A MECHANICAL FILTER OR A COMBINATION PRODUCT?

The advantage of an electrostatic filter is its small size and light weight. The filter has less dead space, which is a desirable property in an ET-tube. In addition, an electrostatic filter has lower resistance to flow than a mechanical filter. Traditionally, mechanical filters are used on the machine side where small size and dead space are less important. Electrostatic filters, in contrast, are designed for use on the patient side. Electrostatic and HEPA filters combined with an effective HME will provide humidity of up to more than 30 mg H_2O/liter of gas (the ISO standard recommended for active humidifiers for long term ventilation). However, as different hospitals and professionals have different routines and opinions on the subject, the GIBECK range includes all filter types and in a range of sizes and configurations.

▶ WHAT IS MEANT BY A HYDROPHOBIC FILTER?

Hydrophobic means resistance to water. Hydrophobic filter materials thus repel water, meaning water droplets and condensation stay on the surface or the filter. All GIBECK bacterial/viral filters are hydrophobic. They do not absorb water.

▶ WHAT DOES BACTERIOSTATIC MEAN?

A product that is bacteriostatic will not eliminate bacteria (or viruses), but prevent them from growing. A GIBECK HME is treated with calcium chloride and thus forms a bacteriostatic environment that inhibits growth.
A GIBECK combined HME/breathing filter comprises two media; bacteriostatic corrugated paper (in the HME) and a true hydrophobic bacterial/viral filter. A combined product is thus extremely effective. Also note that in addition to providing good humidification, the HME also keeps the breathing circuits and filter dry, which gives even more protection against bacterial growth.

▶ HOW LONG DOES AN ELECTROSTATIC FILTER REMAIN EFFECTIVE AND DOES HUMIDITY AFFECT ITS ELECTROSTATIC EFFICIENCY?

All GIBECK bacterial/viral filters have a guaranteed shelf-life of 5 years following manufacturing. Humidity does not affect the efficiency of electrostatic filters since they are designed to be used with humid breathing air. All GIBECK filters are tested in independent laboratories under humid conditions.

▶ ARE SO-CALLED "WATER TESTS" CLINICALLY RELEVANT FOR BACTERIAL/VIRAL FILTERS?

Breathing filters are designed to filter air and not water. The fact that water can be forced through a filter does not mean it will let bacteria and viruses through in a real clinical situation.
The clinically relevant factor is the differential pressure, i.e. the difference in pressure on each side of the filter. In a clinical situation, this is very small (compared to the absolute pressure) and cannot be compared with the pressure difference caused by blowing air into a filter filled with water. (Note: do not confuse differential pressure over the HME/filter with the internal pressure of the circuit as displayed on the meters of most ventilators.)

In addition, all filters are hydrophobic and will repel water. In certain cases, water droplets or a small collection of water can be seen on the patient side of the housing. This is expected and is proof that the HME is working efficiently (as confirmed in several clinical studies).
Many millions of GIBECK electrostatic filters have been used in hospitals all over the world for more than 15 years. A case of water passing through the filter and causing infection has never been reported.

▶ HOW ABOUT SMOKE TESTS, ARE THEY RELEVANT?

No. Not surprisingly, smoke particles do not behave like bacteria or viruses and therefore a comparison is not clinically relevant. Blowing cigarette smoke through a filter will not provide any useful information. Smoke particles are very small and move through the air individually, not collectively with any other particles.

▶ WHAT EXACTLY IS A HEPA FILTER?

HEPA is an abbreviation for High Efficiency Particulate Air. This is an industrial testing method developed to test filtration systems for use against chemical and biological weapons. True HEPA filters have to pass a very sophisticated test, a so-called Particle Test. Every manufacturer who claims to have a HEPA filter must have their product certified and state which HEPA test class it meets. GIBECK Iso-Gard HEPA filters are HEPA Class 13. (See page 8 for further information.)

▶ WHY DOES THE HEPA TEST RESULT IN SO FEW NINES, I.E. 99.97% AND NOT 99.9999%?

The HEPA test uses a different technique to other filtration tests. It is based on the defined particle size that is considered most likely to pass through a filter, i.e. the most difficult size for a filter to stop. This size is therefore called the MPPS (Most Penetrating Particle Size). (See page 8 for further information).

▶ WHAT ARE THE ADVANTAGES OF PLACING A BACTERIAL/VIRAL FILTER ON AN ET-TUBE?

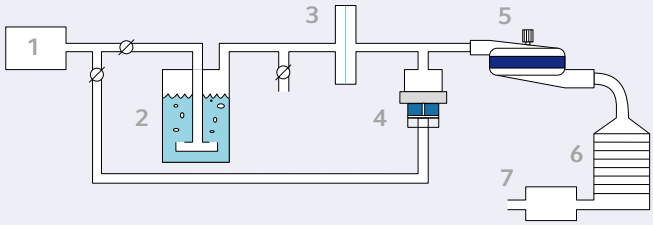
When placed on an ET-tube, the filter not only protects the machine, it also protects the breathing circuits. This can mean less frequent changing of breathing circuits, i.e. a cost/time saving. There will also be less need for a filter on the machine side of the breathing circuit.
In addition, such a filter can easily be combined with an HME within the same housing for the protection of both patient and staff.

Combined HEPA/HME, the Humid-Vent HEPA

TESTING INFORMATION – COMMON BACTERIAL/VIRAL TEST METHODOLOGIES

THE NEBULISATION METHOD

Nowadays, the most established methods such as those employed by Nelson Laboratories and Sangtec Laboratories, test bacterial and viral filtration efficiency. The methods are based on the nebulisation of a water suspension containing bacteria (or bacteriophages when simulating a virus) using the test set-up below:



1. Air supply
2. Humidifier
3. Air filter
4. Bacterial suspension/ nebuliser
5. Humid-Vent filter
6. Andersen sampler
7. Air pump

The nebuliser produces droplets of various sizes, each containing a different number of microorganisms depending on the original concentration of the suspension. The number of microorganisms reaching and eventually penetrating the filter depends upon how many droplets are deposited on the inside walls of the test apparatus, and on the number of bacteria killed by the harsh conditions in the gas stream. The size of the droplets depends on how fast they evaporate and on how far they have to travel to reach the filter.
Several parameters influence the outcome in such a filter test: airflow, temperature and humidity, the efficiency of the pre-filter, the number and sizes of the microorganisms being tested, and the suction power of the air pump. The critical measure of the performance of a breathing circuit filter is its ability to remove microorganisms from air.

Product validation certificates

THE HEPA TEST METHOD

The HEPA test traditionally used for mechanical filters is one of the most difficult filtration tests a filter can pass (the technology was developed during World War II to test filters for use against chemical and biological weapons). For a filter to be called a true HEPA filter, it must pass this test.
The HEPA test is also known as a particle test. Particles used can be DOP (dioctylphtalate), PAO (polyalphaolefin) or NaCl (sodium chloride), all of which have one similar size (0.18 - 0.3 micron CMD, Count Median Diameter). This size is known as the Most Penetrating Particle Size (MPPS) and is thus the most difficult size for a filter to retain.
A true HEPA test cannot be compared with other filtration tests such as the nebulisation method described opposite. The testing technique is totally different and therefore the outcome in percentage terms is not comparable with other tests. For example, HEPA test results are usually rounded to two decimal places, e.g. 99.97%.
There is, however, a direct way of comparing the efficiency of mechanical HEPA filters. Depending on how well a filter performs in the HEPA test, it is allocated a specific HEPA Class, ranging from Class 10 to Class 14. GIBECK Iso-Gard HEPA Light is classified as HEPA Class 13. (Note that every GIBECK HEPA filter undergoes this test.)
We can thus conclude that the GIBECK Iso-Gard HEPA Filter is one of the best hydrophobic mechanical pleated filters on the market!

TECHNICAL INFORMATION

SPECIFICATIONS

COMBINED HMEs AND OTHER BACTERIAL/VIRAL FILTERS

Gibeck

PRODUCT	FILTER TYPE/ MATERIAL	STRAIGHT/ ANGLED	FILTRATION EFFICIENCY %	MOISTURE OUTPUT	MOISTURE LOSS	RESIST-ANCE TO FLOW	DEAD SPACE	WEIGHT
COMBINED HME/BACTERIAL/VIRAL FILTERS								
Humid-Vent Filter Compact*	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.999 (virus) >99.999 (tuberculosis)	31 mg H_2O/l air at Vt 500 30 mg H_2O/l air at Vt 750 30 mg H_2O/l air at Vt 1000	6 mg H_2O/l air at Vt 500 7 mg H_2O/l air at Vt 750 7 mg H_2O/l air at Vt 1000	1.8 cm at 60 l/min	35 ml (straight) 38 ml (angled)	31 g (straight) 32 g (angled)
Humid-Vent Filter Small	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.99 (virus)	31 mg H_2O/l air at Vt 250 30 mg H_2O/l air at Vt 500 29 mg H_2O/l air at Vt 750	6 mg H_2O/l air at Vt 250 7 mg H_2O/l air at Vt 500 8 mg H_2O/l air at Vt 750	2.1 cm at 30 l/min	26 ml (straight) 27 ml (angled)	21 g (straight) 22 g (angled)
Humid-Vent Filter Pedi	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.9 (virus)	33 mg H_2O/l air at Vt 50 30 mg H_2O/l air at Vt 100 30 mg H_2O/l air at Vt 250	6 mg H_2O/l air at Vt 250	1.4 cm at 20 l/min	13 ml (angled)	14.5 g (angled)
Humid-Vent Filter Light*	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.9 (virus) >99.99 (tuberculosis)	31 mg H_2O/l air at Vt 500 30 mg H_2O/l air at Vt 750 29 mg H_2O/l air at Vt 1000	6 mg H_2O/l air at Vt 500 7 mg H_2O/l air at Vt 750 8 mg H_2O/l air at Vt 1000	1.4 cm at 60 l/min	60 ml (straight) 60 ml (angled)	30 g (straight) 30 g (angled)
Humid-Vent HEPA*	Hydrophobic mechanical glass-fibre	straight	>99.99999 (bacteria) >99.9999 (virus) >99.999 (tuberculosis) HEPA class 13	30.3 mg H_2O/l air at Vt 500 31.8 mg H_2O/l air at Vt 1000	6.7 mg H_2O/l air at Vt 500 6.6 mg H_2O/l air at Vt 1000	1.1 cm at 30 l/min 2.6 cm at 60 l/min	81 ml (straight)	53 g (straight)
BACTERIAL/VIRAL FILTERS WITH HME EFFECT								
Iso-Gard HEPA Light*	Hydrophobic mechanical glass-fibre	straight	>99.99999 (bacteria) >99.9999 (virus) HEPA Class 13 (>99.97)	29 mg H_2O/l air at Vt 500	8 mg H_2O/l air at Vt 500	2.0 cm at 60 l/min	80 ml (straight)	38 g (straight)
Iso-Gard HEPA Small*	Hydrophobic mechanical glass-fibre	both	>99.99999 (bacteria) >99.9999 (virus) HEPA class 13 (>99.97)	25 mg H_2O/l air at Vt 250 20 mg H_2O/l air at Vt 500 (Ideal for low-flow anaesthesia)	11 mg H_2O/l air at Vt 250 17 mg H_2O/l air at Vt 500	2.3 cm at 30 l/min	29 ml (straight) 31 ml (angled)	23 g (straight) 23 g (angled)
BACTERIAL/VIRAL FILTERS								
Iso-Gard Filter	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.99 (virus)	N/A	N/A	1.6 cm at 60 l/min	26 ml (straight) 30 ml (angled)	22 g (straight) 23 g (angled)
Iso-Gard Filter Small	Hydrophobic electrostatic polypropylene	both	>99.9999 (bacteria) >99.99 (virus)	N/A	N/A	1.9 cm at 30 l/min	20 ml (straight) 21 ml (angled)	15 g (straight) 16 g (angled)
Anest-Guard	Hydrophobic electrostatic polypropylene	straight	>99.99 (bacteria) >99.99 (virus)	N/A	N/A	1.1 cm at 60 l/min	50 ml (straight)	38 g (straight)

ORDERING INFORMATION

COMBINED HMEs AND OTHER BACTERIAL/VIRAL FILTERS

Gibeck

REF.			PRODUCT DESCRIPTION	QTY
COMBINED HME/BACTERIAL/VIRAL FILTERS				
18402 (angled)	19402 (straight)		Humid-Vent Filter Compact	250 (10 boxes x 25)
18502 (angled)	19502 (straight)		Humid-Vent Filter Small	200 (10 boxes x 20)
11012 (angled)	-		Humid-Vent Filter Pedi	200 (10 boxes x 20)
18832 (angled)	19932 (straight)		Humid-Vent Filter Light	200 (10 boxes x 20)
-	29001 (straight)		Humid-Vent HEPA	80 (5 boxes x 20)
BACTERIAL/VIRAL FILTERS WITH HME EFFECT				
28002 (port)	28012 (w/o port)	28022 (machine version)	Iso-Gard HEPA Light	200 (10 boxes x 20)
28052 (angled)	28062 (straight)		Iso-Gard HEPA Small	250 (10 boxes x 25)
BACTERIAL/VIRAL FILTERS				
18212 (angled)	19212 (straight)		Iso-Gard Filter	250 (10 boxes x 25)
18512 (angled)	19512 (straight)		Iso-Gard Filter Small	200 (10 boxes x 20)
-	28812 (straight)		Anest-Guard	200 (10 boxes x 20)

To order sterile products, please change last digit of the reference no. to 1.

* Humid-Vent Filter Compact, Humid-Vent Filter Light, Humid-Vent HEPA, Iso-Gard HEPA Light and Iso-Gard HEPA Small are validated for HIV and Hep. C.

All products listed above (except Anest-Guard) include a CO_2 port and are available with catheter mounts (ask your local representative for details).
Many of the products are also available with a tethered blue soft CO_2 cap (cap with an attached string).

Several independent filtration studies are available on request.
We also provide product validation and quality guarantee certificates on demand.

Teleflex is a leading global provider of specialty medical devices used for diagnostic and therapeutic procedures in critical care, urology and surgery. Our mission is to provide solutions that enable healthcare providers to improve outcomes and enhance patient and provider safety.
We specialise in devices for general and regional anaesthesia, cardiac care, respiratory care, urology, vascular access and surgery and we serve healthcare providers in more than 130 countries. Teleflex also provides specialty products for medical device manufacturers.

Teleflex global operations: Austria, Belgium, Canada, China, Czech Republic, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, Netherlands, Portugal, Singapore, Slovak Republic, South Africa, Spain, Switzerland, United Kingdom, Uruguay and USA.

YOUR CONTACTS FOR EUROPE, THE MIDDLE EAST AND AFRICA (EMEA):

TELEFLEX HEADQUARTERS EMEA, IRELAND
Teleflex Medical Europe Ltd., IDA Business Park, Athlone, Co. Westmeath
Phone +353 (0)9 06 46 08 00 · Fax +353 (0)14 37 07 73
orders.intl@teleflex.com

AUSTRIA +43 (0)1 402 47 72
BELGIUM +32 (0)2 333 24 60
CZECH REPUBLIC +420 (0)495 759 111
FRANCE +33 (0)5 62 18 79 40
GERMANY +49 (0)7151 406 0
GREECE +30 210 67 77 717
ITALY +39 0362 58 911
NETHERLANDS +31 (0)88 00 215 00
PORTUGAL +351 22 541 90 85
SLOVAK REPUBLIC +421 (0)3377 254 28
SOUTH AFRICA +27 (0)11 807 4887
SPAIN +34 918 300 451
SWITZERLAND +41 (0)31 818 40 90
UNITED KINGDOM +44 (0)1494 53 27 61

For detailed information see www.teleflex.com

The products in this catalogue are only available in the EMEA (Europe, Middle East, Africa) region. For further information contact your local representative. All data current at time of printing (04/2012). Subject to technical changes without further notice.

94 04 60 - 00 00 01 · REV A · MC / SF · 04 12 02

Teleflex