

# USING DIFFERENT PERFORATED LIDS ON MAS-100 FAMILY MICROBIAL AIR SAMPLERS



## PERFORATED LIDS MAKE THE DIFFERENCE

Perforated lids are crucial to the physical and biological sampling efficiency of impaction-based microbial air samplers. Air is accelerated through the holes of the lids and forms a jet which impacts onto the agar surface (Figure 1). Drawing air through leaks, irregular hole diameters, or a thin plate with holes all decrease the jet effect and therefore the sampling efficiency. MBV takes great care to produce perforated lids of the best possible quality. Tight production specifications assure uniformity and permit the exchange of lids between different air samplers.

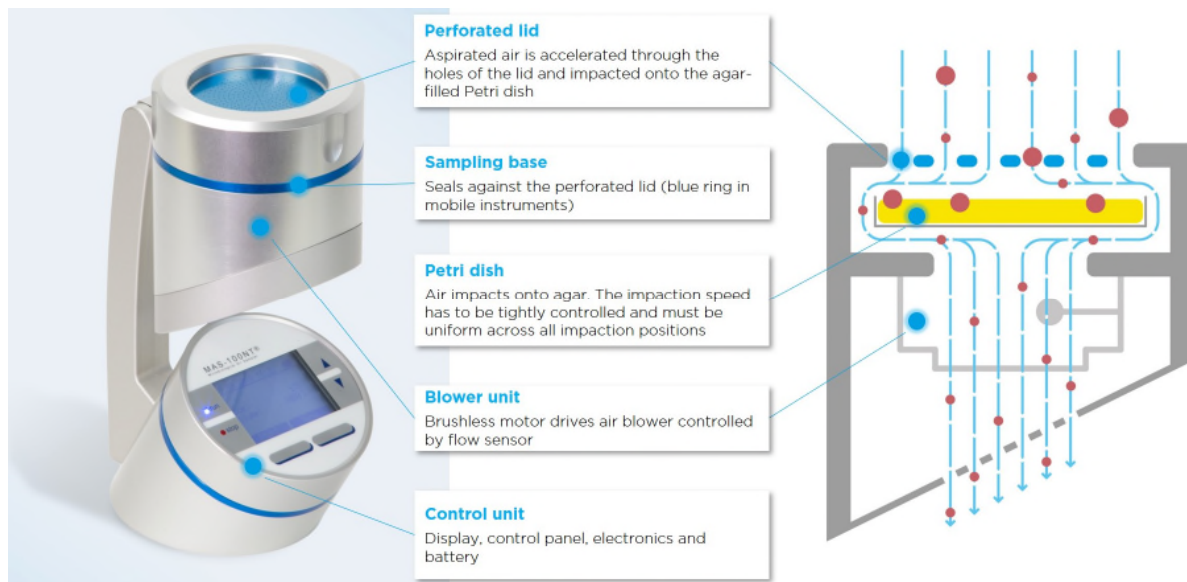


Figure 1: Functioning principle of the impaction-based microbial air sampler MAS-100 NT. On the right schematic cross-section of the sampling head with perforated lid, agar-filled Petri dish and blower unit with airflow sensor. All Andersen-type air samplers are based on this principle. Some may not have an airflow sensor to control the blower but regulate the flow by constant blower revolutions instead.

## SWITCHING PERFORATED LIDS BETWEEN AIR SAMPLERS

Many users of impaction-based microbial air samplers own multiple perforated lids for each of their instruments. This permits using a new lid for each sampling position or production batch or using lids while others are in the sterilization process and inaccessible. The sampling efficiency for an instrument must remain identical, irrespective of the lid used.

Ultimately: It must be assured that a defined amount of air is uniformly impacted onto the agar surface (Figure 2).

MBV recognizes the need for using multiple lids on an instrument without the requirement to match lids to samplers and has put

in place processes to ascertain that lids can be switched between instruments.

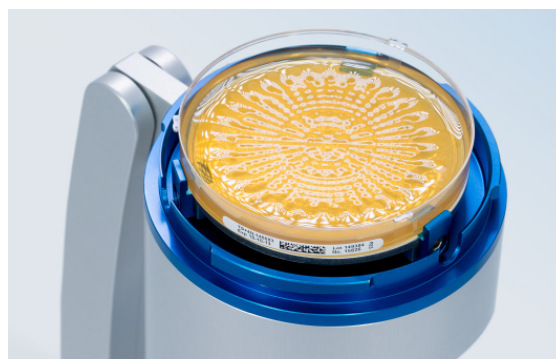


Figure 2: Standard 90 mm Petri dish on a MAS-100 NT microbial air sampler. The impactation pattern generated by drawing 1000 l of air at 100 SLPM through a 300 x 0.6 mm perforated lid is clearly visible.

# WE DO EVERYTHING TO LET YOU SWITCH PERFORATED LIDS BETWEEN SAMPLERS

## TIGHTNESS BETWEEN PERFORATED LID AND SAMPLING BASE

It must be avoided to aspirate air through the gap between the perforated lid and the sampling base (see Figure 3) as this air would count towards the total sampled air volume but would not impact onto the agar.

MBV takes great care to produce sampling lids and bases which are extremely flat and seal against each-other.

We assure tightness between perforated lid and sampling base by multiple measures throughout the instrument life cycle.

**Design:** MBV offers perforated lids with edge protection. The protruding lip prevents scratching of the sealing surface during handling and autoclaving (Figure 4).

Perforated lids made from stainless steel which are mainly used for isolators and RABS are equipped with an edge protection as standard. Aluminum lids with edge protection are available as an accessory.

In any case scratching of the sealing surface must be prevented.

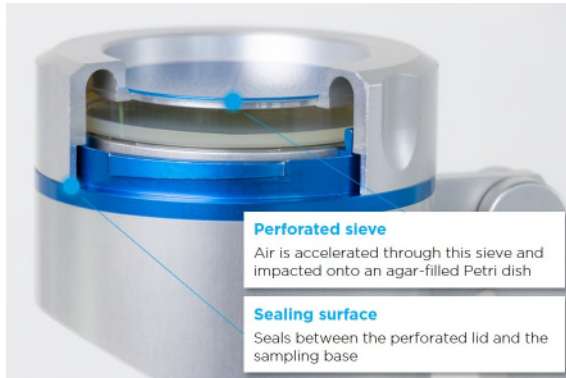


Figure 3 Cross-section of perforated lid on the sampling base. The sealing between these parts is critical for the correct operation of the air sampler.



Figure 4: Stainless steel perforated lid (upside down). The edge protection prevents scratching of the sealing surface which would lead to aspirating air through the gap.

### Production and quality control:

MBV is an [ISO 9001: 2015](#) certified company. Regular internal and frequent customer audits as well as recertifications by SwissTS time and again prove that MBV has its processes under control and potential deviations are found, addressed and rectified.

We develop and produce all our critical mechanical parts in-house or in long-term partnerships with Swiss companies. Our products are made from the best raw material on the most modern machinery park and each lot and sometimes each individual part is tested for conformity (Figure 5 and Figure 6). This meticulous focus on production quality is the basis for the longevity of our products. It is also the reason why customers trust them in their most demanding environment.



Figure 5: Perforated lids in production. Mounting robots in combination with the most modern machining tools produce parts within very narrow specifications. Picture courtesy Femron AG ([www.femron.ch](http://www.femron.ch))



Figure 6: Quality control of a sampling base. State of the art risk-based test plans assure that production lots remain within specifications.

### Instrument maintenance and service:

We recommend annual recalibration of the airflow of MAS-100 microbial air samplers with our [digital anemometer](#). A mandatory test for this regular service is the [tape test](#) where the tightness of the seal between lid and sampling base is tested. The comparison of airflow with and without tape sealing leads to detection of minute scratches and bends (e.g. after a lid or instrument has been dropped).



### SIZE AND UNIFORMITY OF PERFORATED SIEVE

The sieve of the perforated lid is at the core of the air sampler. Each hole must have an identical diameter and length to accelerate the aspirated air correctly. The thickness of the perforated sieve guarantee a well-defined impaction jet. The impaction speed defines the physical sampling efficiency. The cut-off value  $D_{50}$  (the particle size at which 50% of the particles impact in the agar due to inertia and 50% are exhausted with the airstream) must be identical between holes and between lids. That is why intense quality control of the sieves is performed. Quality control procedures also incorporate the effect of anodization.



Figure 7: An aluminium sieve is tested for airflow as the anodization has an influence on the hole diameter and therefore on impaction speed.

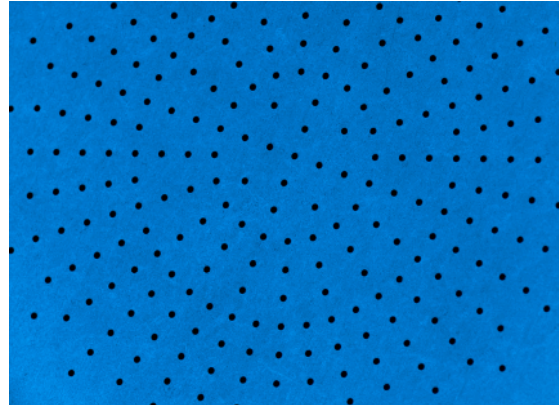


Figure 8: Close-up of an anodized aluminium sieve. The holes are drilled through the thick plate to guarantee ideal impaction by the generated air jet effect.

The combination of all these measures permits you switching and swapping perforated lids between MAS-100 family viable air samplers.

## MULTIPLE LIDS ON MAS-100: YES! THIS IS WHAT YOU NEED TO KNOW



- Mechanically you can mix and match any perforated lid with any base (steel, aluminum, for contact plates or standard 90 mm Petri dishes).
- Because of increased wear we recommend not to use steel lids on aluminum bases.
- A re-calibration must be performed when switching between 300 x 0.6 and 400 x 0.7 perforated lids. New instruments are calibrated for both types and initially only choosing the correct type in the menu is required.
- If you dropped a lid or the sampler: [Check](#) first for correct sealing of lid and sampler. Then re-calibrate your air sampler.
- Avoid scratching the sealing surface of the perforated lid.

# OUR PORTFOLIO OF PERFORATED LIDS

More background informations, pictures, clips and in-depth information on our perforated lid offering can be found here:

[https://www.mbv.ch/en/products/accessories/perforated\\_lid/](https://www.mbv.ch/en/products/accessories/perforated_lid/)

Article name	Description	Best seller	Article number MBV	Article Number Merck
Perforated lid stainless steel 300x0.6mm with edge protection	Stainless steel lid 300x0.6mm with edge protection for standard Ø 90 mm plates (most used lid for isolators and RABS)	✓✓	04.4953.01	1.09189.0001
Perforated lid stainless steel 400x0.7mm with edge protection	Stainless steel lid 400x0.7mm with edge protection for standard Ø 90 mm plates (mainly used for isolators and RABS)		04.4954.01	1.09222.0001
Perforated lid stainless steel 300x0.6mm with edge protection and handle	Stainless steel lid 300x0.6mm with handle and edge protection for standard Ø90 mm plates (mainly used for isolators and RABS)	✓	04.4956.01	n.a.
Perforated lid aluminium 300x0.6mm for contact plate	Aluminium lid 300x0.6mm for Ø 55 mm contact plates. Total height contact plate and agar 13 - 15mm. Fits <a href="#">Merck</a> lockable and not-lockable contact plates		06.6017.01	1.19149.0001
RapidMicroBio perforated lid alu 400x0.7 with 3 clamps	Aluminium lid 400x0.7mm for <a href="#">Growth Direct™</a> plates from Rapid Micro Biosystems		06.6018.01	n.a.
Perforated lid aluminium 300x0.6 mm	Aluminium lid 300x0.6mm for Ø 90 mm plates. Standard lid for MAS-100 NT and MAS-100 VF air samplers. Can not be used for MAS-100 Eco.	✓✓	06.6020.01	1.09195.0001
Perforated lid aluminium 400x0.7 mm	Aluminium lid 400x0.7mm for Ø 90 mm plates. Can be used on all mobile MAS-100 instruments. Standard lid for MAS-100 Eco	✓	06.6021.01	1.09088.0001
Perforated lid aluminium 300x0.6mm with edge protection	Aluminium lid 300x0.6mm with edge protection for standard Ø 90 mm plates. Can not be used for MAS-100 Eco.		06.6023.01	1.19363.0001
Perforated lid aluminium 400x0.7mm with edge protection	Aluminium lid 400x0.7mm with edge protection for standard Ø 90 mm plates. Can be used with all mobile MAS-100 instruments.		06.6024.01	1.19364.0001
Perforated lid aluminium 400x0.7mm for contact plate	Aluminium lid 400x0.7mm for Ø 55 mm contact plates Total height contact plate and agar: – 7-9mm for MAS-100 NT and Eco requires adapter 06.7124.01 (MBV)/1.09214.0001 (Merck). – 7-12mm for MAS-100 VF Fits <a href="#">Merck</a> not-lockable contact plates.		06.7120.01	1.09213.0001
Perforated lid aluminium 400x0.7mm for contact plate including adapter set	Set of 'Perfor. lid alu 400 for contact plate' (06.7120.01) and 'Adapter for contact plate' (06.7124.01). Fits <a href="#">Merck</a> not-lockable contact plates		06.7121.01	n.a.

Please contact us if you require a version of contact plate that is not listed above.

We can provide you with a solution.

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