

SANI



Modular building and event solutions



**Guide to the sustainable use
of sanitation solutions at events**
Save water and money with
SANI vacuum technology



An efficient safeguard

Fresh water supply and sewerage maintenance

Water scarcity and capacity limits – two catchwords that can cause fear and consternation for those in the events sector organising large events such as festivals and marathons. Because events cannot take place without a guaranteed supply of fresh water and sewerage maintenance.

At SANI, we have considered this challenge and developed a number of water-saving, sanitary vacuum products for the events sector. These are especially effective in places where people need to be supplied in the short term and where a guaranteed supply of water is required.

- negative pressure in the pipe network, as the dimensions of the pipes are not designed to transport large quantities at short notice;
- a cut in the water supply for more remote residents.

In Germany and the EU, water supply infrastructure is generally very well developed but regional water suppliers reach their limits when pipe networks experience short-term peaks in demand. This can lead to:

- a deterioration in water quality as biofilms are weakened;
- lower buffer capacity in regional elevated tanks, which results in an increased risk for residents and fire departments, particularly during warmer, drier periods;

Vacuum products are a reliable solution because they save over 80 % of water and reduce costs for everything from toilets, urinal and washbasins to showers. If you use less water, you pay less – that includes fresh water, waste water, transport and staff costs. Ultimately the additional cost of hiring the vacuum technology is recouped thanks to savings on water, waste water, materials and staff.

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How vacuum technology works

Air acts as a conveyor

Many people will be familiar with vacuum technology from aeroplanes, trains, ships or motorway services. The characteristic “flush” noise reveals that a vacuum is serving to remove faecal matter and urine.

Vacuum technology is based on air. Air is removed and reintroduced by opening a valve – generated by a vacuum pump. When the valve opens, toilet waste (black water) or water from showers and washbasins (grey water) is removed by adding air. In total 0.4 – 0.7 litres of water is used and 60 litres of air is used per flush. Traditional toilet flushes require, by contrast, 5 – 8 litres of water per flush.

A plus in hygiene with vacuum technology

A positive and hygienic side-effect of air suction in every flush is the removal of odours and germs. Anyone who has experienced toilets or chemical toilets at large events knows how unpleasant they can be. Vacuum technology reduces toilet odours particularly in high temperatures. It also reduces the number of germs in the air and on surfaces, because there is no water spray.

The vacuum solution

Ready to use sanitation concept

Since 1990, we at SANI have been creating modular worlds for events throughout Europe and are reliable partners for events of any size. We know that the events industry is undergoing radical change. Festival-goers’ demands for cleanliness and hygiene are growing while organisers have to be able to produce sustainable sanitation concepts, for example on grounds of water scarcity, in order to hold an event.

We have considered these challenges and invested in developing vacuum technology. We want to offer modern, sustainable and ready-to-use sanitation solutions which focus on the user as well as water supply and costs. So when developing our products, we considered the entire sanitation sector – from toilets, urinals, showers and washing areas – and created SANI Service Camps* for capacities from approx. 5,000 to over 100,000 visitors per day.

SANI Camps are the first closed sanitation vacuum system which includes not only toilets but also urinals, showers, washing areas and a disabled access module with toilet, washing area and shower.

All of our vacuum products are manufactured in Schleswig-Holstein and meet high quality standards. Our SANI Camps are “Made in Germany”!

* noted in the following SANI Camps.

SANI Service Camps

- Comprehensive sanitation concept
- Saves on water and costs
- Clean & hygienic
- Quality “Made in Germany”

Ø water usage per flush cycle



5 – 8 litres

Ø water usage per flush cycle with SANI vacuum technology



0.5 litres

90%

WATER SAVING



“It’s important to have reliable partners like SANI GmbH on your side. It’s the only way to put in place the many necessary measures, which are required for the successful execution of an event and offer visitors and all participants the highest level of convenience.”

Mirco Markfort, Director of Nürburgring 1927 GmbH & Co. KG



Impressive advantages

What can vacuum technology do?

Vacuum modules from SANI can be used practically anywhere where infrastructure is lacking and where hurdles exist to implementing this in a classical sense. An absence of sewers, inadequate canalisation, differences in altitude or a water supply at the limits of its capabilities pose a problem for toilets, urinals, washbasins and showers which require conventional water usage at large events: Because approx. 80% more mass is generated and this must be managed efficiently and logistically during the event.

SANI vacuum modules:

- Save approx. 90% of water
- Minimise additional costs
- Solve altitude and distance issues
- Guarantee safe operation
- Are easy to install
- Are self-supporting in their operation

Save up to 90% of water – preserve resources!

Traditional flush toilets require up to 6 – 8 litres of water per flush. At a large event with 90,000 day visitors, where each visitor makes approx. 6 toilettrips, between 3.24 and 4.3 million litres of water (3,240 – 4,300m³) per day is used in total.

At a fresh water price of approx. € 2.50 per m³, daily costs for fresh water for toilet use amount to € 8,100 – € 10,750.*

With SANI vacuum modules, on the other hand, you save on water and the accompanying costs. In the aforementioned example, usage of 0.5 litres would produce just 270 m³ of waste water from toilet trips, cutting the costs of fresh water to € 675.* By contrast, urinals with vacuum technology save 100% of the water, because they function without it.

As well as saving on the costs of fresh water, vacuum products also generate savings on waste water. Because every cubic metre of fresh water saved has a positive effect on waste water costs too.

Approx. 0.4 litres of excretions must be added to fresh water per flush to calculate the waste water volume. In the example mentioned with a waste water price of approx. € 4 per m³ **, this would be:

Waste water volumes for 6 – 8 litre flush + 0.4 litres of excretions: 3,456 – 4,536 m³
Costs: € 13,824 - € 18,144

Vacuum waste water volumes for 0.5 litre flush + 0.4 litres of excretions: 486 m³
Costs: € 1,944

With vacuum products, you save up to 90%!

- * These examples are calculated with an average fresh water price of € 2.50 per m³. This varies depending on region and water board. These calculations also do not include costs for waste water and standing charges.
- ** The example here is based on mean domestic waste water price of € 4 per m³, as waste water prices vary by region. This does not include calculations for provision charges and fresh water costs.

Save on transport & staff costs

Less waste water also means a drop in transport costs, as there is less need to travel to treatment plants and discharge points as frequently. This saves on transport and staff, and conserves resources while increasing safety for large crowds due to fewer lorries being used.

Recycling grey water

Additional savings possibilities arise from the use of grey water from showers and washing areas. In SANI Camps, grey water can be collected and then used to flush the vacuum toilets. With technically optimal design, vacuum toilets can be operated without fresh water throughout the entire event. This means a water-free toilet with a water saving of 100%. Drinking water is then only used at sites where visitors require it for their own hygiene or to quench their thirst – at water fountains and in the shower.

Increasing satisfaction

Alongside economic savings, visitor satisfaction also plays a role. For one thing, the effect mentioned above, the lower concentration of aerosols, has an impact and, secondly, vacuum toilets are always available. Imagine you're at a festival and you go to use the toilet; eventually you find one and you can't use it because:

- the toilets are in the process of being emptied or
- maintenance work is being carried out.

With vacuum technology, you can minimise any interference to regular operation, ensuring seamless use.

The additional cost of hiring the vacuum technology, in comparison to conventional sanitation concepts, is recouped thanks to savings on the accompanying costs, such as water, waste water, energy and staff costs, making vacuum technology better value overall.

∅ additional costs per service camp

🚰 Fresh water/waste water: €12,500

🚚 Transport costs: €3,500

👥 Staff deployment: €4,500

∅ additional costs per service camp with SANI vacuum technology

🚰 Fresh water/waste water: €7,500

🚚 Transport costs: €2,000

👥 Staff deployment: €2,250

40%

SAVING ON ADDITIONAL COSTS

| Per cent | Capacity of standard flush toilet | Minutes | Per hour (litres) | Operations/day |
|----------|-----------------------------------|---------|-------------------|----------------|
| 100% | Capacity during operation all | 2 | 192 | 720 |
| 75% | Capacity during operation all | 3 | 128 | 480 |
| 50% | Capacity during operation all | 6 | 64 | 240 |
| 25% | Capacity during operation all | 10 | 38.4 | 144 |
| 0% | Capacity during operation all | 0 | 0 | 0 |
| 50% | Average value | | 84.48 | 317 |

| Per cent | Capacity of vacuum flush toilet | Minutes | Per hour (litres) | Operations/day |
|----------|---------------------------------|---------|-------------------|----------------|
| 100% | Capacity during operation all | 2 | 27 | 720 |
| 75% | Capacity during operation all | 3 | 18 | 480 |
| 50% | Capacity during operation all | 6 | 9 | 240 |
| 25% | Capacity during operation all | 10 | 5.4 | 144 |
| 0% | Capacity during operation all | 0 | 0 | 0 |
| 50% | Average value | | 11.88 | 317 |

Efficiency of vacuum flush toilets to standard flush toilets
Water saving of up to:

86%

Simplified example calculation: Flush cycle/service camp with conventional technology vs. SANI camp 32V with vacuum technology. Calculated with the following values = fresh water: € 2.25/m³, waste water: € 4.80/m³, waste water transport: € 4.20/m³. We'll be happy to carry out calculations for your project and prepare a quote for you!

Vacuum Boxes

Technically sophisticated

The core element of SANI Camps are the vacuum boxes. These boxes contain vacuum and waste water pumps, creating a safe environment with regard to environmental influences and vandalism, for example.

Our vacuum pumps can generally easily span a distance of 500m in order to generate the vacuum. The waste water pumps behind the vacuum system allow for the removal of dirty water from toilets, showers, wash basins and urinals into the intended repositories or sewers. This means that no additional pumps or special parts are required for the entire station. A distance of up to 1,000 m can be covered between pipe section and waste destination.



Always ready to use

At SANI, we depend on the concept of the vacuum chamber as a buffer with its own vacuum pumps to generate a vacuum and on waste water pumps to pump away the accumulated waste water in the

vacuum buffer chamber. Thanks to the segregated systems, foreign matter has no contact with the vacuum-generating components. Fibrous materials such as damp cloths, as well as coins, metal and pebbles do not cause any wear to the pumps – making the vacuum pump much more durable and reliable.*

* Other manufacturers' systems more frequently rely on pumps which generate the vacuum and remove waste water simultaneously. The degree of wear is higher in this case as foreign matter is able to be in contact with vacuum-generating components.

Accurate monitoring down to the second
SANI vacuum boxes are equipped with measuring sensors and are connected to the external control station via a control. This is staffed around the clock and has access to the vacuum boxes in use. Current readings and error reports are displayed in the control station and presented as graphs. Operating parameters, such as the running times and/or performance of individual components can be optimised and adjusted during the event in real time. An error report will appear in the control station within a maximum of 5 seconds, so that a technician can be contacted directly if required. He or she will be able to switch individual parts while the system continues to run. A total shut-down of the entire system is usually not required, even in unforeseeable situations.

The readings are updated every three seconds. These can be viewed and evaluated retrospectively in order to obtain conclusions regarding capacity limits and response behaviour.

The following parameters are to be observed:*

- Capacity of each individual pump in % and RPM
- Total fresh water used and m³/hr
- Total accumulated waste water and m³/hr
- Fill level of vacuum waste water buffer
- Pump function on/off
- Sustained seamless graphical representation of the parameters over the system's entire running time..

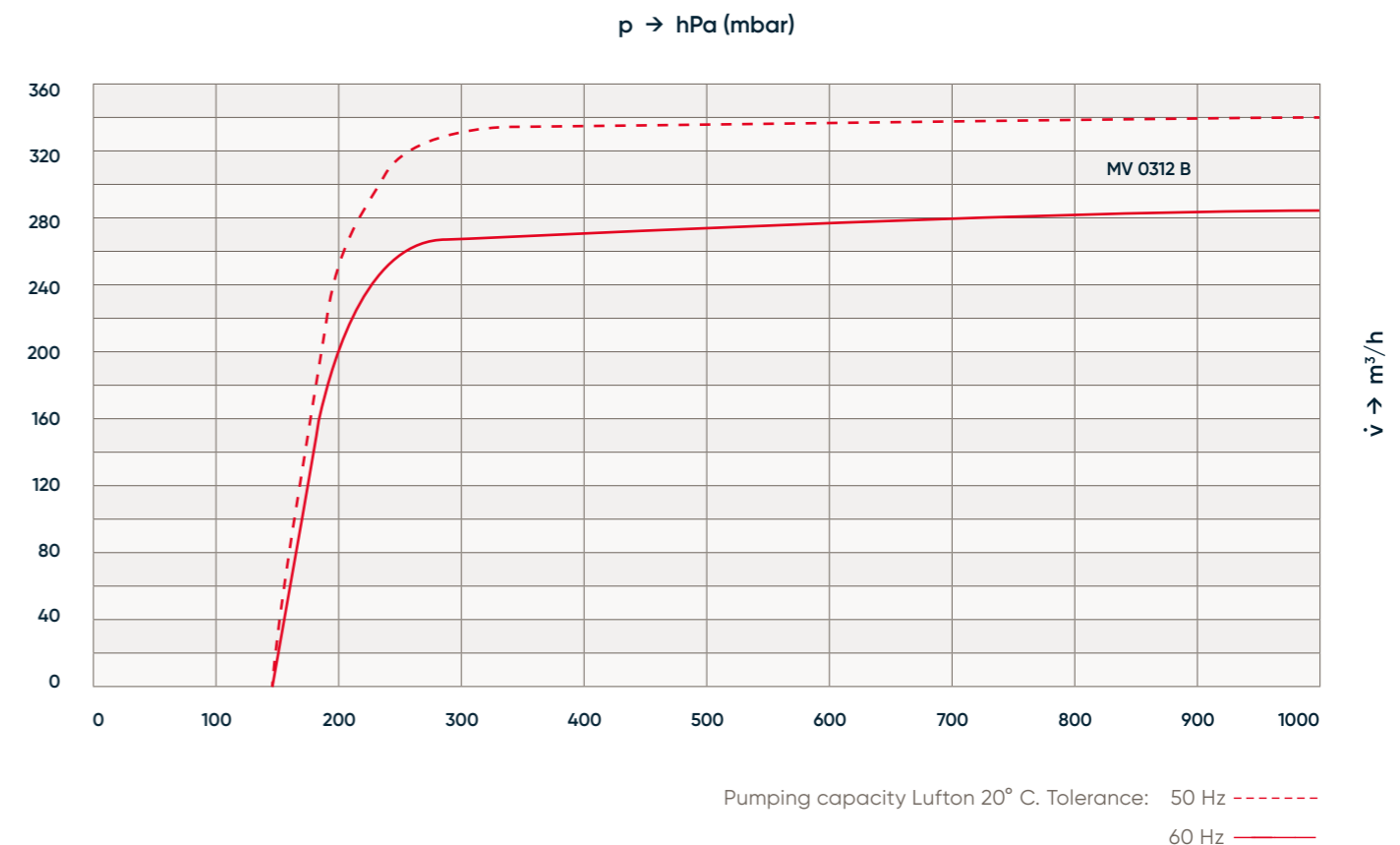
* The control station can intervene more extensively in the system so that, for example, errors can be acknowledged and the system can be controlled without the need for a technician.

Saving energy thanks to frequency control

The pumps are redundantly designed. Each individual pump has over 200% more power than it requires. This guarantees the highest possible degree of operational security, especially in the events sector.

The pumps that we use are also frequency controlled, meaning that they are adapted to the necessary vacuum capacity and only use the energy they require. Another of the pumps' advantages is that they do not require high starting currents because they start up slowly. This preserves the power supply and/or the temporary generator and also makes it possible to use significantly smaller units. This avoids an outage due to overload and saves on energy costs when compared with other pumps.

At the same time, the pumps used guarantee a high, consistent level of suction power to generate the vacuum.



SANI Camps – vacuum modules

Economical, environmentally-friendly, accessible

SANI Service Camps comprise five covered modules which are equipped with 100% vacuum technology. These modules can be operated completely self-sufficiently. In our planning, we aim for optimal allocation and adherence to legal requirements, calculating precise energy and water requirements up to the coordination of operations on site.

Our SANI Service Camps are suited to every event concept. We offer foliation of the vacuum module on request, creating any brand design.

Vacuum Toilet Explorer



The Vacuum Toilet Explorer consists of four seats and can be used with grey water from the shower and washing modules. During product development, we used exclusively high-quality and resistant materials to make cleaning during events as easy as possible.

Details:

- 4 wall-mounted ceramic vacuum toilets with electronic flush and capacitive sensor
- High-quality disinfectant dispenser
- Toilet roll holder with 2 rolls
- Fully closed cabins and automatically closing doors
- Inset LED lighting
- Occupancy signal in green/red

Vacuum Wash Explorer



Each Vacuum Wash Explorer Module has four wash units and four free shockproof sockets (220V), which guests can use for their own needs, e.g. for straightening irons and hair dryers. There are also four hair dryers which, when not in use, can be stowed in the module making them inaccessible to visitors. Like the other modules, the area is smooth and easy to clean, plus resistant to commercial cleaning products. As a special feature, the LED lighting behind the mirrors can be adjusted to the colour of your choice.

Details:

- 4 wash units with automatic valves
- 4 free shockproof sockets (220V)
- 2 mirrors
- LED ambient lighting
- Optional 4 hair dryers

Vacuum Shower Explorer



The Vacuum Shower Explorer comprises four lockable shower units for maximum privacy. Inset LED lighting, water-saving shower heads and mixer, plus clothes hooks and mirror make for optimum comfort.

Details:

- 4 shower cabins with water-saving shower heads
- Automatically closing doors
- Water-saving shower heads and mixer taps
- Warm water supply
- Occupancy signal in green/red

Vacuum Urinal Explorer



The urinal module comprises 2x5 urinals which function entirely without water. Partition walls allow for maximum privacy between the ten urinals. The LED ambient lighting creates the perfect mood at any event. Thanks to the high-quality and durable materials used, it's easy to carry out regular cleaning of the module during an event.

Details:

- 10 wall-mounted, water-free urinals
- Partition walls for more privacy
- LED ambient lighting

Vacuum Accessible Explorer



The Vacuum Accessible Explorer offers absolute accessibility. Access is easy thanks to the ramp and flooring made from non-slip polished stainless steel. In the Explorer, you'll find a toilet, wash basin and a ground-level shower. Fitted with grab handles. The module can be heated.

Details:

- 1 ceramic vacuum toilet with grab handles
- 1 ground-level accessible shower
- 1 wash basin
- Inset LED lighting
- Occupancy signal in green/red
- Warm water from a flow heater
- Ramp

SANI Event

Your expert partner for events

With SANI, you've got an expert partner on your side when it comes to sanitary vacuum solutions for large events. You can rely on SANI Camps. Better service for visitors, lower costs and fewer worries for organisers.

Thanks to our many years of experience in the field of sanitary event planning, we've always got a suitable concept to offer.



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