

European Vacuum Drainage Systems Limited

Presenting

Evac Vacuum Technologies Solution for Buildings

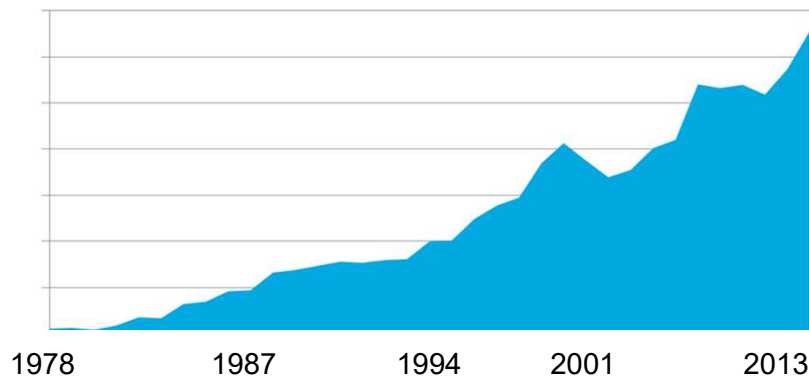


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Who are Evac?

Formed in 1975, Evac are now the world leader in vacuum drainage systems & integrated indoor waste management

Sustainable Growth over ~40years



Who are Evac?

And with now a global portfolio of nearly 2000 buildings fitted with the Evac vacuum drainage system worldwide.

Evac can collect from a wide variety of buildings.



What is a vacuum drainage system?



What is a vacuum drainage system?

The “Evac Vacuum Drainage System” is an alternative method of drainage that offers designers many benefits



What is a vacuum drainage system?

Vacuum drainage allows waste to be transported to high level



Which means it's extremely flexible



What is a vacuum drainage system?

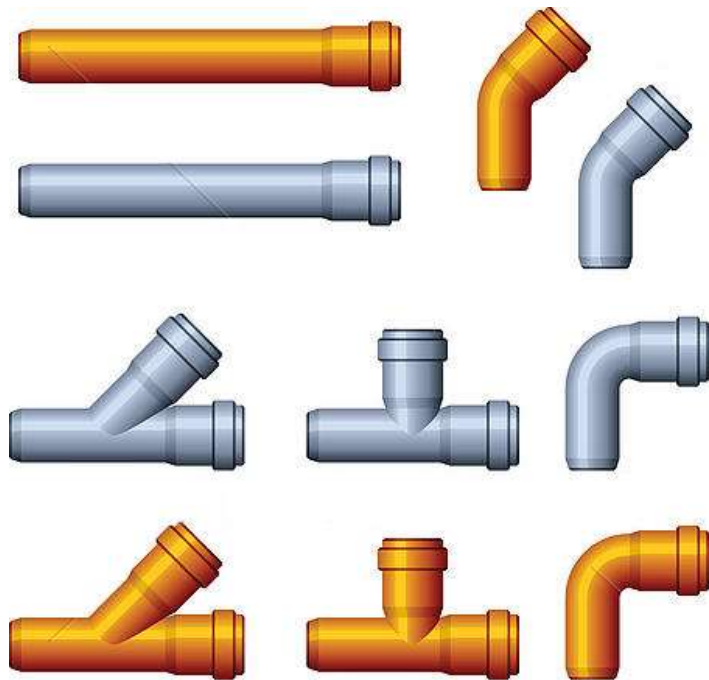
It offers great water savings



Which means it's
environmentally
friendly



What is a vacuum drainage system?



And the pipes used are significantly smaller than conventional gravity pipework



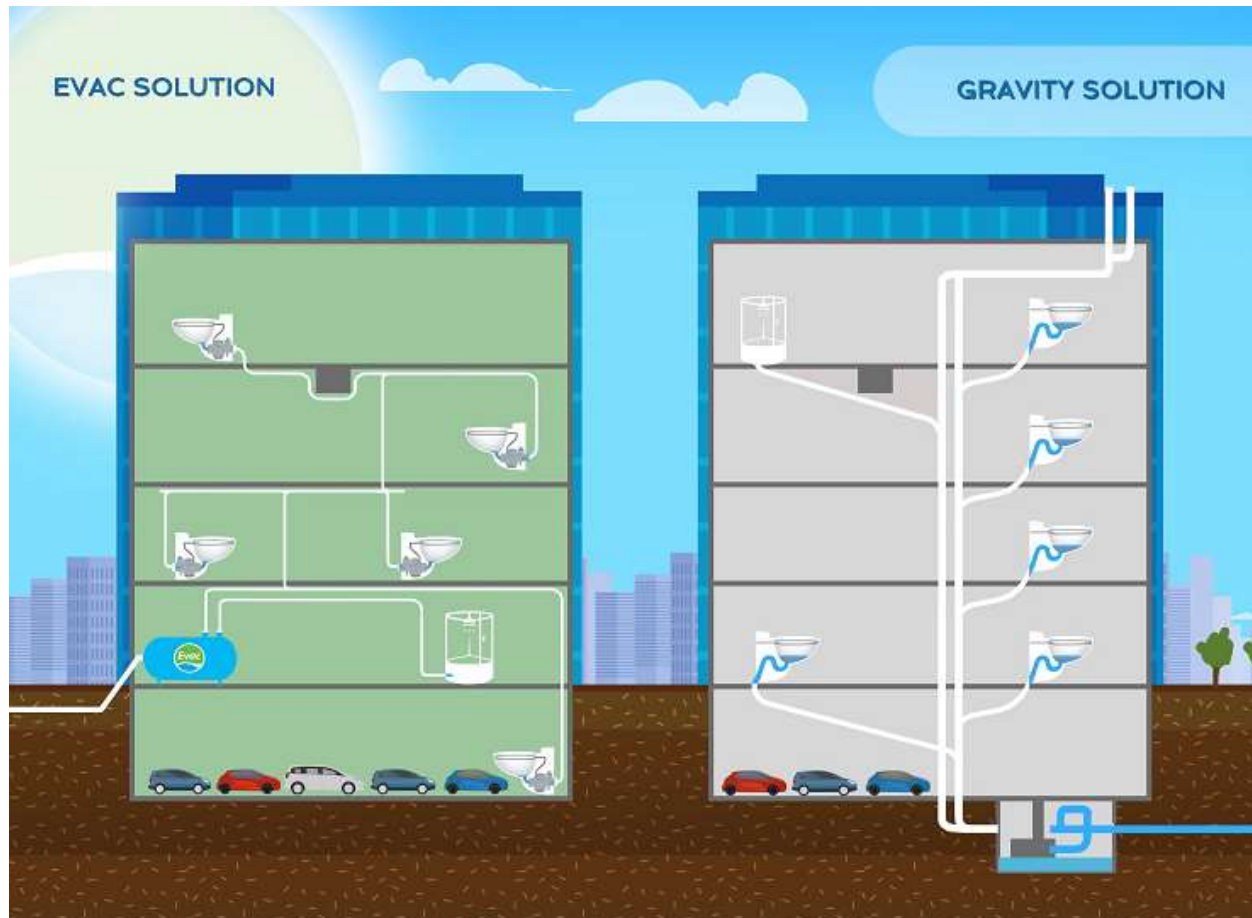
Vacuum Drainage – An Understanding



- ▶ Offers a method of draining a building without having to rely on traditional gravity or pumps.
- ▶ Provides the flexibility to position sanitary appliances anywhere in the building.
- ▶ Allows ease of re-modelling without major work.
- ▶ This is not a new concept. Vacuum systems in buildings have been installed and developed for over 50 years.



Vacuum Drainage – An Understanding



▶ You can defy conventional methods and restrictions that gravity drainage may bring.

▶ Vacuum systems negate the need for traditional stack design as vacuum drainage pipework can rise up to high level with small bore pipework.

▶ This gives you total design Freedom!!



Vacuum Drainage – Certification

- ▶ The Evac vacuum drainage system is a system designed with buildings in mind and is fully compliant to BS EN 12109 “Vacuum Drainage for Inside Buildings”.



Vacuum Drainage – Why Would I Use it?



Vacuum Drainage – Why Would I Use it?

Vacuum drainage has developed into a
“get me out of a problem product”.
Such as, “I can’t you gravity drainage
because....”



Vacuum Drainage – Why Would I Use it?

Potential examples...

- The floor is reinforced and will not allow any excavation
- There is a limited program that will not give time to any excavation
- The building is leased and the landlord will not allow any excavation
- You are only working on a section of the building and high level services on the floor below may not be permitted



Vacuum Drainage – Why Would I Use it?

Potential examples...

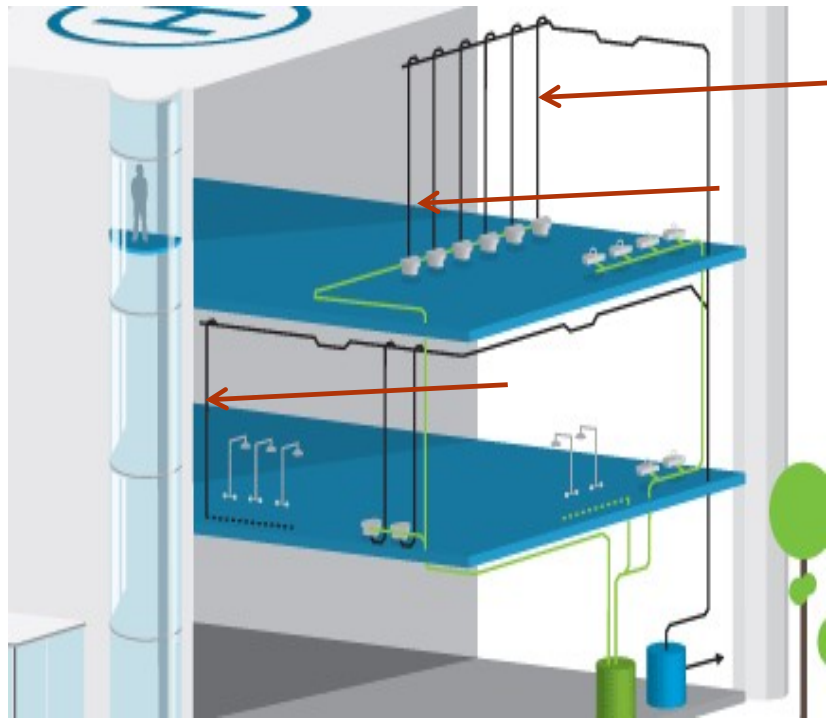
- The sub-structure/foundations/soil make up are not conducive to excavation
- A high water table
- You wish to position sanitary items that are not local to the risers
- You don't want to rely on a network of pumps
- You wish to save water



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Vacuum Drainage – An Understanding



- ▶ A series of pipes connect each appliance back to a collection tank. This pipework is under a negative pressure. (a vacuum)
- ▶ The water will travel through the pipework at speeds of 10 m/sec
- ▶ This pipework can rise up and run in the ceiling voids. Lifts of up to 6 metres are achievable with the Evac vacuum system.



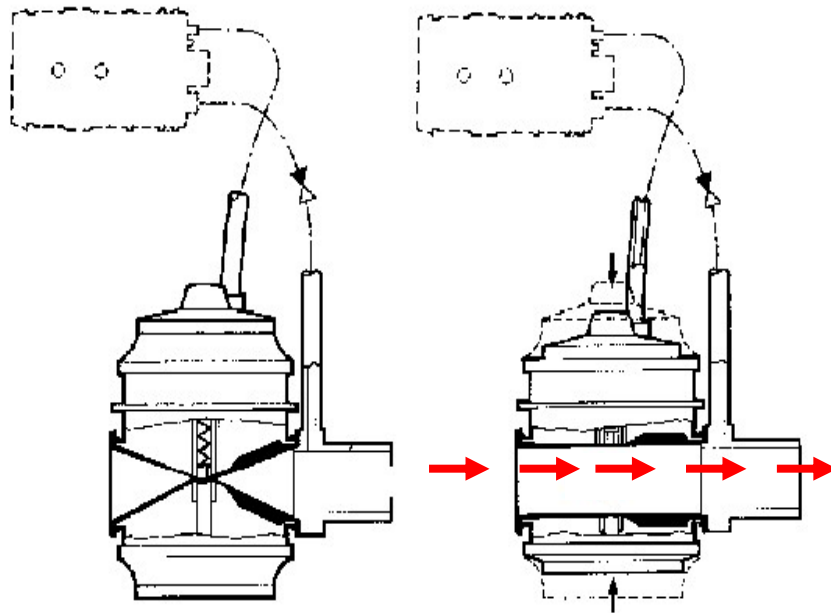
Vacuum Drainage – An Understanding



- ▶ Because the pipes are taken into the ceiling voids, the need for expensive underground drainage is eliminated.
- ▶ This offers a significant reduction in the time required for installation.
- ▶ As the waste is transported by vacuum, only a 1:200 fall is required in the pipework. These very shallow pipe falls save further space in the ceiling void.



Vacuum Drainage – An Understanding



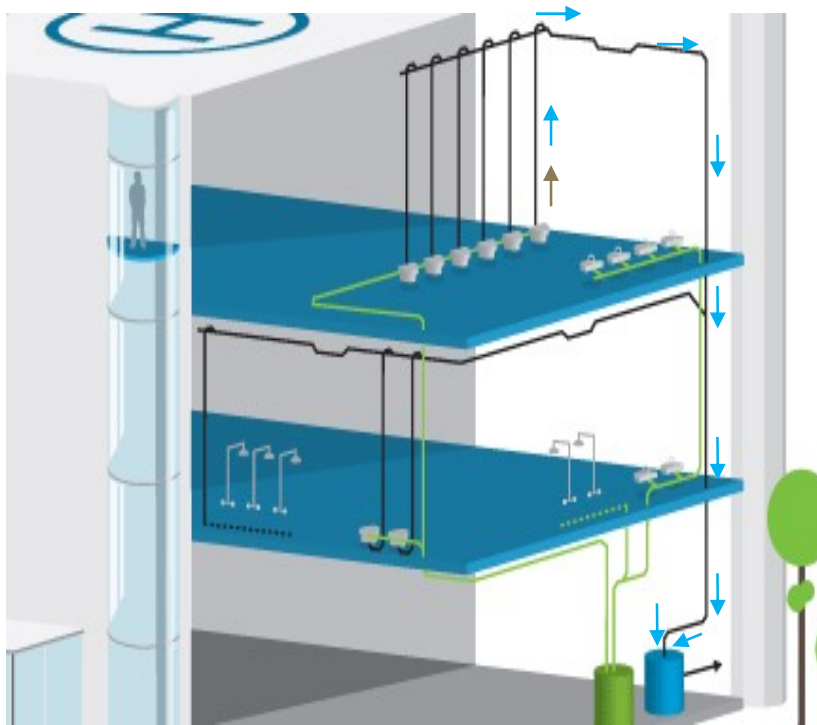
Discharge Valve in the closed position

Discharge Valve in the open position

- ▶ When any vacuum appliance discharges:
- ▶ The discharge valve opens and atmospheric pressure causes air to flow into the pipework.
- ▶ The water that has been collected will be forced into the pipework by this inrushing air.
- ▶ At this stage, the journey back to the collection tank has started.



Vacuum Drainage – An Understanding



- ▶ Once the water has passed through the discharge valve, it will flow back through the vacuum pipework until it reaches the vacuum collection unit.
- ▶ This will be positioned at the lowest point of the system, but not necessarily next to the buildings sewer connection.



Vacuum Drainage – An Understanding



Vacuum piping:
-Flexibility
-Smaller pipe size
-No vent needed



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Vacuum Toilets

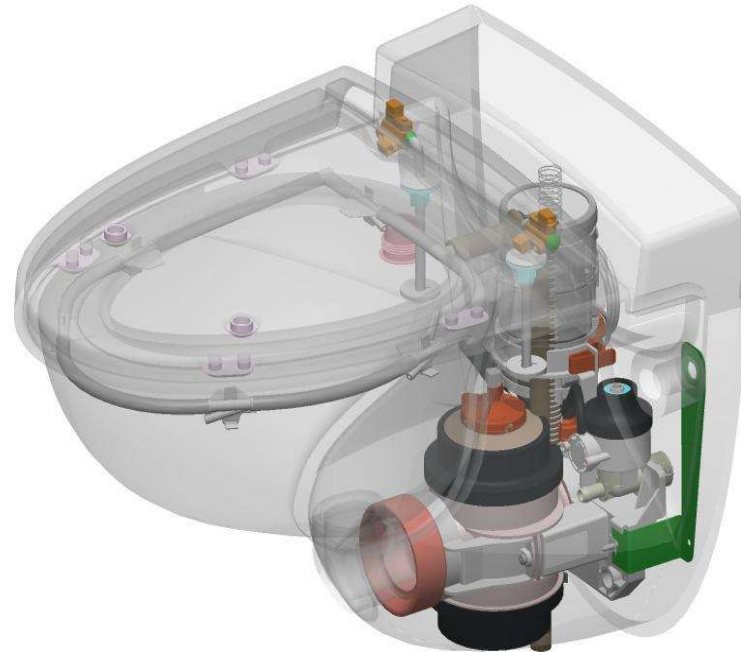


- ▶ The vacuum toilet is the only piece of specialist sanitary ware required. It looks like a conventional toilet as the complete mechanism is concealed within the confines of the porcelain.
- ▶ It is operated purely pneumatically with no electrical connections.



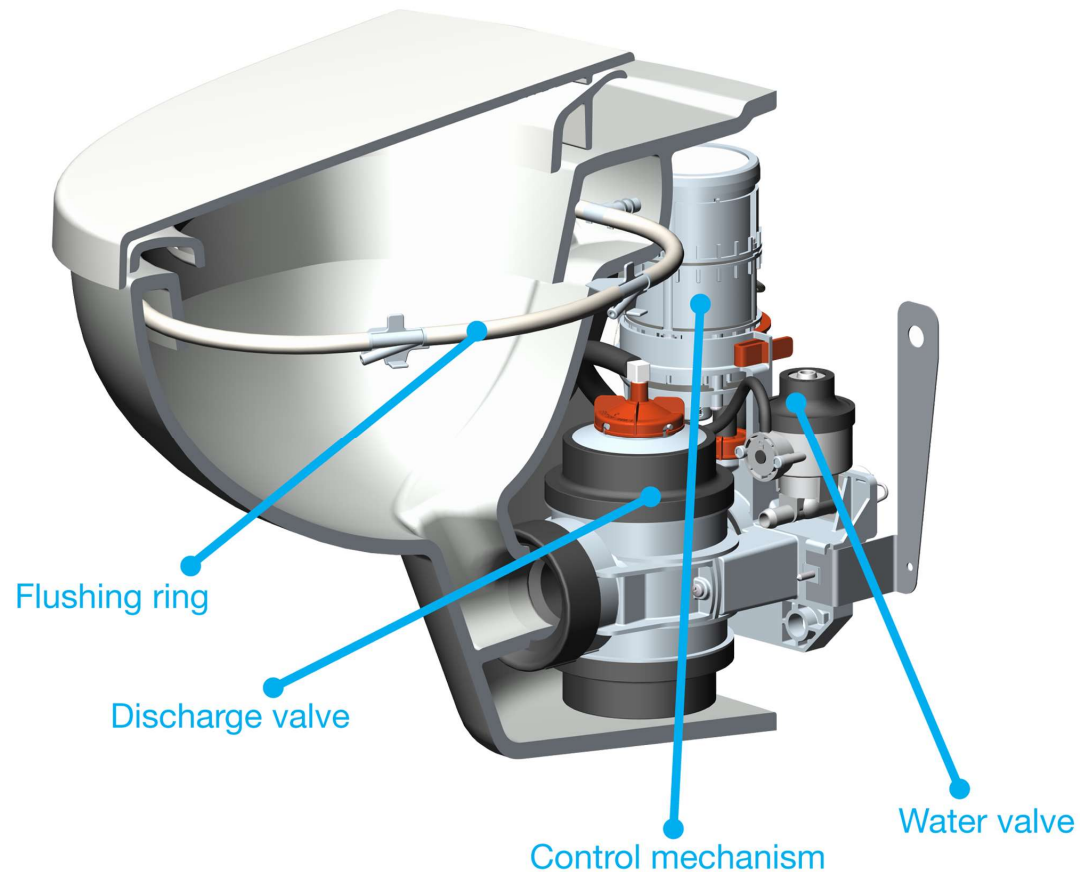
Vacuum Toilets

- ▶ As the control mechanism is located within the confines of the porcelain, servicing to the toilet is done from the bowl side and limited rear access is required.
- ▶ However, it is unlikely that the user will be able to differentiate between a vacuum toilet and a conventional model.



Vacuum Toilets

- ▶ Lets take a closer look at the components that operate an Evac toilet



Vacuum Toilets



- ▶ In addition, the vacuum toilet is environmentally friendly.
- ▶ Each flush only **uses 1.2 litres** of water.
- ▶ As the vacuum toilet has no cistern, the pan is immediately ready to flush again.



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Vacuum Toilets



- ▶ There is a wall mounted or floor standing option.
- ▶ Also within the range is a vacuum urinal and matching bidet



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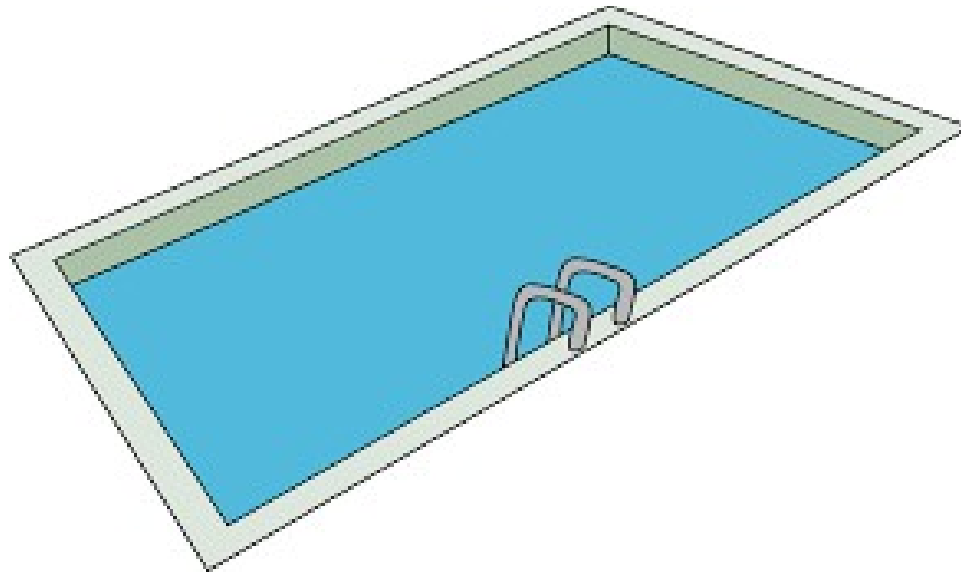
Vacuum Toilets Water Savings

- ▶ Public Toilets Flush at a frequency of 10 flushes per hour
- ▶ Conventional toilets
 - Consumption @ 6l per flush
 - 20 toilets x 10 flushes/hr x 6 l/flush = 1200 l/ hour
- ▶ Vacuum toilets
 - Consumption @ 1.2 l per flush
 - 20 toilets x 10 flushes/hr x 1.2 l/flush = 240 l/hour
 - Saving = 960l/ per hour



Vacuum Toilets Water Savings

- ▶ That equates to a water saving of approximately 2,500,000 litres every 100 days.
- ▶ That's the equivalent of the volume of an Olympic sized swimming pool.



Vacuum Toilets Water Savings

Amount of water saved with our Evac vacuum toilets

13 140 000 000 liters/year
3 471 million gallons/year

It takes 55 hours for this amount to flow through London along the river Thames.



4 380 000 000 litres/year
1 157 million gallons/year

Evac vacuum toilet



Gravity toilet



17 520 000 000 litres/year
4 628 million gallons/year



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Vacuum Toilets



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Vacuum Toilets – A Design Alternative

- ▶ Q. What do you do if the Evac toilet is not to your taste?
- ▶ Q. Do you need a toilet pan that matches the other sanitary appliances?
- ▶ Q. Can I use another toilet of my own choice?
- ▶ A. Yes you can....By using the Evac Vacuconvert frame.



Vacuum Toilets – A Design Alternative



- ▶ The Evac Vacuconvert frame will allow you to use most traditional gravity pans and turn them into a vacuum toilet.
- ▶ And like the standard vacuum toilet, no electrical connections are required



Vacuum Toilets – A Design Alternative

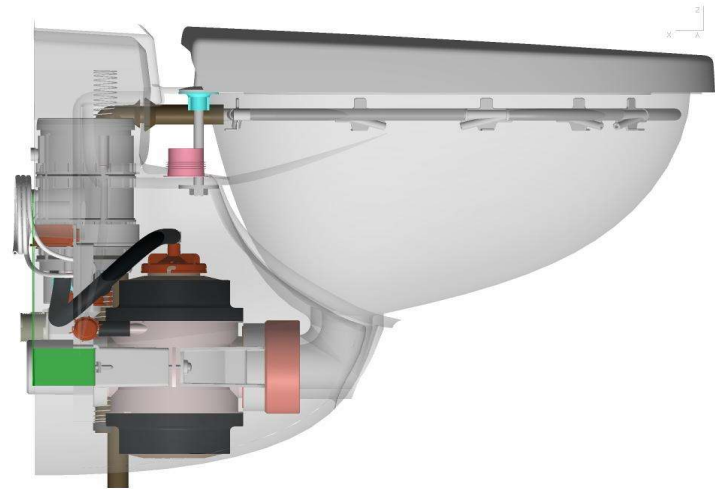
- ▶ The Vacuconvert frame sits in the wall void and is similar in size to a standard concealed cistern frame.
- ▶ It will flush your chosen toilet by vacuum using just 2.5 litres of water and up to 2.8m high.
- ▶ An access panel will be required above the pan of 555 x 383mm where



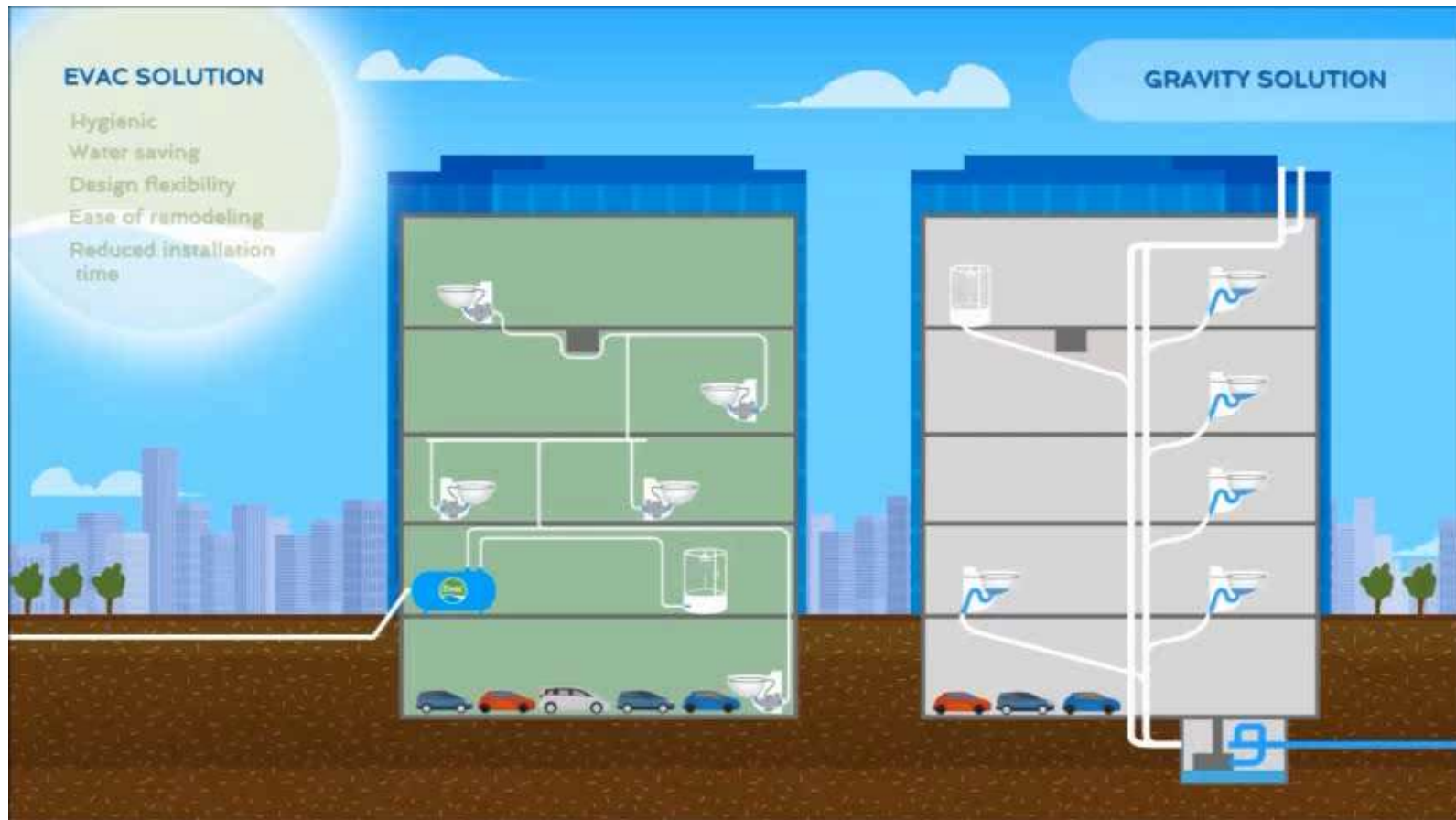
Vacuum Toilets

Evac Vacuum Toilets – An Overview

- Low flush volume. **Only 1.2 litres** for a Evac vacuum toilet vs 6 litres for a conventional toilet.
- Takes in surrounding air and odours
- Dramatically increases ventilation
- Reduces airborne mist
- The vacuum toilet has a low water footprint.



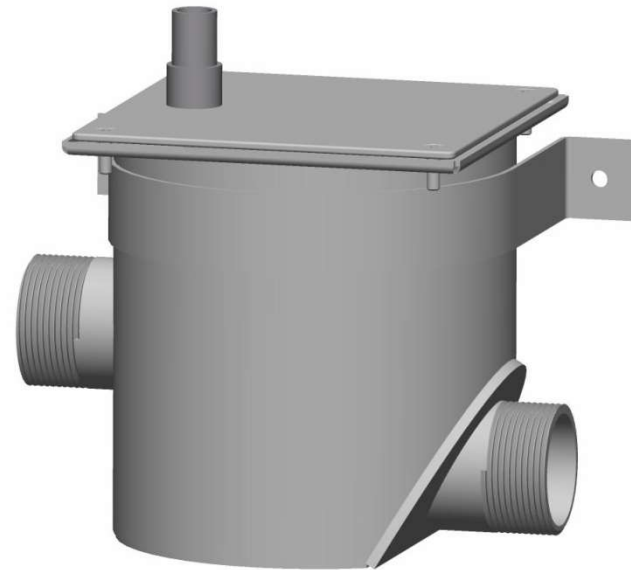
Vacuum Toilets



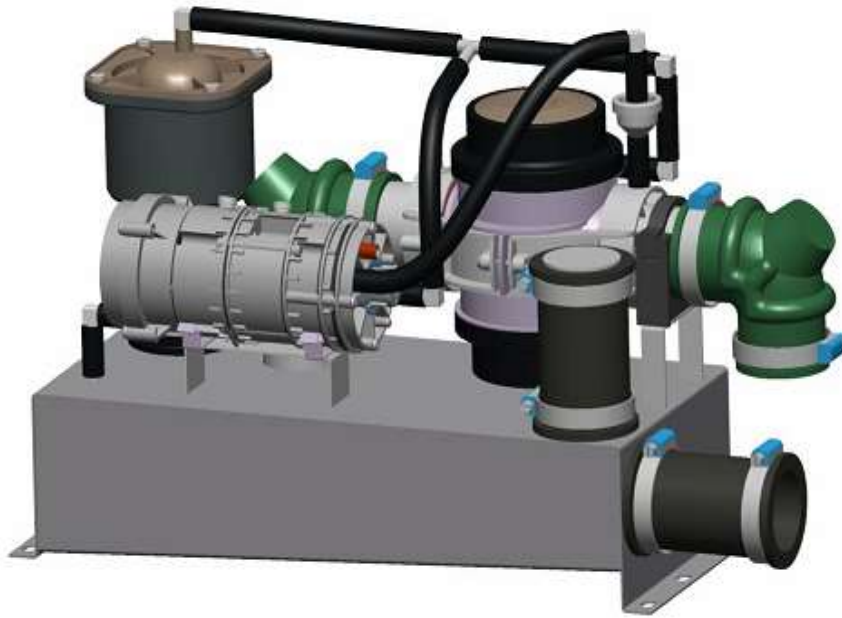
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Other Sanitary Appliances

- The vacuum toilet is the only piece of specialised sanitary ware required.
- The Evac system can drain any other liquid producing appliance via an interface unit.
- The vacuum interface units come in various designs depending upon the application.
- Operation takes place automatically when sufficient water has built up in the collection tank.



Vacuum Interface Units



- As with the vacuum toilet, there are no electrical connections required.
- The interface unit will drain any type of fluid from any type of appliance. These could include standard bathroom & kitchen fixings as well more industrial and commercial waste. Whatever the flow rate or type of location in the building, there's an Evac interface unit to suit.



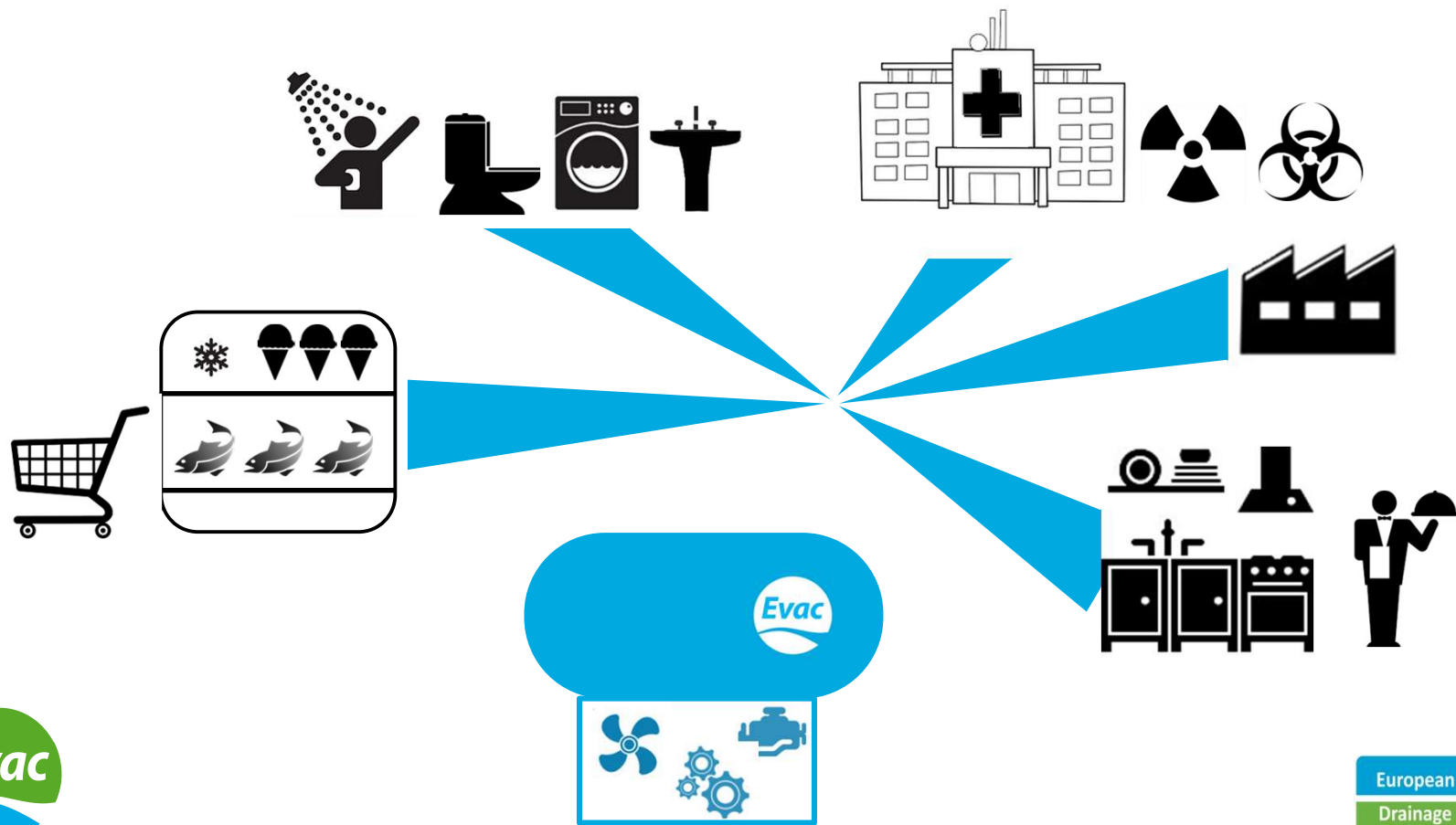
Vacuum Interface Units

- Often, more than one sanitary appliance can be added to an interface unit.
- The vacuum interface units can be discreetly positioned, so that aesthetics of the room are never compromised.
- As with the vacuum toilet, small bore pipework can lift the waste water to high level, eliminating the requirement to dig into the floors and provide complete design freedom.



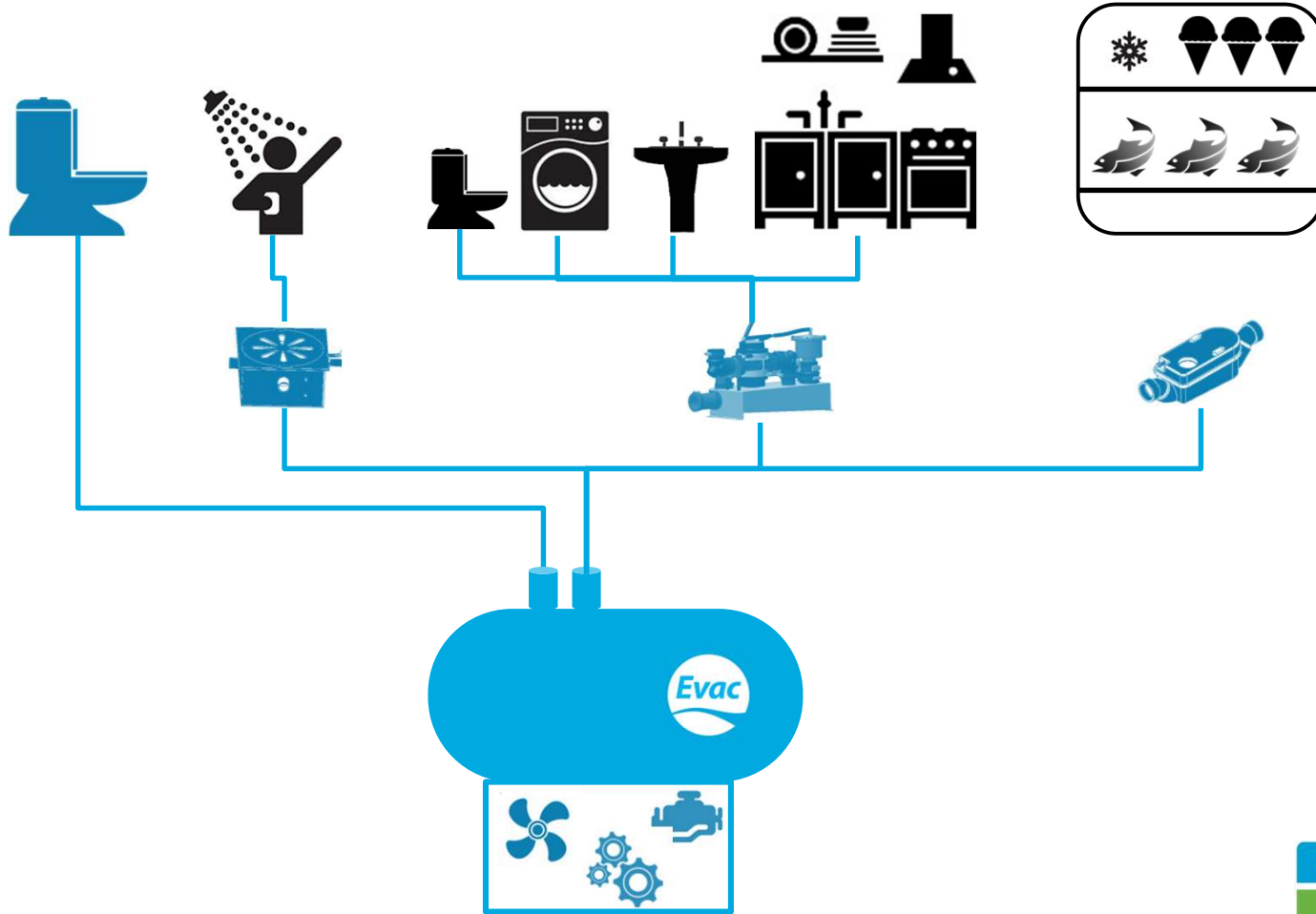
Vacuum Interface Units

The Evac interface unit can collect any liquid.



Vacuum Interface Units

From all your standard fittings.



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Vacuum Collection Unit



- ▶ The Vacuum Collection Unit is the piece of equipment that creates the vacuum that powers of the Evac toilets and interface units. This will sit on the lowest floor that requires drainage.
- ▶ This unit is capable of taking sewage waste, greasy kitchen waste and detergent based grey water without and detrimental effect on the tank or vacuum creation.
- ▶ This is the only part of the Evac system that requires any electrical power.



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Vacuum Collection Unit



- ▶ The vacuum plant will consist of
- ▶ 1 No. collection tank
- ▶ 2 No. offline vacuum pumps
- ▶ 2 No. discharge pumps
- ▶ 1 No. control panel



Vacuum Collection Unit



- ▶ Whichever type of vacuum plant is selected, it will consist of 2 No. vacuum pumps and as required by the EN standard
- ▶ The vacuum pumps are known as offline vacuum pumps. (standby & duty). These pumps will not come into contact with the waste. Therefore foreign objects that might have entered the system via the toilets cannot affect the pumps. The pumps are a dry operation so detergents will not pass through the pump and create a foam that will prevent vacuum creation.



Vacuum Collection Unit



- ▶ The Evac plant will consist of 2 no. discharge pumps and will not require an additional pump set.
- ▶ These pumps will allow that vacuum unit to be sited anywhere in the building and not be reliant with positioning local to a drain connection.



Vacuum Collection Unit



- ▶ The collection tank is a critical part of the system. Having a large amount of stored vacuum helps maintain a sufficient level of vacuum in the system at peak times and avoids delays in the functioning of vacuum equipment.
- ▶ In addition the vacuum mass assists with the transportation of the waste water as the vacuum differential will always be at its strongest at the tank. This will prevent reversal of flow.



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Vacuum Collection Unit



- ▶ The size of the vacuum tank, vacuum and discharge pumps are dimensioned specifically to each project. This is part of our design service to ensure the correct unit is specified for each project.
- ▶ The whole system is automated and controlled via a pre-loaded program in the PLC.
- ▶ The display panel will indicate the vacuum pressure and status of the vacuum system.
- ▶ This can easily be connected to the buildings main BMS system.

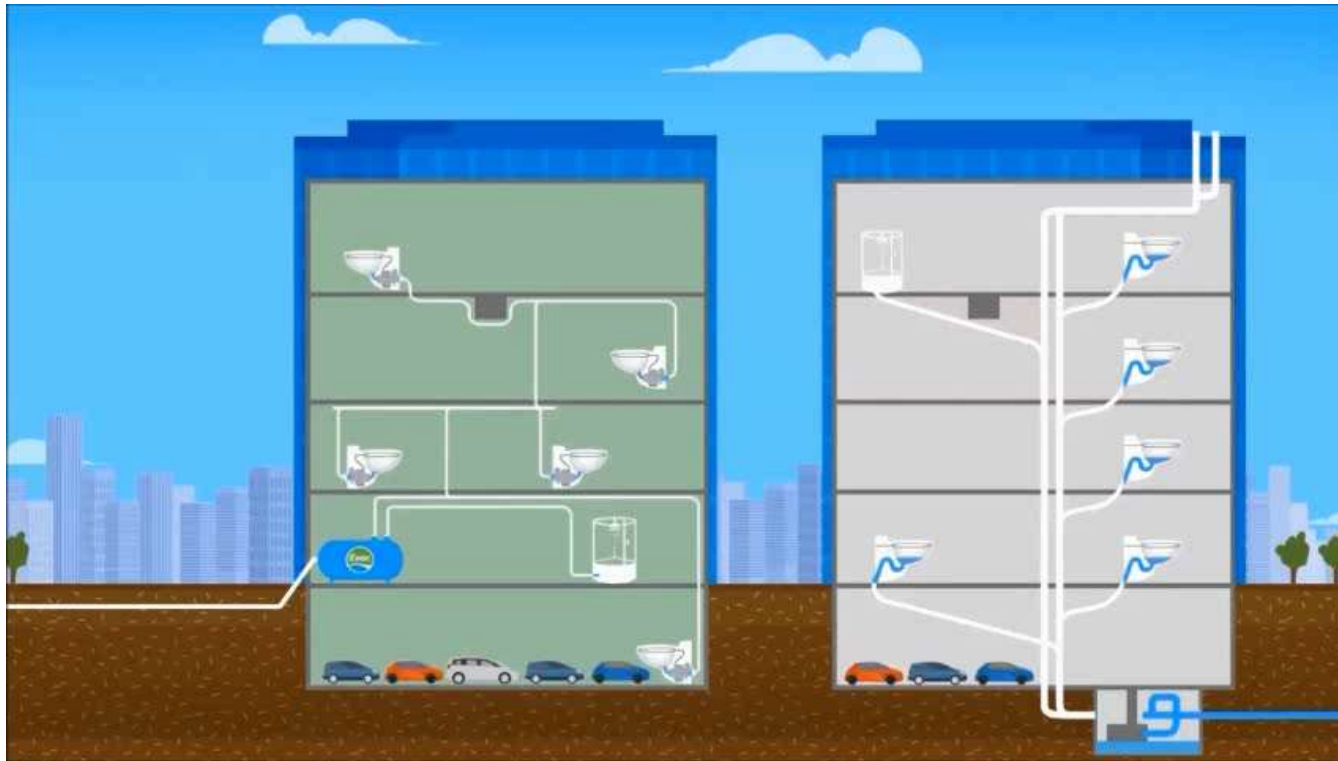


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Vacuum Collection Unit

As the fluid is now collecting inside the tank, it will soon fill to the desired discharge level. There are level switches inside the tank, that once lifted by the rising water levels will start a discharge cycle.



During this cycle, the discharge pumps will run for 20 seconds. All the water discharged will be pumped to the main sewer. Whilst the tank is in discharge mode, the vacuum side of the process remains operational and the system can still receive waste water.

Evac Benefits

▶ Health & Hygiene

- Reduce airborne mist
- Takes in surrounding air and odours
- Dramatically increases ventilation
- Vermin cannot live in a vacuum

▶ Design Flexibility

- Put drains and fixtures anywhere
- Pipe around, under or over obstacles
- Add drains and fixtures without major work
- Small bore piping
- Pipes can be routed upwards, to give lifts of up to 5m



Evac Benefits

• Construction & Installation

- No vents required
- Far fewer floor and ceiling penetrations
- No continuous pipe slope
- No toilet cisterns required.
- No requirement for WC overflow pipework

Waste water management

- Environmentally friendly only 1.2 l per flush
- Down-sized domestic supply system
- Grey water / Black water separation
- Recycled grey water for toilet flushing feasible



Evac Dry Waste Vacuum Systems



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Dry Waste Vacuum Systems

EVDS can also offer a dry/food waste system. This allows the user to place waste/excess food into a macerating feeding station, water is added to form a slurry and the mixture is transported via vacuum pipework to a holding tank ready for outside collection.

This negates the requirement to store waste food products in kitchen/bin stores that often smell or leak. In addition there is no requirement to transport the waste manually to the outside storage.



Dry Waste Vacuum Systems



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Dry Waste Vacuum Systems



The food waste can be contained and collected via an outside agency who can environmentally dispose or re-used as bio fuels.



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EVDS – Our Services



TOMIRIS.SA ® AWACAL

Evac use a design tool called AWACAL.

This tool allows us to size and dimension all of the components required for the vacuum system.

This would include:

- The vacuum tank
- The vacuum pumps
- The discharge pumps
- The vacuum pipework
- The amount of interface units required.



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EVDS – Our Services

During Installation

We provide project management and full product commissioning upon completion.



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EVDS – Our Services



Completion of Installation

A telephone support system is available to all of our clients.

In addition, a range of service plans are available to suit the customers requirements including a reactive service. Customer training bespoke to each individual project.



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EVDS – Our Services

Spare Parts

A full range of spares stocked in the UK.
All ready for immediate despatch.



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EVDS Customer Promise

With all the products that European Vacuum Drainage Systems offer, we aim to make it easy & simple for the client.

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Reference Projects



London Heathrow Airport Terminal 5

During the building of the new terminal at Heathrow, British Airways decided to create 100 private bathrooms for its business and first class customers. However, conservation issues were central to the planning on this project. The Evac Vacuum toilet with its 1.2 litre flush was the obvious choice for water conservation. In addition to this the constraints of the building meant that no drainage pipes were able to enter the floors below. The answer was a vacuum drainage system which allowed maximum flexibility of layout but contained all of the pipework within the BA domain and with no floor penetration.

The complete system consists of over 200 Evac vacuum toilets and Interface Units



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Reference Projects

St Pancras International Railway Station



The redevelopment of St Pancras International Station for the EuroStar operation, required that the historical nature of the building be preserved, but which provided the most modern up to date facilities for its uses. The flexibility of the Evac Vacuum Drainage System meant that both these criteria could be met. A drainage system which was not dependant on falls meant that toilets could be located at either end of the building without the need for major excavations on ground works. The high volume of passengers would mean that toilet flushing would be a major use of water. The 1.2 litres per flush Evac Vacuum toilet reduced toilet flushing water by 80%.

The system consists of over 150 Evac vacuum toilets and Interface Units.



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Reference Projects



KidZania Westfield Shopping Centre

KidZania brings its small world that is totally designed children.

When it was decided to construct their new development in the Westfield Shopping Centre, free space was extremely limited with the only space being above an existing supermarket. The supermarket objected to potential waste water services being piped through there building. The installation of a vacuum drainage system allowed the waste pipes to be lifted to high level where they all remain within the confines of the KidZania premises The system is fitted with over 40 vacuum toilets and over 100 interface units collecting water from the various attractions that KidZania offers its young customers.

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Reference Projects



The Hospital Club – Covent Garden

This building originally built 1749 as a hospital was recently converted into one of London's trendiest meeting places. The building boasts a number of bars, meeting rooms and a TV recording studio.

When the club decided to convert one of the floors into a hotel for its clients, the flexibility of the Evac system allowed them to run waste pipes at high level so not to penetrate into the floors acoustic protection.



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Reference Projects



22 Bishopsgate Tower– London

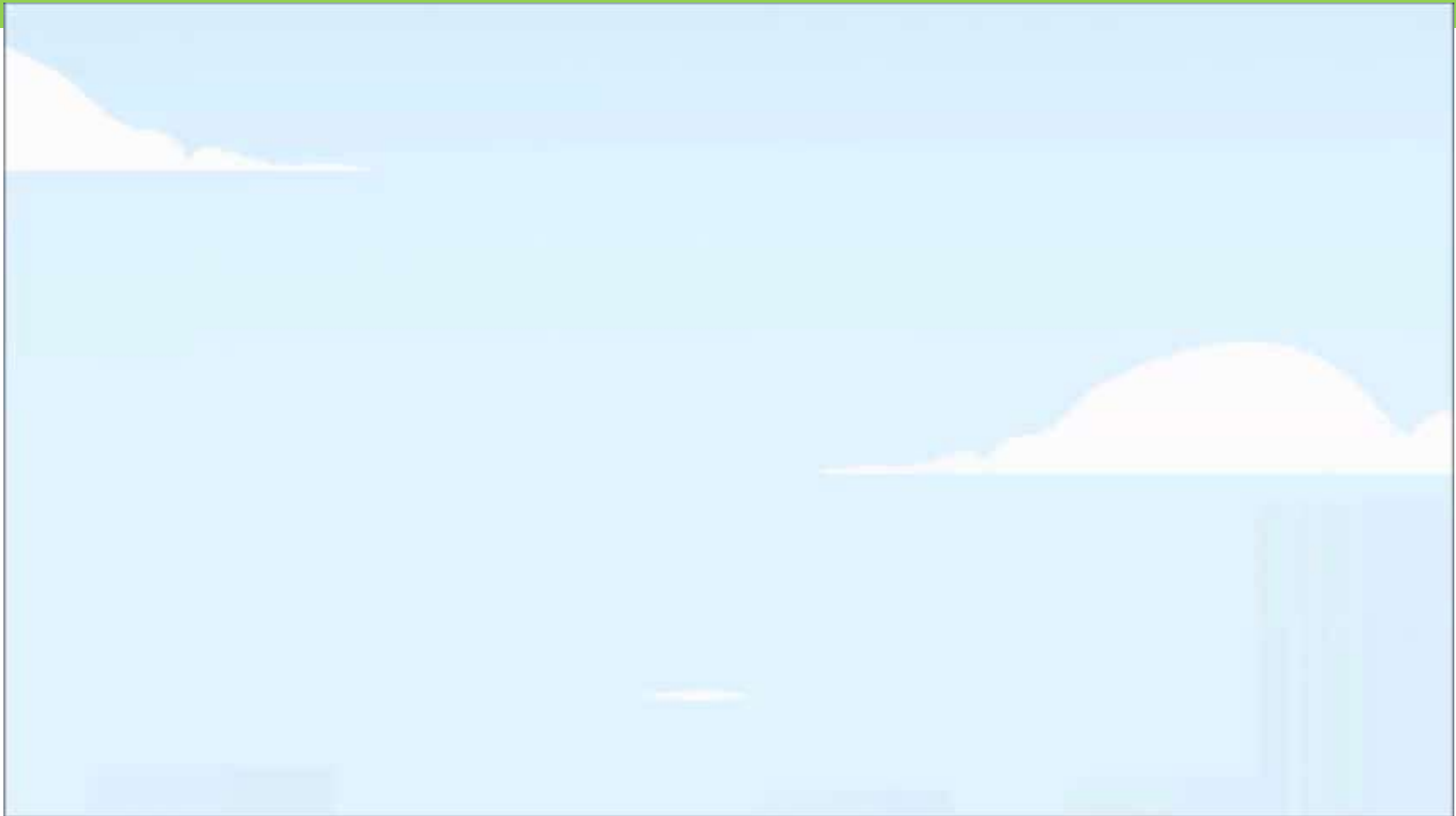
The new tower on the London skyline at 62 storeys high. This building owned by AXA has all of the restaurants on the upper floors. The client wanted to be able to get the food waste to low level without the need of dragging bins through the building. This system allows all of the waste to be transported to holding tanks in the basement and when the tank reaches a desired level, a tanker is called and the waste is taken to an anaerobic digestion plant to be turned into bio gas.



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the drainage alternative

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Save money



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