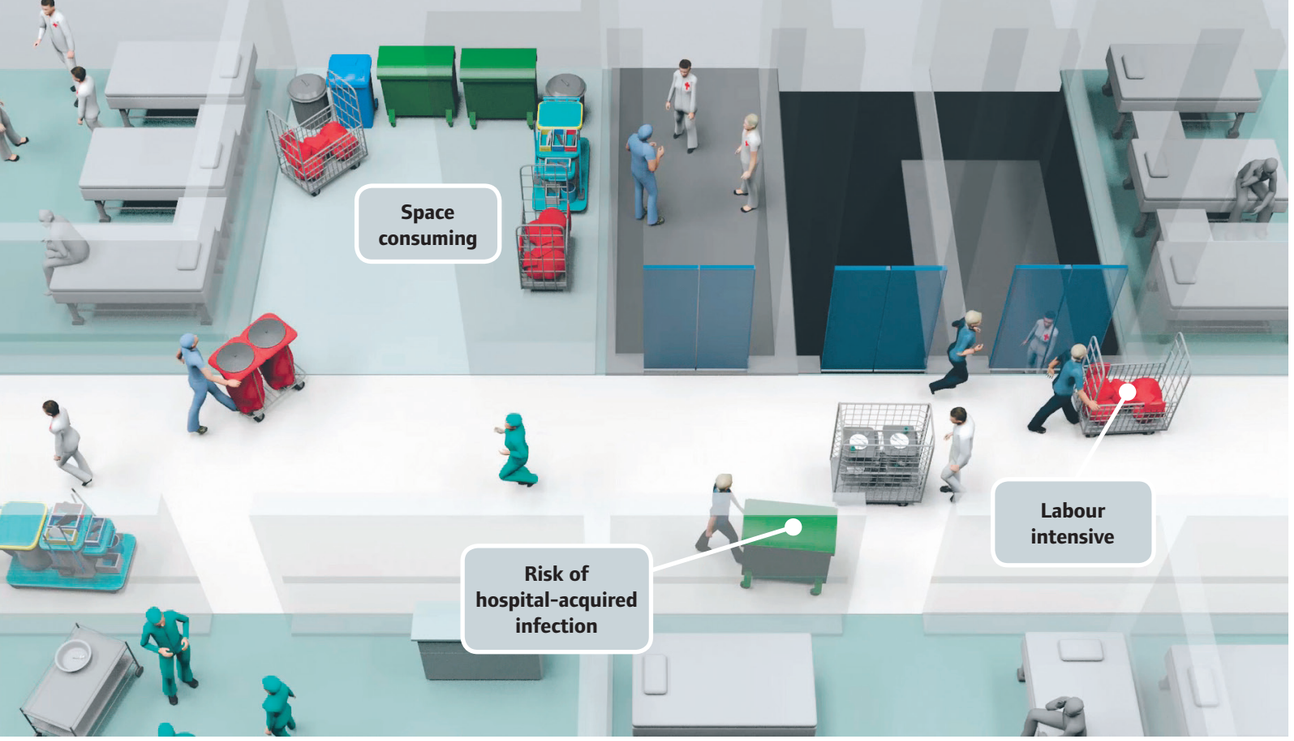
MORE ROOM FOR CARE

ENVAC HOSPITAL SYSTEMS
FOR WASTE AND SOILED LINEN

envac

REMOVING WASTE – CREATING VALUE



Traditional waste management is costly, space consuming and labour intensive.

Taking hospitals to the next level

A rapid increase in the number of doctor visits and in-patients has led to larger volumes of waste and soiled linen being produced in hospitals worldwide. Traditional waste handling can compromise patient safety and increase overall operational costs.

The daily manual handling of general waste, recyclables and soiled linen is a never ending challenge for hospitals and health clinics around the world. Its open transportation through the hospital can impact upon patients' first impressions and also takes up valuable space in corridors, elevators and storage rooms.

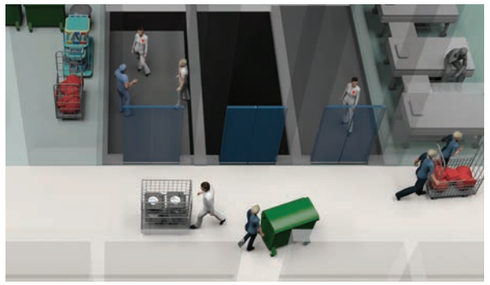
Traditional handling of waste and soiled linen is a heavy, unhygienic and smelly work that is very manpower intensive. Physical contact and contamination is inevitable and this increases the risk of hospital-acquired infections for patients as well as staff.

Increasing productivity requires a lean and clean waste infrastructure that works around the clock. When it comes to staff, energy and supplies, hospitals are resource intensive facilities, which make investing in a modern waste collection system a logical step towards creating environmentally and financially sustainable environments.

Let the air do all the heavy work

Envac's automated waste collection system facilitates free and easy movement of waste and soiled linen in a pipe network that forms part of a building's fabric.

LOWER OPERATIONAL COSTS



BEFORE: Manual handling of waste and soiled linen is time consuming and labour intensive. Heavy and hazardous work may increase sick leave among service staff. Work space and human resources are tied up considerably, affecting productivity.

AFTER: Automated handling of waste and soiled linen eliminates the heavy workload and saves time. Dependence on the physical presence of service staff is reduced, valuable space is freed up for other uses and productivity and profitability is increased.

MINIMISE RISK OF HOSPITAL-ACQUIRED INFECTION (HAI)

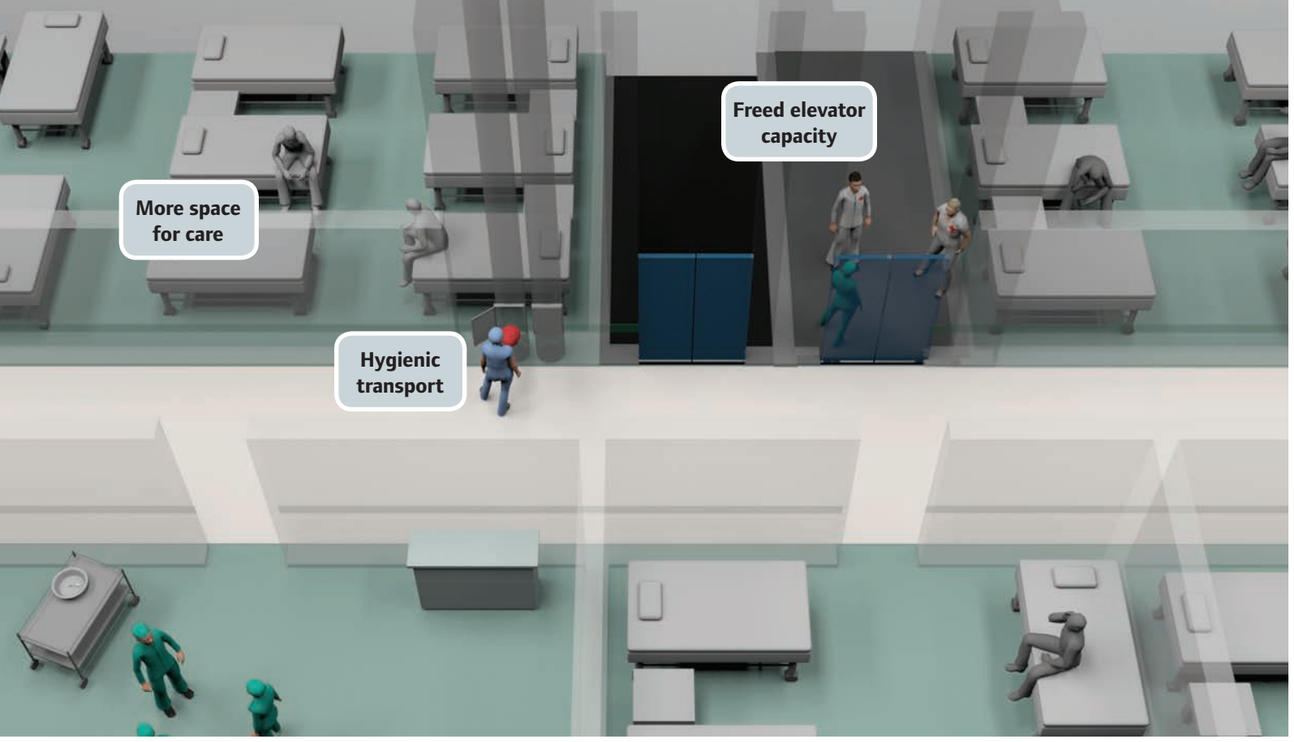
BEFORE: Open transport of soiled linen and contaminated waste throughout public areas is unsightly and unhygienic. Exposure also greatly intensifies the risk of hospital-acuired infections.

AFTER: Transporting waste and soiled linen in a sealed vacuum system significantly increases health and safety levels for patients, staff and visitors.

IMPROVE ACCESSIBILITY AND SUSTAINABILITY LEVELS

BEFORE: Manually collecting, handling and transporting different types of waste, recyclables and soiled linen is labour intensive, heavy, hazardous and costly work. Space that could be used for profit-generating activities is occupied and battery powered vehicles, in addition to the staff needed to transport waste, clutter corridors and elevators.

AFTER: Using a pipe network frees up valuable space. Integrating a waste collection pipe network within a hospital's infrastructure frees up valuable space, simplifies the collection process and negates the need for areas dedicated to waste storage. It also reduces the building's carbon footprint.



Envac's system saves space and money whilst hygiene and efficiency levels are improved.

Envac's waste management system makes all the difference

Less is more. The system is easy to use, easy to upgrade and easy to retrofit.

Envac's user-friendly system uses a sealed pipe network to transport waste, recyclables and soiled linen in a hygienic, convenient and cost effective way. It creates a sustainable, safe and hygienic environment for both staff and patients. With less manpower and significantly improved work environments, not only are the running costs reduced but also the space required for waste and soiled linen are minimised, too.

Find better uses for the space that the Envac system releases and relocate the savings in operational cost to core business activities.

Major benefits:

- Hygiene and infection control
- Reduced manpower
- Improved working environment
- Freed space
- Freed elevator capacity
- More value for money
- Short payback time

User-friendly inlet, located wherever required.

General waste and soiled linen have separate inlets but can be transported through the same pipe.

Automated handling of soiled linen saves hospitals space, time and money.

What can be handled?

Envac has designed systems for handling general waste, soiled linen, food waste and infectious waste – all in sealed pipe solutions.

General waste

Up to 90 percent of waste produced in hospitals is considered to be general waste. From litter and packaging waste through to recyclables, Envac's technology enables each fraction to be separated and transported through only one pipe.

Soiled linen

Most systems have separate pipes for soiled linen and general waste. However, unless stipulated by law, waste and soiled linen can be transported through the same pipe.

Food waste

Most food waste is considered an environmental resource and can be collected directly from where it is produced in the kitchen. A separate system for wet food waste is ideal for biogas production.

Infectious waste

About 10 percent of all waste is regarded as infectious or hazardous and may pose environmental and health risks. It is handled separately by an infectious waste collection system that has a high level of security measures such as disinfection and alarm functions.

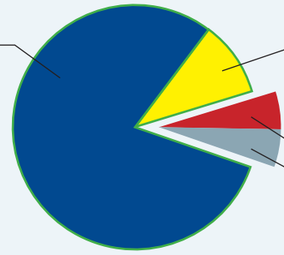
Most types of waste can be handled.

General non-hazardous waste

Comparable to ordinary domestic waste and considered non-hazardous. For example:

- Packaging
- Recyclables
- Administration
- Newspapers
- Food waste

We recommend a separate Envac system for the food waste.



Infectious and sharps waste

Hazardous waste such as infectious and sharps waste are handled separately by Envac's sealed automated infectious waste collection system.

Chemical and radioactive waste

General non-hazardous bulky waste

Chemical, radioactive and bulky waste are to be handled separately.

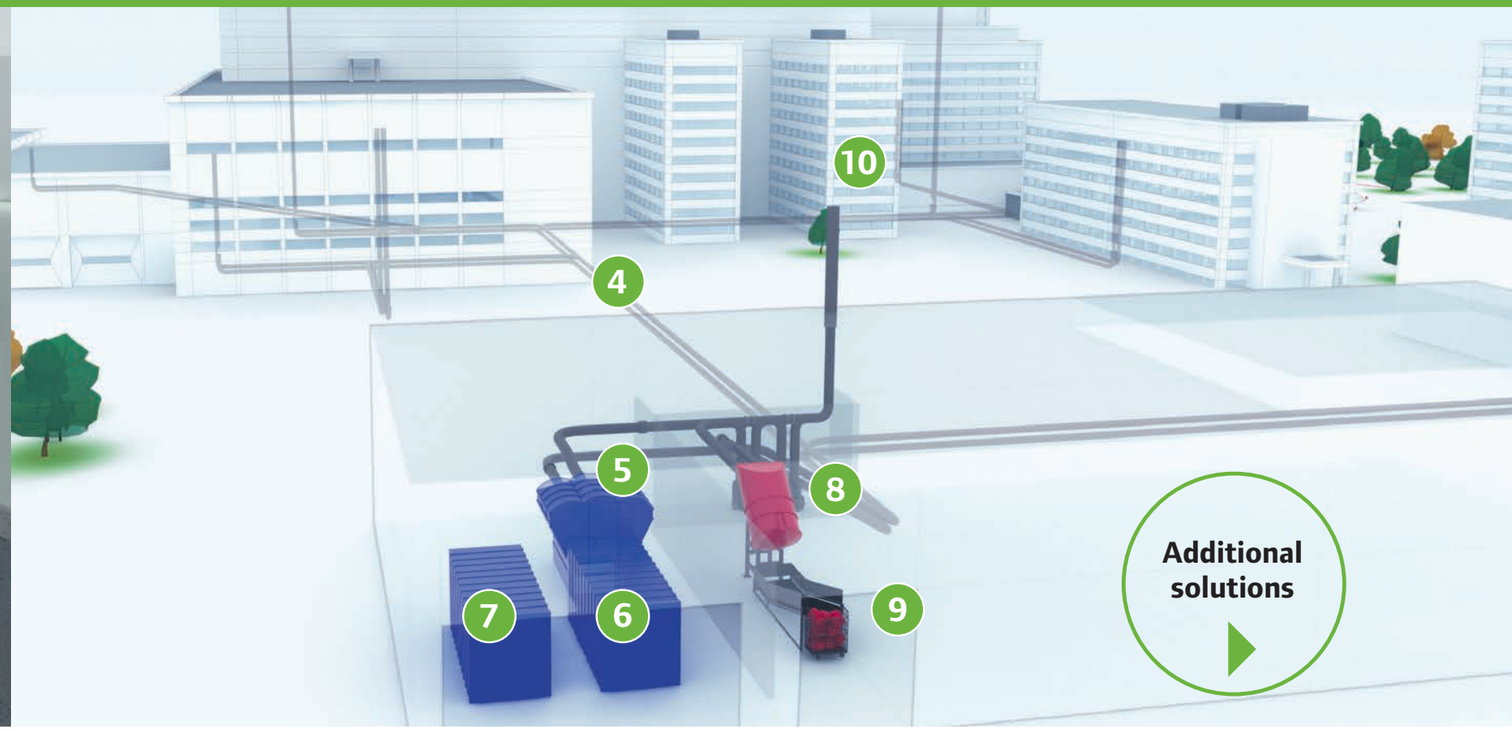
General waste

Soiled linen

Food waste

Infectious waste

Envac's Standard Hospital System



This is how it works

Deposited in separate wall inlets the waste and soiled linen are transported via separate pipes to a collection station. This collection station can be located on the outskirts of the hospital area making access to containers and linen trolleys more convenient for trucks.

In addition to the standard design system, Envac has developed two solutions to transport a variety of materials in only one pipe. This enhances user-friendliness and further reduces investment costs.
See page 8.

1. Wall inlet
Wall inlets are conveniently located where general waste and soiled linen are produced. The inlets are usually locked and access is granted to authorised staff via keys or RFID (Radio frequency identification).

2. Chute
Materials are transported vertically, by gravity, through separate chutes to an intermediate storage section on top of a storage valve.

3. Storage valve
When temporary storage reaches a level, the automated transport process starts. Airflow is used to move the material to a separator in the collection station.

4. Pipe network
A pipe network connects all waste storage valves to the waste separator in the collection station, and a separate network connects all linen storage valves to a linen separator in the collection station.

5. Waste separator
At the end of the waste transportation pipe there is a separator, one for each material. In the waste separator the air is separated from the waste allowing the waste to drop into a compactor.

6. Waste container
The compactor compacts the waste into a waste container in order to reduce its volume. When the container nears capacity the system requests collection.

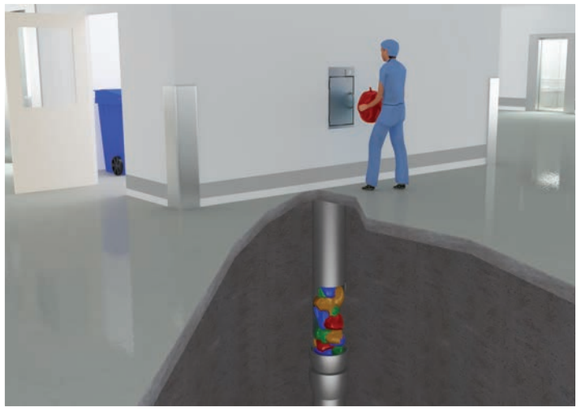
7. Spare container
In order to minimise interruption, a spare container is recommended to quickly replace the full unit.

8. Linen separator
At the end of the linen transportation pipe there is a separator. The air is separated from the soiled linen bags and when the separator is full it will drop the soiled linen on to a conveyor belt.

9. Soiled linen storage
Depending on if the hospital uses off-site laundry services or in-house laundry facilities, the soiled linen can be dropped on to a belt conveyor system that transport the linen bags to either an in-house laundry facility or into trolleys for pick-up by off-site laundry services. The soiled linen bags can be dropped directly in to trolleys without a belt conveyor system.

10. Exhaust air pipe
The same exhaust air pipe is used for both general waste and soiled linen. Before transport air is released into the environment it is processed through filters and sound insulation. The exhaust air pipe can be situated in a separate location from the collection station.

One pipe solution with separate wall inlets, chutes and storage valves for each material.



Optical sorting solution with a single wall inlet, chute and storage valve for all materials.

One hospital. One system. Several options.

Envac's greatest strength is its flexibility when it comes to handling multiple waste streams and soiled linen.

One pipe – multiple materials

With Envac, a single pipe network ensures that multiple materials can be transported from the inlets to the collection station day in, day out, without risk of cross contamination.

How?

With one horizontal pipe net and a diverting valve, Envac can handle a wide spectrum of materials including:

- General waste
- Soiled linen
- Paper
- Confidential documentation
- Plastic, plastic packaging
- Paper packaging

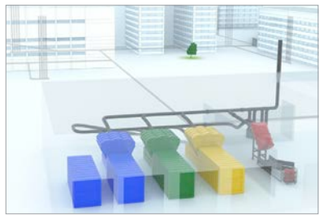
The user simply selects the wall inlet that matches the type of waste they want to deposit. Before collection starts, a signal to the diverting valve ensures that it is connected to the corresponding storage container. The vacuum process then begins, transporting the material via one central pipe to its selected destination.

Only one wall inlet for all collected materials – the optical solution

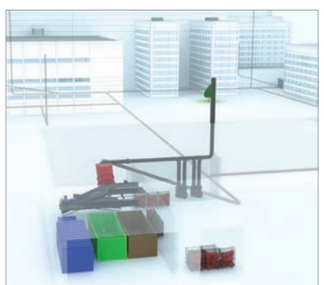
If there is only space to install one wall inlet an Envac system still can handle multiple materials. Using colour-coded bags for each material and an optical sorting unit in the collection station makes it possible.

Users simply place their waste in the colour-coded bag that represents the colour preassigned to the waste stream before depositing it in one universal chute. The bags are transported to an optical sorting unit that automatically separates and directs the bags to the correct storage.

You don't even need to change the colour-codes on the bags you currently use.



One pipe solution's collection station with individual separators for three waste fractions and soiled linen.

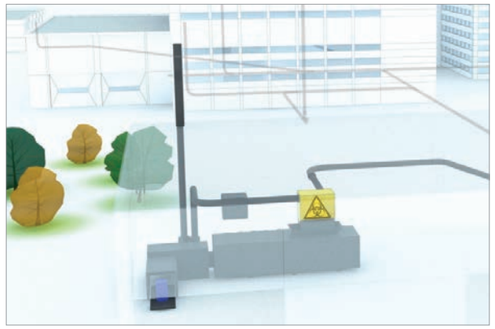


Collection station a with an optical sorting unit for three waste fractions and soiled linen.

Two additional, separate systems

Infectious waste collection (IWC) system reduces costs by up to 90%

Managing infectious waste is hazardous, expensive and time consuming. International guidelines stipulate that hazardous waste must be handled as close to the source as possible. Healthcare facilities are ethically, legally and financially responsible for waste management so as not to endanger public health and safety.



Envac's IWC system can transport infectious, sharps and hazardous waste in sealed carriers from separate wall inlets, through a pipe network to a waste-to-energy-system. Here the waste is converted into energy, which results in a significantly reduced volume of non-hazardous material. When the waste is deposited in the wall inlet it is immediately collected and transported to the waste-to-energy system. Most of the dangerous ADR* transportation issues are eliminated and costs for handling infectious waste is reduced by up to 90 percent.

*European Agreement Concerning the International Carriage of Dangerous Goods by Road

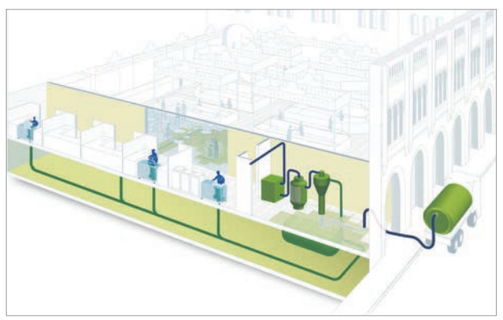
Major benefits of IWC:

- Minimal need for special containers
- Minimise time consuming routines
- Minimise risk of human error
- Complies with international guidelines
- Lower cost for treatment and collection
- Fewer ADR transports from the hospital

Envac's IWC system makes sure that infectious waste remains out of sight and out of mind.

The Envac Kitchen Waste System (KWS) minimises the hygiene risks with handling food waste

Manually handling wet and heavy kitchen waste poses a hygiene risk. The risk of crossing hygiene zones in the kitchen causes problems for kitchen and service staff and compromises the work environment. Correctly processed kitchen waste is a valuable resource and perfect for composting and biogas production.

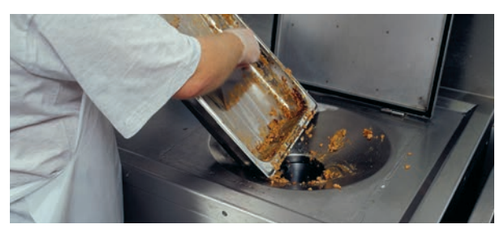


Envac's Kitchen Waste System simplifies disposal, transport, storage and collection. Waste inlets are conveniently placed close to where meal production and dishwashing takes place. All transport goes through hermetically sealed pipes to a storage unit. The solution releases valuable space for profit-generating activities and complies with the most stringent HACCP* hygiene requirements.

*Hazard Analysis and Critical Control Points

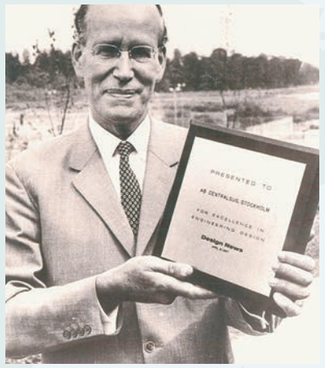
Major benefits of KWS:

- Frees up valuable kitchen space
- Improved hygiene
- No odour, leakage, vermin or insects
- Self-cleaning system
- No need for air-conditioning of waste storage
- No manual handling of kitchen waste



With Envac's Kitchen Waste System, food waste inlets are placed closed to the source.

Envac in brief



"The waste just flies through the pipes!" Olof H Hallström, founder of Envac.

The Envac system before it evolved into the automated waste collection system of today.

The service technician, Edland Olofsson, checks the parameters of a system.

"If we can vacuum dust from every corner of the hospital in one single system, why can't we do the same thing with waste?"

The answer to that question sparked a brilliant idea that led to a revolutionary invention – the automated vacuum waste collection system.

In 1961 Envac delivered the world's first automated waste collection system to Sollefteå Hospital in Sweden. That system is still in operation with many original parts from the early 1960s.

Today, with 50 years' experience of design, installation, development and operation of the systems, Envac is one of the leading environmental technology companies in Sweden and the global leader in the automated waste collection industry. Envac is fully owned by Stena Adactum AB, a company in the Stena Sphere.

The core values are: reliability, rationality and sustainability. These values are based on the properties of Envac's products and solutions. They also provide the foundations on which the corporate culture are built upon. Envac's belief is to have local competence where business is carried out and use the core knowledge, experience and expertise from head office to support its global operation. A high percentage of goods and services are locally supplied as the products are based largely on components developed in-house that can be manufactured locally in each market, except for specific products that are manufactured centrally by certified suppliers.

The systems are found all over the world – in hospitals, industrial kitchens, residential areas, business premises, town centres and airports.

Sollefteå Hospital in Sollefteå, Sweden

The Envac system at Sollefteå Hospital is still going strong

The waste collection systems is designed for 300 beds and consists of:
Fractions: 1 (residual waste)
Inlets: 7
Pipes: 300 metres
– It was the best investment the hospital ever made. The system runs like clockwork. Whilst it is true we have replaced certain parts over the years, much of the original equipment remains in operation, says operating manager at the hospital, Mr. Vincent Måström.

Envac selected hospital projects

St. Olav's Hospital
Trondheim, Norway

Beds: 900
Fractions: 4 (residual waste, plastics, paper and
confidential paper)
Inlets: 110
Pipes: 2,400 metres

The hospital has been completely rebuilt with the first installation of Envac's one pipe solution for four fractions. The system also connects to Øya Helsehus, a 20,000 square metre care facility.

– The hospital is now easier to keep neat and tidy. No bacteria associated with waste is exposed throughout the facility. There is no unpleasant waste odour throughout the hospital wards, corridors or culverts. Even the collection station is odour-free. The system can handle large volumes of waste and less manpower is allocated to waste management, says Mr. Otto Koch, Technical Manager at St. Olav's Hospital.

Hainan Cancer Research Hospital
Haikou City, China

Beds: 1,200
Fractions: 3 (linen, food waste and residual waste)
Inlets: 628
Pipes: 5,199 metres

This 230,000 square metre hospital is an international care and research facility, which incorporates an Envac system that handles waste, soiled linen and food waste. The system also handles waste from the staff quarters, which is located nearby.

– Given the size of the hospital, traditional modes of waste collection and transportation are no longer viable. Envac makes waste collection easier and quicker whilst freeing up valuable corridor space as manual waste collection activity is reduced by 90 percent, says Mr. Wang Tie Lin, Director of Hainan Cancer Research Hospital.

Stockholm South General Hospital
Stockholm, Sweden

Beds: 1,200
Fractions: 2 (waste and linen)
Inlets: 200
Pipes: 3,100 metres

The hospital has the largest emergency care unit in the Nordic region and provides emergency medical care to half a million people throughout Stockholm. This was the first installation for both waste and linen.

Hospital Sírío Libanês
Sao Paulo, Brazil

Beds: 650
Fractions: 2 (waste and linen)
Inlets: 110
Pipes: 800 metres

An expansion project will double the hospital's capacity for patient care. The Envac system will manage daily collections of eight tons of general waste and eight and a half tons tons of soiled linen.

PLA General Hospital, 301
Beijing, China

Beds: 3,600
Fractions: 2 (waste and linen)
Inlets: 357
Pipes: 3,240 metres

Envac manages the waste and soiled linen of the hospital's 125 clinical, medical and technological departments in addition to an educational institution, the PLA Medical College, which is operated by the hospital. Envac also handles the waste of the staff quarters, which is located nearby.

Ng Teng Fong General Hospital & Jurong Community Hospital
Jurong Lakeside District, Singapore

Beds: 1,100
Fractions: 2 (linen and residual waste)
Inlets: 80
Pipes: 2,110 metres

This is the first installation where two hospitals are connected to the same Envac system. These two hospitals are designed and built into an integrated health care hub with an emergency care unit and extended recovery facilities.

We have offices in the following countries:

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REMOVING WASTE – CREATING VALUE

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