



**AUTOMATION**

**iwt**

a **TECNIPLAST** company

## Introduction

Since 2004 IWT, the washing, automation and decontamination division of the Tecniplast group has designed, developed and engineered bedding handling solutions for the laboratory animal industry. A radical approach has been adopted since the beginning, which today is the new standard within the industry. A combination of various technologies provide the most flexible, reliable and consistent solution ever seen. The vacuum transfer of material is supported by other systems such as shredders, augers, belt conveyors, laminar flow hoods, and inverters to ensure the best outcome for your facility.

Today, thanks to a decade of experience gained through the install of over 300 bedding handling solutions in the most prestigious vivarium worldwide and the millions of cages processed, Tecniplast is proud to provide you with the most comprehensive portfolio of bedding handling solutions that you can find on the market.







Modern animal facilities, regardless of size, have to face daily growing concerns associated with ergonomics and allergen exposure, the target being to maximize efficiency and improve staff motivation providing a better working environment.



These are the aims that have lead IWT in the development of its automated solutions:

- **Modular** to fit any size facility both in terms of number of cages, space available and distances to reach;
- **Flexible** to accomplish multiple tasks from dirty to clean side operations and to process the wide variety of materials available in the industry;
- **Ergonomics** and **operator protection** at the center of our design;
- **Cost effective** to meet every budget and documented by Return On Investment analysis;
- Based on **cutting edge technologies** and innovative patented concepts.

Years of research and development has resulted in a unique portfolio of bedding handling solutions capable to meet distance, volume, animal models and budget requirements.

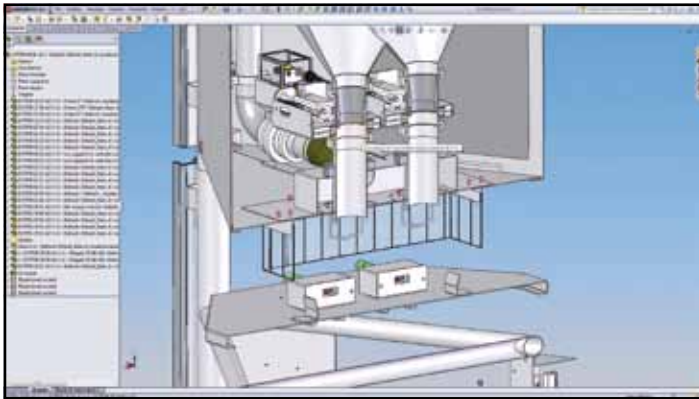
Waste disposal and Bedding dispensing solutions			
<b>Numbers and Species</b>	<b>5000 to 7000 cages/week Mainly rodent</b>	<b>7000 to 10000 cages/week Rodent only</b>	<b>All cage counts Various animal models</b>
<b>Distances Involved</b>	<b>Dirty side: max 5m (16ft) Clean side: max 5m (16ft)</b>	<b>Dirty side: max 38 m (125 ft) Clean side: max 48 m (157 ft)</b>	<b>Dirty side: all distance Clean side: all distance</b>
<b>Technology</b>	<b>Dirty side: mechanical Clean side: vacuum</b>	<b>Dirty side: vacuum Clean side: vacuum</b>	<b>Dirty side: vacuum Clean side: vacuum</b>
<b>Products</b>	 <b>BHS</b> SCREW CONVEYOR WASTE DISPOSAL SYSTEM  <b>BDS+</b> BEDDING DISPENSING SYSTEM	 <b>EASY BHS</b> BEDDING HANDLING SYSTEM	 <b>BHS</b> BEDDING HANDLING SYSTEM
In-line dispensing solutions			
<b>Technology</b>	<b>Gravity flipping Gravity dispensing</b>	<b>Automatic cage inverter system Gravity dispensing or augers system</b>	
<b>Materials</b>	<b>Free flowing bedding</b>	<b>Free and non-free flowing bedding</b>	
<b>Products</b>	 <b>BHS</b> STAND ALONE IN-LINE DISPENSER	 <b>BHS</b> IN LINE DISPENSER WITH CAGE INVERTER	

## Expertise and Standard Features

The IWT automated solutions are products created by an internal team of experts, consisting of designers, software engineers and R&D specialists, a team with a total commitment and focus in developing automation. The **full in house process** is considered crucial to guarantee the efficacy and reliability of these systems, fundamental to the tailor made outcomes that meet the high demands of lab animal applications, essential to grant post installation service and prompt response times.

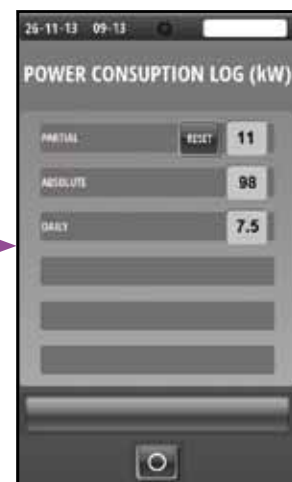
Some of the complementary services are:

- **3D design:**  
all the solutions are fully engineered via 3D modeling of each single component, allowing every system to be a unique fit to the specific project;
- **Real integration and internal commissioning:**  
IWT entirely produce the full range of products to form an automated system that provides a total integrated solution without outsourcing. Every single system is assembled and made operational in the IWT facility at the end of production for internal testing. We also welcome client factory acceptance testing and pre-install customer training. All washers, bedding handling systems and robots are fully tested, functioning and integrated in order to verify all operations and, once on site, guarantee the smoothest and quickest installation and hand over possible;
- **Throughput and Return On Investment analysis:**  
support to provide pre-sale analysis of the cage wash area workload and customised ROI for budget funding and project justification.



Some of the embedded features are:

- **eMeter:**  
a dedicated feature to allow monitoring of the most common utilities such as electrical consumption;
- **LiteView:**  
an outstanding and unique tablet application to control the automation system wherever you are. Monitor the machines, set parameters and send messages directly to the equipment HMI;
- **Teleservice:**  
a specific functionality which allows IWT to directly connect via internet (with your permission) to accelerate and simplify the troubleshooting activities.



## 1/Introduction

The IWT Screw conveyor waste disposal system and BDS+ with remote loading system are specifically designed for small to medium size lab animal facilities with the aim to increase operational efficiency.

The integration of a mix of well-known technologies (shredder, laminar flow, augers and vacuum generators), allows us to guarantee a proven solution for material disposal and dispensing. All combined in a very small footprint, providing enhanced operator protection and labour reduction. The systems comply with local regulations (ATEX 94/9/CE Atmospheres Explosive Directive, NPFA 499/68/69/70/77/654/61)

## 2/Screw Conveyor: Dirty Side System

The screw conveyor waste disposal system is suitable for applications where the waste bin is within 5m (16ft). The operator dumps the soiled material onto a selfcleaning belt which automatically transfers it into the shredder funnel. The fine shredded particles fall by gravity onto the lower conveyor belt which continuously feeds the screw conveyor (AISI 304). The latter, in turn, deliver the waste material into an adjacent room dropping the waste into a bagged bin, dumpster or compactor. A user-friendly control panel informs the operator about the system conditions, a compact electrical cabinet housing the PLC completes the system. The solution is able to **process all types of bedding** (corn, wood or cellulose based) **and the most common enrichment and nesting materials** (wooden blocks, cardboard tubes, etc...). Consult us for your specific requirements.

## 3/BDS+ with Remote Loading: Clean Side System

The BDS+ as a stand alone system for bedding dispensing has been developed and improved upon over a number of years. Now by **utilising the pure vacuum technology** within the standard BDS+ we can convey the bedding from a remote loading hopper, this offers truly unique flexibility. From a storage room nearby, (up to 5 m -16 ft away) it is possible to convey the bedding through the connecting pipe run, avoiding storage of bags next to the unit and optimizing space and flows in already busy washing areas. This **combined with large bulk bedding bags**, offers **outstanding efficiency** generating long buffer times and **important savings** of up to 15%, due to reduced bedding and labour costs. The manual hoist, to work in conjunction with the system, is designed to fit existing buildings with low ceiling height (below 2.5 m - 8.2 ft) making, once again, the solution outstanding for renovation projects.

## 4/Operator Protection

Operator protection from dust and allergens is an **essential feature** of both screw conveyor systems and the BDS+. When bedding materials are dispensed or disposed the **integrated back draft hoods**, inclusive of a double level of filters (G4+F7) and HEPA filtration (H14) for the dirty side applications, **draw allergens and particles away from operators**. A suction point at waste bin level is also provided as an option to enhance protection when bag changes are performed.



## Introduction 1



## Screw Conveyor: Dirty Side System 2

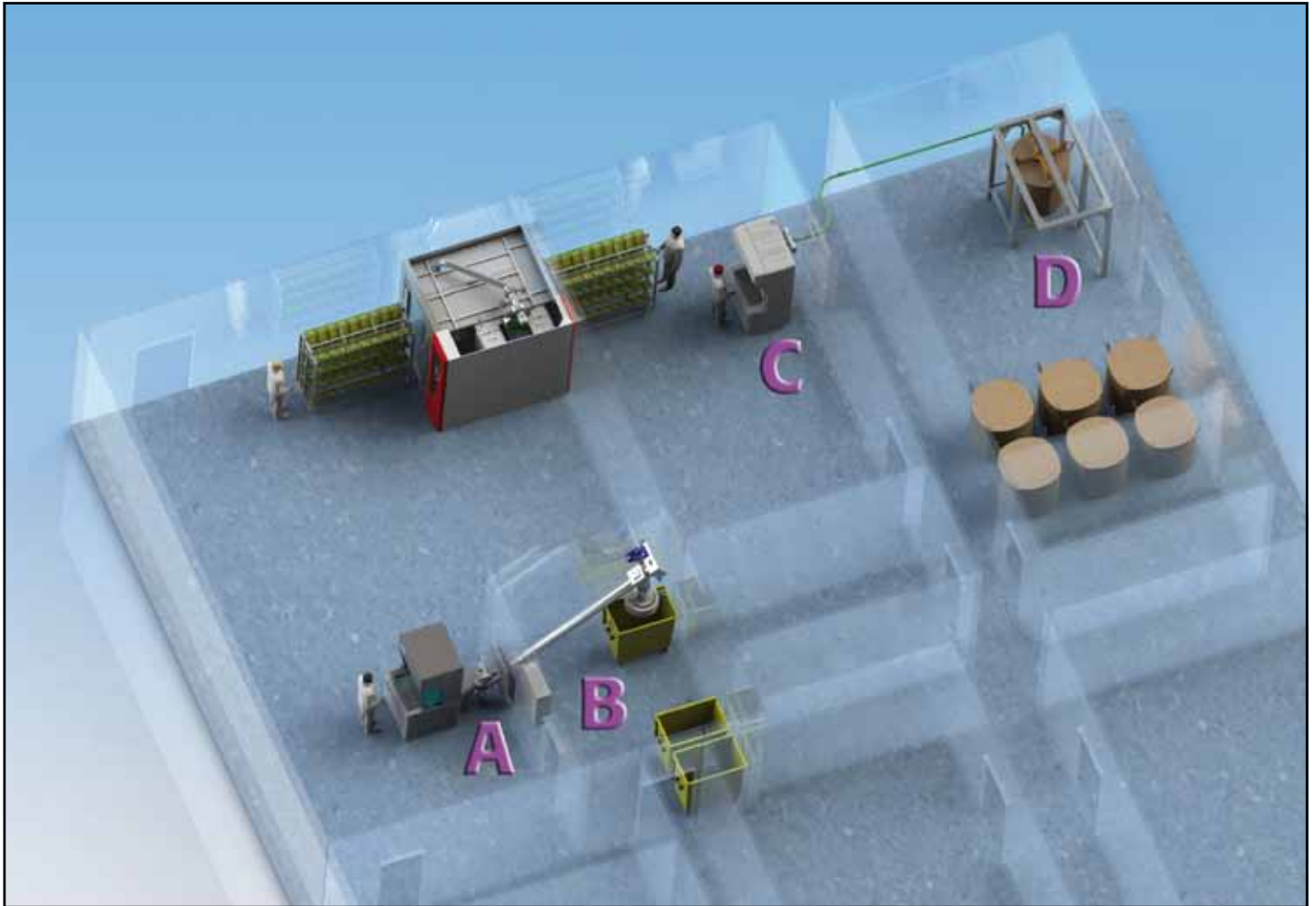


S/S Auger



Shredder

**Screw Conveyor & BDS<sup>+</sup> with Remote Loading - Up to 7000 Rodent Cages/Week, Up to 5 m (16 ft)**



**BDS<sup>+</sup> with remote loading: Clean Side System**

**3**



*Dispensing Point*



*On-board Vacuum Pump*



*Operator Interface*

**Operator Protection**

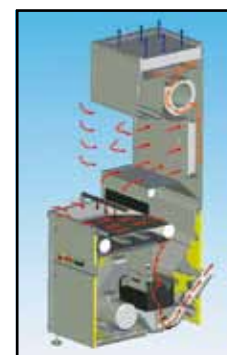
**4**



*BDS<sup>+</sup>: Back-draft Hood*



*Screw Conveyor: Bin Suction Ring*



- Soiled shredder bedding/air max
- Environment air
- Pre-filtered air
- HEPA filtered air

*Screw Conveyor:  
Back-draft Hood (DS36M)*

## 1/Introduction

The IWT EasyBHS Systems are specifically designed for small to medium size lab animal facilities and are particularly useful for challenging renovation applications. Like the centralized bedding handling systems, they use a combination of proven technologies (shredder, laminar flow, mechanical mixing and vacuum generators) to ensure a reliable material disposal and dispensing, reducing labour and enhancing operator protection.

The systems comply with local regulations (ATEX 94/9/CE Atmospheres Explosive Directive, NPFA 499/68/69/70/77/654/61) and the vacuum pumps, which have fixed dimensions, are always managed via inverter. Inverters allow the pump speed to vary and match the specific requirements of a given project in terms of air-speed/air-flow resulting in low electrical consumption and greater efficiency.

## 2/EasyBHS: Dirty Side System

The EasyBHS dirty side system is suitable for applications in rodent animal facilities only, with a workload of about 7000 cages to be processed a week and distances ranging around 38 m (125 ft).

The disposal station remains at the heart of the design solution, exactly as per the centralized system, pre-treating the waste material prior to vacuum transfer. The key features such as the fine shredding of the material, the heat generation to reduce humidity, and the conveyor belt to regulate the volumes and flow of materials into the system all contribute to make this the most reliable entry level solution on the market.

The EasyBHS system is able to process all types of bedding (corn, wood or cellulose based) and all the common enrichment and nesting materials (wooden blocks, cardboard tubes, Enviro-dri, Isopads, etc...) and the patented pre-filtration is still available to enhance filter life-span in the case of fibrous materials applications.

A very compact all-in-one technical area reduces space requirements and simplifies installation activities, this combined with a very short cyclone separator (below 2.5 m - 8.2 ft) for the EURO bin operation make the EasyBHS system the perfect choice for any refurbishment project. Negative containers or open dumpsters are also possibilities for waste collection.

## 3/Easy BHS: Clean Side System

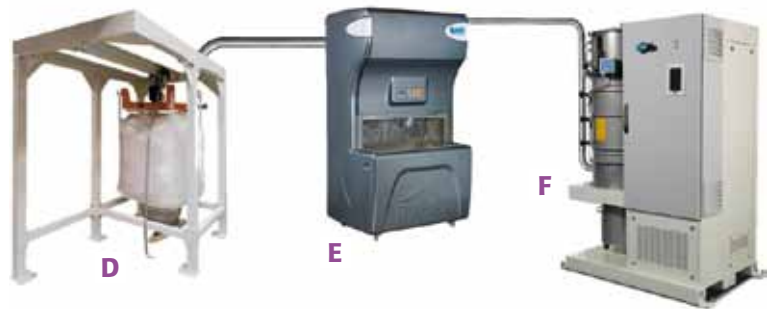
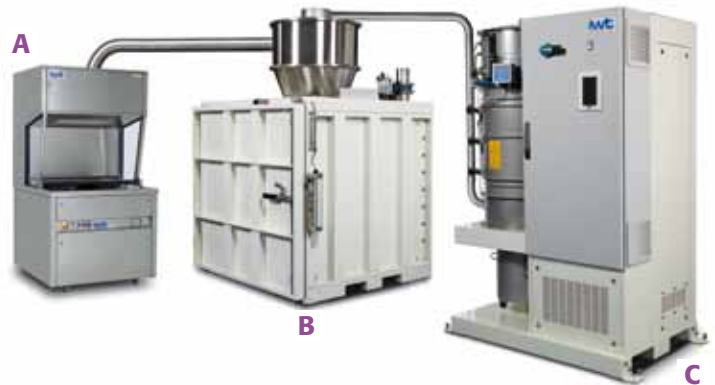
The EasyBHS clean side system is purposely designed for fresh bedding dispensing in facilities with a maximum of 10.000 rodent cages and with distances of up to 48m (157ft) between the clean bedding store and the dispenser. Multiple dispensing solutions are available from off-line dispensers with two dosage points to in-line dispensers for tunnel washer applications (see dedicated section), gravity dispensing technology for all freeflowing materials or mixer/augers for light bedding scenarios. A modular loading hopper suitable for both small bedding bags or tote bags can be combined with an optional intermediate silo to achieve outstanding buffer capabilities. The intermediate silo and manual hoist for large bulk bags can fit within low ceiling heights (2.5m - 8.2ft) and the combination of the two means a buffer for over 5.000 mice cages. The system and its small footprint makes it so easy to be installed in any new or existing facility.

## 4/Operator Protection

Protecting staff properly from dust and allergens generated when bedding is dispensed or disposed is an essential feature of EasyBHS.

Integrated back draft hoods, with a double layer of filters (G4+F7) and HEPA filtration (H14) for the dirty side application, draw air, allergens and dust particles away from operators, guaranteeing them protection. Suction points within critical bedding handling zones such as the waste collection bin are also provided.

### Introduction



### EasyBHS: Dirty Side System



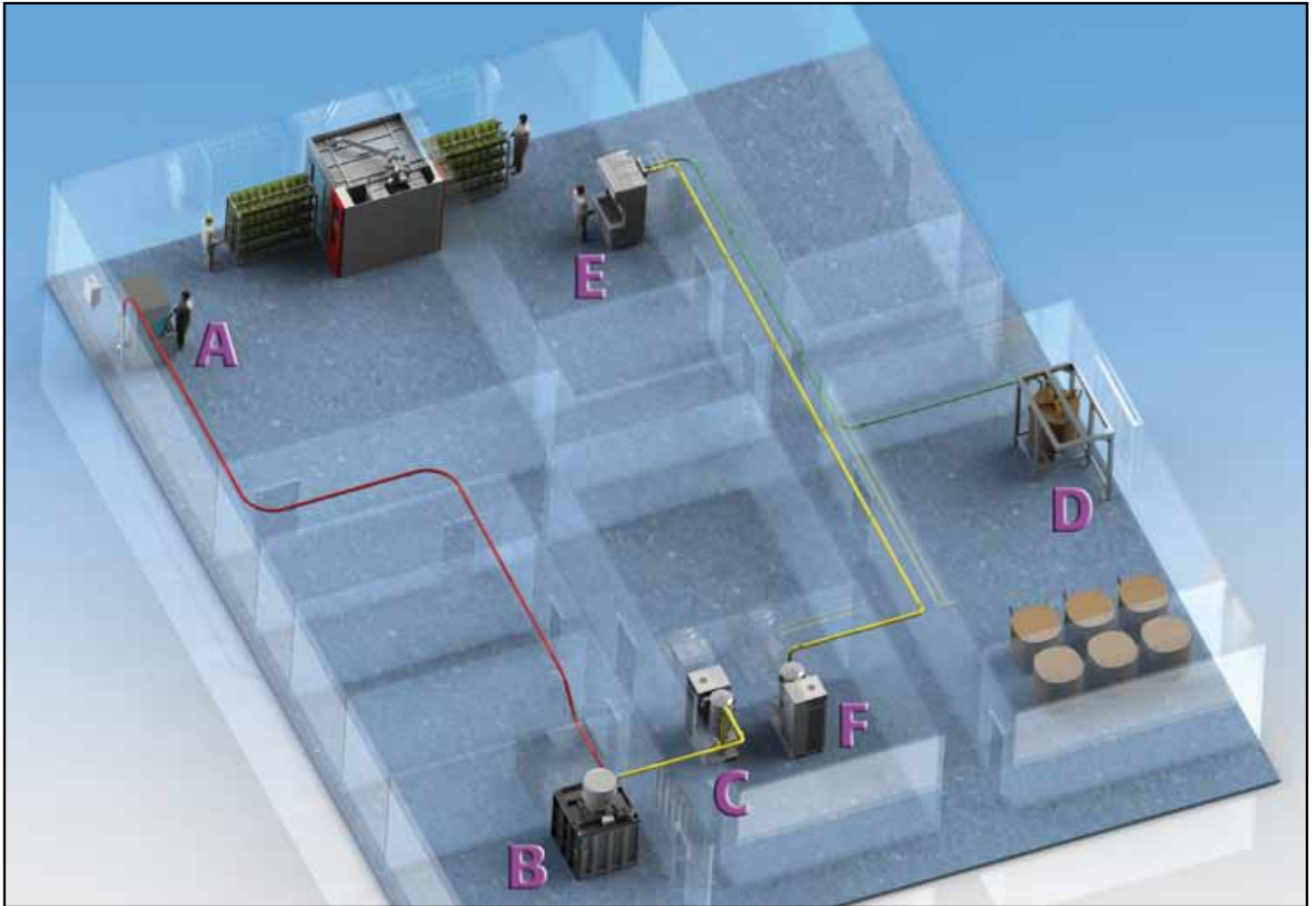
Pump, Filters & Control Box

Bin Container



Shredding Process

**EasyBHS - From 7000 to 10000 cages/week, dirty side up to 38m (125 ft) - clean side up to 48m (157 ft)**



**Easy BHS: Clean Side System**

**3**



*Dispensing Point*



*In-line dispenser*



*Operator Interface*

**Operator Protection**

**4**



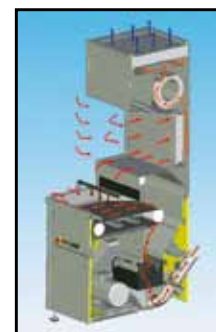
*Back-draft Hood*



*Bin Suction Ring & Max Level Sensor*



*Back-draft Hood (DS36M)*



- Soiled shredder bedding/air max
- Environment air
- Pre-filtered air
- HEPA filtered air

## 1/Introduction

The IWT centralized bedding handling system, specifically designed for vivarium applications, is a highly reliable automated system using a combination of proven technologies (shredder, laminar flow, mechanical mixing, vacuum generators and augers) to ensure total smooth and simple material disposal and dispensing, cutting operator exposure and effort to a minimum. Regardless of the distances involved (horizontal or vertical), the animal models and cage count, the system is easily dimensioned to fit every specific requirement.

The system, entirely made in S/S 304, is purposely configured so as to be compatible with different local waste management systems, to comply with local regulations (ATEX 94/9/CE Atmospheres Explosive Directive, NPFA 499/68/69/70/77/654/61) and with various approaches to the storage and handling of clean bedding.

Vacuum pumps are managed via inverter resulting in low electrical consumption and great efficiency thanks to the perfect association between pump speed and air-speed/air-flow in the different phases of the operation.

## 2/Dirty Side System

Key aspect of the dirty side system is the disposal station design where the material pre-treatment occurs.

The fine shredding prevents clogging upstream during conveyance since the material is rendered uniform in size and volume, moreover the heat generated by the shredder blades themselves is transferred to reduce the humidity of the wet bedding. A conveyor belt feeds the shredder chamber with the double benefit of granting operator protection and regulating the dose of the disposal operation no matter how much material is discharged.

The volume and flow is controlled automatically by the system to ensure a ratio in the pipeline between material and air of 20% and 80%.

The IWT system is able to process all types of bedding (corn, wood or cellulose based) and all the common enriching and nesting materials (wooden blocks, cardboard tubes, Enviro-dri, Isopads, etc...), a patented pre-filtration is also available to enhance filter life-span where fibrous materials are involved.

Different waste collection solutions are available, a choice of standard EURO bins or negative pressure containers can be sized to match the requested daily or weekly buffer.

## 3/Clean Side System

Multiple dispensing solutions are available, from single to four dispensing points, via gravity technology for the free-flowing material or via mixer/augers for light bedding applications. The mixer/auger technology, with an error margin below 5% is also available for freeflowing bedding, such standardization favours experimental conditions and the reduction of material waste (with a consequent reduction in costs).

Different storage solutions are available in terms of loading hoppers and intermediate silos to achieve daily or weekly buffer capacities.

Facilities adopting tunnel washers often require an in-line dispenser, IWT is providing such systems with different technologies for cage inverting, fully automated thanks to the patented cage inverter or via conventional gravity flipping.

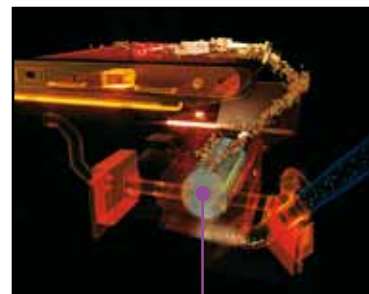
## 4/Operator Protection

The operator works entirely in front of the horizontal laminar airflow. As a result a high degree of air cleanliness is achieved within the whole breathing zone. Airflow control and suction points within critical bedding handling zones such as the waste collection bin are also provided in order to protect the operator against exposure to dust, allergens and any sort of airborne contaminant generated during dispensing, dumping and scraping.

### Introduction



### Dirty Side System



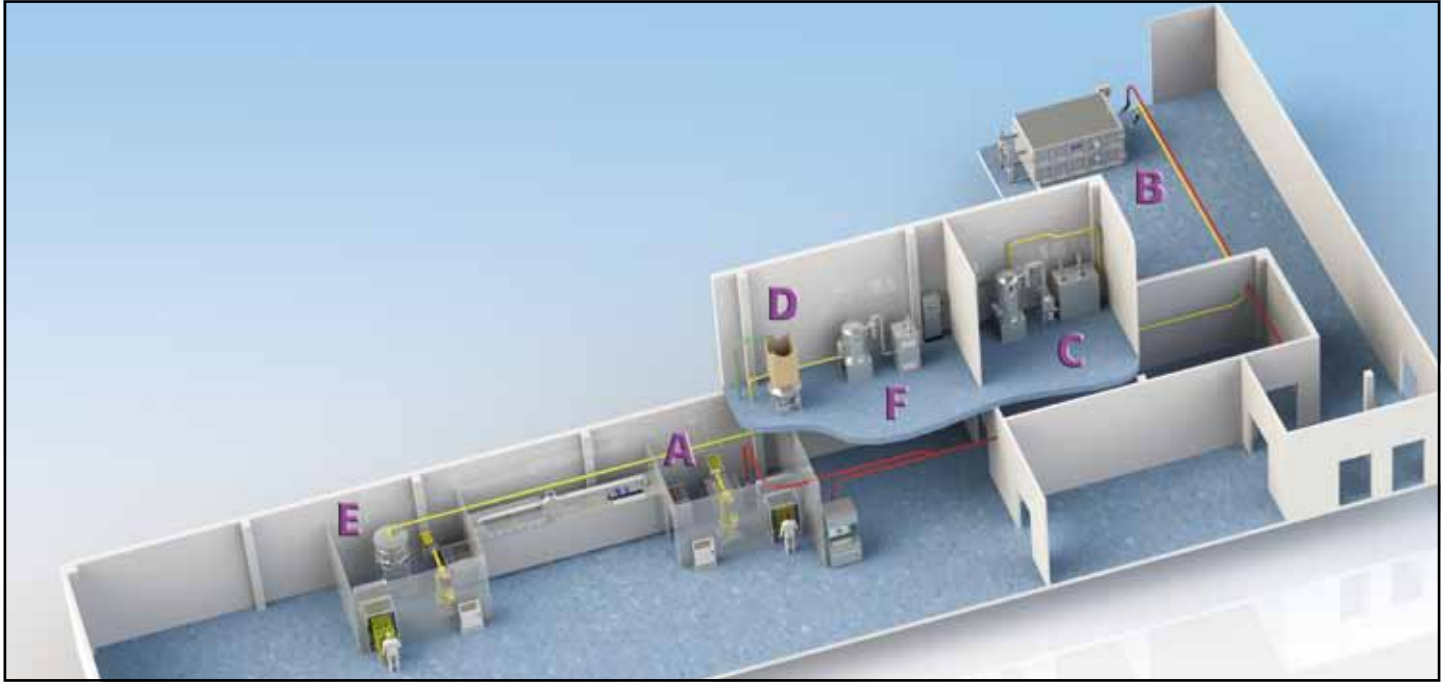
Shredder & Conveyor Belt



Environmental Enrichment



**Centralized Bedding Handling Systems - Every Cage Count & Animal Model, Every Distance Admitted**



**Clean Side System**

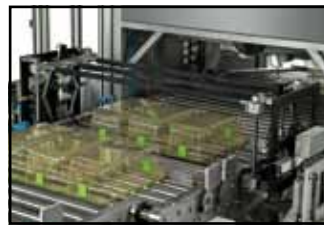
**3**



*Dispenser Via Mixer/Auger*



*In-Line Dispenser with Cage Inverted (Patented)*



**Operator Protection**

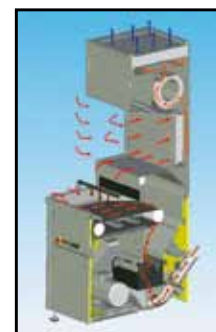
**4**



*Suction Rings*



*Back-draft Hood (DS36M)*



- Soiled shredder bedding/air max
- Environment air
- Pre-filtered air
- HEPA filtered air

## 1/Introduction

The IWT in-line dispensers are designed to cope with high throughput demands of busy washing areas. The dispenser can be configured for use with any tunnel washer either with or without the integral cage inverter and through the correct selection of dosing technology **achieve consistency and accuracy** of materials in every cage. The systems can be easily integrated, following feasibility studies, with any tunnel washer, existing or new, regardless of the manufacturer. The dispensers can be **refilled from remote areas by mean of a vacuum system** (IWT EasyBHS, IWT Centralized Bedding Handling System or third party system) **or they can behave as stand-alone units** featuring an on-board vacuum and filtration system to draw material from up to 5m(16ft) distance. The systems, entirely made in S/S 304, are purposely configured so as to comply with local regulations (ATEX 94/9/CE Atmospheres Explosive Directive, NFPA 499/68/69/70/77/654/61) and with various approaches to the storage and handling of clean bedding.

## 2/In-line dispenser with cage inverter

The cage inverter is a patented device designed to achieve the best consistency for inverting cages coming out on the tunnel washer. Different mice and rats cages are perfectly inverted with **unprecedented consistency and reliability** by mean of an automatic gripper. The clean cage arrives at the motorized conveyor, the cage is drawn into the cage inverter, turned upside down and, if required, realigned to be perfectly presented for the dispensing phase. Gravity or auger dispensing gives the **flexibility to process different type of bedding** ranging from free-flowing materials to non-free flowing ones. The cages under the system are properly refilled with the right amount of bedding, single dosage point for single cage (up to 4 dosage points) with automatic detection of cage presence. The cage inverter, working at tunnel washer height, allows the **operator to collect the fresh cages** at the end of the line **in the best ergonomic position**.

## 3/Stand alone In-line dispenser

The stand alone in-line dispenser is designed to **simplify and improve efficiency** in cage refilling at the end of the tunnel.

Cages, automatically inverted by mean of gravity flipping at the end of the washer, are gradually moved toward the dispensing points by mean of S/S roller conveyor. The fresh bedding is then dispensed into each individual cage via dedicated dosage mouths, maximizing accuracy and minimizing material waste.

**Up to 4 mice cages are dispensed in a single shot** and all free flowing bedding material can be processed.

## 4/Operator Protection

The in-line dispensers can be provided with an **allergen control kit** inclusive of suction ring technology **to contain dust particles at dosage point level** and prevent operator exposure. The dust collected is filtered by the centralized vacuum system, if available, or by an on-board filtration unit in case of stand-alone applications.



### Introduction



### In-line dispenser with cage inverter



Motorized conveyor



Unloading buffer



Cage Inverter (Patented)

*In-line dispensers – Connected to centralized vacuum system or stand-alone version*



*Stand alone In-line dispenser*

**3**



*On-board vacuum pump and inverter*



*Compact footprint*

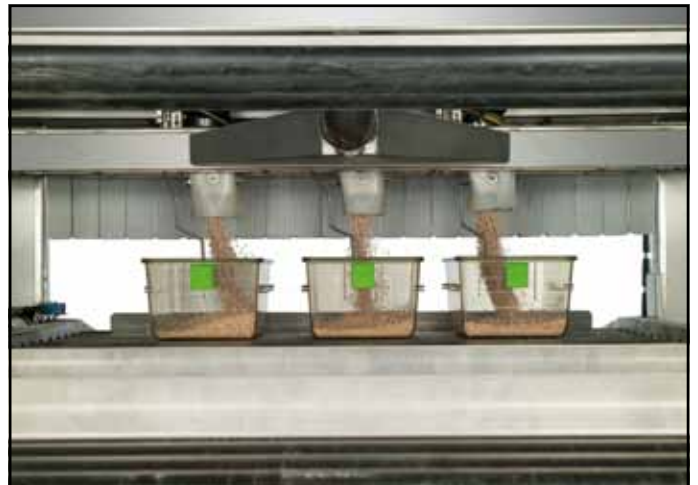


*Operator Protection*

**4**



*Stand alone in-line dispenser:  
dosage points with suction ring*



*In-line dispenser with cage inverter:  
dosage points with suction ring*

## Related Products

To maximise operational efficiency and learn more about these products contact your local representative.



**Atlantis Rack Washer:** designed specifically to meet the throughput needs of medium to large size facilities, these machines will live up to your highest expectations in terms of maximum cleaning efficiency, safety, environmental impact and quality construction.



**Tunnel Washer GP:** lowest water and energy consumption in the industry, high throughput and environment-friendly.



**Pegasus:** the most reliable, versatile automated cage processing system for modern laboratory animal facilities housing large numbers of valuable rodents.



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