



# IVC

## Sealsafe™

### INDIVIDUALLY VENTILATED CAGES

# Safety & Practicality of use



**TECNIPLAST®**

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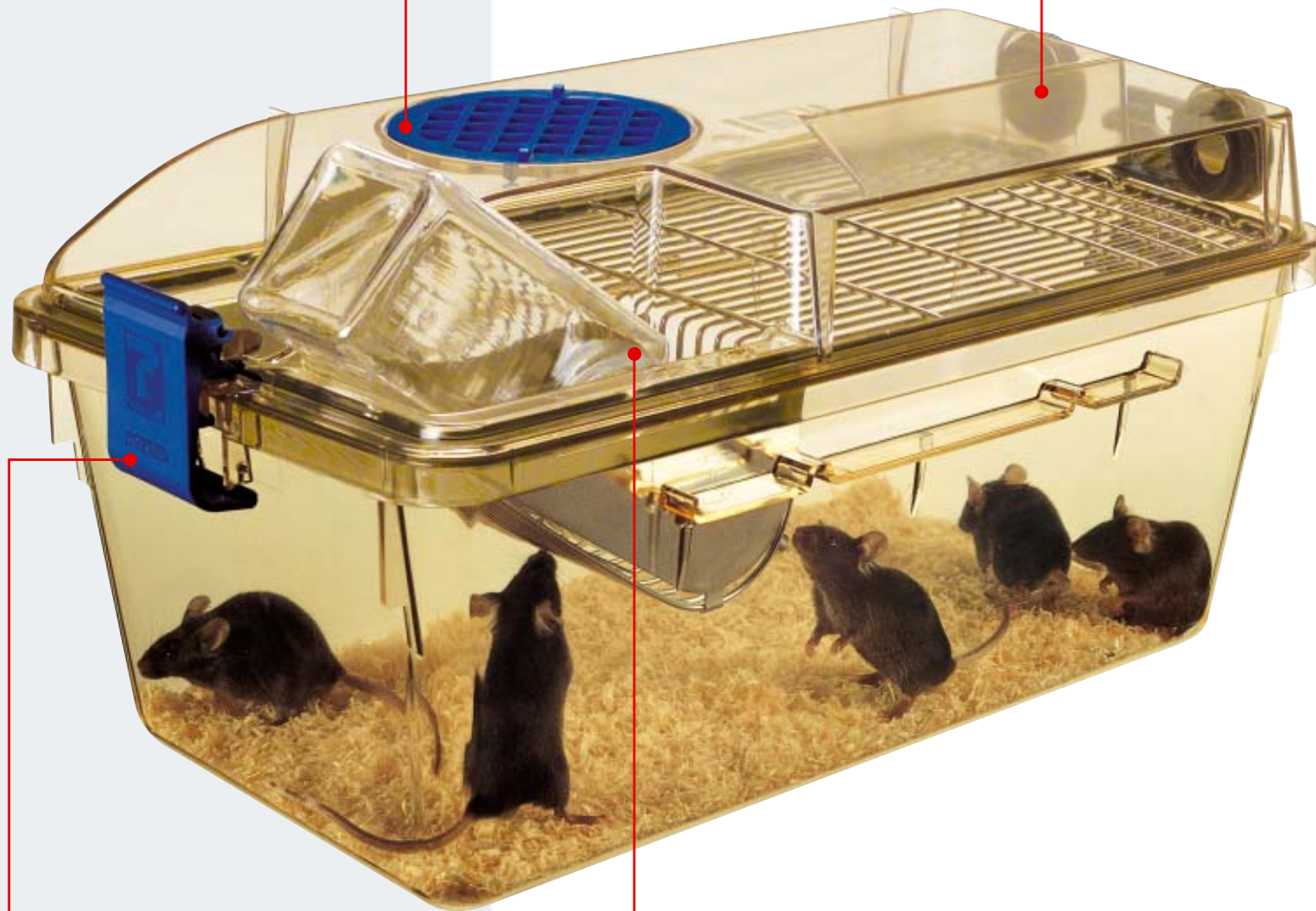
**TECNIPLAST®**

# THE Sealsafe™ CAGE

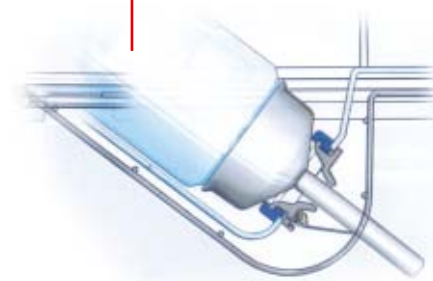
The TECNIPLAST Sealsafe™ Individually Ventilated Cage (IVC) sets the standards by redefining at cage level the well proven air pressure barrier concept.

The filtered▲ Sealsafe™ top.

Self-closing supply air valve assures containment integrity and low speed air diffusion into each cage (< 0,15 m/s)\*.



The specially moulded Nylon Seal and the quick release clamps ensure a secure seal between the top cover and the cage base; the clamps are user friendly and well proven over many years.



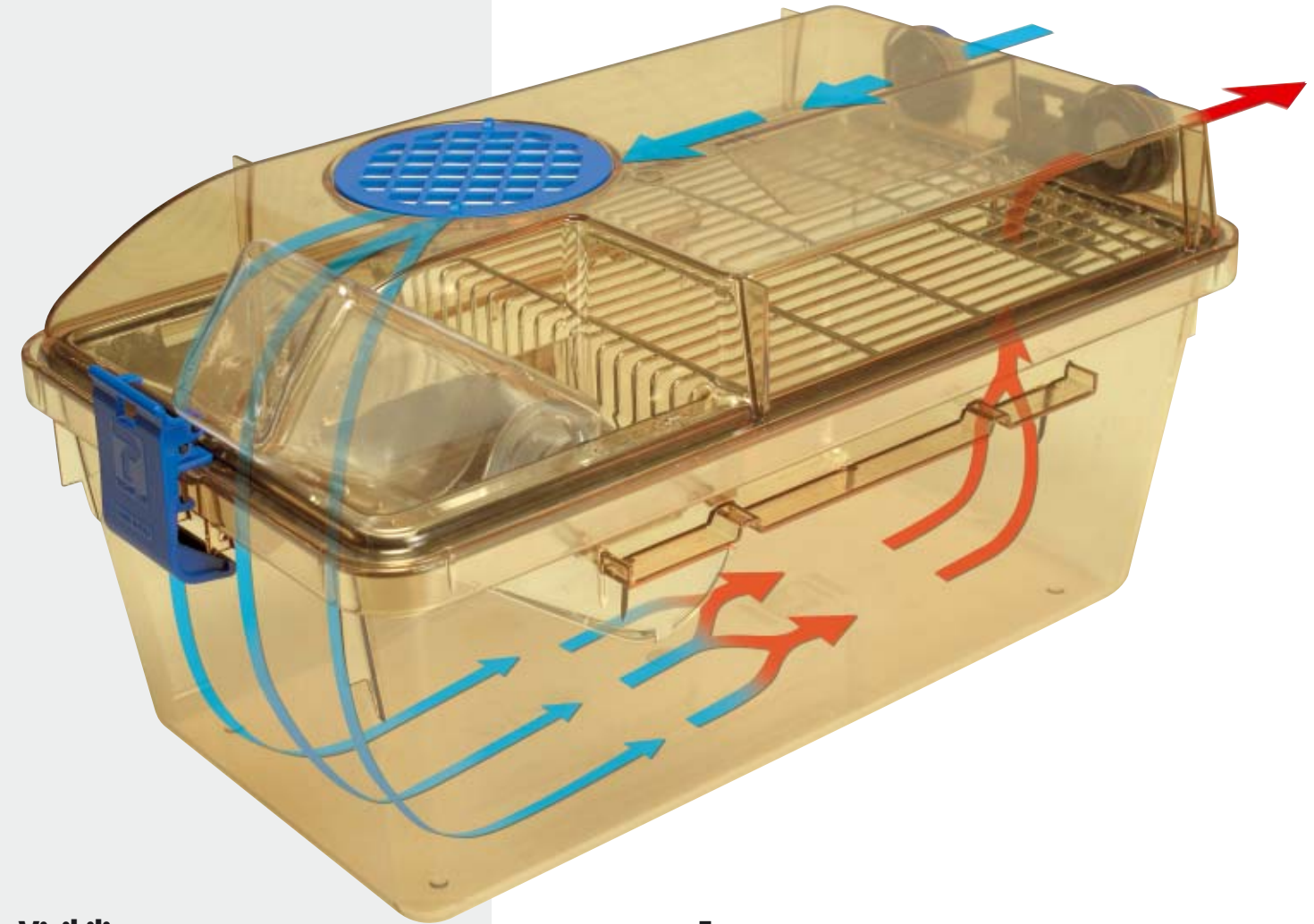
The integral bottle depression accommodates an external water bottle replaceable without removing the cage from the rack and within the overall IVC rack footprint minimising cage opening frequency. The external bottle offers a significant decrease in labour and reduced exposure to contamination during changing.

▲ The 0,2 µ PALL aerosol bacteria barrier filter limits animal exposure to CO<sub>2</sub> levels in absence of ventilation without the need of a battery back-up system.

## Ventilation efficiency with low velocity Air Speed\*

Low velocity HEPA filtered air is delivered to the cage top level through a self-closing valve when docked in position on a Sealsafe™ rack. The cage valve diffuser and the baffle direct the air along the top, avoiding any short cut, to the front of the cage and finally down creating a gentle back flow\* at bedding level on the way back to the exhaust.

Direct exhaust from the cage provides enhanced ventilation efficiency; as a result temperature and humidity are controlled. Bedding stays drier reducing ammonia levels and extending the interval between changes without the need of air inlets at animal level.\*\*



## Visibility

The clear Sealsafe™ top provides excellent visibility into the cage and increased animal space because of the limited bottle/diet depression volume.

## Easy access

Wire bar lid and Sealsafe™ top can be easily pushed and pulled with one hand for a quick access to cage occupants in constrained space such as changing stations. Watch our cage changing video at: [www.tecniplast.it/avi/mice.mov](http://www.tecniplast.it/avi/mice.mov)



\* TÜV performance validation: examination of air distribution/velocity, flow conditions and sound level in animal cages, TÜV SÜDDEUTSCHLAND, January 2000, München.

\*\* Intra-cage ventilation and micro-environmental parameters in an IVC Sealsafe™ caging system, Gianpaolo Milite, D.V.M. M.Sc., September 2000, Milan.

# THE Sealsafe™ FAMILY

## 4 cage sizes for all housing needs

For Tecniplast cages compliance with International Guidelines visit our website: [www.tecniplast.it/equipment.php](http://www.tecniplast.it/equipment.php) or ask for our catalogue "Equipment for Small Animals".



### 1500U

(Euro-standard Type IV S) featuring 1500 cm<sup>2</sup> floor area; suitable for accommodating rats in groups or breeding pairs. Overall dimensions: mm 480 x 375 x 210 ht



### 1291H

(Euro-standard Type III H) featuring 800 cm<sup>2</sup> floor area; suitable for accommodating either mice or rats. No need for multiple food and water components but the SAME CAGE, the SAME wire bar lid, the SAME top, the SAME water bottle and the SAME rack for all your rodents changing requirements. Overall dimensions: mm 425 x 266 x 185 (210\*) ht



### 1145T

A shoe box cage type which allows up to 30% extra cages in the same rack footprint when compared to other sizes such as Type II long or similar. The floor area of 435 cm<sup>2</sup> permits housing four mice or more depending on body weight. Overall dimensions: mm 369 x 156 x 132 ht

### 1284L /1285L\*\*

(Euro-standard Type II L) cage size featuring 530 cm<sup>2</sup> floor area; ideal for experimental and stock groups of 4 mice or more, breeding pairs and trios. Overall dimensions: mm 365 x 207 x 140 ht.

1285L overall dimensions: mm 365 x 207 x 130 ht; floor area 542 cm<sup>2</sup>. The reduced internal height of the cage allows to reduce the space in height between the cages and consequently the total height of the 9-row racks which are indicated as -MAC35, thus improving the ergonomics of these pieces of equipment.

TECNIPLAST IVCs are made to withstand repeated handling, washing, disinfecting and contact with animal waste.

Available in the following materials:



H-Temp™ High Temperature Polysulfone (PSU) is a transparent\* plastic highly resistant to alkaline, acid detergents and steam additives. Even after repeated autoclaving it maintains clarity and strength assuring a long life span and good return on investment. Autoclavable up to 150°C (302°F).

\* Excellent visibility into cages with 80% light transmission reducing animal exposure to excessive lighting.



U-Temp™ is a super heat resistant transparent amber Polyetherimide (PEI) plastic with a good impact strength. Autoclavable up to 160°C (320°F). Because of the superior hydrolytic stability and resistance to most acid and basic solutions, even after 1000 hours of autoclaving at 134°C maintains good impact strength and transparency. Recommended where boiler additives contaminate steam provided by a central generator plant. The remarkable long life and performance of this material make U-Temp™ cages the right choice for long term economy.

\* Good visibility into cages with 65 % light transmission reducing animal exposure to excessive lighting.

**\* NO RELEASE OF BISPHENOL A** even after repeated washing and autoclaving cycles!  
Read the article "Bisphenol A in Lab Animal Caging Materials" at [www.tecniplast.it/panorama/panorama11.pdf](http://www.tecniplast.it/panorama/panorama11.pdf)

## Physical properties of TECNIPLAST IVC plastic materials

### Thermal properties

Material	Code	Suggested autoclaving Temp. °C	HDT °C <sup>(1)</sup>	Water Absorption <sup>(2)</sup>	Transparency	Rigidity	Sterilisation <sup>(3)</sup>				
							Autoclave	Radiation	Gas	Dry-heat	Disinfection
H-Temp <sup>(4)</sup>	PSU	134	165	0,30	Clear	Rigid	Yes	Yes	Yes	No	Yes
U-Temp <sup>(5)</sup>	PEI	134	210	0,70	Clear/Amber	Rigid	Yes	Yes	Yes	Yes	Yes

- (1) Heat Deflection Temperature is the temperature at which a bar of the thermoplastic will deflect 0.01" under 66 psi. Due to stress influences, rigid plastics should NOT be exposed to such heat levels.
- (2) Water absorption: the % of water absorbed by a 3.175 mm (1/8") sample over 24 hours exposure.
- (3) Sterilisation:
  - Autoclaving: 121°C (250°F) for 20 minutes - clean and rinse items with softened water before autoclaving.
  - Certain chemicals which have no appreciable effect on plastics at room temperature may cause deterioration at autoclaving temperatures unless removed with softened water before.
  - Gas: Ethylene Oxide, Formaldehyde, Hydrogen Peroxide.
  - Dry Heat: 160°C for 120 minutes.
  - Radiation: gamma irradiation at 25 kGy (2.5 Mrad) with non-stabilised plastic;
  - Disinfectants: Benzalkonium Chloride, Formalin, Formaldehyde, Ethanol.
- (4) H-Temp™ is a TECNIPLAST trademark for Polysulfone. Compared to standard PC (Makrolon) this material can be exposed to autoclaving cycles up to 150°C max.
- (5) U-Temp™ is a TECNIPLAST trademark for Polyetherimide. Compared to PSU and PC this material can be exposed to autoclaving cycles up to 160°C max for a longer time whilst maintaining initial transparency and impact resistance.

### Chemical Resistance Classification:

- E=Excellent 30 days of constant exposure cause no damage. Plastic may even tolerate for years.
- G=Good Little or no damage after 30 days of constant exposure to the reagent.
- N=Not Recommended Not for continuous use. Immediate damage may occur. The effect will be a more severe crazing, cracking, loss of strength, discoloration, deformation.

### Chemical Resistance

Classes of Substances at 20°C:	H-Temp™ PSU	U-Temp™ PEI
Acid detergents	E	E
Alkaline detergents	E	E
Rinse Aids	N	E
Oxidant agents, strong	G	E

This Chemical Resistance Summary Chart is a general guide only. As many factors can affect the chemical properties of a given product, you should test under your own conditions. If any doubt exists about specific applications of TECNIPLAST products, please contact TECNIPLAST Technical Service at [tecnicom@tecniplast.it](mailto:tecnicom@tecniplast.it).

\*Code of Practice for the Housing and Care of Animals used in Scientific Procedures. Home Office Animals (Scientific Procedures) ACT 1986.  
\*\* See table at page 7.

# THE TouchSLIMLine™: MATHS FREE AIR HANDLING UNIT

Whether seeking safety and practicality of use, the unique Sealsafe™ concept offers a dual level of protection never previously achieved at cage level.

The TouchSLIMLine™ is a SlimLine™ fitted with a microprocessor-controlled touch screen which adapts the speed of both Supply and Exhaust blowers and features in built Temperature and Relative Humidity sensors.

Simply set the Number and the Type of cages and the required Air Changes per Hour (ACH), and the TouchSLIMLine™ automatically controls the in-cage air flow as well as monitoring and displaying all data in real time.

The TouchSLIMLine™ can signal a number of alarms: Minimum and Maximum Supply Flow, Exhaust Flow, Pressure, Temperature, and Relative Humidity %. All alarm thresholds are easily set by the operator.

In the event of system malfunction operators are alerted by a visual alarm and remote control dry contacts communicating with the BMS.



Thimble connection (ACBOX14)

The twin fan modules supply up to 80 HEPA filtered Air Change per Hour (ACH) into each cage. HEPA filtered exhaust air is discharged into the room or preferably into the building extract system via a thimble connection.



The separation of the fan unit from the rack and the multiple linking configuration have demonstrated:

- compliance with safety and ergonomics requirements
- lower sound levels and no vibrations in cages
- significant increase in mobility and easy movement through doors
- lower cost per cage/rodent compared to ventilated racks with individual blowers.



Thanks to the excellent ventilation of the cage provided by the unit, it is possible to reduce the ACH of the whole room from 20/30 to 10/12, with consequent energetic and economic saving.

# THE Sealsafe™ RACK

Smart, light design for excellent visual inspection of the cage and decreased rack weight.

Cages align automatically and quietly on the Nylon suspension runners without any cage-lock system.

SS construction with round plenums for uniform air flow into every cage and simple and efficient cleaning. Recommended procedures for rack washing and assembly post washing can be viewed on our Sealsafe™ Installation Guide.

An innovative series of Silicone closures for plenums are easy to operate and maintain pressure seals.



## Multiple linking

Up to 3-4 Sealsafe™ single sided racks (see table below) can be interlinked and the TouchSLIMLine™ unit can be positioned at either one end or preferably in the middle.

Sealsafe™ racks can also be interlinked in a straight line or:

- "L" configuration leaving the TouchSLIMLine™ unit in the corner
- "T" configuration is also possible depending on room width.

(See page 8)

Sealsafe™ single sided racks allow ease of animal inspection and, depending on the procedures, also cage changing without being moved. Animals are also exposed to relatively uniform light levels.

As an alternative two double sided Sealsafe™ racks can be linked to a TouchSLIMLine™ unit; this housing configuration allows increases in room occupancy.

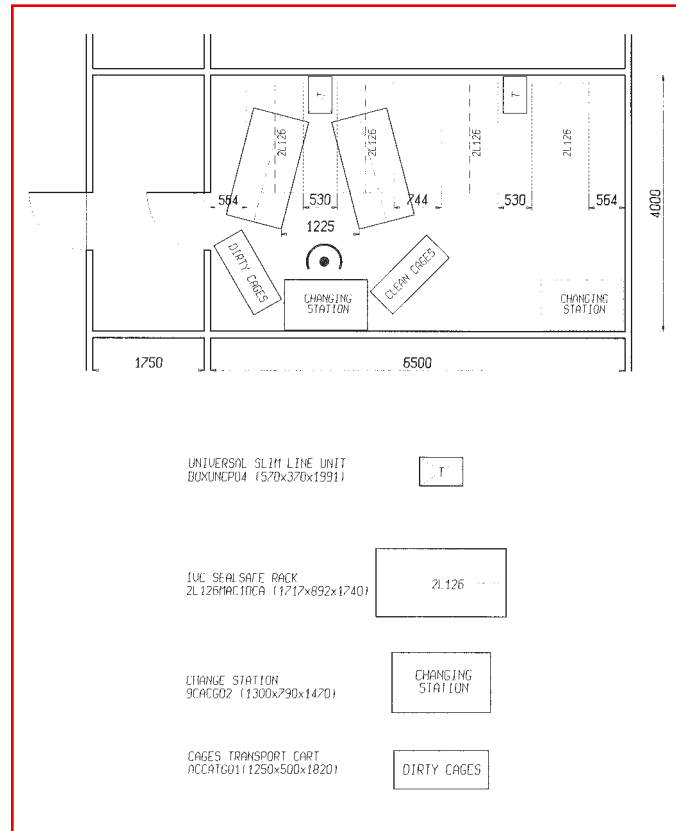
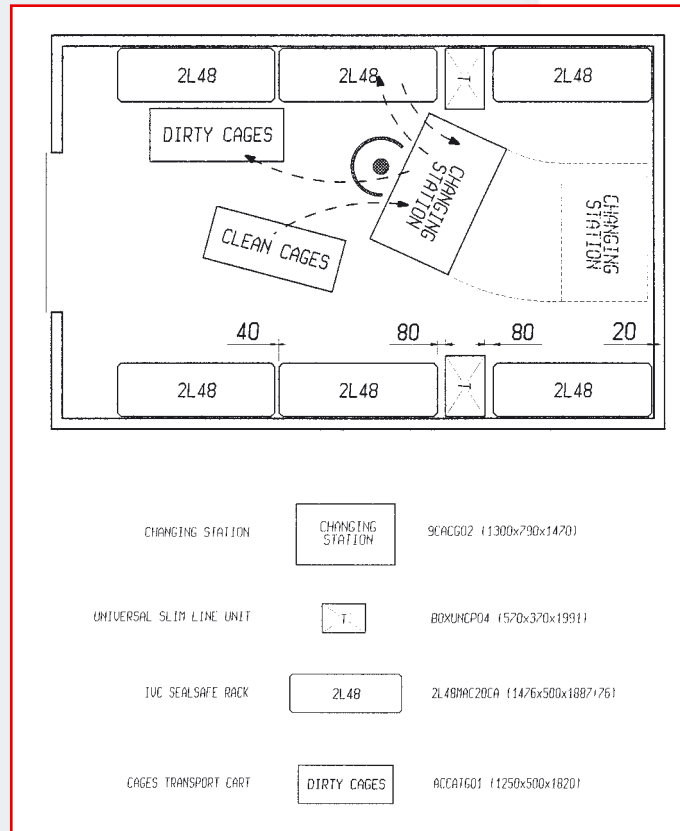
## Sealsafe™ racks are available in the following configurations:

Cage size	No of Cages	Sides	Rack	Complete Rack Weight** Kg	Overall Dimensions L x W x H (mm)	Multiple Racks per Trolley	Species
1145T	64	S	2T64MAC	187	1494 x 500 x 1898 + (78*)	3	Mouse
	72	S	2T72MAC	206	1677 x 500 x 1898 + (78*)	3	Mouse
	81	S	2T81MAC	224	1677 x 545 x 2015 + (82*)	3	Mouse
	128	D	2T128MAC	340	1494 x 888 x 1908 + (91*)	2	Mouse
	144	D	2T144MAC	375	1677 x 888 x 1908 + (91*)	2	Mouse
	162	D	2T162MAC	408	1677 x 888 x 2015 + (100*)	2	Mouse
1284L	48	S	2L48MAC	162	1476 x 500 x 1898 + (78*)	3	Mouse
	56	S	2L56MAC	182	1717 x 500 x 1898 + (78*)	3	Mouse
	63	S	2L63MAC***	199	1717 x 545 x 2015 + (83*)	3	Mouse
	96	D	2L96MAC	276	1476 x 888 x 1908 + (91*)	2	Mouse
	112	D	2L112MAC	315	1717 x 888 x 1908 + (91*)	2	Mouse
	126	D	2L126MAC***	348	1717 x 888 x 2015 + (100*)	2	Mouse
1291H	24	S	2H24MAC	139	1210 x 555 x 1880 + (73*)	4	Mouse/Rat
	30	S	2H30MAC	167	1505 x 555 x 1880 + (73*)	3	Mouse/Rat
	36	S	2H36MAC	190	1800 x 555 x 1880 + (73*)	3	Mouse/Rat
1500U	20	S	2U20MAC	152	1642 x 680 x 1860 + (103*)	3	Rat/Guinea Pig

Universal TouchSLIMLine™ air handling unit Cat. No. BOXUNCP04TCS accepts all racks. \*Quick removable horizontal supply plenum protruding above the roof of the rack. \*\*Includes: rack, cage bases, lids, tops, bottles, caps and label holders. \*\*\*USE ONLY THE 1285L CAGE SIZE (SEE PAGE 4).

# ROOM SIZE AND IVC LAYOUT

The **layouting activity** is something that Tecniplast provides as a **FREE OF CHARGE** service to suggest how to properly design layout equipments for facilities. Thanks to the **flexibility and modularity** of the system, the **IVC Sealsafe™ racks** can be laid out to fit different room shapes and constraints in order to **maximize the cage density and provide the necessary ergonomics in use.**

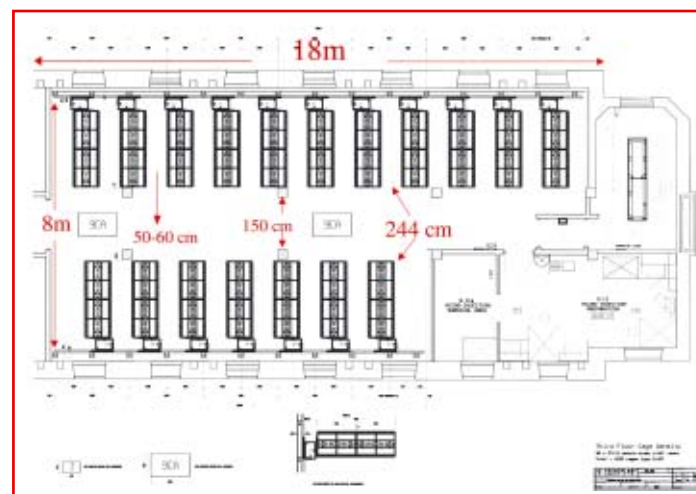


## TYPICAL Library Style™ LAYOUT

### Configurations:

Cage size	N° of cages	Sides	Rack	Overall Dimensions (L x W x H)	Species
1145T	96	D	2T96MAC	1128 x 888 x 1914 + 89	Mouse
1145T	128	D	2T128MAC	1494 x 888 x 1914 + 89	Mouse
1145T	108	D	2T108MAC	1128 x 888 x 2040 + 89	Mouse
1145T	144	D	2T144MAC	1494 x 888 x 2040 + 89	Mouse
1284L	80	D	2L80MAC	1235 x 888 x 1912 + 76	Mouse
1284L	96	D	2L96MAC	1476 x 888 x 1912 + 89	Mouse
1284L	90	D	2L90MAC***	1235 x 888 x 2040 + 89	Mouse
1284L	108	D	2L108MAC***	1476 x 888 x 2040 + 89	Mouse

\*\*\*Use only the 1285L cage size (see pag. 4)



## The Library Style™

The **Library Style™** provides gentle and quiet movement to the racks for desired positioning during cage changing.

Tecniplast's IVC **Library Style™** offers a number of advantages over traditional IVC layouts.

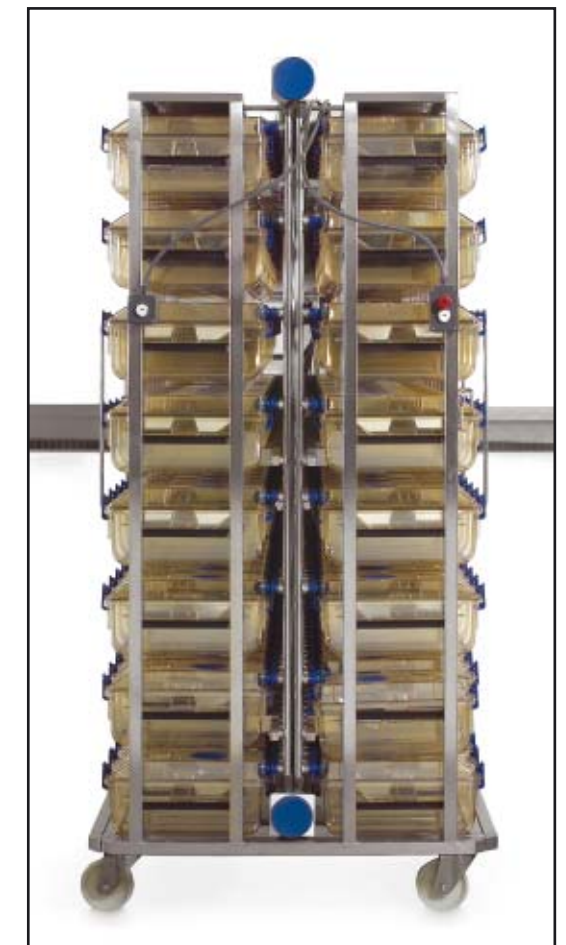
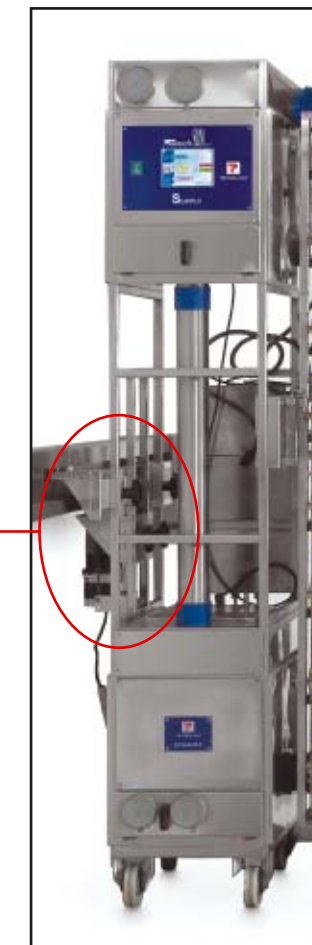
First and foremost, rack movement within the room is far easier: with reduced effort, push-and-pull movements operators can smoothly shift two double-sided racks at the same time.

While legislative requirements stipulate a maximum force for the initial effort in the region of 200 Newtons, and force to maintain movement of around 100, the **Library Style™** takes only around 120 and 60 respectively. That is only just over half in both cases!

The **Library Style™** may be fitted into rooms measuring just 8m (26') by 5m (16').

Special guide rail is fitted along the walls, with custom-built frames to hook up each Air Handling Unit (TouchSLIMline™) serving two double-sided racks. The result is optimum use of space as in document archives.

Smooth, effort-free movement is assured by the conveniently positioned handles, the simple lock/unlock devices linking rack to rack and rack to TouchSLIMline™ and the simple thimble connection to the house exhaust duct.



THE **Library Style™** IS ALSO AVAILABLE IN MOTORIZED VERSION!

Simple "One Touch" of a button initiates rack movement enhancing the ergonomics by removing any need for manual effort in moving the racks.

## IVC TRANSPORT UNIT

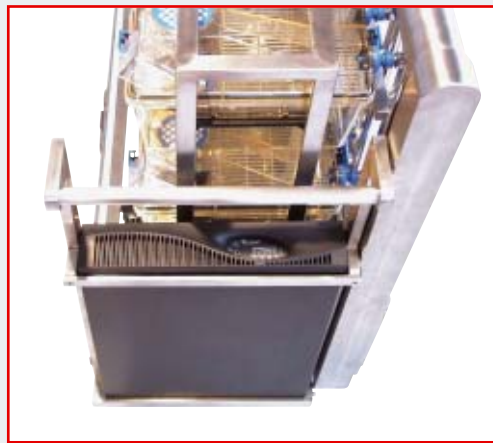
The IVC Transport Unit has been developed to move the cages from a stock/breeding rack to an experimental area and/or to move the animal groups between units, maintaining the same ventilating conditions.

It can also be used as an emergency IVC unit for a small number of animals of high value or as a waiting rack for animals under experimental procedures.

No more non-ventilated cages with animals waiting around.



The IVC Transport Unit has two blowers with pre-filter and HEPA filter on both supply and exhaust, with one fan each.



The Uninterruptible Power System (UPS), which ensures power without mains supply, is fitted vertically under the handle.

**Autonomy without extra batteries: 1 hour.**



Mini-racks on two or three levels for cages type 1145T, 1284L/1285L and 1291H may be installed.

These mini-racks are removable, autoclavable and, when at the same level, interchangeable.

Overall dimensions:  
 mm 1180 x 660 x 1198 (at two levels).  
 mm 1180 x 660 x 1292 (at three levels with cages type 1145T and 1284L/1285L).  
 mm 1180 x 660 x 1503 (at three levels with cages type 1291H).

Cage size	N° of cages	Levels	Codes	Species
1145T	10	2	2T10MAC30TT	Mouse
	15	3	2T15MAC30TT	
1284L/1285L	8	2	2L08MAC30TT	Mouse
	12	3	2L12MAC30TT	
1291H	6	2	2H06MAC30TT	Mouse/Rat
	9	3	2H09MAC30TT	

## IVC RECOVERY UNIT

The IVC Recovery Unit is a TECNIPLAST product designed to ensure a controlled temperature environment for animals during post-surgical treatment and isolation of selected weak/sick groups of animals for Veterinary inspection or treatment.



The IVC Recovery Unit has two blowers with pre-filter and HEPA filter on both supply and exhaust, with one fan each.



The IVC Recovery Unit has an enclosure made of glass which allows to see inside from all five sides and insulates the chamber thermally and acoustically.

The air inside the chamber is warmed by a heating element positioned under the lower row of cages.



The Uninterruptible Power System (UPS), which ensures power without mains supply, is fitted vertically under the handle and may be expanded with extra batteries.

**Autonomy without extra batteries: 30 minutes.**



Mini-racks on two levels for cages type 1145T, 1284L/1285L and 1291H may be installed. These mini-racks are interchangeable, removable and autoclavable.

Overall dimensions: 1180x660x1220 mm.

Cage size	N° of cages	Levels	Codes	Species
1145T	10	2	2T10MAC30RR	Mouse
1284L/1285L	8	2	2L08MAC30RR	Mouse
1291H	6	2	2H06MAC30RR	Mouse/Rat