Shivani
Enabling life through technology

We Innovate.
We Create.

IVF Lab Equipments of International Standards

Fornax

Spermfuge

Temperature Regulated Centrifuge

SF 800

Concept

SPERMFUGE is an improvised centrifuge, dedicated totally for elevating the total motile sperm recovery from the parent semen sample, by regulating the main parameter of "Temperature" which is aimed at enhancing the ART results. The instrument has been designed to regulate and subsequently maintain the "Critical" inner chamber temperature before, after and during centrifugation. By regulating the temperature through out the centrifugation, Spermfuge improves sperm motility and longevity when compared to a non-temperature regulated centrifuge, thus increasing the effectiveness of the sperm wash procedures. Also, Spermfuge may improve semen samples of infertile men with high seminal ROS. Spermfuge eliminates the existing dependency on RPM by providing the exact indication of g-force.

Acceleration and Braking

An adjustable brake is provided to prevent the rotor from stopping too quickly at the end of the run which might disturb the firmly formed pellet. One can select between 3 modes in acceleration and braking-slow mode, medium mode and fast mode on screen.

G Force

The exact indication of g-force helps the ideal sperm pellet formation by subjecting the sperm to an exact and precise amount of g-force unlike other Centrifuges where g-force is subject to RPM and the tube size. Now a days centrifugation speed is never reported in RPM as it is not reproducible. (As RPM is dependent on Rotor radius.)

Sealed Buckets

For preventing cross contamination between sample to sample and it also maintains integrity of sperm samples.

Temperature and Centrifugation

The heating range of SPERMFUGE's chamber is from 26°C to 42°C. The intelligent control system does not allow the centrifugation to commence till the set temperature is attained. However, one does have the option to commence the centrifugation without chamber heating and to commence the chamber heating without centrifugation.

Intelligent Control System

State of the art microcontroller with opto-magnetic encoder provides an intelligent control system. Digital programming via microprocessor control for various parameters including temperature, RCF and time. The parameters are displayed on a four line LCD display .

Multiple Programs

The SPERMFUGE facilitates user with 9 selectable programs for different applications and also for different set of protocols as standardized by various clinics, laboratories and regulatory bodies. The user can select RCF, RPM, Tube Size, temperature, time for each program by a digital encoder.

Scientific Results Supporting the Spermfuge

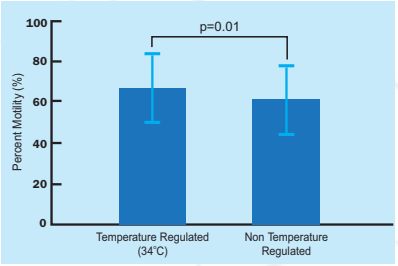
Sperm preparation and processing techniques have changed dramatically since the onset of ART techniques. The role and contribution of sperm parameters have been thoroughly evaluated. Many predictive parameters have been emphasized, studied and continuously improved upon. Numerous reports have shown a significant positive correlation between percentage progressive motility, velocity and morphology parameters with both fertilization and pregnancy rates. Other motion variables are also reliable prognostic indicators for fertilization potential of sperm. The routinely used sperm processing techniques namely the swim-up and density gradient have yielded capacitated motile sperm for use in various procedures in ART. Fluctuating temperature conditions during the entire process of sperm preparation make the sperm very vulnerable, with the result that suboptimal conditions during processing severely compromise the results.The advantages which Spermfuge has over conventional centrifuges in improvisation have been supported by scientific results listed as under.

Table 1 : Comparison between baseline and experimental values presented as average values and standard deviations for percentage rapid, medium, slow and static moving cells after double swim-up

	Rapid (%)		Medium (%)		Slow (%)		Static (%)	
	AVE	SD	AVE	SD	AVE	SD	AVE	SD
Baseline	43.9	18.4	7.7	6.4	11.3	7.8	37.4	17.0
Spermfuge 34°C	40.4	22.8	24.2[a]	11.6	13.2	11.0	22.2[b]	16.4
Spermfuge RT	28.3[C]	28.2	17.4[d]	16.1	16.2	16.4	38.0	39.3
Sigma 34°C	36.1[e]	23.8	21.5[f]	14.0	14.5	8.6	27.9	18.8
Sigma RT	26.3[g]	22.6	20.4[h]	13.3	17.0[i]	12.0	35.9	22.2

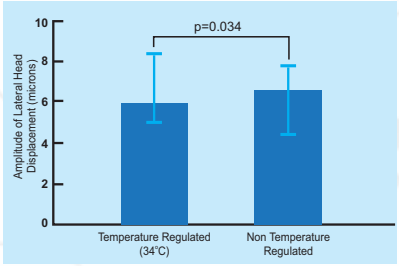
Significant *P*-values, $P < 0.001$ (a, f, g, h); b: 0.006; c: 0.003; d: 0.009; e: 0.032; i: 0.033

Figure 1



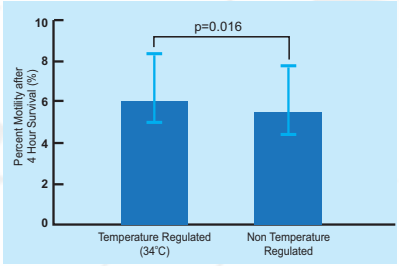
Studies by Agarwal et al.,(J of Clinical Embryology, vol. 13, issue 4, 43) have shown improved sperm motility after temperature regulated centrifugation at 34°C as compared to non-temperature regulated centrifugation

Figure 2



Further motion variables as studied by Agarwal et al., have also registered improvement in sperm incubated at 37°C as compared to 20°C

Figure 3



An improvement in sperm longevity after incubated centrifugation at 34°C was also reported long with reduced ROS values (Agarwal et al.)

Table 2 : Sperm retrieved following Double-Wash swim-up process

	Sperm concentration x10^6 sperm ml)-1	% Motile
Baseline Semen	108.3 ± 63	54.9 ± 16
Sample prepared with SpermFuge and incubated at 34°C	48.1 ± 23.7a	64.0 ± 19.9f
Sample prepared with SpermFuge and incubated at RT	30.9 ± 33.3b	54.7 ± 17.0g
Sample prepared with Sigma and incubated at 34°C	32.7 ± 21.5c	44.2 ± 24.2h
Sample prepared with Sigma and incubated at RT	30.6 ± 17.2d	46.5 ± 14.3i

Students paired *t*-test using ARCSIN values: a vs. b, $P = 0.01$, a vs. c, $P = 0.03$; a vs. d, $P = 0.01$, b vs. c, P = NS; b vs. d, P = NS; c vs. d, P = NS; f vs. g, $P = 0.04$, f vs. h, $P = 0.02$; f vs. i, $P = 0.03$, g vs. h, $P = 0.03$; g vs. i, $P = 0.04$, h vs. i, P = NS.

Jacket Warmer

JW 260

Simple and ***effective system*** to maintain oocytes at **Correct Temperature**

- **Essentials Status information by Voice**
- **Autoclavable Jackets**
- **Digital Mood Bar Indicator**

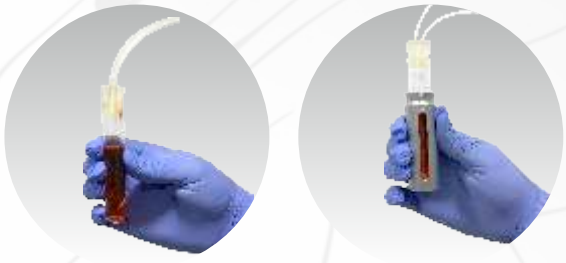
Concept

Traumatization of the oocytes in the oocyte cumulus complex (OCC), during ovum pick up (OPU) resulting from a decrease in temperature (Rapid Temperature Fall) will be minimized by this innovative gadget JACKET WARMER. This innovatively designed metal jacket provides insulation lasting more than a minute with a minimal drop in temperature, thus enhancing success rates in ART. The added advantage of this metal jacket is the fact that it can be autoclaved for subsequent uses.

Design

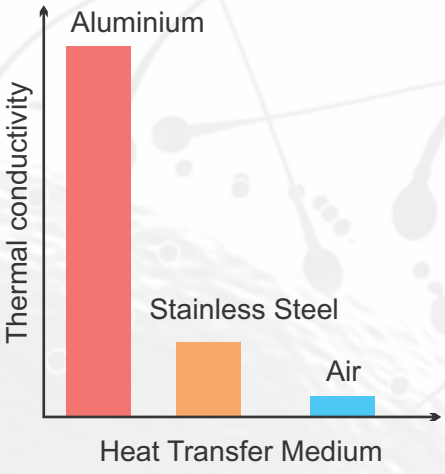
The design metal jacket is made from special aluminium alloy and the profile of jacket is designed in such a way that it protects oocytes from any temperature induced damage. The temperature is homogenously distributed with the unique profile design of block and the jacket. Important error messages are given by voice/audio. The design also has a unique digital mood bar indicator with green and red colour which indicates the rate of rise and the stability of temperature from distance. The control system is water splash proof and has combination of key lock which prevents accidental change in settings.

- The fall in temperature is three times more rapid for a bare Test Tube compared to a Test Tube in the Jacket.
- The Test Tube follicular fluid temperature does not fall more than 0.15 °C in 100 seconds, whereas the follicular fluid temperature in a unprotected Test Tube falls close to 0.75 °C in the same time.
- Jacket Warmer protects the Test Tube temperature **Four** times better.
- The test Tube temperature remains within safe limits for the duration it takes to reach the workstation from the OT. However, it is not the case with an unprotected Test Tube.

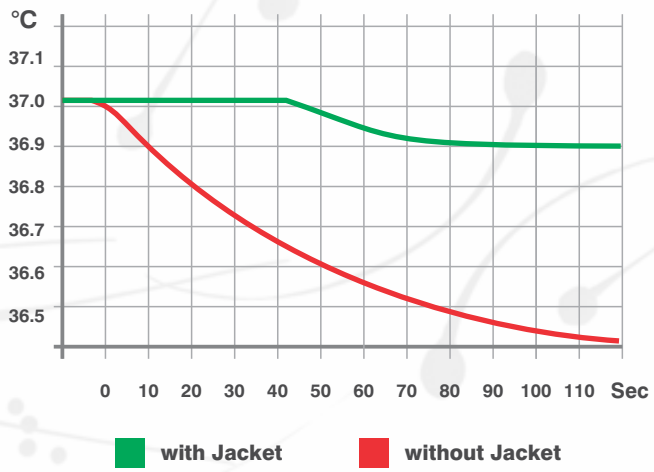


Preheated Tube loses temp. very fast

Jacket Protection to minimize heat loss



Temperature Recovery Graph of Jacket



Oocyte Aspirator
OA 500

Essentials Status information by Voice

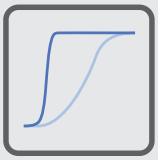
Concept

Oocyte Aspiration is the most basic and integral clinical procedure in ART and to facilitate atraumatic aspiration is the basis of this concept. The negative pressure created is low, gradual and regulated and should also have different profiles in order to match with the patient's clinical parameters. With this concept, there are 2 profiles which are provided – one is rapid profile – wherein after an initial peak the aspiration pressure plateaus off and the other second is an exponential profile – wherein the aspiration pressure peaks gently and exponentially.

Trauma inflicted by sub-optional / harsh pressure during aspiration can be negated by a smooth well controlled pressure build up. For the ease of the gynecologists and to make it more user friendly, this gadget has a dual option of both "Rapid" and "Exponential" aspiration profile.

Design

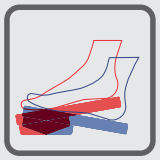
The pump is made of unibody design from the solid aluminium block thus by reducing the footprint by almost 60% from all the existing aspirators. The design has a bright digital display which facilitates setting of negative pressure with choice of the profiles, rapid or exponential. Moreover, the design has facility of dual action foot switch with wireless connection. The dual action foot switch is unique in a way that clinician need not lift his foot to perform aspiration and purging. All error messages are provided by voice/video and the best quality German KNF vacuum pump is used.



Multiple Selectable Aspiration Profile

Clinicians can choose from 2 Profile i.e Rapid and Exponential

- **Rapid Profile -** The preset vacuum level is achieved in a very short time after which it holds on to the level till it is released.
- **Exponential Profile -** The vacuum pressure increases gradually at an exponential rate to achieve the set vacuum level .



Dual Action Wireless Foot Pedal

Clinicians can perform 2 Actions without lifting his foot from the paddle.

- **First action -** Apply negative pressure by pressing the paddle
- **Second action -** Apply purging by tilting the paddle

Lab+Guard
Positive Pressure System

LG 300p

PRESSURISING MODEL LG 300p

Change Filters as per Usage

The Lab+Guard also houses a unique automatic indication system whereby the user is informed when to change the filters, and not "every quarterly". This feature not only gives tremendous relief to the user for tracking the stipulated time of change and also saves a lot of money.

Lab+Guard Monitoring Panel

Design

The Lab+Guard has been designed with the state of the art technology using 4 stage filtration system. The unique filter combination filters out air and gas contaminants thus by giving most suitable air for gametes and embryos.

Lab+Guard system contains a unique 4 stage filtration system containing pre-filter, HEPA Filter and unique blend of activated carbon and alumina, which ensures wide variety of gases & particular contaminants are oxidized or are absorbed. The Lab+Guard has been designed to reduce the microbial air flora to the minimum level.

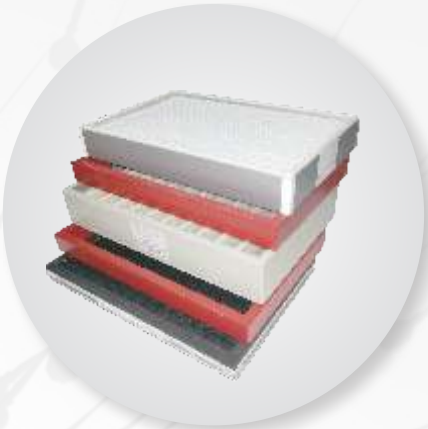
Reduces CFU, Reduces VOC

The unique design and the concept of Lab+Guard Positive Pressure System not only reduces VOC content in the air but also the CFU count in the IVF Lab. The Lab+Guard not only protects the embryos and gametes but also protects embryologists who are the most affected otherwise.

Lab guard pressurising Model gives possibility of fresh air intake and positive pressure in the IVF lab

4 Stage Filtration System

Lab+Guard system contains a unique 4 stage filtration system containing pre-filter, HEPA filter and unique blend of Activated Carbon and Alumina, which ensures that wide variety of gases and particular contaminants are oxidized or absorbed.



Operating Security

Every care has been taken in designing to make sure that air absorbed is thoroughly cleaned for contaminants and to reduce bacterial count in IVF Lab. The Lab+Guard design also facilitates introduction of fresh air into the air circuit which gives maximum safety from Carbon dioxide released into the IVF Lab by CO_2 Incubators and also it protects embryologists from gas mixtures released on work stations.

Maintenance

The Lab+Guard has automatic indication for filter change and its design facilitates extremely easy replacement of filters even by non technical staff. Other than filter change it is virtually maintenance free.

Lab Guard Indoor Model LG 300i

The Lab+Guard Indoor Model is specially designed for IVF labs to capture VOC's and chemical pollutants. It is ideal for the IVF Labs where installation of Positive Pressure Model is not suitable.

It is compact in size and has gentle and quiet airflow. Filters are easy to replace and has 4 stage filtration with HEPA filters. It also comes with a unique automatic indicator for changing the filters.

Lab+Guard
Positive Pressure System

Positive Airflow Technology for Unparallel Protection to Gametes

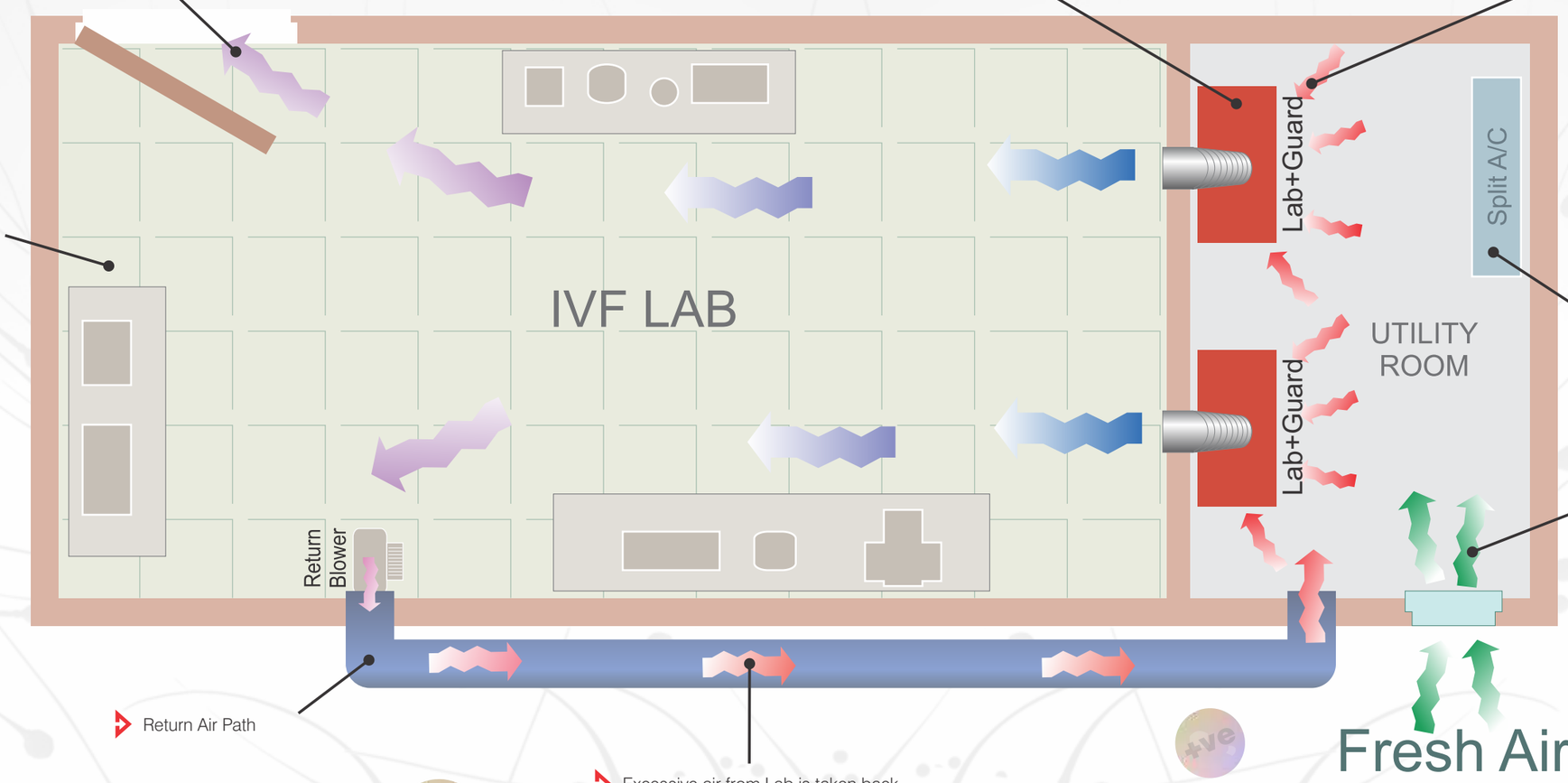
Fornax

Due to Positive Pressure created inside the room the air is pushed out when the door is opened.

Number of Lab+Gaurd units to be decided on room size. One Lab+Gaurd creates enough Positive Pressure for approx 100 sq.ft. area.

Cooled air inside utility room is sucked from the bottom of the Lab+Gaurd, passed through a series of filters and supplied to the Lab with Positive Pressure.

If Lab is situated in a very high ambient temperature region, one more cassette or split A/C can be kept inside the IVF Lab



A/C to cool the Utility room air.

Some amount of fresh air is taken in from a window to dilute CO_2 & other gases released in IVF Lab environment due to frequent opening of CO_2 / Benchtop Incubators.

Return Air Path

Excessive air from Lab is taken back by return blower for refiltration.

CONCEPT

The Lab+Guard is developed to improve the laboratory air quality making it nearly equal to clean air. Thus replenishing and subsequently nourishing the entire laboratory, the device makes it safe for the sensitive procedures to be executed. This is achieved by a number of air changes and their applications all of which are simple, cost effective and user friendly.

The Positive Pressure technology uses the basic principle of “Over Pressure or Positive Pressure in a room which restricts the entry of outside air”. This is achieved by absorbing the circulating air outside the IVF Lab (room) and then subsequently passing the same with Positive Pressure through the 4 stage filters which reduces the CFU count, eliminates the SPM, VOCs and CACs thus making it IVF friendly. Ultimately, the effective circulating air in the IVF lab reaches near to a clean air status and provides unparallel protection to gametes.

Mobile Nest

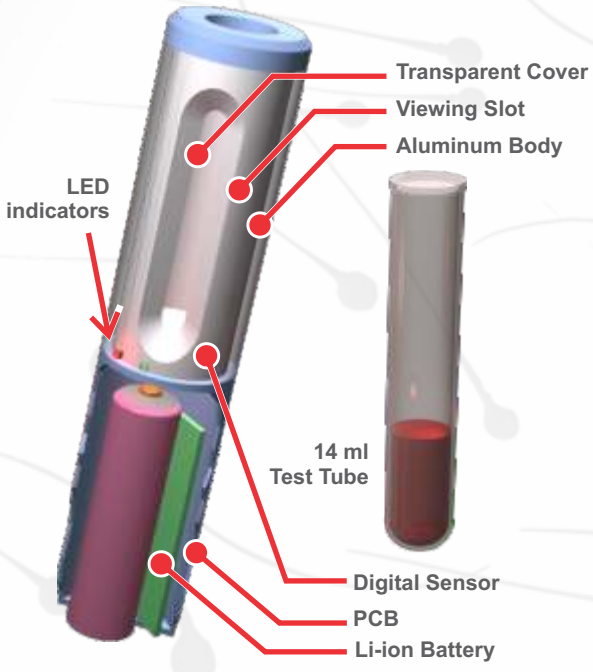
Portable Test Tube Warmer

MN 430

Concept

Human oocytes are extremely sensitive towards temperature and modest fluctuations in temperature can cause irreversible disruption of the meiotic spindle, with possible chromosome dispersal. Oocytes subjected to such thermal shocks if used for fertilization can form embryos which can have high proportion of chromosomal abnormalities and this may contribute to the high rates of pre-clinical and spontaneous abortion.

Therefore, temperature control is of paramount importance and should not be compromised in any way right from Ovum pick up (OPU) till Embryo transfer (ET).



Design

This is a handheld device with Li-ion rechargeable battery. It is equipped with heating element, Digital sensor, microcontroller, non-volatile memory and LED indicators. When placed on the base station, it gets connected electrically by its terminals. These terminals help the base station and the mobile device communicate with each other and also charge the battery. The mobile nest when in mobile mode continuously monitors the temperature with a 14 bit accuracy and corrects it several times a second.

This yields a rock steady temperature profile even in varying surroundings. The mobile nest continues to log for the power consumption index and temperature abnormalities. These are downloaded to the base station when the nest is docked. With monitoring and reporting features the user can be assured about the mobile nest working accurately at every step. A transparent window facilitates easy viewing of the follicular fluid.

How Safe Are Preheated Tubes?

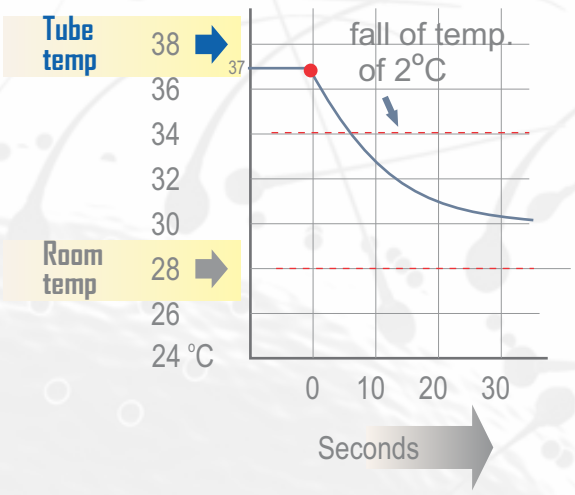
The Falcon Tubes (2001) pre heated by regular test tube warmers lose their temperature in less than 15 seconds once out of the heating block and reach close to room temperature, thus increasing the risk of thermal shock to the oocytes during aspiration. Mobile Nest isa portable test tube warmer with it's own internal rechargeable battery which gives immense mobility and at the same time maintains precise temperature.

Preheated Tube loses temp. very fast

Take Gametes and Embryos anywhere

Intelligent Control System

State of the art microcontroller with optomagnetic encoder provides intelligent control system. Digital programming via microprocessor control for various parameters including temperature and power status. The parameters are displayed on a four line LCD display .



Unique Portability

This Tubenest has been designed keeping in mind its portable nature. The rechargeable battery is capable of running for 30 minutes at a stretch before it indicates low battery level.

The unique locking mechanism for tube allows Embryologist to pour the aspirated follicular fluid into petridish for oocyte scanning very easily. Easy grip design allows convenient handling and battery time facilitates free movement in the LAB and OT.

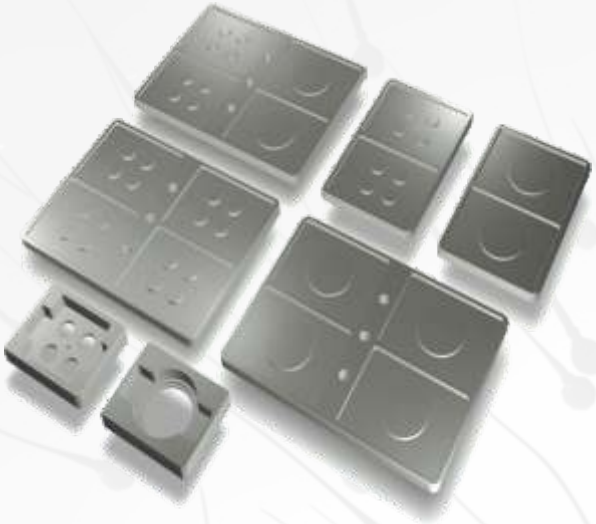
Operating Security

To ensure maximum oocyte survival without quality compromise, this unit has various safety features. The Nest Tube has RED LED INDICATOR which flashes when battery is weak.

When the Nest is replaced in the Base Station it checks the log and indicates any overshoots. Moreover the Nest has a safety over-temperature cut out.

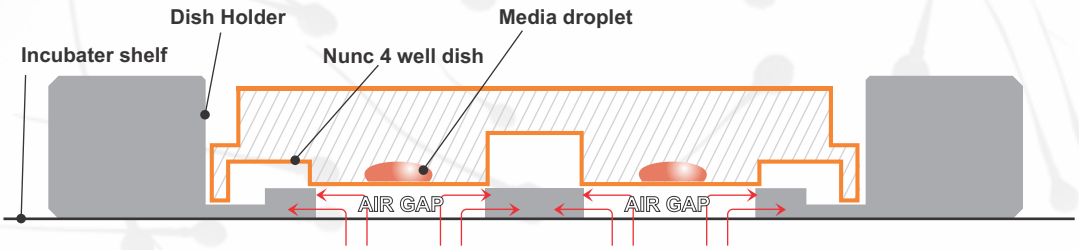
Rapid Recovery System

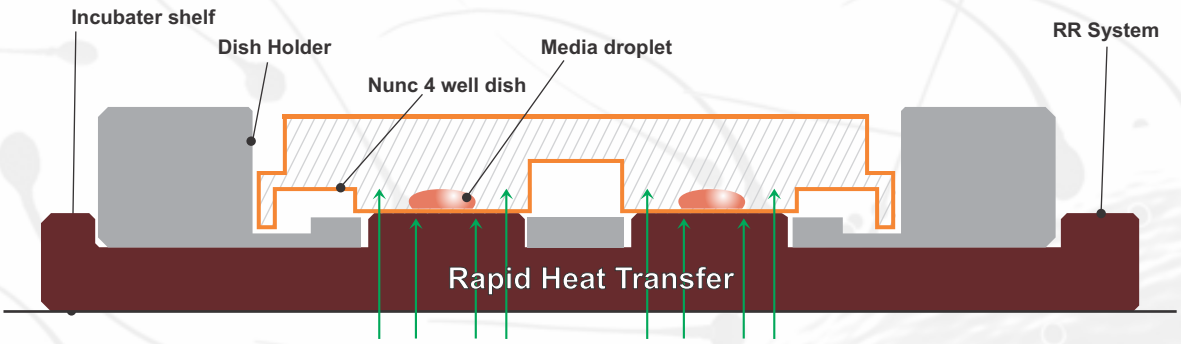
Temperature Retaining Devices



Concept of Heat Transfer

To define Heat Transfer, it requires two important groups of words. It is a form of energy and in that context we are concerned with the transport of heat energy from one body to another. Motivation for this transfer is provided by the difference in temperature. The definition of heat transfer would therefore include transport of energy due to temperature difference.





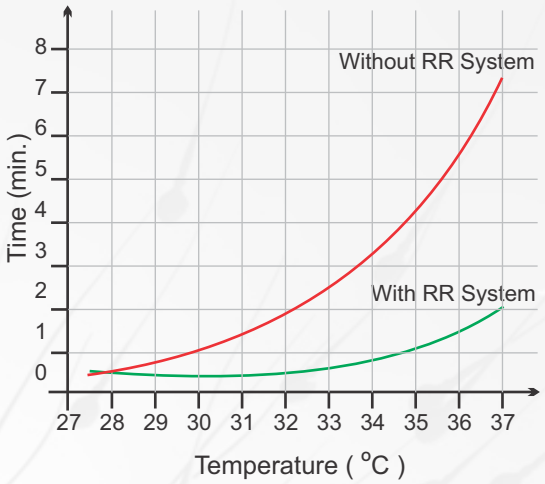
When the dishes are kept back into the CO_2 incubator, incubator often shows recovery of the temperature on the display. However, it does not mean that the target temperature of embryos and gametes has reached. It is often reported that the actual stabilization to 37^0 C in the embryo happens after 12-30 minutes in the Incubator.

The New Rapid Recovery System

The new Rapid Recovery system has been designed to enhance embryo development and the culture conditions by recovering temperature practically faster than conventional methods. The new Rapid Recovery System is to be used with our Dish Holders. The Rapid Recovery System is designed to accommodate 4 well dishes, Nunc Dishes and Falcon Petridishes.

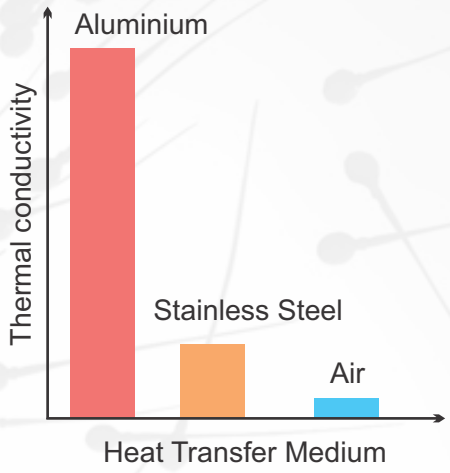
The Rapid Recovery system gives you direct thermal contact between the dry block type heating system and the individual culture dish wells, ensuring rapid temperature equilibration combined with low temperature variability.

Temperature Recovery Graph of Nunc 4 well dish



Are you giving thermal shocks to gametes and embryos?

Sudden and drastic temperature changes, long recovery times and changes in pH are minimized when using fornax warming Blocks. The unique aluminium alloy conducts heat and provides almost direct thermal contact with the warming surface. Dishes at room temperature when kept for incubation without the Warming Block take a prolonged time to attain the set temperature compared to those dishes kept in preincubated Warming Block. It also ensures a safe and easy handling of dishes and test tubes in the IVF laboratory.



FX 4025

Made from Aluminum Alloy
with hard anodised surface
Holding capacity
4 well NUNC 176740

FX 5054

Made from Aluminum Alloy
with hard anodised surface
2 of 4 well NUNC 176740

FX 4026

Made from Aluminum Alloy
with hard anodised of surface
Holding capacity one Petri Dish
Falcon 3002 / 3037

FX 5055

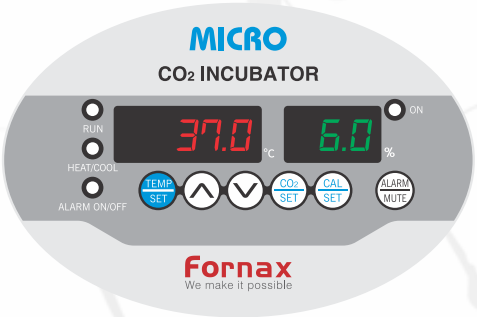
Made from Aluminum Alloy
with hard anodised surface
2 of Falcon 3002 / 3037

MICRO

CO_2 INCUBATOR

Features

- 15.2 Liter Chamber
- Portable Use with carrying handle (car plug available)
- Economical Price and Compact Design for personal use
- Available size to use in work station or clean bench
- Digital Set-up for Temperature & CO_2
- Forced Air circulation by fan
- Excellent Temperature Uniformity
- Quick recovery and precise CO_2 control by IR Sensor
- Two Stainless Steel Shelves (Standard)
- Natural Humidification by Water Pan
- Cooling and Heating by peltier system
- Stainless Steel Water Tray
- Power Plug & Car jack
- 6.8 kg, Light Weight to carry



Intelligent Display

MINI

CO_2 INCUBATOR

Optimum Environment:

Distinguished temperature, gas concentration and humidity retaining with water-jacketed chamber.

Precise Temperature Control:

Water Jacketed Chamber provides exceptionally stable and accurate temperature control.

Chamber Size:

The small chamber allows for fast temperature and gas concentration recovery. Its reduced size allows culturing a reduced number of dishes in the incubator including the dedication of an entire shelf or incubator per dish.

Automatic Maintenance

Easy set-up with automatic set-up function. Mini Incubator also offers automatic zero calibration for CO_2 concentration every 10 days.

User-Friendly:

All the interiors can be removed without using any tools. Every rounded corner facilitates thorough and easier cleaning.

Cleanliness:

Air filter (optional), shelves and all the other interior components can be installed or removed without any tools.

Precision:

Automatic CO_2 calibration (standard for Infra-Red CO_2 sensor models) enables consistent and precise CO_2 control. Automatic O_2 calibration is available with the APM models.

Adaptable to your needs:

The Mini Incubator includes two different chamber sizes and two gas configurations (CO_2 or Tri-gas) adapting to your culture needs.

Dependable:

Mini Incubator includes an alarm system for water level in the water jacket, CO_2, O_2 (in APM models) and temperature. Each incubator is equipped with a BMS connector for remote alarm monitoring.

Power Pipette

Pipettes for IVF

Power Pipette Controller

Can fill 25 ml pipette within 4 seconds. Safety valve and hydrophobic filters provide double protection against fluid penetration. Two different speed modes high and low are present along with gravity drain.

The pump speed can also be fine-tuned by varying finger pressure on operating knobs for better control for speed. Cadmium free environment friendly NiMH batteries. Batteries can be changed very easily by the user. The intelligent charger prevents over charging /heating of batteries.

It also has low battery indicator.

Power Pipette

Calibration as per DIN 12650 & ISO 8655 standards. “CE” mark awarded. It has Click-Stop digital system for volume setting. Autoclavable lower assembly. Ergonomic design ensuring light weight & soft plunger movement. High accuracy and precision guaranteed. Two step plunger operation allows “Reverse Pipetting Technique”.

Individual serial No. permanently marked on each pipette. Calibration report enclosed with every pipette. Color coded for easy identification.

Range available : 5-50 µl, 10-100 µl, 100-1000 µl, 50-200 µl

Ordering information for Spermfuge	Order Code
Spermfuge SF 800 - 100 - 120 Volts, 60 Hz	FX 1055
Spermfuge SF 800 - 220 - 240 Volts, 50 Hz	FX 1056
Sealed bucket sets	FX 1057
Ordering Information for Jacket Warmer	
Jacket Warmer JW 260 - 110 VAC	FX 8055
Jacket Warmer JW 260 - 230 VAC	FX 8053
Ordering Information for Oocyte Aspirator	
Oocyte Aspirator OA 500 - 110 VAC	FX 8056
Oocyte Aspirator OA 500 - 230 VAC	FX 8054
Ordering information for Lab Guard	
Lab Guard LG 300p - 100 - 120 Volts, 60 Hz	FX 2045
Lab Guard LG 300p - 220 - 240 Volts, 50 Hz	FX 2046
Lab Guard LG 300i - 100 - 120 Volts, 60 Hz	FX 2049
Lab Guard LG 300i - 220 - 240 Volts, 50 Hz	FX 2050
Spare Filter Set	FX 2048
Return Blower	FX 2047
Ordering information for Mobilenest	
Mobile nest MN 430 - 100 - 120 Volts, 60 Hz	FX 3035
Mobile nest MN 430 - 220 - 240 Volts, 50 Hz	FX 3036
Spare Tubenest	FX 3037
Ordering information for Rapid Recovery System	
Dish Holder - 4 well NUNC 176740	FX 4025
Dish Holder - Falcon 3002/3037	FX 4026
RR System - 2 of 4 well NUNC 176740	FX 5054
RR System - 2 of Falcon 3002/3037	FX 5055
Round Block	FX 4027
ICSI Holder	FX 4028
Ordering Information for CO_2 Incubator	
Micro CO_2 Incubator - 100 V / 230 VAC, 50 Hz - 60 Hz	FX 8051
Mini CO_2 Incubator - 110 V / 230 VAC, 50 Hz - 60 Hz & 12 VDC	FX 8052
Ordering Information for Power Pipettes & Controller	
Variable Power Pipette 5-50 µl	FX 6051
Variable Power Pipette 10-100 µl	FX 6052
Variable Power Pipette 100-1000 µl	FX 6053
Variable Power Pipette 50-200 µl	FX 6054
Power Pipette Controller	FX 6055

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