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Digitcool™

Programmable automatic freezers

Digitcool – **controlled deep freezing**

- **Accuracy**
- **Power**
- **Consistency**
- **Reliability**

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Programmable automatic freezers

Digitcool – **controlled deep freezing**

The age-old process of **direct freezing over liquid nitrogen vapor**, creates a freezing curve that is difficult to control and can result in poor reproducibility.

The Digitcool's **programmable freezing process** allows the user to customize and control each temperature holding or lowering phase in accordance with sample requirements. With more than 500 operational units throughout the world, **Digitcool** is the respected standard in the sector. It offers solutions to meet your specific requirements – simplicity, repeatability, reliability, ruggedness and traceability.

fig.1

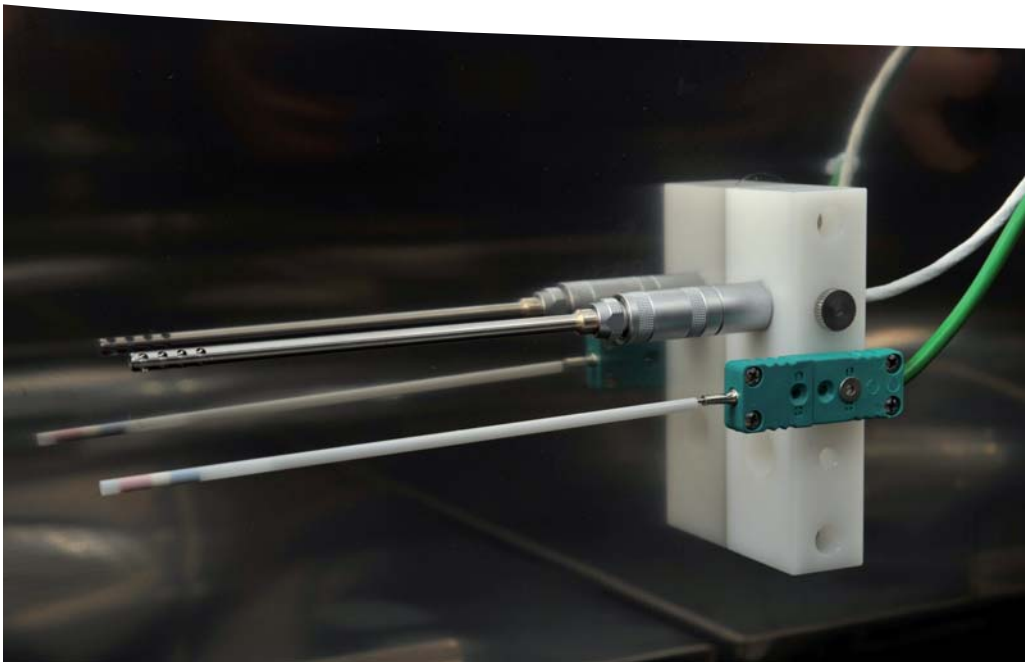


fig.2

Digitcool respects fundamental thermodynamic principles to preserve the integrity of gametes.

To maximize the fertility of preserved cells, the critical temperature lowering stages must be carefully controlled. The initiation of ice crystal formation – nucleation or seeding – must be strictly controlled to ensure optimal crystal size and shape.

Digitcool's perfect airtightness and insulation fig.2, its power and its constant regulation of data parameters, allow the user to determine optimal freezing curves, and provide for simple and accurate repetition. Temperatures are constantly and precisely monitored by two separate probes fig.1 (chamber and product) to ensure that the four main freezing stages are perfectly controlled.

Stage 1: Liquid cooling state

During the liquid stage (prior to reaching the crystallization point), the cooling rate must be regular to avoid any thermal shock affecting the spermatic cells. Here, the **Digit**cool freezer demonstrates its precision and flexibility: ultra-insulated cabinet, controlled nitrogen inflow, and fine temperature control – as low as -0.1°C per minute.

Stage 2: Liquid to crystalline state

The crystal formation stage, characterized by a sudden rise in temperature, is the most critical stage of the freezing process. The control software anticipates nucleation by instantaneously adapting the freezing curve with a powerful, strictly controlled temperature reduction. The **Digit**cool unit thus provides maximal protection of the cell membrane.

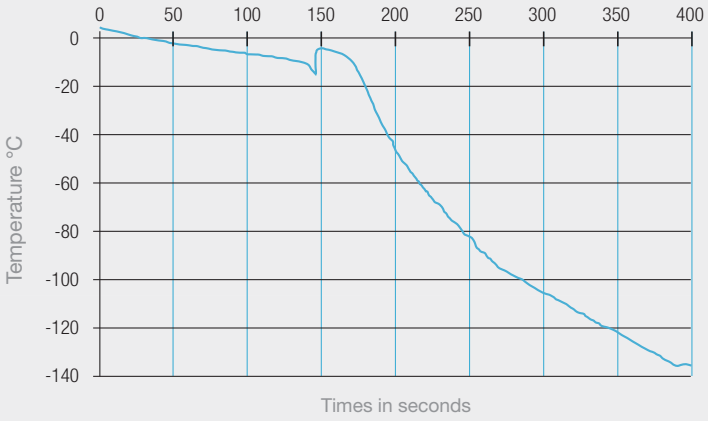


fig.3

Stage 3: Cooling towards stabilized crystal state (-110°C)

At this critical stage, exchanges continue to take place between the environment and the cell. The shortest possible peak in temperature drop, coupled with high-speed, uniform freezing, minimizes the destruction of membranes, ensuring up to 10% more viable spermatozoa over conventional freezing methods. The injection of liquid nitrogen onto the specific vane geometry, 2 750 rpm **Digit**cool turbine fig.3 ensures instantaneous vaporization and uniform fig.4, high-performance mixing to ensure an even cold temperature, an essential factor throughout this stage.

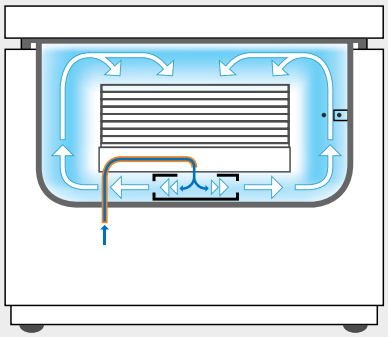


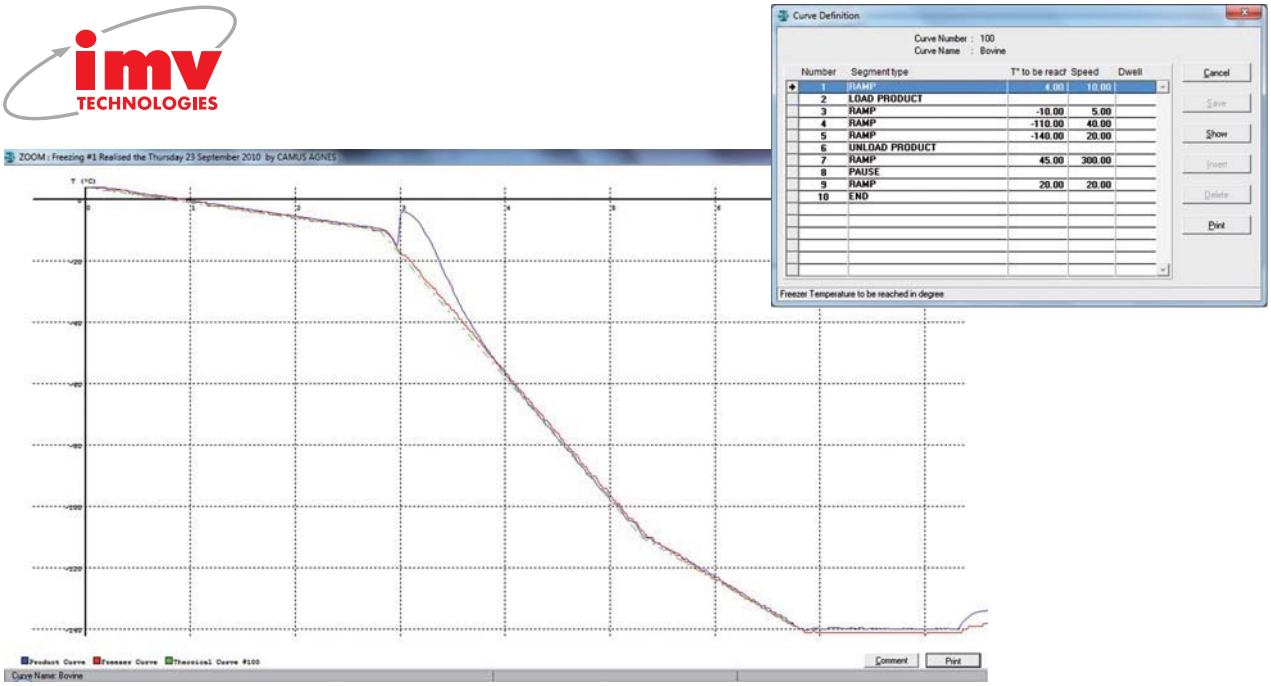
fig.4

Stage 4: Stable stage (from -110°C)

For maximum safety, the **Digit**cool cools straws to -140°C prior to their removal. When the lid is closed during manipulation, **Digit**cool's built-in microswitch ensures that the unit instantly and automatically lowers the temperature back to the requisite level.

Rapid implementation of a new freezing cycle

Once the straws have been unloaded, a reheating and drying program is launched. In 20 minutes, thanks to its efficient and powerful heating elements (up to 2 500 W), the **Digit**cool is ready to begin a new freezing cycle.



Digitcool enhances your Standard Operating Procedures (SOPs)

Rugged and reliable

- Designed and manufactured by **IMV Technologies**
- *Eurotherm* temperature controllers with quick-release probes
- Zero frigorie loss and optimized nitrogen consumption:
  100% 304 L polished stainless steel casing / Argon Tig welds / 95 mm thick walls with polyurethane foam insulation
- Aeronautics technology connectors

Advanced Control Software

- Intuitive and secure operating and monitoring controls
- Production and research tools (up to 99 segments per curve and unlimited number of curves)
- Real-time display of 3 temperature curves (freezing chamber/product/theoretical)
- Win 3T software design providing secure access by administrators and users
- Easy freezing curve parameter definition
- Intuitive visual display of each stage and process
- Fail-soft capability: possibility to operate the unit without Win 3T software or PC

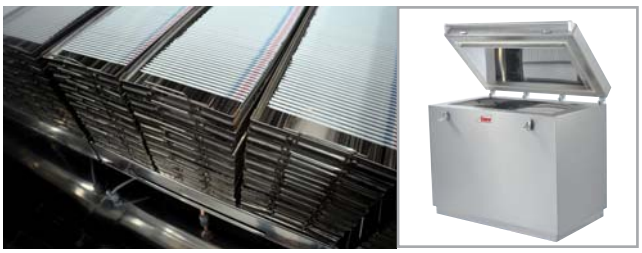
Ease of operation and safety

- Opaque insulated lid preventing UV effect on sperm
- Stackable and easy to remove freeze racks
- Ergonomic design to facilitate the manipulation of straws (loading / unloading)
- Easy to clean and disinfect
- Vapor evacuation at rear of unit
- Microswitch stops turbine automatically when lid is opened

Traceability

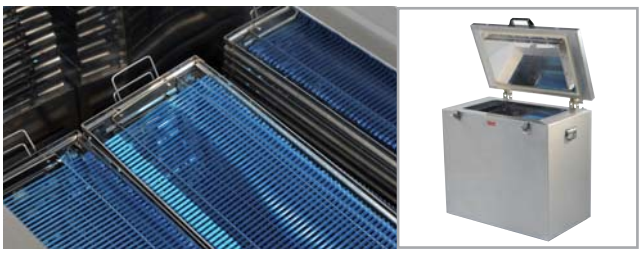
- Automated recording of freezing curves for each sire
- Uniform and repeatable freezing cycles
- Process isolated from any possible human or external environmental influence
- Printed traceability of the freezing process, as required for ISO qualification

Digitcool, **a unique product range to maximize gamete fertility**



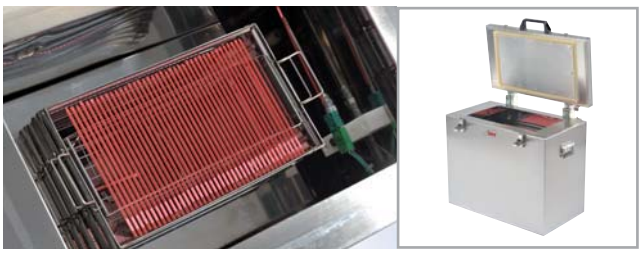
Digitcool

Ideal for major cryopreservation units
30 racks (3x10)
5 250 mini straws / 3 000 medium straws



Mini-Digitcool

Suitable for all users with moderate requirements
24 racks (2x12)
2 400 mini straws / 1 392 medium straws



Micro-Digitcool

Compact unit, ideal for mobile laboratories
6 racks (1x6)
420 mini straws / 240 medium straws

Digitcool accessories

		Freezing racks		Distribution block
007261	**Micro-Digit**cool	007122 007119	70 x 0.25 ml 40 x 0.50 ml	007088 007093
007263	**Mini-Digit**cool	007121 007118	100 x 0.25 ml 58 x 0.50 ml	007090 007092
007262	**Digit**cool	007120 007117	175 x 0.25 ml 100 x 0.50 ml	007089 007091

020086	Pressurized 60 liter LN2 container with hose
007223	Pressurized 120 liter LN2 container with hose
021364	Pressurized 230 liter LN2 container with hose
015397	Multi-species 3T software
007186	RS232 connection cable
003236	PC + monitor
005524	Short forceps 23 cm long (9.1")
007125	Funnel
007124	Funnel divider
022904	Optional legs (**Micro-Digit**cool)
022905	Optional legs (**Mini-Digit**cool)

Digitcool technical specifications

	Digitcool	**Mini-Digit**cool	**Micro-Digit**cool
Outside dimensions and weight	1 170 x 800 x 1 000 mm / 130 kg 46" x 31.5" x 39.4" / 286 lbs	770 x 510 x 730 mm / 58 kg 30.3" x 20.1" x 28.7" / 127.6 lbs	600 x 380 x 520 mm / 38 kg 23.6" x 15" x 20.5" / 83.6 lbs
Inside dimensions of the chamber	960 x 470 x 320 mm 37.8" x 18.5" x 12.6"	640 x 320 x 420 mm 25.2" x 12.6" x 16.5"	490 x 325 x 230 mm 19.3" x 12.8" x 9.1"
Volume	150 liters	90 liters	26 liters
Air displacement	2 750 rpm / 1 360 m^3/h	2 650 rpm / 495 m^3/h	2 650 rpm / 495 m^3/h
Dimensions and weight of control box	360 x 370 x 150 mm / 7 kg 14.2" x 14.6" x 5.9" / 15.4 lbs	360 x 370 x 150 mm / 7 kg 14.2" x 14.6" x 5.9" / 15.4 lbs	360 x 370 x 150 mm / 7 kg 14.2" x 14.6" x 5.9" / 15.4 lbs
Power (heating)	2 500 W (2 x 1 250 W)	2 000 W (2 x 1 000 W)	1 000 W (2 x 500 W)
Capacity	5 250 mini straws 3 000 medium straws	2 400 mini straws 1 392 medium straws	420 mini straws 240 medium straws
Voltage	220 V / 50 Hz / 16 A	220 V / 50 Hz / 10 A	220 V / 50 Hz / 6 A
Working temperature	-145°C to +45°C	-145°C to +45°C	-145°C to +45°C
Cooling rate	-0.1°C to -60°C / minute	-0.1°C to -60°C / minute	-0.1°C to -60°C / minute
Operating pressure	1.8 to 2 bars / 26.1 to 29 psi	1.4 to 1.6 bars / 20.3 to 23.2 psi	1.3 to 1.5 bars / 18.8 to 21.7 psi
Nitrogen consumption per cycle	13 to 15 liters	8 to 10 liters	6 to 8 liters

Crédit photo : P.-Y. Le Meur – 03/2011
yaka communication

YOUR LOCAL PARTNER

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