

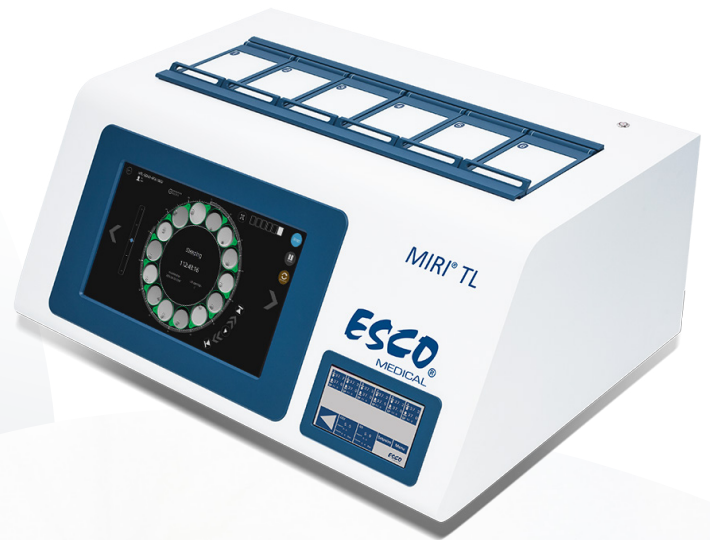
The Next Generation of Time-Lapse Systems

MIRI[®] TL

Time-Lapse Incubator for IVF

This equipment is a CE-marked device and is in conformity with the essential requirements of the medical devices EU regulation 2017/745.

ESCO
MEDICAL



Design Excellence - Superior Quality

All the features you love about
the MIRI® Time-Lapse System.



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MIRI[®] TL

“A state of the art Time-Lapse incubation system for IVF”



MIRI[®] TL — Never miss a significant event in embryo development with the continuous monitoring system.

The MIRI[®] TL is a multiroom incubator with a built-in camera and microscope that allows embryologists to view the development of the embryo from fertilization until the day of transfer without any disturbances. This significantly reduces the environmental stresses on the embryo when compared to current standard incubation practices.

The technology built into the MIRI[®] TL allows all important events to be observed, this allows embryologists to annotate and choose the best embryos for transfer based on their morphokinetics; aiming to improve embryo traits and pregnancy rates.

FEATURES:

Heated Lid

- Prevents condensation.
- Enhances temperature regulation/recovery.
- Excellent uniformity between the top and bottom lid.

Time-Lapse Monitoring

- As images are digitally-stored, a video can be generated to enable a more objective and reliable grading of embryos.
- The Time-Lapse video enables detailed scoring of cultured embryos, to better predict embryo development and implantation potential.

Multiroom System

The MIRI[®] TL6 and MIRI[®] TL12 have multiple independent chambers with very stable environments, allowing embryologist to culture embryos from individual patients in individual chambers.

MIRI[®] TL6: 6 Individual chambers

MIRI[®] TL12: 12 Individual chambers

CO₂ recovery: in average of three (3) minutes*

Temperature recovery: less than one (1) minute*

*If the lid has not been open for more than 30 seconds (based on internal testing; performance may vary depending on various factors and environmental conditions).

Direct Heat Transfer

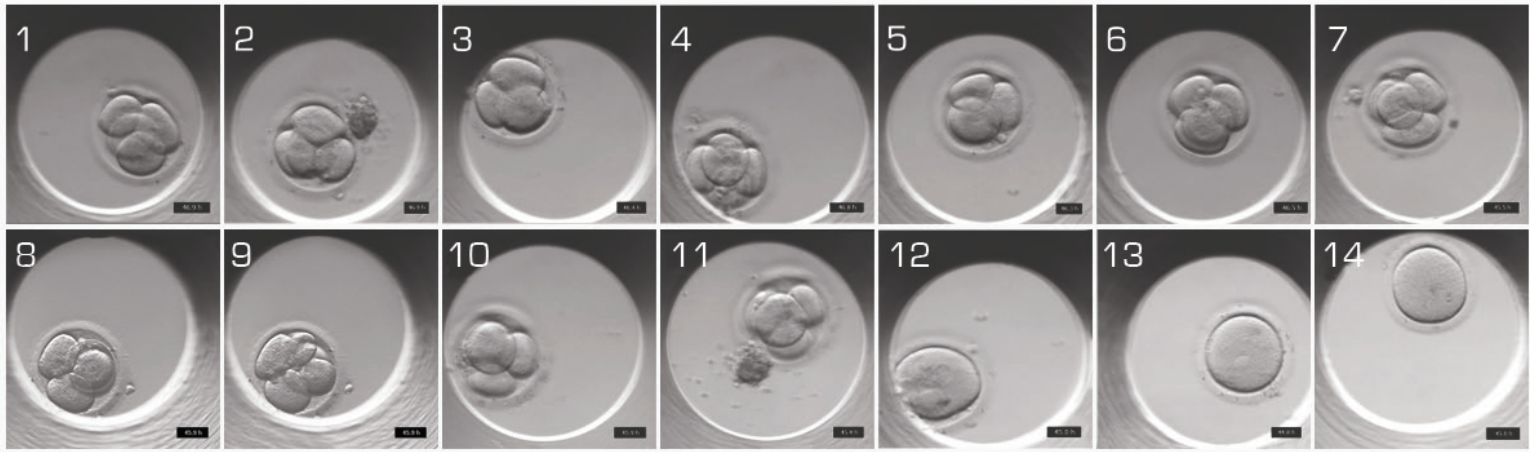
- Provides superior temperature stability.

2 Temperature Mode Options:

- Single: Uniform setpoints for all 6 (six) chambers
- Multi: Individual setpoints for each chamber

Touch Screen Control Panel

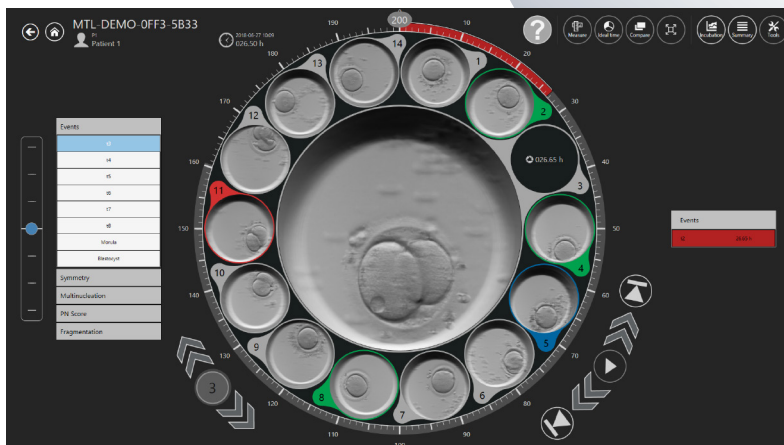
Easily change parameter settings with a reliable touch-screen display. Configuration is as simple as you need it to be.



Watch Them Grow

The MIRI® TL can continuously capture Time-Lapse images of embryos as they develop using a built-in camera and a microscope. This enables users to make better-informed decisions about the embryos' outcomes.

More Data – Better Selections



- Using the embryo evaluation tools on the Viewer station, only the highest-quality embryos can be selected.
- Retrospective data analysis offers a comprehensive documentation of patient details, treatment, and embryo data. This information can also be utilized for reference, sharing knowledge, and training embryologists.
- The embryologist can now easily measure, compare and observe the embryos from up close for better and more effective decision-making.

Don't Miss Out on Crucial Events



- Time-lapse technology allows for continuous monitoring of all embryos, ensuring that no important developmental events are missed.
- It enables the comparison of the actual timing of cleavages and stages, such as morula and blastocyst, with the ideal timing, helps to detect unusual cleavage patterns, such as direct and reverse cleavage, as well as assess the synchrony of divisions and multinucleation.
- The time-lapse session can run for up to 199 hours, and this measurement is included in the exported image and time-lapse report.

Enhanced Image Quality

Monitor your embryonic development with remarkable clarity, thanks to the improved MIRI® time-lapse incubator. Superior image resolution and contrast enable embryologists to monitor cytoplasm features in better detail and detect abnormalities, such as:

- Large perivitelline space
- Dark zona pellucida
- Presence of vacuoles and refractile bodies

Accuracy from Start to Finish:

Enhanced clarity at every stage of embryo development



Clearer Images, Smarter Decision:

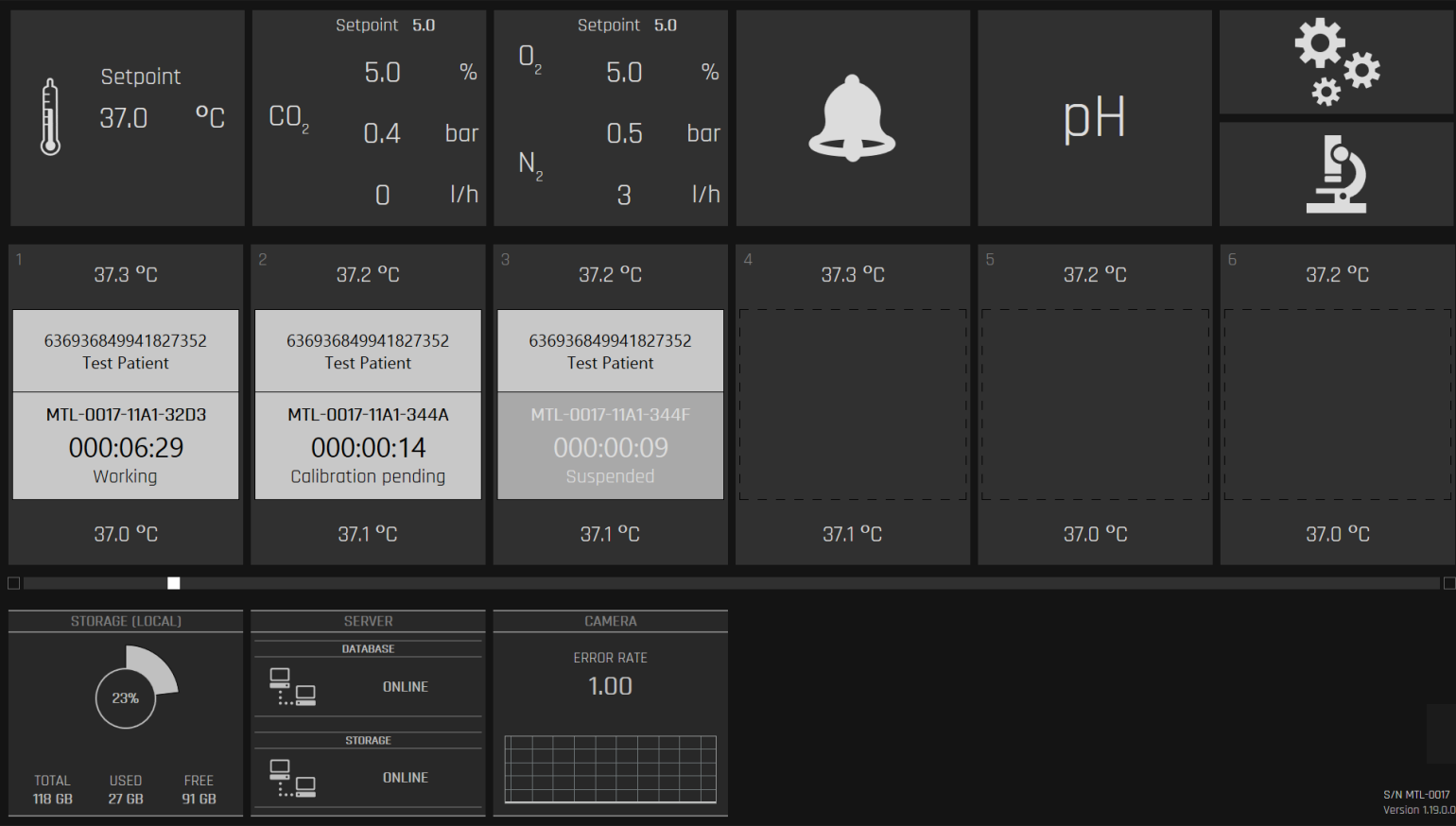
Crystal clear imaging for precise evaluations



Better Imaging, Better Outcomes:

Elevating embryo selection for improved IVF success





Time-Lapse Embryo Recording and Monitoring

The main screen shows all chambers as each counter illustrates the duration of Time-Lapse recording made. At the upper right portion, snapshots of other useful information regarding the incubator such as temperature, pH measurement, CO₂ and O₂ concentration, and Setpoints (SP) are displayed.

CultureCoin[®], a culture dish, exclusively designed for the MIRI[®] TL



One (1) MIRI[®] TL chamber can hold one (1) CultureCoin[®]. Each dish can accommodate up to fourteen (14) embryos, each with a numbered well assignment. The MIRI[®] TL6 can hold up to 84 embryos, and the MIRI[®] TL12 up to 168 embryos.

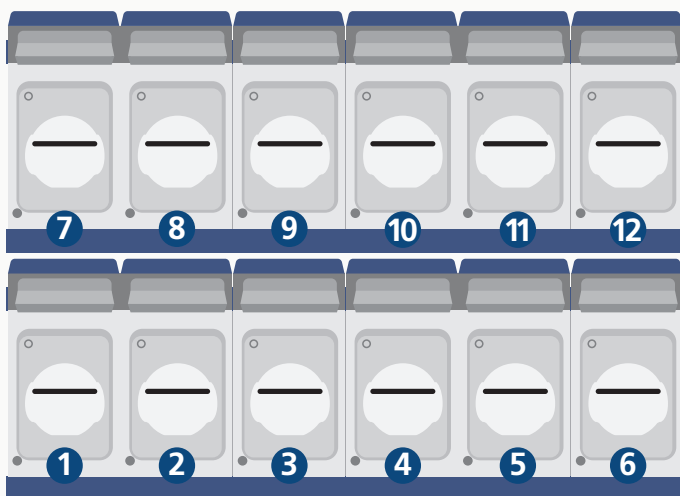
Key Features

- Each embryo is cultured in its own stable environment.
- Ergonomic design for easy, safe, and secure handling of embryos.
- Independent well for pH measurements.
- Corona plasma treated surface for the effective prevention of bubble formation.
- Sterilized by gamma-irradiation



Superior Incubation Environment

In MIRI® TL, separate chambers have been designed to prevent cross-contamination during the incubation process. The independent temperature regulation ensures optimal embryo developmental conditions. This significantly reduces disturbance and minimizes stressful factors that may be introduced when taking the dishes out of the incubator.

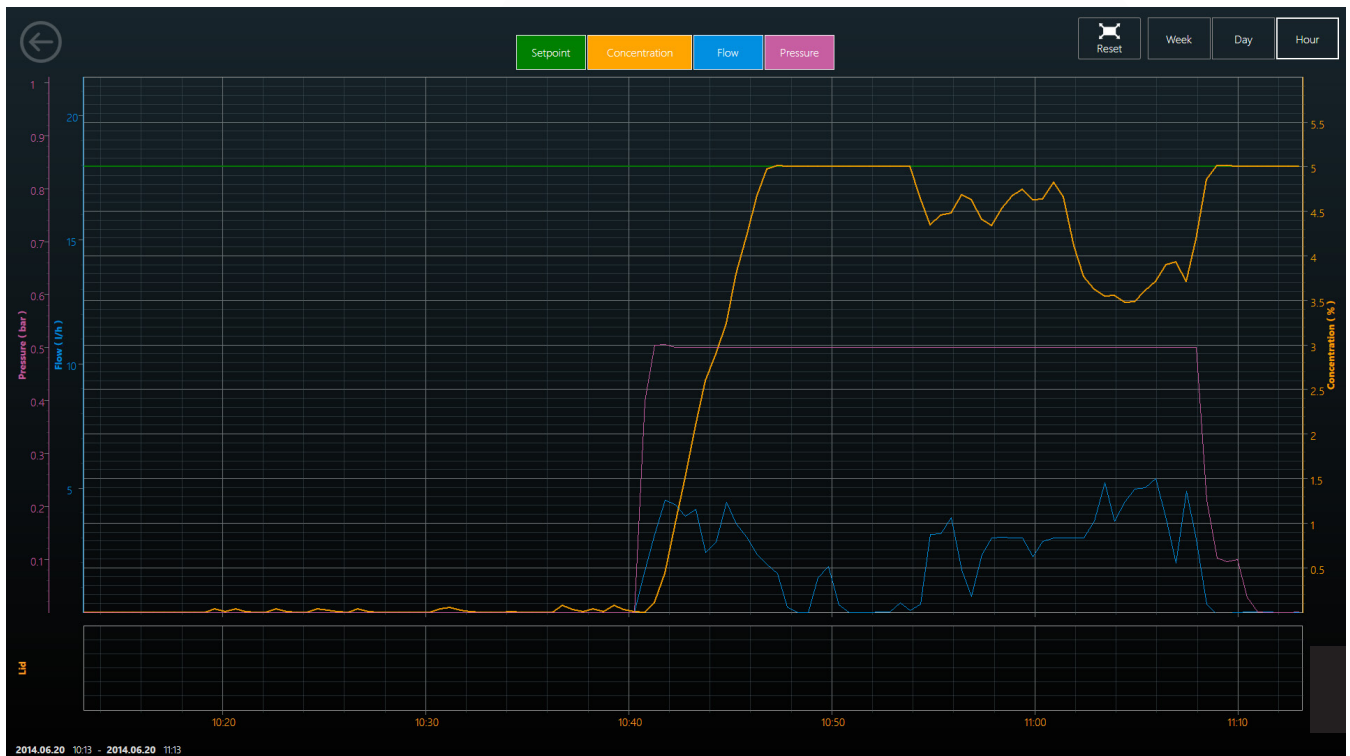


- Provides rapid temperature and gas recovery to ensure optimal environment stability.
- MIRI® TL multiroom IVF incubators do not support premixed gas.

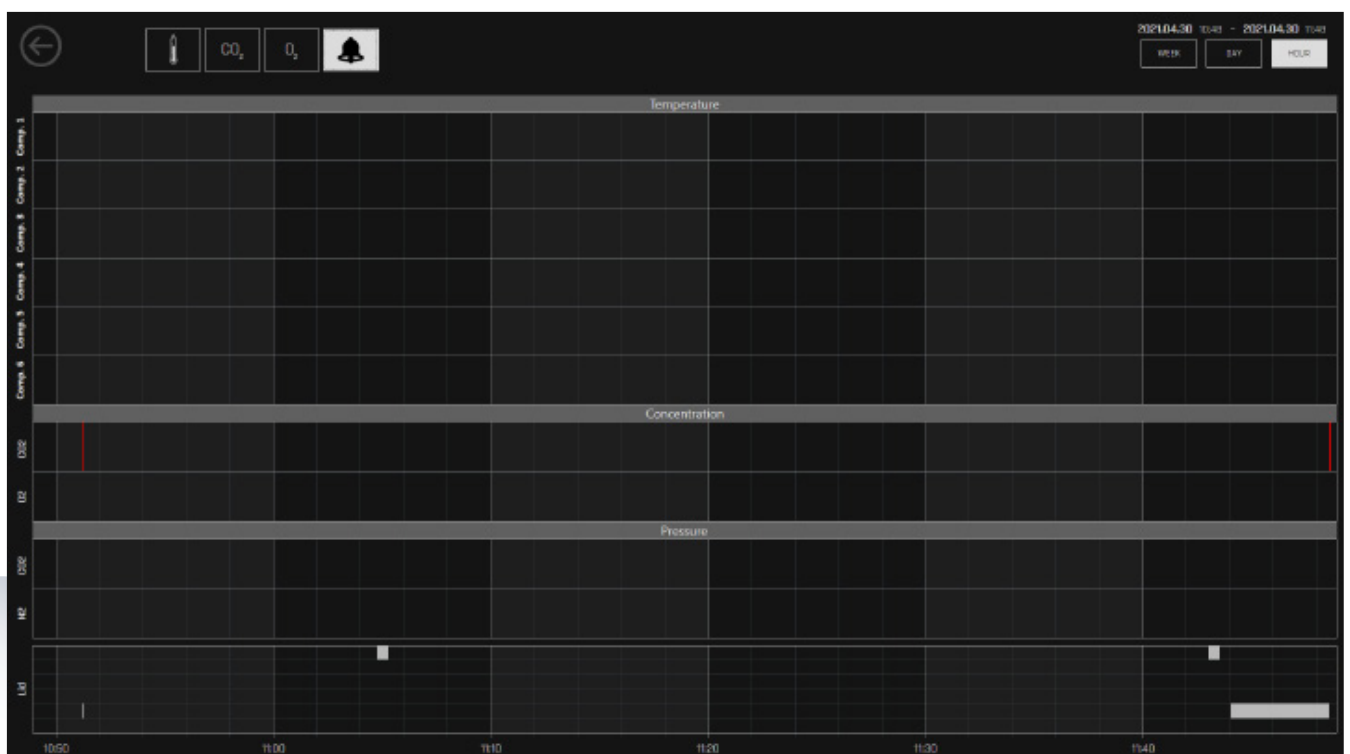
Data and Alarms Logging

The MIRI[®] TL data logger continuously documents all incubation parameters such as flow, pressure, and concentration of CO₂, O₂ and temperature regulation data. Details of any alarm events such as out-of-range parameters are also stored for retrieval.

You can also view similar performance data right on your MIRI[®] TL Viewer Software on a daily or weekly basis for all chambers. Data can also be easily printed for record keeping/audits.



The data logger stores continuous performance data of your device throughout its use. These are viewed in graph form.



Conditions that put the MIRI[®] TL into alarm state are recorded. It is also possible to configure the software to send email alerts.

High Quality Environment for Optimum Embryo Growth

Advanced CO₂ + O₂ Regulation

Provides Total Control of the Gas Phase Environment

The built-in gas mixer and the high-performance CO₂ and O₂ sensors allow accurate control of gas phase composition in the chambers.

High Quality Recirculated Airstream

High Quality Airstream Via:

Volatile Organic Compounds or VOCs are toxic to an embryo. VOCs attach directly to DNA and this can be detrimental to embryo development. The MIRI® TL is specially equipped with VOC/HEPA filter to help eliminate harmful VOCs and particulates. A UV-C light (254 nm) sterilizes the airstream before passing through the filter.

Easy Parameter Validation

Quality Checking is easy!

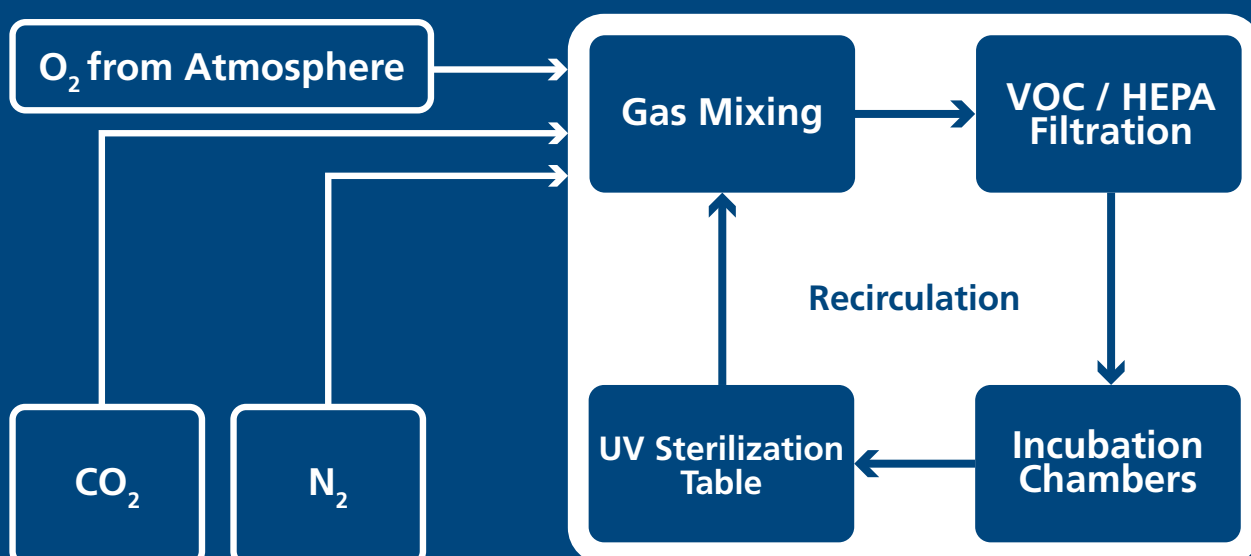
Each chamber has an individual PT1000 sensor and gas sample port specifically designed for independent and continuous validation of temperature and gas concentration. The TL range can be connected to a MIRI® GA, a Gas and Temperature Validation unit, for continuous external validation of both gas and temperature.

MIRI® TL have a built-in pH measuring system and pH well on the CultureCoin® dish can be used for easy checking of the pH in each chamber.



The VOC/HEPA Filter can be easily removed for replacement. No hassle. No downtime.

Airflow Diagram



Input Gases and Mixing

The MIRI® TL is a tri-gas system, which requires 100% CO₂, 100% N₂ and atmospheric oxygen. The gases go through the built-in gas mixer, which regulates the concentration of CO₂ and O₂ in the culture chambers to the desired level. The gas levels are regulated according to the feedback loop from a NDIR CO₂ sensor and a medical grade chemical O₂ sensor. Nitrogen is infused to suppress the ambient O₂ level.



VOC/HEPA Filtration

The gases then go through the VOC/HEPA filter, which effectively removes Volatile Organic Compounds (VOCs) and particulates larger than 0.3 µm.



Incubation Chambers

The MIRI® TL features a recirculated gas system, whereby each of its chambers is constantly monitored for gas concentration and adjusted to the correct level. Gas is drawn from all the chambers and routed through a gas mixing chamber where the gas concentrations are adjusted to the setpoints.



UV Sterilization

The circulated gas is subjected to a 254nm UV light exposure after passing through the mixing chamber and VOC/HEPA filtration. The UV-C light contains light filters that inhibit the production of dangerous ozone. UV-C light may be toggled ON or OFF as required by the user.

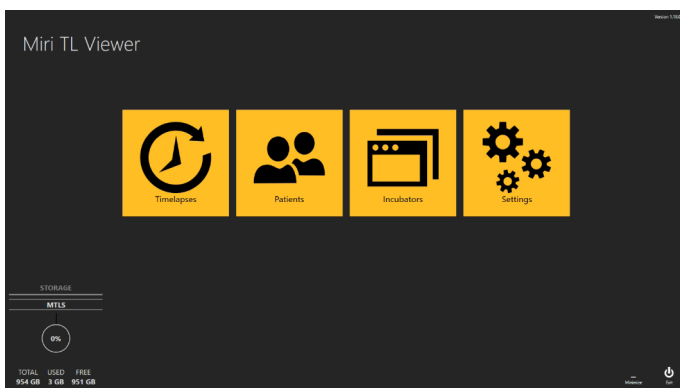


Embryo Analysis and Evaluation System



Simple and Intuitive

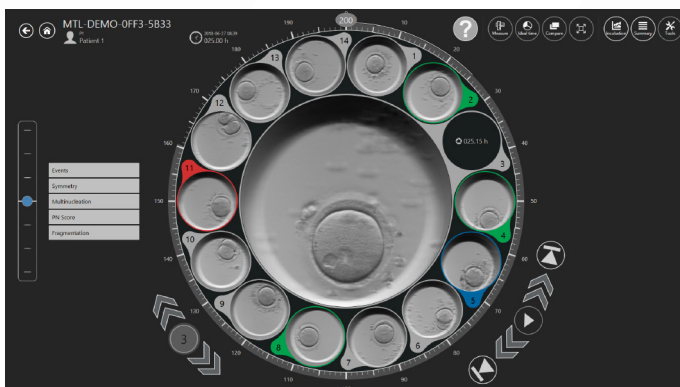
The MIRI® TL Viewer Software is a simple yet sophisticated and highly informative tool that can help embryologists process the data generated. You can review, annotate and compare the morphokinetic parameters of each embryo to select or deselect embryos for transfer while also allowing data export for retrospective analysis.



Complete Data Logging System

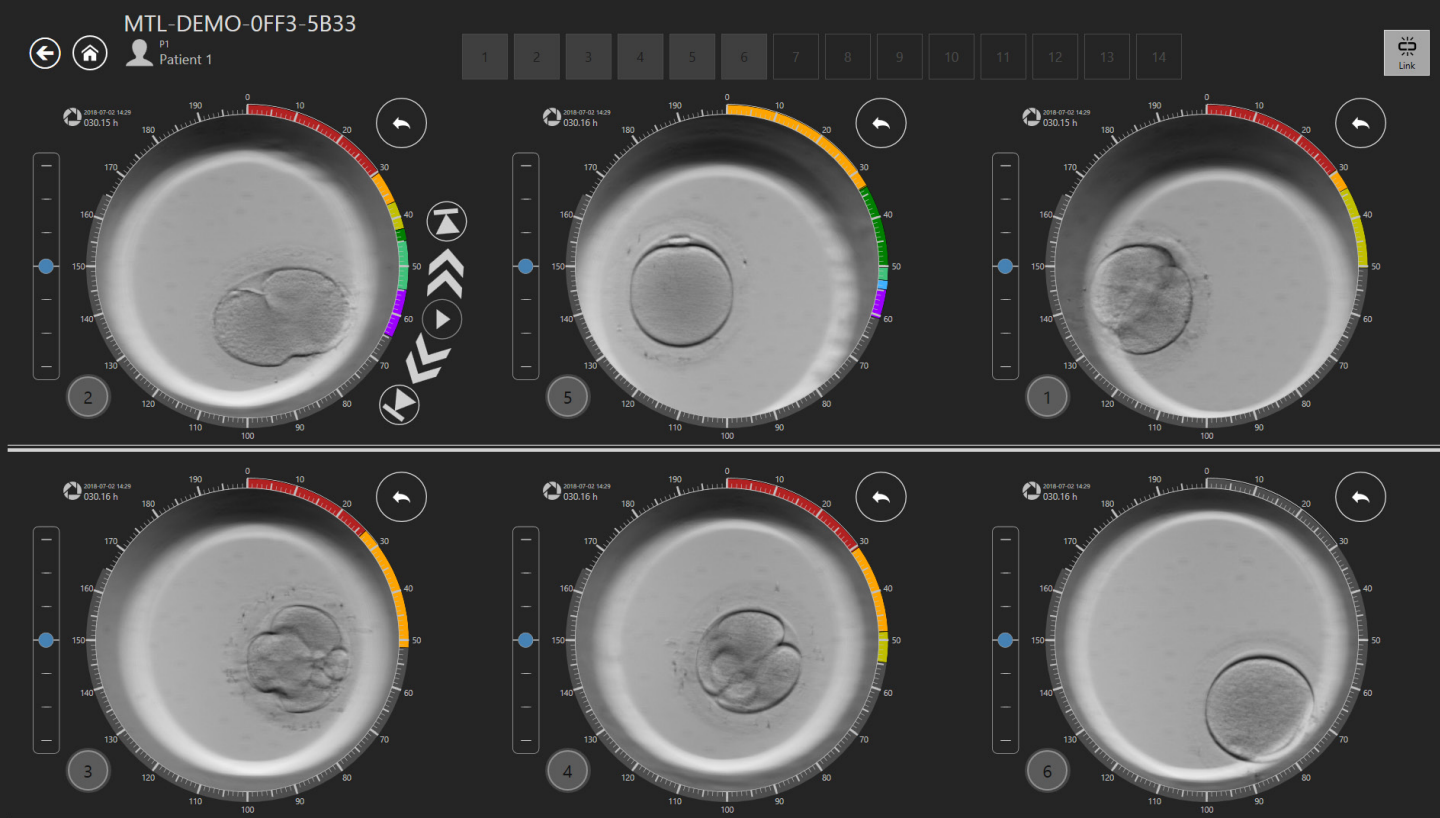
The main view shows four buttons:

- ▶ Time-Lapses (a list of pending, ongoing and past Time-Lapse sessions)
- ▶ Patients (Patient database)
- ▶ Incubators (view connected MIRI® TL Time-Lapse incubators)
- ▶ Settings (customize annotations, ideal timings, score models and more)



Embryo Development Overview

Viewing embryo development has never been better. The Revolver View shows all embryos incubated within a CultureCoin®. This view is your starting point for annotation and selection. From here, you can choose an embryo to annotate and compare its development with other embryos in order to determine the most viable one.



Side-by-Side Comparison

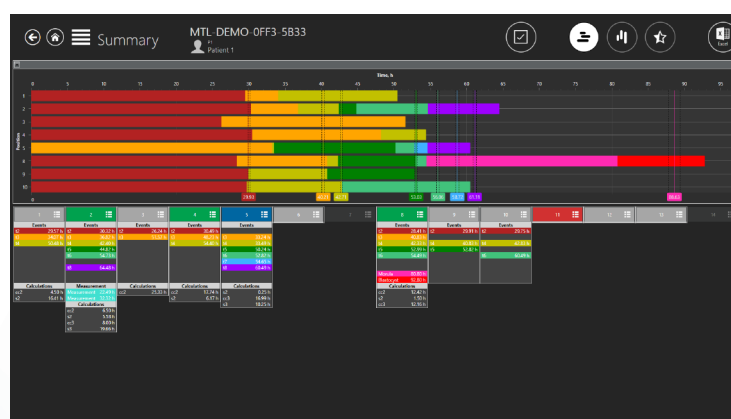
Choosing the most viable embryo for transfer is made easier with the **Compare Tool**. It allows you to make a side-by-side comparison of the embryo development and offers you the flexibility to choose the specific time point you would like to compare. The events annotations are in alignment for comparison, but measurements and calculations are listed normally.

Easy to Understand Summary View

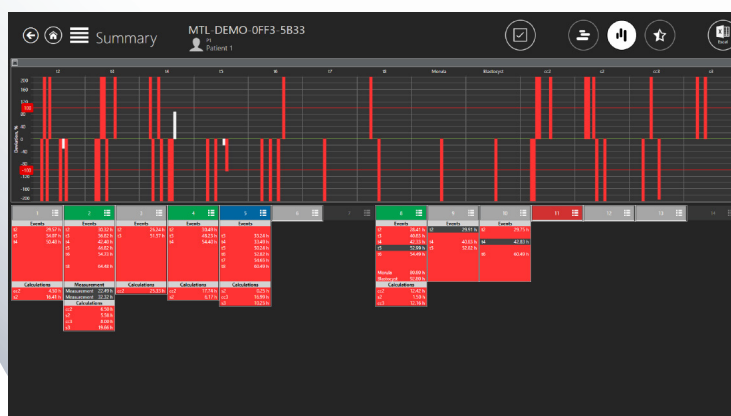
The **Summary View** is a helpful tool in comparing and selecting the most viable embryo based on the annotations made. The Horizontal View allows you to compare the actual cleavage timings of all embryos against the ideal timing.

There is an option wherein the embryologist can select or deselect the dish position one desires to view by clicking the "checkmark" in the summary view.

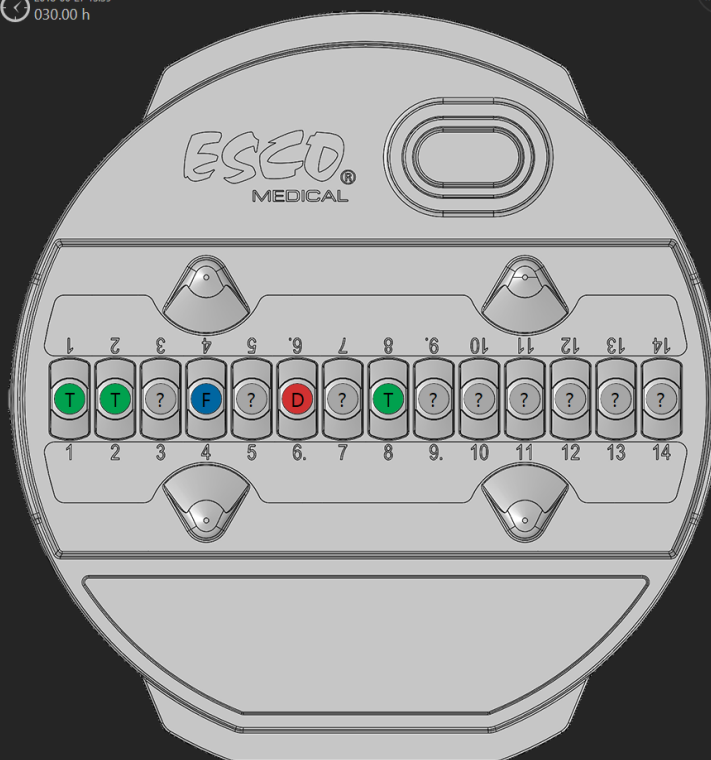
The Vertical View is an efficient way of identifying cleavage timings that are within or out of predetermined criteria (range). The white bar indicates timings within acceptable parameters while the red bar indicates those outside acceptable criteria.



Horizontal View



Vertical View



Once the evaluation and comparison are complete, the embryos can be assigned colours that indicate their outcome:

A coloured ring will appear around the embryo well and the colour on the dish map will change accordingly.



White - No Decision



Blue - Freeze



Green - Transfer



Red - Discard

Freedom to Personalize

Our belief is that as the customer, the device belongs to you. Therefore, it should offer you the freedom to customize and adjust the instrument and parameter settings completely. The "Ideal Time" function and Events for the annotation can be optimized based on the requirements of your clinic.

Additional Features

1. Additional embryo states

The dedicated menu allows you to fully customize and/or create additional embryo states. After being created, new embryo states are visible near the default ones on the timelapse view screen and the Dish Map menu.

2. Score models

Utilising the integrated score model functionality makes it easier to decide on the embryos' viability. Hierarchical and weighted score models provide precise results based on the model created at a moment's notice. These results can also be included in the report.

3. Keyboard shortcuts

Newly introduced keyboard shortcuts help to make the everyday work of an embryologist more efficient while using the Viewer Software. A dedicated menu enables the user to fully customize the shortcuts depending on personal needs.

Monitor the MIRI[®] TL Incubator



MIRI[®] TL Viewer

The MIRI[®] TL Viewer is a specialized software platform that gives you the capability to visualize, compare (side-by-side), annotate and store the embryo development images coming from the MIRI[®] TL incubator. The logging software shows incubator status and provides you with the option to send e-mail alarms. At the same time, the MIRI[®] TL Viewer also serves as a video player for the Time-Lapse videos generated by the MIRI[®] TL incubator.

MIRI[®] TL Server

The MIRI[®] TL Server provides you with secure and high capacity storage of your TL data.



MIRI[®] TL Viewer Specifications

CPU	
CPU Model	Intel® Core™ i7-13700
CPU Architecture	64-bit
CPU Frequency	8-core, up to 5.1 GHz
Memory	
Installed Memory	1 x 8 GB
Memory Type	DDR5-4800 MHz non-ECC
Storage	
Installed	1x 256GB, 1x 1TB
Storage Type	M.2 PCIe NVMe SSD

Operating System	
Manufacturer	Microsoft
Name	Windows 11 Pro
External Ports	
RJ-45 LAN Port	1x rear
USB 3.1 Type A Gen 1	4x rear, 1x side (with PowerShare)
USB 3.1 Type C Gen 2	1x side
Audio	1x Line-Out (rear), 1x Universal Audio Jack (side)
Video	1x HDMI In, 1x HDMI Out, 1x DisplayPort Out, 1x USB-C (DP1.2)
Card Reader	microSDXC card slot
Additional Information	
Display	OptiPlex All-in-One Non-Touch 23.8" FHD Panel
Wireless Connections	Realtek 8853BE Wi-Fi 6, Bluetooth

MIRI[®] TL Server Specifications

Database Storage	AMD Ryzen V1500B, 4GB DDR4, 2x 10TB HDD (RAID1) / 1x 500GB SSD
MIRI [®] TL Server	Intel® Core™ i5-10210U, 8GB DDR4, 1x 256GB M.2 NVMe SSD, Windows 10 Pro x64
Network Switch	16 port, Gigabit Ethernet

General Specifications

MIRI® Time-Lapse IVF Incubators

Specifications	TL6	TL12
Overall Dimensions	805 x 590 x 375 mm (31.7 x 23.2 x 14.8")	950 x 685 x 375 mm (37.4 x 27.0 x 14.8")
Chamber Dimensions	120 x 90 x 26 mm (4.7 x 3.5 x 1")	
Weight	60 kg	93 kg
Temperature Control Range	28.7 - 41.0 °C	
Power Consumption	330 W	650 W
* CO ₂ Gas Consumption	< 2 L/h	
**N ₂ Gas Consumption	< 5 L/h	
CO ₂ Control Range	2.9% - 9.9%	
O ₂ Control Range	2.0% - 20.0%	5.0% - 20.0%
Input Gas Pressure	0.4 – 0.6 bar (5.80 – 8.70 PSI)	
Built-in Microscope	Zeiss 20x, objective has numerical aperture of 0.35, specialized for 640 nm illumination	
Embryo Illumination	0.064s per image, using 1W single red LED (635nm)	
Camera Resolution	1920 x 1200. Monochrome, 8-bit	
Optics Tube Ratio	2.22 px/μm	
Imaging Focal Planes	5, 10 and 20 min intervals in 3, 5 and 7 focal planes	

* Under normal condition (CO₂ setpoint reached at 6.0%, all lids closed).

** Under normal condition (O₂ setpoint reached at 5.0%, all lids closed).

Ordering Information

MIRI® Time-Lapse Incubator		
Item Code	Model Code	Description
Device		
2070091	MRI-TL-MN-6C-8	MIRI® Time-Lapse Incubator, Mini, 6 Chambers, 230 V, 50/60 Hz
2070092	MRI-TL-MN-6C-9	MIRI® Time-Lapse Incubator, Mini, 6 Chambers, 115 V, 50/60 Hz
2070100	MRI-TL-12C-8	MIRI® Time-Lapse Incubator, 12 Chambers, 230 V, 50/60 Hz
2070101	MRI-TL-12C-9	MIRI® Time-Lapse Incubator, 12 Chambers, 115 V, 50/60 Hz
Accessories		
1320011	MRA-1007	VOC/HEPA filter (recommended to be changed every 3 months)
1320088	MRI-CC	CultureCoin® for Time-Lapse of 14 embryos (25 pcs. per pack)
1320045	MRI-GA	MIRI® GA CO ₂ / O ₂ & Temperature Validation Unit, 115V / 230V

MIRI® TL Viewer and Server		
Item Code	Model Code	Description
2070042	MRI-VIEWER	MIRI® Time-Lapse Viewer
1320095	MRI-SERVER	MIRI® Time-Lapse Server

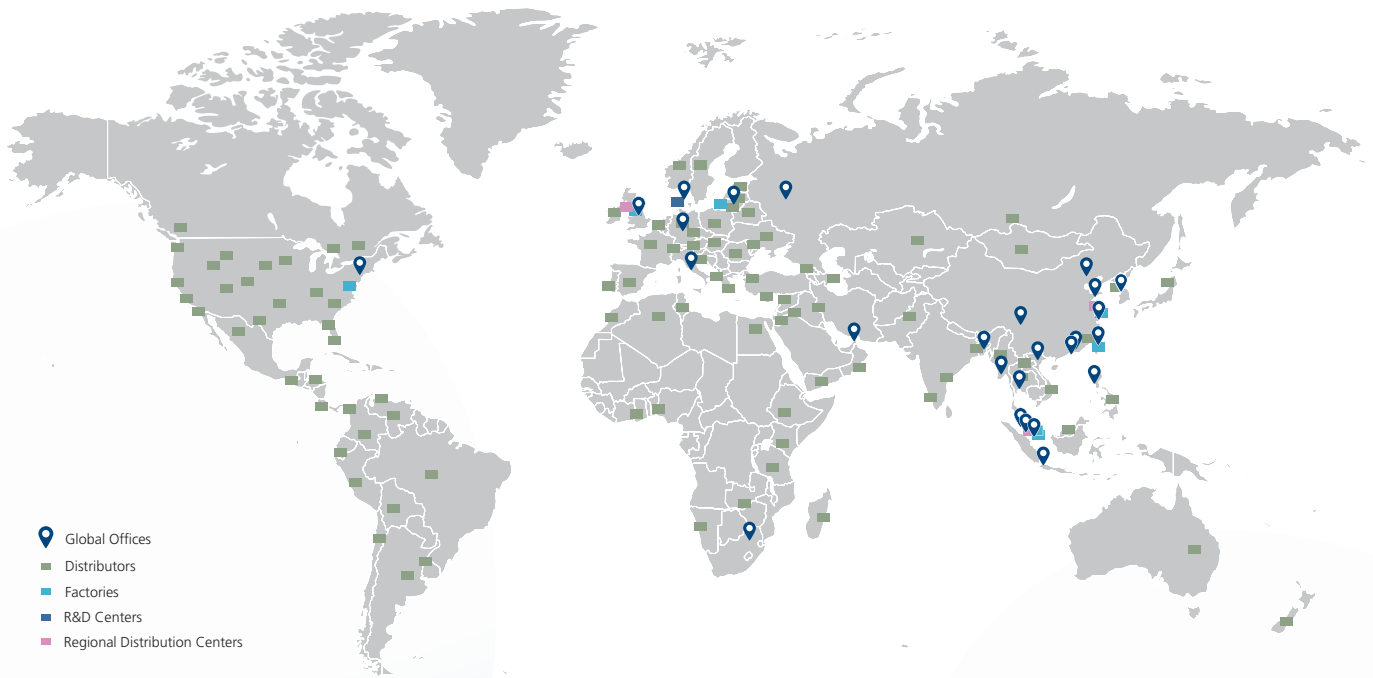


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Esco Medical Products:

MIRI® Multiroom Incubator
 MIRI® Humidity Multiroom Incubator
 MIRI® II-12 Multiroom Incubator
 Mini MIRI® Dry Multiroom Incubator
 Mini MIRI® Humidity Multiroom Incubator

MIRI® TL6 Time-Lapse Incubator
 MIRI® TL12 Time-Lapse Incubator
 Multi-Zone ART Workstation
 MIRI® Laminar Flow Cabinet
 MIRI® Evidence RFID Witnessing & Traceability System

CelCulture® CO₂ Incubator
 MIRI® GA (Gas and Temperature Validation Unit)
 MIRI® AVT
 CultureCoin®

Infertility is a problem that has a significant social, psychological, and economic impact on afflicted individuals and couples. It is a global concern that knows no race or creed. It has been estimated that 1 in 6 couples struggle with infertility at least once in their lifetime.

Esco Medical is one of the divisions of the Esco Lifesciences Group. We provide innovative technological solutions for fertility clinics and laboratories. We aim to become the leading manufacturer of high-quality equipment such as long-term embryo incubators, ART workstations, anti-vibration tables, and time-lapse incubators.

Our products are designed with the Silent Embryo Hypothesis as a guiding principle. The Silent Embryo Hypothesis states that the less disturbed an embryo can remain, the better its developmental potential will be. Most of our products are designed in Denmark and made in the EU. Our primary focus is to increase pregnancy success rates and patient satisfaction.

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