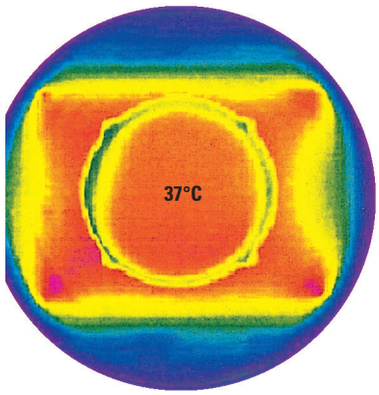
Protect Living Cells

Leica MATS
Thermocontrol Heating Stage System
for Microscopes

Leica
MICROSYSTEMS

Leica MATS – Protect Living Cells

Leica MATS *



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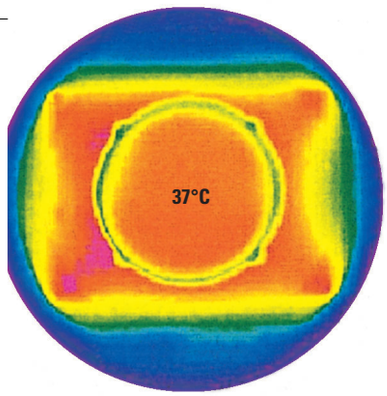

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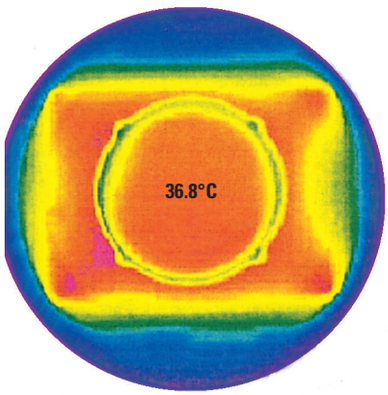

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Warmth is an important precondition for the successful study and treatment of living cells in biology, medicine and pharmaceutics. Leica MATS (Microscope-stage Automatic Thermocontrol System), with its heatable optical glass stage, is the most efficient solution for the protection and preservation of living cells during microscopic observation. Leica MATS provides gentle heating and even temperatures, making it ideal for virtually any kind of specimen or laboratory experiment. With Leica MATS, you can handle living cells without fear of critical temperature drops.

Leica MATS – the most important advantages

- even distribution of warmth over the entire stage surface
- outstanding temperature stability: fluctuation at 37°C < or 0.5°C over 5 hours
- fastest possible warming times: 40°C in approx. 3.5 minutes
- precise, automatic monitoring and control of the stage temperature
- temperature of up to 50°C adjustable in 0.1°C increments for a wide range of specimens and experiments
- precise digital display
- large, flat work field for the efficient warming of several Petri dishes or specimen holders simultaneously
- large selection of stage types for Leica stereomicroscopes (transmitted light) and microscopes (upright and inverted)

* content of a Petri dish warmed to 37°C

Precise temperature monitoring

Leica MATS lets you control the temperature in small, 0.1°C increments up to a maximum of 50°C to ensure the exact reproducibility of experiments. The PID control unit warms the stage quickly (to 40°C in approximately 3.5 minutes), precisely monitoring and controlling the setpoint temperature to prevent deviations. The digital display shows the current stage temperature with an accuracy of ± 0.3°C. The temperature of the specimen remains close to the indicated stage temperature. At 37°C, for example, the temperature of the specimen is only 0.2°C lower. This high degree of precision permits meaningful experiments with temperature-sensitive specimens.

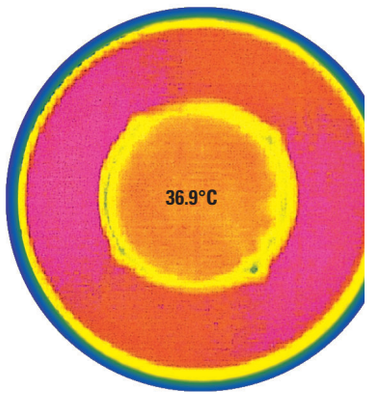
Consistent warmth

The transparent thermocontrol stage consists of laminated glass that does not require a central opening for light from below, unlike conventional metal stages. The distribution of warmth remains stable throughout the observation period, regardless of the specimen or Petri dish position. The temperature of metal warming stages, on the other hand, drops rapidly at the center after a short period.

An integrated sensor ensures excellent thermal conductivity over the entire surface of the stage to prevent overheating or temperature drops. This temperature stability over long periods allows you to perform time-lapse experiments with precision – or safely leave your workplace unattended for a while.

Leica MZ16 high performance stereomicroscope
with Leica MATS thermocontrol system
and Leica DC300 digital camera

Competitive product *



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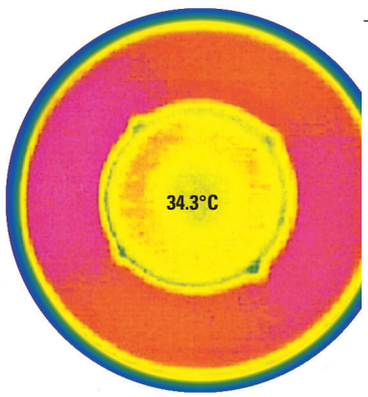

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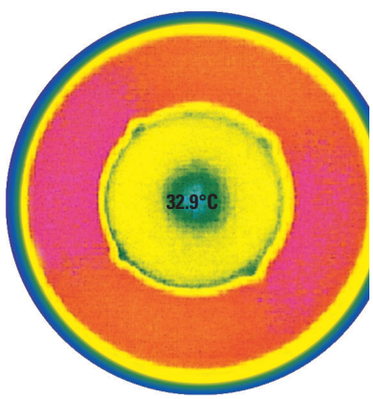
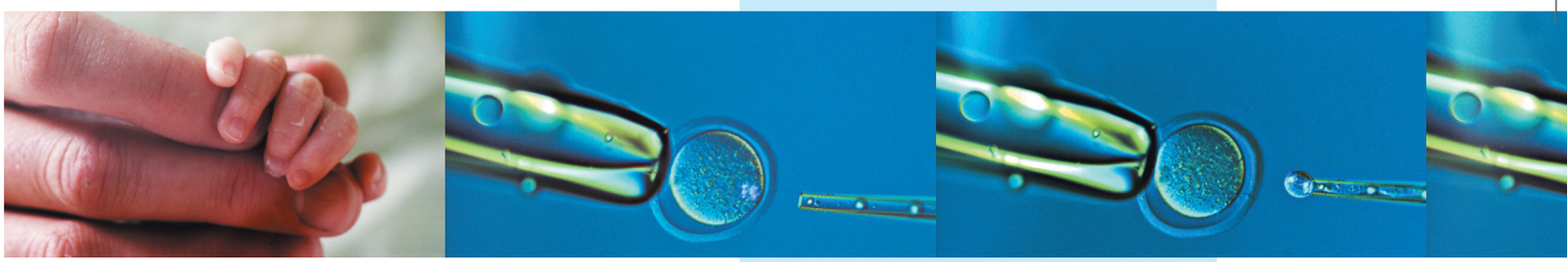


after 5 minutes

Constant Temperature Control

When Louise Joy Brown first saw the light of day in Great Britain in July 1978, every newspaper in the world featured her picture. Little Louise was healthy and happy – and the world's first "test tube baby". As the "baby of the century", Louise gave millions of childless couples the world over new hope for conceiving a child of their own. Today, in-vitro fertilization (IVF) is a routine clinical procedure. Approximately one million children worldwide have been born through assisted reproduction (ART) – and the number is rising.

The latest method in reproductive medicine is intracytoplasmatic sperm injection (ICSI), or simply microinjection. If the male sperm cannot penetrate the outer layers of the female egg during IVF, the sperm is injected directly into the egg cell. The most difficult and sensitive steps of ICSI take place in an embryology laboratory, under a microscope at a constant temperature. As in IVF, ova are recovered from tapped follicular fluid and stored at 37°C. The sperm sample is also examined microscopically. A single spermatocyte is then aspirated and injected directly into the cytoplasm of the ovum with the aid of the microscope. 16 to 20 hours later, it is possible to see whether the fertilization was successful. The embryo is then aspirated into a transfer catheter and placed in the woman's uterus.



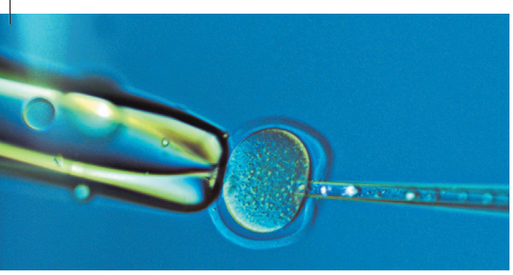
Ova, spermatocytes and embryos are extremely sensitive to temperature fluctuations. The optimal temperature is 37˚C. When working outside the incubator, under the microscope for example, heated stages are required to ensure a constant temperature.

"In a reasonable number of years, instead of this being a wonder, it'll be a reasonably commonplace affair. We're at the end of the beginning, not the beginning of the end."
Prof. Robert Edwards and Dr. Patrick Steptoe, the "scientific fathers" of baby Louise Joy Brown.

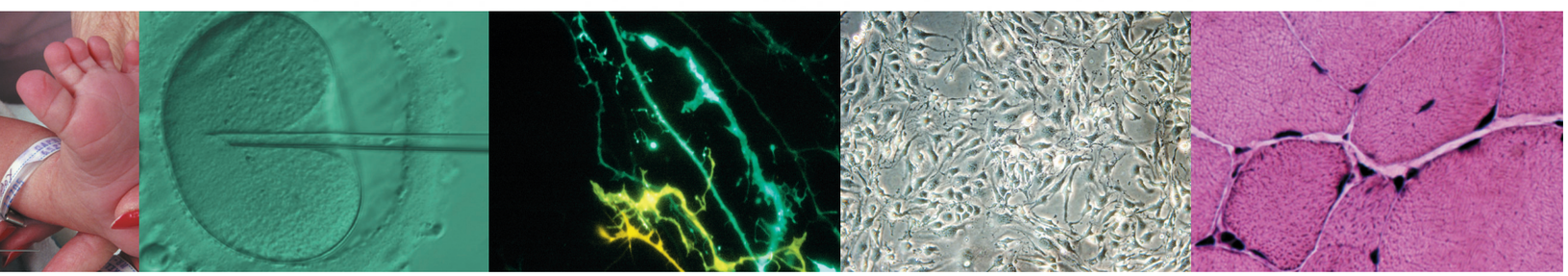
Application Areas

In-vitro fertilization
Genetics
Gynecological endocrinology
Microinjection
Embryology

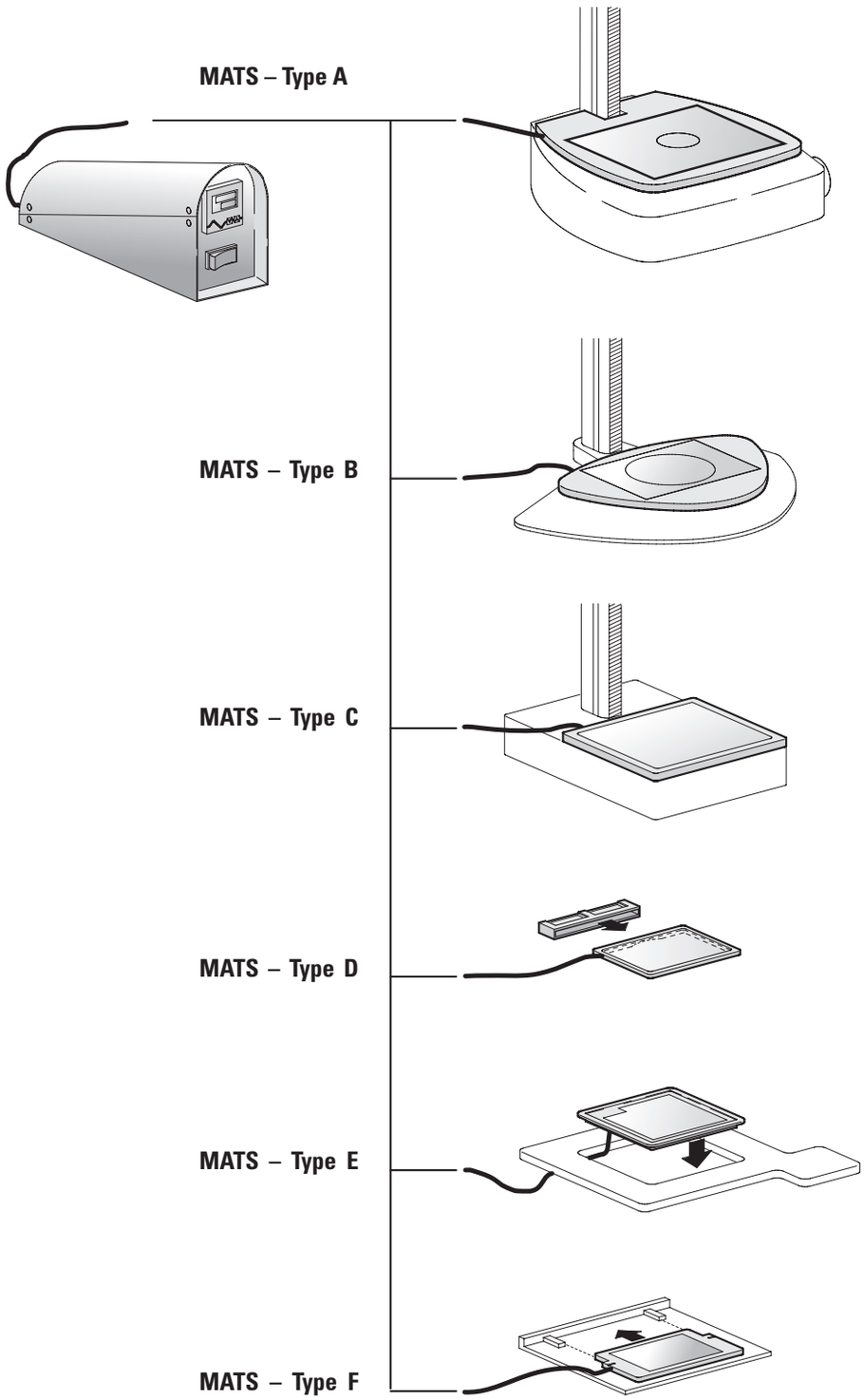
Molecular biology
Physiology
Cytobiology
Spermatology



Leica DM IRE2 inverted research microscope with Leica MATS thermocontrol system



Leica MATS Thermocontrol stages



10 447 164 Thermocontrol stage MATS – Type A for Leica M stereomicroscope with transmitted light base HL

10 447 165 Thermocontrol stage MATS – Type B for Leica M stereomicroscope with transmitted light base (brightfield/ darkfield)

10 447 166 Thermocontrol stage MATS – Type C Standard

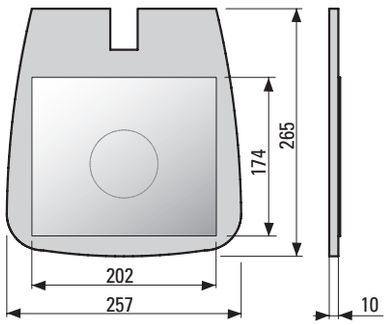
10 447 167 Thermocontrol stage MATS – Type D with adapter for upright microscopes, general

10 447 168 Thermocontrol stage MATS – Type E for inverted microscopes Leica DM IRB (3-plate x/y stage)

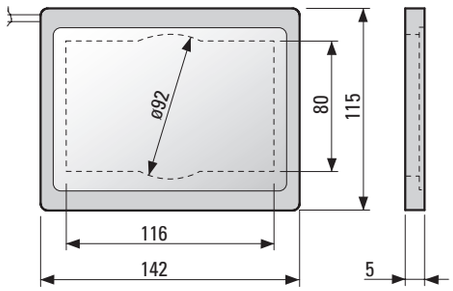
10 447 169 Thermocontrol stage MATS – Type F for inverted microscopes Leica DM IRB and DM IL

Leica MATS Dimensions

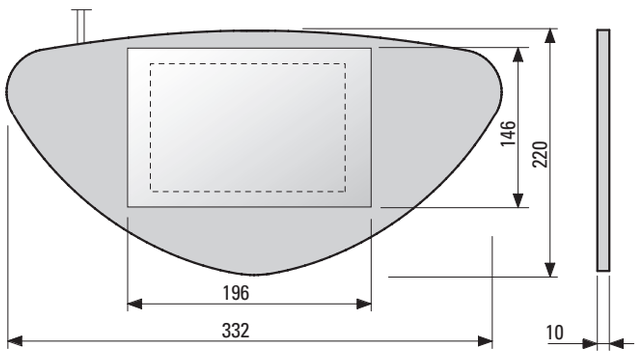
MATS – Type A



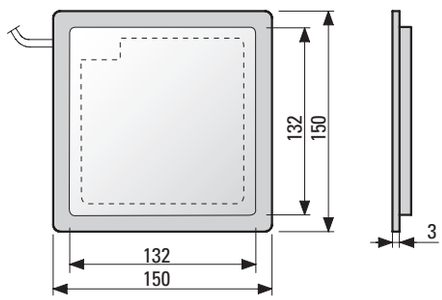
MATS – Type D



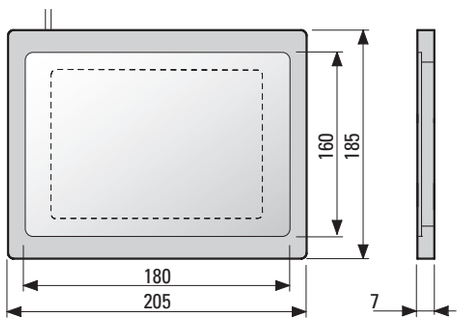
MATS – Type B



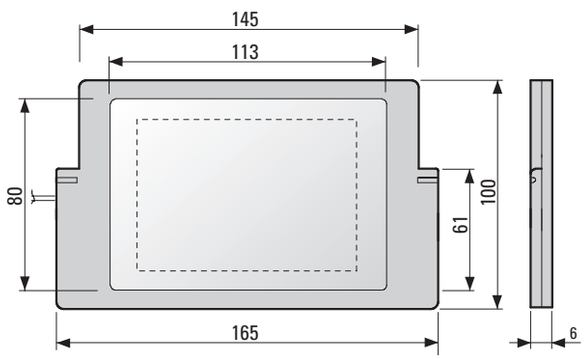
MATS – Type E



MATS – Type C



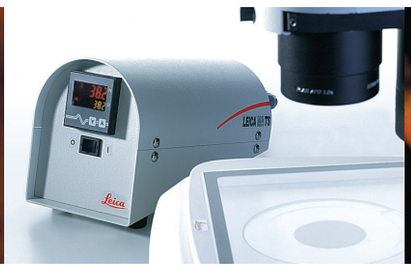
MATS – Type F

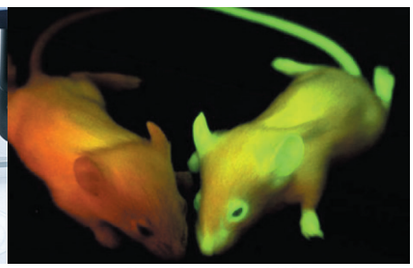


Technical Data

Temperature control	
Regulator	PID control unit with solid state relay
Setting range	up to 50°C in 0.1° increments
Setting method	up and down key
Temperature accuracy	± 0.3°C
Temperature indicator	digital display with 7 segments and individually-lit indicator
Display accuracy	± 0.5 %
Connection to the thermocontrol stage	1,000 mm cable, 4-pin plug
Power supply	100 – 240 V ±10% AC, 50/60 Hz, 0.68 A, safety class 1

Thermocontrol stage	
Warming time	40°C in approx. 3.5 minutes
Heat distribution	delta = 0.2°C at 37°C
Temperature stability	fluctuation at 37°C < or 0.5°C over 5 hours
Sensor	thermocouple
Material	laminated optical glass, plastic frame with limited conductivity
Size	various types for stereomicroscopes (transmitted light) and microscopes (upright and inverted)
Safety standards	CE/UL/c-UL/RL 89/336/EWG





Picture: Samuel Lunenfeld Research Institute,
University of Toronto

Package contents

Order numbers	
10 447 164	Leica MATS Type A thermocontrol stage for Leica M stereomicroscopes with HL transmitted light base, with control unit
10 447 165	Leica MATS Type B thermocontrol stage for Leica M stereomicroscopes with HL transmitted light base (bright field/dark field), with control unit
10 447 166	Leica MATS Type C standard thermocontrol stage, with control unit
10 447 167	Leica MATS Type D thermocontrol stage with adapter for upright microscopes, general, with control unit
10 447 168	Leica MATS Type E thermocontrol stage for Leica DM IRB inverted microscope (3-plate cross-stage), with control unit
10 447 169	Leica MATS Type F for Leica DM IRB and DM IL inverted microscopes, with control unit

Note: The thermocontrol stage and control unit are matched to one another. Always ensure that the control unit and thermocontrol stage have the same serial number.

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