

TOKAI HIT<sup>®</sup>

# Thermo Plate<sup>®</sup>



Microscope-stage Automatic Thermocontrol System

**for Nikon Microscopes**

**MATS-U**  
Series

# ThermoPlate® provides "User Comfort" with its High

Ensures more accurate and more reliable thermal control of the specimens during the observation under a microscope.  
Wide product range supports Biotechnology Science and Industry.

ThermoPlate® comes with Three Significant Features

## Accurate Temperature Control of Specimens Wide Efficient Area Quick Start Up

Process Value displayed on the controller is to demonstrate the temperature of heating plate surface.  
During temperature control of the specimen in a petri dish/on a slide glass, if the specimen indicates lower temperature compared to displayed Process Value of the controller, adjustment of Set Value is required.



### Plate

The *ThermoPlate* utilizes a special transparent heating material coated onto the surface of a hard glass plate. The *ThermoPlate* can be used for observing or manipulating specimen under phase contrast, differential interference contrast and polarization. The flat plate surface ensures easy operation of the microscopes and relocation of specimen.

### Sensor

A sensor built in the plate ensures excellent heat conductivity between the temperature sensor and the middle part of the plate section, thus minimizing overshoot at power up and temperature fluctuation of the plate surface due to disturbance.

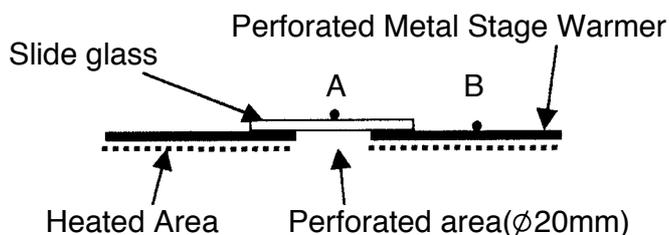
### Controller

The PID control adopted standard for the *ThermoPlate* provides ideal temperature control, and ensures quick startup and high stability against disturbance. The PID control also minimizes overshoot so that accurate and stable temperature control can be ensured at all times.

## Comparison of Thermal Distribution

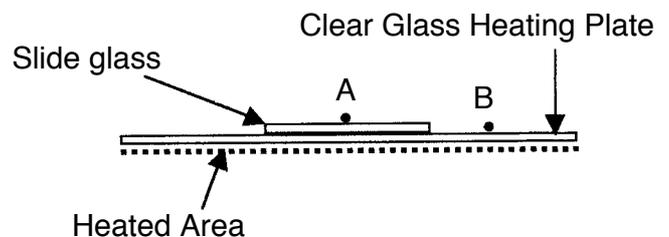
### Metal Perforated Stage Warmer vs. Tokai Hit Clear Glass Heating Plate (Internal Comparison)

#### Perforated Metal Stage Warmer



Point A: 32.9  
Point B: 37.0  
 $B - A = 4.1$

#### TOKAI HIT® ThermoPlate®



Point A: 36.8  
Point B: 37.0  
 $B - A = 0.2$

Setting both plate temperature at 37.0 and placed a slide glass on each plate to compare the temperature of the slide glass center. The room temperature was kept at 25.0. (Carried out by Tokai Hit)

# Quality and High Performance.

## For Inverted Microscopes

MATS-U505R30 installed in NIKON : TE300



When insert type, MATS-U505R30 installed in a microscope stage, the heating plate becomes flush with the stage surface to ensure the easy handling of the specimens and easy operation of manipulator. Specifically, MATS-U505R30 features a thin area (0.5mm) in the plate center (50 x 50mm area), which allows its application with Hoffman Modulation device and high magnification objective lenses.

The plate section of MATS-TS/TMS-30/TMS/CKTS/CKTSW fits to the mechanical stage. MATS-TS/TMS-30/CKTS has the same feature as MATS-U505R30, thin area in the plate center.

【Main Applications】 Temperature control of the specimen in cell engineering, neuroscience, and genetic engineering, where handling by a manipulator is required.

### 【 Plate 】



MATS-U505R30



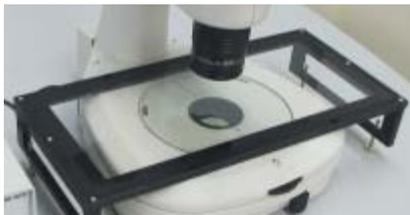
MATS-TS



MATS-TMS

## For Stereo Microscopes

MATS-U4020WF installed in NIKON : SMZ1500



MATS-USMZSL installed in NIKON : SMZ1000



MATS-USMZU installed in NIKON : SMZ-U



### 【 Plate 】



MATS-U4020WF



MATS-USMZSL



MATS-USMZSS



MATS-USMZR



MATS-USMZU

Universal model for stereo microscopes, MATS-U4020WF, features in the wide clear heated glass area(400 x 175mm) that allows large working space for specimen, and with height adjustable legs, MATS-U4020WF is adaptable to most stereo microscopes of all makes.

*ThermoPlate* exclusive models are designed to match specific microscope stage configuration to provide comfortable environment for users. For the whole surface being heated evenly, the wide working area is secured and multiple specimens may be heated at the same time.

MATS-USMZSL/USMZSS/USMZR are designed for Nikon SMZ 1500/1000/800. MATS-USMZR is insert type, which becomes flush with microscope stage and applicable to all SMZ 1500/1000/800.

MATS-USMZU/USMZ are specifically designed to meet SMZ-U series, SMZ-10A, SMZ2T/2B and SMZ 1/1B.

【Main Application】 Ova selections, pre-treatment of ova by means of the IVF technique, warming during manipulation of mice oviduct.

## For Upright Microscopes

MATS-U505S installed in NIKON : E600



### 【 Plate 】



MATS-U505S

The plate is to be installed in the mechanical stage and operated both X-Y directions. Wide and Flat plate surface ensures efficient utilization of the whole area(130mm x 100mm, four slide glasses simultaneously or  $\phi$ 100mm dish may be heated) of the heating surface and easy handling of specimens. It is also applicable to Circular Graduated stage as well.

MATS-U505S is basically designed for upright microscopes, but also suitable for stereo microscopes.

【Main Applications】 Sperm vitality test, ova collections, observation of tissue culture status.

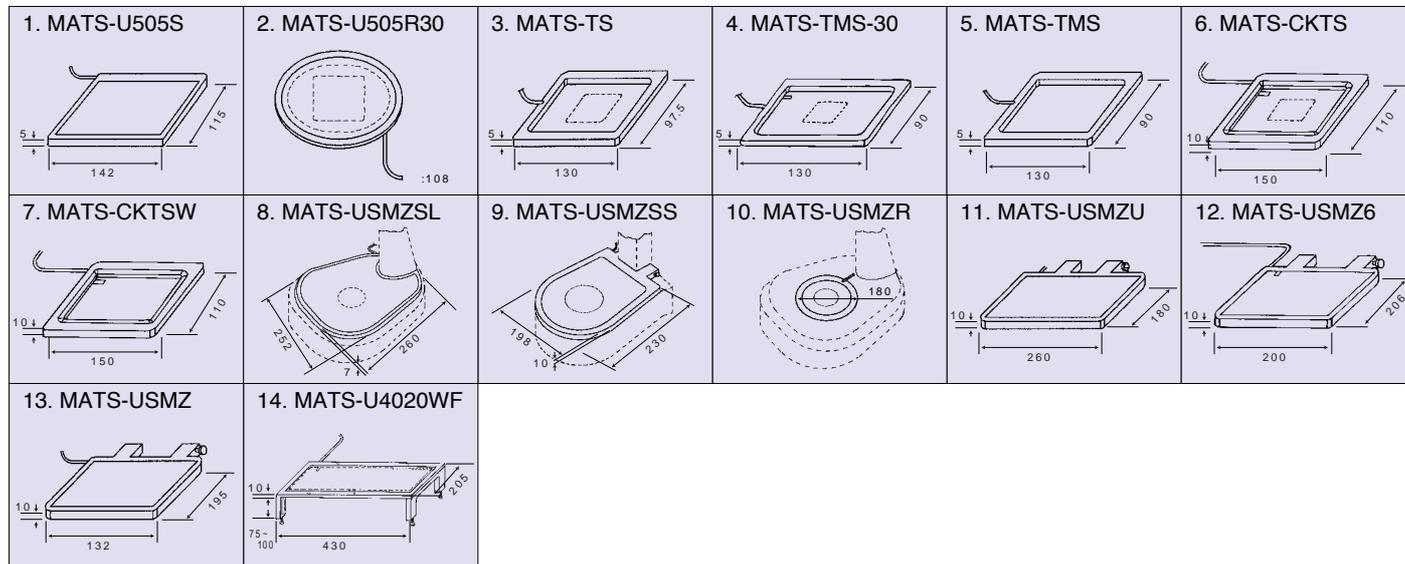
# Specifications

NOTE : Controller is calibrated specifically to make a pair with a plate. Multiple plates can not be applied to one controller.

Type of Microscopes	Applicable Microscopes	Model	Illus. No.	Glass Thickness (mm)	Preset Temp.	Accuracy of Temp. Ind.
Upright	E1000/800/600/400/200 OPTIPHOT-2, LABOPHOT-2	<b>MATS-U505S</b>	1	1.0	Room temp. to 50	± 0.3
Inverted	TE2000, TE300/200 TMD300/200	<b>MATS-U505R30</b>	2	50 × 50( ) plate center area: 0.5 Other surrounding area: 1.0		
	TS100/TS100-F	<b>MATS-TS</b>	3	50 × 50( ) plate center area: 0.5 Other surrounding area: 1.0		
	TMS/TMS-F	<b>MATS-TMS-30</b>	4	50 × 50( ) plate center area: 0.5 Other surrounding area: 1.0		
	TMS/TMS-F	<b>MATS-TMS</b>	5	1.0		
	TMS/TMD with Mechanical Stage TS100/TS100-F	<b>MATS-CKTS</b>	6	50 × 50( ) plate center area: 0.5 Other surrounding area: 1.0		
	TMS/TMD with Mechanical Stage TS100/TS100-F	<b>MATS-CKTSW</b>	7	1.0		
Stereo	SMZ1500/1000	<b>MATS-USMZSL</b>	8	1.0		
	SMZ800	<b>MATS-USMZSS</b>	9	1.0		
	SMZ1500/1000/800	<b>MATS-USMZR</b>	10	1.0		
	SMZ-U SMZ-10A (Illumination Stand)	<b>MATS-USMZU</b>	11	1.0		
	SMZ660/645	<b>MATS-USMZ6</b>	12	1.0		
	SMZ-2T/2B, SMZ1/1B	<b>MATS-USMZ</b>	13	1.0		
	--- Universal Model ---	<b>MATS-U4020WF</b>	14	1.0		

- Dimensions of controller (mm) : W100 × D165 × H123

- Dimensional drawings of plate (Outward dimensions, mm)



\*Custom orders available: preset temperature higher than 50 , isolated sensors, program control, custom design of plate figure, hole processing of heating plates, etc..

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