

## Adapter Plates for More Efficient Microtitre Plate Cooling

### Metallic inserts for the cooled microtitre plate holders

It has come to our attention that the cooled microtitre plate (MTP) holders, though accommodating practically all MTPs, are not ideal in all cases:

- Some microplates are too small so that the user must take care to move them to a specified place (e.g. the bottom right corner). Springs to fix microtitre plates are available, but they can distort flexible polypropylene plates.
- MTPs with rectangular flat bottom wells usually have sufficient contact with the flat metal plate underneath, but plates with V-shaped or round-bottom wells are not efficiently cooled because of the air surrounding the wells.
- If semi- or unskirted plates are used, the cooled air can even leave the place under the MTP, posing the risk of a temperature gradient across the plate.

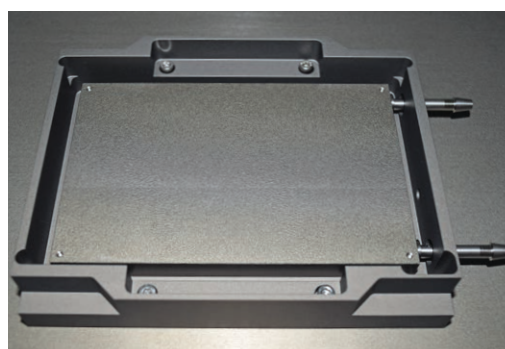
### Thermocoupling via metal adapter plates

The following products are available:

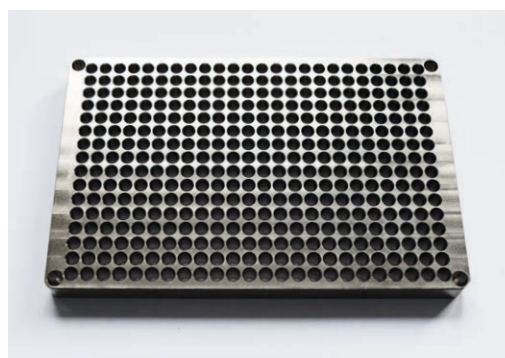
- A070-350: Adapter plate for 384 well plate
- A070-351: Adapter plate for 96 well plate

The boreholes have a flat bottom so that they accommodate both round-bottom and V-shaped wells.

Based on the following experimental results, we recommend to use one of these adapters if your microtitre plates have round wells. Please contact us to make sure your plate fits, as different brands can have different diameters. Customization is possible.



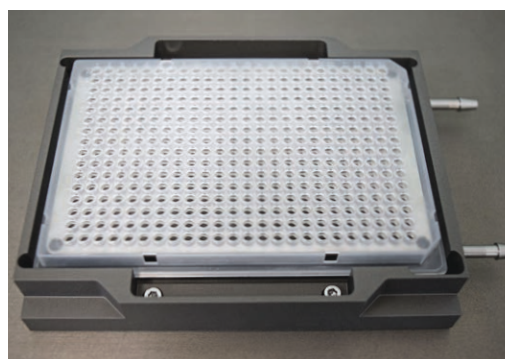
**A070-025** Standard cooled microtitre plate holder. The metal plate under the MTP is even, ideal for flat-bottom wells. A microplate holder with temperature sensor is available.



**A070-350** Adapter plate from stainless steel for 384 well plates, before installation



**A070-350** Adapter plate for 384 well plates from stainless steel, built into the GeSiM cooled microtitre plate holder.



**A070-350** Microtitre plate from polypropylene with 384 V-shaped wells in the adapter plate

# Nano-Plotter

## Microtitre Plate Adapters

### Experimental results

We have measured the effect of the absence and presence of the adapter plates for the temperature distribution in microtitre wells. The temperature in the recirculating thermostat was set to 15 °C, where already condensation occurs at 50 - 60 % relative humidity. The effect is similar at lower temperatures, except that the well temperatures are significantly higher than the bath temperature.

#### 96 well MTP (see figure on the right):

Brand: VWR, Skirted 96 Well PCR Plate, total volume 200 µl

Each well was filled with 150 µl deionized (DI) water. The chiller bath was set to 15 °C.

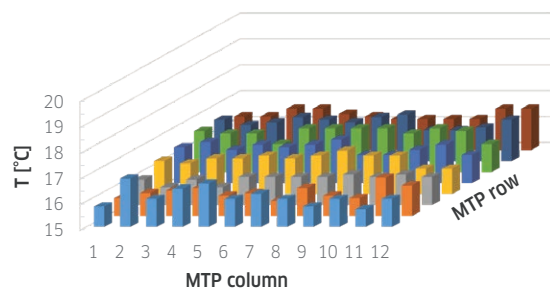
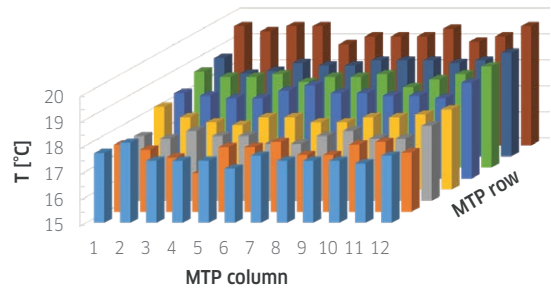
- Without adapter plate: mean temperature 18.1 °C (CV = 3.8 %), max. difference 3.1 °C
- With adapter plate: mean temperature 16,3 °C (CV = 1.8 %), max. difference 1.3 °C

#### 384 well MTP:

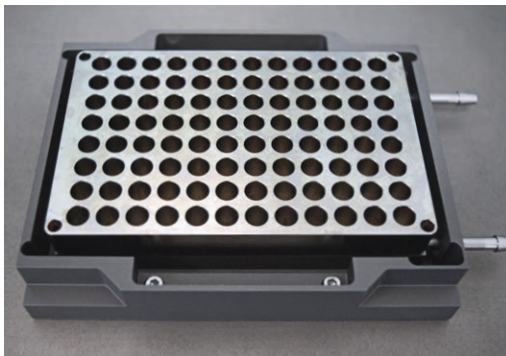
Brand: Thermo Fisher TF-0384 PCR plate, total volume 200 µl

Each well was filled with 30 µl DI water. Chiller bath was set to 15 °C..

- Without adapter plate: mean temperature 18.3 °C (CV = 3.4 %), max. difference 2.7 °C
- With adapter plate: mean temperature 16.3 °C (CV = 3.2 %), max. difference 1.9 °C



**A070-025, -351** Temperature distribution in a 96 well plate without (top) and with (bottom) adapter plate, measured by an infrared camera. The bath temperature of the thermostat (ministat 125, Huber) was 15 °C.



**A070-351** Adapter plate for 96 well plates from stainless steel, built into the GeSiM cooled microtitre plate holder (article number A070-025).



**A070-351** Microtitre plate with 96 round, V-shaped wells in the adapter plate

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