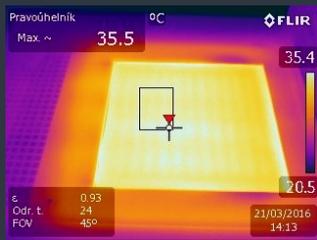


### UNIFORM HEATING

of the hot plate is important for accurate results: we use copper layer to achieve high uniformity. In addition, our temperature regulators measure temperature with 0,018 °C resolution.



### WATER CIRCUIT

wets the sample. As the sample dries, the device adds water under the porous hot plate. An insertion of a cold water can cause inaccurate results, so we heat the water in a two-stage pre-heater.



The device is designed and made in Czech Republic, European Union.

## MPP-220 ISO 11092 Tester



MPP-220 is a special measurement device used for measurement of thermal and water-vapour resistance under steady-state conditions („sweating guarded-hotplate test“) of textiles according to ISO 11092.

The test method, as described in ISO 11092, is based on measurement of the heat losses through the sample in stable temperature (thermal resistance). Sample is placed on the hot plate; the hot plate is surrounded with active heat shields on all sides except for the side with the sample. Electrical power required to hold the hot plate temperature stable is measured and converted to temperature resistance of the sample: the better temperature resistance (better insulation), the lower power is needed.

The sample can be precisely moisturised in order to simulate human perspiration (and measure water-vapour resistance). To achieve this, the hot plate is porous and water can be pumped into the assembly. A digital regulator holds constant level of water/vapour mix in the hot plate assembly. The sample does not soak up with water as the sintered material of the hot plate is permeable only to water vapour.

The sample gets wet with the water vapour and is chilled with a wind, simulated with tangential fans: just like when wearing sweaty clothes. The air speed and turbulent flow are electronically regulated. The water-vapour resistance is then measured from the hot plate heating power requirements.

- ISO 11092 Thermal and Water-vapour Resistance Measurement
- Measurement Hot Plate Size 220 x 220 mm  
Max. Sample Thickness 90 mm
- Automatic Fan (Wind) Speed Regulator
- Motorized Sample Thickness Setting
- For Use in a Climate Chamber
- Hot Plate Made of Sintered Brass with Copper Heat-spreader
- Easy Windows-based Interface with Direct Report Print or PDF output

The device consists of two parts: the hot plate device unit (HPD) and a trolley. The HPD is inserted into a customer-supplied climatic chamber. The trolley is then connected with the HPD by means of a water hose and an electrical connector.

The trolley includes a computer, electrical supplies and measurement circuits and a water tank with pumps and valves. The HPD can be stored on top of the trolley when not in use.

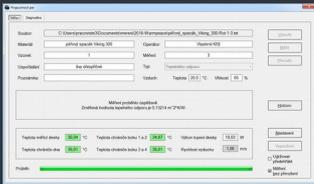
**EQUIPMENT DRAWER**

The trolley includes an equipment drawer and a shelf to store all documents and small parts.



**RUNS WINDOWS**

No special computer needed. We use a Windows 10 based touch notebook computer with Ethernet and Wi-Fi: it would be easy to store the reports on your network. The measurement application is free, in English or Czech. We can even do remote support!



**USE YOUR OWN CLIMATE CHAMBER**



The device fits in all climate chambers that can accommodate 550x430x600 mm (customizable)

# Specification



Power	110 or 230 V AC, 500 W
Sample Size	Hot Plate 220 x 220 mm Max. Thickness 90 mm (cust. up to 110mm)
HPD Unit Size	530 x 365 x 610 mm 8 kg
Trolley	720 x 440 x 815 mm 28 kg
Water Circuit	reversible pump with cut-out valve active drying of the hot plate  5 l water tank
Measurement Accuracy	Temperature: +/- 0,1 K Hot plate power: +/- 0,2 % Air Flow: MEMS sensor +/- 10 % after Calibration  Repeatability and linearity of the measurement exceeds ISO 11092 requirements with a large margin. Results are within +/- 10 % with most devices from last comparative tests made by European testing agencies.

**SERVICES AVAILABLE**

- Technical Support
- Installation and Setup
- On-site Maintenance
- Application Support
- Hardware Support
- 2 Years Warranty

\* - please let us know your climate chamber model and internal size before ordering

# Optional Modifications

- Customizable hot plate size
- Long-time measurements pack (> 2 hours): SW update and bigger water tank
- Measurement in other than ISO 11092 temperatures
- Measurement in other than ISO 11092 air speeds
- Built-in report printer