

Product Information and Safety Instructions

» Heating Microscope EM301

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1 Validity

This document applies to heating microscopes type **EM301** made by **Hesse Instruments**.

2 First steps

- ▶ Read this document completely and carefully.
- ▶ Before operating the heating microscope, make sure that all requirements for its use that are demanded in this document, like environmental requirements or personnel qualification are met.

3 Product description

The **EM301** heating microscope is a laboratory measuring device for the thermo-optical analysis of the sintering, deformation, melting and wetting behaviour of materials.

During a heating microscope measurement, a powder compact or solid body is heated on a substrate in a tube furnace. Looking against a backlight, a digital camera takes photos of the specimen at regular time

intervals. The photos are analysed automatically by the software **EMI III**, in order to determine geometric parameters or characteristic temperatures.

4 Scope of delivery

- ... Optical bench with lamp, furnace and camera
- ... Furnace control with transformer
- ... **EMI III** heating microscope software
- ... Pre-configured measuring station computer with **EMI III** heating microscope software, monitor, keyboard, Windows operating system
- ... Heating microscope accessories, such as a circulating chiller (optional, according to the quotation)

5 Environmental requirements

The components of the **EM301** heating microscope conform to protection rating IP20 and IP30. During storage and operation, they must be protected from dust, dirt, water, etc.

- ... Operating temperature range: 15 °C ... 35 °C
- ... Allowable storage temperature: -10 °C ... +60 °C
- ... Relative humidity: Maximal relative humidity 70 % for temperatures up to 30 °C; linear decrease to 50 % relative humidity at 35 °C.

▲ **Hesse Instruments** does not assume liability for damages that are caused by unfulfilled environmental requirements during storage or operation of the heating microscope.

6 Intended use


The correct operation of the heating microscope is described in **Hesse Instruments'** instruction manuals and application notes


- ▶ During the operation of the heating microscope, stick to the instructions and specifications as described in the manuals and application notes!


- ▶ Do not use the instrument for other purposes without consulting **Hesse Instruments** first.


▲ **Hesse Instruments** does not assume liability for damages that result from an incorrect operation of the heating microscope.

7 Safety instructions

Warning	
	Hot surfaces Danger of burning! Check the temperature before touching the components! Only touch the surfaces, if they have cooled down sufficiently!

Warning	
	Casings contain live electrical components Danger of electric shock! Do not open casings of furnace control, transformer and furnace!

Warning	
	Danger of burning and explosion! Do not measure any flammable or exploding materials!

Warning	
	Health risk! Take all necessary safety precautions, if measuring substances that are harmful to health!

8 Personnel qualification

The qualification for operating the heating microscope is the basis for a safe operation and the reduction of systematic errors.

During the installation, an introduction into the operation of the heating microscope is given. This qualifies the user for the operation of the instrument.

Additionally, you have the option to participate in training courses about and with the heating microscope, offered by **Hesse Instruments**.


- ▶ For further information and detailed instructions for the use of the heating microscope, read the provided technical documentation for the instrument (see section 15).

▲ **Hesse Instruments** does not assume liability for damages that result from an incorrect operation of the heating microscope.

9 Installation

In order to guarantee a reliable and safe operation of the instrument, the heating microscope is installed by qualified technicians from **Hesse Instruments** or from a reliable cooperation partner.


▲ **Hesse Instruments** does not assume liability for damages that result from an incorrect installation of the heating microscope.

Attention	
	Destruction of components possible! The installation of the heating microscope must only be carried out by qualified personnel!

10 Modification of the instrument

Hesse Instruments offers the development and technical realization of modifications of the heating microscope.

▲ **Hesse Instruments** does not assume liability for damages which result from a modification of the heating microscope that is carried out independently by the customer or a third party.

Attention	
	The measuring station computer is an integral part of the heating microscope. Functionality of components is compromised! Do not modify the measuring station computer without consulting Hesse Instruments first!

Attention



Destruction of components possible!

A modification of the heating microscope must only be carried out by qualified personnel!

11 Windows backup image

- ▶ Create a DVD with a backup image of your Windows operating system (OS), which you can use to restore the OS, if it or the hard drive crash.

12 Calibration and maintenance

- ▶ In order to check the condition of your heating microscope, regularly calibrate it according to the provided application note.
- ▶ Check all components regularly and carefully.
- ▶ If you detect any irregularities either during the visual check or the functional check, contact our customer service (see section 15).

- ▲ We recommend a regular maintenance and adjustment by our technicians or from one of our cooperation partners.

13 Measurable materials

All solid bodies, which fulfil the following requirements can be measured with the heating microscope:

- ... They do **not** react with the measuring cell
- ... During the deformation and melting process, they do **not** flow down from or around the substrate due to high wettability
- ... They are **not** oxidising, highly flammable, easily flammable or flammable
- ... They are **not** explosive

If materials are tested, which are labelled as dangerous or hazardous substances or which emit components that are harmful to health or environment, the user must make sure that all necessary safety precautions are met. For instance, this could mean to equip yourself with the required

protective clothing or to install a fume hood at the measuring station.

Attention



Potential destruction of components!

Do not test materials, which

- ... are flammable
- ... are oxidising
- ... explode
- ... react with the measuring cell
- ... flow down from the substrate or around the substrate

14 Behaviour in case of malfunctions and irregularities

In case of malfunctions or irregularities during the operation of the instrument, do the following:

- ▶ Stop your work at the instrument immediately
- ▶ Pull the mains plug
- ▶ Inform your superior
- ▶ Contact **Hesse Instruments'** customer service (see section 15).

Attention



Destruction of components possible!

Do not troubleshoot on your own!

15 Technical documentation / help

The following documents are delivered with the heating microscope in printed form or on the software DVD and can be found on our website:

- ... Product information and safety instructions.
- ... Application notes with background information and step-by-step instructions.
- ... Instruction manuals for all components.
- ... Adjustment manual for **EM301**.

Additionally, you find the instruction manual for the **EMI III** software in the software under **Help ?**.

For further support please contact **Hesse Instruments'** customer service under cservice@hesse-instruments.de or +49 (0) 5522 / 75750.