

Introduction

The **PolyHeater** is a thermal accessory for most **MFP-3D** AFMs that allows controlled heating of dry samples from ambient to 300°C, or from ambient to 400° C in the special high temperature **PolyHeater+** version. The PolyHeater is designed for imaging and measurements in ambient air and is ideal for materials science samples such as polymers, thin films and others.

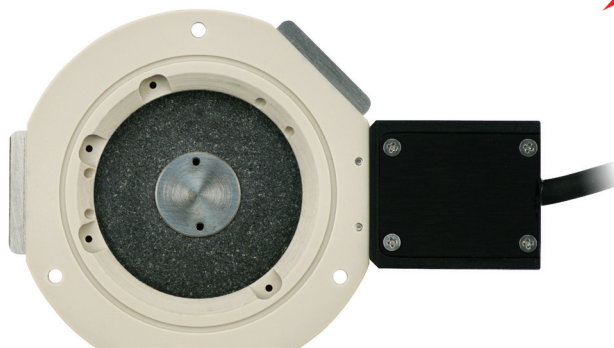
The PolyHeater consists of a metal heating stage embedded in ceramic and high performance plastic. The heating stage can be used with a standard cantilever holder for heating up to 250°C. For experiments between 250° and 300°C a high temperature cantilever holder is included. Sample temperature can be maintained to better than 0.2°C precision with accuracy to 0.5°C. Typical temperature overshoots are less than 0.2°C.

The sample stage accepts magnetic AFM mounting discs and has clips and threaded holes for other sample mounting methods. Sample mounts of 12 mm in diameter are recommended. Sample thicknesses to 2 mm are supported. There are four 1/16" ports which can be used for inert gas purging or electrical connections to the sample. The cell can be fully sealed with a membrane that is included with the kit. Thicker samples of 5-10 mm are possible when the cell is not sealed. The maximum coarse sample translation is 10 mm.

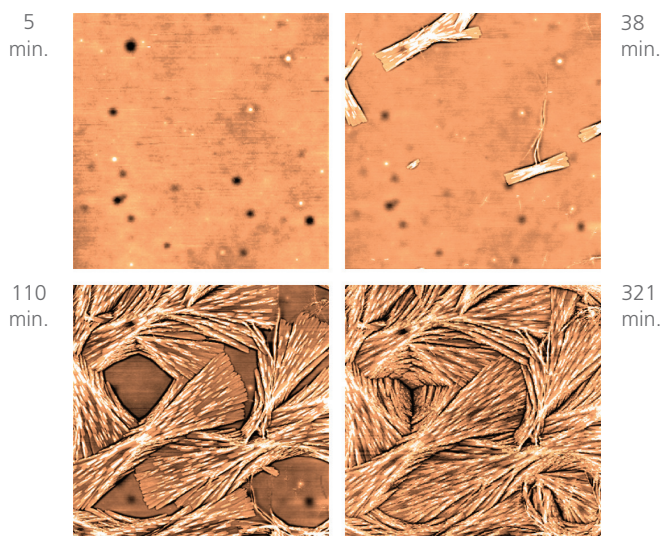
Environmental Controller – Closed Loop Accuracy

The PolyHeater requires the Environmental Controller, a state-of-the-art digital controller (purchased separately). The built-in microprocessor maintains closed loop performance independent of the AFM controller. All control and measurement functions are fully programmable through the MFP-3D software interface, including built-in capability for temperature ramps. Fully integrated temperature information is stored with each AFM image. SmartStart™ allows plug and play operation without the use of parameter files.

High Voltage Compatible 



The PolyHeater sample stage allow easy sample mounting



Syndiotactic polypropylene melted to 160°C, then allowed to crystallize at 105°C. The initial image (top left) shows cooling after approximately five minutes. The remaining images show the crystallization process occurring after the amount of time shown, 80 μm scans.



The Business of Science®

Specifications

The PolyHeater includes the heater stage, a high temperature cantilever holder, and an accessory kit containing an initial supply of consumable items required for operation. The PolyHeater also requires the Environmental Controller, which must be purchased separately and can be shared with other MFP-3D environmental control accessories.

Temperature control

- Heats from ambient to 300°C (400°C for PolyHeater+)
- 0.2°C precision and 0.5°C accuracy with <0.2°C overshoot

Environmental control

- Sample chamber can be fully sealed to control gas environment
- Four 1/16" access ports are provided for tubing or electrical connections

Sample compatibility

- Samples up to 20 mm diameter (12 mm recommended) and 2 mm thickness
- Samples may be manually positioned on the 20 mm diameter heated stage
- Supports up to 10 mm coarse sample translation

Cleaning

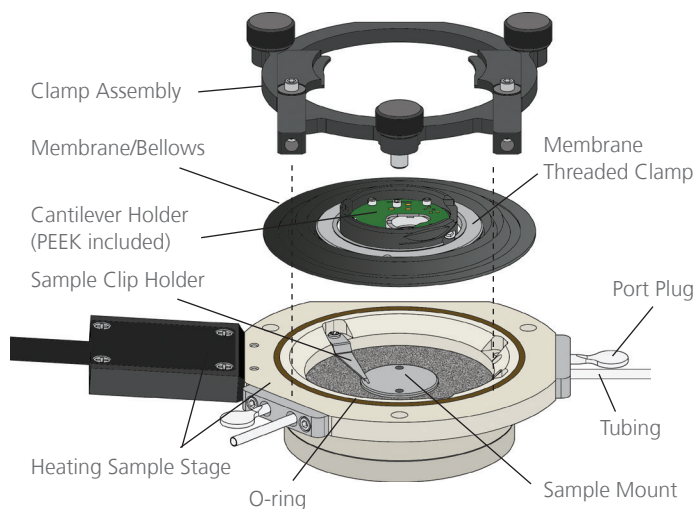
- Swap with alcohol; not immerse in fluid
- Not autoclavable

System compatibility

- Compatible with all MFP-3D AFMs except the MFP-3D Origin™

Environmental Controller

- Closed loop operation
- SmartStart for plug and play operation
- Operates at 110 or 220 VAC
- CE tested
- Built-in microprocessor for temperature control
- Fully programmable through the MFP-3D software



Schematic of PolyHeater assembly

Visit www.AsylumResearch.com to learn more

The foregoing datasheet is copyrighted by Oxford Instruments Asylum Research, Inc. Oxford Instruments Asylum Research, Inc. does not intend the datasheet or any part thereof to form part of any order or contract or regarded as a representation relating to the products or service concerned, but it may, with acknowledgement to Oxford Instruments Asylum Research, Inc., be used, applied or reproduced for any purpose. Oxford Instruments Asylum Research, Inc. reserves the right to alter, without notice the specification, design or conditions of supply of any product or service. Data Sheet 18 – 7/2015.

6310 Hollister Avenue
Santa Barbara, CA 93117
Voice +1 (805) 696-6466
Toll free +1 (888) 472-2795
Fax +1 (805) 696-6444

www.AsylumResearch.com
info@AsylumResearch.com
sales@AsylumResearch.com



The Business of Science®