

Instructions - English & German

Heat-On™ & PTFE Safety Covers

Simply the safest, fastest,
most efficient way of heating
a round bottom flask



 **heidolph UK**
research made easy

Heidolph Instruments GmbH & Co.KG
Walpersdorfer Str. 12 · D - 91126 Schwabach
Tel: (+49) 0 91 22 - 99 20 85 · Fax - 99 20 65
Sales@heidolph.de · www.heidolph.com

Index

English

Page 1	Index
Page 2	Introduction
Page 3 - 4	Safety Information Important WARNINGS
Page 5	Products & Accessories
Page 6 - 12	Set-up
Page 13	Warranty & Liability Questions & Repairs

Deutsch

Seite 15	Inhaltsangabe
Seite 16	Einführung
Seiten 17 - 18	Sicherheitsinformationen Wichtige VORSICHTSMAßNAHMEN
Seite 19	Produkte & Zubehörteile
Seiten 20 - 26	Aufstellung
Seite 27	Gewährleistung & Haftung Fragen & Reparaturen

Thank you for purchasing Heat-On

Please read this Instruction Manual thoroughly before operating your unit.

Introduction

Heat-On is a modular heating and stirring work station designed to accept either one or two round bottom flasks from 10ml to 5 litres. The optional PTFE Safety Covers are designed to compliment and enhance the performance and safety of Heat-On blocks.

Heat-On offers the following features and benefits:

- All Heat-On blocks are manufactured from solid aluminium providing excellent, even heat transfer to the entire block, preventing hot spots
- Sleek weight saving design reduces the mass of the block to be heated, improving heat-up times
- Uniquely shaped deep wells maximise heated surface area to improve heat-up time and minimise the difference between the block and solution temperature
 - Fluoropolymer coating gives added durability
- Tests have shown that a 250ml flask of water can be boiled in under 9 minutes, 50% faster than the competition
 - All Heat-On blocks have a probe hole for use with separate temperature probe
- Heat-On blocks can be used up to 200°C without damage to the block. Temperatures up to 260°C can be achieved but some minor surface degradation may occur.

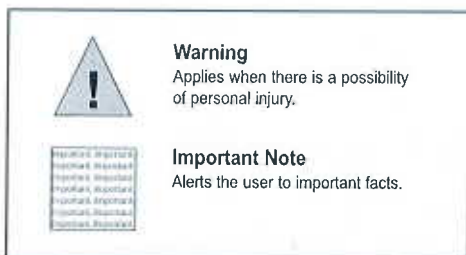
PTFE Safety Covers

These innovative, solid PTFE Safety Covers reduce the risk of users touching the 'hot' Heat-On block and provide the added benefit of lowering energy consumption...

- PTFE insulation reduces the temperature of contact surface areas by up to 50% and provides a thermal safety barrier to the operator when working at elevated temperatures.
 - PTFE insulation reduces energy consumption required to heat the Heat-On Block by up to 15%
- PTFE covers hot metal surfaces and helps prevent accidental spills of solvents on to hot surfaces
 - Chemically resistant PTFE withstands temperatures up to 260°C
 - Fits easily over existing Heat-On Blocks
- All Heat-On Safety Covers have a probe hole for use with separate temperature probes

Safety Information

The following symbols are intended to assist the user in the safe and efficient operation of Heat-On.



Important WARNINGS

1. Please read these instructions completely before using your Heat-On Block.

Heat-On should only be operated by trained and competent personnel. As with all chemistries, a full risk assessment should be performed prior to starting, and care should be taken to monitor your reactions at all stages. During operation Heat-On should not be left unattended unless in a supervised area.

2. Operate only in a fume cupboard with protective safety sash.

3. During and after heating take care not to touch the Heat-On block.

4. Risk of burns from hot blocks

Like oil baths, Heat-On blocks remain hot for some considerable time after the heating source has been switched off. A temperature probe or temperature sensitive label can be used to indicate when blocks are too hot to touch. The use of Heat-On PTFE Safety Covers will also reduce the risk of users touching the 'hot' block.

5. Flask selection process

Heat-On is designed so that over sized flasks cannot fit through the slightly narrower opening at the top of the block well. This means that all suitable flasks should sit at the bottom of the block well, be a loose fit and as such spin freely in the Heat-On well.

When a flask is inserted into the well it is important to ensure that the flask touches the bottom of the well and does not 'catch or stick' on the sides of the block well. If the flask is 'catching or sticking' it may be deformed and may result in jamming and even cracking of the flask when the Heat-On block is cooling.

There is a simple rule when using glassware with the Heat-on: **"If it does not spin, then throw it in the bin"**. If the flask does not spin freely then it is unsuitable for use in the Heat-On and an alternative flask should be used.

During the design of Heat-On, Radleys have evaluated and tested flasks from a wide range of glass manufacturers to ensure that Heat-On blocks will accept the widest possible range of sizes and styles. However, because the tolerances on mass produced glassware can vary greatly it is not possible to guarantee that all brands will fit. Indeed, experience shows us that glassware from a single manufacturer may vary considerably in size and shape from batch-to-batch and also from item-to-item. In such circumstances customers may have to pre-select appropriate sized glassware to use with Heat-On.

Important WARNINGS - continued

6. Starting and stopping your reaction

In an ideal situation you should load your glassware into the block when the block is at ambient (room temperature).

However in certain situations this may not be practical. In such circumstances you should note:-

- You can use cold water to cool the block down rapidly, but take care with blocks above 100°C as steam is a potential hazard.
- It is generally safe to insert flasks into blocks that are below 50°C, but the flask should be removed before the block temperature drops below the start temperature as there is a small risk that the contraction of the block could crush the glass flask.
- In all eventualities flasks should be removed at or above the temperature they were originally inserted; i.e. in the case of a flask that is inserted at 80°C, it should be removed when or before the block cools to 80°C.

7. Chemical resistance

Anodised Heat-On blocks are resistant to the majority of solvents and splash resistant to dilute acids and alkalis at room temperature. The fluoropolymer coated Heat-On blocks offer superior resistance to the majority of solvents, acids and alkalis.

Extended exposure to acids or alkalis will attack the surface of the Heat-On blocks. The stronger the concentration and the longer the exposure time the more chance and intensity of any attack. Heat will also speed up and intensify any attack. e.g. hot concentrated sulphuric acid will damage the fluoropolymer coated Heat-On blocks over a period of time. It is important to clean off any residual chemical spills immediately after they occur.

8. Temperature range

Heat-On blocks can be used up to 200°C without damage to the block. Temperatures up to 260°C can be achieved but some minor surface degradation may occur.

9. Use of the Optional PTFE Safety Covers

- The Heat-On Safety Cover is designed to be used in conjunction with Heat-On blocks. Please ensure that you have read the Heat-On instructions fully before using the Heat-On Safety Covers.

- Operate only in a fume cupboard with protective safety sash.

- During and after heating take care not to touch the Heat-On Safety Covers and blocks.

Risk of burns from hot covers and blocks

- Whilst the Safety Cover significantly reduces the temperature of exposed surfaces, it will still be hot and may also increase the time taken for the Heat-On block to cool down after use. A temperature probe or temperature sensitive label can be used to indicate when blocks and covers are too hot to touch.

Chemical Resistance

- Heat-On Safety Covers are manufactured from solid PTFE, providing chemical resistance to the majority of chemicals. However, although the Heat-On Safety Cover is designed to give additional chemical protection to the Heat-On block, it does not provide a complete sealed enclosure, and care should be taken to avoid any spillage that may result in damage to the block.

Temperature Range

- Heat-On Safety Covers can be used on Heat-On blocks operating at up to 200°C without damage to the cover or block. Operation with Heat-On block temperatures up to 260°C can be achieved but some distortion to the cover and minor surface degradation to the Heat-On block may occur.



Products & Accessories

Heidolph Cat No.	Description	Flk Qty
MR Gold 1 Package		
505-81600-00	1 x MR Hot-Tec Inclusive Temperature sensor PT 1000	
	1 x Support Rod Temperature sensor PT 1000	
	2 x Heat-On 25ml Insert	
	2 x Heat-On 50ml Insert	
	2 x Heat-On 100ml Insert	
MR Gold 2 Package		
505-81200-00	1 x MR Hot-Standard	
	2 x Heat-On 25ml Insert	
	2 x Heat-On 50ml Insert	
	2 x Heat-On 100ml Insert	
	2 x Retort Clamps	
	2 x Boss Heads	
Package Heat-On Multi-Well		
505-81200-00	Heat-On Multi-Well System (Polymer coated)	
	1 x Heat-On Multi-well Holder (Polymer coated)	
	2 x Heat-On 25ml Insert (Polymer coated)	
	2 x Heat-On 50ml Insert (Polymer coated)	
	2 x Heat-On 100ml Insert (Polymer coated)	
Package Heat-On Multi-Well Basic		
505-81300-00	Heat-On Multi-Well Basic System (Polymer coated)	
	1 x Heat-On Multi-well Holder (Polymer coated)	
	1 x Heat-On 25ml Insert (Polymer coated)	
	1 x Heat-On 50ml Insert (Polymer coated)	
	1 x Heat-On 100ml Insert (Polymer coated)	
Heat-On Blocks for Multi-well Holder with Fluoropolymer Coating		
505-80060-00	Heat-On Multi-Well Holder (Polymer coated)	1
505-80061-00	Heat-On 10ml Insert (Polymer coated)	1
505-80062-00	Heat-On 25ml Insert (Polymer coated)	1
505-80063-00	Heat-On 50ml Insert (Polymer coated)	1
505-80064-00	Heat-On 100ml Insert (Polymer coated)	1
505-80065-00	Heat-On 150ml Insert (Polymer coated)	1
Heat-On Blocks with Fluoropolymer Coating		
505-80066-00	Heat-On 100ml Block with flask sidearm outlets (Polymer coated)	1
505-80067-00	Heat-On 250ml Block (Polymer coated)	1
505-80069-01	Heat-On 250ml Block with flask sidearm outlets (Polymer coated)	1
505-80069-00	Heat-On 500ml Block (Polymer coated)	1
505-80071-00	Heat-On 1 Litre Block (Polymer coated)	1
505-80073-00	Heat-On 2 Litre Block (Polymer coated)	1
505-80075-00	Heat-On 3 Litre Block (Polymer coated)	1
505-80078-00	Heat-On 4 Litre Block (Polymer coated)	1
505-80076-00	Heat-On 5 Litre Block (Polymer coated)	1
Heat-On PTFE Safety Covers		
505-80080-00	PTFE Safety Cover for Multi-Well Holder	1
505-80081-00	PTFE Safety Cover for 200-300ml Block	1
505-80082-00	PTFE Safety Cover for 500ml Block	1
505-80083-00	PTFE Safety Cover for 1L Block	1
Heat-On Accessories		
505-80077-00	Heat-On Safety Lifting Handles (Pair)	2
505-81075-00	Base Head	1
570-31100-00	Retort Clamp	1
505-81400-00	Flask Stand & Clamp Kit (Support Stand A-Shape Base, Support Rod 600 x 12.5mm, Retort Clamp, Boss Head)	1
505-58500-00	Set spin bars cross shape 16.5mm for 25 to 50ml Flasks	20
505-58300-00	Set spin bars Evaluation Kit 25mm for Flasks	10

A full range of stirring bars and round bottom flasks are available on request.

Set-Up

Select your stirring hotplate

Heat-On is compatible with most leading brands of stirring hotplate with a diameter of up to 145mm including the Radleys Carousel Stirring Hotplate and the Heidolph Magnetic Stirrer (505-20000-00, 505-30000-00, 505-40000-00, 505-50000-00)



Do you need an adapter plate?

The Heat-On blocks and Multi-well holders have a single recess in the base to locate onto your stirrer hotplate. Some hotplates, such as the Carousel Stirring Hotplate have a smaller top plate diameter (135mm) so some movement will be noticed between the block and the top plate.

If you feel this is unacceptable an adapter plate can be purchased. This optional aluminium adapter plate for 135mm diameter top plates is available from Heidolph: -

Cat No **Description**
505-81000-01 Heat-On Adapter Plate for 135mm Hotplates



Important Note

Always fully read the instructions of any third party equipment, such as stirring hotplates or temperature probes thoroughly, to ensure you are not contravening any safety recommendations or manufacturers warranty when used in conjunction with Heat-On.

Optimising the temperature performance of Heat-On

The heating performance of Heat-On will be affected by:

1. The limit of the maximum operating temperature of the stirring hotplate.
2. Heating power (Watts) of the stirring hotplate.
3. Flatness of the top plate on the stirring hotplate.
4. Ambient temperature.
5. Load to be heated.
6. Maximum housing temperature of the stirring hotplate.
7. Whether you use a separate temperature controller (probe) see overleaf.

**Important Note**

Heat-On blocks can be used up to 200°C without damage to the block. Temperatures up to 260°C can be achieved but some minor surface degradation may occur.

**Warning**

When placing oil baths, sand baths, polymer coated or aluminium blocks etc onto a stirring hotplate the increased surface area will reflect heat back to the stirring hotplate. In such instances care should be taken to ensure that the hotplates external housing does not exceed the maximum temperature recommended by the manufacturer. Such overheating can cause damage to internal and/or external parts and lead to failure of your stirring hotplate.

**Warning**

Always refer to the manufacturers operating instructions for your stirring hotplate before using it with Heat-On to be sure of any limitations or safety restrictions.

Set-Up - continued

Using a separate temperature controller

For accurate temperature control of your block and/or solution temperature we recommend using a temperature controller such as the 509-67910-00 Temperature Sensor Pt 1000 (V4A) or 509-67920-00 Temperature Sensor Pt 1000 (glass coated).

All Heat-On blocks feature a hole (3.5mm ID) for inserting a temperature probe.



Important Note

Please note that typically temperature controllers should be set between 5°C and 15°C above the boiling point of the solvent to achieve a gentle reflux.



Warning

Temperature controller wire/cable should not come into contact with the Heat-On Block. Always rotate the block to ensure that the probe hole is nearest to the probe socket on the stirring hotplate.

Optimising the stirring performance of your Heat-On

The Heat-On system uses the magnetic field of the stirring hotplate to stir your sample. The Heat-On blocks have been optimised to work with leading brands of stirring hotplates with a top plate diameter of up to 145mm.

The stirring performance of Heat-On will be affected by:

1. The limit of the maximum stirring speed of the stirring hotplate.
2. Power and size of the magnet within the stirring hotplate.
3. Selection of an appropriate magnetic stirring bar for your chosen flask
4. Viscosity of sample.

Wide choice of magnetic stirring bars

The selection of an appropriate magnetic stirring bar for your chosen flask is key to the performance of stirring within the Heat-On block.

For more information on suitable stirring bars please contact Heidolph or your local distributor.



Set-Up - continued

Beginning your experiment

In an ideal situation you should load your glassware into the block when the block is at ambient (room temperature).

However in certain situations this may not be practical. In such circumstances you should note:-

- a. You can use cold water to cool the block down rapidly, but take care with blocks above 100°C as steam is a potential hazard.
- b. It is generally safe to insert flasks into blocks that are below 50°C, but the flask should be removed before the block temperature drops below the start temperature as there is a small risk that the contraction of the block could crush the glass flask.
- c. In all eventualities flasks should be removed at or above the temperature they were originally inserted; i.e. in the case of a flask that is inserted at 80°C, it should be removed when or before the block cools to 80°C.

Heat-On blocks are available from 10ml to 5 litres and are designed to locate directly on to the stirring hotplate or adapter plate (see page 6)

1. Select the appropriate Heat-On block for your chosen flask. Each Heat-On block is designed for a specific size of glassware and is identified accordingly with engraving on the side of the block.
2. If using a 135mm hotplate, place adapter plate on hotplate.
3. Place block onto hotplate/adapter plate, ensuring block is sitting level.
4. If using a temperature probe rotate Heat-On block until probe hole is located at the rear of your stirring hotplate.



Warning

Always refer to the manufacturers operating instructions for your stirring hotplate before using it with Heat-On, to be sure of any limitations or safety restrictions.



Important Note

Compatibility between Heat-On block and flask is essential for overall safety of this equipment (see page 11).



Set-Up - continued

Multi-well formats for smaller flasks

The unique Multi-well holder is designed to hold either one or two inserts for flasks or tubes. The inserts are available for 10ml, 25ml, 50ml, 100ml or 150ml flasks as well as multi-tube inserts for 16mm ϕ , 20mm ϕ and 24mm ϕ tubes or vials. Flask inserts feature cut-away sides to enable the use of flask with or without sidearms.



Simply place the multi-well block holder directly on to the hotplate or adapter plate (see page 5) and select appropriate insert for your flask(s) or tube(s).

**Warning**

Always refer to the manufacturers operating instructions for your stirring hotplate before using it with Heat-On, to be sure of any limitations or safety restrictions.

Important Notes

- 1: Compatibility between Heat-On block and flask is essential for overall safety of this equipment (see page 11).
- 2: The Multi-well holder only accepts ONE 150ml insert.



Fluoropolymer Coated

The Heat-On blocks, holders and inserts can be purchased as polymer coated. The fluoropolymer coated Heat-On blocks offer superior resistant to the majority of solvents, acids and alkalis.

**Important Note**

Extended exposure to acids or alkalis will attack the surface of the Heat-On blocks. The stronger the concentration and the longer the exposure time the more chance and intensity of any attack. Heat will also speed up and intensify any attack. e.g. hot concentrated sulphuric acid will damage the fluoropolymer coated Heat-On blocks over a period of time.

**Important Note**

Heat-On blocks can be used up to 200°C without damage to the block. Temperatures up to 260°C can be achieved but some minor surface degradation may occur.

**Important Note**

It is important to clean off any residual chemical spills immediately after they occur.

Set-Up - continued

Fitting optional safety lifting handles to Heat-On blocks

Safety lifting handles have a simple and secure quick release mechanism that allows the user to quickly attach the handles and move the block while it remains hot.

**Warning**

When lifting the block using the handles, always be sure to touch only the handles and not the block itself, which may be too hot to touch and may cause injury.

**Warning**

Always wear heat resistant gloves when handling hot blocks - even when using the lifting handles.

The handles are attached to the block or holder as follows:

1. Take handle and push button on top (as shown in picture to the right).
2. Slide handle into the stainless steel insert.
3. Release button.

To remove handle, simply press down on button and pull handle out.

**Warning**

Handles should always be removed from block when heating. If handles are left in block whilst heating they will become hot.

**Warning**

Extreme caution should always be used when lifting hot vessels or objects. Please check with your laboratory safety officer to ensure that you are complying with all relevant safety procedures.

Many laboratories do not permit the handling of hot liquids or objects and therefore the use of the optional handles may not be permitted within such a laboratory.



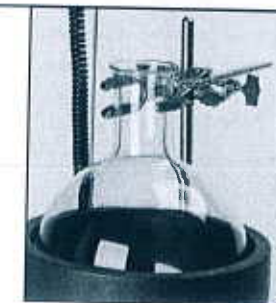
Handles should always be removed from block when heating. If handles are left in block whilst heating they will become hot.



Using a retort stand

To increase user safety Radleys recommend the use of a retort stand with Heat-On blocks, adding further stability to the system, particularly when using the larger blocks.

We find it best to locate the stand to the rear of your set-up thus avoiding any obstruction when using hotplate controls.



Set-Up - continued

Flask selection process

Heat-On is designed so that over sized flasks cannot fit through the slightly narrower opening at the top of the block well. This means that all suitable flasks should sit at the bottom of the block well, be a loose fit and as such spin freely in the Heat-On well.

When a flask is inserted into the well it is important to ensure that the flask touches the bottom of the well and does not 'catch or stick' on the sides of the block well. If the flask is 'catching or sticking' it may be deformed and may result in jamming and even cracking of the flask when the Heat-On block is cooling.

There is a simple rule when using glassware with the Heat-on: **"If it does not spin, then throw it in the bin"**. If the flask does not spin freely then it is unsuitable for use in the Heat-On and an alternative flask should be used.

During the design of Heat-On, Radleys have evaluated and tested flasks from a wide range of glass manufacturers to ensure that Heat-On blocks will accept the widest possible range of sizes and styles. However, because the tolerances on mass produced glassware can vary greatly it is not possible to guarantee that all brands will fit. Indeed, experience shows us that glassware from a single manufacturer may vary considerably in size and shape from batch-to-batch and also from item-to-item. In such circumstances customers may have to pre-select appropriate sized glassware to use with Heat-On.



Warning

Factors that could lead to a flask failure...

Description of Problem

1. The flask does not spin freely and therefore is deformed and is catching or sticking on the inside of the well. The flask may well crack when the Heat-On block cools.
2. There is grit or an object between the flask and the well.
3. The flask was sealed with a closure or cap and there was a build up of pressure in the flask during heating.
4. The flask was scratched, or cracked and failed due to weakness.
5. The flask was not properly annealed during manufactured and has cracked due to stress.

Remedy

1. There is simple rule when using glassware with the Heat-on: **"If it does not spin, then throw it in the bin"**. If the flask does not spin freely then it is unsuitable for use in the Heat-On and an alternative flask should be used.
2. Always thoroughly clean the Heat-On block before and after use.
3. Never heat sealed glass vessels, unless they are specifically pressure rated.
4. Never use glassware that shows signs of scratching, cracking or has chips, as this causes inherent weaknesses in the glass strength.
5. Always buy glassware from reputable sources.

Set-Up - continued

Set-Up of PTFE Safety Covers

1. Follow the set-up procedure for the Stirring Hotplate and Heat-On block as described previously.
2. Ensure that you have the correct Safety Cover for the Heat-On block that you are using. You can check this by matching the size information inscribed on the PTFE Cover with that on the Heat-On block.
3. Carefully position the Heat-On Safety Cover over the Heat-On block. Check that the Cover is properly located and fitting on the block securely. There should be adequate clearance between the inner circumference of the Heat-On Safety Cover and the inner rim of the Heat-On bowl, such that there is no obstruction when glassware is positioned in the block. The PTFE cover should turn freely on the Heat-On block.
4. Rotate the cover until the access holes for the Heat-On safety lifting handles and Temperature Probe in the cover are correctly aligned with the respective holes in the Heat-On block.
5. Load Glassware: Select the appropriate glassware for your application. Ensure that the glassware is fully compatible with the Heat-On block and Safety Cover to be used. Position the glassware in the Heat-On block. Check that the glassware is properly located in the block, and not constrained in anyway by the Heat-On Safety Cover.



Set-Up of PTFE Safety Covers for Multi-Well Block

A dedicated Multi-Well Safety Cover is available for the Heat-On Multi-Well Holder, which is fully compatible with the full range of inserts. Simply place the Multi-Well Holder directly on to the hotplate, position the PTFE Safety Cover and rotate so that the central cut out of the cover is correctly aligned with; the locating rings in the Multi-Well Holder; and the access holes for Heat-On safety lifting handles and Temperature Probe.

