

Instructions

Cool-It[™] Bowls

Your Local Distributor

Radleys

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Thank you for purchasing your Cool-It Insulated Bowl

Please read this Instruction Manual thoroughly before operating your unit.

1. Introduction

• Cool-It is a cooling and stirring work station designed to accept single round bottom flasks up to 2 litres.

• Cooling is achieved by using an appropriate cooling mixture (e.g. dry ice / acetone) to obtain the desired temperature from ambient to -78°C (see Cooling Mixture Appendix page 9).

• Cool-It is not suitable for heated reactions.

• Cool-It is designed to fit on a standard stirring hotplate, which provides magnetic controlled stirring through a magnetic stirring bar in the reaction flask.

• All Cool-It bowls are manufactured from a rugged, chemically resistant HDPE polymer that is compatible with a wide range of freezing mixtures for manually controlled cooling.

• High quality encapsulated insulation provides unprecedented insulating performance, allowing contents to be maintained at constant temperature for extended time periods.

• Insulation minimises condensation on the outer surfaces, preventing water ingress to the electronic stirring motor, protecting the stirrer from freezing.

• Uniquely shaped pouring spout allows cooling liquid to be drained at the end of the reaction without spilling or splashing solvents.

• Ergonomically sculptured handle provides additional support and control when draining the contents.

• Custom designed lid enhances cooling performance and minimises condensation build-up and frosting of glassware, enabling clear visibility into the reaction flask at all times.

• Tests have shown that a 100ml flask of solvent can be cooled to -70°C in under 5 minutes, and the temperature maintained at that level without further addition of cooling agent for periods of up to 6 hours.

• Cool-It bowls can be used down to -85°C without damage to the bowl.

2. Warranty

Cool-It includes one year full parts and labour warranty from date of original purchase.

Warranty will only be valid if a completed Warranty Email Back is returned within 1 month of date of purchase (see last page). In the event of product failure please contact your local distributor.

Please do not return any goods without prior agreement.

3. Safety Information

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



Warning Applies when there is a possibility of personal injury.



Important Note Alerts the user to important facts.

4. Important WARNINGS

- · Please read these instructions completely before using your Cool-It bowl.
 - Operate only in a fume cupboard with protective safety sash.
 - · Cool-It is NOT suitable for heated reactions.
- Ensure that the heating control on the stirring hotplate is switched off and that the hotplate is cool before using Cool-It.
 - During and after cooling take care not to touch the Cool-It bowl.
 - Risk of burns from cold bowls. Cool-It bowls contain fluids at low temperatures. Care should be taken to avoid contact with bowl and contents during operation. Cooling mixtures can cause severe frost burns.

• Always wear suitable protective gloves, aprons and face shield.

Cooling solvents such as acetone are extremely flammable. Always follow appropriate safety instructions and chemical handling procedures.

• To avoid pressure build-up, always allow cooling mixtures to reach ambient temperatures before disposing or decanting.

Cool-It has a 145mm recess in the base. If your stirring hotplate's top plate is smaller we recommend the use of an adapter plate. See page 5.

Temperature Range

Cool-It bowls can be used down to -85°C without damage to the bowl. They must not be placed on hot surfaces or heated above ambient.

5. Dimensions

Cool-It Small Bowl – External: 95mm high x 210mm wide (spout to handle). Internal: 70mm deep x 129mm diameter. Cool-It Large Bowl – External: 154mm high x 305mm wide (spout to handle). Internal: 125mm deep x 216mm diameter.

6. Products and Accessories

Cool-It Bowls

Cool-It Small Bowls							
RR71011 RR71021	Cool-It Small Bowl + Free Lid Cool-It Large Bowl + Free Lid						
RR61085	Adapter Plate for 135mm Stirring Hotplates						
Cool-It Syst	ems						
RR71500	Cool-It Basic System 1 Consisting of the following: RR71011 - 1 x Cool-It Small Bowl + Free Lid RR71021 - 1 x Cool-It Large Bowl + Free Lid RR61085 - 1 x Adapter Plate for 135mm Hotplates RR71200 - 1 x Stirring Bar Evaluation Kit — for Flasks, pk 10 RR99908 - 1 x Dry Ice Scoop						
RR71501	Cool-It Standard System 2 Consisting of the following: RR71011 - 1 x Cool-It Small Bowl + Free Lid RR71021 - 1 x Cool-It Large Bowl + Free Lid RR61085 - 1 x Adapter Plate for 135mm Hotplates RR99905 - 1 x Digital Thermometer (-250C to +400C) and 200mm Probe RR71120 - 1 x Support Rod Hotplate Adapter RR71127 - 1 x Support Rod 500 x 13mm RR71110 - 1 x Retort Clamp to 85mm RR71115 - 1 x Boss Head 16mm RR71120 - 1 x Stirring Bar Evaluation Kit — for Flasks, pk 10 RR99908 - 1 x Dry Ice Scoop						
RR71502	Cool-It Complete System 3 Consisting of the following: RR71011 - 1 x Cool-It Small Bowl + Free Lid RR71021 - 1 x Cool-It Large Bowl + Free Lid RR61085 - 1 x Adapter Plate for 135mm Hotplates RR91203 - 1 x Carousel Tech Stirring Hotplate 230v UK Plug RR99905 - 1 x Digital Thermometer (-250C to +400C) and 200mm Probe RR71120 - 1 x Support Rod Hotplate Adapter RR71127 - 1 x Support Rod Hotplate Adapter RR71110 - 2 x Retort Clamp to 85mm RR71115 - 2 x Boss Head 16mm RR71200 - 1 x Stirring Bar Evaluation Kit — for Flasks, pk 10 RR9908 - 1 x Dry Ice Scoop RR99909 - 1 x Cold Temperature Apron 1060mm Long, Waterproof RR99910 - 1 x Protective Face Shield RR98024 - 1 x Protective Cold Temperature Gloves (pair)						
RR71505	Cooling Protection System Consisting of the following: RR99909 - 1 x Cold Temperature Apron 1060mm Long, Waterproof RR99910 - 1 x Protective Face Shield RR98024 - 1 x Protective Cold Temperature Gloves (pair)						
RR71510	Flask Stand & Clamp System Consisting of the following: RR71120 - 1 x Support Rod Hotplate Adapter RR71127 - 1 x Support Rod 500 x 13mm RR71110 - 1 x Retort Clamp to 85mm RR71115 - 1 x Boss Head 16mm						

Cool-It Accessories

Hotplates and Pt1	000 Temperature Sensor
RR91200	Carousel Standard Stirring Hotplate 230v UK Plug
RR91203	Carousel Tech Stirring Hotplate 230v UK Plug
RR91206	Carousel Tech Stirring Hotplate + Pt1000 230v UK Plug
RR91291	Carousel Tech Package 230v UK Plug
	Includes Tech Stirring Hotplate, Pt1000 S/Steel Sensor and Pt1000 Clamping System.
RR91204	Carousel Advanced Stirring Hotplate 230v UK Plug
RR91205	Carousel Advanced Stirring Hotplate + Pt1000 230v UK Plug
RR91226	Pt1000 S/S Temperature Sensor
RR91227	Pt1000 Glass Coated Temperature Sensor
RR91228	Temperature Sensor Holder
DTEE Magnatia St	timing Doro
PTFE Magnetic Si RR98075	-
RR98091	Cross Shape Stirring Bar 10mm (for 5 to 10ml), pk 40 Cross Shape Stirring Bar 16.5mm RE (for 25 to 50ml), pk 20
RR99064	Elliptical Stirring Bar 25mm RE (for 100 to 400ml), pk 10
RR95920	Oval Stirring Bar 40mm (for 500 to 1000ml), pk 5
RR95921	Oval Stirring Bar 50mm (for 2000ml), pk 5
RR71200	Stirring Bar Evaluation Kit – for Flasks, pk10
11111200	(Contains 2 of each of the above stirrer bars)
Cool-It Accessorie	s
RR99905	Digital Thermometer (-250C to +400C) and 200mm Probe
RR99906	Digital Thermometer (-250C to +400C)
RR99907	200mm Temperature Probe
RR99908	Dry Ice Scoop
RR99909	Cold Temperature Apron 1060mm Long, Waterproof
RR99910	Protective Face Shield
RR98024	Protective Cold Temperature Gloves (pair)
Support Stands ar	
RR71120	Support Rod Hotplate Adapter
RR71127	Support Rod 500 x 13mm
0074440	
RR71110	Retort Clamp to 85mm
RR71115	Retort Clamp to 85mm Boss Head 16mm
	Retort Clamp to 85mm
RR71115	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod
RR71115	Retort Clamp to 85mm Boss Head 16mm
RR71115	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod
RR71115	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod
RR71115	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Adapter Plate
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Refort Stand, 2 Position Base + 12x750mm SS Rod Adapter Plate
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Refort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Refort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Refort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Refort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring Hotplate Retort Clamp & Boss
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring Hotplate Retort Clamp
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring Hotplate Retort Clamp & Boss
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Carousel Stirring Hotplate Retort Clamp & Boss Head
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Cool-It Cool-It
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Scoop
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Digital
RR71115 RR31210	Refort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Scoop
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Digital
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Digital
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Digital
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Coo
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Coo
RR71115 RR31210	Retort Clamp to 85mm Boss Head 16mm Retort Stand, 2 Position Base + 12x750mm SS Rod Cool-It Large Lid Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Bowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Large Dowl Cool-It Cool-It Cool-It Cool-It Cool-It Large Dowl Cool-It Cool-

7. Set-Up and Operation

7.1. Selecting a stirring hotplate

Cool-It is compatible with leading brands of stirring hotplate with a diameter of up to 145mm, including the Radleys Carousel Stirring Hotplates, and popular IKA, Eyela and Heidolph stirring hotplates.

Do you need an adapter plate?

The Cool-It bowls have a single recess in the base to locate onto your stirring hotplate. Some hotplates, such as the Carousel Stirring Hotplates and IKA, have a smaller top plate diameter (135mm), so some movement may be noticed between the bowl and the top plate. If you feel this is unacceptable, an optional aluminium adapter plate can be purchased from Radleys.

• RR61085 – Adapter Plate for 135mm Hotplates



Important Note

Always fully read the instructions of any third party equipment, such as stirring hotplate or temperature probe, thoroughly to ensure you are not contravening any safety recommendations or manufacturer's warranty when used in conjunction with Cool-It.

7.2. Locating the Cool-It bowl onto stirring hotplate

Select the appropriate size bowl for your application. The circular recess in the base fits around the top plate, yet allows it to be lifted on or off the stirring hotplate with ease.



Important Note

Always check that the bowl is stable when placed on to the top plate. Also check that the bowl can be removed from the top plate without sticking before you fill it with cooling mixture. Use an adapter plate (RR61085) if required.



Warning

Cool-It is not suitable for heated reactions. Always ensure that the heating control on the stirring hotplate is switched off and that the top plate is cool before using Cool-It.

7.3. Setting up the support stand and clamp

The use of a support stand and clamp, to support the reaction vessel and stabilise the system, is essential with Cool-It bowls. The stand should be positioned on a flat surface to the rear of your stirring hotplate, thus avoiding any obstruction when using controls. The clamp should be in good working order and adequate to support the weight of the flask and contents being used.

Support stands and clamps

- RR31210 Retort Stand, 2 Position Base + 12x750mm SS Rod
- RR71110 Retort Clamp to 85mm
- RR71115 Boss Head 16mm







7. Set-Up and Operation – Continued

7.4. Selecting suitable glassware and the correct Cool-It bowl

Cool-It is designed to be used with all common glassware formats, including round bottomed flasks and Florentine (pear-shaped) flasks. Glassware should be selected that is appropriately sized for the Cool-It bowl to be used.

- The Cool-It Small Bowl has been designed to take flask sizes up to 400ml.
- The Cool-It Large Bowl has been designed to take flask sizes up to 2000ml.

Important, Important,

Important Note

Care should be taken to select the appropriate bowl size. Choosing too large a bowl will result in excess cooling liquid being required to maintain adequate cooling performance. Choosing too small a bowl may result in insufficient cooling liquid being available to maintain optimum cooling performance, and may compromise the fit of the lid.

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Important Note

Flasks with side arms may not be compatible with the Cool-It lid. Position of side arms and suitability for use with the lid should be determined before assembling apparatus.

7.5. Optimising the stirring performance of your Cool-It

The Cool-It system uses the magnetic field of the stirring hotplate to stir your sample. The Cool-It bowls have been optimised to work with leading brands of stirring hotplates with top plate diameters up to 145mm.

The stirring performance of Cool-It 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.
- 5. Distance flask base is clamped above the stirring hotplate.

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 Cool-It bowl.

PTFE magnetic stirring bars

- RR98075 Cross Shape Stirring Bar 10mm, pk 40
- RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
- RR99064 Elliptical Stirring Bar 25mm, RE pk 10
- RR95920 Oval Stirring Bar 40mm, pk 5
- RR95921 Oval Stirring Bar 50mm, pk 5

Recommended for flask

for 5 to 10ml for 25 to 50ml for 100 to 400ml for 500 to 1000ml for 2000ml

RE = Rare earth magnets have a more powerful magnetic force than conventional magnets. This results in better coupling and stirring in viscous samples. Rare earth magnets are also almost completely resistant to demagnetisation.

If you wish to test which stirring bars are suitable for your application a selection of two of each of the above bars are available in the Stirring Bar Evaluation Kit - for Flasks.

• RR71200 Stirring Bar Evaluation Kit - for Flasks, pk 10







7. Set-Up and Operation - Continued

7.6. Selecting a suitable cooling mixture for your application

Examples are given in Cooling Mixture Appendix - see page 9.

Optimising the temperature performance of Cool-It

The cooling performance of Cool-It will be affected by:

- 1. Ambient temperature.
- 2. Location of reaction set-up in the fume cupboard.
- 3. Load to be cooled.
- 4. Choice of cooling mixture used.
- 5. Volume and ratio of cooling mixture components.



Important Note

Cool-It bowls can be used down to -85°C without damage to the bowl. Cool-It is not suitable for heated reactions. Always ensure that the heating control on the stirring hotplate is switched off and that the hotplate is cool before using Cool-It.

7.7. Set-up overview

- 1. Select the appropriate Cool-It bowl for your chosen flask and hotplate.
- 2. Place bowl onto top plate, ensuring bowl is sitting level and the fit is acceptable. You may wish to use an adapter plate if using a stirring hotplate with a 135mm top plate (see page 5).
- 3. Position support stand and clamp to the rear of the stirring hotplate.
- 4. Position your flask (with stirring bar) into the Cool-It bowl, and secure it with the clamp. Adjust the clamp so that the flask is located centrally within the bowl.
- 5. Adjust the height of the clamp so that the flask is not touching the bottom of the Cool-It bowl.
- Using a suitable wash bottle or similar add the cooling fluid into the bowl until it surrounds the flask. Ideally, the cooling fluid should be at the same level as the liquid within the flask. Do not over fill the bowl.
- 7. Using a scoop carefully add the dry ice, being very careful to only add a few chips at a time.



Important Note

Alternatively, it may be preferable to put the dry ice in first and carefully add the solvent via a wash bottle afterwards.



Warning

Do not over fill the bowl with solvent as splashing and bumping can occur when adding dry ice. Additional cooling fluid can always be added later if required.



Warning

Cooling mixtures can unexpectedly spit and splash. Therefore it is important to cover all exposed skin by wearing suitable protective gloves, aprons and face shield.







7. Set-Up and Operation - Continued

7.7. Set-up overview - continued

8. The Cool-It lid can now be located on the bowl; the profiled shape of the lid should locate securely inside the inner diameter of the bowl. The two halves of the lid can be easily placed around the neck of the flask without having to move the clamp.



Important Note

Using the lid can increase the cooling time of your reaction by 20%. The lid also reduces condensation and ice formation on your reaction flask, helping you maintain visibility throughout your reaction and prevent cooling mixtures spitting.

- 9. For low temperature measurement we recommend the use of a digital thermometer and temperature probe (RR99905). The probe may be placed directly into the Cool-It bowl to monitor the cooling mixture, by sliding the probe through the slot in the bowl lid. Alternatively insert the probe into the reaction flask to directly monitor the solution temperature. The thermometer can be clamped to the support stand using a retort clamp (RR71110) and boss head (RR71115) if required.
- 10. The flask contents can now be stirred by carefully turning up the stirring speed on the stirring hotplate. Please refer to stirrer instructions.

You are now ready to begin your chemistry.



Warning

Cool-It is not suitable for heated reactions. Always ensure that the heating control on the stirring hotplate is switched off and that the top plate is cool before using Cool-It.



Warning

Always refer to the manufacturer's operating instructions for your stirring hotplate before using it with Cool-It, to be sure of any limitations or safety restrictions.



Warning

Cooling mixtures can unexpectedly spit and splash. Therefore it is important to cover all exposed skin by wearing suitable protective gloves, apron and face shield.

7.8. Disposing of used cooling fluid

Cool-It has been designed with an integral handle and non-drip spout to aid the disposal of cooling mixture.



Warning

Do not attempt to pour cold mixtures into containers that can be sealed. There is a danger of splashing and pressure build-up. Preferably allow the cooling mixture to warm to room temperature before disposing of it according to appropriate local regulations.



Warning

Always wear suitable protective gloves, aprons and face shield when disposing of used cooling mixture.









8. Stay Safe

Use protective equipment and follow the instructions

The use of manual cooling mixtures offers considerable savings in time, convenience and cost when compared with chillers or cryostats. However, extreme care should be taken when using cooling mixtures.

- 1. Cooling mixtures can unexpectedly spit and splash. Therefore, it is important to cover all exposed skin by wearing suitable protective gloves, apron and face shield.
- Do not initially fill the reservoir with solvent beyond the recommended depth as vigorous bumping (splashing) can occur and solvent may be ejected from the reservoir. In particular, as the cooling mixture contacts the warmer surface of flasks or tubes rapid evaporation of CO₂ can occur, causing bubbling and spitting.
- 3. Take care when disposing of dry ice / acetone or other solvent mixtures! Do not attempt to pour cold mixtures into containers that can be sealed. There is a danger of splashing and pressure build-up. Preferably allow the cooling mixture to warm to room temperature before disposing of it according to appropriate local regulations.

The following protective equipment is available from Radleys:

- RR71505 Cooling Protection Kit; includes:
 - 1 x RR99909 Cold Temp. Apron 1060mm Long Waterproof
 - 1 x RR99910 Protective Face Shield
 - 1 x RR98024 Protective Cold Temperature Gloves
- RR99909 Cold Temp. Apron 1060mm Long Waterproof
- RR99910 Protective Face Shield
- RR98024 Protective Cold Temperature Gloves







9. Cooling Mixture Appendix

Dry Ice / Solvent Cooling Mixtures

Solvent	Minimum Temperature (°C)	Flash Point (°C)	Inhalation Toxicity	Skin Toxicity	Explosion/ Fire Hazard
Ethylene glycol	-15	110	low	low	low
Butyl ethyl ketone	-38	41	moderate	low	high
Acetonitrile	-42	5	high	high	high
Cyclohexanone	-46	46	moderate	low	moderate
Di(ethylene glycol) diethyl ether	-52	71	moderate	moderate	moderate
Ethanol	-72	8	low	low	high
Methanol	-78	11	high	high	high
Acetone	-78	-17	low	low	high
A Phipps & D N Hume J Chem Educ, 45, 664,	1968				
Other Cooling Mixtures					
	Minimum				

	Minimum Temperature (°C)	Comments	
Sodium chloride / ice Calcium chloride / ice	-21 -40	33g salt / 81g ice 100g salt / 81g ice	
	-40	Toby Sait / Org ice	

Warranty – Email Back

sales@radleys.co.uk

To qualify for your warranty please complete, scan and email this form to Radleys

Date of Purchase									
Supplier's Name and Address									
Product Batch/Serial No. (if shown)									
Your Details	Your Details								
Mr Mrs	Miss	Ms Dr	Prof						
Name									
Position									
Dept						Building			
Organisation									
Address 1									
Address 2									
Town/City					County/State				
Country					Post/Zip Code				
Telephone					Ext	Fax			
Email					Website				
Type of Organisation; please tick all boxes relevant									
 Academic Insti Animal Health/. Agrochemical Chemical Manu 	/Zoology	Consum Contract Contract	Lab Synthesis	 Defence/Military/Forensi Environmental/Water Flavours/Fragrances Food/Beverages 					

Areas of Interest; please tick all boxes relevant

Areas of interest, please	e tick all boxes releval				
Analytical Chemistry	Chromatography	Estate & Facilities	Health & Safety	Organic Chemistry	🗆 QC/QA
□ Automation/HTS	Clinical/Medical/Pathology	/ 🗌 Food & Agriculture	Inorganic/Metallurgy	Parallel Chem/Combi-Chem	Sales & Marketing
Biochemistry	Construction	Formulation	□ Liquid Handling/MicroPlates	Polymers & Oils	Separation/SPE
Biological Sciences	Drug Discovery	Geology	Material Science	Process Dev/Scale-up	Support/Engineering
Catalysis	Environmental Health	Glassblower	Medical Devices	Process Safety/Calorimetry	Temperature Control
Other			Medicinal Chemistry	Purchasing/Stores	Veterinary

To request specific product information from Radleys please fill in below

Findenser Air Condenser Carousel 12 Plus Reaction Station Heat-On Block System Cooled Carousel 12 Reaction Station Cool-It Insulated Bowls Carousel 6 Plus Reaction System StarFish Work Station Cooled Carousel 6 Plus Reaction Station Carousel Stirring Hotplates Carousel Work-Up Station Overhead Stirrers GreenHouse Plus Parallel Synthesiser Jacketed Lab Reactors GreenHouse Blowdown Evaporator Reactor-Ready Lab Reactor Tornado Overhead Stirring System Reactor-Ready Duo Lab Reactor Breeze Heating/Cooling Work Station Custom Jacketed Reaction Systems Storm Heating/Cooling Work Station	 AVA Lab Control Software Level 1/2 Level 3/4 Data Hub Automated Reaction Stations Mya 4 Reaction Station Other Huber Heidolph Other
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