

# Carousel 12 Plus™

## Reaction Station Patented Design

Simultaneously heats/cools,  
stirs and refluxes multiple  
samples under an  
inert atmosphere

-78°C

220°C



# Carousel 12 Plus Reaction Station

The patented Carousel simultaneously heats/cool, stirs and refluxes multiple samples under an inert atmosphere.



The world's most popular parallel synthesiser

## Temperature Control

- Heated via hotplate
- Precise temperature control  $\pm 1^\circ\text{C}$
- Optional Pt1000 temp. sensor
- Up to  $180^\circ\text{C}$  ( $220^\circ\text{C}$  for short periods)

## Aluminium Reflux Head

- Efficient refluxing
- Water-cooled
- Easy quick-release couplings

## Reaction Tubes

- 12 heavy duty glass tubes
- Reaction volume of 5 to 20ml (1ml with reduced volume tubes)

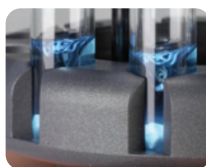
Avoid post synthesis bottlenecks with the complimentary Carousel Work-Up Station.



Carousel Stand is ideal for use between reactions when changing tubes and for reactions that require rapid air cooling.

## Viewing Slots

- Good visibility of tube contents
- Easy to rotate round design gives access to all tubes



## Insulating PTFE Plate

- Removable PTFE insulation plate
- Faster heating and energy savings of up to 36%



## Central Vacuum/Gas Quick-Release inlet/outlet

- Use for vacuum or inert gas
- Radial vacuum/gas distribution system
- Perform reactions under an inert atmosphere



## Easy-on PTFE Caps

- Chemical-resistant
- Quick-thread for fast attachment
- Push-on connections to the stainless steel gas outlets



## Quick-Release Water Couplings

- Push fit couplings connect cooling water supply to reflux head without leaks
- Shut-off valves prevent dripping



## Carousel Movie

Visit [www.radleys.com](http://www.radleys.com) to watch the demonstration



Fits on a standard Carousel stirring hotplate.



Removable water-cooled aluminium reflux/inerting head provides efficient refluxing within individual reaction tubes.



Transfer the reflux/inerting head to the Cooled Carousel for cooling to -78°C.

## Chemical-Resistant

- Fluoropolymer coating
- Easy to clean

## Aluminium Heated Base

- Compact design improves heat transfer and provides energy savings
- Maximum operating temperature 180°C (220°C for short periods)

## Powerful, Even Stirring

- Patented design - uses the magnetic field of the stirring hotplate to stir all the positions evenly and powerfully
- Rare earth cross shaped stirring bars for more vigorous stirring



## Carousel Stirring Hotplate

- Single rotating magnetic field to stir all positions
- Even and powerful stirring
- Choice of 3 models

## Compact

- Small bench-top footprint
- Easy to store



# Carousel features and benefits

Cost effective personal synthesis station for parallel solution phase chemistry and solid supported reagent based synthesis.

-78°C

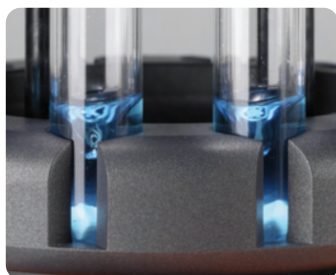
220°C



The innovative Carousel 12 Plus is quick to set-up and easy to use; providing heating/cooling, stirring and refluxing with inert gas control of 12 reaction tubes simultaneously. Whether using a single position or all 12, the Carousel is a neat and efficient way to perform chemical synthesis; providing all the productivity benefits of automated synthesis, but at a fraction of the cost.

## Features

- Accepts up to 12 tubes with a reaction volume from 1 to 20ml.
- Powerful, even stirring - fits on to a Carousel Stirring Hotplate.
- Rapid heating to 220°C and cooling to -78°C.
- Quick to set-up and easy to use.
- Easy viewing of tube contents during experiments.
- Water-cooled reflux head.
- Perform reactions under an inert atmosphere.
- Fluoropolymer coating for chemical resistance and easy cleaning.
- PTFE caps feature a 'quick-thread' for fast attachment to tubes.
- Removable reflux head allows reaction tubes to be transferred between heated base, cooled base or stand.



## Rapid, efficient heating

Locating onto the Carousel Stirring Hotplate, the Carousel 12 Plus will simultaneously heat up to 12 reactions from ambient to 180°C (220°C for short periods) with an accuracy of  $\pm 1^\circ\text{C}$ . The temperature can be controlled using the hotplate's integral digital control or for greater accuracy, via an optional Pt1000 temperature sensor. The Pt1000 temperature sensor allows users to control by block or solution temperature. Either insert the temperature sensor into the aluminium base or through the Suba-Seal in the cap, directly into the reaction solution.

## Powerful, even stirring

The Carousel's patented design ensures powerful and equal stirring in all 12 reaction tubes. By positioning the tubes and magnetic stirrer bars equidistant from the stirring hotplate's centrally located magnet, the Carousel ensures that all tubes are stirred at the same speed. This simple design coupled with high performance stirring bars provides powerful magnetic stirring from 30 to 1400rpm.

## Efficient refluxing

The Carousel's integral water-cooled reflux/inerting head provides efficient cooling to all tubes; minimising solvent evaporation and loss. Water circulates inside the reflux head creating a cooling zone within the upper part of each tube, where vapours cool and condense back into the reaction. Quick-release water couplings with integral shut-off valves aid the connection of the water supply and minimise leaks.



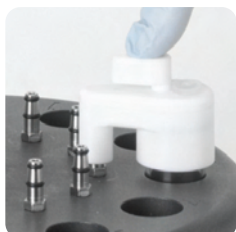
Fast  
Efficient  
Easy to use  
Modular





## Easy viewing of tube contents

Viewing slots in the heated base allow a view of tube contents during synthesis. The Carousel's circular design allows easy rotation of the unit providing access to all tubes without having to lean into the fume hood.



Chemical-resistant Easy-On PTFE caps feature push-on connections to the stainless steel gas outlets.

## Operate under an inert atmosphere

An integral radial gas distribution system in the Carousel 12 Plus reflux/inerting head combines with individual gas-tight Easy-On PTFE caps, which screw directly onto each reaction tube, to distribute inert gas to all 12 tubes. To purge the tubes simply connect the central gas inlet via flexible tubing to a two-way stopcock then, by alternating between vacuum and inert gas, the tubes are quickly purged of unwanted air. This easy to use inerting feature is ideal for reactions requiring an air or moisture-free environment.



## Easy-On PTFE caps

The PTFE caps are an essential component of the Carousel 12 Plus system. Manufactured from a chemically-resistant PTFE the caps are attached to the reaction tube using a quick-thread and feature an Easy-On push connection to the radial gas system. The caps include an on/off valve for isolation and removal from the inert gas system. A replaceable silicone Suba-Seal septum allows the addition or removal of reagents or samples using a suitable syringe.



## Durable glass reaction tubes

Manufactured from high quality, heavy-walled borosilicate glass, the tubes are precision engineered to maximise heat transfer from the heated base and cooled reflux head. This ensures that all tubes are heated and cooled at the same rate. Standard tubes have a reaction volume of 5 to 20ml. Reduced volume tubes have a reaction volume of 1 to 5ml.



## Removable reflux/inerting head

An innovative removable reflux/inerting head allows the removal of the head with the tubes in situ. This allows the reflux/inerting head to be easily transferred between the heated base, the stand or the cooling reservoir, providing the user with maximum flexibility.



## Chemical-resistant fluoropolymer coating

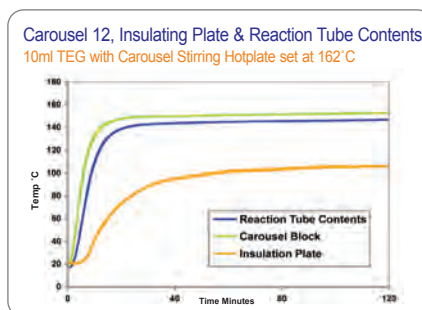
The Carousel's fluoropolymer coating offers heightened chemical resistance, minimises the effects of chemical attack and makes the surface easier to clean.



Central quick release inlet/outlet for vacuum and gas allow reactions under an inert atmosphere.

## Insulating plate improves heating and energy efficiency

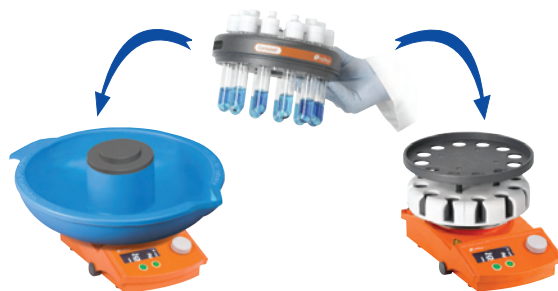
The 2-piece PTFE insulating plate sits over the Carousel's heated base and acts as a barrier to heat loss for faster heating and energy savings of up to 36%.



# Cooled Carousel 12 Plus



Cost effective low temperature parallel synthesis from ambient down to  $-78^{\circ}\text{C}$ .



HDPE lid keeps reactions cooler for longer

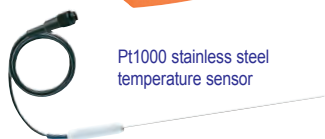
## Upgrade your Carousel to perform cooled chemistry

The innovative Cooled Carousel 12 Plus reservoir is designed to accept the removable reflux/inerting head from the Carousel 12 Plus, allowing reaction tubes to be easily and rapidly transferred between heating and cooling bases.

### Features

- Simultaneously performs 12 cooled and stirred reactions to  $-78^{\circ}\text{C}$ .
- Powerful, even stirring. Reservoir fits onto a Carousel Stirring Hotplate.
- Robust HDPE cooling reservoir is compatible with a wide range of cooling mixtures, including dry ice/acetone for manually controlled cooling from ambient down to  $-78^{\circ}\text{C}$ .
- Features a non-drip spout and handle for disposal of waste solvents.
- Insulated foam core maintains low temperatures for long periods whilst protecting the stirrer from freezing. Reduces condensation and ice formation on outer surfaces.
- HDPE lid keeps your reaction cooler for longer, minimises ice formation on your tubes (maintaining visibility of the contents) and prevents spitting from the cooling mixture.
- The robust HDPE reservoir is virtually unbreakable.

# Carousel Stirring Hotplates



Pt1000 stainless steel temperature sensor

The popular Carousel Tech Stirring Hotplate offers a unique combination of performance, control and safety at an affordable price and is the recommended hotplate for use with the Carousel 12 Plus. Two additional stirring hotplate models are also available:



Standard



Tech



Advanced

- Carousel Standard Stirring Hotplate for analogue heating and stirring control.
- Carousel Advanced Stirring Hotplate with digital control, RS232 connection for software control and additional safety features.
- Optional Pt1000 temperature sensors are available with a stainless steel or glass coated stainless steel probe.

Includes  
**3 year**  
warranty

	Carousel Standard	Carousel Tech	Carousel Advanced
Speed, max (rpm)	100 to 1400	100 to 1400	30 to 1400
Display	-	Digital	Digital
Analogue/digital interface	-	-	RS232
Heating power (W)	800 (600 for 115V)	800 (600 for 115V)	800 (600 for 115V)
Hotplate temperature ( $^{\circ}\text{C}$ )	20 - 300	20 - 300	20 - 300
Accuracy temperature setting (K)	$\pm 5$	$\pm 1$	$\pm 1$
External temperature sensor	Pt1000	Pt1000	Pt1000
Temp. accuracy with external temp. sensor (K)	$\pm 1$	$\pm 1$	$\pm 0.2$
Temperature control	Micro controller	Micro controller	Micro controller
Safety circuit hotplate ( $^{\circ}\text{C}$ )	$25^{\circ}\text{C}$ over hotplate temperature	$25^{\circ}\text{C}$ over hotplate temperature	$10 - 25^{\circ}\text{C}$ over nominal temperature
Plate diameter (mm)	$\varnothing 135$	$\varnothing 135$	$\varnothing 135$
Plate material	Kera-Disk (Silumin with ceramic coating)	Kera-Disk (Silumin with ceramic coating)	Kera-Disk (Silumin with ceramic coating)
Weight (kg)	2.9	2.6	2.6

# Accessories

Support stand, magnetic stirring bars, septa, reaction tubes, caps and tube racks.

## Support stand

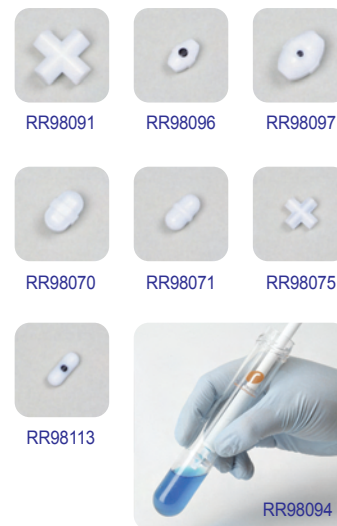
The Carousel stand **RR91038** is designed to support the reflux/inerting head either with or without reaction tubes. The heavy duty metal stand is fluoropolymer coated for improved chemical resistance and ease of cleaning. The integral tray catches any dripping condensation from tubes and gives excellent stability.



RR98095

## PTFE magnetic stirring bars

- **RR98091** Medium Cross Shaped Rare Earth bar creates a deep vortex and is ideal for stirring resins and viscous samples.
- **RR98096** and **RR98097** Elliptical Rare Earth stirring bars facilitate powerful stirring with a good vortex even in viscous samples. Available in both small and large sizes.
- **RR98070** and **RR98071** General purpose octagonal stirring bars are available in both small and large sizes.
- **RR98075** Small Cross Shaped stirring bar creates a vortex at slow speeds.
- **RR98113** Medium Cylindrical Rare Earth stirring bar, a small, powerful, general purpose stirring bar.
- **RR98095** Stirring bar evaluation kit contains 3 of each of the above.
- **RR98094** PTFE stirring bar retriever. Retrieve stirring bars from reaction tubes. 350mm long.
- **RR98114** PTFE stirring bar restrainer. Hold your stirring bar within your tube when dispensing liquids.



RR98091

RR98096

RR98097

RR98070

RR98071

RR98075

RR98113

RR98094

## Glass reaction tubes and inserts

150mm x 24mm Ø tubes manufactured from heavy walled borosilicate glass feature a unique quick-thread for fast attachment to the caps. The **RR91080** reaction tube has a reaction volume of 5ml to 20ml and the **RR91088** reduced volume tube has a working volume of 1 to 5ml. The lower part of these tubes tapers to 16mm OD. The reduced volume tubes require the **RR91089** aluminium insert to reduce the well size accordingly.

- **RR91080** Quick-Thread glass reaction tube, pk 6
- **RR91081** Quick-Thread glass reaction tube, pk 12
- **RR91088** Quick-Thread reduced volume reaction tube, pk 4
- **RR91089** Carousel 12 Plus reduced volume aluminium inserts, pk 6



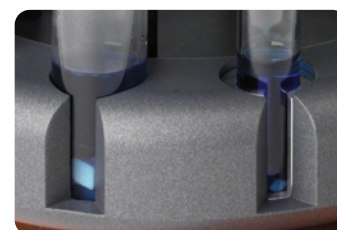
PTFE caps and glass tubes provide an inert, gas tight seal



## Easy-On PTFE reaction caps

PTFE caps are attached to the reaction tube using a quick thread and feature an Easy-On push connection to the radial gas system. The **RR91070** cap features a Suba-Seal septa and on/off valve for isolation and removal from the inert gas system. The **RR91072** Easy-On storage cap features the quick-thread and Suba-Seal septa, but with no sidearm or valve. Caps include a replaceable Nitrile o-ring with an optional Viton replacement. Replaceable septa allow the addition of reagents or removal of samples. All septa are silicone as standard (Viton is available).

- **RR91070** Easy-On cap with valve, pk 6
- **RR91072** Easy-On storage cap, pk 6
- **RR98076** Silicone Suba-Seal for caps, pk 100
- **RR98176** Viton Suba-Seal for caps, pk 100



## Tube racks and Lab Marker pen

- **RR98901** Zinc plated wire rack for 36 x 24mm tubes
- **RR98902** Zinc plated wire rack for 40 x 24mm tubes
- **RR98903** Zinc plated wire rack for 80 x 24mm tubes
- **RR98906** Black Lab Marker, pk 10 (writes on glass, metal and plastic)



# Carousel 12 Plus Ordering Information

## Carousel 12 Plus - Basic System 1

RR91091	Carousel 12 Plus Basic System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On PTFE Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba-Seals for all caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes

## Carousel 12 Plus - Standard System 2 (with stand and stirring hotplate)

RR91092	Carousel 12 Plus Standard System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On PTFE Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba-Seals for all Caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes
	1 x RR91038 Carousel 12 Plus Stand
	1 x RR91206 Carousel Tech Stirring Hotplate + Pt1000

## Carousel 12 Plus - Complete System 3 (heated and cooled system)

RR91093	Carousel 12 Plus Complete System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On PTFE Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba-Seals for all Caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes
	1 x RR91038 Carousel 12 Plus Stand
	1 x RR91206 Carousel Tech Stirring Hotplate + Pt1000
	1 x RR91040 Carousel 12 Plus cooling reservoir & lid
	1 x RR99905 Digital Thermometer (-250°C to +400°C) & 200mm Probe
	1 x RR99908 Dry Ice Scoop

Choose the system above if you want to perform heated and cooled reactions

## Carousel 12 Plus Heated

RR91030	Carousel 12 Plus Reaction Station
	1 x RR91032 Carousel 12 Plus Reflux/Inerting Head
	1 x RR91034 Carousel 12 Plus Heating Base
	1 x RR91036 Carousel 12 Plus Insulating Plates, pair

## Carousel 12 Plus Cooled

RR91040	Carousel 12 Plus Cooling Reservoir and Lid
---------	--

## Carousel 12 Plus Components

RR91032	Carousel 12 Plus Reflux/Inerting Head
RR91034	Carousel 12 Plus Heating Base
RR91036	Carousel 12 Plus Insulating Plates, pair
RR91038	Carousel 12 Plus Stand
RR91041	Carousel 12 Plus Cooling Lid

## Caps and Tubes

RR91070	Easy-On PTFE Cap, pk 6
RR91072	Easy-On PTFE Storage Cap, pk 6
RR98076	Silicone Suba-Seals for all Caps, pk 100
RR98176	Viton Suba-Seals for all Caps, pk 100
RR91080	Quick-Thread Glass Reaction Tube 24 ø x 150mm, pk 6
RR91081	Quick-Thread Glass Reaction Tube 24 ø x 150mm, pk 12
RR91088	Quick-Thread Reduced Volume Tube 24 ø x 150mm, pk 6
RR91089	Carousel 12 Plus Reduced Volume Inserts, pk 6

## PTFE Magnetic Stirring Bars

RR98070	Octagonal Stirring Bar 13mm, pk 20
RR98071	Pivot Ring Stirring Bar 12 x 6mm, pk 40
RR98075	Cross Shape Stirring Bar 10mm, pk 40
RR98091	Cross Shape Stirring Bar 16.5mm RE, pk 20
RR98096	Elliptical Stirring Bar 10mm RE, pk 40
RR98097	Elliptical Stirring Bar 15mm RE, pk 20
RR98113	Cylindrical Stirring Bar 12mm RE, pk 20
RR98094	PTFE Magnetic Stir Bar Retriever 350mm
RR98095	PTFE Magnetic Stir Bar Evaluation kit, pk 30
RR98114	Stirring Bar Restrainer

## Stirring Hotplates

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
<i>Includes Tech Stirring Hotplate, Pt1000 S/Steel sensor, Pt1000 Clamping System + Support Rod and Cable Guide.</i>	
RR91204	Carousel Advanced Stirring Hotplate 230v UK Plug
RR91205	Carousel Advanced Stirring Hotplate + Pt1000 230v UK Plug

Hotplates available in other voltages, please add /EURO, /SWISS or /USA to end of Cat. No.

## Pt1000 Temperature Sensors and Accessories

RR91226	Pt1000 S/S Temperature Sensor
RR91227	Pt1000 Glass Coated Temperature Sensor
RR91228	Temperature Sensor Holder
RR91235	Pt1000 Clamping System + Support Rod and Cable Guide
RR91236	Pt1000 Clamping System + Support Rod and Cable Guide (baths from 3 to 5 litres)
RR91229	Support Rod (13mm x 425mm)
RR71127	Support Rod (13mm x 500mm)
RR71125	Support Rod (13mm x 340mm)
RR71120	Support Rod Hotplate Adapter (extension plate)
RR91234	RS232 Interface Cable - 15 Pin to 9 Pin

## Racks and Other Accessories

RR98901	Zinc Plated Wire Rack for 36 x 24mm Tubes
RR98902	Zinc Plated Wire Rack for 40 x 24mm Tubes
RR98903	Zinc Plated Wire Rack for 80 x 24mm Tubes
RR98906	Black Lab Marker (writes on glass, metal and plastic) pk 10

## Spare Parts and Replacement O-rings

RR98160	O-Rings for Caps - Viton 24mm, pk 100
RR98060	O-Rings for Caps - Nitrile 24mm (standard), pk 100
RR91060	Nitrile O-rings 4mm Gas Outlet - Bottom, pk 50
RR91061	Nitrile O-rings 3mm Gas Outlet - Top, pk 50
RR91062	Viton O-rings 4mm Gas Outlet - Bottom, pk 50
RR91063	Viton O-rings 3mm Gas Outlet - Top, pk 50
RR91065	Quick-release Male Body Coupling No Shut-off
RR91066	Quick-release Barbed Coupling No Shut-off
RR99062	Quick-release Barbed Coupling + Shut-off, pk 2
RR99063	90 Elbow Quick-release Barbed Coupling + Shut-off, pk 2
RR99065	Quick-release Female Body Coupling + Shut-off, pk 2

## Cooled Carousel 12 Plus Accessories

RR99905	Digital Thermometer (-250°C to +400°C) and 200mm Probe
RR99906	Digital Thermometer (-250°C to +400°C)
RR99907	200mm Temperature Probe
RR99908	Dry Ice Scoop
RR99909	Cold Temperature Apron 1060mm long, Waterproof
RR99910	Protective Face Shield
RR98024	Protective Cold Temperature Gloves
RR71505	Cooling Protection Kit
	1 x RR99909 Cold Temperature Apron 1060mm long, Waterproof
	1 x RR99910 Protective Face Shield
	1 x RR98024 Protective Cold Temperature Gloves

© Radleys (R.B.Radley & Co Ltd) August 2014



Shire Hill, Saffron Walden,  
Essex, CB11 3AZ. United Kingdom.  
t: +44 1799 513320  
f: +44 1799 513283  
e: sales@radleys.co.uk

[www.radleys.com](http://www.radleys.com)

World leaders in innovative productivity tools for chemists