3000 Clini-RF Rapid Freezer Manual

MADE IN BRITAIN

Bright Instruments

Contents

SAFETY WARNING

Low temperatures are present in this equipment. Extreme care should be taken.

DO NOT let bare skin come into contact with metal surfaces.

Safety Information

CONSUMER PROTECTION

The Consumer Protection Act 1987 Part 1. refers to Product Liability. This legislation was issued as a direct result of an EC Directive to all member states and has been in force with effect from 1 March 1988.

The Bright Instrument Company Limited, ever mindful of the need to ensure that their products are not subject to misuse and/or incorrect handling, have made it their aim to communicate any possible dangers to their customers.

Whilst the Bright Instrument Company Limited markets products manufactured to the highest safety standards, it is in the interest of the purchaser that he is aware of the resultant dangers of misuse and/or incorrect handling of these products.

Your attention is therefore drawn to the following precautions:

ELECTRICAL

a. Warnings - A warning notice is fixed to the instrument stating that it should be disconnected from the power supply before removing the panels. This warning should be strictly observed. This cryostat is fitted with an in line mains filter which may affect portable appliance test results.

b. Fuses - Fuse ratings are clearly indicated on all fuse panels adjacent to the fuse holder. If and when replacement is necessary, the correct fuse rating must be adhered to.

c. Earthing (Grounding) - A protective earth terminal is fitted, and must be used in all two wire installations.

OPERATION

Parts of this instrument may attain temperatures as low as –83°C. It is important to avoid allowing bare skin to touch such cold surfaces – when in doubt, wear gloves.

ACCESSORIES

Fluids supplied as accessories with Bright instruments, such as Cryospray 134, Cryo-M-Bed and microtome oil, are strictly for laboratory use only. They should not be taken by mouth and precautions afforded to other laboratory chemicals should be adhered to. Please refer to the material safety data information, towards the back of this instruction manual for further details.

PRODUCT SAFETY SUGGESTIONS

All Bright Instrument Company Limited personnel are encouraged to make suggestions regarding product safety. We also welcome such suggestions from our Customers. They may be submitted by completing the appropriate (Safety) section of the Quality Survey Record Form supplied with all Bright instruments, or alternatively by letter, telephone fax or email [sales@brightinstruments.com,].

All communications should be direct to our Warranty Assurance Department and will be acknowledged.

Safety Information Cont.

DECONTAMINATION CERTIFICATES

IMPORTANT If the instrument or any part of it is to be returned to Bright Instrument Company Limited, please note the following:

a. If the instrument or any part of it has been exposed to or been in contact with potential pathogenic or radioactive material, it is essential that it be decontaminated.

b. A code of practice for decontamination has been prepared by the Health Services Advisory Committee and endorsed by the Health and Safety Commission, see section 3.3. For the avoidance of doubt, we require that a completed decontamination certificate should accompany all instruments or parts returned to us. A copy of this can be found towards the back of this instruction manual and we suggest you use a photocopy of this. Alternatively we would be pleased to either post or fax you another copy should you require.

c. Decontamination certification should be faxed to Bright Instrument Company Limited prior to the unit being received, or can be attached externally to the carton. Should no decontamination certificate be received, or the instrument or any part of it be received in a condition that Bright Instrument Company Limited consider to be a potential biological hazard, the instrument or part will be returned, un-repaired, at the expense of the Customer.

d. Customs declarations must indicate that the package contains 'British Returned Goods'. Failure to do so will involve customs duty payable by us, which will be invoiced to the sender.

Warranty

i. The Seller 's products are carefully inspected and submitted to its standard tests.

ii. The Seller warrants all its products to be free from defects in workmanship and materials under normal conditions of use and service provided always:

a. That if any of the goods so manufactured is alleged to be defective in workmanship and material and is returned carriage paid, and protected against damage in transit to the Seller's works at Huntingdon within 12 months from the date of despatch and if after examination by the Seller that goods or part of them are found to be so defective then the Seller will repair or replace them free of charge and will return them to the Buyer, carriage paid.

b. Where any part of the goods manufactured by the Seller is repaired or replaced under the terms of the foregoing warranty, such warranty shall thereafter be limited to a period of six months from the date when the goods shall have been re-delivered to the Buyer.

c. This warranty does not apply to any defects caused by wear and tear, incorrect installation abnormal conditions of working, accident, misuse or neglect.

d. That save as in this clause herein before expressed, the Seller shall not be under any liability for negligence or otherwise in respect of defects in goods delivered or for any injury, damage or loss resulting from such defects and the Seller's liability under this clause shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose of such goods.

e. This warranty is expressly in lieu of all other warranties, guarantees or liabilities expressed or implied by any of the Seller's Representatives or Agents.

Please see our separate Product Warranty sheet for deliveries to the mainland UK.

WARNING: Before proceeding to Operating Instructions, ensure you are familiar with the contents of the pages marked 'Safety Information'. This instrument must only be used by competent persons.

1. Introduction

1.1 RECEIPT OF PRODUCT

1.1.1 RECEIPT AND UNPACKING

This instrument received a final test and inspection prior to despatch from the factory. The following instructions are given for the re-assembly of the instrument, adjustments and its correct use. If the instrument is received before preparations for installation are completed. It should be stored in a clean, dry place and not exposed to dirty or damp conditions.

1.1.2 RECEIPT

Immediately upon receipt of the instrument, make a careful examination for evidence of damage encountered in transit. If any damage is found or suspected, notify both the carrier and Bright Instrument Company Limited immediately.

1.1.3 UNPACKING

All packing must be carefully removed and parts checked against the enclosed packing list. If any damage or discrepancy is noted, please inform our agent/distributor or Bright Instrument Company Limited immediately.

1.2 ASSEMBLY & INSTALLATION

1.2.1 POSITIONING

Fit the two spacer brackets to the rear of the cabinet and ensure that nothing will block the vents on this rear panel. The instrument should be positioned on a level floor so that an unrestricted air flow through the cooling louvers is obtained. This is necessary in order to ensure adequate ventilation and can usually be achieved by leaving a gap of at least 100mm on either side of the cabinet.

Ensure that the instrument has been positioned away from hot, direct sunlight and is in a location completely free from draughts. The instrument is mounted on castors, two of which are lockable, to give easy movement.

1.3. ELECTRICAL CONNECTIONS

1.3.1 SETTLING

During transit the oil in the compressor will have been subject to movement, so it is important to let the instrument settle before switching ON. We recommend the instrument is left standing for at least eight hours and preferably overnight before switching ON.

Moving the instrument around, eg: from one laboratory to another, will not affect the compressor oil.

1.3.2 ELECTRICAL REQUIREMENTS

The supply cord of the instrument should be connected to any ordinary electrical outlet (minimum 13 amps for 220/240V, or 20amps for 110/115V), a 13 amp or 20 amp fuse should be incorporated in the line. Check the voltage stamped on the nameplate, located on the back of the instrument with your supply.

The connections are:

Brown - Positive (live)
Blue - Negative (neutral)
Yellow/Green - Earth (ground)

1. Introduction Cont.

1.3. ELECTRICAL CONNECTIONS CONT.

1.3.3 ELECTRICAL SAFETY

Where earth cables may have to be removed from panels for servicing or repair purposes, care should be taken to replace them when replacing the panel.

Where earth connections are taken through connectors, then the connector must be rated to take the maximum fault current. The machine should be disconnected before such connectors are separated for servicing purposes.

1.3.4 SWITCHING ON

After settling, switch ON the main switch in the centre of the control panel. Initially the LED display will flash for a few seconds. Once the displays are constant, the required temperatures can be set (see section 2.4)

2. Operating Instructions

On receipt of your new Bright instrument, please refer to section 1.1 (Receipt and Unpacking) and section 1.2 (Assembly and Installation). As part of its policy of continual improvement, Bright Instrument Company Limited, reserves the right to incorporate changes, or make additions without prior notice. There may, therefore, be minor details differences between the information in this manual and your cryostat. These differences will not affect the safety and use of the cryostat.

2.1. START UP AND NORMAL USE

a. Before starting, dry the upper and lower chamber of the Clini-RF with tissue or similar absorbent material.

b. If applicable ensure the appropriate sleeve is fitted into the freezer block to accept the object holder to be used (a sleeve for object holder 22mm diameter and 30mm long is supplied as standard).

c. Switch the mains switch ON and rapid freezer switch OFF (or clock timer if fitted). See section 2.3 (if applicable).

> **NOTE:** If the rapid freezer is switched ON at start up, the Clini-RF will take longer to reach its operating temperature due to operation of its safety thermostat. Frequent operation in this manner may affect the Clini-RF's long term reliability.

d. When the upper chamber temperature has fallen to below –35°C, switch ON the Rapid Freezer switch. The upper chamber will generally reach –35°C within an hour, though this time will vary with air temperature. The upper chamber temperature may rise for several minutes after switching on the Rapid Freezer. Once the Rapid Freezer temperature is cycling at –80°C, the Upper Chamber will cool to its thermostatically controlled temperature of –43°C.

e. After 30 minutes the Rapid Freezer will display a temperature of –70°C or below. Please note this is the temperature of the freezer wall. The Rapid Freezer block will take approximately 20 minutes more to freeze down to its normal working temperature. After this time if applicable, insert the object holder into the sleeve. Apply a layer of embedding compound. Once frozen, remove the object holder complete with the frozen embedded sample.

f. The Rapid Freezer will continue to cool and will cycle at –70°C ± 2°C. During long periods of continual use the Rapid Freezer temperature may start to rise. If the temperature becomes too warm, close the lid and allow the Rapid Freezer to cool to –80°C before continuing. This should only take a few minutes.

2. Operating Instructions Cont.

2.1. START UP AND NORMAL USE CONT.

g. The Clini-RF will operate reliably with the Rapid Freezer left ON at –80°C. However, it is recommended that the Rapid Freezer is not run continuously for 24 hour periods but switched OFF when not required to reduce frosting and electricity consumption. The Upper Chamber and Rapid Freezer will then continue to operate at –43°C. A clock timer is available to automatically switch the Rapid Freezer ON and OFF at pre-set times of the day, see section 2.3.

NOTE: If required, a small volume of low freezing point liquid, such as 3M Novec Engineered Fluid, can be introduced into the lower chamber around the object holder, the outside of the freezing block and the lower chamber wall. This has the effect of increasing conductivity and therefore decreasing freezing times.

2.2. USE AS A LIQUID BATH

a. Remove the freezer block from the Rapid Freezer using the threaded tool supplied. (Note: it will be necessary to remove any object holder sleeve and base fitted using the Allen Key supplied to remove the M5 screw).

b. Ensure the surfaces of the rapid freezer are clean and dry.

c. Pour in the required liquid. The liquid used must be suitable for use with the samples to be frozen and have a freezing/melting point below –90°C, eg: hexane. Please note that a suitable metal beaker may be placed in the lower chamber to contain the liquid. The size of the beaker will limit the size of specimens to be frozen.

d. Switch the mains switch on and rapid freezer switch off.

e. When the upper chamber temperature has fallen to below –35°C, switch on the Rapid Freezer switch. The upper chamber will generally reach –35°C within the hour, though this time will vary with air temperature.

The upper chamber temperature may rise for several minutes after switching on the Rapid Freezer. Once the Rapid Freezer temperature is cycling at –80°C the upper chamber will cool to its thermostatically controlled temperature of –43°C.

f. After 30 minutes the liquid bath should be below –70°C and ready for use. If using a metal beaker, allow 30 minutes after the Rapid Freezer display has dropped below -70°C before using the bath.

g. Pick up the tissue sample, using either forceps or a suitable wire container and place the sample straight into the liquid ensuring it is completely submerged. The frozen sample can now be mounted onto a frozen object holder either in a cryostat or in the –43°C upper chamber of the Clini-RF.

2. Operating Instructions Cont.

2.3. RAPID FREEZER 7 DAY TIMER -/T (WHERE FITTED)

The 7 day timer clock automatically switches the Rapid Freezer ON/OFF at the beginning/ end of the working day. Saving energy whilst enabling the Clini- RF to be used first thing in the morning, while the rapid freezer is off, the chamber will be maintained at its normal operating temperature.

Set the 12-hour clock and 7 day timer to the correct time and day by turning the clear plastic disc with your finger. Note that the days are indicated as number 1 to 7, and the hours are indicated as on a 24-hour clock along side the timer segments.

Position the correct day and hour next to the small black triangle to the right had side of the bottom of the clock. Adjust the analogue clock to the correct time.

The segments of the clock are set in the factory such that day 1 is the first working day of the week (Monday). The rapid freezer is set to switch-ON at 08.00 hours and switch-OFF at 17.00 hours for days 1 to 5. ***The switch-off time is shown as Red on the Timer Segments.*** Please note the rapid freezer can take up to 60 minutes to reach its normal working temperature, so will be ready for use by 09.00 hours.

If different times or working days are required, simply switch the corresponding segments around the clock as required.

2.4. VARIABLE TEMPERATURE CONTROL -/VTC (WHERE FITTED)

The displays have four keys for controlling status and programming of the instrument.

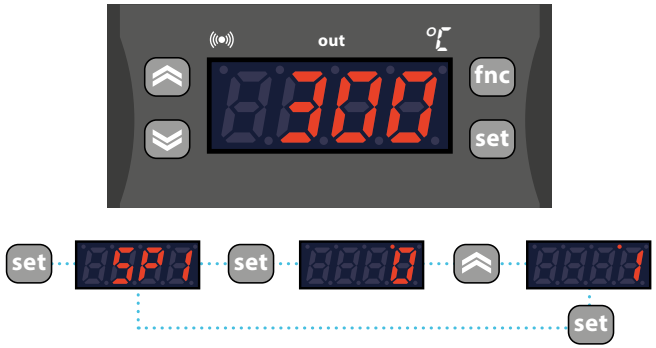
KEYS AND MENUS

UP key	Scrolls through the menu items Increases the values
DOWN key	Scrolls through the menu items Decreases the values
FNC key	ESC function (exit)
SET key	Accesses the setpoint Accesses the menus Confirms the command Displays the alarms (if active)

2. Operating Instructions Cont.

2.4. VARIABLE TEMPERATURE CONTROL -/VTC (WHERE FITTED) CONT.

RAPID FREEZE: This is located on the left of the control panel to set the rapid freezer temperature. In normal conditions, the labels for the Set point values are found in the menu.



Once the 'SP1' label has been displayed, press the "set" button to display the Set point 1 value. The Set point value appears on the display. To change the Set point value, use the "UP" and "DOWN" buttons within 15 seconds.

If you press the "set" button again, when the fnc button is pressed or 15 seconds elapse, the last value displayed will be stored and the "SP1" label will reappear on the display.

CHAMBER: This is located on the right of the control panel to set the chamber temperature. In normal conditions, the labels for the Set point values are found in the menu.

KEYBOARD LOCKING: The instrument includes a facility for disabling the keyboard, by programming the "Loc" parameter. (see folder with "Dis" label) You can enter parameter programming, modify them and change the status of this parameter.

To unlock the keyboard:
y = yes (keyboard locked); n = no.

If the keyboard is locked, you can still access the programming menu by pressing the "set" key. The Setpoint can also be viewed.

Resources are arranged in a menu, which can be accessed by pressing and quickly releasing the "set" key ("Machine Status" menu) or by holding down the "set" key for more than 5 seconds ("Programming" menu).

To access the contents of each folder, indicated by the relevant label, just press the "set" key once. You can now scroll through the contents of each folder, modify it or use its functions. If you do not use the keyboard for over 15 seconds (time-out) or if you press the "fnc" key once, the last value shown on the display is confirmed and you return to the previous screen mask.

WARNING: hold the Set button down for more than 6 seconds, as the control will go into a diagnostic/calibration mode. If the diagnostic/calibration mode is selected in error, take the following steps:

a. If Up or Down has not been pressed (i.e.: no new parameters have been entered), simply leave for 15 seconds. Display will revert to normal.

b. If new parameters have been selected, contact Bright Instrument Company Limited or your local representative for advice.

3. Maintenance

3.1 SERVICING AND REPAIRS

In the event of a breakdown a qualified person should be called. Refrigeration problems are likely to be rare and will normally be dealt with by your local refrigeration specialist. For electrical and mechanical problems contract either your local agent. Distributor or Bright Instrument Company Limited direct. Please provide the following information:

- Model
- Serial Number (see ID plate on rear panel)
- Date of Installation
- Nature of Fault

The following tasks can be carried out by competent personnel:

- Changing fuses

Determine which fuse is blown and replace it with one of exactly the same type and rating. If the Clini-RF or any part of it is returned to the agent/distributor or manufacturer, it is important to observe the precautions in section 3.3 to minimise the risk of infection.

NB: A completed decontamination certificate must either be sent by post prior to return of instrument or attached to the exterior of the instrument. Work on the instrument will not proceed until satisfactory notification of decontamination has been received.

3.2 DEFROSTING

It will be necessary to periodically defrost the Clini-RF to carry out cleaning and/or other procedures. The frequency of this total defrosting will depend on how heavily the Clini-RF is used. It may be as often as daily but is commonly once a month. Defrosting is generally more convenient if the Clini-RF is switched off over night.

To de-frost, simply switch off the mains switch and allow the Clini-RF to warm to room temperature. Always ensure the chambers are completely dry before switching back on – use a hair dryer if necessary.

3.3 DECONTAMINATION

It is the responsibility of the user to ensure that a decontamination procedure is employed which is appropriate to the nature of the work carried out.

The Clini-RF's chambers are constructed of corrosion-resistant materials and the following decontamination procedures can be used. Hypochlorite (bleach) solutions are corrosive to many metals and should be avoided.

Two suggested methods of decontamination are as follows:

3.3.1 FORMALDEHYDE DECONTAMINATION

a. Defrost the Clini-RF completely, with the lid closed.

b. Place 50-100ml of Formalin BP in a flat dish in the chamber. Close lid.

c. Leave for at least 24 hours and preferably 48 hours.

3. Maintenance Cont.

3.3.1 FORMALDEHYDE DECONTAMINATION CONT.

d. Open lid briefly and place a beaker containing 10ml of ammonia SG.880 in the chamber.

e. Leave for one hour. The Clini-RF is then ready for cleaning.

3.3.2 VIRKON DECONTAMINATION

Virkon is a virucidal disinfectant made by Antec International and is widely used in microbiology and clinical departments.

a. Defrost the Clini-RF completely, with the lid closed.

b. Make up the Virkon solution according to the manufacturers instructions.

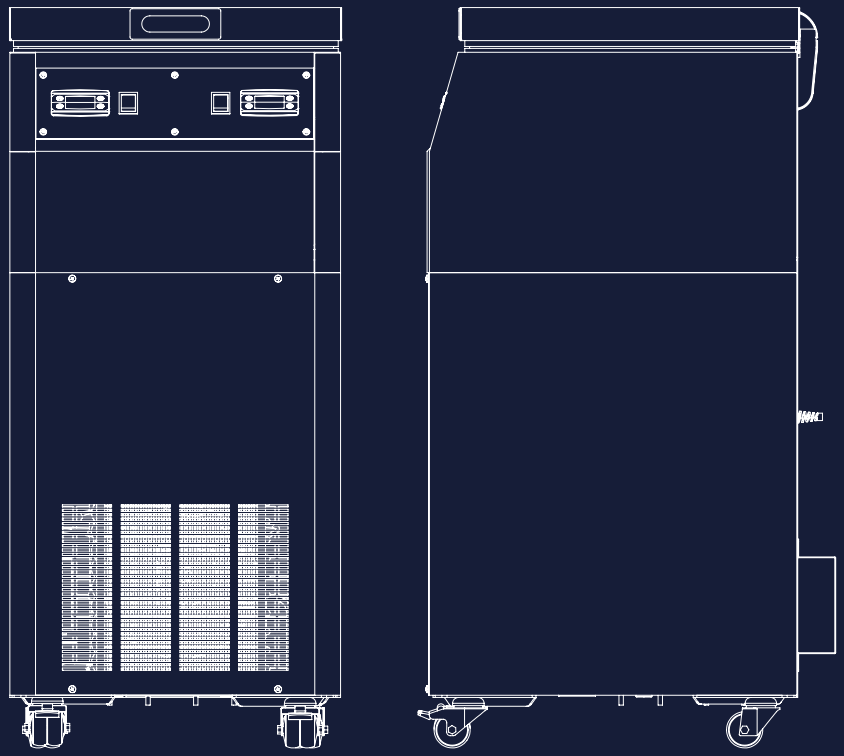
c. Wipe around the chamber with a cloth or paper towel wetted with Virkon solution. Ensure all debris is collected and all surfaces have ample contact with the solution.

d. Wipe over again with clean water.

> **NB:** DO NOT use excessive quantities of Virkon solution or water during this procedure.

e. Ensure the chambers are completely dry.

f. The Clini-RF is now ready to be switched back ON.



4. Specifications

Compressor type	1 x 15cc displacement (primary) 1 x 12cc displacement (secondary)
Refrigerant	Ozone friendly HFC refrigerants R404a (primary) R23 (secondary)
Cooling power	300 watts Main freezer at -40°C Rapid freezer at - 70°C
Lowest set temperature	Main freezer -43°C (preset) Rapid freezer -83°C
Main freezer to -35°C	60 minutes
Rapid freezer to -80°C (Liquid bath or solid freezer block)	50 minutes (Main freezer at -40°C)
Fixed freezer block (optional) to -80°C	Less than 30 minutes (Main freezer at -40°C)
Safety Features	Handle designed to ensure maximum distance away from knife edge. Knife guards cover full width of knife
Total power consumption	1100 watts
Dimensions	Cabinet: H1000 x W450 x D500mm Freezer dimensions: Diameter 275 x D136mm Rapid freezer dimensions: Diameter 95 x D95mm
Packing	Packed weight: 85kg Unpacked weight: 113kg

Weights vary according to specification of instrument

3000 Clini-RF Rapid Freezer

Order List 2021

PRODUCT	
Code	**Description**
ULTRA LOW TEMPERATURE RAPID FREEZERS	
3000-001	**Clini-RF Rapid Freezer for 220/240V AC, 50/60Hz** Complete with: • Rapid freezer tank to -80°C. • -30°C freezer area for short term storage of specimens. • Removeable block. • Object holder adaptor. Standard accessories include: • Cryo-M-Bed embedding. compound. • Cooling block removal tool. • Allen Key. • Spare set of fuses. • Operating manual.
3000-002	**Clini-RF Rapid Freezer for 110/115V AC, 50/60Hz** Same features & accessories as 3000-001
/T	**Clini-RF Rapid Freezer Timer (optional feature)** For all models of the Clini-RF, 7 day timing facility, complete with operating instructions.
/VTC	**Clini-RF Rapid Freezer Variable Temperature Control (optional feature)** For all models of the Clini-RF, variable temperature control for temperatures above -80°C.
57807	**Stainless Steel Beaker**
57807-1	**Stainless Steel Metal Strainer with lid** Recommended for use with 3M's Novec 7100
CRYOSTAGE - REFRIGERATED FREEZING STAGE	
8000-208-01	**Cryostage Freezing Stage for 220/240V AC, 50/60Hz** Complete with: • 130 x 90mm stage. • Freezing to -30°C. • Heater for easy removal of specimen debris. Standard accessories include: • Cryo-M-Bed embedding. compound. • Spare set of fuses. • Operating manual.
8000-208-02	**Cryostage Freezing Stage for 110/115V AC, 50/60Hz** Same features & accessories as 8000-208-01

PRODUCT	
Code	**Description**
SOLID STATE FREEZER WITH PELTIER DEVICE	
53024-01	**Solid State Freezer for 220/240V AC, 50/60Hz** Complete with: • 40 x 40mm stage. • Freezing to -25°C • Temperature control is by current limit to Peltier device. • Safety cut-out to detect low water pressure. Standard accessories include: • Cryo-M-Bed embedding. compound. • Cooling block removal tool. • Allen Key. • Spare set of fuses. • Operating manual.
53024-02	**Solid State Freezer for 110/115V AC, 50/60Hz** Same features & accessories as 53024-01
200-012	**Solid State Filters**
231-001	**Cooling Water Re-circulator (for Solid State Freezer (240v 50/60Hz only).** Removes the reliance on close proximity to a sink and water supply while preventing water loss and is subsequently environmentally friendly.

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MADE IN BRITAIN

*Included in standard order | **Not included in overseas orders. VAT not included - E & OE

Bright Instruments

Material Safety Data Sheets

Cryo-M-Bed 53581

MATERIAL SAFETY DATA SHEET

1. Cryo-M-Bed 53581 Product Information	
Trade/Type:	Embedding Compound.
Container:	Disposable plastic bottles.
Uses:	Embedding compound for frozen tissue specimens.
Description:	Colourless viscous liquid.

2. Cryo-M-Bed 53581 Product Information		
Information on Ingredients:	Blend of polyviol alcohol 217, thymol and water.	
Physical and Chemical Properties:	Colourless viscous liquid.	
Stability and Reactivity:	May react with oxidising materials.	
Toxicological Information:	No harmful effects if handled correctly. May give off toxic fumes in the case of fire.	
Ecological Information:	Degradable, miscible in all proportions.	
Transport Information:	No restrictions.	
Hazards Identification:	Skin:	Can cause skin irritation.
	Respiratory:	May cause difficulty in breathing if exposed to very high concentration.
	Ingest:	May be harmful by ingestion.
	Eyes:	Can cause Eye irritation.
First Aid Procedures:	Skin:	Wash thoroughly, with soap and water.
	Respiratory:	Move to fresh air.
	Ingest:	Rinse mouth out with water, in sever cases seek medical attention.
	Eyes:	Flush copiously for at least 15 minutes.
Fire Fighting Measures:	Hazards:	May cause toxic fumes.
	Equipment:	Water spray, foam, dry powder, CO_2.
Disposal Considerations:	Bag and dispose of waste in accordance with local authority requirements.	
Handling Storage:	No special requirements.	
Regulatory Information:	None.	
Accidental Release Measures:	Absorb spillage on an inert absorbent, bag and arrange disposal. Wash area in water and detergent.	
Exposure Controls:	Skin:	Avoid contact.
	Respiratory:	Avoid very high concentrations.
	Ingest:	Do not eat, drink or smoke.
	Eyes:	Goggles should be worn.
	OES:	Not assigned (long term, 8 hour TWA).

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Bright Instruments

Cryospray 1234ze

MATERIAL SAFETY DATA SHEET

1. Cryospray 1234ze Product Information

Trade/Type:	Bright Cryospray 1234ze Freezing Agent.
Container:	Aerosol.
Uses:	Rapid Freezing of tissue specimens to –52°C.
Description:	Gases under pressure, Liquefied gas.

2. Hazards Identification

Classification of the substance or mixture:	Classification according to Regulation (EC) No 1272/2008/EC (CLP/GHS):	Gases under pressure, Liquefied gas H280 Contains gas under pressure; may explode if heated.	
Label Elements:	Labelling Pictograms:		
	Signal Word:	Warning	
	Hazard Statements:	H280:	Contains gas under pressure; may explode if heated.
	Precautionary Statements:	P281:	Use personal protective equipment as required.
		P260:	Do not breathe dust/fumes/gas/mist/ vapours/spray.
		P308 + P313:	If exposed or concerned: Get medical advice/attention.
		P410 + P403:	Protect from sunlight. Store in a well-ventilated place.
	Potential Health Effects:	Skin:	Rapid evaporation of the liquid may cause frostbite.
		Eyes:	May irritate eyes.
		Ingestion:	Unlikely route of exposure.
		Inhalation:	Inhalation may cause central nervous system effects. Vapours may cause dizziness and drowsiness.
		Chronic:	None known.
		General:	Warning. Container under pressure.
	Potential Environmental Effects:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.	

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Bright Instruments

Cryospray 1234ze

MATERIAL SAFETY DATA SHEET

3. Composition / Information on ingredients

Substance or mixture:	**CAS number:**	29118-24-9
	EC Number (from EINECS):	471-480-0

4. First Aid Measures

General advice:	Show this safety data sheet to the doctor in attendance. Keep warm and in a quiet place.
Inhalation:	If inhaled, move to fresh air. Seek medical attention if irritation develops and persists.
Skin contact:	Rapid evaporation of the liquid may cause frostbite. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Call a physician if irritation develops or persists.
Eye contact:	If eye irritation persists, consult a specialist.

5. Fire-fighting measures

Extinguishing media:	Show this safety data sheet to the doctor in attendance. Keep warm and in a quiet place.
Special hazards arising from the substance or mixture:	If inhaled, move to fresh air. Seek medical attention if irritation develops and persists.
Advice for fire fighters:	**Special protective equipment** Rapid evaporation of the liquid may cause frostbite. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Call a physician if irritation develops or persists.
	Further information In the event of fire, cool tanks with water spray.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:	Provide adequate ventilation. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid skin contact with leaking liquid (danger of frostbite). Use personal protective equipment. Keep people away from and upwind of spill/leak.
Environmental precautions:	Prevent further leakage or spillage if safe to do so. The product evaporates readily. Prevent spreading over a wide area e.g. by containment or oil barriers.
Methods for cleaning up:	Do not direct water spray at the point of leakage. Allow to evaporate.

7. Handling and Storage

Advice for safe handling:	Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use. Do not burn. Exhaust ventilation at the object is necessary.
Advice on protection against fire and explosion:	Do not spray on a naked flame or any incandescent material. Keep away from direct sunlight. Fire or intense heat may cause violent rupture of packages. Vapours may form explosive mixtures with air. The product is not easily combustible.
Hygiene measures:	Avoid breathing vapours, mist or gas. Keep working clothes separately. Do not smoke.
Further information on storage conditions:	Keep containers tightly closed in a cool, well-ventilated place. Keep only in the original container at temperatures not exceeding 50°C. Keep away from direct sunlight.
Advice on common storage:	Do not store together with Oxidising agents.

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8. Exposure controls / personal protection

Occupational exposure limits:	**Components:**	Trans-1,3,3,3-Tetrafluoroprop-1-ene		
	Basis:	Honeywell	**Exceeding factor:**	N/A
	Value type:	Time weighted average	**Form of exposure:**	N/A
	Control parameters:	800 ppm	**Remarks:**	We are not aware of any national exposure limit.
Occupational exposure controls:	The Personal Protective Equipment must be in accordance with EN standards: respirator EN 136, 140, 149; safety glasses EN 166; protective suit EN 340,463, 468, 943-1, 943-2; gloves EN 374; safety shoes EN-ISO 20345. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Avoid inhalation of vapour or mist.			
Environmental exposure controls:	Avoid breathing vapours, mist or gas. Keep working clothes separately. Do not smoke.			
Engineering measures:	Keep containers tightly closed in a cool, well-ventilated place. Keep only in the original container at temperatures not exceeding 50°C. Keep away from direct sunlight.			
Personal protective equipment:	**Respiratory protection:**	Remarks: In case of insufficient ventilation, wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator.		
	Hand protection:	Glove material: Vitron (R). Heat insulating gloves.		
	Eye protection:	Goggles.		
	Skin and body protection:	Wear suitable protective equipment. Protective footwear.		

9. Physical and Chemical Properties

Form:	Liquefied gas.
Appearance/colour:	Colourless.
Odour:	Slight, ether-like.
Boiling point:	-19°C.
Flash point:	Does not flash.
Auto-ignition temperature:	368°C.
Lower explosion limit:	No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28°C.
Upper explosion limit:	No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28°C.
Vapour pressure:	4.271 hPa at 20°C.
Vapour pressure:	11.152 hPa at 54.4°C.
Density:	1.17 g/cm^3 at 21.1°C.
Ph:	Neutral.
Solubility in water:	0,373 g/l.
Partition coefficient (n-octanol/water):	log Pow 1.6.
Relative vapour density:	4 (Air = 1.0).

10. Stability and Reactivity

Conditions to avoid:	Some risk may be expected of corrosive and toxic decomposition products. Avoid heat, flames and sparks.
Materials to avoid:	Reactions with alkali metals.
Hazardous decomposition products:	Pyrolysis products containing fluoride. Fluorocarbons. Hydrogen fluoride.
Stability and reactivity:	Stable under normal conditions. Hazardous decomposition products formed under fire conditions. To avoid thermal decomposition, do not over heat.

11. Toxicological Information

Acute oral toxicity:	Not applicable.
Acute dermal toxicity:	No data available.
Acute inhalation toxicity:	LC50/rat, value: >207000 ppm, >965 mg/l. Exposure time: 4 h.
Skin irritation:	Species: rabbit, result: no skin irritation. Method: OECD Test guideline 404.
Eye irritation:	No data available.
Sensitisation:	Species: human, classification: non-sensitizing.
Further information:	Not mutagenic in Ames Test. May cause headache and dizziness. No experimental indications on genotoxicity in vivo found. Detailed toxicological data and examinations, exceeding the data set in the MSDS are available for professional users on request.

12. Ecological Information

Persistence and degradability

Biodegradability:	Aerobic. Result: Not readily biodegradable.

Ecotoxicity effects:

Effects:		**Species:**	**Value:**	**Exposure time:**	**Comments:**
Toxicity to fish.	NOEC	Cyprinus Carpio (Carp)	>117 mg/l	96 h	
Toxicity to aquatic plants.	NOEC	Algae	>170 mg/l	96 h	Growth inhibition
Acute toxicity to aquatic invertebrates.	EC50	Daphnia magna (Water Flea)	>160 mg/l	96 h	

13. Disposal Considerations

Product:	Dispose according to legal requirements. Contact manufacturer.
Packaging:	Legal requirements are to be considered in regard of reuse or disposal of used packaging materials.
Further information:	Provisions relating to waste: EC Directive 2006/12/EC; 91/689/EEC Regulation No. 1013/2006.

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14. Transport Information

ADR/RID:	**Class:**	2.
	Classification code:	2A.
	Un number:	3163.
	Hazard labels:	2.2.
	Proper shipping name:	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene).
	Hazard number:	20.
	Environmentally hazardous:	No.
IATA:	**Class:**	2.2.
	Un number:	3163.
	Hazard labels:	2.2.
	Proper shipping name:	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene).
IMDG:	**Class**	2.2
	Un number	3163
	Hazard labels	2.2
	Proper shipping name	Liquified Gas, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene)
	Ems number	F-C,S-V
	Marine pollutant	No

15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture.

Other inventory information:

Country	Legislation	Information
US	Toxic Substances Control Act.	On TSCA inventory.
Australia	Industrial Chemical (Notification & Assessment) Act.	Not in compliance with inventory.
Canada	Canadian Environmental Protection Act (CEPA).	Not in compliance with inventory.
	Domestic Substances List (DSL).	
Japan	Kashin-Hou Law List.	On the inventory or in compliance with the inventory.
Korea	Existing Chemicals Inventory (KECI).	Not in compliance with inventory.
Philippines	The Toxic Substances and Hazardous and Nuclear Waste Control Act.	Not in compliance with inventory.
China	Inventory of Existing Chemical Substances.	On the inventory or in compliance with the inventory.
New Zealand	Inventory of Chemicals (NZIoC), as published by ERMA New Zealand.	Not in compliance with inventory.

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16. Other Information

Abbreviations:	**EC:**	European Community.
	CAS:	Chemical Abstract Service.
	WEL:	Workplace Exposure Limit.
	MAK:	Maximale Arbeitsplatz-Konzentration.
	AGW:	Arbeitsplatzgrenzwert.
	STEL:	Short Term Exposure Limit.

Other inventory information:

When using this document care should be taken as the decimal sign and its position complies with rules for the structure and drafting of international standards and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

This data sheet contains changes from the previous version, CLP03 dated January 2018. Sections 1 and 9 have been updated.

This datasheet was prepared in accordance with Regulation (EC) No. 1907/2006.

Information given is, to the best of the Company's knowledge and belief, accurate and reliable. However, no warranty, guarantee or representation is made to it's accuracy, reliability of completeness. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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Bright Instruments

Low Temperature Oil 57491

MATERIAL SAFETY DATA SHEET

1. Low Temp Oil 57491 Product Information	
Trade/Type:	Clavus Oil 15.
Container:	Plastic Bottle.
Uses:	For lubrication of microtomes and remote control spindles.
Description:	Low Temperature Oil.

2. Low Temp Oil 57491 Product Information		
Information on ingredients:	Mineral oil	
Physical and chemical properties:	Form:	Liquid
	Density:	@15°C, Kg/1 0.878
	Odour:	Mineral oil odour
	Colour:	Pale amber
	Flashpoint:	153°C (IP 34PM closed cup)
Stability and reactivity:	Stable:	Yes
	Conditions to avoid:	Extreme temperatures store between 0 – 50°C
	Materials to avoid:	Strong oxidising agents
	Hazardous Decomposition/Combustion Products: Dependant of conditions bringing about decomposition the following substance may be expected from normal combustion: carbon dioxide – polyeyelic Aromatic Hydrocarbons, carbon monoxide – Unburnt hydrocarbons, water – unidentified organic and inorganic compounds, particulate matter – nitrogen oxides.	
Ecological information:	Soil:	Will biodegrade
	Water:	Will not evaporate or dissolve
	Air:	Nil
	DO NOT allow to enter drainage systems, rivers or waterways.	

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2. Low Temp Oil 57491 Product Information (Cont.)		
Hazards identification:	Skin:	Unlikely to irritate on brief or occasional exposure.
	Respiratory:	Low volatility make inhalation unlikely at ambient temperatures.
	Ingest:	Possible aspiration into the lungs with possible resultant chemically induced neumonia.
	Eyes:	May cause transient irritation.
First aid procedures:	Skin:	Wash thoroughly, with soap and water..
	Respiratory:	Remove from exposure.
	Ingest:	DO NOT induce vomiting. Wash out mouth with water. SEEK MEDICAL ATTENTION URGENTLY.
	Eyes:	Flush copiously for at least 15 minutes. If irritation persists SEEK MEDICAL ADVICE.
Fire fighting measures:	Extinguish fires with foam, dry powder, CO2 or water fog - do not use water jets.	
Toxicological information:	This product is NOT classified as dangerous for supply or conveyance.	
Accidental release measures:	Let spillages evaporate and ventilate area well.	
Disposal considerations:	Dispose waste in accordance with local authority requirements.	
Handling storage:	No special requirements. Store away from direct heat and avoid extremes of temperature. DO NOT leave container unsealed.	
Transport information:	Not classified as dangerous to transport.	
Exposure controls:	5mg/m3 (8hour TWA) and 10mg/m£ (15 minute reference period) (Ref: EH40/1999).	
Regulatory information:	This product is a preparation and is NOT classified according to EEC Guideline.	

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