

Cryogenic Containers

RCB

User manual



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The devices in the RCB range are medical devices for the cryopreservation of biological samples. Any serious incident according to Regulation (EU) 2017/745 on medical devices, should be notified to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

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¹ Illustrations are non-contractual.

LEXICON

A	Accessories	Fitting accessories are modules designed specifically for sample storage containers. Examples: rack, canister, visotube, beaker, cryoplastic box, etc.
	Autonomy	According to ISO 21014, for an open system, this is the time that elapses from the initial filling level until the container is empty (no liquid), calculated from the heat input data.
C	Canister	Canisters are plastic accessories used in cryogenic vessels. They are used to receive, store and transport beakers, visotubes and straws.
	Curative maintenance	This is maintenance carried out after a breakdown has been detected and designed to restore an asset to a condition in which it can perform a required function.
	Commissioning	Operations to prepare the container for use. This applies to a new container used for the first time or to a container that has been removed and put back into service.
	Cryogenic temperature	By convention, temperature below -150°C.
D	Decontamination	Operation designed to eliminate or reduce the number of microbes on living tissue and inert objects to levels considered safe, in order to comply with hygiene and public health standards.
	Daily evaporation	Loss by volume of liquid nitrogen by natural heating, container in static state, closed cap, measured and calculated in accordance with ISO 21014.
F	Flexible transfer hose	Flexible piping systems for cryogenic fluids, enabling the container to be filled with liquid nitrogen.
	Gas atmosphere	Formation of a cloud of condensed air when the cap is opened, interfering with visibility inside the container.
	Gas phase	How to use the container to store samples without liquid nitrogen. <i>RCB "Phase Gas"</i> containers contain liquid nitrogen only under the accessories. The accessories and samples are in gaseous nitrogen (cf. Figure 5).
L	Liquid phase	How to use the container for storing samples in liquid nitrogen. The containers in the <i>RCB "Liquid Phase"</i> range can contain liquid nitrogen up to the top of the samples. However, sample immersion may not be continuous (cf. Figure 6).
M	Medical Devices	According to Regulation 2017/74: "Any instrument, apparatus, equipment, material or article, used alone or in combination, including the software necessary for its proper functioning, intended by the manufacturer to be used in humans for the purpose of: <ul style="list-style-type: none"> - the diagnosis, prevention, control, treatment or alleviation of a disease, - diagnosis, control, treatment, mitigation or compensation of an injury or disability, - study, replacement or modification of the anatomy or a physiological process, - design control, whose principal intended action in or on the human body is not obtained by pharmacological or immunological means or by metabolism, but whose function can be assisted by such means".
	Mud trap	Access to the bottom of the container through the rotating basket floor.
N	Normal operation	Intended operation of the container according to its technical specifications, under normal conditions of use.

O	Option	These are separate, optional items for use with containers. These items make it easier to use the containers or accessories.
	Oxygen meter	Safety device that monitors and alerts you to the level of oxygen in the ambient air.
P	PPE	Personal protective equipment
	Periodic inspection	Check that the container is operating normally and that it is capable of maintaining this state.
	Preventive maintenance	This is maintenance carried out at predetermined intervals or according to prescribed criteria and designed to reduce the probability of failure or degradation in the operation of an asset.
R	Rack	Racks are metal accessories used in cryogenic containers to receive, store and transport cryoplastic bags/boxes (containing biological samples).
S	Static state	State of the container after stabilisation of the cryogenic temperatures it preserves, without manipulation of the sample or accessory, without opening the cap and without moving the container.
	Stabilisation time	Time it will take for the container to go from ambient temperature to cryogenic temperature when it is first filled (time before there is a regular daily evaporation rate).
	Straw	The straws directly contain the biological samples to be stored in the containers.
T	Transfer line	Rigid piping systems for cryogenic fluids, enabling the container to be filled with liquid nitrogen.
	Transfer hose	Flexible pipe systems for cryogenic fluids enabling the container to be filled with liquid nitrogen.
	Tumbler	Cups are accessories used to organise the storage of straws or visotubes. The cups are placed in the canisters.
V	Visotube	Visotubes are accessories for organising the storage of straws. It offers the user a superior degree of organisation of samples in cups.

IDENTIFICATION OF FUNCTIONAL SUB-ASSEMBLIES

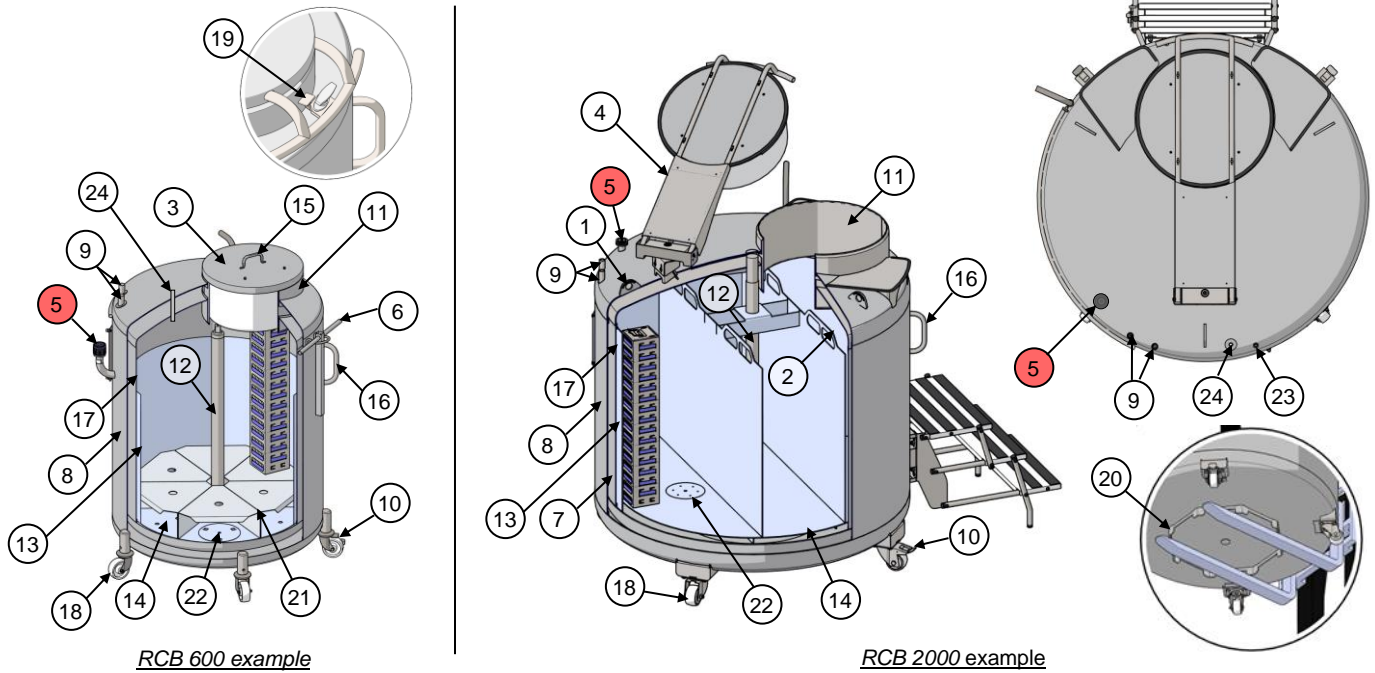



Figure 1 - RCB functional sub-assembly identification diagram

Marker	Description	Function
1	Lifting ring	To enable the handling of the empty container using a sling.
2	Basket handle	To support the rotation of the revolving basket.
3	Manual cap	To close the container.
4	Assisted cap	To incorporate a mechanical system that compensates for the weight of the cap, in order to make it easier to handle, in addition to the manual cap.
5	Pump check valve	To maintain the proper insulation of the container.
6	Basket key	To enable the revolving basket to be handled.
7	Dual heat insulation shell	To thermally insulate the container. It is made up of an inner container and an outer heat insulation shell.
8	External heat insulation shell	To produce insulation through a leaktight chamber.
9	Gauge sleeve	To provide access to the lowest possible point of the inner container from the dual heat insulation shell.
10	Caster brake	To maintain the container in the static position.
11	Container opening	To enable access to the inside of the container.
12	Basket mast	To enable the rotation of the revolving basket.
13	Revolving basket	To guide equipment accessories under the opening of the container.
14	Floor of the revolving basket	To support equipment accessories.
15	Cap handle	To handle the assisted cap.
16	Maintenance handle	To handle the container during maintenance operations.
17	Inner container	To contain cryogenic fluid.
18	Casters	To move the container during maintenance.
19	Key lock	To lock the assisted cap.
20	Lifting base	To enable the container to be handled using the forks of a lifting device such as a fork-lift truck.
21	Extension	To raise the storage accessories in the revolving basket.
22	Mud trap	To provide access beneath the floor of the revolving basket.
23	Filling tube	To enable nitrogen filling through the bottom of the inner container.
24	Probe feed tube	To enable the insertion of temperature probes into the container.

 Important element for container safety

1. Manufacturer identification

The manufacturer of the containers in the *RCB* range is:



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2. Safety information

All residual risks are identified in the manual by the following icon:



2.1. General instructions

Prerequisites for using the containers:

- Working in scientific research,
- Be informed about the risks associated with liquid nitrogen/gas,
- Have read this user manual in its entirety,
- Be authorized by the operator to use the containers.

Prerequisites for container maintenance

- Be informed about the risks associated with liquid nitrogen/gas,
- Have read this user manual and the maintenance manual in full,
- Be authorized by the operator to maintain the containers.

The user manual can be sent in paper format on request within 7 days.

For correct and safe use and for any maintenance work, it is essential that personnel follow normal safety procedures.

If the container does not function under normal conditions of use, only a person trained and authorized to maintain containers in the *RCB* range may work on the container and its peripheral components. Any intervention by the user is prohibited because of the health and/or safety risks involved. To avoid a rise in temperature which could jeopardise the conservation of samples, the intervention time must be as short as possible.

The periodic checks described in this manual are used to monitor normal operation. The application of procedures, the use of accessories or the installation of a dedicated device are authorized in addition.






Cryopal recommends that when storing biological samples categorized as sensitive by the user, the nitrogen level in the container should be checked daily. This test, presented in paragraph 4.4.2 confirms that the thermal performance of the container complies with the manufacturer's specifications (cf. Table 5).

It is advisable to have a cryogenic storage container permanently supplied with liquid nitrogen so that samples can be transferred in the event of container failure.






2.2. General precautions for use

When handling, wear personal protective equipment (PPE):

Table 1 - List of PPE required for handling cryogenic containers

	Cryogenic protective gloves must be worn
	Protective clothing (long sleeves) must be worn
	Wearing a protective visor is compulsory
	Safety shoes must be worn
	Oxygen meter must be worn

Precautions for use are the same for all cryogenic containers:

	<p>Liquid nitrogen is extremely cold (-196°C). Parts of containers that have been in contact with liquid nitrogen, particularly during filling, can cause burns on the skin.</p> <p>Cold burns and/or frostbite</p> <ul style="list-style-type: none"> On the surfaces of the container near the container opening. On furnishing accessories. On tubes passing through the double casing. By spraying with liquid nitrogen. <p>When handling the fittings, liquid nitrogen may be poured outside the container.</p> <p>To avoid burns, never touch cold parts (container opening, cap, hose, etc.) and wear personal protective equipment in accordance with safety instructions.</p>
	<p>Pinching</p> <ul style="list-style-type: none"> Through the stopper, when the container is closed. <p>Crushing of the feet</p> <ul style="list-style-type: none"> By the castors and the cryogenic container when the container is moved.
	<p>Anoxia</p> <p>The liquid nitrogen used in storage containers evaporates naturally as it heats up; 1 litre of liquid nitrogen releases around 650 litres of nitrogen gas. Nitrogen is an inert gas and is non-toxic, but when released into the air, it displaces the oxygen in the air. If the oxygen content falls below 19%, there is a risk of anoxia.</p> <p>Any room or premises where containers containing liquid nitrogen are kept must be equipped with suitable ventilation and at least one oxygen detector (refer to the standards in force in the country of use and contact your technical contact).</p> <p>All staff must be warned of the risks involved in using nitrogen.</p>
	<p>Regular verification of thermal performance ensures that the container has retained its original characteristics (cf. Table 5).</p> <p>Check daily that there is no frost on the opening of the vessel or on the outer casing. If frost is present (outside the periods when the vessel is being filled with liquid nitrogen), stop operating the cryogenic vessel and contact your technical contact as soon as possible.</p> <p>Check the condition of the cap (deterioration, separation from the lid). In the event of severe wear, replace the cap to maintain the container's performance.</p>
	<p>If liquid nitrogen spills onto the pumping valve, this may cause an insulation fault. If this is the case, check that 24 hours later, all traces of frost have disappeared from the container apart from around the opening. Contact your technical contact if liquid nitrogen is spilt on the pumping valve.</p>



We recommend using the container on a flat, level floor to guarantee its stability and the reliability of the liquid level check. The **floor** must be able to support a **weight** of between **1000kg/m² and 1600kg/m²**, depending on the capacity of the container, without deformation.



The container must be filled with cryogenic liquid nitrogen in a room equipped with a permanent ventilation system appropriate to the size of the room. The room must also be equipped with an oxygen level monitoring system with a display outside the room, and the user must be equipped with a portable oxygen level monitoring and warning device.

The safety conditions required and the provision of safety systems for the operation of a cryogenic room are the responsibility of the operator.







Before handling (rack, cap, etc.), users must ensure that they are in a stable position and that the container **opening** is level with their **abdomen**.








2.3. Definition of pictograms


Table 2 - List of pictograms used

	Manufacturer		Warning: low temperature
	Refer to the instructions in the manual		Gloves must be worn
	Wearing a protective visor is compulsory		Ventilate the room
	Do not touch frosted parts		Attention
	CE marking, compliance with the requirements of Regulation 2017/745 0459: Identification of the notified body		Container reference
	Date of manufacture (in YYYY-MM format)		Serial number
	Temperature limits for use of the container		Capacity in litres
	Altitude limit for use of the container		Position the container vertically
	Humidity limits for use of the container		Don't puke
	Fragile		Keep out of the rain
	Keep out of direct sunlight		Empty container lifting weight
	Lifting with a trolley on this side		Do not lift with a trolley on this side
	UDI symbol: UDI-DI + UDI-PI		Medical equipment

	<p>This label prohibits the use of the full flange on the valve support elbow.</p>
	<p>This label indicates that the lifting rings should only be used when the container is empty of liquid (RCB2000 only).</p>
	<p>This label provides information on the maximum load permitted by the running board (RCB2000 only).</p>
	<p>Fill only with liquid nitrogen</p>


2.4. Labelling on the container



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MD RCB1001-L-BC-SANS EQUIPEMENT

Product Id. NH104933-02

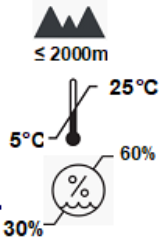
REF RCB1001N-L-2

SN 001149999-99

 2022-09



500 Kg



≤ 2000m
5°C - 25°C
30% - 60%

● 1040 L

CE 0459

(BR) Registro ANVISA nº 80204410014

AH106745_B

0001142439

Figure 2 - Labels on containers

2.5. Labelling on packaging

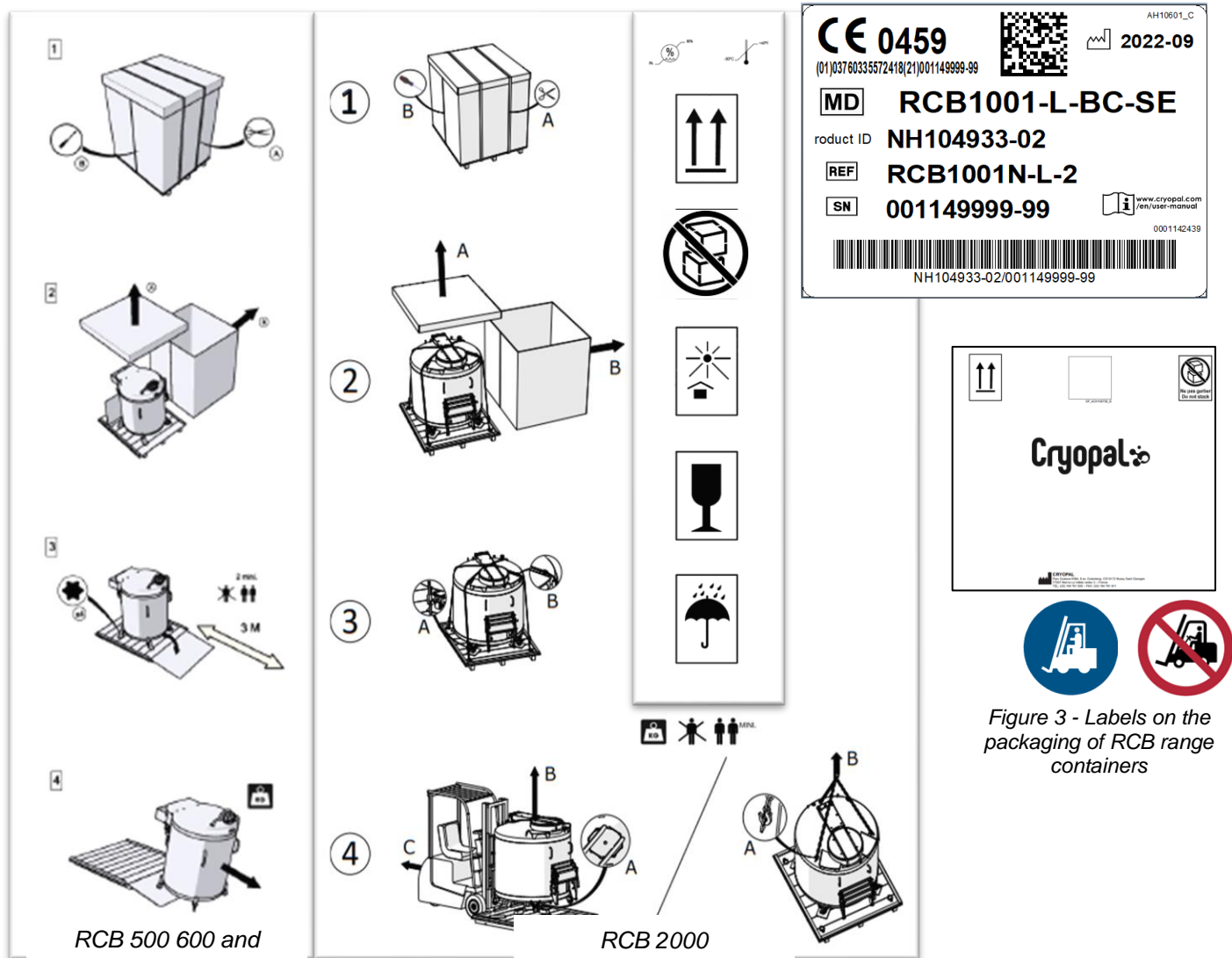


Figure 3 - Labels on the packaging of RCB range containers

FR - Dispositif médical pour la cryoconservation d'échantillons biologiques
 GB - Medical device for cryopreservation of biological samples
 DE - Medizinprodukt zur Kryokonservierung von biologischen Proben
 BG - Медицинско устройство за криоконсервация на биологични проби
 HR - Medicinski uređaj za krioprezervaciju bioloških uzoraka
 DK - Medicinsk udstyr til kryokonservering af biologiske prøver
 ES - Dispositivo médico para la criopreservación de muestras biológicas
 EE - Meditsiiniseade bioloogiliste proovide külmsäilitamiseks
 FI - Lääketieteellinen laite biologisten näytteiden kylmäsäilytykseen
 GR - Ιατρική συσκευή για κρυοσυντήρηση βιολογικών δειγμάτων
 HU - Orvosi eszköz biológiai minták mélyhűtésére
 IT - Dispositivo medico per la crioconservazione di campioni biologici
 LV - Medicīniskā ierīce bioloģisko paraugu kriokonservēšanai
 LT - Medicinos prietaisas, skirtas biologinių mėginių kriokonservavimui
 NL - Medisch hulpmiddel voor cryopreservatie van biologische monsters
 NO - Medisinsk utstyr for kryokonservering av biologiske prøver
 PL - Urządzenie medyczne do kriokonserwacji próbek biologicznych
 PT - Dispositivo médico para criopreservação de amostras biológicas
 RO - Dispozitiv medical pentru crioconservarea probelor biologice
 SK - Zdravotnícky prístroj na kryokonzerváciu biologických vzoriek
 SI - Medicinski pripomoček za kriokonzervacijo bioloških vzorcev
 SE - Medicinsk anordning för kryokonservering av biologiska prover
 CZ - Zdravotnický prostředek pro kryokonzervaci biologických vzorků
 TR - Biyolojik numunelerin dondurularak saklanması için tıbbi cihaz

AH107301A

Medical destination label

3. PRESENTATION OF THE RCB RANGE

3.1. Presentation of containers

The *RCB* range of containers are medical devices designed to store and preserve large quantities of biological samples in a cryogenic atmosphere. Cryogenic temperatures are maintained using liquid nitrogen.

These containers are particularly suitable for long-term storage, as they have a narrow, off-centre opening to optimise liquid nitrogen consumption and maintain cryogenic temperatures.

Access to the fittings through this opening is made possible by a rotating basket integrated into the containers.

The *RCB* range comes in 4 storage capacities, each with its own dimensions and the liquid capacity to which its name refers: RCB 500, RCB 600, RCB 1001 and RCB 2000.



Figure 4 - RCB range

- There are **two ways of storing** samples in *RCB* containers:
 - storage in nitrogen: "**Liquid Phase**"
 - non-liquid nitrogen storage: "**Gas Phase**"

Table 3 - Possible storage methods for containers in the RCB range

Cryogenic vessel	"Gas phase"	"Liquid Phase"
<i>RCB 500</i>		■
<i>RCB 600</i>	■	■
<i>RCB 1001</i>	■	■
<i>RCB 2000</i>	■	■

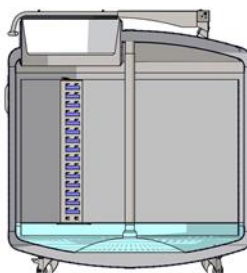


Figure 5 - Gas phase

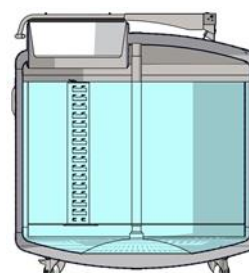





Figure 6 - Liquid phase

Storage conditions according to the "Gas phase" or "Liquid phase" mode of use are described in the table below:


Table 4 - Help in choosing the storage method

Advantages depending on how it is used	"Phase Gas	"Phase Liquid phase
Storage temperature below -150°C	X	X
Storage temperature as close as possible to -190°C	(X) <i>RCB 2000 only</i>	X
Optimum autonomy (between two refills of liquid nitrogen)		X
Optimum visibility of liquid nitrogen levels		X
Eliminate the risk of samples coming into contact with liquid nitrogen	X	
Eliminate the risk of liquid nitrogen splashing during handling	X	
Easier handling of racks and other storage accessories	X	
Speed up container filling cycles	X	
Maintain access under the rotating basket for any special operations (e.g. decontamination).	X	X

- 
The containers should only be used for storing biological samples and not for freezing.
- 
Cryogenic temperatures may not be maintained by any fluid other than nitrogen.
- 
It is forbidden to load the container with accessories and samples in excess of the weight indicated.

3.2. Technical specifications

Table 5 - Technical characteristics of RCB range containers

			RCB 500	RCB 600	RCB 1001	RCB 2000
CLINIC						
Indication			Non-pressurised containers for storing and preserving previously frozen biological elements at very low temperatures.			
Contraindication			Do not use outside the prescribed ranges. Do not fill with anything other than liquid nitrogen.			
Performance			Maintaining a cryogenic temperature for preserving biological samples using a low rate of evaporation of liquid nitrogen.			
Reference	TECHNICAL	Units				
	Maximum liquid nitrogen capacity					
	<i>Liquid phase</i> " storage mode	L	500 +/-5%	625+/-5%	996+/-5%	1636+/-5%
	<i>Gas phase</i> " storage mode		NA	125+/-2%	241+/-2%	223+/-2%
Do	Aperture diameter	mm	461	461	601	618
D_n	Nominal storage diameter	mm	850	850	1150	1354
d_m	Inside mast dimensions	mm	60	60	60	60
H_n	Nominal storage height	mm	730	786	674	885
H_m	Maximum height ⁽¹⁾ storage	mm				
	<i>Liquid phase</i> " storage mode		780	955	858	960
	<i>Gas phase</i> " storage mode		NA	815	718	960
	Empty weight	kg	270+/-5%	320+/-5%	470+/-5%	750+/-5%
	Full weight of liquid nitrogen <i>(without fittings)</i>	kg				
	<i>Liquid phase</i> " storage mode		674+/-5%	824+/-5%	1273+/-5%	2069+/-5%
	<i>Gas phase</i> " storage mode		NA	421+/-2%	665+/-2%	930+/-2%
	Maximum rotating basket load	kg	240	260	420	860
	Maximum full weight with fittings <i>(Empty weight + full equipment + liquid nitrogen at maximum level)</i>	kg	810	990	1540	2500
e	Height of access to container opening from ground level	mm	1260	1440	1382	1615
g	Height of access to the container opening from the step provided for this purpose	mm	NA	1190 <i>(option)</i>	1132 <i>(option)</i>	1045
d	Total height, cap (compensated) closed	mm	1305	1485	1427	1664
b	Depth (without footboard)	mm	1160	1160	1420	1557
c	Depth (with folded step)	mm	NA	NA	NA	1723
a	Width	mm	1100	1100	1350	1524
i	Width, open compensated cap	mm	1210	1210	1880	1985
f	Maximum height for handling a fitting accessory	mm	2060	2300	2130	2570
	Daily evaporation ⁽²⁾	L/day	5,1	5,1	7	10,5
	Autonomy ⁽³⁾	days				
	<i>Liquid phase</i> " storage mode		98	122	142	155
	<i>Gas phase</i> " storage mode		NA	24	34	21
	Stabilisation time	days	2	2	3	4
Container material:			Stainless steel, aluminium alloy, polycarbonate, polystyrene			
 Autonomy values are given for containers tested without accessories. They are indicative and correspond to the general conditions of use observed. They may vary according to atmospheric conditions, the type of storage accessories and the monitoring or control electronics used.						

(1): This is the maximum height that can be used to achieve the nominal performance of the container.

(2): Loss of liquid nitrogen by natural heating, container in static state (after stabilisation of cryogenic temperatures without sample handling, opening of the cap or displacement of the container), cap closed, measured and calculated in accordance with ISO 21014.

(3): According to ISO 21014, for a system open at a given filling level, this is the predicted time it will take for the container to empty of its liquid, from full to empty, calculated from available data on volumes and heat inputs.

NA: Not Applicable

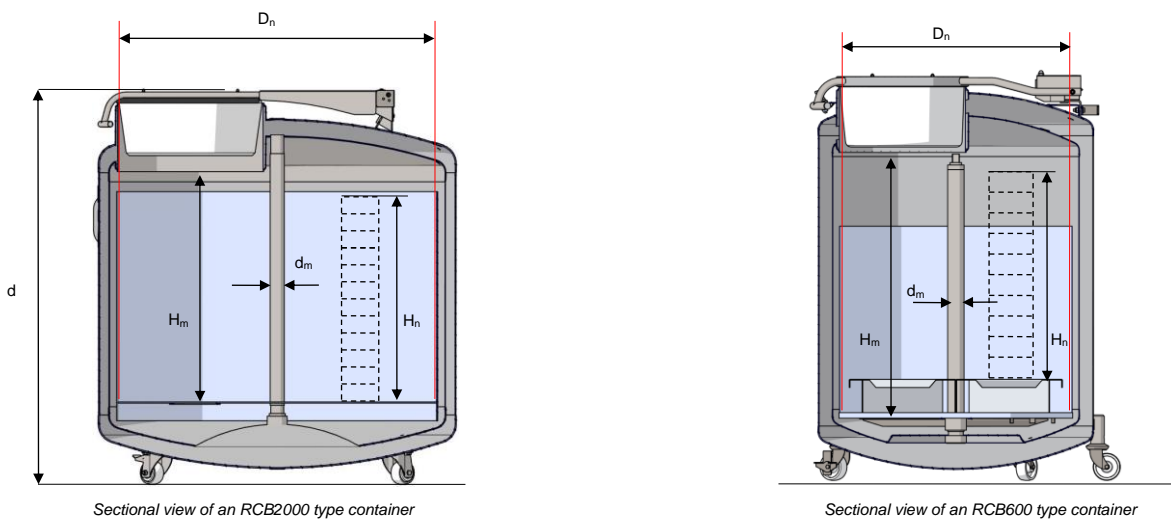
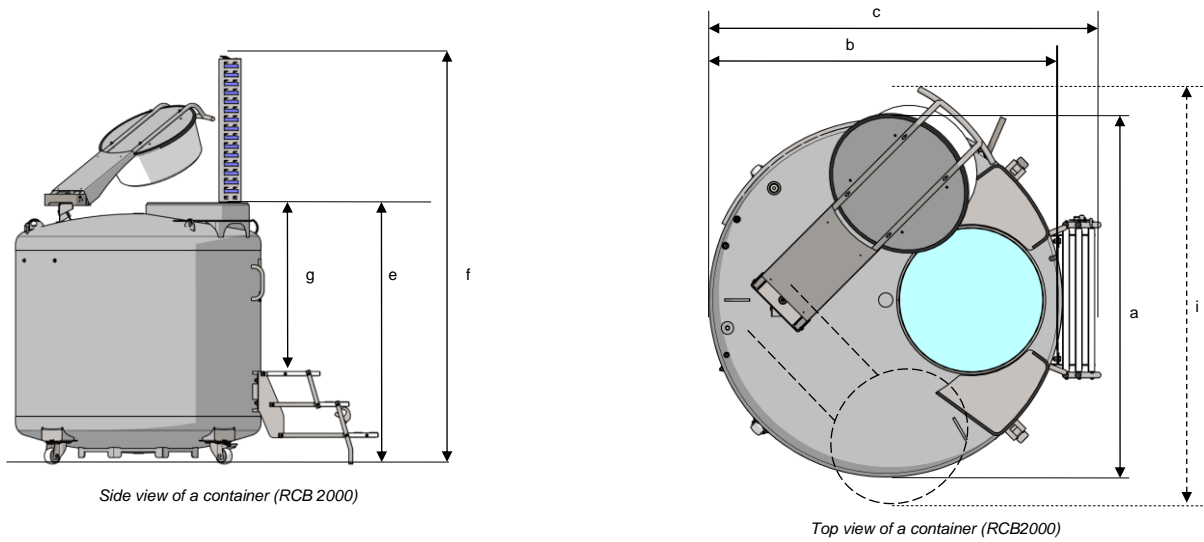


Figure 7 - Technical representation of RCB

3.3. References for the RCB range

Table 6 - List of commercial references

References	IUD-DI	Container description	DM class
RCB500N-L-1	03760335572302	RCB 500 Manual cap	IIa
RCB500N-L-2	03760335572319	RCB 500 Compensated cap	IIa
RCB600N-L-1	03760335572340	RCB 600 Manual cap	IIa
RCB600N-L-2	03760335572357	RCB 600 Compensated cap	IIa
RCB1001N-L-1	03760335572401	RCB 1001 Manual cap	IIa
RCB1001N-L-2	03760335572418	RCB 1001 Compensated cap	IIa
RCB2000N-L-1	03760335572463	RCB 2000 Compensated cap	IIa

The medical devices in the RCB range comply with EMDN code V0499 on the European Commission website. EMDN code wording V0499: CLINICAL USE CONTAINERS (NON-IVD) - OTHER

3.4. Materials used

Table 7 - Materials in the RCB range

Materials in direct or indirect contact with the user	Stainless steel, aluminium alloy, polycarbonate, polystyrene
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4. Use of containers

4.1. Indication of use

4.1.1. Intended use

The RCB range of cryogenic containers is designed for use in laboratories, bio-banks, hospitals and other specialist establishments for preserving biological samples. Samples may include cord blood, blood bags, cells, body tissues, etc.

The container must be filled only with liquid nitrogen (cryogenic fluid).

Users

The devices in the RCB range are intended for use by professionals in the following three categories:

- Laboratory assistants and researchers, within the conservation establishment.
- The operator's maintenance technicians (conservation facility).
- The distributor's or manufacturer's service technicians.

4.1.2. Expected technical performance

The expected performance of the RCB range of cryogenic containers is the maintenance of a cryogenic temperature for the preservation of biological samples with a low rate of evaporation of liquid nitrogen.

In normal operation, temperatures of -150°C in the gas phase and as close as possible to -196°C in the liquid phase correspond to the maximum temperature guaranteed if the cap is closed and the container thermally stabilised.

4.1.3. Container service life

The expected lifetime of the RCB range is 10 years. This corresponds to the period during which the container has the capacity to maintain its thermal insulation at an optimum level in order to limit heat transfer from the outside to the inside of the container as much as possible.

The service life of the containers can only be maintained if all the recommendations in this manual are followed.

4.1.4. Contraindications and warnings

RCB range vessels use only liquid nitrogen as the cryogenic fluid. No other fluid may be used to fill the vessel.

RCB range containers must only be used under the conditions specified in the user manual.

4.1.5. Major risks for users and samples

For the user

There are two major risks for the user associated with the use of liquid nitrogen:

- Burns, frostbite and other cold-related injuries
Extensive or prolonged contact with liquid nitrogen, even in small quantities, can cause severe "burns" or frostbite.
- Anoxia
Nitrogen's ability to rapidly generate a large volume of nitrogen gas at room temperature from the evaporation of a small volume of liquid nitrogen can cause asphyxiation and damage to the central nervous system in the event of prolonged exposure, through displacement of oxygen from the air and dilution.

To avoid these risks, it is essential to follow the safety instructions described in this user manual.

For the retained sample

There are several risks that can affect the biological sample during storage:

- **Alteration or degradation of the sample due to loss of thermal insulation of the container**
A loss of thermal insulation in the container due to a vacuum break in the space between the walls can cause the temperature in the container to rise, leading to deterioration and even destruction of the samples.
The very low temperature of liquid nitrogen (-196°C) can cause damage to equipment. The ductility of materials is reduced by repeated contact with liquid nitrogen. For example, prolonged contact between the container's pumping valve and liquid nitrogen can cause it to degrade, leading to a vacuum rupture in the container's inner wall.



If liquid nitrogen **overflows** the valve, check that all traces of frost have disappeared from the container opening within 24 hours and check the container's thermal performance by applying the liquid nitrogen level control protocol (see § 4.4.2).

- **Contamination of the sample**

During the cryopreservation period in liquid nitrogen, there is a (very slight) risk of microbiological contamination of the samples. Micro-organisms may be deposited on the samples during human intervention and contaminate the liquid nitrogen when the samples are introduced into the cryogenic container. Some micro-organisms can survive in liquid nitrogen and proliferate on other samples.

The ice crystals that can form on the walls of cryogenic containers during storage can trap viruses, bacteria, fungal spores and debris. This constitutes a risk of transmission of micro-organisms.



To minimise the risk of cross-contamination, it is recommended to reduce the formation of ice in (and on) cryogenic containers and to pack samples in closed packages with a primary and a secondary packaging.

4.2. Conditions of storage and use

Several conditions and warnings must be observed to ensure the safe use of containers in the *RCB* range.

4.2.1. Storage and transport conditions in original packaging

- Transport and store the empty container in its original packaging.
- *RCB* range containers must be kept in an upright position.
- Respect the temperature and humidity ranges during storage :
 - Ambient temperature: -30°C to +60°C.
 - Relative humidity: 0% to 85% non-condensing.
- Do not store containers near sources of heat.



Please note that the container in its packaging can only be lifted from one side with a trolley. Refer to the labels on the packaging.

4.2.2. Normal conditions of use

- *RCB* range containers must be kept in an upright position.
- Avoid shocks and sudden movements.
- Protect samples before placing them in the container (tubes, bags, cases, etc.).
- Respect the temperature and humidity ranges in use:
 - Ambient **temperature: +5°C to +25°C**. The **recommended** temperature is **15°C**.
 - Relative humidity: 30% to 60% non-condensing.
 - Altitude: ≤ 2000m

The room in which the container is used must be equipped with personal protective equipment (PPE).

- Maintain a **safety distance** of at least **0.5 m** around containers.
- Provide a minimum **ceiling height** of **3.10 m** for the *RCB 2000*.
 - §Do not store containers near a source of heat.
- Ensure that the ventilation and volume of the space in which the liquid nitrogen is stored or used is sufficient, as liquid nitrogen evaporates and produces a large quantity of nitrogen gas which can reduce the proportion of oxygen in the ambient air of a confined space, hence the risk of anoxia.
- Install an oxygen level detector linked to a powerful audible and visual warning indicator in the event of danger. It must be installed close to all storage and sampling areas.
- Do not use containers in confined and/or cramped spaces.

§Ensure that the **floor** can support a **weight** of between **1000kg/m² and 1600kg/m²** depending on the capacity of the container without deformation.



The reduction in oxygen in the air breathed in causes no sensation. As a result, **anoxia** leads to syncope and death without any warning signals.

4.3. Unloading and moving the container

The container in its packaging should be moved using forklift or pallet truck type handling equipment.

Cryopal recommends approaching the package as close as possible to the container installation area before unpacking.

When unpacking the container, follow the **instructions** printed on the **packaging**. **Two people** are needed to unpack the container. You will need the tools indicated on the packaging.

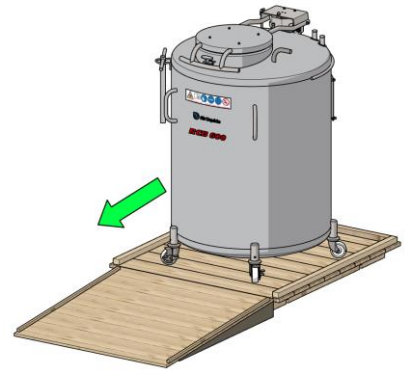


Figure 8 - Ramp unloading



Remove the clamps holding the castors before removing the container from its pallet.

For the *RCB500*, *RCB600* and *RCB1001*, a container unloading ramp is provided in the packaging to enable the container to be lowered by rolling it off the transport pallet.

For the *RCB 2000*, the pallet can be unloaded:

- Or by means of the lifting rings provided on the top of the container, using a lifting device fitted with at least a 3-strand sling, in compliance with good handling practice and safety rules.
- Or by its lifting base designed to accommodate the forks of a forklift truck.

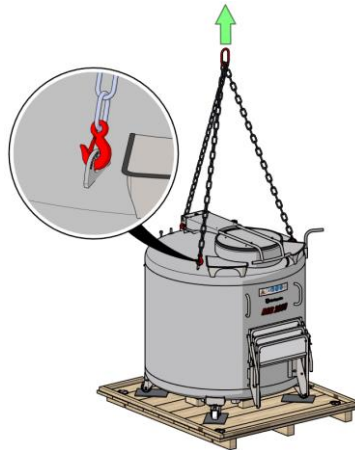


Figure 9 - Unloading with a 3-strand sling

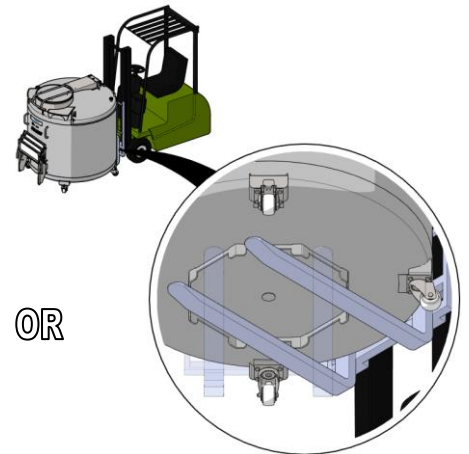


Figure 10 - Unloading with a forklift truck

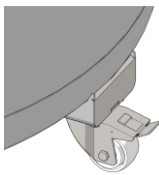


Figure 11 - Castor brake

On the floor, move the empty container by rolling it on its castors.

Once the container has been placed in the desired position, it must be immobilised by locking the brakes on the castors.

For maintenance purposes, the container may be moved only to facilitate access to the rear. To do this, first release the brakes on the castors, and take care to avoid any collisions or sudden movements that could damage the container.

If the cryogenic vessel has already been used and needs to be moved, it must be transported empty of sample and liquid.



It is **forbidden** to **move or lift** a cryogenic vessel from the *RCB* range containing liquid nitrogen and/or samples.

When handling the container, empty of all accessories, samples and fluids, check that the lifting equipment complies with the standards and follow the best practices associated with the operation to be carried out.

Make sure that the container is vertical and balanced.

Lifting via interfaces other than those provided for this purpose is prohibited.

Any other means of lifting is prohibited.

The commissioning of a piece of equipment must be carried out with your technical assistance, who will carry out the checks and any reconditioning beforehand.

Avoid any mechanical impact with the pump valve.



Please note that the container in its packaging can only be lifted from one side with a trolley. Refer to the labels on the packaging.

4.4. Use of the container

4.4.1. Filling the container

When topping up with liquid nitrogen for the first time or recommissioning, refer to the maintenance manual in force. **Refilling** must only be carried out by **trained and authorised personnel**.

To reach cryogenic temperatures, *RCB* range containers must be filled with liquid nitrogen.

From a liquid nitrogen tank or from a transfer line, filling can be carried out by passing either:

- By opening the container directly, using a hose and a filling tube for example;
- Only available as an option in the Cryopal product range.

Before filling, make sure that the storage accessories, without the samples, have been placed inside the container.

Then fill the container to $\frac{3}{4}$ of the desired final volume, leave to cool for a few minutes, then top up to the final level. A **stabilisation time** specific to each container allows the nominal thermal performance to be reached (cf. **Table 5**), making sure that the cap is tightly closed throughout this period at an ambient **temperature** of around **15°C**.

Filling must be carried out in several stages up to the high level, and with care to avoid splashing liquid nitrogen.

The liquid level falls naturally as the nitrogen evaporates. Normal operation therefore requires the level to be checked regularly (see §4.4.2), comparing the results with the specifications given in the technical characteristics (cf. Table 5), and refill the container when the level falls below the desired level.

If the results of the previous test comply with the specifications, the samples can be introduced into the containers using the cryogenic temperature storage accessories.

For use in "**Gas phase**", the liquid nitrogen level must be maintained below the storage accessories (see §4.4.2).



During the container **stabilisation** time, liquid nitrogen **evaporation** is **high** and generally above specification. To obtain maximum autonomy, it is necessary to top up the liquid nitrogen level after this period.



When filling and inserting samples, make sure you use appropriate PPE and follow the safety procedures (see §.2).

Cryopal recommends that at least one person always be present to monitor the filling process through to completion.

The maximum **pressure** to be used at the filling source must be less than **3 bar** absolute (1.5 bar recommended).

It is not possible to maintain a cryogenic temperature in the container without the presence of liquid nitrogen.

Avoid exposing the **pump valve** to temperatures below **-20°C** during filling.



Fitting **accessories**, without samples, must be introduced into the container **before filling** to avoid thermal shock which could cause splashing or evaporation of nitrogen.



Two people are needed for **filling** if the technician is unable to hold the hose over the opening with one hand and manipulate the nitrogen inlet valve with the other without changing places.

4.4.2. Liquid nitrogen level control

It is advisable to check the nitrogen level **daily**.

Checking the fluid level enables:

- Ensuring that cryogenic temperatures are maintained in the *RCB* range of vessels.
- To warn of the need to refill with liquid nitrogen.

To check the level of liquid nitrogen in the container, use the plastic level indicator supplied with the container:

- **Gently open** the cap to limit the formation of a gaseous cloud.
- Insert the level indicator vertically **between the basket and the side of the container** until the **COLLEGE LEVEL** mark is at the edge of the neck. (See Table 8)
- After a maximum of 3 seconds, remove the indicator and shake it in the air until frost appears.

The presence of frost indicates the presence of nitrogen in the container.

Observations: The frost must be below the **MAXIMUM REFERENCE LEVEL** and as close as possible.



Figure 12 - Reading the level on the indicator

Special precautions:

- If the frost **exceeds** the **MAXIMUM REFERENCE LEVEL**:
Do not add any more nitrogen until the level falls naturally below this reference.
- If the samples are not to meet nitrogen:
Remove one rack and visually check that the nitrogen has not passed over the floor of the rotating basket. If this is the case, transfer the samples concerned to the emergency container.
- If **frost does not form** on the indicator as described above, cryogenic temperatures can no longer be maintained in the container.

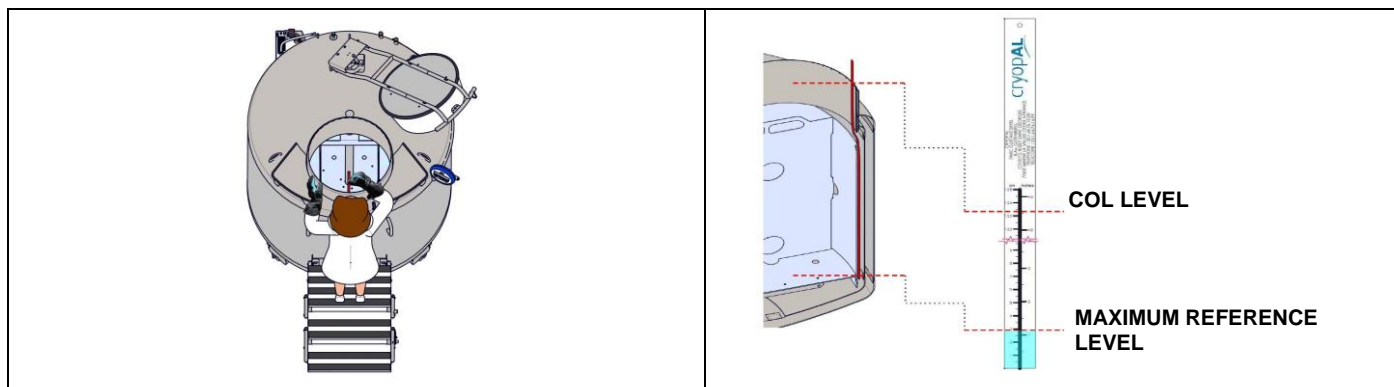


Figure 13 - Example of a liquid nitrogen level check in the "Gas phase"

Table 8 - Grid of reference values

Storage mode	Landmarks	RCB 500	RCB 600	RCB 1001	RCB 2000
GAS PHASE	COL LEVEL	X	115 cm	115 cm	135 cm
	MAXIMUM REFERENCE LEVEL (under the rotating basket)	X	5.5 cm	15.5 cm	7 cm
LIQUID PHASE	MAXIMUM REFERENCE LEVEL (above the racks)	Visually check for the presence of nitrogen just under the handles of the rotating basket or just under the handles of the racks.			



If daily **evaporation** significantly exceeds the specifications given in the technical data (cf. Table 5) in the static state, this indicates an **insulation fault** which is also reflected in :

- Excessive evaporation of nitrogen (risk of anoxia and risk of heating the container).
- By the formation of frost on the outer casing of the container (risk of heating up the container).

All necessary safety measures must be taken **in the event of a fault**:

- Transfer the samples to the emergency cryogenic container.
- Isolate the container in a ventilated environment.
- Contact your distributor.

When checking the level of liquid nitrogen, make sure you use suitable PPE and follow the safety procedures (see §.2).



The periodic checks described in this manual are used to monitor normal operation. The application of procedures, the use of accessories or the installation of a dedicated device are authorised in addition.



Regular verification of thermal performance ensures that the container has retained its original characteristics (cf. Table 5).

Cryopal recommends recording the measurement results to monitor the evolution of the container (number of fills, daily consumption, daily evaporation, etc.).

The container is naturally emptied by the continuous evaporation of liquid nitrogen and must therefore be refilled periodically to ensure that the samples are properly preserved in a cryogenic atmosphere.

Wait for the container to stabilise before checking the level through the **sludge trap** (a few hours).

4.4.3. Assessing the temperature in the container

The presence of frost indicates the presence of nitrogen in the container and ensures that samples are stored at cryogenic temperature.

It is also possible to check the temperature by fitting the container with a temperature probe, available in the Cryopal product range.

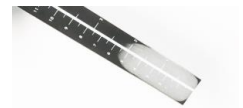


Figure 14 - Frost on the level gauge

To assess the temperature of the container, insert the temperature sensor either:

- Through the opening of the container.
- Through the pass-through tube.



The temperature sensor must be installed by trained and authorised personnel. Do not modify the location of the sensor.

4.4.4. Opening the cap



The person accessing the contents of the cryogenic receptacle must be trained and authorised to use it.

Carefully open the cap to limit the formation of a gas cloud. To improve visibility in the container, wait for the gas to clear naturally (minimum 15 minutes). The gas can disappear more quickly by injecting a small amount of liquid nitrogen into the container in accordance with the filling instructions (see §4.4.1).

For optimum nitrogen consumption, to limit heat ingress and to limit ice formation, leave the cap closed when not handling samples.

As the **cork** is exposed to cryogenic temperatures, it is essential to always **handle** the cork using the appropriate **PPE** (see §.2).

Compensated cap

The compensated cap is available for every container in the *RCB* range.

This cap is fitted with a handle and cylinders to assist **opening**. To open, lift the handle/lock and move it to the left or right until it **stops**. To close, reverse the movement.

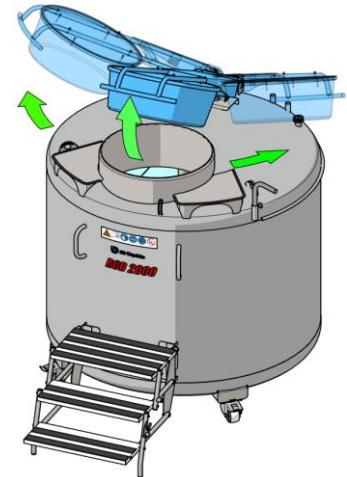


Figure 15 - Compensating cap



Manipulate the compensated by using the handle and accompanying the movement as far as it will go.



The cover must be opened voluntarily. The lock is not an anti-intrusion lock. It limits access to authorised personnel; access to samples must be protected by other means.

Manual cap

The manual cap is only available for *RCB 500*, *RCB 600* and *RCB 1001* products.

To open, lift the cap by the handle(s) and place it on a smooth, clean, dry surface.

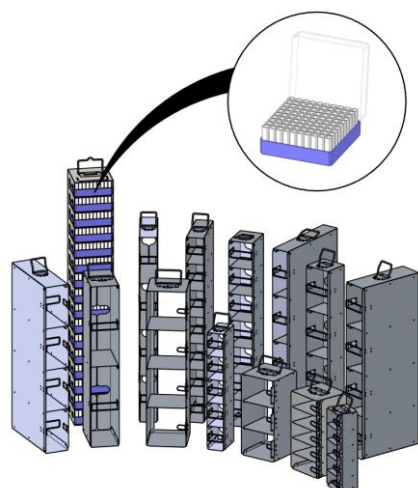


Figure 16 - Manual cap



Make sure you have enough space to handle the cap and samples.

4.4.5. Introducing or withdrawing samples



Before **handling** the samples, refer to the **general precautions for use** (see §.2).

The samples are placed in racks. These are then placed inside the container.

Sample storage conditions are the responsibility of the operator.

Layout plans are available from your sales contact to help you organise the accessories in the containers.

Manually guide the rack out of or into the container when using a lifting device.

Figure 17 - Fitting accessories

Depending on the position in which the racks are stored when the container is opened, if **the useful mass of the racks** has to exceed the **limits**² below, we recommend using a **vertical lifting system** to avoid risks to the health of users.

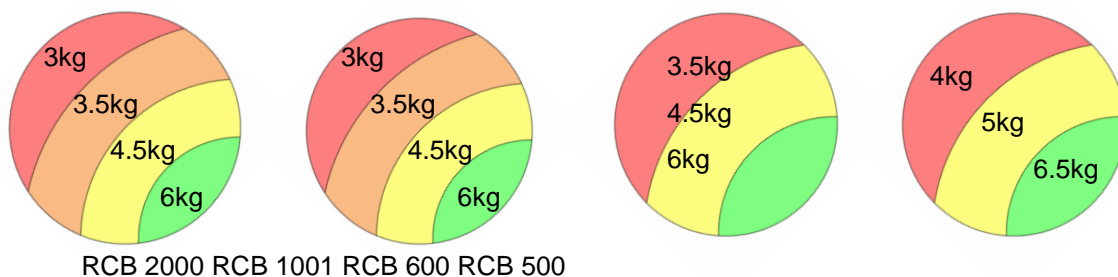
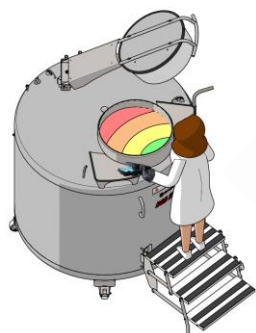


Figure 18 - Manual lifting weight limit



Take care not to damage the container opening when removing or inserting the racks into the container.

When **handling accessories**, liquid nitrogen may be sprayed. **PPE** such as cryogenic gloves, long clothing and a visor must be worn.

Gradually lift the accessories to allow the nitrogen to flow without splashing.

It is essential to place all storage inside the container, even if it is empty. Any storage unit that is not conditioned to the temperature of the container before being inserted will cause the temperature to rise significantly, creating a high level of nitrogen evaporation and therefore a safety risk for the user.

When checking the level in relation to the rotating basket floor, make sure that the latter is accessible.



The exposure time of the samples outside the containers must be as short as possible to prevent any risk of the samples thawing. This is the responsibility of the operator.

²Conditions given as a guide for two-handed handling of racks and for less than one vertical handling operation every 10 minutes.

4.4.6. Handling the rotating basket



When **handling the rotating basket**, it is essential to use the appropriate **PPE** such as gloves, long clothing, visor, etc. (see chap.2)



Take care with the temperature of the frozen products and the cold parts of the container.

Containers in the *RCB* range are fitted with a rotating basket so that accessories can be placed under the container opening.

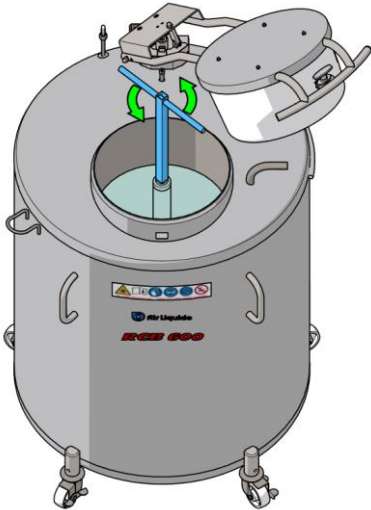


Figure 19 - Rotating the rotary basket using the basket key

To handle the rotating basket of the *RCB 500*, *RCB 600* and *RCB 1001*, use the basket key supplied with the container (located on the left-hand side of the container) and mount it on the basket mast.

Put the key back in its holder before closing the cap.

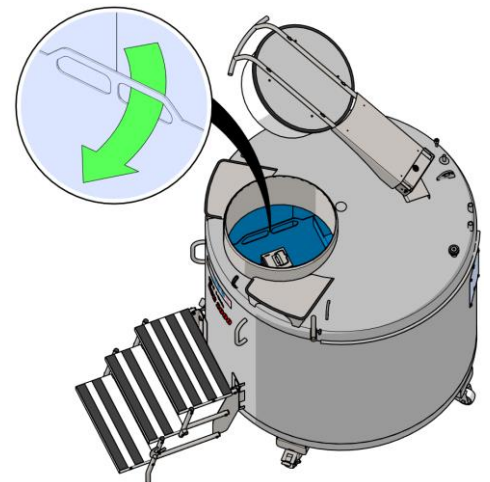


Figure 20 - Handling the rotating basket with the handles

To handle the *RCB 2000* rotating basket, use the handles built into the basket walls. They are accessible from the container opening, so you can rotate it manually.



Make sure you do not exceed the **maximum permissible load** on the **rotating basket**, to preserve the integrity of the container.



Make sure that the load is evenly distributed in the rotating basket to limit stress on the basket and make it easier to rotate manually.

4.4.7. Integrated footboard

This feature is only available on the RCB2000.

The maximum total **load** on the running board must not exceed **150 kg**.

Dismantling and reassembly may only be carried out by authorised personnel.

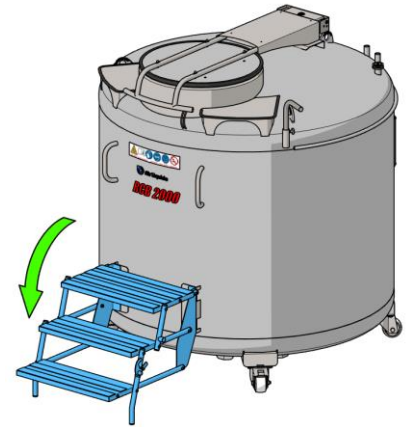


Figure 21 - Footboard

4.4.8. Notes on use

- Cryogenic temperatures can cause frost, ice and even condensation to form on the outer surfaces of the container. To prevent these deposits from accumulating, it is important to remove them frequently.
- Periodic checks must be carried out to verify the normal operation of the container and its ability to maintain this condition.
- If excessive frost or ice appears, contact your maintenance distributor immediately.
- The **operator** must implement procedures for **daily monitoring** of its installations (checking liquid levels, checking alarms, etc.).
- At the end of the period of use, allow the container to warm up naturally. Blow dry the inside of the cryogenic container with de-oiled dry air to remove all traces of moisture.

5. Installation and Preventive Maintenance

- ***Installation***

Every operator in the distribution chain must be familiar with the installation and verification of RCB range containers. For RCB containers fitted with an optional control system, the distributor or operator must:

- Carry out commissioning or Installation Qualification (IQ) and Operational Qualification (OQ) as recommended by Cryopal in the qualification protocols accompanying the containers.
- Systematically forward commissioning and qualification reports to Cryopal at the following address: sqhe.cryopal@cryopal.com



Commissioning and qualification operations may only be carried out by technicians who have received the corresponding training and obtained Cryopal authorisation.

Failure to provide commissioning and qualification records will result in suspension of the equipment warranty.

Cryopal declines all responsibility for incidents relating to equipment performance.

- ***Preventive maintenance***

Preventive maintenance is required to ensure that the container continues to operate correctly and safely. It is the responsibility of the container operator. The container is no longer covered by its warranty if maintenance has not been carried out in accordance with Cryopal's recommendations.



Preventive maintenance operations may only be carried out by technicians who have received the appropriate training and have been authorised by Cryopal.

In the event of failure of the container due to lack of preventive maintenance, the manufacturer cannot be held responsible for any stored products lost because of this failure, even during the warranty period.



The container is no longer covered by its warranty if spare parts from a source other than Cryopal are used.

Preventive maintenance of the equipment must be carried out in accordance with the manufacturer's instructions set out in the maintenance manual in force, by a person trained and authorised to maintain these containers.

5.1. Periodic inspection - Monitoring containers

The container should be inspected daily to monitor its operation under normal conditions of use.

This **control** must necessarily include:

- Visual check that there are no traces of **impact** on the outside of the container
- Visual check that there are no traces of **oxidation** on the outside of the container
- Visual check that there is no **frost** on the **outside of** the container
- Visual check of **caster** integrity
- Visual check of **cork** integrity
- Visual check of the integrity of the **running board**, if fitted
- Visual verification of the presence of a sufficient **level of liquid nitrogen** in the container or verification by another type of detection.

5.2. Maintenance of the container

Maintenance and cleaning are mandatory to ensure that the equipment remains in normal operating conditions. They are the responsibility of the container operator.

These operations must be carried out using non-abrasive, non-cutting and non-sharp tools.

▪ **Cap defrosting (twice a month):**

Open the stopper and cover the container opening with a clean protective tarpaulin to prevent hot air and moisture from entering the cryogenic container. Leave the stopper to defrost naturally in the open air until all traces of frost have disappeared. Carefully wipe off any water residue before replacing the cap on the opening.



Ice and/or water must be collected so that it does not fall into the container.

▪ **Cleaning the outside of the container (once a month):**

Cleaning is limited to the external parts of the container. Do not use acetone, solvents, chlorine-based liquids or any other flammable products.

For plastic parts, wipe with a dry cloth and, if necessary, with a slightly damp sponge or non-abrasive cloth (do not use abrasive powder).

For the rest of the container, including the metal parts, you can use household products (low-abrasive ammonia creams). Rinse with a cloth slightly dampened with water, then wipe dry.



Keep the container clean to maintain normal operation.



Decontamination and internal cleaning of the container are possible if deemed necessary. The container must first be emptied.

A broad-spectrum bactericide can be used for cleaning.

The maintenance intervals given are for guidance only and should be adapted to the frequency of use of the container.

The container must be empty and dry before it can be put back into service.

▪ **Replacement of cylinders (once / 2 years):**

For cap systems fitted with cylinders, we recommend changing the cylinders every 2 years in accordance with the cylinder change procedure defined in the maintenance manual.

5.3. Emptying the container

Emptying the container is a maintenance operation that must be carried out by authorised personnel at least every **5 years**.



Remove the frozen samples beforehand and transfer them to another cryogenic container.



Do not dispose of nitrogen in sewers, basements, pits or any other place where its accumulation could be dangerous.

Ventilate the area.



A **certificate of decontamination or non-contamination** of the container may be requested by the maintenance technician **before any operation**.

5.4. Decontamination



All equipment or containers returned to the manufacturer must be accompanied by a decontamination or non-contamination certificate.

Internal and external **decontamination** of containers is possible if deemed necessary. It removes any harmful agents and eliminates any infectious material to protect the personnel handling the container and avoid contaminating the environment. You need to call in an **approved company** for this type of work. Decontamination is the responsibility of the operator.

6. Assistance

6.1. General conduct in the event of damage

Do not use a container that shows signs of impact or oxidation, a dented metal plate, a broken castor or any other damage.

Contact your technical support if necessary.

6.2. General procedure for returning a container to service

The commissioning of equipment must be carried out with your technical assistance, who will carry out the checks and any repairs beforehand.

6.3. General procedure in the event of samples being blocked

(e.g. samples falling to the bottom of the container, rack containing samples jammed in the container, etc.).

- Keeping the cryogenic vessel cold and controlling it.
- Check that the liquid nitrogen inlet to the container is not blocked.
- Contact technical services or the distributor.

6.4. General behaviour in the event of liquid nitrogen spraying

When handling liquid nitrogen, if splashed in the eyes and/or on the skin:

- In the eyes**
- Rinse eyes immediately with plenty of water for at least 15 minutes.
- On the skin**
- In the event of frostbite, spray with water for at least 15 minutes.
 - Apply a sterile dressing.
 - Obtain medical assistance.

6.5. General conduct in the event of an accident

- Mark out the perimeter to avoid over-accidents.
- Intervene quickly: the rescuer must have taken personal protective measures (self-contained breathing apparatus, PPE).
- Perform emergency extrication of the victim(s).
- Apply the general procedure in the event of a nitrogen spill.
- Comply with your establishment's emergency response rules.
- Ventilate the room.
- Treat the cause of the accident.

6.6. General procedure in the event of a cap opening failure

Table 9 - Identification and resolution of common failure cases

Failure	Corrective action
Lock locked	Unlocking the lock
Lock jammed and frosted	Defrosting the lock
Lock not frosted	Changing the lock
Frosted stopper on the container	In the event of severe blockage, defrost using an appliance blowing hot air at a temperature not exceeding 50°C. The lid can be removed for easier access to the frosted areas. Then defrost the container completely.

7. Accessories and options



Only Cryopal accessories and spare parts have been validated with Cryopal containers. The use of different accessories and spare parts may affect the safety and/or performance of Cryopal containers and releases Cryopal from any liability in the event of an incident. The container will no longer be covered by its warranty if other accessories and spare parts are used.

RCB 500	RCB 600	RCB 1001	RCB 2000	COMMERCIAL REF	DESCRIPTION	FUNCTION
		X		ACC-RCB-214	Compensated cap option	Close the container
X	X			ACC-RCB-215	Compensated cap option	
		X		ACC-RCB-212	Step option	Accessing the container opening
	X			ACC-RCB-213	Step option	
X	X			ACC-RCB-5	Double partition option	Compartmentalising the basket
X	X			ACC-RCB-6	Triple partition option	
X	X			ACC-RCB-7	Quadruple partition option	
		X		ACC-RCB-8	Double partition option	
		X		ACC-RCB-9	Triple partition option	
		X		ACC-RCB-10	Quadruple partition option	
X	X	X		ACC-BOXTUBE-304	Cup holder option	Organising storage
X	X	X	X	ACC-ESP-344	Protective cover for cleaning cap	Prevent hot air and moisture from entering the container
X	X	X		ACC-BOXTUBE-412	Level indicator (manual measurement)	Measuring nitrogen levels
X	X	X	X	ACC-BOXTUBE-416	Level indicator (manual measurement)	
X	X	X	X	UPGRADE-ESP-RCB (Cryomemo)	Upgrade ESP-RCB new electronic version (excluding bonnet - support arm)	Monitor temperature and regulate filling
X	X	X	X	UPGRADE-RCB (Cryomemo)	Upgrade RCB CRYOMEMO (support arm included) (RCB500-600-1001)	
X	X	X	X	TRACKER-1	T° TRACKER	Monitor the temperature in the container
X	X	X	X	ACC-TRACKER-1	T° TRACKER temperature sensor kit	
X	X	X	X	ACC-TRACKER-2	Accessory kit (Velcro, hook, probe sleeve, rilsan) T° TRACKER	
X	X	X	X	ACC-TRACKER-3	Power supply kit (USB cable, mains adapter) T° TRACKER	
X	X	X	X	ACC-TRACKER-4	T° TRACKER support kit	

TTRACKER and CRYOMEMO monitoring and/or control accessories are optional on RCB range vessels.

RCB range containers are sold "bare" (without interior fittings) with the option of adding the following accessories:

- Rack storage systems.
- Availability of a variety of storage systems adapted to tubes, straws, bags, etc.



Samples stored in containers must be protected by an airtight container (e.g. cryotube + seal, straw + seal, etc.).

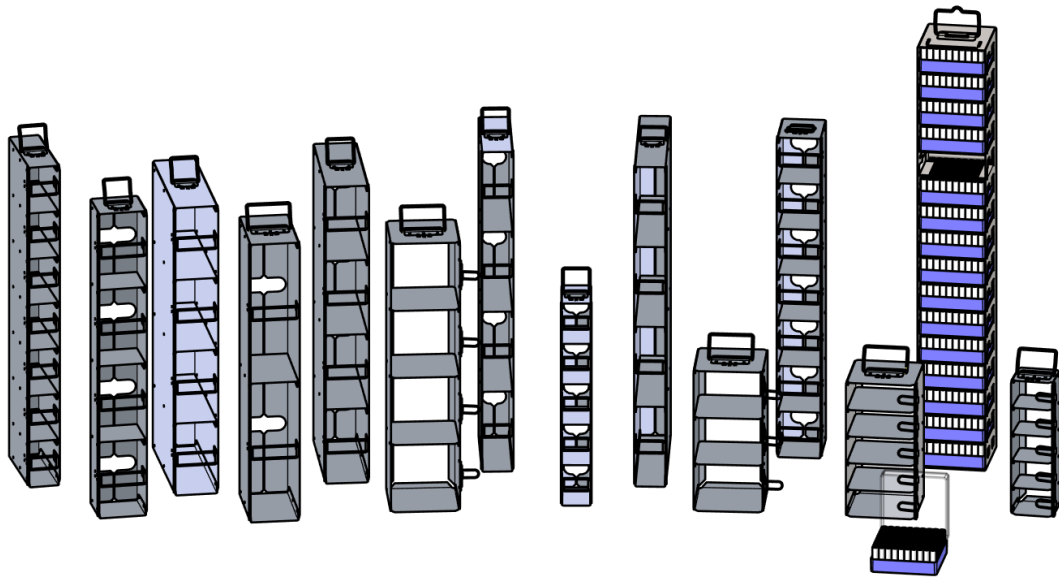


Figure 22 - Fitting accessories flap RACKS

RCB 500	RCB 600	RCB 1001	RCB 2000	COMMERCIAL REF	DESCRIPTION	FUNCTION
	X	X		ACC-BOXTUBE-414	Batch: 250 sleeves	Organise
X	X	X	X	ACC-BOXTUBE-6	Batch: 100 Cryotubes 1 mL	Storing samples
X	X	X	X	ACC-BOXTUBE-11	Batch: 100 Cryotubes 2 mL	
X	X	X	X	ACC-BOXTUBE-16	Batch: 100 Cryotubes 5 mL	
X	X	X	X	ACC-BOXTUBE-301	Batch: 20 Tumblers Ø 65 mm	Storing glitter
X	X	X	X	ACC-BOXTUBE-302	5 Marguerite tumblers Ø 65 mm with stopper	
X	X	X	X	ACC-BOXTUBE-415	Batch: 10 Ø 65 mm pierced tumblers with stopper	
X				ACC-BOXTUBE-404	Angled pull tab for 5-stage canister	Handling cups
	X	X		ACC-BOXTUBE-406	Angled pull cord for 6-stage canister for sleeve	
				ACC-BOXTUBE-409	Rack hook	Handling cryoboites
X	X	X	X	ACC-BOXTUBE-1	Batch: 100 polygonal Visotubes	Storing glitter
X	X	X	X	ACC-BOXTUBE-3	Batch: 100 Visotubes Ø 10 mm	
X	X	X	X	ACC-BOXTUBE-4	Batch: 100 Visotubes Ø 12 mm	
X	X	X	X	ACC-BOXTUBE-5	Batch: 100 Visotubes with cap	
X	X	X	X	ACC-BOXTUBE-104	Batch: 10 boxes 133x133x51 mm cryoplastic (100 tubes of 2 mL)	Store 2ml tubes
X	X	X	X	ACC-BOXTUBE-105	Batch: 8 boxes 76x76x51 mm cryoplastic (25 tubes of 2 mL)	
X	X	X	X	ACC-BOXTUBE-106	Batch: 4 boxes 133x133x51 mm cryoplastic (81 tubes of 2 mL)	
X	X	X	X	ACC-BOXTUBE-107	Batch: 4 boxes 133x133x95 mm cryoplastic (81 tubes of 5 mL)	
	X			ACC-RACK-3	8-tier rack for 5 ml tubes without box	Storing bags and tubes
		X		ACC-RACK-5	12-tier rack for 1.2 and 2 ml tubes (81/100 box)	
X				ACC-RACK-6	13-tier rack for 1.2 and 2 ml tubes (81/100 box)	

RCB 500	RCB 600	RCB 1001	RCB 2000	COMMERCIAL REF	DESCRIPTION	FUNCTION	
X				ACC-RACK-9	13-tier rack for 1.2 and 2 ml tubes (box 25)		
X	X	X		ACC-RACK-10	4-level rack for 50 mL bags		
X		X		ACC-RACK-29	7-tier rack for 5 ml tubes (box 81)		
	X			ACC-RACK-30	14-tier rack for 1.2/2 ml tubes (81/100 box)		
	X			ACC-RACK-31	14-tier rack for 1.2/2 ml tubes (box 25)		
X	X	X		ACC-RACK-32	2-level rack for 700 mL bags		
X	X	X		ACC-RACK-34	4 tier rack for 500 mL bags		
X	X	X		ACC-RACK-35	4 tier rack for 750 mL bags		
X	X	X		ACC-RACK-36	4 tier rack for 700 mL horizontal bags		
X	X	X		ACC-RACK-37	7-tier rack for 50 mL bags		
X	X	X		ACC-RACK-38	4-level rack for 200 mL bags		
X	X	X		ACC-RACK-39	4-storey glitter rack		
			X	ACC-RACK-50	16-tier rack for 1.2&2 ml tubes (81/100 box)		
X	X			ACC-RACK-155	Batch: 26 2-tier racks for 700 mL bags		
		X		ACC-RACK-162	Batch: 50 2-tier racks for 700 mL bags		
		X		ACC-RACK-167	Pack: 30 4-tier racks for 750 mL bags		
X				ACC-RACK-168	Batch: 20 13-storey racks (box 81/100) + 4 13-storey racks (box 25) for 2 ml tubes		
	X			ACC-RACK-170	Batch: 20 racks 14 levels (box 81/100) + 4 racks 14 levels (box 25) for 2 ml tubes		
	X			ACC-RACK-171	Batch: 20 racks, 8 levels, 5 ml tube (box 81)		
		X		ACC-RACK-172	Batch: 40 12-storey racks for 2 ml tubes (81/100 box)		
	X			ACC-RACK-193	10-tier rack for 25 mL bags		
	X	X		ACC-RACK-194	9-tier rack for 25 mL bags		
X		X		ACC-RACK-195	8-tier rack for 25 mL bags		
X	X			ACC-RACK-200	Pack: 20 x 4-storey glitter racks		
X		X		ACC-RACK-204	7-tier rack for 25 mL bags		
	X	X		ACC-RACK-205	8-tier rack for 25 mL bags		
	X			ACC-RACK-206	9-tier rack for 25 mL bags		
X		X		ACC-PLASCAN-3	5-stage plastic canister		Storing straws and tubes
	X			ACC-PLASCAN-5	6-stage plastic canister		
X		X		ACC-PLASCAN-100	Batch: 120 5-tier canisters + 600 cups		
	X			ACC-PLASCAN-101	Batch: 120 6-tier canisters + 720 cups		
		X		ACC-PLASCAN-102	Batch: 225 5-tier canisters + 1125 cups		
		X		ACC-PLASCAN-118	Serotheque pack: 207 5-storey canisters		
	X			ACC-PLASCAN-119	Lot serotheque: 105 canister 6 floors		
X	X	X		ACC-BOXTUBE-200	Aluminium case for 50 mL bags	Protecting pockets	
X	X	X		ACC-BOXTUBE-201	Aluminium case for 500 mL bags		
X	X	X		ACC-BOXTUBE-202	Aluminium-plastic case for 500 mL bags		
X	X	X		ACC-BOXTUBE-203	Aluminium-plastic case for 50 mL bags		

RCB 500	RCB 600	RCB 1001	RCB 2000	COMMERCIAL REF	DESCRIPTION	FUNCTION
X	X	X		ACC-BOXTUBE-204	Aluminium-plastic case for 200 mL bags	
X	X	X		ACC-BOXTUBE-205	Aluminium case for 200 mL bags	
X	X	X		ACC-BOXTUBE-206	Aluminium case for 700 mL horizontal pouch	
X	X	X		ACC-BOXTUBE-207	Half-aluminium, half-plastic case for 700 mL horizontal pouch	
X	X	X		ACC-BOXTUBE-250	Batch: 600 cardboard boxes for 50 mL bags	
X	X	X		ACC-BOXTUBE-251	380 cardboard boxes for 200 mL bags	
X	X	X		ACC-BOXTUBE-252	Batch: 300 cardboard boxes for 500 mL bags	
X	X	X		ACC-BOXTUBE-253	Batch: 300 cardboard boxes for 700 mL bags	
X	X	X		ACC-BOXTUBE-254	Batch: 700 cardboard boxes for 25 mL bags	

Please contact your distributor if you require any additional fittings.



In the "**liquid phase**", the level of the highest **racks** will **not** be **submerged** because the maximum filling level must be below the rack handles.

8. Elimination

8.1. Disposal of the container

The containers in the RCB range are 95% metal (stainless steel, aluminium alloy). Under no circumstances should you dispose of the containers via household waste channels. They must be disposed of or recycled through specialist scrap metal and metal recycling centres available in your country.

8.2. Elimination of nitrogen

Do not dispose of nitrogen in sewers, basements, pits or any other place where its accumulation could be dangerous. Nitrogen is eliminated by evaporation.

Ventilate the area.

Contact your nitrogen supplier for specific recommendations.

8.3. Disposal of accessories

All waste arising from the use of the container (tubes, bags, etc.) must be disposed of using the appropriate waste treatment channels.

If in doubt, contact the container's maintenance staff.



All equipment or containers returned to the manufacturer must be accompanied by a decontamination certificate.





NH78453_EN_MU_RCB_Rev D

Your service provider



