



## Thermo Scientific Nunc Cryobank Vials and Bank-it Tube System

Innovative Storage Technologies for:

- Cell banking
- Biobanks
- Pharma research

nunc

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# Thermo Scientific Nunc Next Generation CryoTube Vials

## Superior tracking combined with low temperature experience

The new generation of Thermo Scientific Nunc CryoTube Vials has been developed for superior tracking of valuable samples. The cryo vials have the same features as the standard cryo-tubes and provide a safe, tight storage container for long term low temperature storage. As an additional benefit the cryo vials have laser etched unique 2D codes that allow for tracking of the samples. The codes are attached so they do not separate from the vials.

## Manual system

- Vials can be labeled with a cryopen and stored in normal cryoboxes with 13 x 13 inserts, thereby increasing storage density and freezer capacity
- 2.0 and 5.0 ml Nunc™ Cryobank vials can be stored in standard cryogenic boxes

## Semi-automated system

- Use with a 96 or 48 place decapper as a stand-alone
- Use with 8 channel decapper
- Compatible with automated systems from companies such as The Automation Partnership and Nexus

For updated information on compatibility with storage systems and liquid handling platforms, contact us at: [cryo.nunc@thermofisher.com](mailto:cryo.nunc@thermofisher.com)

Very little initial investment is needed to start up with this CryoTube™ system. It has the ability to let the user decap whole racks and it will allow the user to store DNA, protein and cells in different volumes.

## Dense storage format for optimized freezer utilization

- Fits either 48 or 96 individual CryoTube Vials in a microplate format frame (SBS footprint)
- Working volume of 0.5, 1.0, 2.0 or 5.0 ml
- Designed for use in the gas phase of liquid nitrogen
- The highest-density 1.0 ml cryo storage system available



## Unique 14 x 14 array 2D Code

Cryobank and Bank-it vials are available with laser-etched unique 2D codes. The 96 or 48 2D codes can be read in one pass by a Thermo Scientific scanner. 2D codes are more error-proof and denser than normal linear codes.

- The open Datamatrix ECC 200 code allows for safe sample identification and reading of whole racks in one scan
- 14 x 14 array 2D codes

## Certifications

- CE marked for diagnostic use
  - Sterility assurance level 10<sup>-6</sup> on Cryobank vials
  - DNase/RNase free (0.5 and 1.0 ml)
  - Non-pyrogenic\* (LAL-test)
  - Non-toxic (USP class VI test)
  - Conform to IATA requirements for the transport of diagnostic specimens, UN packing instructions 602 and 650
  - Polypropylene vials with TPV gasketed polypropylene cap
- \*only valid for Cryobank vials

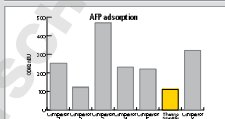
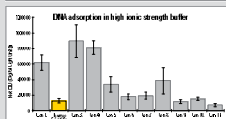
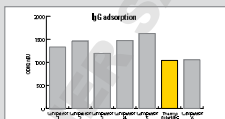
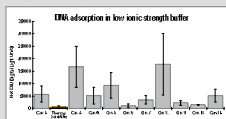
## CryoTube with unique low binding surface

- High sample recovery with low concentration samples
- Cryobank vials for cells and proteins (black racks)
- Thermo Scientific Nunc Bank-it™ for DNA (white racks)



# The Thermo Scientific Nunc low binding surface ensures maximum sample recovery

Compare adsorption levels of Thermo Scientific Nunc vials to other brands



## Bank-It vials for DNA storage

Test samples (diameter = 4 mm) of polypropylene were cut from storage containers of different manufacturers. Test samples incubated in a solution of 50  $\mu$ l  $^{32}$ P-labeled DNA (0.4 ng/ $\mu$ l) dissolved in low and high ionic strength buffer, respectively. Samples were incubated overnight at 20°C, and radioactivity adsorbed to the test samples was measured.

## Cryobank vials for cells and proteins

Adsorption of AFP and IgG: Two layer assay with incubation of surplus IgG/AFP in neutral PBS followed by detection with HRP linked secondary antibody.

See Thermo Scientific Nunc Tech Note No. 50: *Low DNA Adsorption to Thermo Scientific Nunc Bank-It Vials* at [www.thermoscientific.com](http://www.thermoscientific.com)

## FEATURES

## BENEFITS

### Design

96 vials - 0.5 ml or 1.0 ml use the same rack; or 48 vials - 2.0 or 5.0 ml use the same rack; both racks based on microplate format

The vial snaps into the rack

The cap snaps on to the socket/gripper

The snap in the rack is stronger than the snap of the socket/cap

The narrow gap between the vials in the rack means more storage capacity in less volume

Easy to open

### Surfaces

Low cell and protein binding on the Cryobank vial

Low DNA adsorption on Bank-It vial

### 2D codes

Fast, unique, easy to read, 14 x 14 array 2D codes

The microplate format allows for automated liquid handling and the capping system provides easy access using disposable pipette tips

The vial will not get lost during manual handling

The cap can be handled by a screwdriver with a simple system employing only the internal part of the cap

Vial is firmly held in rack, even when cap is manipulated either manually or in automated systems. Cherry picking is best done manually by pressing from the bottom of the rack using the tube selection tool

The high density storage system vial can be used in a 169-place cryobox (5 x 5 x 2" or 132 x 132 x 50 mm) or in the 96-place microplate format (height 50 mm or 2" for 1 ml vials and 38 mm or 1.25" for 0.5 ml vials)

Packaging can subsequently be used as a lid

Higher sample recovery with low concentration samples

Higher sample recovery with low concentration samples

The open DataMatrix EDC 200 code allows for safe sample identification and reading of whole racks in one process

## New! Larger Volume Cryobank Vials

Available in two  
new sizes - 2.0 and  
5.0 ml



Because the new, larger-capacity 2.0 and 5.0 ml Cryobank Vials share the same design as existing 0.5 and 1.0 ml vials, existing tools - tube selection tools, readers and electric screwdriver - can be used. Thermo Scientific Nunc products comprise the only integrated portfolio for screw top vials from 0.5 ml to 5.0 ml.

They are excellent choices, when 2D tracking and the highest cryogenic standards are required: the design is based on the Cryotube range, and the vials will fit the standard accessories as racks and boxes. The Cryobank system provides a complete, efficient workflow, which seamlessly incorporates superior 2D barcode tracking with a standard microplate format for easy pipetting, and standard Cryotube design for safe storage and easy handling. The 2.0 and 5.0 ml Cryobank cap has an identical socket to the smaller size Cryobank cap, and it is designed to work with the Thermo Scientific CapIt-All instrument in a new 48 way version.

**All features of existing Nunc Cryobank products are retained, plus these new ones:**

- Space for manual labels
- 2.0 ml vial is the same height as the standard 1.8 ml Nunc CryoTube Vials – uses standard freezer racking and cryoboxes
- 5.0 ml is the same height as standard 4.5 ml CryoTube Vials
- Cap fits standard Thermo Scientific Nunc internal thread CryoTube Vials
- Cap accepts standard Cryo Color Coders
- Vials are self standing
- Human readable text is printed next to 2D barcode
- Available soon: pierceable caps and colored caps

### Checkerboard vial configuration

Positioned in a standard microplate format, the new 2.0 and 5.0 ml vials are arranged in a staggered array of 48. The centers of these vials are in exactly the same location as those on a 96-vial plate. The result: existing manual picking equipment, readers and databases can be used.



Available soon: 48 way CapIt-All®  
Decapper for 2.0 and 5.0 ml tubes

## Ordering Information

Cat. No.	Description	Packaging
374002	0.5 ml Cryobank vials, 2D coded, sterile, racked	96/192
374006	0.5 ml Cryobank vials, 2D coded, sterile, racked	96/960
374006	0.5 ml Bank-It, 2D coded, racked	96/192
374074	0.5 ml Bank-It, 2D coded, racked	96/960
374025	0.5 ml Cryobank vials, 2D coded, racked, blue cap	96/960
374006	0.5 ml Cryobank vials, 2D coded, racked, red cap	96/960
374027	0.5 ml Cryobank vials, 2D coded, racked, green cap	96/960
374083	0.5 ml Cryobank vials, uncoded, sterile, racked	96/192
374087	0.5 ml Cryobank vials, uncoded, sterile, racked	96/960
374067	0.5 ml Bank-It, uncoded, racked	96/192
374075	0.5 ml Bank-It, uncoded, racked	96/960
374099	0.5 ml Cryobank vials, uncoded, racked, red cap	96/960
374100	0.5 ml Cryobank vials, uncoded, racked, blue cap	96/960
374080	0.5 ml Cryobank vials, uncoded, sterile, loose pack	96/960
374097	0.5 ml Cryobank vials, alphacode, sterile, racked	96/960
374084	1.0 ml Cryobank vials, 2D coded, sterile, racked	96/192
374088	1.0 ml Cryobank vials, 2D coded, sterile, racked	96/960
374070	1.0 ml Bank-It, 2D coded, racked	96/192
374078	1.0 ml Bank-It, 2D coded, racked	96/960
374110	1.0 ml Cryobank vials, 2D coded, racked, green cap	96/960
374120	1.0 ml Cryobank vials, 2D coded, racked, red cap	96/960
374130	1.0 ml Cryobank vials, 2D coded, racked, blue cap	96/960
374085	1.0 ml Cryobank vials, uncoded, sterile, racked	96/192
374089	1.0 ml Cryobank vials, uncoded, sterile, racked	96/960
374081	1.0 ml Cryobank vials, uncoded, sterile, loose pack	96/960
374090	1.0 ml Bank-It, uncoded, racked	96/192
374079	1.0 ml Bank-It, uncoded, racked	96/960
374094	1.0 ml Cryobank vials, alphacode, sterile, racked	96/960
374221	2.0 ml Cryobank vials, 2D coded, sterile, racked	48/488
374223	2.0 ml Cryobank vials, uncoded, sterile, racked	48/488
374220	5.0 ml Cryobank vials, 2D coded, sterile, racked	48/488
374222	5.0 ml Cryobank vials, uncoded, sterile, racked	48/488

Cat. No.	Description	Packaging
<b>Accessories</b>		
374028	Loose racks, barcoded	10
374017	Cryobank/Bank-It caps, irradiated	96/960
374019	Cryobank/Bank-It caps, green	96/960
374018	Cryobank/Bank-It caps, red	96/960
374021	Cryobank/Bank-It caps, blue	96/960
389644	Electric screwdriver, European plug	1
389658	Electric screwdriver, UK plug	1
389641	Electric screwdriver, US plug	1
389643	Small black screwdriver, manual	1
389640	13 x 13 standard cryobox, cardboard	1/48
374001	13 x 13 inserts for Nalgene 9090-001	50
374011	Retention plate	1
374009	Tube selection tool (cherry picker)	1
367014	74 cm Cryobank rack	1
330042	Nunc 96 scanner, EU	1
330043	Nunc 96 scanner, UK	1
367002	Microplate storage racks / natural	1

Color options are now available for Cryobank vials. Available with green, red or blue caps.

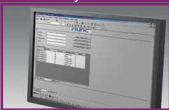


#### 4. Scanning the vials



The scanner software reads the codes and sends information about position of the different codes to the database program. Thermo Scientific Nunc guarantees verified unique barcodes on the racks and on the Cryobox vial. 2D codes are laser etched into the bottom of the vial. The 2D codes have many advantages, including a large degree of robustness and the ability to read multiple codes at the same time using the 2D scanner.

#### 5. Database storage module



The database program uses the location of the vial in the rack, the location of the rack in the freezer and the associated sample data to keep track of the position of every sample and combines it with the data used for selecting samples at retrieval.

#### 6. The rack is placed in the freezer



Thermo Scientific Nunc racks are available for both dewars and freezers that optimize the storage density. Racks are made in aluminum and can be color coded. For both microplate format racks and standard cryobox formats.

#### 4. Tube selection tool



The Thermo Scientific Nunc tube selection tool has a cut off corner that ensures that the rack and tube selection tool orientation is always aligned, the selected vials are released by the lever and can be easily harvested. The rest of the rack is rapidly returned to the freezer to avoid significant thawing.

#### 5. The vials are placed in 37°C water



Codes can be verified either prior to or after thaw. If the database is used properly, the user avoids problems with condensation or frosting during the reading process, as he can thaw prior to checking the codes. Condensation and frost are problems that can be overcome by wiping the codes, having them covered during storage or using dehumidified air.

#### 6. The code on the vials is checked



Vials should always be checked to make sure that the correct samples have been retrieved.

#### Data tracking

The advantage of having position, code and associated data stored in an integrated database is that, based on specific search criteria, samples are selected directly by the program, and their position in the freezer are listed. This is printed out and, using the Thermo Scientific Nunc tube selection tool, the samples can easily be cherry picked.

#### Scanning of cold samples

Codes must be read to validate that the correct samples have been retrieved. When storing cells at liquid nitrogen temperatures, it is recommended to either scan single vials with a single vial scanner or thaw the cells in a warm water bath. Frosting and condensation can be minimized on samples stored at  $-80^{\circ}\text{C}$  and  $-20^{\circ}\text{C}$ , if the codes are wiped with a cloth and read immediately after the rack has been placed on the scanner.

#### Centrifugation

Prior to opening the vials, a slight centrifugation can be beneficial, especially if the samples have been stored for a longer period and sublimation has led to frosting and sample residue on the cap or in the threads. Centrifugation can be performed at low G with a microplate rotor.

# Storage

## 1. Decapping the vials



Removal of caps can be easily automated using a socket that clicks into the cap and controls the cap. Thermo Scientific 96 head decappers are available as stand alone or integrated with robotic liquid handling.

## 2. The empty vials are filled



The Cryobank vials are arrayed in a microwell format that allows for the use of multi-channel pipettors or liquid handling robots. This facilitates sterile work and minimizes handling time.

## 3. Vials are recapped



Vials are recapped using the single or multiple head screwdriver. Vials are locked into the rack, which ensures that they do not fall out during transport in the lab or storage. The click in the rack also retains the vial in the rack when the cap is inserted and the screwdriver is removed.

# Retrieval

## 1. The selection of vials in the database



With the information stored in the database, it is possible for a technician - based on different search criteria - to select a number of vials for retrieval. The database program lists the racks, their location in the freezer and the individual positions of the vial, thereby facilitating fast retrieval. Fast retrieval of samples is pertinent, as prolonged thaw cycles limit the viability of cells and can ruin other biological samples as well.

## 2. Rack Position



The racks are selected in the database program. Each rack can contain more vials than are required to be picked. The Nisco tube selection tool is intended for picking several vials out of a rack; while still at room temperature, the bits are placed in the positions listed in the database selection list.

When it is verified that they are placed in the correct position, the rack is ready to be taken out of the cold.

## 3. The vials are taken out of the freezer



The Cryobank rack position is listed in the database output and can be verified by scanning the barcode on the rack as it faces the user.

## Decapping and filling

Multi-vial decapping of Cryobank/Bank-it vials is possible using the CapIt-AIP Decapper. It works as a stand alone unit or as an integrated part of a liquid handling robot.

Multi-vial decapping enables the user to handle a large number of vials without fear of repetitive strain injuries (RSI) and ensures that all caps are mounted using the specified minimum torque for a tight closure.

The benchtop rack holder turns your rack of Cryobank tubes into a convenient and ergonomic workstation. With your rack secured to the benchtop, you can cap and decap tubes using the electric screwdriver with one hand while pipetting with the other hand. See instruction video on <http://www.thermoscientific.com/cryobank>.

## 2D codes and scanning

Thermo Scientific 2D codes allow the user to relate a specific sample with a unique 2D code number. In traditional barcoding, the patient number or sample number has often been used to track the sample. This is not necessary, since a scanner is normally connected to a computer. When the unique 2D code has been read, it will enable the user to gain access to all data regarding the sample.

Similarly, 5 identical samples can be stored using individual unique codes, but grouped as a cluster in the database.

## Racks and freezing

The Thermo Scientific Nalgene horizontal racks for multi-well plates (Cat. no. 5039-0043/-0072) accommodate the 0.5, 1.0 and 2.0 ml Cryobank racks. The racks are ideal for upright freezers. A retainer on each compartment holds the racks securely in place, and allows for fast retrieval of single racks.

Controlled rate freezing is desirable if the stored material is viable cells. We recommend freezing the filled rack in a polystyrene box in a -80°C freezer overnight to approximate a freezing rate of -1°C/min, and thereafter transfer it to the vapor phase of liquid nitrogen. Studies based on a commonly used cell line have shown that viability after thawing with this method is similar to normal CryoTubes using a Thermo Scientific Nalgene Air Frost™ 1°C Freezing Container.

# Accessories for Cryobank vials and Bank-It System

A range of accessories is provided to facilitate easy handling and storage

## Screwdriver

For manual capping and decapping.



## Storage box

White cardboard box for 169 vials (13x13). Standard cryobox size.



## Thermo Scientific Handheld electric screwdrivers

The cap is retained by the socket, allowing one-handed manipulation.



## Thermo Scientific Freezers

Researchers world-wide protect more than two billion samples inside Thermo Scientific cold storage equipment, giving them peace of mind in and out of the laboratory.



## Retention plate

Holds the rack while manipulating or filling/emptying the vials.



## Tube selection tool

The Thermo Scientific Nunc tube selection tool is intended for quickly picking multiple vials out of the rack. This avoids thawing the remaining vials. The Thermo Scientific Nunc tube selection tool has a cut-off corner that ensures correct tool orientation. The vials selected are released by the levers and can be harvested easily.



## Capit-All Decapper

Choose the ideal decapper for your application



## 8-Channel Decapper

The Thermo Scientific 8-Channel Decapper (4105NUN) will cap/decap a full column of Nunc screw cap tube in seconds.

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