

WHEATON[®]

BioBanking Solutions Guide

When Your Research Depends on Your Sample
Integrity, Trust WHEATON CryoELITE[®]





Organize, Track and Retrieve with Color-Coded Ease

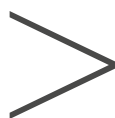
BioBanking Solutions

WHEATON BioBanking Solutions, a comprehensive offering of high-quality products for your cryogenic needs. WHEATON offers solutions for all your needs, be it routine lab cryogenic storage or the storage and tracking of hundreds of thousands of samples, WHEATON CryoELITE® Cryogenic vials, glass Cryules® and accessories offer you the solutions to organize, track and retrieve your samples with ease. Offering both color-coding and bar coding options, WHEATON provides you with the tools to make your job easier and more efficient.

About WHEATON®

WHEATON admires those people who devote their life to science. It's this admiration that drives us to design and deliver today's most innovative solutions for the laboratory research, diagnostic packaging and specialty pharmaceuticals industries. It's this admiration that motivates us to offer the best customer service experience and most dependable products in the industry. And, it's with admiration that we stand behind those people who help move the world forward one discovery, one sample at a time.

Table of Contents



- > Sample Storage3-6
- > Sample Traceability.....7
- > Sample Batching.....8





The WHEATON CryoELITE® Tissue Vial is for those who value sample integrity, designed specifically for tissue collection, transport and storage to provide the utmost protection. Different from cells and biofluids, tissue specimens have particular requirements for cryogenic storage (see the WHEATON blog at www.cryofeed.com for more information). Offering researchers a uniform vial able to maintain sample integrity while maximizing storage capacity and organization, the CryoELITE Tissue Vials feature a wide-mouth opening, 5mL capacity and high integrity closure. The CryoELITE Tissue Vial offers researchers who work with tissue samples ease of use, convenience and security.

The CryoELITE Tissue Vials are manufactured from low binding, cryogenic-grade virgin polypropylene that meets the USP Class VI classification. Lot tested and certified to be free of pyrogens, RNase / DNase and endotoxins, the vials have a sample capacity of 5mL and a storage temperature range of -156°C to 121°C. The externally threaded cap provides a seal that exceeds DOT and IATA classifications for diagnostic specimens and their transport and is capable of maintaining a secure closure during freeze/thaw procedures. The vials have a flat bottom and a stippled external surface to promote easier handling.

The CryoELITE Tissue Vial is for those who value sample integrity, designed specifically for tissue collection, transport and storage to provide the ultimate protection. When your decision depends on sample integrity...Trust that specimen to a WHEATON CryoELITE Tissue Vial.



CryoELITE® Tissue Vial

- Lot certified RNase/DNase and Endotoxin Free providing assurance of product integrity
- Unrivaled cap seal exceeds DOT and IATA regulations ensuring ultimate protection of samples during transportation and demanding freeze-thaw handling
- Wide mouth for insertion and removal of tissue with forceps
- 5mL volume for use with tissue sections
- Directional indicators to allow orientation of tissue within vial

Cat. No.	Size (mL)	Color	Sterile	Dimensions Dia. x H (mm)	Depth (mm)	Qty/Case
W985100	5	White	Yes	22 x 27	18	250

CryoELITE® Cryogenic Vials

- Lot certified RNase / DNase and endotoxin free and non-pyrogenic providing assurance for sample integrity
- Unrivaled cap seal exceeds DOT and IATA regulations ensuring ultimate protection of samples during transportation and demanding freeze-thaw handling
- Made from low binding, cryogenic grade virgin polypropylene
- Screw cap can be easily removed with one hand

Freestanding

- Loctagon™ Vial Skirt provides stability in freestanding position and locks into CryoELITE® Benchmate Rack in order to provide easy open and close with one hand
- Colored caps allow for color coding projects along with WHEATON colored freezer and storage boxes
- Optional 2D Data Matrix Bar Code Insert provides unique identifier for traceability
- Bottom format allows unrestricted view of 2D bar code for convenient automated scanning

Round Bottom

- Exacting round bottom allows for up to 17,000 MAX RCF (xG)

Cat. No.	Size (mL)	Color	Writing Patch	Sterile	Dimensions Dia. x H (mm)	Qty / Case
CryoELITE® Vials, Freestanding, Internal Thread						
W985915	1.2	Natural	Yes	Yes	12 x 40	500
W985902	2	Natural	Yes	No	12 x 50	1000
W985903	2	Natural	No	No	12 x 50	1000
W985922	2	Natural	Yes	Yes	12 x 50	500
W985916	2	White	Yes	Yes	12 x 50	500
W985917	2	Red	Yes	Yes	12 x 50	500
W985918	2	Pink	Yes	Yes	12 x 50	500
W985919	2	Yellow	Yes	Yes	12 x 50	500
W985920	2	Green	Yes	Yes	12 x 50	500
W985921	2	Blue	Yes	Yes	12 x 50	500
W985923	3	Natural	Yes	Yes	12 x 63	500
W985924	4	Natural	Yes	Yes	12 x 77	500
W985925	5	Natural	Yes	Yes	12 x 91	500

CryoELITE® Vials, Freestanding, External Thread

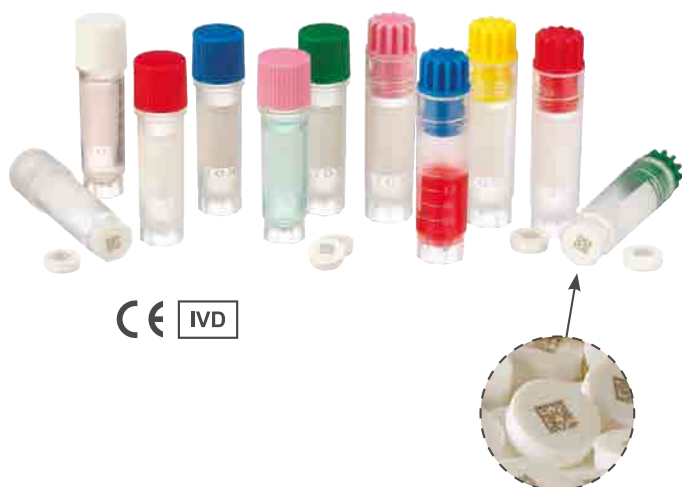
W985874	0.5	White	Yes	Yes	12 x 49	500
W985862	1.2	Natural	Yes	Yes	12 x 37	500
W985852	2	Natural	Yes	No	12 x 49	1000
W985853	2	Natural	No	No	12 x 49	1000
W985863	2	White	Yes	Yes	12 x 49	500
W985864	2	Red	Yes	Yes	12 x 49	500
W985865	2	Pink	Yes	Yes	12 x 49	500
W985866	2	Yellow	Yes	Yes	12 x 49	500
W985867	2	Green	Yes	Yes	12 x 49	500
W985868	2	Blue	Yes	Yes	12 x 49	500
W985869	3	Natural	Yes	Yes	12 x 63	500
W985870	4	Natural	Yes	Yes	12 x 78	500
W985871	5	Natural	Yes	Yes	12 x 93	500

CryoELITE® Vials, Round Bottom, Internal Thread

W985910	1.2	Natural	Yes	Yes	12 x 39	500
W985911	2	Natural	Yes	Yes	12 x 49	500
W985900	2	Natural	Yes	No	12 x 49	1000
W985901	2	Natural	No	No	12 x 49	1000
W985912	3	Natural	Yes	Yes	12 x 63	500
W985913	4	Natural	Yes	Yes	12 x 76	500
W985914	5	Natural	Yes	Yes	12 x 90	500

CryoELITE® Vials, Round Bottom, External Thread

W985860	1.2	Natural	Yes	Yes	12 x 35	500
W985861	2	Natural	Yes	Yes	12 x 49	500
W985850	2	Natural	Yes	No	12 x 49	1000
W985851	2	Natural	No	No	12 x 49	1000



CryoELITE® Cryogenic Vials Shelf Packs

- Packed in convenient, smaller quantities
- 2 packs of 50 vials

Cat. No.	Size (mL)	Color	Writing Patch	Sterile	Dimensions Dia. x H (mm)	Qty / Case
CryoELITE® Vials, Freestanding, External Thread						
W985863-100	2	White	Yes	Yes	12 x 49	100
W985864-100	2	Red	Yes	Yes	12 x 49	100
W985865-100	2	Pink	Yes	Yes	12 x 49	100
W985866-100	2	Yellow	Yes	Yes	12 x 49	100
W985867-100	2	Green	Yes	Yes	12 x 49	100
W985868-100	2	Blue	Yes	Yes	12 x 49	100
W985872-100	2	Natural	Yes	Yes	12 x 49	100

CryoELITE® Cryogenic Vials, Pre-inserted Barcodes

- CryoELITE vials with 2D Data Matrix Barcode insert already applied

Cat. No.	Size (mL)	Color	Writing Patch	Sterile	Dimensions Dia. x H (mm)	Qty / Case
CryoELITE® Vials, Freestanding, External Thread						
W985863-BC	2	White	Yes	Yes	12 x 49	500
W985864-BC	2	Red	Yes	Yes	12 x 49	500
W985865-BC	2	Pink	Yes	Yes	12 x 49	500
W985866-BC	2	Yellow	Yes	Yes	12 x 49	500
W985867-BC	2	Green	Yes	Yes	12 x 49	500
W985868-BC	2	Blue	Yes	Yes	12 x 49	500

2D Data Matrix Bar Code Bottom Insert

- When purchasing WHEATON CryoELITE® freestanding vials, you can purchase an optional 2D Data Matrix Bar Code Insert that allows for immediate bar coding of your samples. The insert can also be applied to the vial at a future date, which eliminates jeopardizing the integrity of your sample by transferring it to another vial
- 2D Data Matrix Bar Code Insert press fits and locks into place in bottom of vial

Cat. No.	Description	Sterile	Qty / Case
W985881	2D Data Matrix Bar Code Bottom Insert	No	500

E-Z Microtube

- Polypropylene
- Uniquely numbered to ensure zero duplicated
- Fully traceable for perfect data management
- For storage down to -196°C
- Long lasting performance stability
- Supplied in a standard format 96-well rack with locking lid
- 1.0 and 1.4mL tubes supplied in standard twist-lock 96-well rack with locking lid



Cat. No.	Volume (mL)	Description	Qty / Case
W280110	0.5	E-Z Microtube, PP, 2D Barcode	10
W280121	1.0	E-Z Microtube, PP, 2D Barcode	10
W280135	1.4	E-Z Microtube, PP, 2D Barcode	10

Cryule® Cryogenic Ampule

- For biological sample preservation in glass
- Allows for storage at low temperatures
- Made from low extractable borosilicate glass that conforms to USP Type I and ASTM E 438 Type I, Class A requirements
- Can be used in the vapor phase of liquid nitrogen
- Special design allows for storage at low temperatures as well as rapid thawing



Cat. No.	Volume (mL)	Dimensions Dia. x H (mm)	Qty / Case
at Top (mm) Qty / Case			
Non-Scored			
651463	1.2	11.8 x 58	144
W651466	2	11.5 x 70	455
W651469	5	16.5 x 98	293
Pre-Scored			
651483	1.2	11.8 x 58	144
651486	2	11.5 x 70	144

* Approximate OD

CryoELITE® Technical Information

Material:	Made from low binding, cryogenic grade virgin polypropylene
Temperature Range:	-156°C to +121°C, tested to -196°C
Sterility:	Lot Certified Sterile, Radiation Sterilization
DNase & RNase Free:	Lot Certified, Ethidium Bromide (EtBr) Agarose Gel Electrophoresis Analysis
Non-Pyrogenic, Endotoxin Free:	Lot Certified < 0.500 EU/mL (Kinetic Turbidimetric LAL Method, FDA guideline)
Seal psi:	Exceeds 15 psi / 1 atmosphere / 95kPa pressure tested
IATA (International Air Transportation Association):	Can be used as a primary receptacle for the Transport of Diagnostic Specimens as outlined by the IATA Dangerous Goods Regulations, Part 6.3.5
DOT (U.S. Department of Transportation):	Exceeds U.S. DOT 49 CFR Parts 171-180 requirements for Diagnostic Specimen Packing and Transportation Requirements
Liquid Nitrogen:	Liquid phase tested / Vapor phase accepted
Autoclavable:	Recommended at +121°C, 15 psi (1 bar) for 20 minutes
Cap Pigmentation:	Cap colors were chosen to ensure no reactivity with common biological samples
2D Data Matrix Capacity:	Numeric 16 / Alphanumeric 10
2D Data Matrix Symbol Size:	Row x Column: 14 x 14
CE:	Product is CE compliant to The European <i>In Vitro</i> Diagnostic Medical Devices Directive 98/79/EC

Abstract

Cell preservation is an extremely important aspect of cell culture. The most effective means of preserving cells is by freezing, using either liquid nitrogen or cryogenic freezers.

Required Materials

- > Sterile DMSO or Glycerol
- > Culture Media
- > WHEATON Glass Ampules or CryoELITE® Cryogenic Vials

Background

Preserving cultured cells differs from preserving bacteria and fungi in that higher viability is required. While a 1% survival rate of a microbial culture is practical, such low viability is unacceptable for cell culture. High survival rates are important for cell lines due to the expense and difficulty in preparation, slow rate of growth, and the tendency to change during culture. Consequently, methods used for cell culture cryopreservation must ensure high viability.

Internal or External Threading - The Great Debate

Internally threaded cryogenic vials are sometimes perceived to hold a better seal due to the fact that the outside dimensions of the cap and the vial are equal. This means that under equal temperature the cap and the vial will have expanded the same amount, thus ensuring a better seal. Additionally, internally threaded vials generally have a silicone seal that is perceived to keep liquid nitrogen out of the vial should it be immersed in the liquid.

In practice, however, the contraction going into liquid nitrogen is so small that it does not, in fact, strain the seal. All WHEATON CryoELITE vials exceed standards for internal pressure leak resistance, but WHEATON externally threaded CryoELITE vials provide additional protection from internal pressure leaking. Through independent studies (see table 1). WHEATON CryoELITE externally threaded vials have proven to be the most reliable vials under pressurized environments because of its unique 2° plug seal (See diagram on page 5). This design allows more cap to vial surface contact, allowing for an absolute seal. The added advantage of externally threaded vials is that the threads are protected from the environment, thus reducing the risk of contamination to the culture. Externally threaded vials also allow for a greater filling volume than internally threaded vials.

Most notable reason for choosing an internally threaded vial is for increased storage capacity. Externally threaded vial closures are wider than internally threaded vial closures as a result you gain 19% greater storage density in a standard freezer box with internally threaded vials compared to externally threaded vials.

Another Debate - In the Vapor or In the Liquid

Some cryogenic vial manufacturers advocate that there is no trouble immersing cultures into liquid nitrogen, most researchers advise against this practice. Although the vast majority of vials do seal in liquid nitrogen, there is a potential chance that the liquid could seep into the vial. If this does happen when the vial is warmed, the trapped liquid nitrogen rapidly becomes a gas, exploding the vial.

It is therefore advisable to store cultures in the vapor layer above the liquid nitrogen. Here the cells will remain in the appropriate temperature provided that proper techniques are applied to the opening and closing of the liquid nitrogen storage system. Moreover, a system should be in place so that cultures can be easily found in the freezer, limiting the time the freezer and cultures are disturbed.

Sealing Glass Cryule® Ampules

WHEATON Glass Cryule® Ampule are sealed with a flame by rolling the sealing neck of the Cryule Ampule in a flame until it becomes soft and pliable. Use forceps to slowly pull the sealing neck of the Cryule Ampules while continuing to roll the tube. As the top of the sealing neck separates from the ampule, roll the tip of the Cryule Ampule in the flame to seal. After the Cryule Ampules have cooled, they can be submersed into a solution of methylene blue or trypan blue in order to verify that the Cryule Ampules have sealed. Wash the Cryule Ampules to remove the stain and examine the cell suspension for the dye. Any dye on the inside of a Cryule Ampule means the vial is not sealed and should be discarded.

Initial Freezing & Storage

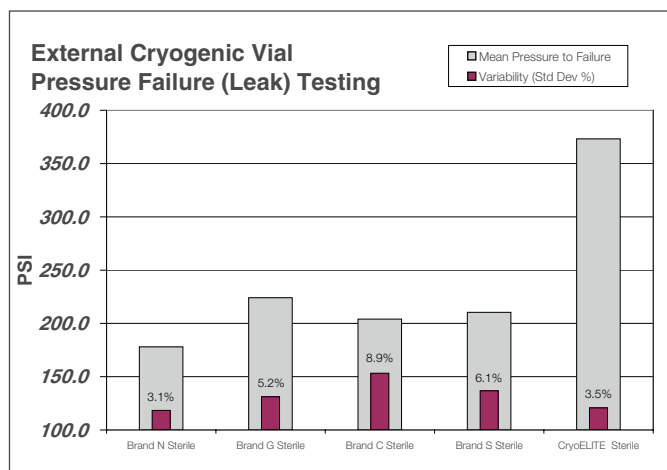
The rate of cooling your specimen controls the size and location of ice crystals as well as the rate they are formed, all of which can affect cell recovery. In most cases a slow, uniform cooling rate of -1°C per minute from ambient temperature is effectual. Placing the vials into a disposable plastic polystyrene rack on the shelf of an -80°C freezer for 2-3 hours is close to 1°C per minute and works well for a range of cell types. After initially cooling your specimens to a predetermined temperature, the vials are then placed in long-term storage.

Whether using WHEATON CryoELITE Cryogenic Vials or glass Cryule Ampules, leaving the culture in the -80°C freezer overnight is a good way to initially freeze the cells. The temperature at which frozen cells are stored will affect their viability – generally speaking the lower the storage temperature, the longer the viable storage period. Storage at -80°C may permit slow chemical reactions to occur from the presence of small amounts of unfrozen water, resulting in cell death.

Thawing

In contrast to freezing, rapid thawing of cells is needed to maintain viability. When removing vials from the freezer, cryogenic gloves must be worn to protect you from burns due to low temperatures. Directly after removal from storage, the vials should be thawed with agitation, (except for fragile hybridoma cells) in a 37°C water bath. As the last ice crystals melt, remove the vial from the water. Wipe, spray, or submerge the vial with 70% ethanol before opening it in a biosafety hood. You can determine the percentage of viable cells recovered by trypan blue staining.

Table 1.

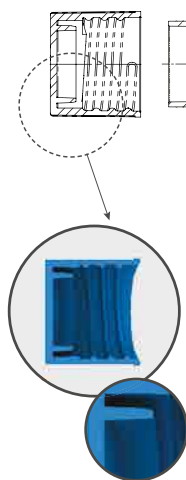


Freestanding

Round Bottom

External Thread

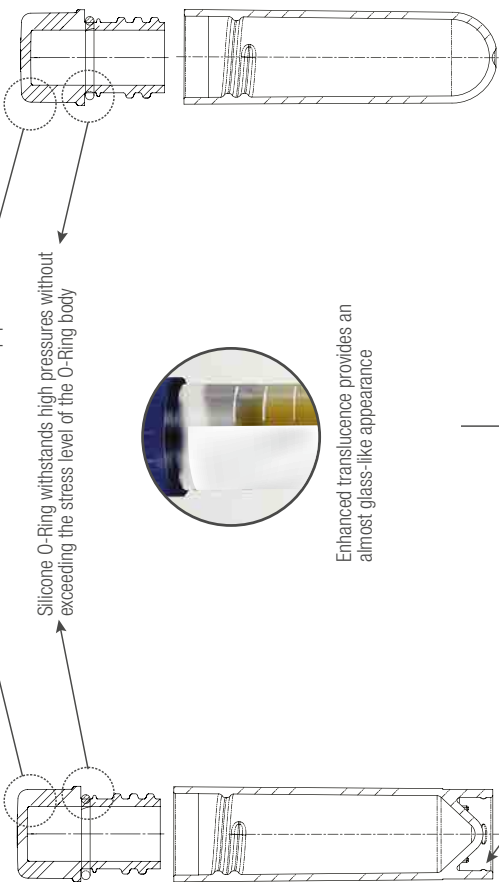
Unique 2° Angle Plug Seal creates more cap to vial surface contact for an absolute seal



Internal Thread

Ridged Cap allows for easy cap removal with one hand or with automated equipment

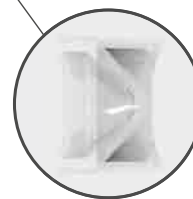
Silicone O-Ring withstands high pressures without exceeding the stress level of the O-Ring body



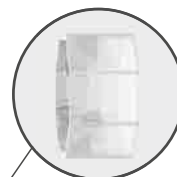
Enhanced translucence provides an almost glass-like appearance

Exacting Round Bottom allows for up to 17,000 MAX RCF (xG)

E-Z Ex-Traction® Conical Well Design provides controlled, low CV sample retrieval for both automated and manual liquid handling systems



Loctagon™ Vial Skirt provides stability in the freestanding position; locks into the CryoELITE Benchmark Pack to provide easy open and close with one hand



Accommodates 2D Data Matrix Bar Code Bottom Insert which provides a unique identifier for permanent traceability



Freestanding Bottom Features



SingleScan™ Bar Code Reader

- Plug and play design enables easy set up with no software installation required
- USB interface allows easy connection to computer
- Reads 1D linear bar codes and 2D Data Matrix bar codes on any vial or ampule
- Inputs decoded bar code ID into any software application where cursor is placed



Cat. No.	Description	Qty
W986000	SingleScan™ Bar Code Reader	1

PluraScan™ Bar Code Reader

- 2D Data Matrix Bar Code Reader
- Works with WHEATON KeepIT® Boxes and WHEATON CryoELITE® Cryogenic Vials and Cryule® Ampules as well as WHEATON E-Z Microtubes
- Flexible software integration
- Integrated frost reduction system allows multiple racks to be read
- Capable of reading bar codes from wide range of manufacturers and label printers



Cat. No.	Description	Qty
W986010	PluraScan™ Bar Code Reader	1

2D Data Matrix Bar Code Bottom Insert

- When purchasing WHEATON CryoELITE® freestanding vials, you can purchase an optional 2D Data Matrix Bar Code Insert that allows for immediate bar coding of your samples. The insert can also be applied to the vial at a future date, which eliminates jeopardizing the integrity of your sample by transferring it to another vial
- 2D Data Matrix Bar Code Insert press fits and locks into place in bottom of vial

Cat. No.	Description	Sterile	Qty / Case
W985881	2D Data Matrix Bar Code Bottom Insert	No	500

WHEATON Scanners Technical Information			
		SingleScan™	PluraScan™
Code Formats	1D Linear	✓	—
	2D Data Matrix	✓	✓
	ISO 16022	✓	✓
	Square Rectangular Format	✓	✓
	ECC 200	✓	✓
	0-20 Grid Sizes	✓	✓
	White on Black Black on White	✓	✓
	Numeric	✓	✓
	Alphanumeric	✓	✓
Sensor Type	1.3 million pixel CMOS sensor		CCD Image Sensor
Light Source	Class 2M visible laser diode at 630nm		CCFL (Cold Cathode Fluorescent Light Source)
Dimensions (W x D x H)	61mm x 167mm x 41.2mm		75cm x 50cm x 30cm
Power	USB Hub (5V)		AC 100 to 240V, +10%/-10%, Less than 8W
User Interface	Keyboard Wedge		WHEATON GUI, including Windows® operating system TCP / IP, ODBC
Cable Interface	USB		USB2.0 USB 1.1 (B Type)
Operating System	Factory configured for Windows® operating systems compatibility. Also compatible with non-windows operating systems		Windows®7, 2000, XP
Ambient Operating Temperature		5 to 50°C	
Storage Temperature		-20 to 65°C	
Operating Humidity		(Non-condensing) 5 to 95°C	

KeepIT® Freezer Boxes



KeepIT®-25



KeepIT®-81 & 100

- KeepIT® Freezer Boxes provide an ideal method for batching and storing samples
- Six different colors match the colors of CryoELITE® Cryogenic Vials, creating alternatives for batching and identifying groups of samples
- KeepIT®-25 accommodates up to 25 internal or external threaded cryogenic Vial Sizes: 1.2 - 2mL
- KeepIT®-100 accommodates up to 100 internal threaded cryogenic vials and the KeepIT®-81 accommodates 81 external threaded cryogenic vials (sizes: 1.2 - 2mL)
- Openings in bottom facilitate scanning CryoELITE® 2D Data Matrix Bar Code Inserts
- Made from Eastman Tritan™ BPA free, shatter resistant resin
- Standard footprint compatible with liquid nitrogen storage shelves and freezer drawers

Cat. No.	Color	Dimensions (L x W x H) (mm)	Qty / Case
KeepIT®-25 For External Thread Vials			
W651702-W	White	75 x 75 x 52	10
W651702-R	Red	75 x 75 x 52	10
W651702-P	Pink	75 x 75 x 52	10
W651702-Y	Yellow	75 x 75 x 52	10
W651702-G	Green	75 x 75 x 52	10
W651702-B	Blue	75 x 75 x 52	10
Low Profile KeepIT®-81 For External Thread Vials			
W651703-W	White	130 x 130 x 52	10
W651703-R	Red	130 x 130 x 52	10
W651703-P	Pink	130 x 130 x 52	10
W651703-Y	Yellow	130 x 130 x 52	10
W651703-G	Green	130 x 130 x 52	10
W651703-B	Blue	130 x 130 x 52	10
Low Profile KeepIT®-100 For Internal Thread Vials			
W651704-W	White	130 x 130 x 52	10
W651704-R	Red	130 x 130 x 52	10
W651704-P	Pink	130 x 130 x 52	10
W651704-Y	Yellow	130 x 130 x 52	10
W651704-G	Green	130 x 130 x 52	10
W651704-B	Blue	130 x 130 x 52	10

CryoELITE® Benchmate Rack



- For use with both freestanding and round bottom vials
- One hand cap removal of freestanding vials
- Holds 50 cryogenic vials
- Manufactured from polypropylene
- Easily cleaned in an automatic washer or autoclavable at 121°C for 20 minutes
- Non-skid feet offer additional stability for bench work
- Stackable
- Well ID: 12.5mm
- Dimensions (L x W x H): (190 x 100 x 22mm)

Cat. No.	Description	No. of Wells	Qty / Case
W985810	50-Position Rack	5 deep x 10 wide	5

CryoFile® and CryoFile® XL Storage Boxes



- Use with cryogenic vials
- Partitions numbered from 1 – 81 for easy content identification
- Numbering system printed on lid and bottom of box
- Six colors provide easy sample identification
- Water repellent allows for longer durability
- For use with vapor phase of liquid nitrogen
- Directional holes in bottom allow for drainage and orientation of bottom to top of box
- Dimensions (L x W x H): CryoFile® (130 x 130 x 52mm) / CryoFile® XL (130 x 130 x 97mm) / CryoFile® Tissue Box (130 x 130 x 26mm)

Cat. No.	Fits	Color	Qty / Case
CryoFile® Storage Box			
W651600	1.2 & 2mL Vials	Green	15
W651601	1.2 & 2mL Vials	Yellow	15
W651602	1.2 & 2mL Vials	Pink	15
W651603	1.2 & 2mL Vials	White	15
W651604	1.2 & 2mL Vials	Blue	15
W651605	1.2 & 2mL Vials	Red	15
CryoFile® XL Storage Box			
W651600-XL	3, 4 & 5mL Vials	Green	15
W651601-XL	3, 4 & 5mL Vials	Yellow	15
W651602-XL	3, 4 & 5mL Vials	Pink	15
W651603-XL	3, 4 & 5mL Vials	White	15
W651604-XL	3, 4 & 5mL Vials	Blue	15
W651605-XL	3, 4 & 5mL Vials	Red	15
CryoFile® Tissue Storage Box			
W651610-G	5mL Tissue Vials	Green	15
W651610-Y	5mL Tissue Vials	Yellow	15
W651610-P	5mL Tissue Vials	Pink	15
W651610-W	5mL Tissue Vials	White	15
W651610-B	5mL Tissue Vials	Blue	15
W651610-R	5mL Tissue Vials	Red	15

FTA® Nucleic Acid Collection Storage box



- Storage boxes provide an ideal method for batching and storing FTA Nucleic Acid Collection pouches
- For use with small or large FTA cards
- Accommodates two rows of 3" FTA card pouches or one row of 6" FTA Card Pouches
- Removable divider for use with smaller pouches
- Water repellent box material allows for longer durability
- For use at RT, 4°C, -20°C or colder

Cat. No.	Dimensions (L x W x H) (in)	Qty / Case
W651611	18 x 6 x 4	2
W651612	18 x 7 x 4	4

Resource Links

<http://www.cryofeed.com/>

Biobanking Solutions: A curated collection of biobanking information and exciting science

<http://www.isber.org/>

International Society for Biological and Environmental Repositories (ISBER)

<http://www.esbb.org/index.html>

European, Middle-Eastern and African Society for Biopreservation and Biobanking (ESBB)

<http://cahub.cancer.gov/>

Home page of the cancer Human Biobank (caHUB)
Part of the United States National Cancer Institute (NIH)

<http://biospecimens.cancer.gov/default.asp>

Office of Biorepositories and Biospecimen Research (OBBR)
Part of the United States National Cancer Institute (NIH)

<http://www.bbmri.eu/>

Biobanking and Biomolecular Resources Research Infrastructure (BBMRI)
Funded by the European Commission (EC)

<http://p3g.org/>

Public Population Project in Genomics (P³G)
International association of researchers and biobanks focused human population genomics

www.oecd.org/sti/biotechnology/hbgrd

Organisation for Economic Co-operation and Development (OECD)
Recommendation on Human Biobanks and Genetic Research Databases

<http://www.hhs.gov/ohrp/international/index.html>

Office for Human Research Protections U.S. Department of Health and Human Services

<http://www.genomics.health.wa.gov.au/home/>

Government of Western Australia, Department of Health, Office of Population Health Genomics

<http://biocor.net/>

University of Minnesota Biopreservation Core Resource (BioCoR)





DURAN Group GmbH

Hattenbergstrasse 10

55122 Mainz

Germany

Tel.: +49 (0)6131 1445 4131

Fax: +49 (0)6131 1445 4016

sales@duran-group.com

www.duran-group.com

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