

FlashFREEZE

The science of flash freezing
for standardized tissue banking



MILESTONE
H E L P I N G
P A T I E N T S

Need good results? Start with good preparation

THE PROBLEM

There are few resources as valuable to cancer researchers as tissue samples - the biospecimens that patients donate to aid in the search for cancer-related biomarkers. Harvesting and storing human tissue for research purposes is not new. Human biospecimens have been collected and stored for 100 years, and today, in excess of 300 million biospecimens are warehoused in freezers or stored in other formats such as paraffin-embedded tissue blocks ⁽¹⁾. However, over the past decade or so it has become clear that the great majority of biospecimens stored in the world's biorepositories may not be suited for the state-of-the-art genomics, proteomics, metabolomics, and other bioanalytical technologies used today to search for cancer-related biomarkers. The irreproducibility of many reported biomarkers is due at least in part to the fact that the biospecimens utilized are often procured using different collection, processing and storage techniques.* Such variability can lead to significant differences in biospecimen molecular integrity.



FlashFREEZE - Benchtop flash freezing station

THE SOLUTION

To overcome some of these difficulties Milestone has developed the FlashFREEZE unit to standardize the flash freezing processing step. With FlashFREEZE it is now possible to run evidence-based biospecimens protocols with the full documentation needed for QA purposes. FlashFREEZE combines the advantages of a state-of-the-art Stirling cooler, capable of reaching temperature down to -80°C, with the outstanding environmental and safety features of the new 3M™ Novec™ 7000 engineered fluid. Novec™ 7000 is a non flammable, non toxic, low global warming potential (GWP) transfer fluid. The FlashFREEZE eliminates need for liquid nitrogen and for the toxic and flammable isopentane.



⁽¹⁾ Eiseman E, Haga S. *A Handbook of Human Tissue Sources*. Santa Monica, CA: RAND Corporation; 2000.

* *International Approaches to Advancing Biospecimen Science*. Helen M. More et al. *Cancer Epidemiol Biomarkers Prev*. May 2011; 20(5): 729-732

FlashFREEZE. The first step towards standardized and safe flash freezing

Touch screen terminal (4.3")

USB port for full documentation

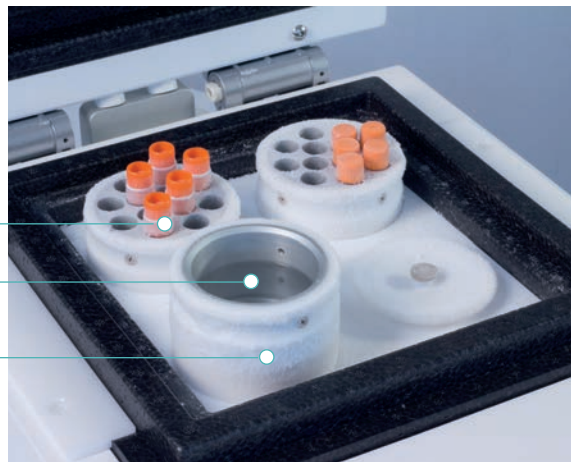
Cool trap for defrost step



2 holders for 12 cryo vials

Freezing fluid at -80°C

Vessel for freezing with PTFE liner



This is flash freezing the way it should be

NO LIQUID NITROGEN

NO ISOPENTANE

PRESET FREEZING TIME

FULL DOWNLOADABLE DOCUMENTATION

Simple. Intuitive operation makes everyone an expert



1

Place the biospecimen...



2

... in the PTFE special holder.



3

Place the PTFE cover on top of the biospecimen to avoid floating.



4

Introduce the holder in the transfer fluid at -80°C .



5

Place cover on vessel and close lid. Set freezing step time (15-30 sec.). Start timer.



6

After expiration of the preset time, repeat operation in reverse.



7

The sample can now be placed in the cryo vials for storage.

Whenever several small biospecimens have to be simultaneously flash frozen, a modified sample holder is available.



1

Place specimen in the numbered cavities (1-5).



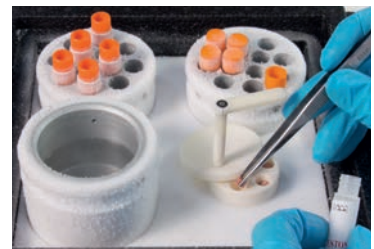
2

Place the cover on the holder.



3

Immerse holder in the fluid at -80°C .



4

Place frozen biospecimens in the cryo vials for storage.

What sets us apart ?

THE UNIQUE COMBINATION OF A NON TOXIC,
NON FLAMMABLE TRANSFER FLUID WITH A STATE-OF-THE-ART,
RAPID STIRLING COOLING DEVICE AT -80°C

The advantages of the 3M Novec 7000* Engineered Fluid

- Non-flammable
- Low in toxicity
- HAPs-free (Hazardous Air Pollutant)
- Zero ozone depletion potential
- Low global warming potential
- U.S. EPA SNAP-approved

<i>Typical physical properties</i>	3M Novec™7000	Isopentane
Boiling Point@ 1 atmosphere	34°C	28°C estimated
Freeze Point	-122.5°C	No data available
Flash Point estimated	No Flash point detected	-51°C
Flammability Limit	None detected	Fire Hazard 4

<i>Toxicological test results</i>	3M Novec™7000	Isopentane
Tox: 8 hr exposure guideline	75 ppmv	600 ppmv
Eye Irritation	No significant irritation	Irritant
Skin Irritation	No significant irritation	Irritant
Mutagenicity	Not mutagenic	Unknown

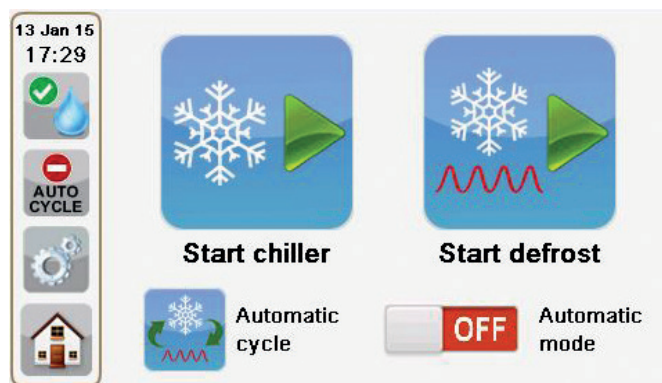
* 3M and Novec are trademarks of 3M,

FlashFREEZE has been designed, tested and manufactured to be operated without the use of isopentane or similar extremely flammable fluids.

Defrost feature

To eliminate potential formation of ice on the freezing platform, a manual defrost cycle is provided. It consists of a heater embedded in the freezing platform and a vacuum pump to extract water vapors from the chamber.

Vapors are condensed and collected in a cold-trap placed in the front of the unit for easy handling. A HEPA filter is provided on the exhaust side of the pump. Integrated software can set the defrost cycle to take place during off hours and restart the cooling cycle at a preset time to ensure availability for the first case of the day.



The FlashFREEZE unique features

HIGH FLEXIBILITY

- Standardized freezing at -80°C for all types of tissues.
- Two holder types to fit varying biospecimen dimensions.

FAST

- Only 1 hour 40 minutes from room temperature to operating temperature of -80°C.
- At the set temperature 5 biospecimens can be frozen simultaneously in only 15-30 seconds.

SAFE

- No liquid nitrogen, no isopentane.
- HEPA cap filter.

ENVIRONMENTAL FRIENDLY

- Advanced Stirling Cooler technology uses Helium gas as a refrigerant in a sealed stainless steel chamber. No standard compressor, therefore no CFC (Chlorofluorocarbon).
- Non flammable, non irritating, low toxicity freezing fluid.

FULL DOCUMENTATION

- USB port enables both updating of software and downloading of event logs.

SPACE SAVING

- Small footprint accommodates space restricted lab environments.

Technical specifications

- Stirling Cooler freezing module
- Anodized aluminium freezing platform
- 4.3" touch screen terminal. 1 USB port
- Dimensions: *h* 45cm/17,7" (with cover open 73cm/28,7") - *w* 30cm/11,8" - *d* 54cm/21,3"
- Weight: 22Kg - 48.5lbs
- Power supply: 230V~ 50/60Hz or 115V~ 60Hz (250W)

MILESTONE



HELPING
PATIENTS

