

# Smart Notes



## How can the NEW Thermo Scientific CryoMed controlled-rate freezer be used to prepare samples and therapies for long-term storage in a cryogenic storage device?

Using the new Pre-Set Profile #3 run program in the Thermo Scientific™ CryoMed™ Controlled-Rate Freezer, end-users can now utilize a pre-programmed profile to freeze samples to  $-140^{\circ}\text{C}$ , allowing end-users to usher their samples or therapies through the “glass transition” phase of amorphous ice formation.

Laboratories storing samples or therapies for future studies should follow the ISBER *Best Practices: Recommendations for Biorepositories* 4th Edition guidelines for preserving samples for future use. According to the guidelines,  $\text{LN}_2$  cryopreservation is optimal for long-term specimen storage, as these systems maintain specimen temperatures below the glass transition phase temperature of  $-132^{\circ}\text{C}$ .

While storage below the glass transition temperature is important, the preparation of samples for storage below the glass transition temperature is equally important. Controlling the rate at which a specimen is frozen fosters greater cellular viability once a sample is removed from a cryogenically frozen state. In order to safely prepare samples for cryogenic storage, the Thermo Scientific CryoMed Controlled-Rate Freezer should be utilized to safely usher specimens through the latent-heat of fusion threshold.



The CryoMed Controlled-Rate Freezer offers 6 factory-set freezing profiles for end-users. In addition to the pre-set profiles, users may create up to 14 custom freezing profiles. For samples and therapies that are being stored cryogenically, CryoMed users should consider using the NEW Pre-set Profile #3 with a Step 6 end-temperature of -140°C:

**Preset 3:** Commonly used for hemopoietic stem cells that are 65 to 100 mL in size, resulting in a 1°C rate from nucleation to -45°C and a 10°C per minute cooling rate to a -140°C for end storage at cryopreservation temperatures.

Step	Increment	Temperature
Step 1	Wait	@ 20.0°C
Step 2	1.0°C/m S	to -6.0°C
Step 3	25.0°C/m C	to -50.0°C
Step 4	10.0°C/m C	to -14.0°C
Step 5	1.0°C/m C	to -45.0°C
Step 6	10.0°C/m C	to -140.0°C
Step 7	End	

For long-term storage of samples, Thermo Scientific™ offers two LN<sub>2</sub> cryogenic freezer platforms: the Thermo Scientific™ CryoExtra™ High-Efficiency LN<sub>2</sub> Storage Tanks and the Thermo Scientific™ CryoPlus™ LN<sub>2</sub> Storage Devices provide cryogenic storage for samples. When choosing between the CryoExtra and CryoPlus platforms, customers should consider how many samples they will be storing and whether they will be storing in liquid phase or vapor phase states. For larger sample sizes being stored in vapor phase, the CryoExtra platform is best. The CryoExtra platform is offered in four capacities and can accommodate between 19,500 and 93,000 2 mL vials. For smaller sample sizes, the CryoPlus may be selected, accommodating both liquid or vapor phase storage, with a 2 mL vial capacity ranging from 6,318 to 39,000.

## Conclusion

The Thermo Scientific CryoMed Controlled-Rate Freezer in combination with the CryoExtra and CryoPlus platforms provide biorepositories and laboratories a complimentary product offering for preparing and cryogenically storing samples and therapies at cryogenic temperatures.



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