CELLSTORE

Revella Cell Thawing Instrument – Frequently Asked Questions (FAQ)

1. What is the thawing principle of the cell thawing instrument?

The instrument is more accurately described as a "dry thawing device". It operates based on three core technologies: resistive heating, programmable temperature control, and low-temperature sensing, enabling precise and controlled cell thawing.

2. What is the thawing duration?

The thawing time is comparable to that of a water bath and varies depending on the container type.

For 2 mL cryovials: pre-heat for approximately 1 minute, followed by a nucleation induction phase of about 1 minute 10 seconds, and a thawing phase of approximately 1 minute 20 seconds. The entire process is completed within 3 minutes.

3. What is the temperature profile during thawing?

The process operates at a variable temperature. The starting temperature is 50°C, which may rise to a maximum of 54°C during thawing, cycling between 50°C and 54°C. The vial wall temperature rises gradually throughout the process.

4. Does 50 °C cause damage to the cells?

Cell thawing follows the principle of "slow freezing, rapid thawing." The temperature we monitor is the vial wall temperature. The initial 50°C is applied to enhance thawing efficiency. At this stage, the internal content remains frozen and is far from reaching 50°C. Once thawing begins, the interior is in an ice-water mixture state at approximately 0°C.

5. What are the post-thaw viable cell count and cell viability?

The results are consistent with those obtained using a water bath. Multiple users have independently verified through testing that post-thaw viability is comparable to that achieved with water bath thawing.

6. What are the advantages over a water bath?

Water bath thawing is a traditional method that is low-cost and easy to operate. However, it is typically limited to routine laboratory use or Grade D cleanroom environments, which inherently increases the risk of contamination. Additionally, water baths are not suitable for use in GMP-grade clean areas.

Our Cell Thawing Instrument is a dry thawing device designed for use in Grade B and even B+A cleanroom environments, enabling higher sterility assurance for cell storage and transfer. The programmable, automated thawing process also offers superior reproducibility compared to water baths, making it ideal for R&D and quality control applications. Routine maintenance, such as water bath replacement, is also eliminated.

7. Can the instrument be validated?

Yes. We provide 3Q qualification documentation in compliance with GMP quality system requirements, with services delivered by our factory engineers. Please note that validation tools are not available for purchase separately.

8. What is the after-sales service during the warranty period?

The instrument comes with a 12-month warranty from the date of on-site acceptance (excluding damage caused by improper operation, such as dropping, burning, or short-circuiting).

9. Does the instrument have a self-diagnostic function?

Yes. Upon power-on, the instrument performs an automatic self-test, indicated by a flashing light sequence. Once completed, the instrument is ready for use. A secondary self-check is performed after a cryovial is inserted; if the vial wall temperature exceeds the set threshold, the vial will be automatically ejected.

10. Does the instrument measure the external wall temperature or the internal temperature?

The instrument uses an infrared temperature sensor. Since infrared cannot penetrate plastic, it measures the external wall temperature. Imported instruments using the same technology likewise

measure the external wall temperature.

11. Can temperature records before and after thawing be exported?

The instrument is equipped with a built-in screen that displays real-time temperature curves, and data can be exported. Please note that the 6-position model does not currently support this function.

12. What is the sample temperature after thawing?

Upon completion of thawing, the temperature inside the cryovial is approximately 0°C, as the contents remain in an ice-water mixture state. The measured temperature is the vial wall temperature.

13. What cell types have been tested?

The instrument has been validated with various cell types, including lymphocytes, tumor cells, and stem cells.

14. Can the instrument be used inside a biosafety cabinet or laminar flow hood?

Yes. The compact design allows it to fit inside most cabinets, and the instrument surface can be disinfected with alcohol.

15. How is post-thaw cell viability assessed?

Viability can be assessed using multiple standard methods, including flow cytometry, microscopy, and automated cell counters.

16. How is the instrument sterilized?

The entire unit can be wiped with 75% alcohol. The vial wells can be cleaned with an alcohol-wiped swab. The internal circuitry is protected against moisture; however, do not pour alcohol directly into the unit. After wiping, we recommend placing the instrument in a pass-through box with UV irradiation, which generates ozone to achieve overall sterilization.

17. What data can be exported?

Exported data includes temperature curves, start time, thawing duration, and user identification. The system supports audit trail functionality, allowing tracking of operator and time stamps.

18. How is the temperature controlled?

The instrument is equipped with an infrared temperature sensor for each well, operating independently to monitor temperature changes in real time.

19. What criterion determines the completion of thawing?

Thawing completion is determined based on the temperature profile.

20. Is customization available?

Yes. Customization is available for specific cryovial formats or thawing requirements (e.g., complete ice crystal melting). Please note that customization costs and associated risks will be borne by the customer. We aim to achieve thawing performance comparable to that of water baths.

21. What sample types are compatible?

The standard configuration is compatible with 2 mL cryovials filled with 0.3–1.5 mL of sample. Other vial formats can be accommodated upon customization.

22. How can large ice crystals be addressed?

Thawing is a process step; the primary objective is to achieve optimal cell count and viability. For concerns regarding ice crystal size, we recommend consulting our technical support team and completing a customer feedback form. We can then adjust the instrument parameters accordingly.

23. What is the difference between this instrument and a metal bath?

Our instrument employs a variable-temperature heating program, whereas a metal bath provides a linear heating profile. Our system automatically adjusts temperature and timing based on sample

characteristics, while a metal bath requires manual settings.

24. What routine maintenance is required?

Upon power-on, the instrument automatically performs a self-test and preheating cycle. A single red light indicator signals that the instrument is ready for use. If any issue is detected during self-testing, an alarm will sound.

25. Is the instrument waterproof?

The outer casing is coated with a conformal coating (three-proof paint) to protect against splashes and drips. For liquid spills in the sample wells: volatile liquids (e.g., alcohol) can be left to evaporate; for cell cryopreservation media spills (e.g., from vial rupture), wipe gently with a cotton swab.

26. How many temperature points are supported for probe calibration?

Each well can be calibrated independently, but calibration is currently supported at a single temperature point: 50 °C.

27. What is the accuracy of the infrared sensor and the temperature control precision?

The infrared sensor offers an accuracy of ±0.5 °C, and the temperature control precision is ±1 °C.