TEMPERATURE MAPPING STUDY

Office Fridge — Temperature Mapping Report (Feels Like)

A

Generated: 3/22/2026

💧 FEELS LIKE TEMPERATURE MODE

Protocol Ref: TM-OFFICE-2026-03-20

CUSTOMER / FACILITY	STUDY START	STUDY END
Office Fridge	2026-03-20T14:00	2026-03-21T08:45

ACCEPTABLE RANGE	DURATION	PERFORMED BY
1.00°C – 5.00°C	19h	Admin

EQUIPMENT MODEL	NUMBER OF SENSORS
EDGE Thermo	15 sensors

SENSOR SERIAL NUMBERS

LOCATION	SERIAL NUMBER	CALIBRATION CERT. #
BACK-TOP-LEFT	92600044	—
DOOR-TOP-RIGHT	92600044	—
DOOR-TOP-LEFT	92600044	—
DOOR-FLOOR-LEFT	92600444	—
BACK-FLOOR-LEFT	92600444	—
BACK-TOP-RIGHT	92600444	—
BACK-FLOOR-RIGHT	92600447	—
Center	92600447	—
DOOR-FLOOR-RIGHT	92600447	—
BACK Center	92600445	—
TOP Center	92600445	—
DOOR Center	92600445	—
LEFT Center	92600446	—

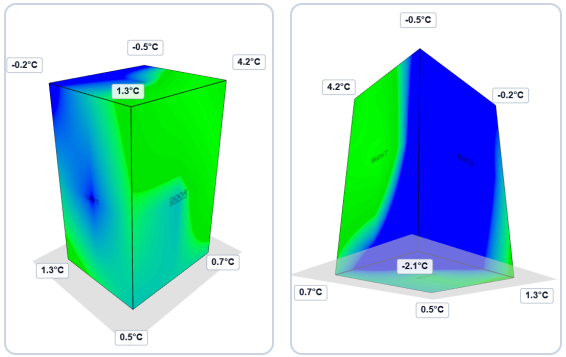
LOCATION	SERIAL NUMBER	CALIBRATION CERT. #
RIGHT Center	92600446	—
FLOOR Center	92600446	—

1.0 — THERMAL ANALYSIS TABLE

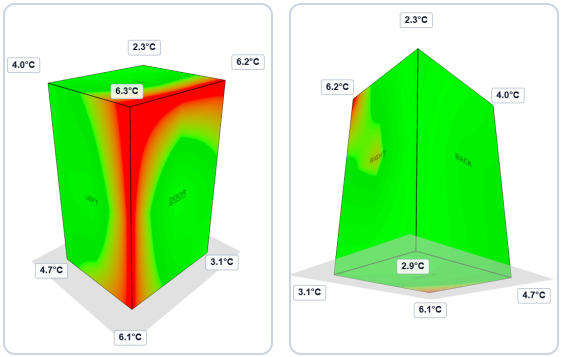
SENSOR LOCATION	LOGGER S/N	MIN	MAX	MKT	AVERAGE	READINGS
BACK-TOP-LEFT	92600044	-0.23°C	3.96°C	1.51°C	1.46°C	1103
DOOR-TOP-RIGHT	92600044	4.24°C	6.22°C	4.98°C	4.97°C	1103
DOOR-TOP-LEFT	92600044	1.25°C	6.33°C	1.85°C	1.82°C	1103
DOOR-FLOOR-LEFT	92600444	0.54°C	6.10°C	2.84°C	2.76°C	1080
BACK-FLOOR-LEFT	92600444	1.26°C	4.74°C	2.63°C	2.61°C	1080
BACK-TOP-RIGHT	92600444	-0.50°C	2.29°C	0.22°C	0.21°C	1080
BACK-FLOOR-RIGHT	92600447	-2.07°C	2.86°C	0.06°C	-0.01°C	1075
Center	92600447	-0.83°C	2.86°C	0.62°C	0.59°C	1075
DOOR-FLOOR-RIGHT	92600447	0.72°C	3.08°C	1.44°C	1.43°C	1075
BACK Center	92600445	-1.58°C	4.10°C	0.68°C	0.60°C	1080
TOP Center	92600445	0.17°C	4.00°C	1.68°C	1.64°C	1080
DOOR Center	92600445	0.48°C	3.04°C	1.25°C	1.23°C	1080
LEFT Center	92600446	-0.03°C	3.89°C	1.44°C	1.41°C	1080
RIGHT Center	92600446	3.28°C	5.49°C	4.11°C	4.10°C	1080
FLOOR Center	92600446	0.90°C	3.36°C	1.68°C	1.66°C	1080
OVERALL SUMMARY	—	-2.07°C	6.33°C	1.92°C	1.77°C	**16254**

2.0 — THERMAL DISTRIBUTION MODELS

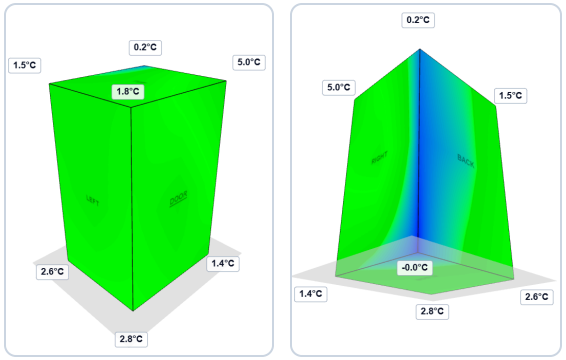
MIN TEMP DISTRIBUTION



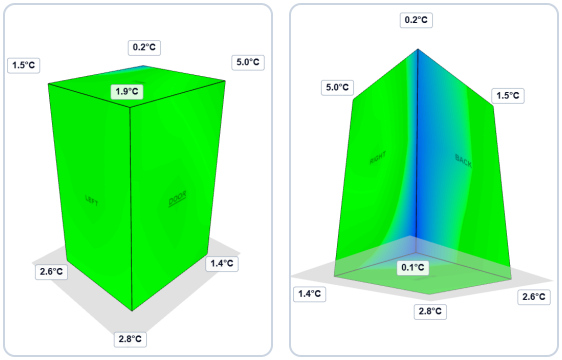
MAX TEMP DISTRIBUTION



AVERAGE DISTRIBUTION

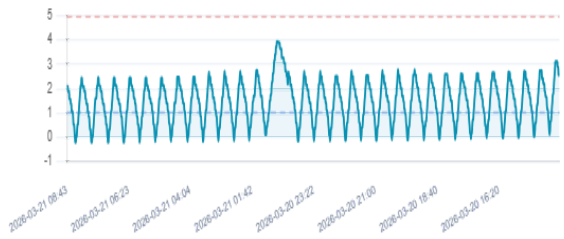


MKT DISTRIBUTION

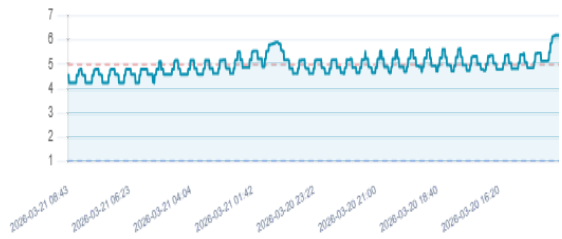


3.0 — INDIVIDUAL LOGGER TRENDS

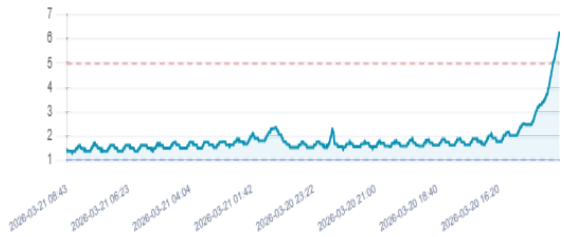
BACK-TOP-LEFT SN: 92600044



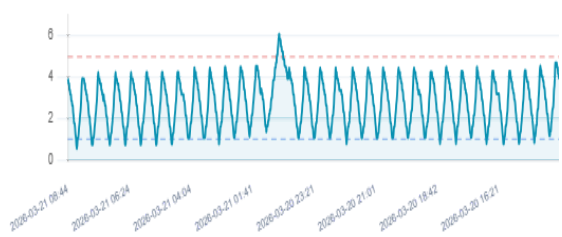
DOOR-TOP-RIGHT SN: 92600044



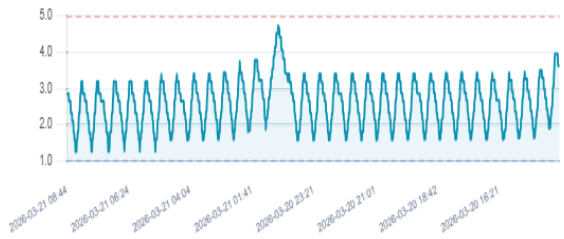
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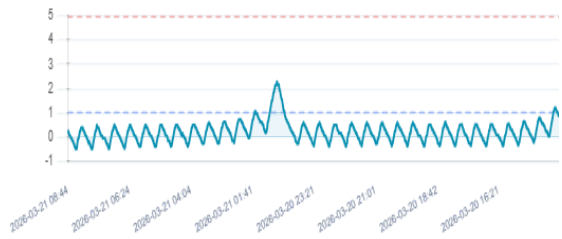
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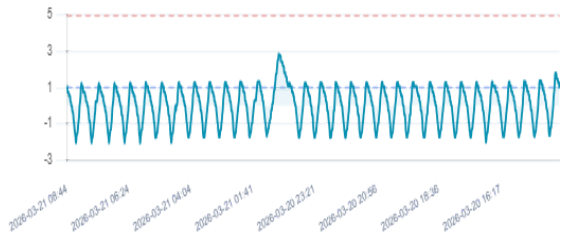
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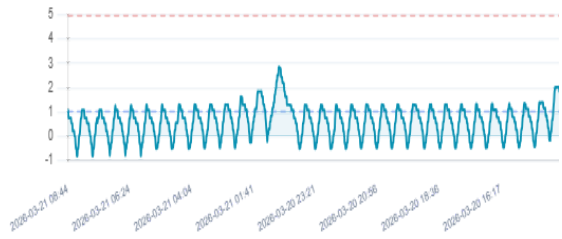
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BACK-FLOOR-RIGHT SN: 92600447

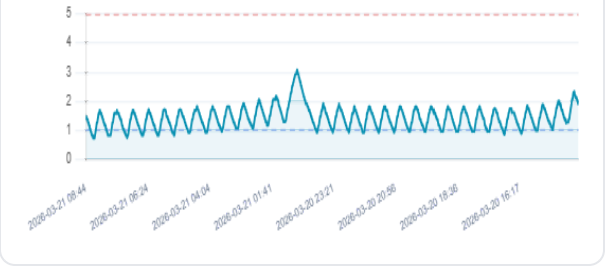


CENTER SN: 92600447



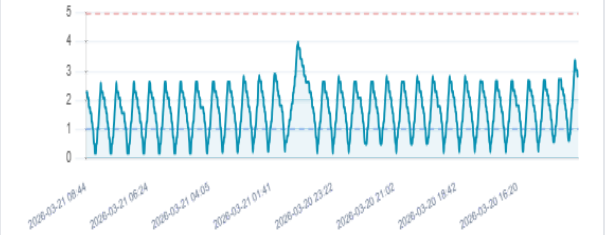
DOOR-FLOOR-RIGHT SN: 92600447

BACK CENTER SN: 92600445

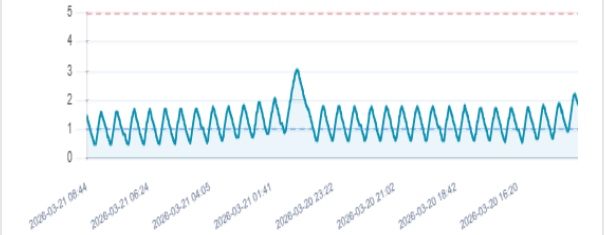




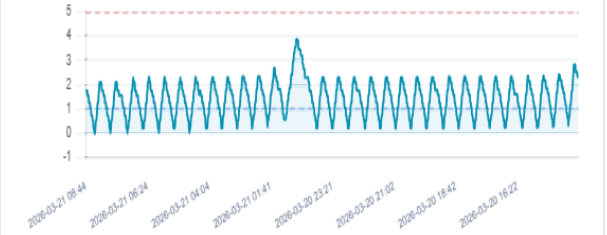
TOP CENTER SN: 92600445



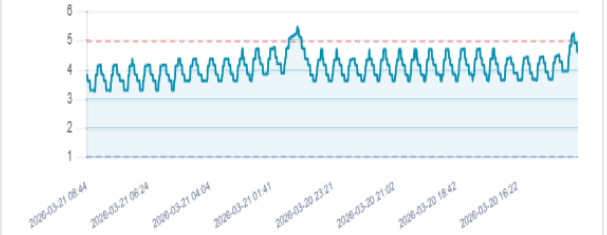
DOOR CENTER SN: 92600445



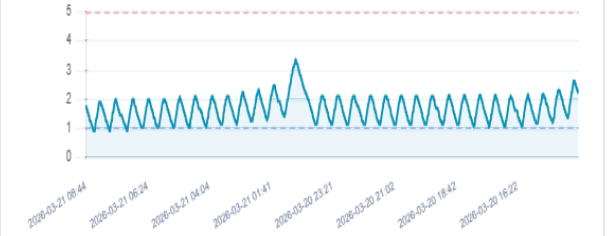
LEFT CENTER SN: 92600446



RIGHT CENTER SN: 92600446



FLOOR CENTER SN: 92600446



4.0 — EXECUTIVE SUMMARY

STUDY OUTCOME

❌ **FAIL**

14 sensor location(s) recorded readings outside the acceptable range.

KEY FINDINGS

Study period: 2026-03-20T14:00 to 2026-03-21T08:45
Overall Min: -2.07°C | Max: 6.33°C | Average: 1.77°C
Overall MKT: 1.92°C (limit: 5.00°C)
15 sensor locations monitored
14 excursion(s) detected

⚠ TEMPERATURE EXCURSIONS DETECTED

- **BACK-TOP-LEFT**: Min -0.23°C, Max 3.96°C — BELOW lower limit (1.00°C)
- **DOOR-TOP-RIGHT**: Min 4.24°C, Max 6.22°C — ABOVE upper limit (5.00°C)
- **DOOR-TOP-LEFT**: Min 1.25°C, Max 6.33°C — ABOVE upper limit (5.00°C)
- **DOOR-FLOOR-LEFT**: Min 0.54°C, Max 6.10°C — BELOW lower limit (1.00°C) — ABOVE upper limit (5.00°C)
- **BACK-TOP-RIGHT**: Min -0.50°C, Max 2.29°C — BELOW lower limit (1.00°C)
- **BACK-FLOOR-RIGHT**: Min -2.07°C, Max 2.86°C — BELOW lower limit (1.00°C)
- **Center**: Min -0.83°C, Max 2.86°C — BELOW lower limit (1.00°C)
- **DOOR-FLOOR-RIGHT**: Min 0.72°C, Max 3.08°C — BELOW lower limit (1.00°C)
- **BACK Center**: Min -1.58°C, Max 4.10°C — BELOW lower limit (1.00°C)
- **TOP Center**: Min 0.17°C, Max 4.00°C — BELOW lower limit (1.00°C)
- **DOOR Center**: Min 0.48°C, Max 3.04°C — BELOW lower limit (1.00°C)
- **LEFT Center**: Min -0.03°C, Max 3.89°C — BELOW lower limit (1.00°C)
- **RIGHT Center**: Min 3.28°C, Max 5.49°C — ABOVE upper limit (5.00°C)
- **FLOOR Center**: Min 0.90°C, Max 3.36°C — BELOW lower limit (1.00°C)

5.0 — OBJECTIVE & SCOPE

The objective of this study was to evaluate the spatial temperature distribution within the temperature-controlled storage area operated by **Office Fridge** and confirm its suitability for pharmaceutical/cold-chain storage within the defined acceptance criteria.

The study covered the entire internal volume of the unit (**L: 58 cm × W: 67 cm × H: 109 cm**), including all vulnerable zones (door, ceiling, floor, corners). The study period ran from **2026-03-20T14:00** to **2026-03-21T08:45** (a total of **19h**), encompassing representative real-world operating conditions.

The temperature mapping was conducted using **15** calibrated data loggers positioned according to the **15-point wireless (5 faces × 3 points)** sensor placement protocol.

6.0 — METHODOLOGY

Equipment: LoggerFlex wireless/wired data loggers with calibrated NTC thermistor probes (±0.1 °C accuracy). All devices were within their calibration validity period at the time of the study.

Sensor placement: Loggers were placed at **15** pre-defined positions covering all critical zones including corners, geometric center, near-door zone, floor level, and ceiling proximity. The 3D placement maps are documented in Section 2.0.

Study duration: 19h. Data was recorded continuously at a sampling interval of approximately every 1 minutes. The study was started after the unit reached stable operating temperature (equilibration period ≥ 4 hours).

Data collection: Temperature readings were retrieved from the LoggerFlex Cloud API (RetrieverID: Tempmapping) after the study period. All timestamps are reported in the user's local timezone (America/Vancouver).

MKT calculation: Mean Kinetic Temperature was computed per ICH Q1E using ΔH = 83,144 J/mol and R = 8.314 J/(mol·K).

7.0 — ACCEPTANCE CRITERIA

PARAMETER	REQUIREMENT	RESULT
Minimum temperature at all sensor locations	≥ 1.00°C	❌ FAIL -2.07°C
Maximum temperature at all sensor locations	≤ 5.00°C	❌ FAIL 6.33°C
Overall Mean Kinetic Temperature (MKT)	≤ 5.00°C	✅ PASS 1.92°C
Temperature uniformity (Max – Min across all sensors)	≤ 3.0 °C	❌ FAIL 8.40°C

* MKT acceptance criterion: MKT must not exceed the upper temperature limit of the acceptable range. Overall MKT is computed from all readings across all sensor positions combined.

8.0 — HOT & COLD SPOT IDENTIFICATION

🔴 **HOT SPOT (HIGHEST MAX TEMP)**

DOOR-TOP-LEFT

Max: 6.33°C | Avg: 1.82°C | MKT: 1.85°C | SN: 92600044

→ Candidate location for permanent temperature monitoring probe.

🔵 **COLD SPOT (LOWEST MIN TEMP)**

BACK-FLOOR-RIGHT

Min: -2.07°C | Avg: -0.01°C | MKT: 0.06°C | SN: 92600447

→ Monitor this location to prevent product freeze risk.

Recommendation: Install permanent monitoring probes at the identified hot spot and cold spot locations. These positions represent the greatest risk of temperature excursion and should be continuously monitored during routine operation. Conduct quarterly re-mapping studies to confirm stability following any significant change to the unit (repositioning, maintenance, load change).

9.0 — DEVIATIONS & CORRECTIVE ACTIONS

DATE/TIME	LOCATION	DURATION	DESCRIPTION	CORRECTIVE ACTION

✅ No temperature deviations or corrective actions were recorded during this study period.

Note: Power failures, door-open events, or equipment alarms should be documented above. If no deviations occurred, this section confirms the study was conducted under uninterrupted conditions.

10.0 — CONCLUSION

Based on the temperature mapping study conducted from **2026-03-20T14:00** to **2026-03-21T08:45** at the facility of **Office Fridge**, the following conclusion is drawn:

The temperature-controlled storage unit (L: 58cm × W: 67cm × H: 109cm) was monitored at **15 sensor positions** covering all critical zones. Over the 19h study period, the overall temperature ranged from **-2.07°C** to **6.33°C**, with an overall Mean Kinetic Temperature (MKT) of **1.92°C**.

The acceptable temperature range was defined as **1.00°C to 5.00°C**. **ONE OR MORE SENSOR LOCATIONS RECORDED READINGS OUTSIDE THE ACCEPTABLE RANGE.** The unit requires investigation and corrective action before it can be approved for temperature-sensitive storage. See Section 4.0 for details.

The identified hot spot (**DOOR-TOP-LEFT**, max 6.33°C) and cold spot (**BACK-FLOOR-RIGHT**, min -2.07°C) should be assigned permanent monitoring probes for ongoing compliance.

PERFORMED BY	REVIEWED BY	APPROVED BY

Admin

Signature / Date	QA Manager / Date	Authorized Signatory / Date