

1 Challenge #1: Dry Ice Shortage

- Dry ice continues to be in short-supply, requires PPE and handling training, and does not provide sample temperature control or monitoring. An average dry-ice block has a life span of 18-24 hours and cannot provide permanent protection.
- Ultra-low temperature (ULT) shipments often rely on dry-ice for -20°C to -80°C samples.
- Alternative option: Stirling ULT freezers and SenseAnywhere use universal electric power supply for complete protection and remote cloud-based monitoring for these critical vaccine doses.

2 Challenge #2: Local Inoculation

- Local leaders will be challenged to get vaccines from a central state repository to remote or immobile communities – rural populations, extended care facilities, nursing homes, etc. without breaking the ULT cold chain.
- On-site ULT storage is absolutely necessary to for multi-dose vaccine treatments.
- Vaccine distribution partnerships with large pharmacy chains or health systems will only work if patients can and will drive to them.
- Large pharmacy chains are not consistently available across the USA – one size may not fit all.

3 Challenge #3: Storage Requirements & Power Supply Limitations

- Depending on which vaccine candidates release, cold storage requirements of -20°C to -80°C must be available. Stirling Ultracold freezers are the ONLY units available to cover that range.
- Most ULT freezers require dedicated power supply to remain operative and are not portable.
- Stirling freezers operate nearly anywhere, powered by standard 120VAC or alternate sources such as: uninterrupted power supplies (UPS) designed for small computers, portable solar panels, or a connection to a 12V DC vehicle power supply.



SU780XLE (-20°C to -86°C)

- 60,000 2ml vials
- 300,000 vaccine doses
- Freezer farm deployment
- Reliable operation in the broadest range of environmental conditions with optional remote monitoring



SU105UE (-20°C to -86°C)

- 7,200 2ml vials
- 36,000 vaccine doses
- Undercounter cold storage
- Ready-now vaccine access and flexible to support local storage



ULT25NEU (-20°C to -86°C)

- 1,800 2ml vials
- 9,000 vaccines doses
- Uniquely portable storage for clinics
- Plugs in anywhere, worldwide