Cincinnati Sub-Zero

GO GREEN with CSZ and Save

Environmental chambers utilizing CSZ's patented Tundra® refrigeration systems offer more performance and can save up to 54% in operating costs!

How can CSZ test chambers with the Tundra save operating costs?

Operating costs are reduced compared to a chamber with a cascade refrigeration system since there is only one compressor now needed to run temperatures as cold as -45˚C and -54˚C. This can provide your company with substantial costs savings.

Energy efficiency for refrigeration compressors is measured by the Energy Efficiency Ratio (EER). Typical EERs at -40˚C are:

- **Tundra 3.5 EER**
- **Tundra II 4.6 EER**
- **Cascade 2.5 EER**

What is the Tundra refrigeration System?

Conventional single-stage systems can reliably test product to -34˚C. The patented Tundra and new Tundra II systems can efficiently test product to -45˚C or -54˚C with a single compressor.

Tundra

Tundra is a patented refrigeration system design that uses one compressor and can be used in any CSZ chamber from 3.5 to 15 HP. The Tundra is ideal for testing products down to -45˚C. The Tundra is a proven and reliable system that has been in production for over 10 years.

Tundra II

Built off of the original Tundra platform, the Tundra II is a unique refrigeration system design that also uses one compressor and can be used in any CSZ chamber available from 12 to 30 HP. The Tundra II is ideal for larger systems and accelerated testing down to -54˚C.

The Tundra system offers the following benefits:

- Increased Performance Capacity - The system offers even greater capacity with rapid temperature change rates and increased live load capability.
- High Reliability – Utilizing proven refrigeration system design that has a single compressor with fewer parts than a cascade system adds to the reliability of the Tundra system. CSZ provides a 3 year part & labor warranty on Tundra chamber compressors.
- Reduced Maintenance Costs – With few parts to service, maintenance cost will be lower.

Myths and Facts about the Tundra® Refrigeration System

1. **Myth:** The compressor may have high discharge temperatures and will be damaged.
   Fact: The discharge temperature is controlled at approximately 200°F. Copeland, the compressor manufacturer, approves up to 225°F for reliable operation.

2. **Myth:** The compressor is not designed for R-410A.
   Fact: This is true; it is designed for R-404A. However, during the prototype phase CSZ worked with Copeland to run simulated life tests on two different size compressors. They were disassembled after the test and confirmed no unusual wear was found.

3. **Myth:** The compressor will not be covered by Copeland's warranty.
   Fact: After evaluation of the prototype compressors, Copeland granted CSZ approval for this application, which includes their standard warranty.

4. **Myth:** The system will run at high pressures which will damage the compressor and other components.
   Fact: Part of the design/patent limits use of the Tundra to indoor applications for air cooled and water cooled units only. With these specifications, the discharge pressures will be within the normal operating pressures of a typical R-404A system.

5. **Myth:** To achieve -40°C or -45°C the compressor is running at undesirable conditions.
   Fact: This system is designed to stay inside the typical operating pressures of R-404A. To run the temperatures listed above, the system will operate at the same pressures as an R-404A system running at -34°C and -40°C, respectively.

6. **Myth:** Compressor will wear more quickly running at these "extremes" and eventually will not be able to achieve -40°C or -45°C.
   Fact: There is no evidence of this happening. In fact, CSZ has testimonials from customers with units that are several years old still running -40°C with no issues.

7. **Myth:** This is unproven technology and there are not many units in the field.
   Fact: CSZ has sold over 500 systems in all types of chambers, including reach-in chambers, Walk-ins, Altitude, Thermal Shock and Liquid Conditioners. The Tundra has been on the market for over 10 years.

8. **Myth:** Little power is saved when operating a Tundra vs. cascade.
   Fact: Up to 54% of power consumption can be saved with the Tundra system.

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