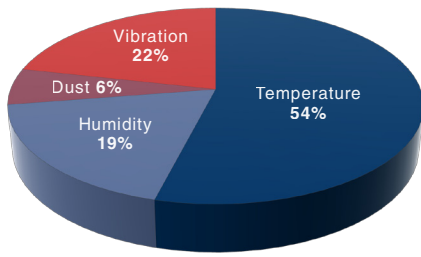


Electronic Equipment Failures: Cause, Effect and Resolution



Electronic Equipment Failure Causes

High temperatures cause over 50% of electronic equipment failures, according to a study by the US Air Force Avionics Integrity Program. Vibration and humidity each contribute an additional 20% of failure says the same study. Long term weather forecasts for 2014 predict temperatures in many areas will be hotter than normal beginning in May and continuing through August with temperatures peaking in late June through late August. To prevent loss of productivity this summer, take preventative action now to address thermal management of electrical components, electronics, control systems and VFDs.

Research shows that every 18°F rise in temperature in an electrical enclosure reduces the reliability of the electronic components by 50%. And with manufacturers and integrators placing a higher density of components in each cabinet, the heat load is amplified.

So what impacts the temperature rise in an enclosure?

1. Heat input of the components in the enclosure:

Ideally, the component manufacturer or integrator will provide this information. If not, the heat input can be estimated by determining the temperature inside and outside of the enclosure, at several ambient temperature levels.

2. Enclosure Materials of Construction:

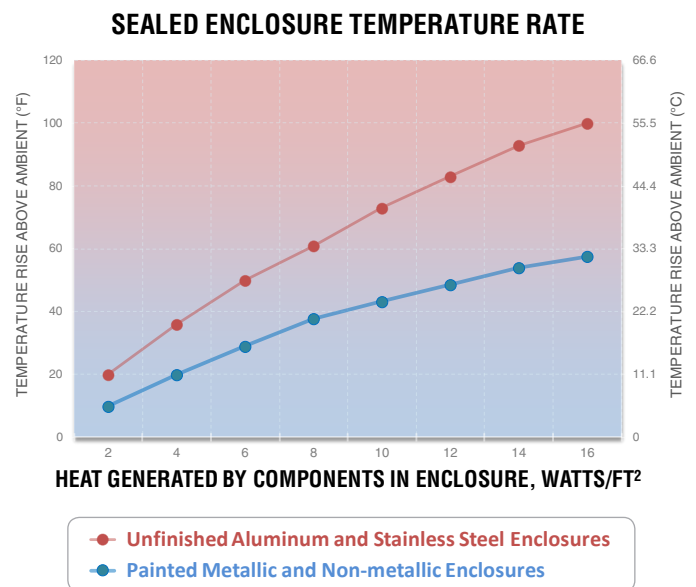
Non-metallic and painted metallic enclosures maintain coolness better than unfinished metal enclosures.

3. Enclosure Surface Area:

Larger enclosures dissipate more heat from the components than smaller boxes.

4. Solar Effects:

Enclosures exposed to direct sunlight absorb more heat. Additionally, darker colored enclosures absorb more heat than lighter colored enclosures.



The [Vortec Heat Load Calculator](#) incorporates all of these factors into an easy-to-use calculator.

Impact of Vibration and Humidity

The USAF study cited above attributes 40% of electronics failures to vibration and humidity. Unfortunately, many methods for managing heat inside an enclosure contribute detrimentally to vibration and humidity inside the enclosure:

- Refrigerant-based air conditioners can increase vibration
- Fans push humid air through an enclosure.

[Vortec Enclosure Coolers](#) combat all three issues at once, circulating clean, dry, cold air through the enclosure to cool the electronics, without any moving parts to cause vibration. Vortec has a complete line of enclosure coolers to handle any heat load from 400 BTU/hr up to 5000 BTU/hr. Our thermostatically controlled Vortex A/C Enclosure Coolers maintain ideal temperatures in the enclosure to keep electronic components functioning at optimal levels.