

## Cold Temperature Operation of Solid State Lighting Systems

### Cold Temperature Operation

Color Kinetics makes a wide variety of fixtures for many applications including dry, damp, wet or submersible operations. All of these fixtures and power/data supplies are thoroughly tested to meet regulatory and compliance standards by Underwriters Laboratories and other certified and traceable third-party laboratories. In addition to safety, emissions, and electrical testing, a variety of environmental testing procedures are employed both within Color Kinetics and by external third party testing companies to insure product quality.

Environmental product testing includes a rigorous set of thermal cycling, humidity, salt fog, spray, water immersion and more depending on the fixture application. These tests determine both Ingress Protection (IP) ratings and other environmental testing specifications.



### Low Temperatures

The limitation for low temperature operation of solid-state lighting is not the LEDs themselves; other electrical components are often the limiting factor. However, we have successfully tested all of Color Kinetics' outdoor-rated fixture operation to  $-40^{\circ}\text{C}$  (or  $^{\circ}\text{F}$ ) without component or system failures. All of Color Kinetics' outdoor fixtures have been tested to  $-40^{\circ}\text{C}/^{\circ}\text{F}$  including ColorBlast4/12, ColorBurst4/6, iColor Flex SL, iColor Tile, ColorCast 14, iW Cast and iW Blast. This also includes all outdoor rated power supplies such as the PDS 60 series and other NEMA 4-type enclosures. While published startup temperature is down to  $-20^{\circ}\text{C}$ , in operation the units can be at temperatures down to  $-40^{\circ}\text{C}/^{\circ}\text{F}$ . This means that the fixture can be started at the standard range but the ambient temperatures can go considerably below that range during operation.

### Examples of Low Temperature Operation

We have many customers who have successful exterior Color Kinetics installations in cooler climates. This includes installations in both Alaska and Canada with good success. These include:

- Eaton Centre, Toronto with 250 eight foot sections of iColor Accent.
- Winterlude in Montreal, Hundreds of ColorBlasts and Fresco emplaced in ice sculptures.
- SoHo Metropolitan Hotel, Toronto, iColor Accent on the exterior
- and many more.



In summary, Color Kinetics stands by its products and lighting systems. backed by extensive testing of its outdoor rated fixtures at very low temperature operation to  $-40^{\circ}\text{C}/^{\circ}\text{F}$  and many successful installations in cold regions.