

February 16, 2009

White Paper:

Low Voltage ProLED® Products

Recently, there has been some confusion about the compatibility of the low voltage DC products produced by Halco under the ProLED brand name. This document is to address compatibility issues and concerns.

All 12 volt power sources require a transformer to operate with the American Standard 120V 60Hz power that comes out of nearly every wall socket. The vast majority of these transformers are Magnetic transformers, using coils and magnets to convert the 120VAC power into 12VAC power. Some electronic power supplies provide 12VDC and some will provide 12VAC power. Since the traditional use for low voltage lighting has been filament based incandescent and halogen products, it is usually not a distinction that is noticed. Filament based products will operate in a nearly identical manner on AC or DC as long as the voltage is the same, as it operates on a principle of heating a filament with current to produce light. A filament doesn't care which way the current flows, or if it is switching, it heats up either way.

ProLED products are not filament based products, they are electronic products. The LED chips within the ProLED lamps that actually produce the light operate in a very narrow range of voltage and current, because they are essentially a type of microchip. Within the ProLED product case is a driver designed to convert 12VDC power down to the voltage and current that is accepted by the chips. All of the ProLED low voltage products are designed to operate on a Direct Current (DC) system, designed for 12VDC but capable of operating within a range of 8VDC to 25VDC input voltage.

A 12VAC *Magnetic* transformer will run the ProLED products properly, but *some* of the 12VAC Electronic transformers will not. While most (about 90%) electronic transformers are compatible, some can cause problems for the electronic drivers contained within the ProLED products, depending on the frequency and waveform. Another potential problem is with *load balancing transformers*, which turn off if not enough power is being drawn. This is due to the extremely low power that LED lamps use in comparison to incandescent or halogen.

The performance is slightly different with AC power as well. At 12VAC the power consumption of the ProLED products is about 10% more, and the output is about 10% lower. The problem with the differences in transformers is if you ask many of the fixture manufacturers' technical departments, many don't know immediately whether or not the transformer is AC or DC, and it is not always included in the product literature.

To prevent issues and problems on installations, it is suggested that when considering the purchase of ProLED products, or any other low voltage LED product, a test of a few of the desired products in the desired fixtures be performed, even if the manufacturer of the fixture assures compatibility.

While we cannot control what the fixture manufacturers put in their product, we are working on a miniature device that can be wired between the transformer and socket that will convert *any* 12VAC current into DC current, pre-empting any issues, guaranteeing dimmability, and improving performance of the produce over an AC circuit.

If you have any questions, please feel free to contact Halco and the Product Development Department, and we will answer your questions the best we can.

For information contact:

David Nelkin
Director, Product Development
Halco Lighting Technologies
dnelkin@halcolighting.com