



ADVANCE Class N  
200°C Insulation

Standard on Ballasts  
600W and Higher!

### Overview

For many years, High Intensity Discharge (HID) core & coil ballasts have been standard throughout the lighting industry with a UL insulation system temperature rating of "Class 180". Also known as "Class H", this rating permits a maximum ballast coil hot spot temperature, during operation, of 180°C. In some installations, typically associated with higher lamp wattages, the Class H coil temperature limit can pose a restrictive barrier to effective fixture design and application. A higher UL insulation system temperature rating exists. Known as "Class 200", or "Class N", it allows maximum ballast coil temperatures to reach 200°C, a 20°C improvement. However, until now, the Class N rating was difficult to achieve in a highly-producible, cost-effective ballast design.

To answer this challenge, Advance is proud to introduce a Class N (200°C coil temperature) insulation rating as standard on all ballasts rated 600W and higher.

### Problem Solving Opportunities

- Applications now possible where higher ambient temperatures previously limited ballast and fixture options
- Fixtures can be installed into more accessible but warmer areas, decreasing installation and maintenance costs
- Extra 20°C margin between operating temperature and ballast design limit ensures long life and reliability in many applications
- Added flexibility in new fixture designs for thermal management of the ballast(s)

## High Temperature Insulation System for HID Ballasts



### Dual Rated: Class H (180°C) / Class N (200°C)

To facilitate inspection of lighting fixtures, UL has developed a system for categorizing ballasts by assigning a letter code (A,B,C, etc) according to coil temperature rise measured while operating the ballast on a bench top in the controlled conditions of a lab (not in a lighting fixture). The temperature rise letter code scale for Class N insulation ballasts differs from that of Class H ballasts as shown in the chart below. Essentially there is a 20°C difference in the respective rating scales. To minimize confusion, and considering that ADVANCE Class N ballasts are also perfectly suitable for Class H applications, they are marked with dual Class H / Class N temperature codes.

UL Temp. Rise Code	Class H (180°C) Temp. Rise Range	ADVANCE Class N (200°C) Temp. Rise Range
A	less than 75°C	less than 95°C
B	75°C < 80°C	95°C < 100°C
C	80°C < 85°C	100°C < 105°C
D	85°C < 90°C	105°C < 110°C
E	90°C < 95°C	110°C < 115°C
F	95°C < 100°C	115°C < 120°C
G, etc.	etc.	etc.

Consult the *Conditions of Acceptability* on reverse side prior to specifying ADVANCE Class N ballasts

# ADVANCE Class N Conditions of Acceptability

- Lead wires are rated 150°C maximum In-fixture testing of ballasts should also include measurement of ballast lead wire temperature at the point where the wires enter the ballast outer wrapper and any other points where the wires could contact hot surfaces. Since a small portion of the lead wire insulation is positioned underneath the ballast out wrapper, the surface temperature of the outer wrapper near the wires should also be measured. All measurements must be 150°C or below at the fixture's intended ambient temperature rating.
- For Class N and Class H systems, 200°C and 180°C, respectively, represent maximum theoretical hot spot temperatures within the ballast coil and cannot be measured directly with accuracy. Therefore, the ballast coil temperature must be determined in the intended fixture using either the thermocouple or rise-of-resistance methods as outlined in UL1598, the *Standard for Luminaires* (Table 11.1.2, Clauses 16.6 & 16.7). The following table provides a quick reference to the requirements noted above with respect to Advance Class N and Class H ballasts:

## Maximum Allowable Ballast Temperatures

	CLASS H	ADVANCE CLASS N
Coil hot spot temperature (not measured)	180° C	200° C
Coil temperature by Rise-of-Resistance Method	165°C	185°C
Coil temperature by Thermocouple Method on outer coil surface	150°C	150° C (170°C <sup>Note 1</sup> )
Lead wires	150°C	150° C (200°C <sup>Note 1</sup> )

- Although ADVANCE Class N ballasts provide more thermal flexibility in fixture applications than their Class H counterparts, the case temperatures of capacitors and/or ignitors in the ballast circuit also need to be evaluated to ensure they do not exceed their respective maximum ratings. Advance offers a wide selection of 100°C rated dry-film capacitors and 105°C rated ignitors.

## Ballasts Available with ADVANCE Class N Insulation STANDARD <sup>Note 2</sup>

Metal Halide		High Pressure Sodium	
750W M149 (Pulse-start)	71A64_2 SuperCWA	600W S106 [	71A85_5 CWA
1000W M141 (Pulse-start)	71A65_3 SuperCWA		71A85_8 CWI
1000W M47	71A65_2 CWA	750W S111	71A86_5 CWA
1500W M48	71A67_2 CWA	1000W S52	71A87_3 CWA
1650W M112	71A68_0 CWA	<b>Mercury Vapor</b>	
2000W M134	71A69_0 CWA	1000W H36	71A50_0 CWA

Notes:

1. Class N ballasts with 200°C lead wire available on special order basis. Consult factory for availability.
2. Most other core and coil ballasts can be built with the ADVANCE Class N insulation system on a special order basis. Consult factory for availability.



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