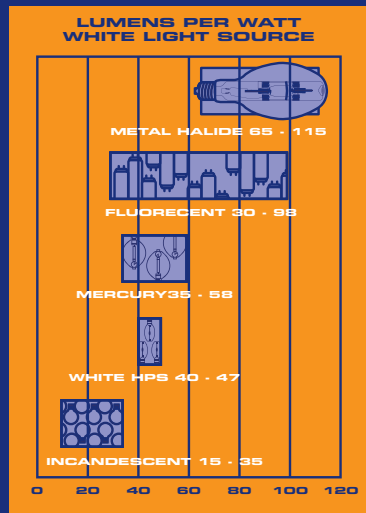
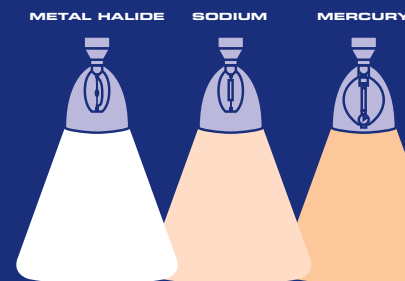
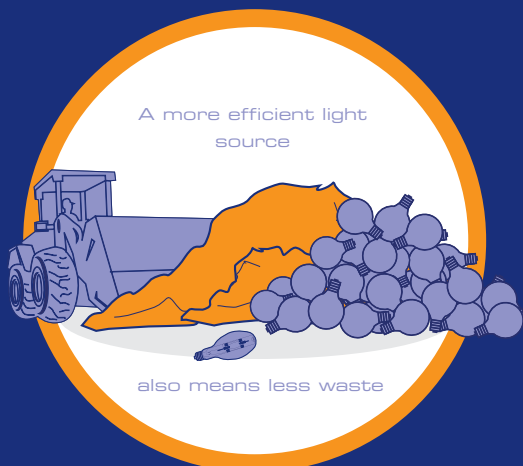


# ABOUT METAL HALIDE



## Fun Facts

In 1893 Nikola Tesla used cordless low pressure gas discharge lamps, powered by a high frequency electric field, to light his laboratory. He displayed fluorescent lamps and neon lamps at the World Columbian Exposition.



Metal halide generates light that is closer to sunlight than any other HID light source.



# TECHNICAL INFORMATION

# ABOUT PULSE START

## CHARACTERISTICS

The unique characteristics of metal halide lighting provide high performance such as:

**Long Life** Metal halide lamps have an average life of 15,000 - 20,000 + Hours, more than 10 times that of incandescent lamps

**Better Light Quality** The output of metal halide lamps is closer to natural sunlight than most other light sources. People prefer white light because of better visual acuity, even at lower light levels.

**Excellent Color Rendering** Metal halide lamps offer excellent color rendering, with a 65-90+ CRI (color rendering index).

**Compact Size** Metal halide lamps generate high light levels from a compact light source. This allows for smaller, more controllable luminaires.

**Versatility** Metal halide lamps are unaffected by ambient temperature and are equally suited for indoor or outdoor use. Extensive style and wattage options allow for many applications.

**High Efficiency** Metal halide lamps generate 65-115 lumens per watt, more than incandescent, fluorescent or mercury vapor lamps. (see chart at left)

**Positive Environmental Impact** Since metal halide lamps deliver light more efficiently than incandescent, widespread acceptance of the technology has a positive effect on air quality and the environmental waste stream. Lower electrical power generating requirements means less air pollution. Efficient long-life systems mean less landfill waste.

### TECHNOLOGY GOES HEAD-TO-HEAD

**MH vs. Incandescent** A 100 watt pulse start metal halide lamp provides five times the lumen output of a 100 watt incandescent lamp, and will last 20 times longer. Although incandescent has a low initial lamp cost, metal halide has a lower total operating cost over the life of the lamp.

**MH vs. Mercury Vapor** Mercury vapor lamps have long life, but are not as energy efficient as metal halide, producing only 35-58 lumens per watt. Their limited blue-green light spectrum has a lower CRI than metal halide.

**MH vs. HPS** While HPS lamps offer long life, they do not deliver the same light quality as metal halide. Because of their dominant sodium content, HPS lamps yield strong yellow light (2200K) and have a very poor CRI of 20-25. The full spectrum light of metal halide lamps has a much higher CRI.

**MH vs. Fluorescent** Fluorescent lamps are difficult to direct because of their larger size. One 100 watt pulse start metal halide lamp produces the same light as three 45" high output T5 Fluorescent lamps. Metal halide lamps also tolerate a wider operating temperature range. Fluorescent lamps are often limited to temperature-controlled indoor applications: T8 Fluorescent lamps perform optimally at approximately 70°F (25°C), degrading measurably as temperature varies. T5 lamps perform similarly, but peak at 95°F (35°C).

**Wider Range of Applications** Specifiers can now select from a broad variety of lamp types and wattages to instead of 10 suit almost any application. Metal halide lighting is used today indoors and out, for industrial, commercial, retail and municipal spaces. Popular for sports facilities, and site lighting, it is increasingly found in supermarkets, big box retail, offices and lobbies.

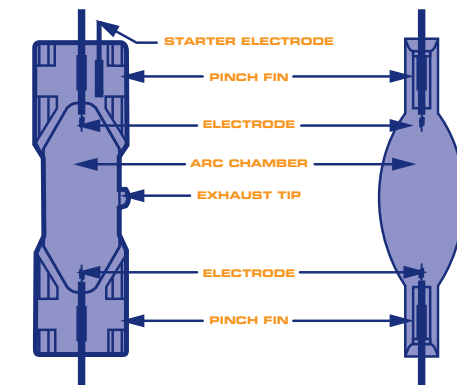
**The Most Advanced Technology** A major advancement in metal halide lighting was the introduction of Venture's revolutionary Uni-Form-pulse start system. This second generation technology holds the future for metal halide.

Uni-Form systems offer up to 50% more lumens per system watt than do standard probe start metal halide lamps and ballasts. Its capabilities continue to improve. Recently, Venture became the only manufacturer to offer Uni-Form lamps optimized for horizontal-only operation. Venture's high wattage e-Lamp product, designed for operation on high frequency electronic ballasts with builtin dimming down to 35% power, is another unique new high performance product. Future developments will soon bring better lumen maintenance and even more wattage options for specifiers.

## UNI-FORM® PULSE START LAMP TECHNOLOGY

Uni-Form lamps provide superior performance compared to standard probe start metal halide lamps. The specific benefits are higher efficacy, better color uniformity, faster warm-up, improved lumen maintenance and longer life. It all takes place in Venture's revolutionary formed-body arc tube.

**Probe Start Arc Tube** vs. **Uni-Form® Pulse Start Tipless Arc Design**



One key to superior lamp performance is heat management. In probe start arc tubes, uneven heating prevents optimum arc enhancement. Venture created an exclusive, tipless formed-body arc tube, sculpted to follow the actual curve of the arc stream. The shape creates a more uniform temperature profile. Higher temperatures draw more halides into the stream, resulting in more light generated. Venture's unique sculpting process also molds each arc tube for improved color uniformity.

**System Solutions** Venture's pulse start system technology, actualized in Uni-Form lamps and Opti-Wave® ballasts, represents advancement as important as the invention of the metal halide lamp. Every change in arc tube design, lamp construction and the ballast enhances overall system performance. This metal halide focus allows us to offer a vast array of integrated packages, providing optimum lighting efficacy and quality for virtually any application.

### HIGH PERFORMANCE DESIGN

**Formed-Body Arc Tube** The shape of Venture's formed-body quartz arc tube follows the actual curve of the arc stream, preventing uneven temperatures in the arc tube surface. This significantly improves thermal performance and allows more halides

to be pulled into the arc, thus emitting more light.

**Reduced Pinch Seals** The large pinch fins on standard probe start metal halide arc tubes radiate heat. By reducing the quartz mass in the arc tube, Venture's formed body arc tubes help in producing a more uniform thermal profile which results in greater lamp efficacy.

**Tipless Arc Tube** The exhaust tip on probe start arc tubes creates a cold spot which degrades arc tube performance. Venture's exclusive tipless design ensures a totally uniform arc tube shape, improving efficacy and color uniformity.

### High Voltage Pulse Ignition

High voltage pulse starting eliminates the starter electrode, bi-metal switch and resistor of standard probe start lamps. It also provides quicker breakdown of gases, so starting (cold and hot) is faster.

### Higher Fill Pressure

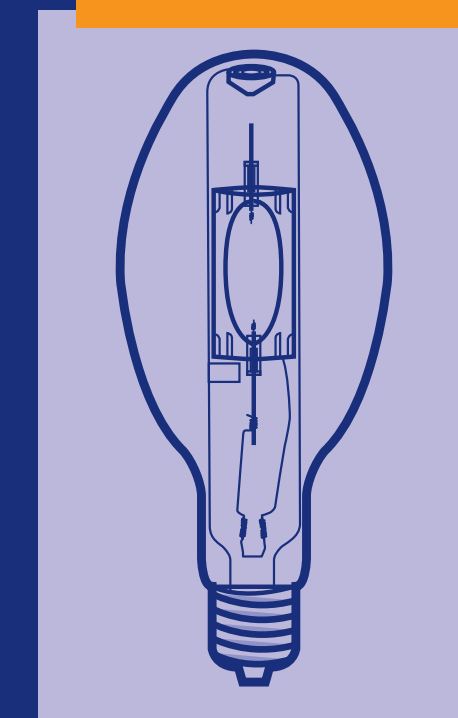
Venture's formed-body design and pulse ignition support a higher fill gas level that helps to reduce wall blackening caused by tungsten sputtering from the electrodes during starting.

### Weldless Arc Tube Mount

Venture's nearly unbreakable, patented weldless construction is stronger than standard welded mounts.

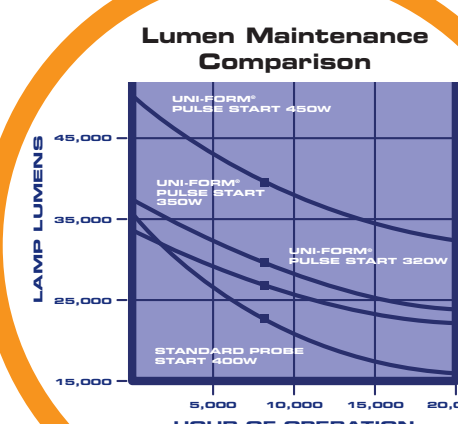
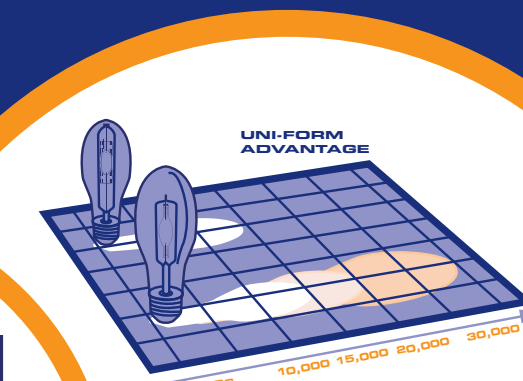
### Opti-Wave® Ballasts

The lower current crest factor in the electrical output of Venture's Opti-Wave ballasts improves lamp lumen maintenance. Ballast energy losses are reduced by as much as 50% compared to standard probe start CWA ballasts, and ballast noise levels are significantly reduced.



## Fun Facts

The "Fountain of the Planets" at the 1964 New York World's Fair was illuminated by GE's new metal halide lamps.



Standard Probe Start