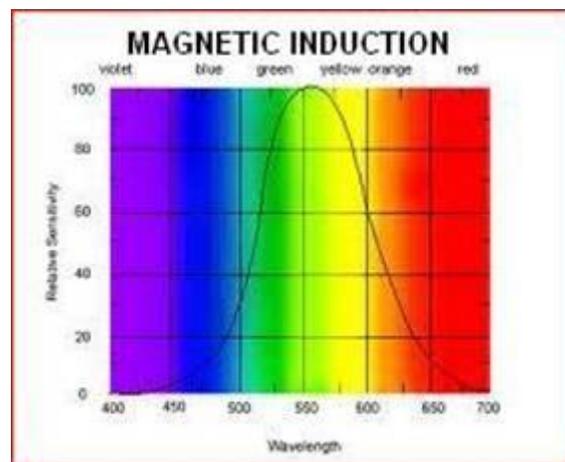
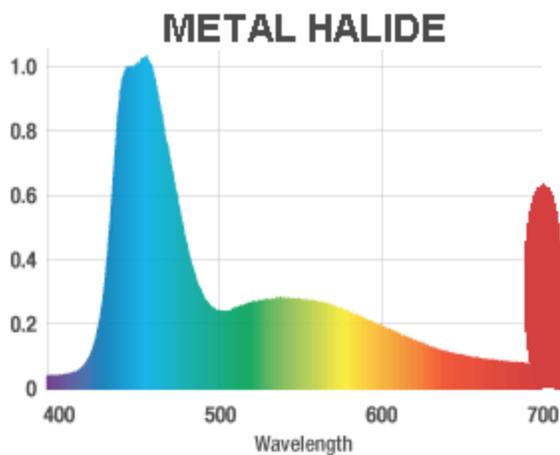


## SNOW-BRIGHT™ FAQ'S

Do Snow-Bright™ MIL fixtures produce the same lumen output as HIDs, in spite of much lower wattage?

No, a 300W Snow-Bright™ fixture will not produce the same lumens as a 1,000W MH measured at the source. When measured at the bulb, the MH produces more lumens, but not within the visually effective range of the human eye (known as Visually Effective Lumens or VEL). The photometric graph below shows a comparative dispersion pattern (note that our VariBeam™ technology changes the focal length of the fixture, a feature not available with MIL fixtures). For example, a high-intensity Mongoose fixture by Halophane that is frequently used to light playing fields has a very high spectral output in the ultra-violet and deep blue range as well as substantial heat and a significant spike in the deep red to infrared range. Neither the blue or red range is effective for properly lighting snow.



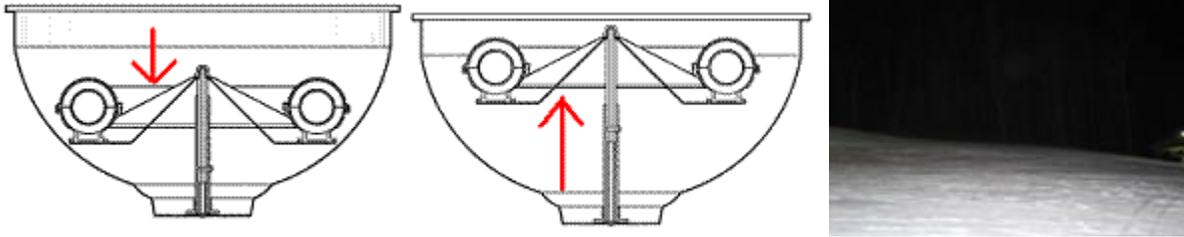
The science of lighting a white reflective surface like snow, centers on the type of light as opposed to the intensity. This is why Snow-Bright™ can achieve more visual acuity on the snow with less power. Moreover, the Mongoose lamp utilizes an intense concentrated light source that results in very poor dispersion onto the snow as well as “hot spots.” The Snow-Bright™ bulb provides a very large source and uses a nano-white high dispersion reflector specifically tuned for snow.

We are happy with our MH fixtures. Explain why Snow-Bright™ fixtures achieve superior visual acuity over our existing MH lamps for illuminating snow?

MH does not produce consistent color. Depending upon the model, the color rendition index for most MH lighting ranges from 65 to 90. Since MH is a very hot bulb, the lumen output and color can be significantly affected by cold temperatures. From freezing down below zero F, the light output can deteriorate as much as 20% to 40%. Also, MH bulbs lose 20% of their lumen output within the first third of the lifecycle. For example, the Mongoose color temperature is 5000K which is not ideal for snow. In comparison, Snow-Bright™ is a tuned 6500K light that maintains consistent output without sensitivity to ambient temperature. The CRI of Snow-Bright™ is greater than 90. The bulb yields only 140 degrees F at its surface. Snow-Bright is designed to provide consistent color without snow glare. Aside from color, the most important consideration is glare, which causes the pupil to expand and contract from hot spot to hot spot. MH fixtures are sure to look nice and bright, but in actuality the issue is that they are too bright and cause excessive contrast that flattens the snow's appearance.

**Are Snow-Bright™ lights "full area cut off" fixtures?**

**Yes! This was one of the most important design features that allowed Steamboat to get their town approval for their night skiing expansion on Mt. Werner. Snow-Bright™ with its proprietary VariBeam™ technology actually provides more than full cut-off. It allows you to stop the light at the edge of the slope by raising or lowering the bulb assembly within the reflector. By providing us with your CAD files complete with contours, we will prepare a photometric study and determine the lighting boundaries of a Snow-Bright™ illumination plan. This picture of the Mt. Peter installation shows how the light extends exactly to the edge of the slope and cuts off, leaving the trees completely in the dark.**



**Will we get a chance to ski under these lights to see if they really do have light qualities as good (or better) than MH or HPS lights?**

**A demo of the lights without snow on the ground would prove little; however we can provide some photography that illustrates the quality of the light and the resolution on the snow. As an example, in the pictures below, notice the color rendition on the red netting, even at a distance (picture on left). There is no glare from the lamp. The detail on the snow is clear and sharp. Keep in mind that this is a single 300-watt fixture.**



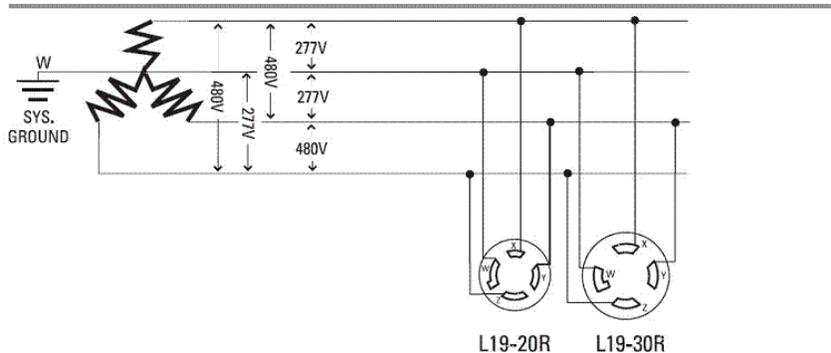
**The picture on the right demonstrates the difference between Snow-Bright and sodium. Notice the orange tint of the HPS fixture down the hill and to the left, compared the white light provided by the Snow-Bright™ fixture.**

**Our current fixtures use 480V. Will the Snow-Bright™ fixtures work on our current wiring scenario?**

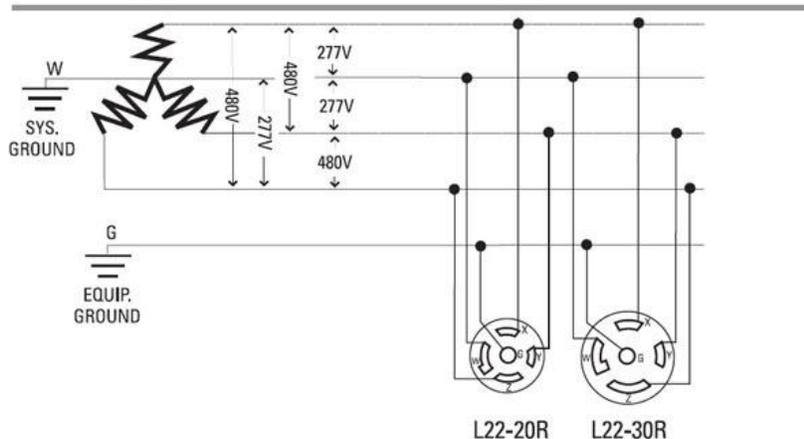
**Snow-Bright™ driver ballasts are auto-sensing from 110V to 277V. To go from 480V to 277V requires the neutral. The Snow-Bright™ current consumption is about 1 amp at 277V. We have not encountered any problems with other existing 480V infrastructure. The "in-rush current" for Snow-Bright™ lamps is negligible. By comparison, the Mongoose 1000-watt fixture carries a ballast overhead between 50W and 150W and a significant "in-rush" current when switched on of about 10X. Generally, Snow-Bright™ drivers will be more robust and less vulnerable to current and voltage issues. For example, the Mongoose ballast has tighter operating parameters since the ballast for their 480W is**

not autosensing, nor does it have built-in protective circuitry for sags and spikes. MH ballasts are also susceptible to high frequency noise and harmonics that result from variable frequency drives (VFDs) that many ski areas have installed on their lift motors (see wiring schematics below).

#### 4-Pole, 4-Wire Non-Grounding: 3Ø 277/480V



#### 4-Pole, 5-Wire Grounding: 3Ø 277/480V



Replacing lamps and ballasts is expensive and time consuming. How often will I have to replace the Snow-Bright™ lamps, and are mounting brackets included?

Snow-Bright™ lamps have a lifecycle rating of 100,000 hours (50+ years under normal ski area usage). They maintain better than 90% of their luminosity over their lifecycle. By comparison, metal halide can lose 20% to 40% of their output within a single season. There are two mounting brackets which are available: the standard U-bracket and the optional Slip-fitter U-bracket. The slip-fitter mounts onto a 2 3/8ths bullhorn. There is an additional cost for the heavy-duty slip-fitter bracket depending upon the quantity of the order.

What about LED lights?

LED lights (Light Emitting Diodes) are highly energy efficient, but they are not practical for lighting snow surfaces because LEDs tend to have deficiencies in spectral output, which can only be compensated with overly intense output. LED fixtures can be 3-4 times the price of MIL or HID fixtures.