

GYMNASIUM APPLICATIONS

Technology is our specialty: Gymnasium lighting by LaserLight Inc.

Gymnasium lighting is for sports activities and as such is not as easy as it might seem. Certainly there are Recommended Practices (IES RP6-01) which recommend minimum illuminance and uniformity for Class I, II, III and IV basketball, and discusses other design issues to watch out for. These design issues are nearly as important as the illuminance (footcandle) level on the floor.

Uniformity:

Uniformity: This is how “even” the lighting is, with maximum and minimum intensities being very similar to each other (no “bright” or “dim” spots). Class III lighting design requires that the Uniformity Ratio is no greater than 3.0-to-1. Example: Maximum= 75ftC (brightest spot on the floor) and Minimum=25ftC (dimmest spot on the floor).

Uniformity Gradient is an issue that is important for basketball when the ball is passed or shot (moving fast horizontally). As the ball travels, it may be lighted by different fixtures, and it may be lighted “brighter and dimmer” as it travels. When the ball moves from a darker to a brighter area, it appears to accelerate... and when it moves from brighter to darker, it appears to decelerate. It’s an optical illusion that can affect the player’s reactions to the ball, and it’s important to minimize this effect to acceptable levels. For Class III play, a ratio of 1.5 or less is an acceptable UG. Example: if the ball moves from a 60ftC area to a 40ftC area (or the reverse) the acceleration/deceleration effect is minimal.

Glare is experienced when a very bright light (or reflection) makes it difficult to see other objects or players. With very bright lights mounted 25 or 30 feet above the floor, they may not present much of a glare issue when looking down or across the court, but when looking up at the basket, or upwards at the ball, glare cannot be avoided. White painted ceilings can help by minimizing the contrast between luminaire and the ceiling behind it. Locating the luminaires some distance (at least outside of the “Key”) from the basket eliminates the worst glare issues, however, locating them too far away will result in a “dim” area under the basket.

Performance Story: Point-by-point of typical area, appropriate mtg hts, IES criteria for

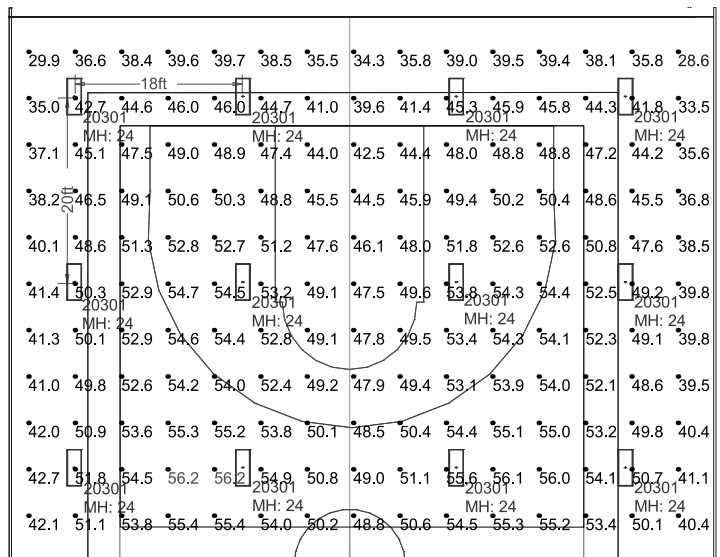
Class III = 50ftc _____ quan 6L

Class IV=30ftc _____ quan 6L?

30ft mtg ht

Gymnasium Point-by-Point layout

IES RECOMMENDATIONS
FOR CLASS III BASKETBALL COURT:
LASERLIGHT HT SERIES GYM



Plan view: 3 ft. above finished floor



More light less energy

Because you don't need ALL the lights on ALL the TIME

Energy efficiency is a top priority in today's buildings. Gymnasiums and athletic facilities are no exception.

Efficient lighting products use less energy than older technologies not only due to high performance lamps and ballasts, but also because the optical designs (reflectors) deliver the light to the floor efficiently, without wasting it. But even the most efficient luminaire doesn't need to be "ON" all the time... and often, it doesn't need to be operating at full output, either. Therefore...

Lighting Controls are important for gymnasiums because you don't need ALL the lights on ALL the TIME, and you don't need maximum intensity All the time or in every area of the gymnasium. For example:

Basketball practice, gymnastics training, or many physical education classes don't need the lighting system to provide full brightness.

If the gymnasium can be divided into more than one room, a Yoga class can be conducted in one half, and Basketball practice can be held in the other. The class may only need minimal lighting (and not every fixture ON) whereas Basketball practice may need 60% of "full brightness."

The solution for the Yoga class: Operate only three or four luminaires, and only burn two lamps in each of those. Lighting is comfortable, and uses only 8.3% of the maximum lighting available. This "scene" can be created manually, or pre-set and scheduled if the class is a recurring event.

The solution for Basketball practice: Operate all remaining fixtures, and only burn four lamps in each of those. Lighting is adequate and saves 33% of the energy that would be used at full brightness (during actual games).

When lights are not running at 100%, you save energy dollars, and maintenance costs..

Gymnasium Energy Calculator

| | Cost of Energy (\$/Kwh) | | \$0.12 |
|---------------------------------------|---|---|--|
| WITH NO CONTROLS (100% or OFF) | | | |
| Lighting Equipment | Present Lighting HID High Bays | LaserLight Luminaires T5 High Bays | Energy saved per year, without controls |
| Number of Lamps/Fixt | 1 | 6 | |
| Maintained Lumens Per Lamp | 23500 | 4420 | |
| Lumen per Fixture | 23500 | 26520 | |
| Total Number of Lamps | 24 | 144 | |
| Number of Fixtures | 24 | 24 | |
| Total Number of Lumens | 564000 | 636480 | |
| Fixture Efficiency | 0.889 | 0.969 | |
| Effective Lumens to Floor | 501396 | 616749.12 | |
| Average Illumination | 49 | 51 | |
| Cost per Fixtures | \$0.00 | \$250.00 | |
| Watts per Fixture | 455 | 356 | |
| Total Watts | 10920 | 8544 | |
| Number of Hours/Year | 1280 | 1280 | |
| Cost of Energy | \$1,677.31 | \$1,312.36 | \$364.95 |
| Cost of Equipment | 0 | \$6,000.00 | |

LASERLIGHT
LIGHTING AND CONTROLS EQUIPMENT



More light less energy