

## **SDERC Lighting Display**

### **Hibay Applications: T8 Fluorescent Hibay**

Location: Fixture #5

Technology Description: Many hibay applications use standard (also known as probe start) metal halide (MH) lamps and magnetic ballasts, but high lumen T8 fluorescent lamps, with high (1.15 – 1.20) ballast factor (BF) electronic ballasts, can provide improved light quality with lower energy usage. Hibay generally refers to applications 25ft or higher, but the technology is relevant for lowbay applications as well. The improved light quality comes from an increased color rendering index (CRI), better luminaire efficiency, and better lumen maintenance over the life of the lamp. High performance T8s have a CRI of 82-86 while metal halides have a CRI of 65 - 70. Luminaire efficiencies for T8s can be as high as 92% with enhanced aluminum reflectors while MH lamps with basic grade spun aluminum domes are approximately 75%. Also, at the end of their life, T8s put out approximately 92% of the rated lumens while standard MH lamps typically lose more than half of their initial lumens. T8s for hibay applications should be at least 3100 lumens (catalog rating) or higher. Additionally, the service life of the T8 lamps is 30,000 hours (based on 12 hour cycles) versus 20,000 hrs for standard MH.

Linear fluorescent hibays produce less glare and cause fewer shadows than basic grade spun aluminum dome MH hibays, because the light from linear fluorescent lamps is less concentrated. The display fixture is a 6 lamp T8 with Philips F32T8/ADV850/ALTO lamps.

Applications: Industrial, gyms, sports arenas, retail, warehouses. In extreme temperature applications, above 52°C (125°F), T8 lamp performance may degrade and manufacturer warranties for lamps and ballasts may not apply. For hot or cold applications, it is important to use T8 hibays that have good thermal designs which can make a big difference with light output and keeping ballast case temperature below manufacturer warranty. As long as T8s that are rated for at least 24,000 hours at industry standard 3 hour cycles with instant start ballasts are used, occupancy sensors can be used with a delay set for at least 15 or 20 minutes. In the second half of 2005, high BF program start ballasts should become available from several manufacturers, which will allow T8s to be used in even very short cycle applications with occupancy sensors.

Energy Savings Case Study: The San Diego Ice Arena replaced their 38 400W standard MH lamps with magnetic ballasts with 6 lamp T8/ADV850 hibay fixtures with a 1.15 BF. Each T8 fixture draws 220W; each 400W MH hibay drew 465W. The total installed cost for the retrofit was \$12,190 and with a rebate of \$4,598 will pay back in just over one year. The energy savings amount to \$7,276 (67,963 kWh) per year. The Ice Arena operates 7,300 hours per year and the average energy cost is \$0.0824 per kWh and \$15 per kW demand.

Donated Product: SDREO would like to formally thank Ed Musbach of the Lighting Association of San Diego for donation of the fixture. For more information please contact Ed Musbach at (858) 505-1055 and [emusbach.sdl@lighting.net](mailto:emusbach.sdl@lighting.net). SDREO would also like to thank Virginia Wilken of Philips for donating the T8 lamps. She can be reached at (760) 634-5380 and [virginia.wilken@philips.com](mailto:virginia.wilken@philips.com).

Discussion: Standard MH and also HPS hibays, especially ones with basic grade spun aluminum domes, should be eliminated. Although T8 hibays are one good replacement, T5HO, induction, or electronically ballasted quartz or ceramic pulse start (PS) MH with high performance domes can often be a better solution for specific applications. For example, ceramic PS MH, with a 90+ CRI in a clear prismatic dome, is aesthetically pleasing and provides uniform upright and can be the best solution for retail. Coated PS MH lamps in clear prismatic domes with a light colored ceiling can significantly reduce glare compared to clear MH lamps and metal dome.