

SOLUTION DELIVERED



<u>Current Fixtures</u>	<u>New LED Kits</u>	<u>Improvement/ Hourly Savings</u>
44ps. 400W High-bays 18,920 watts total	Varied: G2-3 to G2-10 4,964 watts total	Improved light uniformity 13,956 watts saved, 74% savings
3ps 400W Wallpaks 1290 watts total	G2-5 & G2-2 171 watts total	Proper light; improved safety/security 1119 watts saved; 86% savings
14ps 8ft. FL tubes, T12 1624 watts total	4ps LED tubes 144 watts total	Whiter light 1480 watts saved

PROJECT OVERVIEW

The Kopfmann Company, Inc. of Milwaukee, WI. is a manufacturer of custom countertops. The facility is a 40,000 sq./ft. factory, lit primarily with (44) 400 watt metal halide high-bay fixtures and (7) 220 watt t-12 fluorescents. The ceiling height in the main portion of the factory is approximately 24 feet and the southwest section of the ceiling is painted white to reflect the light inside. The balance of the factory ceiling is dark and unpainted. Workers in the plant had grown accustomed to either having a lot of light and foot candles on the ground directly under or near the metal halide fixtures. As they moved away from the direct cone of light, there was noticeably less light between the fixtures making it more difficult to work and read instructions or drawings.

The metal halide high-bays were being serviced on an occasional basis by Kopfmann's local electrical contractor who replaced the lamps and ballasts as needed, to keep light levels and uniformity as best as possible. The lights were being operated 10 hours per day, 5 days per week for a total of 225 hours/month. Annual lighting labor and maintenance costs were estimated, by the owner, to be approximately \$7 per fixture (contractor was a friend) and Kopfmann provided the bulbs and the lift on site. If contracted out, the maintenance would be significantly more expensive.



LED Industries and the electrical contractor, Envision Services, sat down and discussed the idea of using "zone lighting" with the owner of Kopfmann Company, Mr. Bob Kopfmann. Bob agreed to proceed with the plan to provide more light over the dedicated work areas and reduce light in non dedicated work areas. The objective was to save money and energy while maintaining proper light in all areas. Non crucial areas that could get by with less light coverage were areas like the storage, aisleways, and around the receiving/shipping dock. In these non-crucial areas, less light engines were installed into the high-bay fixtures using as few as 3-4-5 triangles while the critical work areas were given 8-9-10 light triangles to provide for more foot candles on the ground.

Upon completion of the LED retrofit kits into the existing high-bay fixtures, the following improvements were achieved for the customer:

The total fixture count was reduced from 44 high-bay metal halide fixtures down to 32 fixtures retrofit with the LED kits. Light uniformity was greatly improved since the new retrofit kits threw a wider beam pattern and covered more work area when compared to the prior metal halide fixtures.

The LED kits now produce 25-35 foot candles on the ground where there is a painted ceiling and 15-20 foot candles where the ceiling is not painted. This was uniform across these areas.

Mr. Bob Kopfmann, President and Owner, states that....."I really like the new LED lighting system and I'm looking forward to saving a ton of electricity in the coming years. It's a great investment for the company and going to the new LED technology makes perfect sense as we look for ways to cut costs and improve our margins. My employees have commented to me that the work conditions and environment is brighter and the lights are more uniform than before."

Mr. Mark Metzke, the Owner for Envision Services, Inc., the electrical contractor for this job stated that....."The LED kits supplied by LED Industries gave us the design flexibility to do the zone lighting concept which helped us to exceed expectations regarding energy savings. Instead of using one standard kit and light output spec for all the fixtures, we were easily able to grab additional savings for the client by customizing each fixture for each location in the factory."