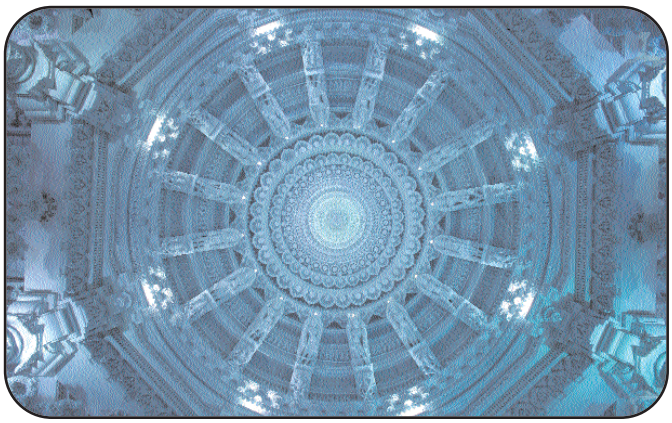
State-of-the-Art Lighting Highlights Centuries-Old Hindu Temple Design

By Dan Polito, Vice President of Marketing, Lamina



It's brand new. And, it's centuries old. It's hand-carved from marble and limestone according to religious tradition. And, its visual impact is made possible by cutting-edge technology.

It's the Shri Swaminarayan Mandir, a temple recently constructed in Lilburn, Georgia. It's a study in how the marriage of ancient custom and innovative LED technology can create surprising and unique results.

Three Entities Come Together

The project represents collaboration between three primary entities: New Jersey-based Lamina, a developer and manufacturer of solid state LED light engines; Illinois-based North Star Lighting, a lighting solutions design and engineering firm; and the Bochasanwasi Shri Akshar Purushottam Swaminarayan Sanstha (BAPS), a socio-spiritual organization, which to its followers represents the Hindu religion in its purest form.

The BAPS, with more than 640 mandirs (temples) and 9,090 religious centers in 45 countries, approached North Star Lighting two years ago when the organization was building a temple in Bartlett, Ill. North Star eventually engineered the lighting design for the Bartlett project and also worked on a subsequent BAPS temple project in Toronto. The Toronto project, for which North Star developed an interior lighting plan, required a very compact lighting solution with very high light output. That led North Star to Lamina, with whom the company had been collaborating for some time. Lamina is well-known for its compact, high-output LEDs, and North Star ended up using one of Lamina's premier products, the Lamina Titan LED, in the Toronto project.

At this point the relationships were sealed. So when the BAPS began work on designing a new temple in Georgia, North Star and Lamina were naturally part of the team.

Swaminarayan mandirs are traditionally designed according to instructions for the construction of religious buildings written into scripture thousands of years old. Temple designers Bharat Patel and Sanjay Parikh worked with principal architect Smallwoods, Reynolds, Stewart and Stewart to develope the design of the 20,000 square foot building, which sits on a 25-acre site. Mike Patel headed the lighting design and manufacturing team from North Star, which developed the preliminary lighting recommendation for the interior and exterior.

At this point, the unique lighting specifications and custom design dictated by the highly ornate and unusual architecture began to fall into place. The exterior of the building is made of Turkish limestone and Italian Carrara marble, and the interior is decorated with Indian pink sandstone. The stone for the project, 34,671 pieces in all, was meticulously hand-carved in India by more than 1,500 skilled craftsmen and shipped piece by piece to the Georgia site, where it was reassembled according to ancient dictate.

The intricate, proper display of religious idols and figurines inside and outside the structure led to extraordinary effort in lighting design, both technically and logistically.

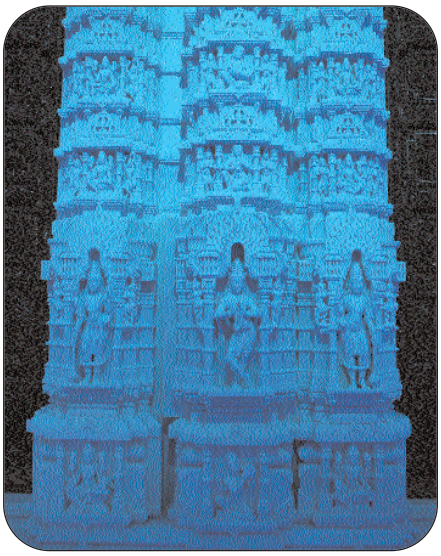
"At one point, there was a section of marble that had already been carved out in India to accept a lighting product that had not even been designed yet," said Tom Rotkis, vice president of Sales and Marketing for North Star Lighting Group. "They said, 'this is how we want it to look' and we said, 'if that's your concept, North Star will design a product to meet your needs.'"

Lamina specializes in super-bright solid-state LED lighting arrays that allow for optimum light output and improved heat management. Their products allow for color variability in compact designs, which have introduced LEDs to applications that were until recently only possible with traditional lighting sources.

The ongoing ability of North Star and Lamina to work as a team in response to the highly sensitive and unique needs of the BAPS project is a source of pride at both organizations.

"I believe the BAPS were able to create the lighting effects they really wanted on this mandir due in large part to the ability of North Star to come through with solutions," said Rotkis.

"The team at North Star was great to work with; they have such insight and unique technical acumen for how to put things together logically in terms of how to drive the LEDs, how to package them in a fixture and more importantly, how to integrate the whole thing into a unique environment like the temple stonework," said Michael Konczyk, Lamina's vice president of Sales. "The result is beautiful, unobtrusive and elegant. It really captures the whole essence of how to use solid-state lighting."



Reprinted from the January/February 2008 Issue of *LED Journal*.
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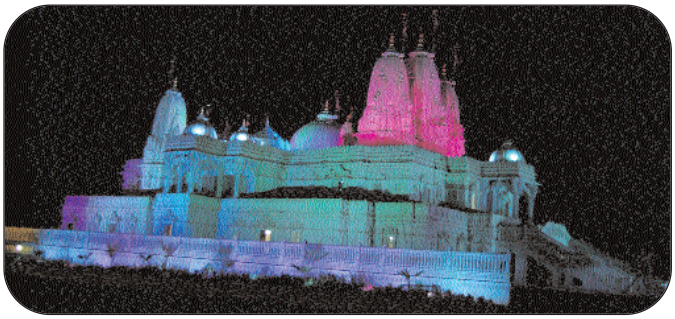
Impressive Numbers, Performance

In the end, North Star used more than 2,000 fixtures in its lighting design for the 20,000 square foot interior and the 65,000 square foot exterior of the mandir. The fixtures used for the exterior featured 452 Lamina Titan and 342 Atlas LEDs integrated with North Star Lighting RAF series floodlights. Fixtures used for the interior featured 711 Lamina Titan and 410 Atlas LEDs integrated into North Star's recessed column lights and 268 North Star recessed step lights featuring Lamina Titan LEDs. The Atlas and Titan Daylight White and RGB LEDs were chosen because of their enhanced ability to deliver optimum output power, especially in RGB. The LEDs deliver up to 1,070 lumens from the Titan Daylight White and up to 882 lumens from the Titan RGB. Both the Atlas and the Titan offer an enhanced red and orange color spectrum, which made the products well suited as replacements for incandescent or halogen options.

The Lamina LEDs also offered North Star simplicity in mounting; one Titan can be mounted directly to a heat sink through an integral EZ Connector that eliminates the need for soldering. To get equivalent brightness, multiple competitive LEDs would have to be soldered onto an aluminum-core PC board, individual optics added to each one, and then be mounted onto a heat sink.

The Lamina products packaging technology represents a breakthrough in thermal performance for LED packaging. Its thermal performance coupled with package interconnectivity allows Lamina LEDs to be clustered. Both the Atlas and the Titan are configured with cavities (a single cavity in the case of the Atlas and an array of cavities on the Titan) that are populated with multiple LEDs to deliver the maximum usable light to achieve high luminous intensity in very small footprints. That ability was key to achieving some of the lighting effects for showcasing the intricate carvings and etchings on the exterior walls and domes and the interior pillars and ceilings of the mandir.



Working Together

The resultant lighting effects, both on the interior and the exterior of the structure, are a testament to the effort of Lamina and North Star working together.

Not ironically, working together was a recurring theme in the overall construction of the Atlanta mandir. According to custom, over 10,000 volunteer laborers, all BAPS Swaminarayan followers, came together to donate thousands of hours of their time to make the project a success and keep costs down. The building was completed in five months. The mandir has been open to the public since September 1, 2007; it is said to be the largest temple in the US and the largest Hindu temple of its kind outside of India.

Dan Polito, is the vice president of Marketing at Lamina. Dan joined Lamina, a developer & manufacturer of high power LED light engines, in March of 2007 having most recently served as vice president of Branding & Marketing at Environmental Lighting Concepts (ELC), a marketer of natural lighting products. Dan Polito can be reached at Dpolito@laminalighting.com.

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