

Smithsonian Plans LED-Spangled Banner



[1]**Energy News:** The [40-ft. x 32-ft. American flag at Fort McHenry](#) [2] in 1814 was made just a few years after [the dawn of the incandescent lamp](#) [3], and now Smithsonian preservationists intend to [protect it further](#) [4] with modern [LED](#) [5] technology.

Best known as the Star-Spangled Banner, because of the Francis Scott Key poem that became the national anthem, the flag will return to public display when the National Museum of American History completes its renovation in summer 2008. The [new gallery being constructed](#) [6] is airtight, has no electricity inside because of the fire risk, and will display the flag at a 10° horizontal angle with just a few foot-candles of illumination because of the tattered fibers and the exhibit's somber tone.

So it's the quality, not the quantity, of illumination that caused Smithsonian managers to embark on the exhibit illumination project several years ago. The plan calls for using digital projectors with metal halide lamps until light-emitting diodes are ready. If the LEDs are ready in time, then they'll be used from the start, but the project won't be rushed due to the flag's historical importance.

"Where this all stemmed from is the desire to limit the amount of energy from light going into the flag... We're fearful of anything that can cause chemical reactions within the fibers," project manager Jeffrey Brodie explained. For example, in [the conservation lab](#) [7] that's doubled as a public exhibit since 1998, there are fluorescent lamps along the edges of the wall to avoid shining directly on the flag, chief conservator Suzanne Thomassen-Krauss said.

For the new chamber, Brodie and his team considered different kinds of lights, such as tungsten halogen. Light-emitting diodes were interesting but too imprecise when the project began. Just deciding on the right color LEDs to use is a huge challenge, said Steven Weintraub, a project consultant from New York-based Art Preservation Services. In theory, the flag – like all American flags – is red, white, and blue. But

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after 194 years, most of the red and blue fabrics are either dark or faded, and the whites are shades of brown. When a LED supplier is selected, another challenge will be [manufacturing enough LEDs of the right colors in each bin](#) [8]. A tool called a [spectrophotometer](#) [9] is used to determine the actual shades, he said.



[6]“Our consultants are working and they're doing that cognitive analysis. We're trying to work with what's out there,” Brodie added. The energy savings of LEDs are “not lost on us,” but the real advantages for the flag are LEDs’ ability to be monitored by computer, their tendency to stay cool and not transfer heat into the flag chamber, and their long life. “We don’t have the resources or the staff or the inclination to go up there and change those every couple of months,” he said.

For all these reasons, LEDs are the best compromise to display the flag in public and maintain the fabric’s integrity. “There's been great pains taken in the design of the chamber” and with LED planning, Brodie said. “It is definitely our preference.”

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Links:

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- [2] http://en.wikipedia.org/wiki/Star_Spangled_Banner_Flag
- [3] <http://www.ieee-virtual-museum.org/collection/tech.php?id=2345804>
- [4] http://www.americanhistory.si.edu/ssb/7_preserving/fs7.html
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