



Solid State Lighting Sources and Systems

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Sources and Systems**

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Approved by the IES Board of Directors, May 1, 2017, as a Transaction of the Illuminating Engineering Society.

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Published by the Illuminating Engineering Society, 120 Wall Street, New York, New York 10005.

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Printed in the United States of America.

ISBN # 978-0-87995-343-0

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INTRODUCTION

This document is intended to serve as a technical resource to members of the lighting community by providing a high-level overview of the history and technology of light-emitting diode (LED) light sources and LED lighting systems. Although this document is not intended to be a design guide, LED source and lighting system applications will be addressed as well.

As any document cannot serve as the final word on the rapidly evolving field of LED lighting, readers are encouraged to use this Technical Memorandum as a starting point toward a greater understanding of LED light sources and systems. To that end, informative references are provided in **Annex A** of this document.

1.0 SCOPE

This document provides an update to the previous version, IES TM-16-05, to include current information pertaining to the history, technology and applications of LED sources and systems.

2.0 NORMATIVE REFERENCE

ANSI/IES RP-16-17, *Nomenclature and Definitions for Illuminating Engineering* <https://www.ies.org/standards.ansi-ies-rp-16/>

3.0 DEFINITIONS

Annex B contains a glossary of commonly used terms.

4.0 HISTORY OF LEDS

Although the scientific community had been aware from the beginning of the twentieth century that diodes were capable of emitting radiation, the first practical light-emitting diode (LED) to operate in the visible spectrum was invented in 1962 by Nick Holonyak of General Electric. Further inventions throughout the later 1960s and the 1970s facilitated the development of LEDs that produced additional colors and enabled integration into consumer products. **Figures 1** and **2** illustrate the advances made in LED technology from 1907 to 2000.

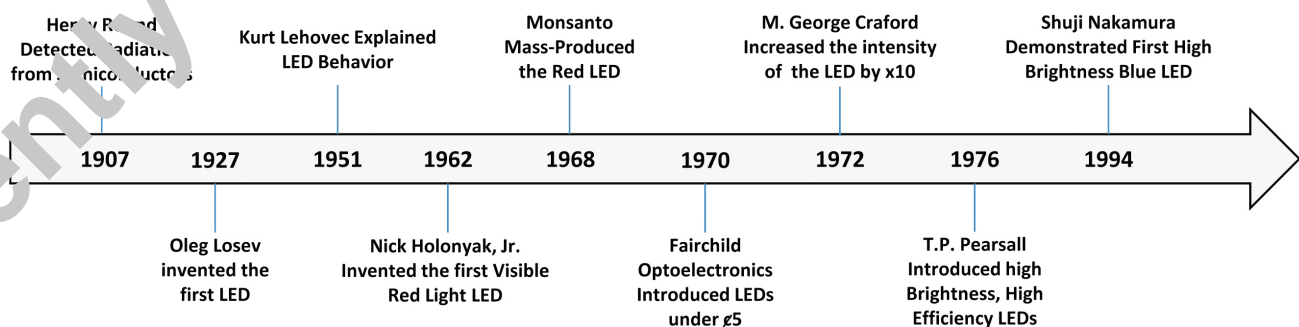


Figure 1. Timeline of the invention of the light emitting diode. (Image courtesy of Ray Janik)