



Award

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SBIR Phase I: Titania-Loaded Silicone with High Refractive Index for Light-Emitting Diode Encapsulation

Awardee

[Troy Research Corporation](#)
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TROY, NY, 12180-6576
USA



Awarding Agency

NSF

Award Year: 2005

UEI: N/A

HUBZone Owned: No

Woman Owned: No

Socially and Economically

Disadvantaged: No

Congressional District: N/A

SBIR

Phase I

Total Award Amount: \$100,000

Contract Number: 0512690

Agency Tracking Number: 0512690

Solicitation Topic Code: AM

Solicitation Number: NSF 04-604

Abstract

This Small Businesses Innovation Phase I research project concerns the development of a new class of polymer encapsulation materials with a very high refractive index (exceeding 2.0) and the use of the encapsulant material for light-emitting diodes (LEDs) with high light-extraction efficiency. The proposed effort introduces a new class of nanomaterial-based polymer encapsulants with an unprecedented high refractive index ($n > 2.0$). Such materials would be extremely beneficial for light extraction in light-emitting diodes. Increases of 20 % - 45 % in light extraction efficiency are expected from the employment of the new encapsulant. The intellectual merit also lies in the fundamental assessment of the optical scattering properties of this nanocomposite. The availability of the new encapsulant would be very beneficial to all technical fields employing LEDs including signage, lighting, communications, imaging, biotechnology, and medicine. The development of a new high-index encapsulant would have a tremendous impact on LED technology because virtually all LEDs are packaged and encapsulated. A successful completion of the program could result in a worldwide paradigmatic shift in the packaging and encapsulation of optoelectronic devices. The broad deployment of efficient LED technology for general lighting applications would result in electrical energy savings in the TWh range per year in the United States.

Award Schedule



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Research Institution

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