

Section 1 – Project Purpose & Objective

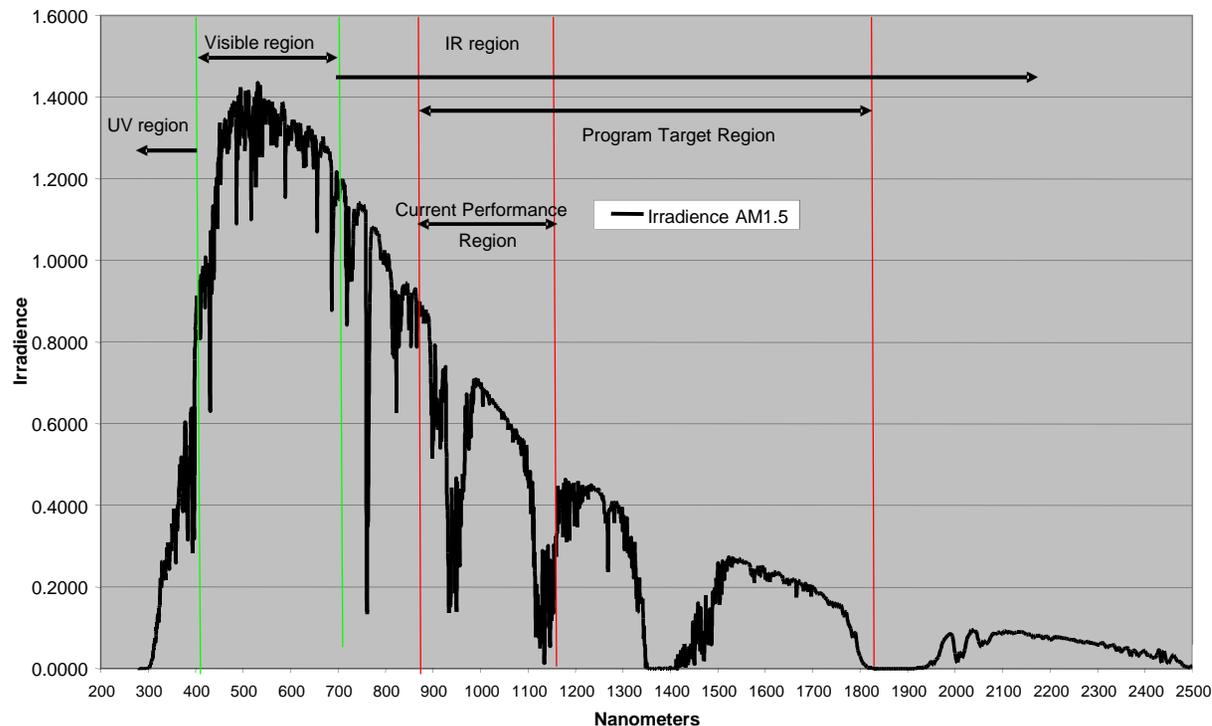
DE-EE00003837: Polymeric Multilayer Infrared Reflecting Film Development

Recipient Name: 3M Company

Project Purpose & Objective

The objective of this project is to develop a polymeric multilayer infrared reflecting film that is essentially clear and colorless in the visible portion of the electromagnetic spectra (visible light transmission of about 89%) while reflecting 90-95% of the infrared energy in the 850 nm to 1830 nm specified spectra.

Solar Irradiance AM1.5 W/m² ASTM G173



Section 1 – Project Scope & Cost

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Project Scope of Work:

- Modeling optical performance of various resin systems and layer structures
- Resin production and procurement
- Extrusion of resins in a $\frac{1}{4}$ wave and 7-11 system
- Optical tuning and extrusion understanding with a $\frac{1}{4}$ wave and 7-11 system

Funding and Cost:

- Total Award Amount (Federally Funded 55%): \$1,966,611
- Non-Federally Funded (Private Share 45%): \$1,609,045

Section 2 – Progress to Date

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Progress to Date:

- Modeling resins systems and layer constructions – **100% Complete**
- Modeling IR reflecting film in multiple window/glass constructions – **50% Complete**
- Extrusion of resins in a $\frac{1}{4}$ wave system & Optics tuning and extrusion understanding in a $\frac{1}{4}$ wave system – **100% Complete**
- Extrusion of resins in a 7-11 system – **50% Complete**
- Optics tuning and extrusion understanding in a 7-11 system – **40% Complete**

Significant Milestones:

- Demonstrated broadening IR reflection beyond 1200nm without introduction of color in the visible spectrum with a 7-11 system
- Demonstrated control of a 7-11 system on large-scale equipment

Section 3 – Next Steps & Expected Outcome

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Next Steps & Expected Outcome:

- Optimize 7-11 system performance for maximum solar heat gain performance
- Demonstrate optimized 7-11 system performance on large-scale equipment