Case Study

Project

VCC's custom light pipe is almost as efficient as the renewable energy that goes into it

Application Characteristics

Solar panels can be a great source of renewable energy. However, they must be monitored with great care. Left unregulated, an influx of too much solar energy can cause problems ranging from device destruction to fire hazards. Therefore, proper status indication is crucial for the safe operation of solar panel installations.

The same bright light that charges these panels can make it difficult to read the status indicators on the control panel. Especially when the design isn't optimized for the task at hand.

Our client came to us with a unique design challenge — drastically reduce the amount of light being lost in its current design while improving the panel's poor daytime visibility.

Application Requirements

Because of the glaring sun and control panel design, light needed to illuminate the side of the indicator rather than the top of it. With the current design, the light shining through the top of the light pipe was not only wasteful — it caused challenges for technicians in properly assessing the operating status of the panels.

Our team needed to design a solution that would:

- Direct more light from the side of the light pipe
- Work with the pre-existing LED voltage specifications
- Reduce amount of light being lost from the top of the light pipe
- Enhance daytime visibility of indicators

Are you ready for next level illuminated components?

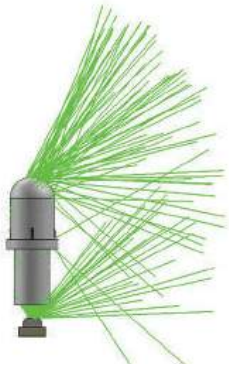
1.800.522.5546

vcclite.com

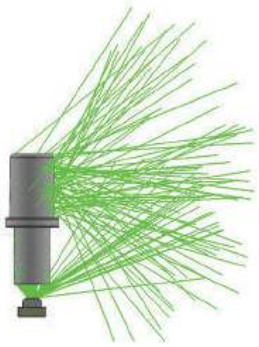
Case Study

Solution / Approach

To determine the best possible design, our team ran simulations using advanced light modeling software. These simulations validated our team's updated design would meet the customer's needs. We then used a 3D printer to create samples for testing prior to tooling the light pipe.



Optical simulation of customer's current light pipe design



Optical simulation of VCC's custom designed light pipe design

Through a fast and collaborative approach to light modeling and prototyping, the VCC team ensured we had the ideal solution prior to production.

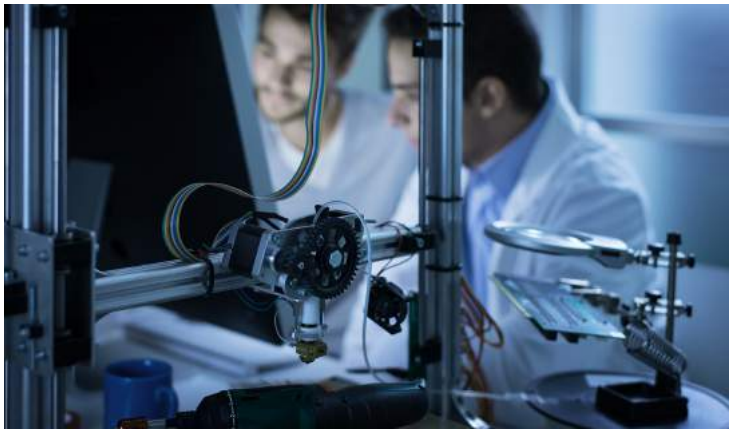
SLA sample

Optically clear 3D printed samples assured proof of concept before tooling was initiated.

Results & Benefits

After all of the research and customization, we developed a custom light pipe that:

- Measured .05" longer in length to help prevent light loss without having to update the LED the client already specified for the device
- Replaced the inefficient dome-shaped surface with a concave surface to help disperse the light in the desired direction
- Leveraged a textured surface on the sides of the lens to aid in light emission
- Reduced the number of lumens being wasted through the top of the light pipe by over 80 percent
- Provided a 360-degree viewing angle for maximum visibility
- Increased daytime visibility for improved human-machine interaction by XX percent
- Enabled more energy efficient and long-lasting operation of the product



Value-added Service

Using the latest in light modeling technology, our team quickly designed, tested and produced a light pipe that drastically optimized performance and reduced light loss.

And we'd like to solve a unique design challenge for you, too. Our team can customize our off-the-shelf products or design something completely new to meet your mechanical, electrical and optical needs.

Are you ready for next level illuminated components?

1.800.522.5546

vcclite.com