

# UV LED PRODUCT GUIDE

## OVERVIEW

### [PART 1: UV LED Product Guide](#)

UV LED technology is rapidly evolving. To ease the selection process of UV LEDs, Kopp compiled a list of over 600 products currently on the market.

They are organized in two useful ways:

1. Number of LED products (from each manufacturer) by wavelength
2. LED products by wavelength *and* technology

### [PART 2: Overview of Secondary Glass Optics](#)

Although Kopp does not manufacture LEDs, we have expertise in creating custom molded glass optics to optimize light output for performance.

Custom molded glass optics help meet challenges that go along with the new technology:

- ▶ Do you need to **decrease or increase the beam angle** of your LED?
- ▶ Is your **desired working distance** unachievable through your current UV LED array design?
- ▶ Would you benefit from **decreasing the number of LEDs** in an array while maintaining the same power output?

Learn how custom molded glass optics can help solve these problems!



MOLDED TECHNICAL GLASS FOR  
**DEMANDING APPLICATIONS**

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# PART 1: UV LED PRODUCT GUIDE | NUMBER OF LED PRODUCTS BY WAVELENGTH

	UVC							UVB				UVA											BLUE		TOTALS				
	250	255	260	265	275	278	280	285	295	300	310	325	340	350	353	355	360	363	365	370	375	380	385	390		395	400	405	
Crystal IS	2	3	2	9	7		4																						27
Dowa				11			8			7	7	7																	40
Epigap LED				4			7			6	6	6			1	1		2	1	1			1		1	1		38	
Fox Group												1	4			4												9	
Guangzhou Hongli Opto-Electronic							1											1										2	
LED Engin																		2							5	1	8		
LG Innotek						5				2								7				8		7		7	36		
Light Avenue					3		3			3	3	3								1					1	2	19		
Lumileds-Luxeon																					12	3	10	7	9	6	47		
Luminus																		8			2	5	2	3	2	14	36		
Marubeni America Corporation				8			12			11	9	11						15		20		16		23		28	153		
Nichia																		9		8		8		6		8	39		
Nitride Semiconductor					5					3				1	3	4		18	8	11		10		6	2	7	78		
RayVio							8			2																	10		
SemiLEDs															2		4	4	2	8	3	9	3	9	3	47			
Seoul Viosys/SETi		2		1	5			3	1	3		2						9		2		8		8	2	6	52		
Toyoda Gosei																						3		3		3	9		
VCC																						2				3	5		
Vishay					1														2			3		3		4	13		
<b>TOTALS</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>33</b>	<b>21</b>		<b>43</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>35</b>	<b>25</b>	<b>30</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>11</b>	<b>77</b>	<b>14</b>	<b>44</b>	<b>22</b>	<b>70</b>	<b>21</b>	<b>76</b>	<b>25</b>	<b>92</b>	<b>668</b>		

This guide is based on available information, as of October 2018. Because the UV LED market is evolving, please realize that this information will change over time; we will update this information periodically. We also welcome feedback and strive to make this reference tool as useful as possible; please email us at [solutions@koppglass.com](mailto:solutions@koppglass.com) for any suggestions, additions, or corrections.



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# PART 1: UV LED PRODUCT GUIDE | LED PRODUCTS BY WAVELENGTH & TECHNOLOGY

Technology and Company	Wavelength (nm)																				Total										
	250	255	260	265	275	278	280	285	295	300	310	325	340	350	353	355	360	363	365	370		375	380	385	390	395	400	405			
<b>Chip</b>																															
Dowa				1			1				1	1	1																5		
Fox Group																															
Light Avenue					3		3				3	3	3								1					1		2	19		
Lumileds-Luxeon																							6		5		5		16		
Marubeni America Corporation				1			3				2	1	2						1				1		1				12		
Nitride Semiconductor											1					2	2		3	2	3								13		
SemiLEDs																	2		2	2	2	3	3	3	3	3	3	3	26		
Toyoda Gosei																								2		2		2	6		
<b>Chip Total</b>				<b>2</b>	<b>3</b>		<b>7</b>				<b>7</b>	<b>5</b>	<b>6</b>			<b>2</b>	<b>4</b>		<b>6</b>	<b>5</b>	<b>5</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>97</b>			
<b>Chip on Board (COB)</b>																															
Luminus																			5				2	2	2		2	10	23		
RayVio								1				1																	2		
<b>COB Total</b>								<b>1</b>			<b>1</b>								<b>5</b>				<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>10</b>	<b>26</b>		
<b>Surface Mounted Diode (SMD)</b>																															
Crystal IS				9	3																								12		
Dowa				2			6				6	6	6																26		
Epigap LED				1			3				3	3	3				1										1		15		
Fox Group														1			1												2		
Guangzhou Hongli Opto-Electronic								1											1										2		
LED Engin																				2						5		1	8		
LG Innotek							5			2										7				8		7	7		36		
Lumileds-Luxeon																							6	3	5	6	4	6	30		
Luminus																				3				3		3		3	12		
Marubeni America Corporation				3			5				5	4	5						11		8		9		16		20	86			
Nichia																			5		2		6		5		6	24			
Nikkiso																															
RayVio								1				1																	2		
SemiLEDs																				2	2		5		6		6	21			
Seoul Viosys																															
Seti																															
Toyoda Gosei																								1		1		1	3		
Vishay																				2				3		3		4	12		
<b>SMD Total</b>				<b>15</b>	<b>8</b>		<b>5</b>	<b>16</b>			<b>2</b>	<b>17</b>	<b>13</b>	<b>14</b>	<b>1</b>			<b>2</b>				<b>38</b>	<b>2</b>	<b>11</b>	<b>11</b>	<b>40</b>	<b>11</b>	<b>50</b>	<b>12</b>	<b>53</b>	<b>321</b>

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	250	255	260	265	275	278	280	285	295	300	310	325	340	350	353	355	360	363	365	370	375	380	385		390	395	400	405	
<b>T-Type</b>																													
Crystal IS	2	3	2		4		4																						15
Dowa				8			1																						9
Epigap LED				3			4				3	3	3		1			2	1	1		1		1				23	
Fox Group													1	3			3											7	
Marubeni America Corporation				4			4				4	4	4					1		5		3		2		4		35	
Nichia																		4		6		2		1		2		15	
Nikkiso																													
Nitride Semiconductor															1	1	2		7	6	7					1		25	
Seti																													
VCC																							2				3	5	
<b>T1 Total</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>15</b>	<b>4</b>		<b>13</b>				<b>7</b>	<b>7</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>		<b>14</b>	<b>7</b>	<b>19</b>		<b>8</b>		<b>4</b>	<b>1</b>	<b>9</b>	<b>134</b>	

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## UP NEXT:

### Now that you've chosen your UV LED, learn how to optimize it!

In Part 2, get an introduction to custom molded glass optics. These are used as a secondary optic (in addition to the primary optic or clear casing around LED diodes) to assist in directing the rays of UV LEDs to the target surface more efficiently.

#### COMBAT THESE CHALLENGES:

- ▶ Working distance constraints
- ▶ Control over beam angle and irradiance profile
- ▶ Number of LEDs needed
- ▶ Energy density preferences



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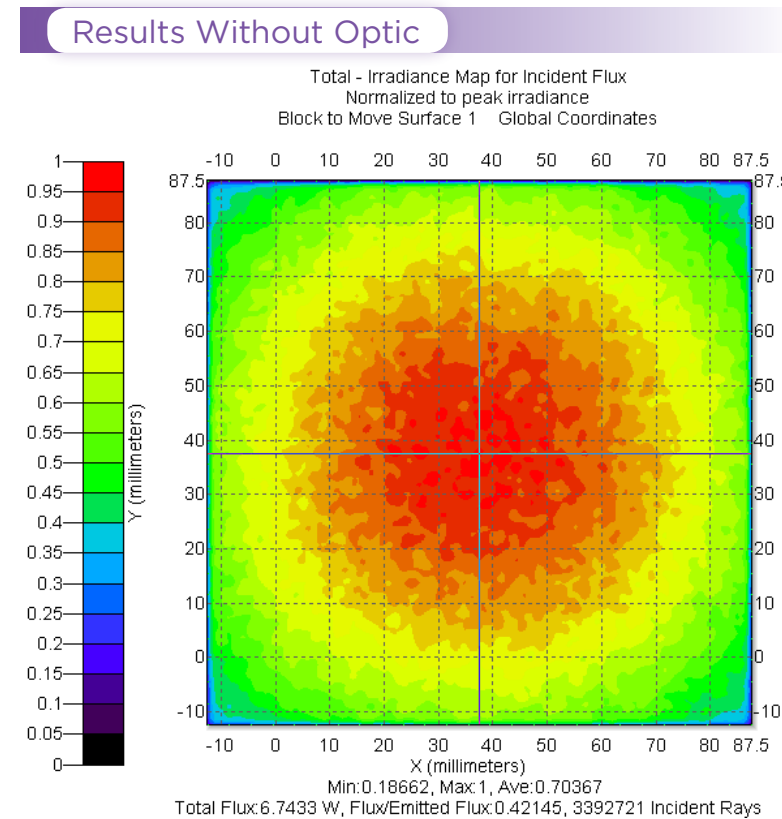
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# PART 2: UV LEDS & GLASS OPTICS | WORKING TOGETHER

## MOLDED UV OPTICS | CREATE HIGH-PERFORMING DEVICES

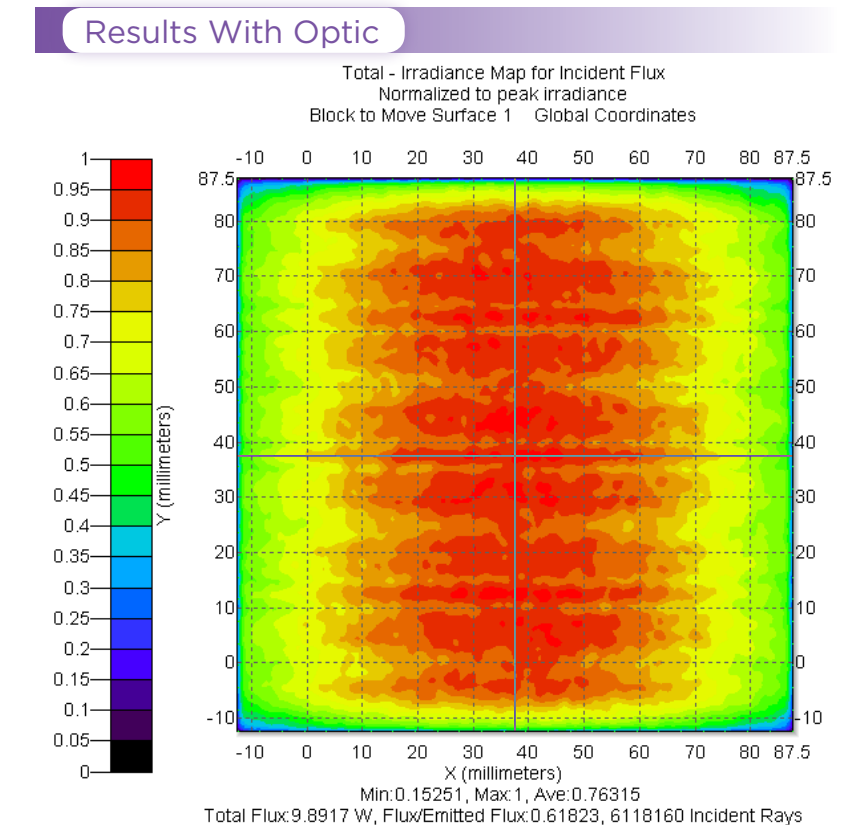
### DESIGN CHALLENGES WITH UV LEDS

- ▶ Unlike traditional light sources like incandescent bulbs that emit light in all directions, LEDs are directional. They illuminate a beam angle up to 180° which is typically too broad for most purposes.
- ▶ Although the light output of UV LEDs is more concentrated, UV LEDs have a lower power output that often cause designers to add additional LEDs to meet power requirements. In addition, the light loses intensity over distances.
- ▶ Standard primary optics (or the protective casing around diodes) are not always optimized for specific application challenges.



### OPTIC SOLUTIONS

- ▶ Secondary optics shape the light beams produced by LEDs to a particular profile in accordance with the application. They control the light spread of the LED to ensure light beams hit the flat or complex 3D target surface.
- ▶ Optics capture stray light that otherwise would not be directed to the target surface. This additional light can be used to increase UV LED irradiance and improve light distribution uniformity, as well as to reduce the number of UV LEDs in the unit or to reduce the drive current while still achieving the desired light output. As a result, quality can be improved, and the overall cost of the UV LED light fixture is reduced.



\* Taken from comparative study "Custom Molded UV-C Transmitting Glass Optics" presented at the International Ultraviolet Association (IUVA) Americas 2018 conference.

## KOPP GLASS | COLLABORATIVE INNOVATION

### OUR GOAL:

PROVIDE CUSTOM MOLDED GLASS OPTICS THAT FULLY OPTIMIZE UV LED SYSTEMS BY MAXIMIZING THE AMOUNT OF ENERGY REFRACTED FROM THE UV LED ARRAY TO THE TARGET SURFACE

## CONTACT US TO LEARN MORE!

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Website: [www.koppglass.com](http://www.koppglass.com)

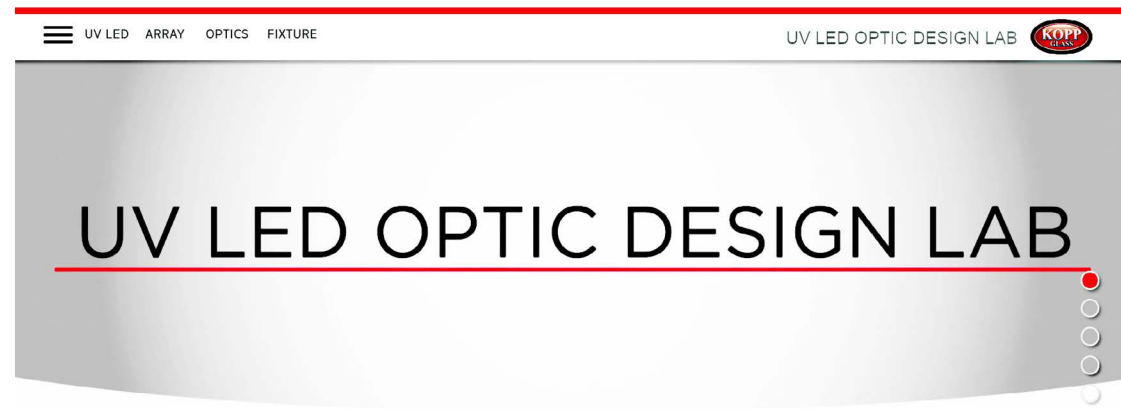


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## PART 2: UV LEDS & GLASS OPTICS | ADDITIONAL RESOURCES

### INTERACTIVE UV LED OPTIC DESIGN LAB



Learn how to design UV LED systems that optimize performance output while meeting demanding challenges.

[www.koppglass.com/UVLED](http://www.koppglass.com/UVLED)

### READ MORE ABOUT DESIGN

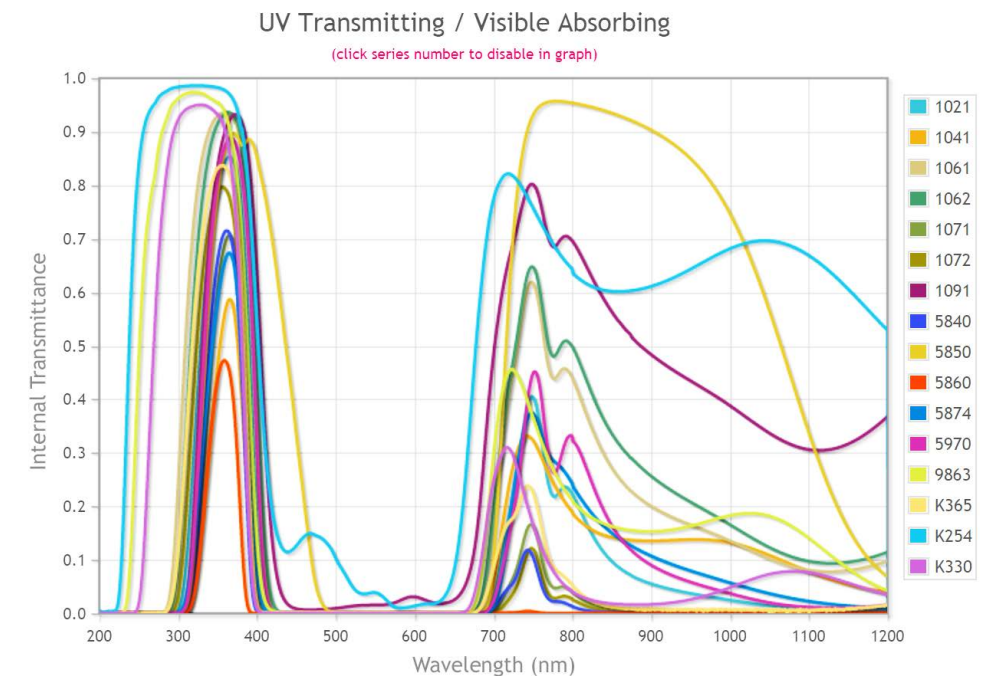


Helpful article:

“How to Design with LEDs: Iterative Approach Yields Fully Optimized Lighting Systems”

[Visit the article here.](#)

### UV FILTER GLASS PORTFOLIO



[Click here to visit our interactive UV Filter Glass Portfolio.](#)

### READ MORE ABOUT PERFORMANCE



Helpful article:

“Optimize UV LED Arrays for Efficiency and Performance”

[Visit the article here.](#)



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