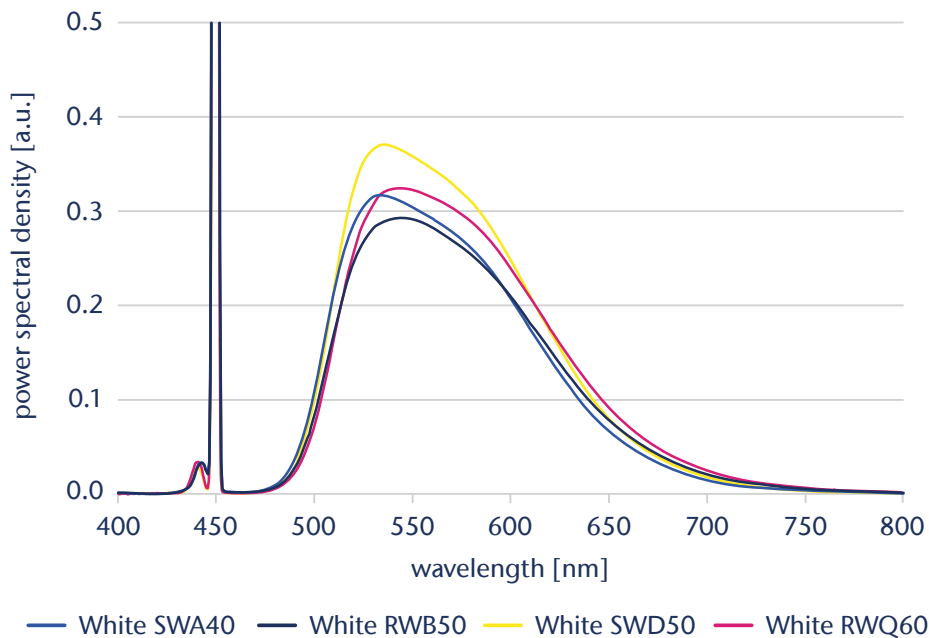


# Static Ceramic Converter

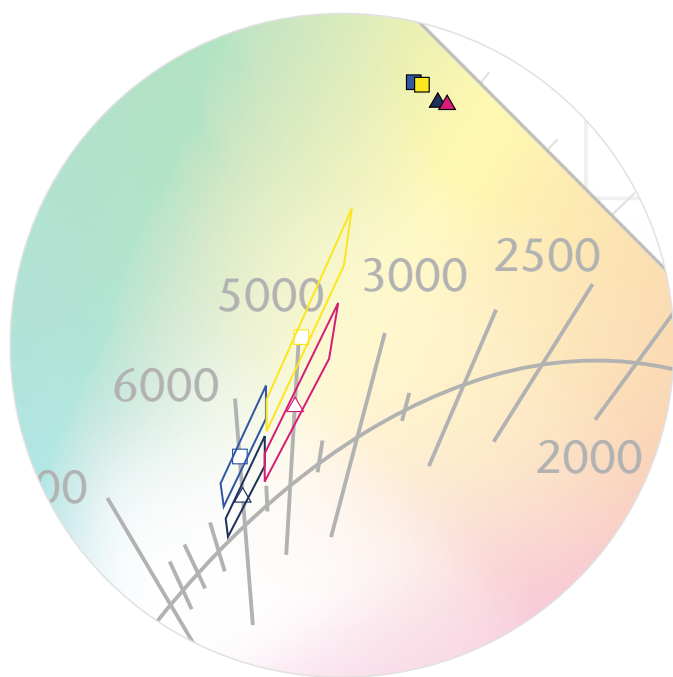
High Luminance Light Sources  
White 6,000 K and 5,000 K, Yellow and Green  
Anti-reflection coated phosphor on heatspreader

# SCHOTT offers several types of white material

## Emission spectrum



## Tolerance window for white color coordinates ( $c_x$ and $c_y$ )



Visualization of spec in the CIE 1931 color space.

## Tolerance window

	$c_x$	$c_y$
<b>6,000 K</b>		
□ White SWA40	0.3326	0.4021
	0.3098	0.3516
	0.3114	0.3397
	0.3326	0.3845
△ White RWB50	0.3326	0.4021
	0.3325	0.3764
	0.3121	0.3342
	0.3136	0.3231
□ White SWD50	0.3325	0.3604
	0.3325	0.3764
	0.3787	0.4952
	0.3330	0.3965
△ White RWQ60	0.3328	0.3797
	0.3739	0.4645
	0.3787	0.4952
	0.3708	0.4450
	0.3327	0.3688
	0.3326	0.3530
□ White RWQ60	0.3664	0.4178
	0.3708	0.4450

# Technical details

## White 6,000 K (150 µm die thickness, anti-reflection coated phosphor on heatspreader)

Optical specifications	White SWA40	White RWB50	
Conversion efficacy [lm/W]	> 230	> 220	
Conversion efficiency [W/W]	> 63 %	> 62 %	
Emission color coordinates $c_x$	0.4100	0.4233	Center values, tolerances $\pm 0.007$
Emission color coordinates $c_y$	0.5603	0.5514	
White color coordinates $c_x$	0.3198	0.3212	Tolerance window see previous pages.
White color coordinates $c_y$	0.3655	0.3454	
Emission color coordinates $u'$	0.18420	0.19306	
Emission color coordinates $v'$	0.56637	0.56585	
White color coordinates $u'$	0.18961	0.19759	
White color coordinates $v'$	0.48759	0.47807	

## White 5,000 K (150 µm die thickness, anti-reflection coated phosphor on heatspreader)

Optical specifications	White SWD50	White RWQ60	
Conversion efficacy [lm/W]	> 240	> 230	
Conversion efficiency [W/W]	> 62 %	> 61 %	
Emission color coordinates $c_x$	0.4142	0.4287	Center values, tolerances $\pm 0.007$
Emission color coordinates $c_y$	0.5598	0.5490	
White color coordinates $c_x$	0.3520	0.3488	Tolerance window see previous pages.
White color coordinates $c_y$	0.4286	0.3926	
Emission color coordinates $u'$	0.18640	0.19642	
Emission color coordinates $v'$	0.56677	0.56594	
White color coordinates $u'$	0.18930	0.19895	
White color coordinates $v'$	0.51851	0.50378	

### Notes:

White color coordinates change with blue laser wavelength and are measured at 449.5 nm.

Emission spectrum is defined by the power spectral density > 465 nm.

Efficacy and efficiency is measured for full (white) spectrum, defined by the power spectral density > 400 nm.

AR coating optimized for blue light incident angle of 60°.

Efficacy, efficiency and color coordinates measured with 60° incident angle of blue laser at low laser power.

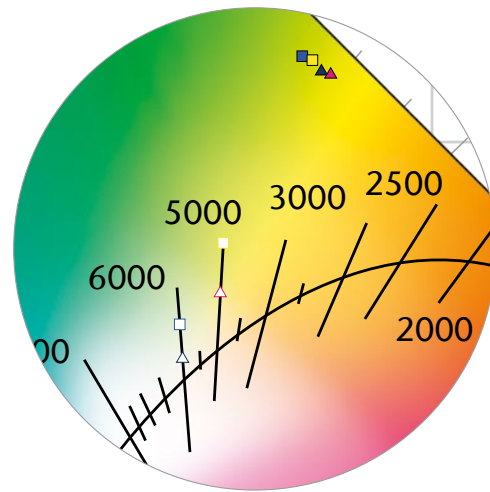
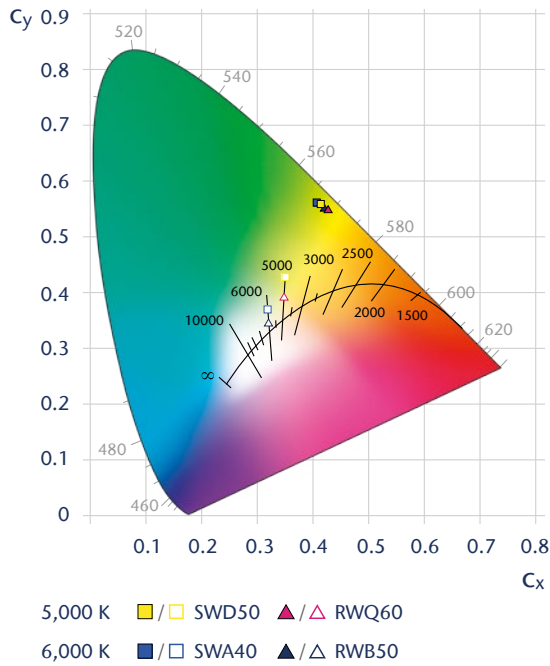
Emission is detected in normal direction.

More details see webpage:

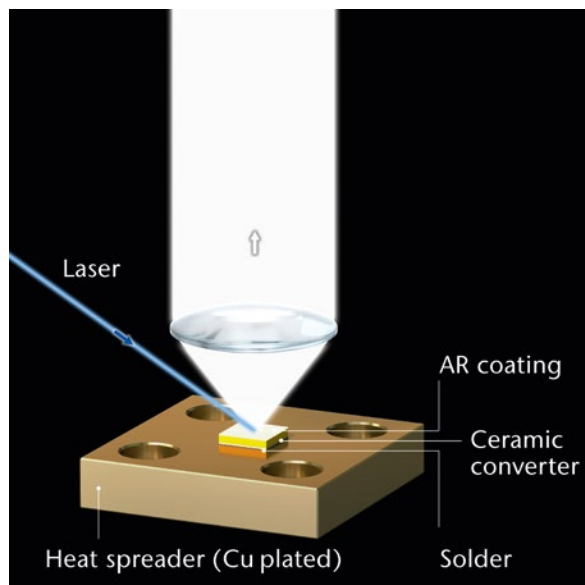
<https://www.schott.com/ceramic-converter>

# Static Ceramic Converter – Enabling high luminance for your laser pumped phosphor light sources

SCHOTT converter allow high irradiance and superior luminance. Assembled on a heat sink these components enable compact light sources without moving parts. This is a 100% inorganic solution offering high reliability.\* SCHOTT offers several types of white static converter materials for correlated color temperatures (CCT) of 6,000 K and 5,000 K each, to serve various applications.



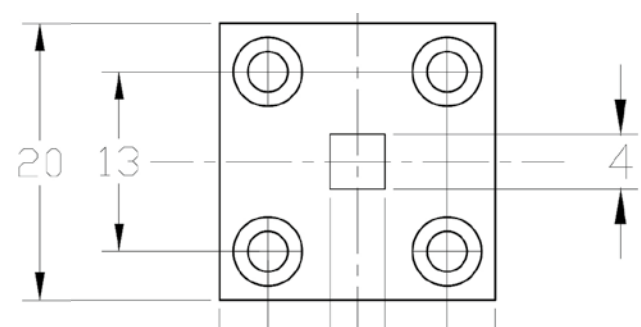
## How does it work for white light?



For white light generation, the material is designed for diffuse reflection of just the right portion of blue light to meet the desired color coordinates.

\* Operation above 65 °C on the heat spreader is not recommended.

## White standard samples

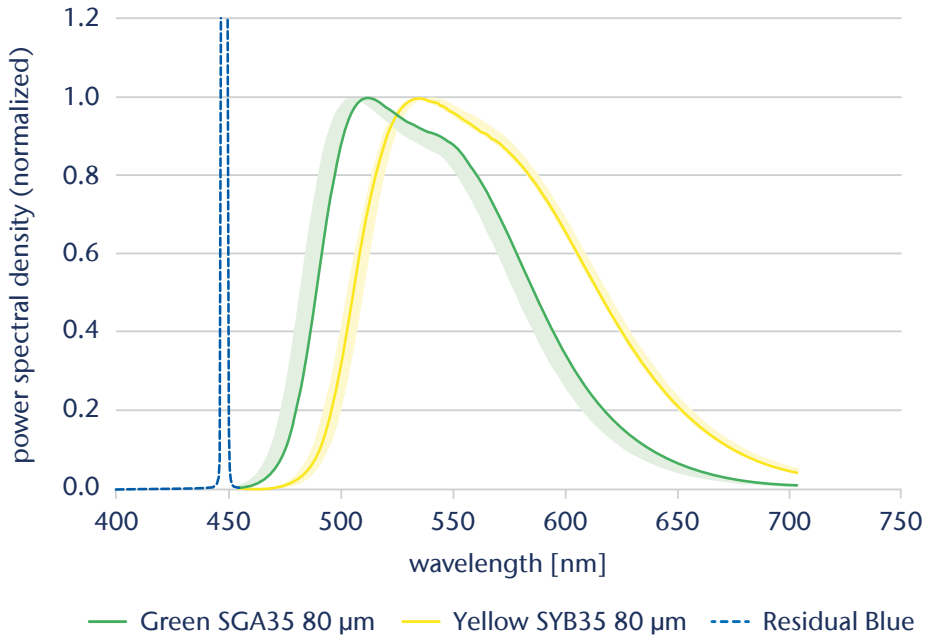


Standard samples available with heat spreader dimensions of 20 x 20 x 4 mm and phosphor material dimensions of 4 x 4 x 0.150 mm.

- Customization available upon request
- The applicable tolerances for both dimensions are not shown in this sketch, but are available in the technical drawings upon request.

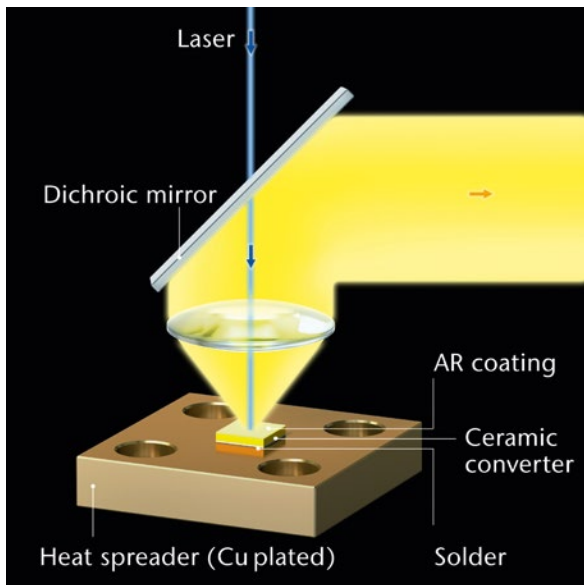
# SCHOTT offers green and yellow converter material

## Emission spectrum



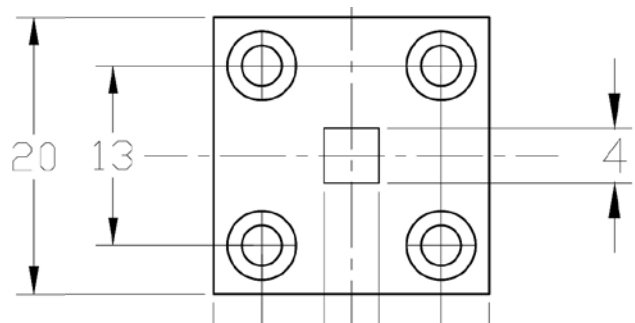
1. Range shows different materials, including GGB35 80 μm, SGF35 80 μm, SGB35 80 μm, SGA35 80 μm, SWA40 80 μm, SYA35 80 μm, SWD50 80 μm, SYB35 80 μm and others
2. Details can be provided upon request

## How does it work for green and yellow light?



Blue laser light is applied via a dichroic mirror. This also blocks residual blue light, that is reflected from the sample. The pure emission spectrum of green or yellow light serves applications like digital projection or stage lighting.

## Yellow/Green standard samples



Standard samples available with heat spreader dimensions of 20 x 20 x 4 mm and phosphor material dimensions of 4 x 4 x 0.080 mm.

- Customization available upon request
- The applicable tolerances for both dimensions are not shown in this sketch, but are available in the technical drawings upon request.

# Technical details

## Yellow (80 µm die thickness, anti-reflection coated phosphor on heatspreader)

Optical specifications	Yellow SYA35	Yellow SYB35	Yellow SWA40 <span style="background-color: #008080; color: white; padding: 2px;">NEW</span>	
Conversion efficacy [lm/W]	> 240	> 250	> 200	
Conversion efficiency [W/W]	> 50%	> 52%	> 42%	
Color coordinates $c_x$	0.411	0.417	0.409	Center values, tolerances $\pm 0.01$
Color coordinates $c_y$	0.561	0.557	0.559	

## Green (80 µm die thickness, anti-reflection coated phosphor on heatspreader)

Optical specifications	Green SGA35	Green SGB35	Green SGF35	Shifted Green GGB35	
Conversion efficacy [lm/W]	> 280	> 270	> 240	> 260	
Conversion efficiency [W/W]	> 59%	> 57%	> 51%	> 57%	
Color coordinates $c_x$	0.333	0.326	0.320	0.299	Center values, tolerances $\pm 0.01$
Color coordinates $c_y$	0.590	0.587	0.583	0.579	

### Notes:

Emission spectrum defined by the power spectral density  $> 465$  nm.

Efficacy and efficiency specified for emission spectrum.

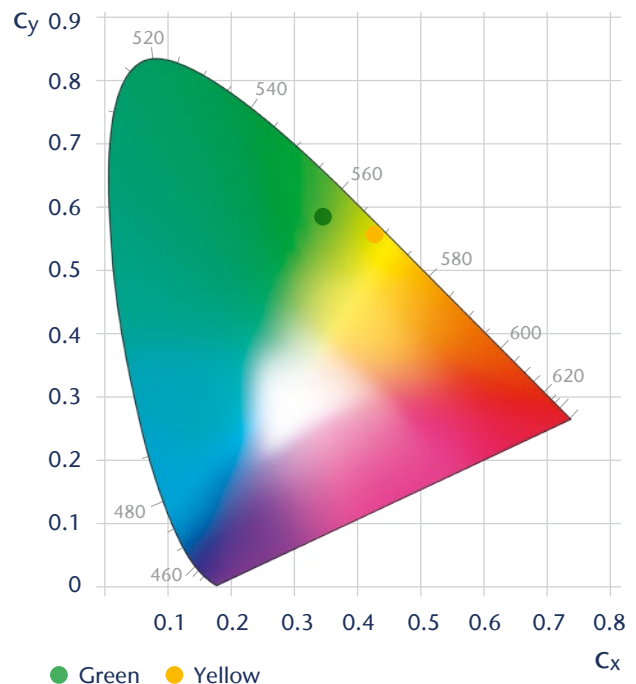
AR coating optimized for blue light normal incidence.

Efficacy, efficiency and color coordinates measured with  $60^\circ$  incident angle of blue laser (449.5 nm) at low laser power.

Emission is detected in normal direction.

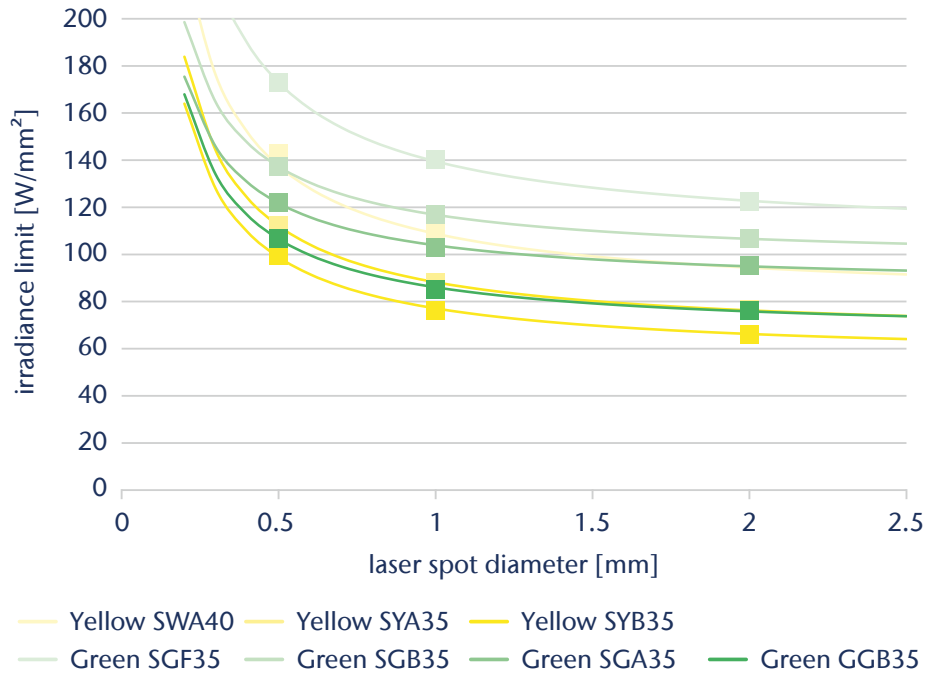
More details see webpage:

<https://www.schott.com/ceramic-converter>

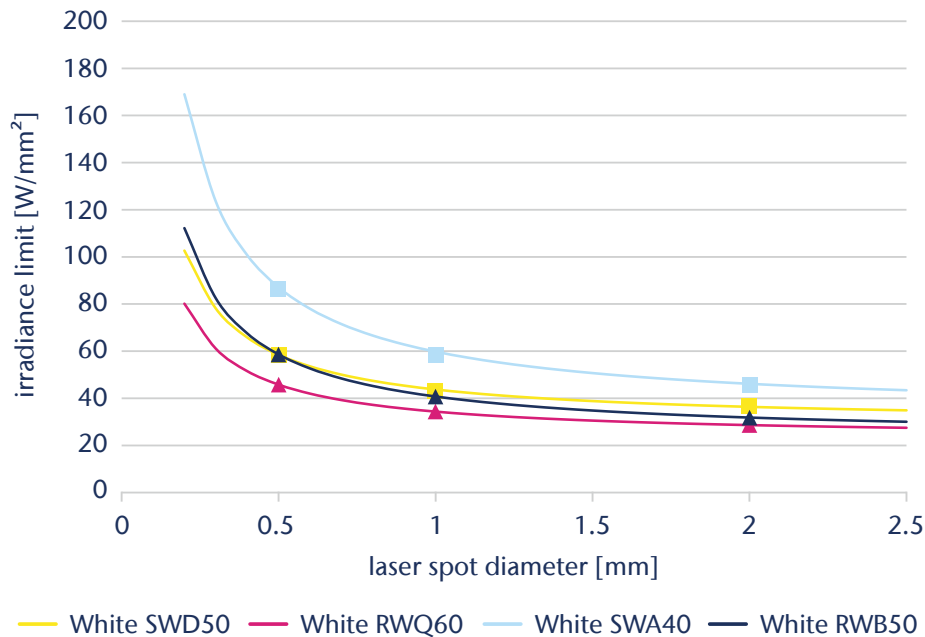


# Products offer high irradiance limits for maximum luminance

## Yellow and green



## White 5,000 K and white 6,000 K



### Notes:

Indicated irradiance limits are not based on measurements, but on validated numerical simulation, taking into account all properties of relevance.

The values apply for illumination by a 450 nm CW mode laser with tophat profile, and for good thermal contact of a heatspreader sized 20x20x4 to a heatsink at 30°C.

For safety reasons stay at least 20% below indicated irradiance limit. Accordingly, the values on this page may in no case be understood as technical product specifications, and are for general orientation purposes, only.

**[schott.com](https://www.schott.com)**

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