

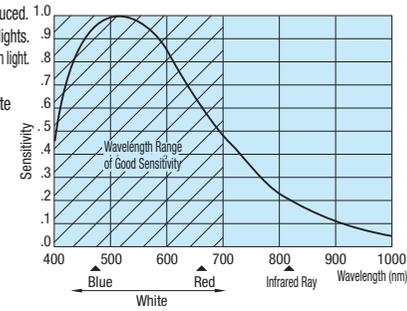
LED Lighting for Cabinetry

Overview

Features of LED Lighting

- Long Life** : Has longer operation life than conventional halogen and fluorescent lights. Maintenance frequency can be reduced.
- Quick Response** : Can be switched on/off quickly compared to halogen lights. The response speed is about 1/1000 of the halogen lights.
- Energy-Saving** : When lit at the same brightness with the halogen light, the LED light consumes only about 1/5 of electrical power of the halogen light.
- Compatibility with CCD Cameras** : Due to the CCD Camera's spectral sensitivity (graph on right) adapting well to the blue, red, and white LED wave length, better images are obtained.

CCD Camera Spectral Sensitivity Characteristics

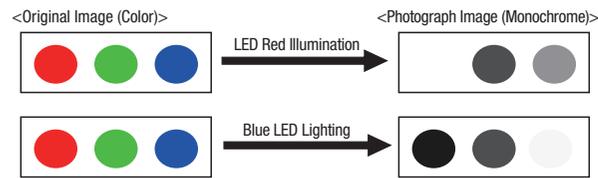


LED Lighting Selection Tips

1. When making workpiece color disappear or exaggerate

<Relations between the Workpiece Position and the Light Color (Image)>

When using a light similar to the workpiece color, the workpiece shows whitish; while using a light opposite to the workpiece color (complementary color), the workpiece shows dark.



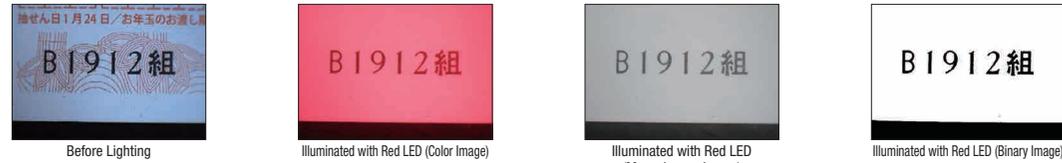
<Complementary Relationship between the Color of Workpiece and Light>

LED Color of Lighting	Color of Workpiece		
	Blue	Green	Red
Blue	○	○	○
Red	●	●	○

○ : make it white
● : make it black

<Actual Example>

When making the workpiece background color white and disappear : Use similar color light.

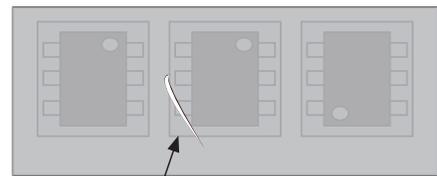


2. When observing the workpiece exterior or interior

<Relations between the Workpiece Position and the Light Color (Image)>

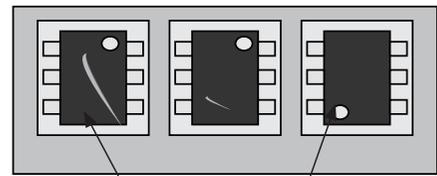
Visible part of the workpiece will vary depending on lighting's wavelength.

(To observe the workpiece exterior)



Detecting scratches or foreign matters on the tape film surfaces.
→The lights with low transmittance and short wavelength are effective.

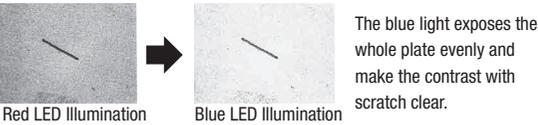
(To observe the workpiece interior)



Transmit the light through the film to detect chipped ICs or polarity error under the taping.
→The lights with low transmittance and short wavelength are effective.

<Actual Example>

When a clear image of the exterior is desired : Use a light color with high scatter rate (Blue) • When illuminating the interior of the workpiece clearly : Use light with high transmission (Red, Infrared)



For detailed image samples, P.1060.



Note that, for some of the types shown here, order might be unable to be received by the MISUMI Indonesia offices.

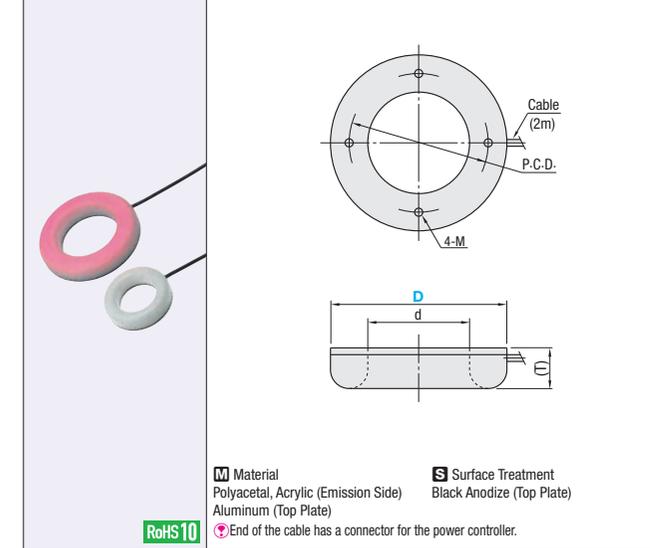
LED Lighting for Cabinetry

Multi-Lighting Type

Features: This structure offers the suitable contrast for image processing by only switching the distance between the light and the object as it changes the illumination angle.

Multi-Lighting Type

MMD



M Material: Polyacetal, Acrylic (Emission Side), Aluminum (Top Plate)
S Surface Treatment: Black Anodize (Top Plate)
End of the cable has a connector for the power controller.

Part Number	Type	D	Color	d	P.C.D.	M	(T)	Unit Price	
								1 ~ 20 pcs(s)	
MMD	42		R (Red)	16	30	3	(15)		
			W (White)						
			N (Infrared Ray)						
	55			R (Red)	32	44	M3	(15)	
				W (White)					
				N (Infrared Ray)					
	80			R (Red)	46	63	M3	(18)	
				W (White)					
				N (Infrared Ray)					
	100			R (Red)	60	80	M4	(18)	
				W (White)					
				N (Infrared Ray)					
120			R (Red)	80	100	M4	(20)		
			W (White)						
			N (Infrared Ray)						
150			R (Red)	90	120	M4	(23)		
			W (White)						
			N (Infrared Ray)						

For orders larger than indicated quantity, please check with WOS.



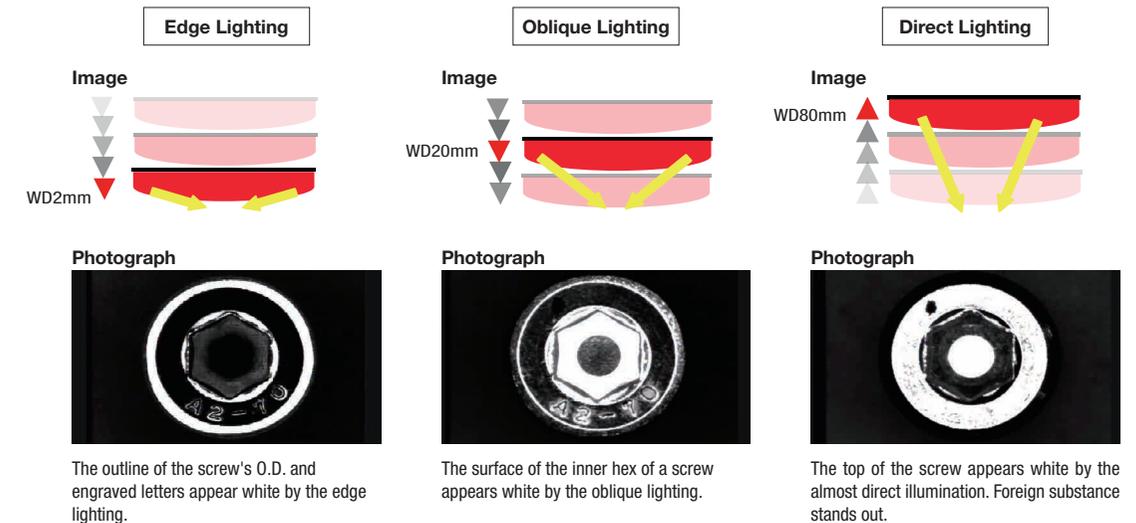
Part Number	Color
MMD 55 - R	R

- Color R : RED, W : White, B : Blue, N : Infrared
- Use LEDCNR1/LEDCNRF2 on P.1060 for the power controller. Do not use third-party controllers.

Features of LED Multi-Lighting

- Wide Illumination Range** : The illumination angle can be changed optionally by changing the WD (Working Distance).
- Good Uniformity** : It is suitable for highly reflective objects as diffused light is used, and the light disperses uniformly on the objects causing less reflections.
- Excellent Dust Resistance** : Dust can be easily wiped off since it is covered. It is most suitable for the clean rooms of semiconductor factory or food factory.

Variation of the Photograph Based on WD (Working Distance)



The outline of the screw's O.D. and engraved letters appear white by the edge lighting.

The surface of the inner hex of a screw appears white by the oblique lighting.

The top of the screw appears white by the almost direct illumination. Foreign substance stands out.