



Lightings for Visual Inspection

Comprehensive Catalog

Sales outlet



HIKARIYA LIGHTING Co.,Ltd.

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Optical Technologies to People, to Companies



【 Basic Idea 】

<Our Organization> (Root) aims to contribute to happiness of <the Local Community including people related with the Organization> (Blossom) through quality improvement of the Organization by self-development and cooperation works.

In other words, we mean "By efforts of each person and by cooperation of all members, our company aims to improve our overall capacity and quality of work, and to assist people around us to be happy."

To achieve the idea above, with empathy of values as a major premise, we HIKARIYA LIGHTING is marching toward the formation of the strongest strategic organization.

Representative Director : Tamiya Suzuki

Corporate Profile

Trade name : HIKARIYA LIGHTING Co.,Ltd.

Date of foundation : March, 1997

Representative : Representative Director Tamiya Suzuki

Capital : 20 M yen

Address : 3F Woody3 Bldg., Watta 77-1, Izumida-cho,
Kariya-shi, Aichi-ken 448-0004 Japan

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Affiliated companies : Belltec Co., Ltd.
TOTAL SERVICE SYSTEMS
TSS, Inc.
KAKUBUN INC.G.S. Electech Inc.



Overview of the office building

Our customers

- | | | |
|-----------------------------|---|---------------------------|
| ●TOYOTA MOTOR CORPORATION | ●Toyota Motor Manufacturing, Kentucky, Inc. | ●SUZUKI MOTOR CORPORATION |
| ●Zojirushi Corporation | ●CENTRAL MOTOR CO., LTD. | ●Honda Motor Co., Ltd. |
| ●Ricoh Company, Ltd. | ●Kanto Auto Works Co., Ltd. | ●Aisin Seiki Co., Ltd. |
| ●TOYOTA AUTO BODY Co., Ltd. | ●Hino Motors, Ltd. | ●Panasonic Corporation |
| ●JFE Steel Corporation | ●SUMITOMO LIGHT METAL INDUSTRIES, LTD. | ●Kansai Paint Co., Ltd. |
| ●DENSO CORPORATION | ●Bridgestone Corporation | ●TPK Holding Co.,Ltd |
| ●TOYODA GOSEI Co., Ltd. | ●DAIKIN INDUSTRIES, LTD | |

◆ Many other companies in addition to the above are our customers.

Company history

- | | |
|------|--|
| 1997 | Founded in Kariya-shi, Aichi-ken, Japan. |
| 2000 | Started sales of Mihariban series products. |
| 2000 | Started sales of LED Flat Light Guide series of products. |
| 2009 | Started sales of LED Flat Light and Light Board PRO. |
| 2011 | Started sales of LED Flat Light F280/F420. |
| 2013 | Started sales of Light Board PRO II. |
| 2015 | Started sales of LED Flat Light Portable series of products. |
| 2018 | Established Komono Laboratories in Komono-cho, Mie-ken, Japan. Moved manufacturing site to Komono-cho. |

The principle of finding faults

On the ground of inspection and quality control, reducing failure rates and costs are crucial.

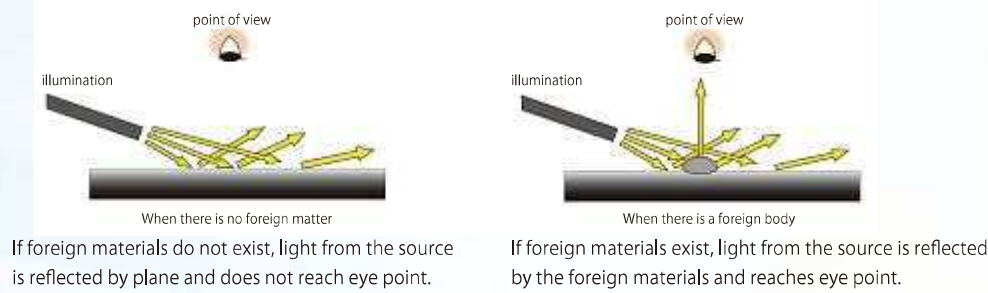
Therefore, we often increase a number of fluorescent lights to get brighter environment so that defects can be found more easily during the visual inspection process.

It is important to provide lighting suitable for the work and for the operators to improve the work efficiency.

We, HIKARIYA LIGHTING Co., Ltd. proposes better inspection environment by producing the most appropriate lighting.

How defects appear under “direct light” and its principle

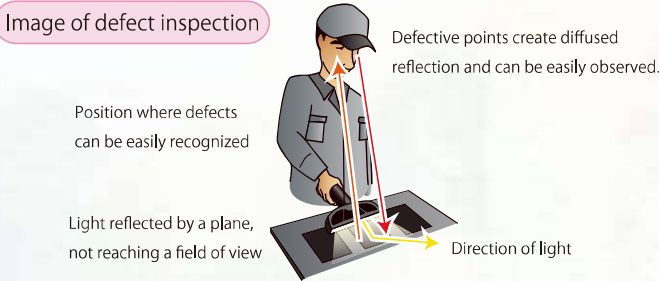
The principle that defects become observable



How defects appear

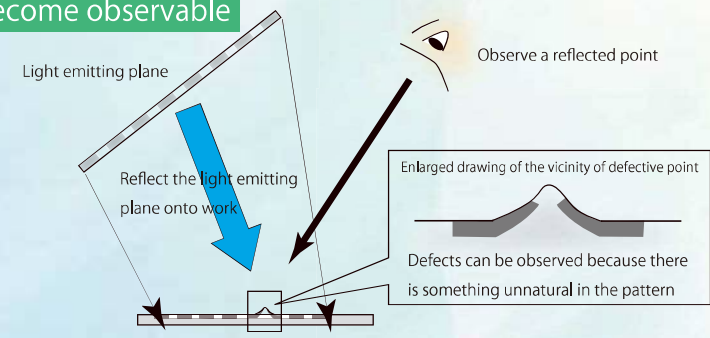


Image of defect inspection



How defects appear under “reflection” and its principle

The principle that defects become observable



How defects appear

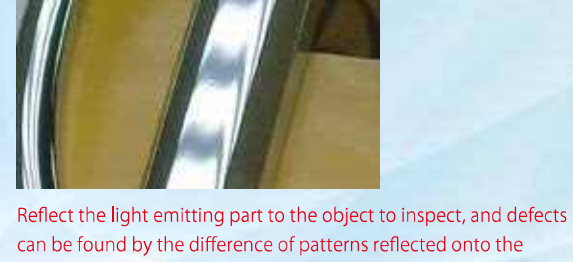
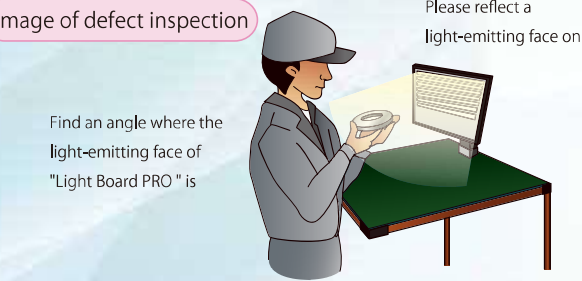


Image of defect inspection



Lighting for visual inspection used in various areas

Die/Forming/Casting

- Scratches on mirror surface metal/die surface
- Oil leak of casting

Automotive parts

- Scratches on plated parts
- Poor clear coating
- Granular structure on coating surface

LCD products

- Dust on LCD surface
- Scratches on LCD panel

LED Flat Light series

Automotive

- Polishing trace on body surface
- White blurring after coating
- Lack of hiding of paint

Furniture/Hous

- Scratches/Dents on panel

Transparent film

- Scratches on film surface
- Granular structure on film

LED Flat Light Wide series

Description of icons

Suitable for inspection of granular structures	Suitable for inspection of burrs	Suitable for inspection of wrinkles	Suitable for inspection of planes	Suitable for inspection before coating
Suitable for inspection of scratches and cracks	Suitable for inspection of contaminations	Suitable for inspection of irregular colors	Suitable for inspection of solid bodies and spherical bodies	Suitable for inspection after coating
Suitable for inspection of abrasion	Suitable for inspection of dust	Suitable for inspection of light leakage	Suitable for inspection before forming	
Suitable for inspection of dents and indentations	Suitable for inspection of distortion		Suitable for inspection after forming	

Best for visual inspection of planar works

HL-DFL-F120/F280/F420

LED Flat Light

Major inspection examples

- Inspection of dust, scratches and granular structures on coated surface
- Surface inspection of dust, scratches and wrinkles on LCD, sheet metal, woods, leather, etc.
- Inspection of scratches, shrinkage holes, wrinkles, etc.

※ F120 is used in the photo.

(F120/F280/F420)

LED Flat Light

Inspect scratches, dust, and irregularities on flat surface with intense straight light.

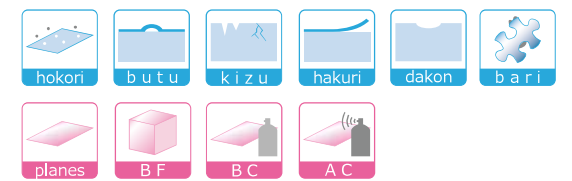


F120 type



F280 type

F420 type



Product Name	LED Flat Light	LED Flat Light 280	LED Flat Light 420
Model	HL-DFL-F120	HL-DFL-F280	HL-DFL-F420
Light emission width	144×12	285×15	421×15
Light source	White high-brightness LED	White high-brightness LED	White high-brightness LED
Weight	200g	650g	940g
Dimension	164×181×23	299×76×25.5	430×76×25.5
Power consumption	2.6W	5.2W	7.8W
Power supply	AC100V ~ AC240V (Input:AC100V ~ 240V / Output:DC12V 1.5A)		
Accessory	AC adapter		
Illuminance	54000Lx (100mm)	59400Lx (100mm)	64000Lx (100mm)
	17000Lx (300mm)	27800Lx (300mm)	28400Lx (300mm)
	7300Lx (500mm)	12600Lx (500mm)	15800Lx (500mm)

How it looks / How to



Dust cannot be observed visually under highly-diffusive fluorescent light.



With irradiation of the Flat Light, dust can be clearly observed.



Line-up in three types of color (customization with other color is possible).



The Flat Light is used for surface condition inspection of various materials.



Three types are available in accordance with work size and use.

option

F120-45D type only



- Light control unit (HL-DFL-CHO)
- Light control range : 15%~100%
 - External dimension : 65×40×41 mm



- Dedicated stand (HL-DFL-STD)
- Vertical adjustment : 50 mm ~600 mm
 - Load capacity : About 500 g

F280-45D/F420-45D type only



- Dedicated arm stand (HL-DFL-AMN-ST)
- Vertical adjustment : 50 mm ~450 mm
 - Load capacity : About 2 kg

Best for visual inspection
of vertical shapes and
various works.

LED Flat Light Wide

Major inspection examples

- Inspection of dents, poor cutting, and scratches of machined parts
- Inspection of burrs, shrinkage holes, wrinkles, cracks, etc. of resin molded parts
- Inspection of visual defects of other various shapes and materials

※ The photo shows an example of combination of F120-45D and dedicated stand.

(F120-45D/F280-45D/F420-45D)

LED Flat Light Wide

Inspect defects of various works with wide-spreading
straight light.

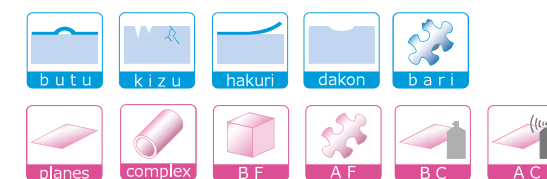


F120 type



F280 type

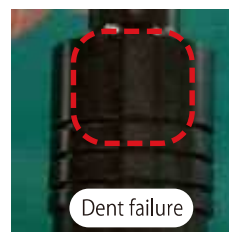
F420 type



Product Name	LED Flat Light Wide	LED Flat Light 280 Wide	LED Flat Light 420Wide
Model	HL-DFL-F120-45D	HL-DFL-F280-45D	HL-DFL-F420-45D
Light emission width	144×12	285×15	421×15
Light source	White high-brightness LED	White high-brightness LED	White high-brightness LED
Weight	180g	580g	840g
Dimension	164×181×23	299×76×25.5	430×76×25.5
Power consumption	2.6W	5.2W	7.8W
Power supply	AC100V ~ AC240V (Input:AC100V ~ 240V / Output:DC12V 1.5A)		
Accessory	AC adapter		
Illuminance	11000Lx (100mm)	13000Lx (100mm)	14000Lx (100mm)
	2700Lx (300mm)	5000Lx (300mm)	6000Lx (300mm)
	1000Lx (500mm)	2200Lx (500mm)	3100Lx (500mm)

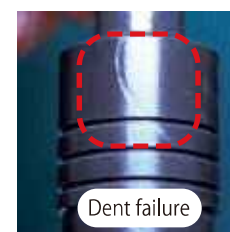
✓ How it looks / How to

Under fluorescent light



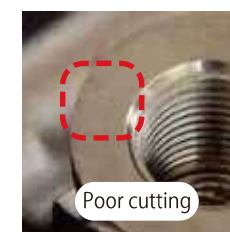
Dent failure

LED Flat Light Wide



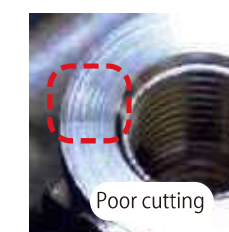
Dent failure

Under fluorescent light



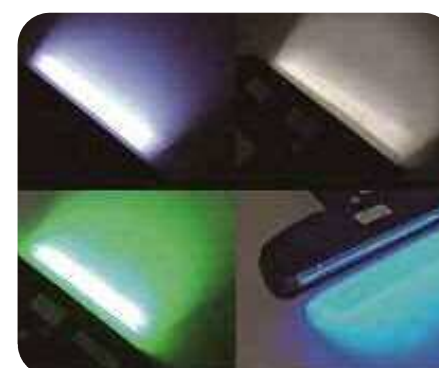
Poor cutting

LED Flat Light Wide



Poor cutting

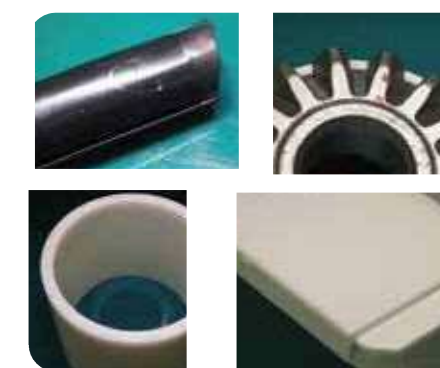
Scratches and burrs can be identified clearly by radiating highly straight light to works of complex shape of metal machined parts or resin molded parts.



Line-up in three types of color
(customization with other color is possible).



Pattern of the front lens can be modified
freely upon your request.



Suitable for visual inspection of works of
various shapes

option

F120-45D type only



Light control unit
(HL-DFL-CHO)
• Light control range
: 15%~100%
• External dimension
: 65×40×41 mm



Dedicated stand
(HL-DFL-STD)
• Vertical adjustment
: 50 mm ~600 mm
• Load capacity
: About 500 g

F280-45D/F420-45D type only



Dedicated arm stand
(HL-DFL-AMN-ST)
• Vertical adjustment
: 50 mm ~450 mm
• Load capacity
: About 2 kg

Pattern and color of the light emitting plane can be customized freely. Brightness of maximum 47000 Lx

HL-LBDC-A5/A4/A3

Light Board PRO II

Major inspection examples

- Inspection of scratches, granular structures, etc. on shining surfaces such as coating, plating, and various die surfaces
- Inspection of scratches on film
- Inspection of scratches on wheel

※ The photo shows an example of combination of Light Board PRO II and a dedicated arm.

(A3/A4/A5)

Light Board PRO II

Uniform surface emitting light without unevenness

※ One mask pattern that you specify is included in the system.



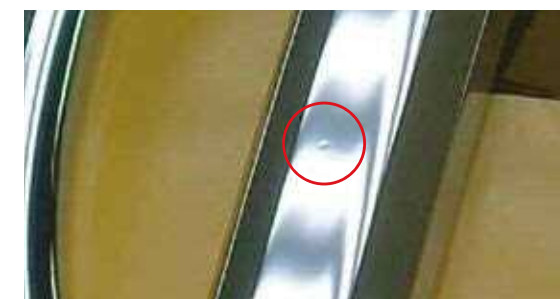
Size comparison



Product Name	Light Board PRO II A5	Light Board PRO II A4	Light Board PRO II A3
Model	HL-LBDC-A5	HL-LBDC-A4	HL-LBDC-A3
Light emitting surface size	147×208	208×296	294×416
Dimension	235×202×47	323×263×47	450×349×47
Weight	1.0kg	1.7kg	3.0kg
Power consumption	15.4W	30.7W	61.4W
Light control method	PWM (Pulse/Width/Modulation) control		
Power supply	AC100V ~ AC240V (Input: AC100V ~ 240V / Output: DC24V 2.7A)		
Accessory	AC adapter		
Surface illuminance	47000Lx (When mask pattern P0 is used)		
Direct illuminance	24000Lx (100mm) 7000Lx (300mm) 3100Lx (500mm)		

※One mask pattern that you specify is included in the system.

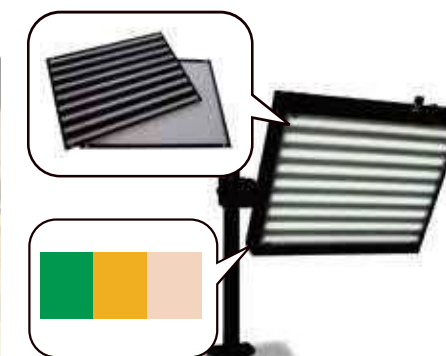
✓ How it looks / How to



Granular structure cannot be observed under fluorescent light but it can be identified by Light Board PRO II irradiation.



Lineup of about 700 types of color filters



The mask pattern and color filters are replaceable.



Transmission inspection is possible.

option

A5/A4/A3 type only



mask pattern

(LBDC-(A5,A4,A3)-(P0~P2)(S1~S2))

- Lineup of patterns suitable for various works
- Pattern can be modified freely upon your request.



Dedicated arm (LB-AMN)

- The arm can be mounted to various locations as it uses a clamp to fix.
- Vertical adjustment : 50 mm ~450 mm (Option : Pole length 750 mm /1000 mm)

Q & A

Q Life of the LED, life of the product?

A Life of LED devices is as long as 50,000 hours. The product life will vary according to the use environment but our warranty period is set to one year from your purchase. In addition, in case of the product failure, it can be repaired in short period because it is designed and manufactured by ourselves.

Q What are differences from fluorescent light?

A As the fluorescent light is diffused light, reflection and shadow will hardly occur. LED Flat Light series products cause reflection with highly directional light to make scratches and dust more easily detectable.

Q LED is not good for eye health?

A You may feel eye fatigue due to blue light.
Blue light is included also in the sun light and fluorescent light which are called as white lights. Though they look white, the white is generated actually by mixing various colors such as seven colors from blue to red in a rainbow.
As some of our products have light sources that contain the blue light region, your consideration on workload reduction for your operators is appreciated.
In addition, ultraviolet light will cause almost no effect.

Q Can you build a large-sized Light Board?

A At present, A3 size is the maximum that we build. As a customized size, we have built a light emitting surface of 830 mm × 150 mm in size.

Q How many millimeters is the maximum width of the LED Flat Light that you can build?

A We can build up to 550 mm width as a customized product.
For the size exceeding that, please use multiple units placed side by side, or contact our sales representative.

Q Why the green light is chosen?

A The wave length that human eye senses bright is close to 555 nm, green light. During inspection of foreign materials, light that human eye feels brighter is the green light. In addition, during inspection of aluminum materials, irradiation of green light will make defects detection easier than white light because of stronger contrast between the defect area and the environment.

Q About selection of product

A Please visit “Examples of Effect and Introduction” or use “Model Selection Simulator” in our Web site.
<http://www.hil.co.jp>

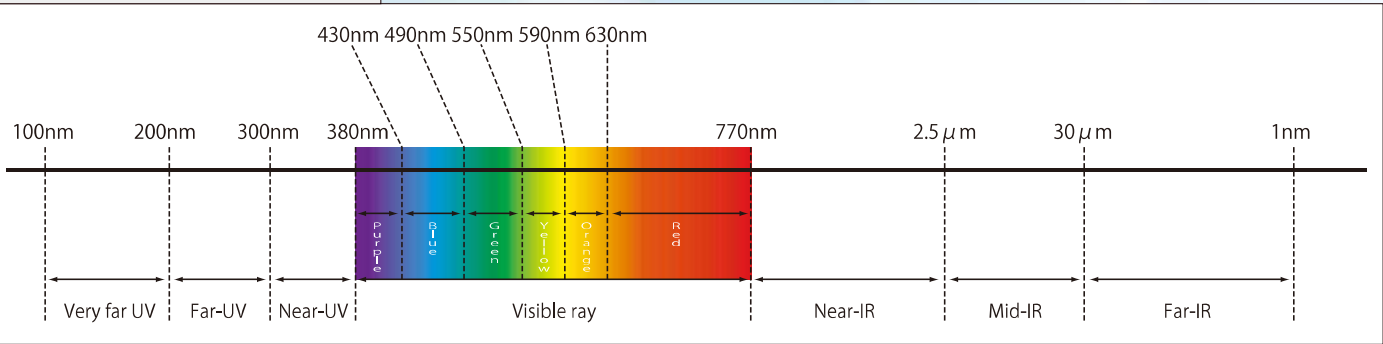
Q We want to see the products, or to try demonstration equipment.

A Please contact your machine and tool supplier.



Click here to visit our Web site.

Wavelength of color



Visible light

Among electromagnetic waves, the wavelength (light) that human eye can see. Unit : nanometer (nm)
Wavelength: Lower limit is about 360–400 nm, upper limit is about 760–830 nm.
※ nm (nanometer) : one millionth of a mm (millimeter)

Total luminous flux

Total amount of lights irradiated to all directions from a light source. Unit : lm (Lumen)

Illuminance

Brightness of light irradiated to a flat object. Unit : lx (Lux)

Luminance

Brightness per unit area at a planar light source. Unit : cd/ m²

Color temperature

A scale of color of light irradiated from a light source represented by a quantitative value. Unit : K (Kelvin)
※ The unit Kelvin is K for the absolute temperature. A substance irradiates various lights in accordance with its temperature. For example, it is well known that in the course of heating iron, its color is orange at first but changes to white along with further heating. Color temperature of rising or setting sun is about 2000K, sun light is 5000–6000K, and the sky is 8000K.

Color rendering properties

An evaluation index that indicate how an object appears (color rendering) indoors. According to the spectral distribution of the light source, its light color, spectral reflectivity of the object illuminated, and chromatic adaptation of an eye are related. Unit : Ra (average of Rendering index)

Glare

Though proper lighting will help to see how an object appears, improper lighting may impair the view due to excessive light to the eye, or may cause discomfort due to too much brightness of the light source. It is called “glare” . The degree of glare is affected by brightness of the background.

Ultraviolet light

Electromagnetic wave of invisible light with shorter wavelength than visible lights and longer wavelength than X-ray.
Wavelength: 10–400 nm
Among them, near-ultraviolet light of wavelength 380–200 nm contained in the sun light, is divided into three types, i.e. UV-A wave, UV-B wave and UV-C wave. Among them, A wave and B wave reach the Earth.
A lamp that emits UV-A is called as a black light. Though light of the black light itself can hardly be recognized by human eyes, only fluorescent substances contained in an object irradiated by a black light emit light.
※ Fluorescent substance: When an electromagnetic wave with energy of ultra violet light level is absorbed, electron transition will occur in the substance and high energy state (excited state) is reached. When it returns to the original state, the fluorescent substance emits visible light.

Blue light

Among visible lights, the blue light has the shortest wavelength and the strongest energy. Wavelength: 380-495 nm

Fluorescent light

If you apply current to an electrode to heat it up, electrons will be emitted and move to the other electrode to start discharging. Electrons caused by the discharge are irradiated to fluorescent substances coated inside the glass tube and visible lights are emitted.

LED

LED is a semiconductor device and emits lights by the Electroluminescence Effect when electric current is applied. The device itself can be used almost indefinitely but the actual life is until when translucency of the package drops due to the package resin degradation.