— BROAD-WAVELENGTH INFRARED LIGHT SOURCE —

# XENON FLASH LAMP

## ~ For highly precise quantitative / qualitative analysis ~

Hamamatsu now introduces a new xenon flash lamp that emits a continuous spectrum over a broad wavelength range from 0.16 µm to 7.5 µm and is ideal for high-precision inspections and chemical analysis requiring multi-wavelength infrared light source.
Compared to other infrared light sources, this xenon flash lamp offers excellent characteristics such as higher stability and higher light output making it a powerful tool for applications where high precision is required.
Despite its high output, this xenon flash lamp delivers a long life and ensures high reliability.

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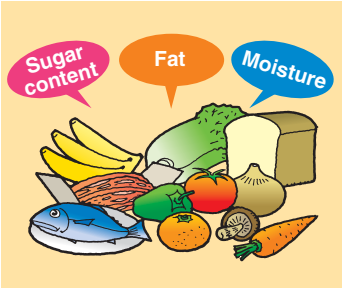
# APPLICATIONS

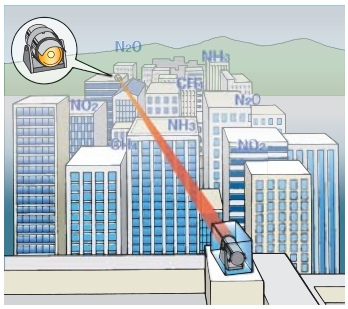
## ●Food product inspection

- Food sorting
- Food analysis
  sugar content
  fat
  moisture measurements
- Foreign matter inspection




## ●Gas measurement and analysis

- Multiple gas detection
  $CH_4$ (methane)
  $C_3H_8$ (propane)
  $CH_3OH$ (methanol) etc.




# SPECIFICATIONS

## ●20 W xenon flash lamp

| Parameter | | Standard type | | Mirror integrated high output type | | Unit |
|---|---|---|---|---|---|---|
| | | L14691 | L14693 | L14692 | L14694 | |
| Arc size | | 1.5 | 3.0 | 1.5 | 3.0 | mm |
| Window material | | $MgF_2$ | | | | — |
| Spectral distribution | | 0.16 to 7.5 | | | | μm |
| Recommended main discharge voltage | | 400 to 1000 | | | | V |
| Main discharge capacitance | | 0.1 to 1.0 | | | | μF |
| Maximum input energy (per flash) ① | | 500 | | | | mJ |
| Maximum average input (continuous) ② | | 20 | | | | W |
| Maximum repetition rate ③ | | 1000 | | | | Hz |
| Light output stability | Typ. | 0.5 | | | | % CV |
| | Max. | 2.0 | | | | |
| Guaranteed life ④ | | $1 \times 10^8$ | | | | flashes |

## ●2 W xenon flash lamp module

| Parameter | | L13651-01-3 | L13651-02-3 | L13651-03-3 | L13651-04-3 | Unit |
|---|---|---|---|---|---|---|
| Arc size | | 1.0 | | | | mm |
| Window material | | $MgF_2$ | | | | — |
| Spectral distribution | | 0.16 to 7.5 | | | | μm |
| Recommended main discharge voltage | | 400 to 600 | | | | V |
| Main discharge capacitance | | 0.141 | 0.094 | 0.047 | 0.02 | μF |
| Maximum input energy (per flash) ① | | 25.4 | 16.9 | 8.5 | 3.6 | mJ |
| Maximum average input (continuous) ② | | 2 | | | | W |
| Maximum repetition rate ③ | | 1250 | | | | Hz |
| Light output stability | Typ. | 0.5 | | | | % CV |
| | Max. | 2.0 | | | | |
| Guaranteed life ⑤ | | $1 \times 10^9$ | | | | flashes |

## ●20 W xenon flash lamp module

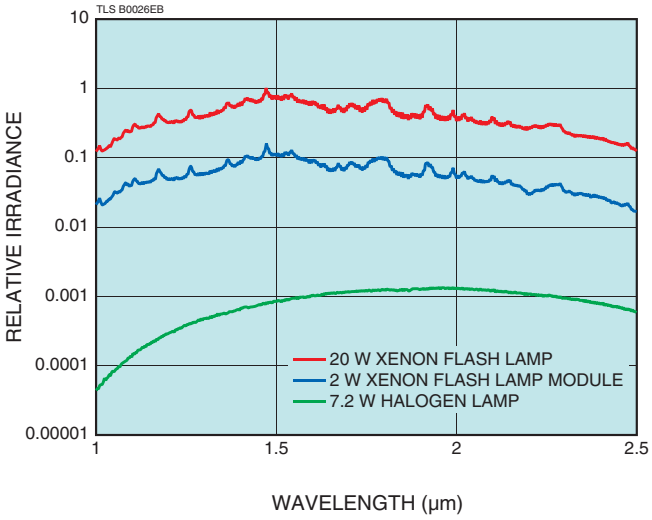
| Parameter | | L12745-01-3 | L12745-02-3 | L12745-03-3 | Unit |
|---|---|---|---|---|---|
| Arc size | | 1.5 | | | mm |
| Window material | | $MgF_2$ | | | — |
| Spectral distribution | | 0.16 to 7.5 | | | μm |
| Recommended main discharge voltage | | 400 to 1000 | | | V |
| Main discharge capacitance | | 0.64 | 0.32 | 0.1 | μF |
| Maximum input energy (per flash) ① | | 320.0 | 160.0 | 50.0 | mJ |
| Maximum average input (continuous) ② | | 20 | | | W |
| Maximum repetition rate ③ | | 1000 | | | Hz |
| Light output stability | Typ. | 0.5 | | | % CV |
| | Max. | 2.0 | | | |
| Guaranteed life ⑥ | | $1 \times 10^9$ | | | flashes |

**NOTE:** ①$E=1/2\ CV^2$ E: Maximum input energy(J) C: Main discharge capacitance(F) V: Main discharge voltage(V)
②$W=E \times f$ W: Maximum average input (continuous) f: Repetition rate
③Recommended repetition rate is 10 Hz or more.
④The life end is defined as the time when the light output at 0.19 μm to 1.1 μm falls below 50 % of the initial value or when the light output stability exceeds 2.0 % CV, measured at a main discharge voltage of 1000 V, main discharge capacitance of 1.0 μF, and repetition rate of 40 Hz.
⑤The life end is defined as the time when the light output at 0.19 μm to 1.1 μm in 2 W operation falls below 50 %of the initial value or when the light output stability exceeds 2.0 % CV.
⑥The life end is defined as the time when the light output at 0.19 μm to 1.1 μm in 20 W operation falls below 50 % of the initial value or when the light output stability exceeds 2.0 % CV.

# COMPARISON WITH OTHER INFRARED LIGHT SOURCES

| Light source | Wavelength range | Output | Time response characteristics | Power consumption | Life | Price |
|---|---|---|---|---|---|---|
| Xenon flash lamp | Wide | ☆☆☆ | ☆☆ | ☆ | ☆☆ | ☆☆ |
| Mid infrared LED (MWIR-LED) | Narrow | ☆☆ | ☆☆☆ | ☆☆☆ | ☆☆☆ | ☆☆☆ |
| Quantum cascade laser (QCL) | Line spectrum | ☆☆☆☆ | ☆☆☆ | ☆☆ | ☆☆ | ☆ |
| Halogen lamp | Wide | ☆☆☆ | ☆ | ☆ | ☆ | ☆☆☆ |

# SPECTRAL DISTRIBUTION (Typ.)

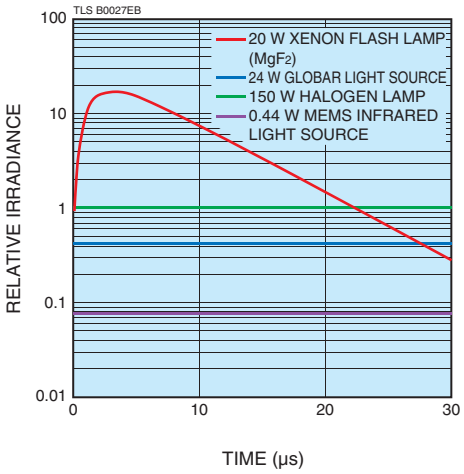



Measurement conditions
Detector: Spectrometer NIRQuest512-2.5
made by Ocean Optics
(Slit width: 25 μm, integration time: 1 ms)
Optical fiber: MF11L1 made by Thorlabs
(Core diameter: 100 μm,
$InF_3$ transmission wavelength range:
0.3 μm to 5.5 μm)

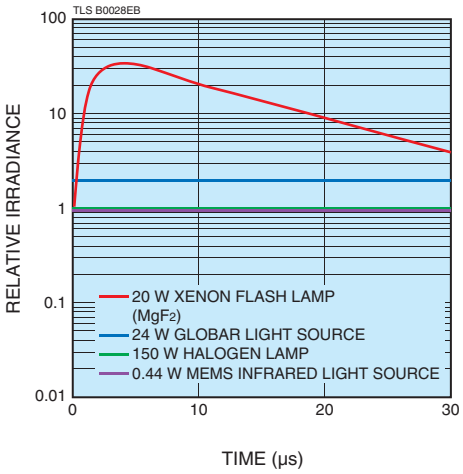
* Light output depends on detector sensitivity.
Use this data as a reference for comparison with other infrared light sources.
* Light output of halogen lamp is corrected to peak irradiance of xenon flash lamp (flash duration: Approx. 6 μs)

# EMISSION PULSE WAVEFORM (Typ.)

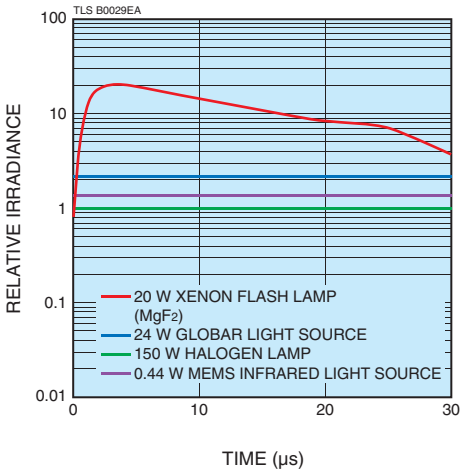
**●Wavelength at 3 μm**




**●Wavelength at 5 μm**




**●Wavelength at 7 μm**



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