

**1. Spectral response characteristics**

UV LABEL gradually changes from white to reddish-purple irreversibly when exposed to UV light. The wavelength of the irradiation affects the degree of color change of the label and therefore the color sensitivity changes even in the same irradiation time.

The spectral response curve shows how the sensitivity of the label changes depending on the wavelength of ultraviolet rays. The horizontal axis shows the wavelength and the vertical axis shows sensitivity respectively.

**2. Measuring method and instrument**

The ultraviolet rays of each wavelength is irradiated on UV label. After the difference of the color before and after the color change reaches to fixed value ( $\Delta E=15$ ), we worked out the sensitivity value (test environment  $23\pm 2^\circ\text{C}$ ).

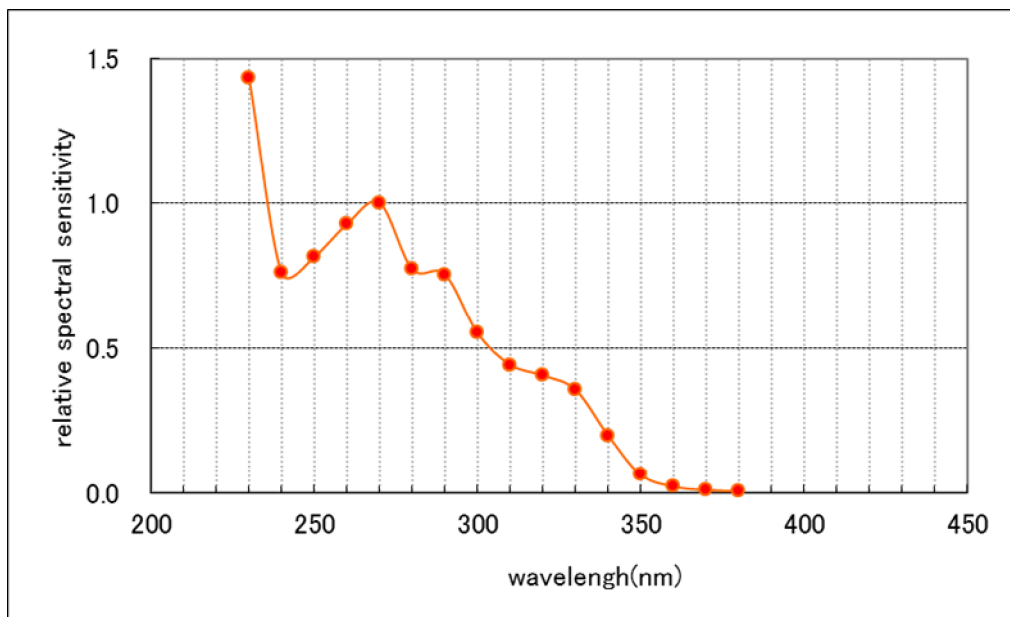
The result is shown in the graph in Clause 3. The graph line shows relative value (relative spectral sensitivity) when sensitivity of the peak value (270nm) is set to the standard value of 1.0.

## ○Spectrum irradiation apparatus

- Source of light: Xenon source of light MAX-301 (Asahi Spectra Co., Ltd.)
- Spectroscope: Single mono chromator CMS-100 (Asahi Spectra Co., Ltd.)
- Spectrum ultraviolet rays exposure dose measurement: silicon photodiode S2281-04(proofread)  
(Hamamatsu Photonics K.K.)

## ○Spectrophotometer

- Spectrophotometer : Spectrophotometer NF333 (NIPPON DENSHOKU INDUSTRIES CO., LTD.)
- Color system: CIE 1976 L\*a\*b\* color system

**3. Result****4. Summary**

- UV label (type H) reacts to ultraviolet rays shorter than 350nm, but sensitivity greatly varies according to the wavelength.
- The UV label (type H) changes color with the low-pressure mercurial lamp of around 200nm (No measured data available). Please refer to technical data for details.

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