



Starna scientific
'Setting the Standard'

Quality Assurance in the Analytical Laboratory

Spectrophotometer UV and Visible Stray Light Qualification Starna Stray Light Glasses

Purpose

These Reference Materials can be used to qualify the Stray Light (or Stray Radiant Energy) of ultraviolet and visible spectrometers.

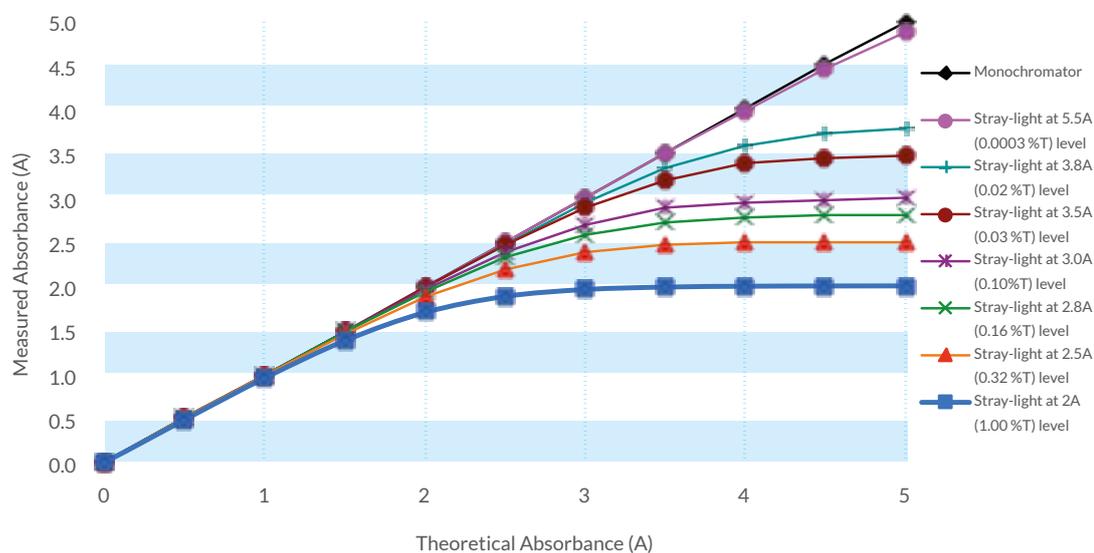
Description and Discussion

Glass cut-off filters that allow stray light to be checked, nominally at 280 nm, 360 nm and 450 nm. Note that variations from melt to melt of the glass can cause variation in these wavelengths, up to ± 10 nm, so each Starna filter is individually certified. Sliding window covers are provided to protect the surface from damage when not in use.

Stray light, also called Stray Radiant Energy or Power, is any light reaching the detector that is outside the Spectral Band Width selected for analysis by the monochromator. It can be due to optical imperfections or stray reflections within the monochromator itself or to light leaks or other effects in the rest of the optical system. As the detector cannot discriminate between the analytical wavelength and the stray light, the stray light contributes to the detector signal and introduces an error in the measured absorbance. The stray light is not absorbed even at high concentrations of the absorbing species, so its effect is a negative deviation from the linear relationship between concentration and absorbance (the Beer-Lambert law) on which most quantitative determinations are based.



Effects of Stray Light on Instrument Linearity



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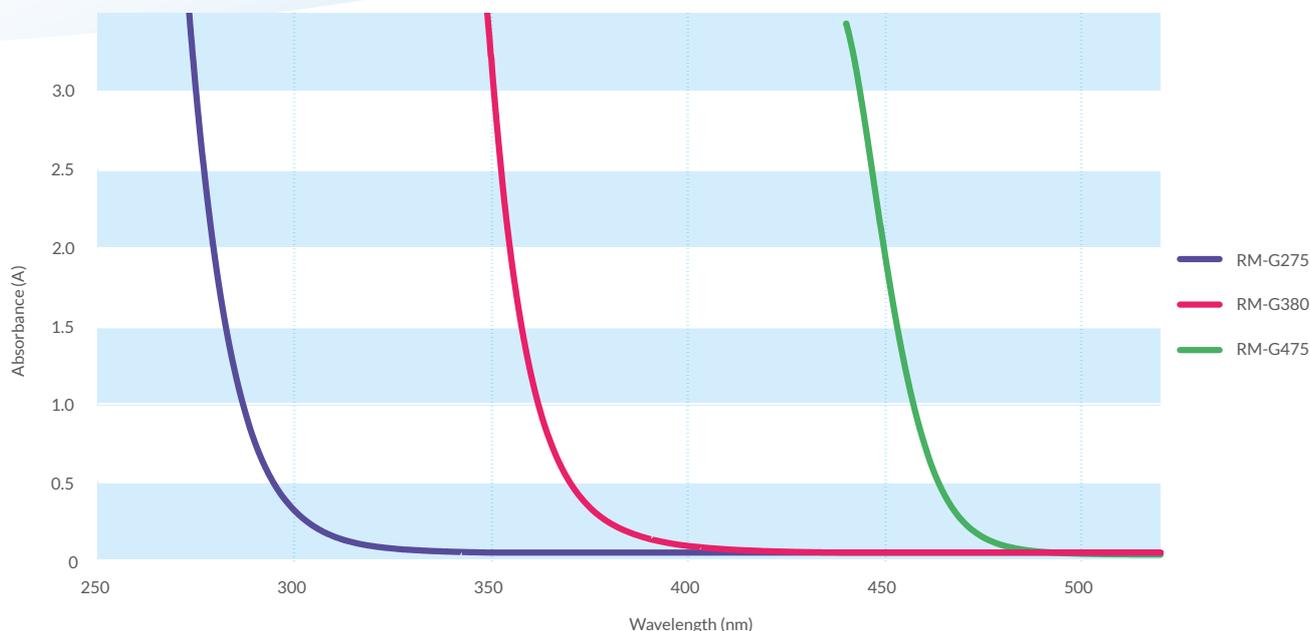
Stray light is wavelength and instrument dependant. It can be present at any wavelength but is most noticeable when the energy throughput of the system at the analytical wavelength is relatively low, and any stray light will be comparatively more significant. At these wavelengths, any deterioration in the instrument optics or light source will exaggerate the apparent stray light, so it is desirable to check it on a regular basis, as it is an excellent way of monitoring the condition of the instrument optics.

The usual way of assessing stray light is to measure, at the desired analytical wavelength, a sample that totally absorbs the radiation at that wavelength,

but transmits at all other wavelengths. Any light detected by the instrument is then stray light.

Practically, the usual method is to use cut-off filters that cut off all light near the analytical wavelength and transmit at all higher wavelengths. The certified wavelength is that at which the spectrum transitions 2.0 A. Below this wavelength, within the indicated usable range, any indication of light transmission must be stray light.

Stray Light Glasses



MATERIAL	CUT-OFF	USABLE RANGE
WG295	280 nm	210 - 270 nm
GG375	360 nm	270 - 350 nm
GG475	450 nm	350 - 440 nm

Note: Variations from melt to melt of the glass can cause variation in these wavelengths, up to ± 10nm, so each Starna filter is individually certified.

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Certification and Documentation

A Certificate of Calibration and Traceability and full instructions for use are provided with each Reference Material. The certificate is supplied in electronic format, on a USB drive in the same box as the references, allowing hard copy to be produced on demand and giving easy interface to the user's own IT systems. Certification measurements are made on a reference spectrophotometer that has been qualified using Standard Reference Materials certified by the National Institute of Standards and Technology (NIST) in the USA, or against primary physical references such as elemental emission lines.

Accreditation

Starna Scientific is accredited to both ISO 17034 as a Reference Material producer, and ISO/IEC 17025 as a Calibration Laboratory for optical reference measurements. Starna Scientific's manufacturing facility is accredited to the ISO 9001 Quality Management System with BSI. For details see www.starna.com/accreditations.

Warranty

STARNA offers a Lifetime Guarantee on all Starna reference materials, unless otherwise stated, such that any reference material that moves outside its published uncertainty budget will be replaced free of charge. This guarantee is subject to the reference materials being re-certified at least every three years and that the references have not been physically, thermally or optically abused. The STARNA UKAS accredited calibration laboratory aims to re-certify and despatch references within five working days from receipt.

How to Order

MATERIAL	CUT-OFF (NM)	USABLE RANGE (NM)	CATALOGUE NUMBER
WG275	280	210 - 270	RM-G275
GG380	355	270 - 350	RM-G380
GG475	450	350 - 440	RM-G475



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