

DESCRIPTION

The P4220 Spectronic Standards Set 2 is a certified, NIST traceable standards set used for performance verification of certain UV-Visible spectrophotometers, and may also be suitable for performance verification of other UV-Visible spectrophotometer makes and models. The Spectronic Standards Set is manufactured by Thermo Fisher Scientific.

The P4220 Set contains one NIST traceable wavelength accuracy standard with three absorbance peaks, four NIST-traceable photometric standards, and two manufacturer certified SRE filters.

APPLICATION(S)

When the difference between your result and the calibrated value is within the accuracy specification for your instrument, you can document this result and continue using the spectrophotometer with confidence.

The set is used to verify two key performance aspects when used in the application of dosimetry:

1. **Photometric Accuracy:** the agreement between the measured absorbance value of a standard and the true value of the absorbance of the standard. Photometric accuracy is the most direct measurement of whether your spectrophotometer delivers the right answer, and is measured by recording the absorbance of a calibrated standard at a specific certified wavelength, then comparing the measured value to the calibrated value.
2. **Wavelength Accuracy:** the agreement between the wavelength value reported by the instrument to the actual value. Wavelength accuracy is measured by scanning a calibrated standard, with absorbance peaks at certified wavelengths, and comparing the measured peak absorbance value to the certified absorbance value for the standard.

For additional information on other standards in the set, please refer the *Thermo Scientific Spectronic Standards 2 User Manual*.

SPECIFICATIONS

Physical Specifications:

Product Dimensions	Packaging Dimensions	Weight
17.75cm (L) x 14cm (W) x 8.85cm (H)	38cm x 26cm x 18cm / 15.0" x 10.0" x 7.0"	1.23 kg / 2.7 lbs.

Included Components:

- NIST certified wavelength accuracy standard with peaks at approximately 400nm, 525nm and 782nm
- 3%T, 10%T, 30%T and 50%T Neutral Density Glass photometric standards
- Stray Radiant Energy filters at 220nm and 400nm
- User Manual (typically on CD or USB drive)
- Calibration Certificate (hard copy)

Packaging:

Pelican brand, latching plastic case with foam protection for holding each standard. Each standard is labeled with an ID. The accompanying Calibration Certificate references all standards by the standard's ID number.

Re-certification:

The recommended interval for re-certification of the standards set is every 2 years. Users may order the service through GEX Customer Service using GEX Part # S4320 or order the service from Thermo Fisher Scientific directly. The service includes cleaning of the glass filters. Damaged glass will be replaced for an additional cost. Re-certification is equivalent to 'calibration'.

Storage:

Store the set in a cool and dry location.

PRODUCT PHOTOS



USAGE

1. Frequency of Performance Verification (P.V.):

The interval for P.V. may be as long as six months or as short as a single day. Please refer to the following instrument specific documents when using the set as part of the DoseControl Dosimetry System:

- GEX Doc# 100-270, GENESYS 30 Performance Verification Procedure
- GEX Doc# 100-271, Evolution220 Performance Verification Procedure

2. Performance Verification:

- 2.1. See the two procedures listed above in Section 1 for explicit instruction.
- 2.2. Each standard is a piece of glass mounted in a metal cuvette, and sized to fit into the standard 1cm² cuvette holder of the spectrophotometer.
- 2.3. Execute a blank or baseline measurement with the cuvette holder empty, then insert the standard and record the value.
- 2.4. Calculate the difference from the calibrated value, and compare this difference to the performance specification for your instrument.

2.4.1. Wavelength Accuracy:

- 2.4.1.1. The Wavelength Accuracy Standard has transmittance (%T) peaks (absorbance mode - valleys) at nominal values of 400 nm, 525nm and 780nm.
- 2.4.1.2. The standard is NIST-traceable and certified by Thermo Fisher Scientific at each wavelength, in accordance with their ISO 17025 accreditation.
- 2.4.1.3. Test photometric accuracy of the spectrophotometer, both above and below the wavelengths used for routine measurements, whenever possible.
- 2.4.1.4. The symmetry of the peak/valley means the tests of wavelength accuracy are independent of the spectral bandwidth (up to 20nm) of the instrument being tested.

2.4.2. Photometric Performance:

- 2.4.2.1. Four (4) Neutral Density Glass Standards are suitable for checking the photometric accuracy and reproducibility of a spectrophotometer at nominal values of: 50%, 30%, 10%, and 3%T which cover an absorbance range of approximately 0.300 to 1.500 A.
- 2.4.2.2. The standards are NIST-traceable and certified by Thermo Fisher Scientific in accordance with their ISO 17025 accreditation.

2.4.2.3. The calibration certificate provides both %T and Absorbance values at each of 5 (five) different wavelengths: 440nm, 465nm, 546.1nm, 590nm and 635nm.

2.4.2.4. The user should test photometric accuracy of the spectrophotometer above and below the wavelengths used for routine measurements, whenever possible.

2.5. The acceptance criteria for a given spectrophotometer are calculated by adding the uncertainty of the standard and the specification of the instrument.

2.5.1. The measured value must lie within the certified value of the standard \pm the acceptance criteria.

2.6. For details on the SRE filters, please refer to the *Thermo Scientific Spectronic Standards 2 User Manual*.

PRECAUTIONS

- Always keep the standards in their case when not in use and keep the cover closed and latched.
- Minimize exposure of the standards to airborne contaminants like smoke, dust, oil vapor, or chemical fumes.
- Handle all standards using only the metal frames. Do not touch the glass surfaces.
- Cleaning the glass filters is part of the re-certification service. See the 'Re-certification' section above for details.
- Refer to the User Manual for additional information and the full listing of precautions.

WARRANTY/GUARANTEE

Warranty:

90-day manufacturer's warranty.

Guarantee:

1-year GEX satisfaction guarantee. Product may be returned, with or without reason, within one year from the date of delivery.

RELATED DOCUMENTS

- Thermo Scientific Spectronic Standards 2 User Guide
- GEX Procedure #100-269 Spectrophotometer Performance Verification Form
- GEX Procedure #100-270 GENESYS 30 Performance Verification Procedure
- GEX Procedure #100-271 Evolution 220 Performance Verification Procedure

REVISION HISTORY

DATE	CHANGE DESCRIPTION	REVISION
02/03/2015	Initial release under new revision control system.	A
05/24/2019	Removed all reference to Set 1 and revised all content for simplification, clarity, and organization, and to reference new Related Documents section. ECO 70444.	B
01/20/2020	Clarified 2.4.11 – users of abs measurements use valleys not peaks in the spectrum. ECO 10022.	C