

Qualification Specifications and Test Points for UV-Vis Spectrophotometer Systems

Test	Set Points/ Range	Acceptance Criteria
Wavelength Accuracy	Holmium Oxide standard	±1nm
Photometric Accuracy	Wavelengths: 350, 313, 257, 235nm	±0.005A
Photometric Repeatability	Potassium Dichromate	% RSD ≤0.05%
Linearity	Potassium Dichromate 20, 60, 100mg/ml	R ² ≥ 0.999
Stray Light	Wavelengths: 340, 220, 198nm	340nm and 220nm ≥ 3.3A 198nm ≥ 2.0A
Noise	10 readings on air	±0.0002A

Overview for Above Mentioned Tests

1. Wavelength Accuracy

DESCRIPTION:

Holmium Oxide standard is scanned and wavelengths of maximum absorbance are compared to the calibration certificate.

ACCURACY CALCULATION:

Abs (certified value – measured value)

UNDERLYING PRINCIPLE:

Wavelength Accuracy is important for transferring methods between systems and for quantitative and qualitative analysis accuracy.

2. Photometric Accuracy

DESCRIPTION:

Readings at wavelengths 350, 313, 257, and 235 are taken of Potassium Dichromate.

ACCURACY CALCULATION:

Abs (certified value – measured value)

UNDERLYING PRINCIPLE:

Photometric accuracy is critical for quantitative analysis accuracy.

3. Photometric Repeatability

DESCRIPTION:

Five consecutive readings at 257nm of Potassium Dichromate are made and the %RSD for is calculated.

PRECISION CALCULATION:

$$\frac{\text{Standard Deviation}_{Area/RT}}{\text{Average}_{Area/RT}} * 100$$

UNDERLYING PRINCIPLE:

Photometric repeatability is critical for quantitative analysis accuracy.

4. Linearity

DESCRIPTION:

Absorbance readings are taken at 257nm of three concentrations of Potassium Dichromate.

ACCURACY CALCULATION:

R² is calculated

UNDERLYING PRINCIPLE:

Linearity is important for transferring methods between systems and for quantitative and qualitative analysis accuracy and reliability.

5. Stray Light

DESCRIPTION:

Readings are taken on Potassium Chloride, Sodium Iodide, and Sodium Nitrate at wavelengths 198, 220, and 340nm respectively.

CALCULATION:

Absorbance value

UNDERLYING PRINCIPLE:

The presence of stray light can decrease the photometric selectivity, increase the photometric response and create non-linear response of the instrument causing problems with quantitative analysis.

6. Noise

DESCRIPTION:

10 readings are taken on air.

TRANSCAT[®]

Compliance Services

PRE-APPROVAL
UV-Vis Spectrophotometer Systems

CALCULATION:

Average of 10 readings

UNDERLYING PRINCIPLE:

Large noise can interfere with readings.

Pre-approval of Qualification for company: _____

The undersigned person(s) approve the following:

1. The use of a validated Excel Spreadsheet to calculate the test results.
2. The delivery of tests appropriate to the actual configuration of the systems covered by the services.

Name and Role	Signature and Date

This pre-approval is applicable to the following systems.

After signing; print this page (and the next if there are variances) to PDF and return it to Analytical@Transcat.com.