Low Commitment Spectrophotometer Care

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1 Objective

- Can you trust your instrument?
- Spectrophotometer certification
- Quick
- Easy
- Supporting ISO 9001
- Process control
  - precision more important than accuracy
  - HVS is irrelevant
- record historical data

2 Frequency

- Yearly
  - absolute calibration
  - rely on specialized lab
  - permanent references
- Quarterly
  - real world comparison to consensus values, CTS
  - disposable references
- Daily
  - relative calibration
  - database
  - Internet based
  - permanent reference

3 Database

- Guarantees integrity
- Data normalization
  - certificate table
  - reference table
  - measurement table
  - measurement set table
- Gather statistics in support of ASTM E 1345-90
- Support data mining & time series analysis
- Fulfill ISO 9000 reqs.

4 Certification type

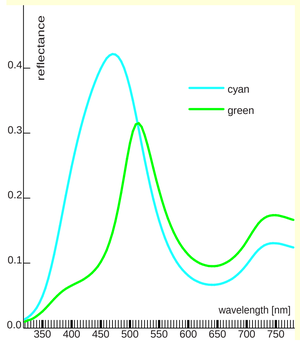
- Absolute
  - traceable to a national standard
  - a dozen colored and gray references
  - complex characterization of gain, offset, wavelength & bandpass errors
  - characterization requires high commitment
- Relative
  - initial characterization
  - only one color necessary
  - low commitment

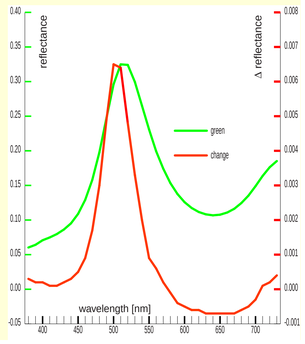
5 Permanent reference

- Ceramic tiles
  - durable
  - easy to clean
  - well researched and documented
- Problems:
  - non-uniform; must ensure always same location is measured
  - thermochromism; must track temperature & compensate for it

6 Green tile

- Steep slopes in sensitive range
- Several inflection points
- Moderate lateral diffusion problem
- Low thermochromism





7 Conclusions

- Low commitment spectrophotometer care is possible
- Use a database
- Use a green tile
- Compensate for thermochromism

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