Experiences in standardisation, conformance and certification

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- Agenda
  - Factors that limit Excellence
    - Inter Instrument Agreement
    - Communiction of data.
    - Calculation uncertainty
    - Specification changes
    - Media Dependencies
  - A look to the future

A little history....inter instrument agreement

- 2006 -> GretagMacbeth and X-Rite merged
- 2009 -> ISO 13655 is updated
  - UV cut filter
  - Polarization filter
  - Illumination
- ISO 13655 requires physical changes to new products.

- The former X-Rite and the former GretagMacbeth each had different calibration standards for graphic arts instrumentation.
- Continuity of standards was a benefit, but systematic differences between the two companies' instruments occurred on a given sample.
- Differences could be large enough on certain colors to cause color standards between facilities to fail.
- Market dominance in local regions by each company lead to regional differences

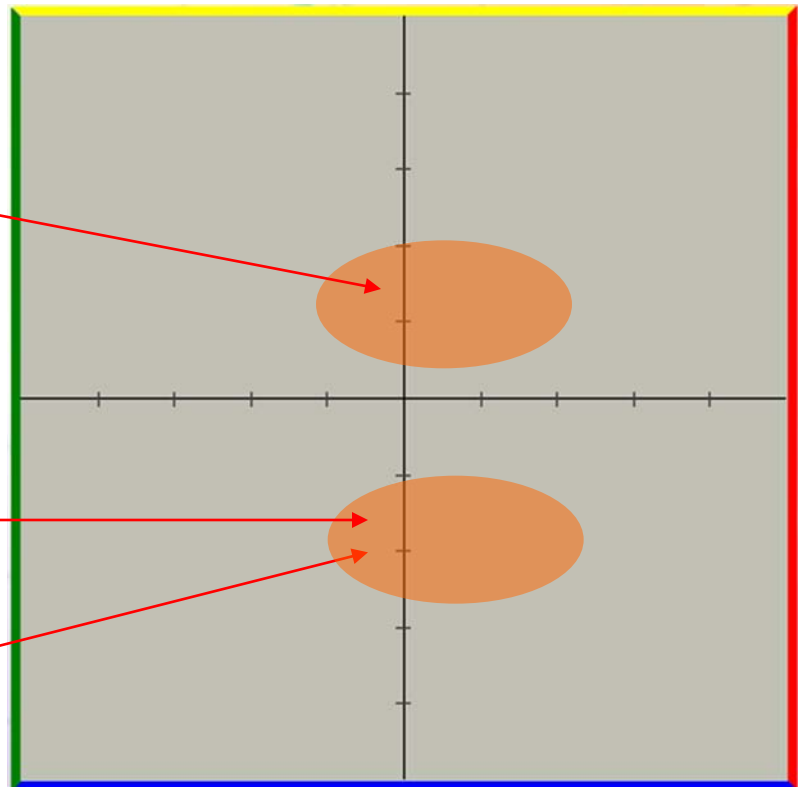
- 2010 -> X-Rite introduced XRGA as new corporate calibration standard
  - Addressed the systematic differences between GMB calibration standard and XR calibration standard for best possible agreement
  - Updated parts of instruments to meet ISO 13655

- 2012 -> Customers adopt more and more to XRGA
  - PepsiCo
  - CocaCola
  - MüllerMilch
  - …..
- Over 7500 instruments in the market on converted to XRGA

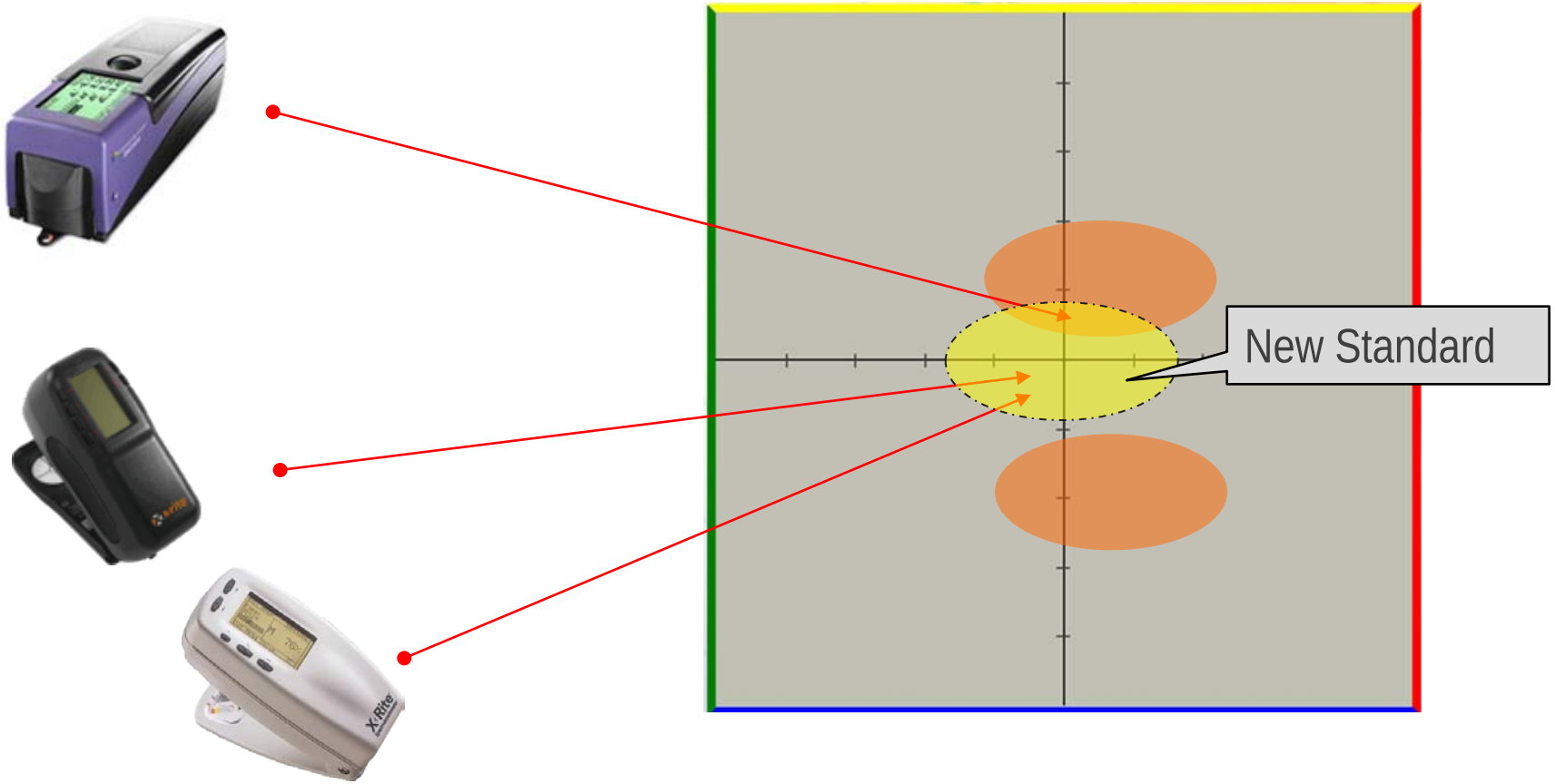
- The new production white calibration standard
- XRGA is applicable to all 0/45 and 45/0 instruments
- Incorporates improved methods for calibration and fulfill the ISO 13655:2009

- Maintains traceability to the American National Institute of Standards and Technology (NIST)
- Best implementation with respect to existing standards
- Improves inter-model agreement for existing instruments
- Preserves agreement among former X-Rite and GretagMacbeth instruments
- Provides a single spectral standard for all future graphic arts applications to be delivered by X-Rite

Inter-model agreement



Inter-model agreement II



- Different Optical Geometries can affect the measurement of certain media:
  - Lateral error diffusion in inks
- Different methods of calculation of XYZ and CIE LAB can lead to small errors.
- Measurement Modes have significant impact on the data.
- XRGA is one part of the solution.

- New Measurement modes defined in ISO 13665 introduce uncertainty into the communication process.
- XRGA conversion needs to be converted.
  - CxF is an extensible data format standard
  - New CxF elements identify Measurement Modes and XRGA compliance

ASTM E 308 - 06

- Standard for computing colors of objects
- 1996 standard introduced a new set of tables to compute D50 CIE XYZ values.
- Most legacy data and applications use older tables.
- From the spec:
  - "…if the new tables are introduced by not universally adopted, there may again be, perhaps for several decades, a significant disparity among the tables of tristimulus weighting factors commonly used. It is highly desirable that this should be avoided."
- This needs to be addressed in the market place.

- X-rite is considering support of an industry wide group of users and manufacturers to support a common set of practices and certified reference media to minimize the obvious deficiencies in the current practices.
- Discussions are currently on going to formulate this working group.