

After the success of **xDReflect**, the consortium has launched **BiRD**, a new European research project on the metrology of appearance focused on **Normalization**, that will run between May 2017 and April 2020.

Topic

The characterization of appearance of surfaces is required at several crucial stages of industrial or virtual production. For actual effects like goniochromatism, sparkle or gloss, existing standards (ISO11664 & ISO2813) do not meet the needs. The characterization of these effects requires measurement of the BRDF, or of BRDF based quantities that correlate with visual sensation. At the moment, no standard exists for BRDF measurement.

This project initiates normalization work to clarify how reflectance measurements on standard artefacts and surfaces exhibiting goniochromatism, gloss and sparkle visual effects should be carried out and will provide data file recommendation for BRDF measurement share.

Objectives

The scientific and technical objectives of this project are to:

1. Propose standard parameters for the measurement of the BRDF in the visible range in order to allow for better agreement between standard and commercial goniospectrophotometers. The focus is on settings of solid angles, illuminated and measured areas, convergence of light beams, polarization.
2. Provide guidance on how to sample the BRDF space efficiently and to propose a minimum number of measurement geometries according to the appearance properties of the sample.
3. Propose arrangements for data handling and processing for BRDF measurements.
4. Propose a new method for gloss measurement that correlates with visual perception based on BRDF measurements and the definition of a standard gloss observer.
5. Propose a consensual definition of sparkle and graininess measurands and define procedures for their measurement in correlation with visual scales for sparkle and graininess.
6. Facilitate the uptake of the technology and guidance developed in the project by instrument manufacturers and end-users (automotive, cosmetics, pigments, packaging and 3D printing industries) and contribute to the standards development work under the frame of CIE TC2-85.

Visit <https://www.birdproject.eu/>

Contact **Gaël Obein** (gael.obein@lecnam.net) for details

This project is funded by



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Implementation

This project is organized in 5 work packages which allow to efficiently address the objectives. Please, contact the WP leaders to get information

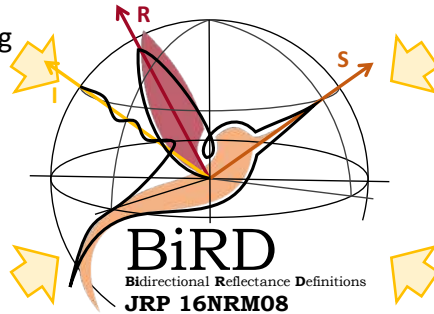
- WP1 : Recommendation for BRDF measurements (Leader PTB, Alfred.Schirmacher@ptb.de)
- WP2 : BRDF data handling and visualization (Leader Univ Alicante, verdu@ua.es)
- WP3 : Gloss (Leader KU Leuven, Frederic.Leloup@kuleuven.be)
- WP4 : Sparkle and graininess (Leader CSIC, alejandro.ferrero@csic.es)
- WP5 : Impact (Leader CMI, msmid@cmi.cz)
- WP6 : Management (Leader CNAM, gael.obein@lecnam.net)

The project will also benefit from external support:



CIE TC2-85 + 2 new TC ensuring global expertise & efficient transfer into standard

Collaboration with instrument manufacturers of multiangles spectrophotometers



Fresh scientific heritage from **JRP xDReflect**



Support & feedback from key industrial sectors

Automotive, pigments & coatings, materials, luxurious devices, papers, 3DPrinters, ...

Impact

It is expected from this research at the pre-normative level to provide a progress in the overall control of the appearance of industrial products and in particular to allow :

- The development of better references at the national metrological institute level
- A better and cheaper traceability based on new calibration artefacts
- The emergence of comparable & interchangeable multiangles/gonio spectrophotometers
- The development of new instruments specialized on gloss, sparkle, goniochromatism

Consortium

The consortium inherits from the JRP xDReflect. It is composed of 8 National metrological institutes and 2 universities laboratories. It has a strong expertise in BRDF measurements and can count on 9 full metrological goniospectrophotometers.

le cnam France

A! Finland

MI CZECH METROLOGY INSTITUTE Czech Republic

CSIC Spain

PTB Germany

RI SE Sweden

KATHOLIEKE UNIVERSITEIT LEUVEN Belgium

Universidad d'Alicante Universidad de Alicante Spain

METAS Switzerland

MSL New Zealand

Collaborators and stakeholders:

The project has already received the support of 21 key industrials in the field of spectrophotometers manufacturers, standard artefacts, Materials, pigments, coatings, automotive, pulp and papers and normalization

