

# Instructions for participants in the 2015 NFRC inter-laboratory comparison for specular measurements of optical properties of glass products

## Introduction

Laboratories that submit data to the International Glazings Database (IGDB) have to participate in an inter-laboratory comparison (ILC) every four years. This a procedure that allow both contributors and database maintainers to confirm that the measurement capabilities of the laboratories are of high quality.

## The box

**Warning:** Be careful when you open the box to avoid any injury handling the samples in case they have broken during shipping. Some glass edges might be sharp and cause cuts. Take necessary precautions to avoid injury.

Each box is labeled on the outside with its number, e.g. Box 14. All reports will use this number as identifier rather than the individual laboratories.

The 2015 specular ILC consists of 3 samples:

1. 6 mm clear monolithic glass supplied by Viracon
2. Saflex SG 41 Solar laminate on 6 mm clear substrates supplied by Eastman
3. Double silver low-e on 6 mm clear supplied by Guardian

Each sample have a sticker on the non film/coated side with the box number and sample number, e.g. 14-3 would be the identifier on the clear-clear laminate in box 14.

## **Storage recommendation**

Even though the samples are considered highly stable it is recommended to store them with the desiccant and lid sealed after you are done with your measurements. Saving the samples allow for you to remeasure them in the future if you get a new instrument or move your instrument and are worried about the alignment.

## **Cleaning the samples**

The samples have been handled with care but that is no guarantee that the samples are clean. Use your standard cleaning procedure if you have one. Otherwise recommended practices to consider are soap and water or ethanol are typically good solvents. Using a soft cloth soaked with soap water could be used to mechanically remove dirt. Rinsing with preferably deionized water and drying with dry air or nitrogen are other good practices. Please describe your cleaning procedure in the comments section of your instrument description, see below.

## **Measurement instructions**

### **UV/Vis/NIR**

The UV/Vis/NIR range is defined as 300-2500 nm. The data interval must be equal to, or lower than, 5 nm.

Three values should be measured for each wavelength: Transmittance (T), Reflectance front (Rf), and Reflectance back (Rb).

The samples have labels stuck on the side that is defined as back, if the label for some reason has come off the back can is the side without film or coating.

### **Emittance**

The IR range is defined as 5-25  $\mu\text{m}$  with a data interval of at least 1  $\mu\text{m}$ . All samples are opaque in this region but front and back reflectance is to be measured. The measured reflectance is reported in the same file as the solar values and you simply append the wavelength and reflectance columns. The transmittance is reported as 0 for all samples.

If you have access to an emissometer we are interested in results using such instruments as well. Use of emissometer is not yet an accepted procedure for IGDB submission, but we want to collect data to compare results from such instruments with FTIR and dispersive instruments.

## **Reporting instructions**

### **Instrument information**

An example text file box0info.txt will be provided, please fill that out with your information to the

best of your capabilities. This is also where you would describe your cleaning procedure. When saving the file you are supposed to replace the 0 with the box number you have received.

## Sample data

Sample data shall be formatted in the way that all IGDB submissions are, in brief the files all have a header section with information and ends with the data tabulated in four columns for *Wavelength*, *Transmittance*, *Front Reflectance*, *Back Reflectance*, in that order. The complete instructions are available at <http://windowoptics.lbl.gov/data/igdb/submit> and templates at <http://windowoptics.lbl.gov/data/igdb/examples-1>.

These are both important information sources for IGDB submitters. Being able to create these files is part of the submission process and alternative submissions will not be accepted.

Participants of the ILC who are not IGDB submitters still have to use this data format to allow for automated data handling.

An example file will be provided, box0\_3.txt for sample 3.

## Submission summary

Your submission should contain 4 text files. If you have, e.g., box nr 5 you shall submit box5info.txt, box5\_1.txt, box5\_2.txt, and box5\_3.txt. These files should be emailed to [jcjonsson@lbl.gov](mailto:jcjonsson@lbl.gov). Please pay attention to the naming of the files as it greatly helps the automated processing of the data.

You are most welcome to package the files in e.g. a zip archive, in that case please name the archive your box number plus extension, e.g. box5.zip. The files in the archive must be properly named.

One easy way to verify that the formatting is correct is to import the text file into Optics 6 available at <http://windows.lbl.gov/materials/optics6/>. The program was unfortunately created for older computers and it requires some pampering to run under more modern operating systems, but most of your questions have answers in the knowledge base:

[http://windows.lbl.gov/materials/optics5/CurrentVersion/Optics\\_Knowledge\\_Base.htm](http://windows.lbl.gov/materials/optics5/CurrentVersion/Optics_Knowledge_Base.htm)

## Goal

The goal of the ILC is to make sure the submitting laboratories populate the IGDB with accurate data. In past ILCs LBNL has been working with outliers trying to make sure they measure accurately and that is still our mission.

## Questions

For any questions please contact [jcjonsson@lbl.gov](mailto:jcjonsson@lbl.gov) or [igdb@lbl.gov](mailto:igdb@lbl.gov).

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