Instructions for participants in the 2026 IGDB/NFRC inter-laboratory comparison for specular measurements of optical properties of glass products

Introduction

Laboratories that submit data to the International Glazing 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.

Specific goals for this ILC
A thin glass sample is included to let the participants measure very low absorption, as negative absorption data is not allowed in IGDB this will exercise that aspect of measurement.
For the low-E we are requesting that you measure data in the gap between 2500 nm and 5000 nm if you have equipment to do so. The gap is based on the state of instruments 30 years ago when most FTIRs did not measure shorter wavelengths than 5 micron.
The blue sample add some color to the exercise. This data may be used in the future to study variability of color coordinates in an ILC dataset.

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 name of the participant.
The 2026 specular ILC consists of 3 samples:

1. Monolithic glass at 0.5 mm thickness.
2. Laminate with blue interlayer. The manufacturer used permanent marker to show the up-direction.
3. Low-e coating. Ignore the permanent marker labels.

Samples will have a label on the front on the format boxnr-sample nr, i.e. Box14 will have samples marked 14-1, 14-2, and 14-3. The marker is on the uncoated side for the coated sample. The side with the label is designated as front. If the label has fallen off, this information will hopefully be enough to figure out which side to put it back on.

Storage recommendation

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 shorter than, 5 nm.

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

This exercise defines the uncoated side as the front of the coated sample.

This exercise is not concerned with the difference between air side and tin side of the uncoated sample and that does not have a marker on that sample. 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 µm with a data interval no longer than 1 µm. 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.

New for this ILC: If your instruments can cover the gap between 2.5 and 5 µm, please include data in that region using 0.1 µm steps (if possible, do not report data with smaller steps than your instrument is producing). Do not report two values for exactly 2500 nm, but feel free to report it 1 nanometer off at the instrument change, e.g. if the UV/Vis/NIR instrument ends at 2500 nm, having steps 2490, 2495, 2500, 2501, 2600, .. 4900, 5000, 6000… 25000.

For this exercise it is acceptable to submit thousands of wavelength data points, but for IGDB/IGSDB there is an upper limit at 600 which makes interpolating to .5 micron steps in IR appropriate.

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.

This file format has been the same since 2015 so if you have a record of your previous submission(s) it can be easier to start with one of those files.

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 definitions are available at
https://windows.lbl.gov/sites/default/files/Downloads/IGDB%20Data%20file%20format.pdf
and templates at https://windows.lbl.gov/igdb-submitting-data under the IGDB Data format.

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 on the LBNL web site https://windows.lbl.gov/igdb-interlaboratory-comparison, box0_2.txt which contains data for coated glass. N. B. the data in the file does not match that of sample 2 of this ILC. The example is of the formatting.

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. Please pay attention to the naming of the files as it greatly helps the automated processing of the data.

If your lab has multiple instruments that you want to get approval for you should name the subsequent data sets as 1000+boxnr, 2000+boxnr, etc. e.g. if the first data set was box5, then the next data set should be box1005_1.txt etc. If you are submitting data for multiple UV/Vis/NIR instruments but only one FTIR it is preferable to not include IR in the higher numbers. However, if you are submitting for more FTIR instruments than UV/Vis/NIR machines you will have to fill those extra submissions out with something for the shorter wavelengths.

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 https://windows.lbl.gov/software/optics. 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: https://windows.lbl.gov/tools/optics/knowledge-base

By submitting data by July 1st 2026 you will be included in the report. Participants that have not submitted data by that date will not be allowed to be used as test labs for data submitted to the IGDB until they submit acceptable.

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. The report from past ILCs can be helpful to learn about issues that have been resolved in the past:
https://windows.lbl.gov/sites/default/files/Downloads/ILC2019LBNLreport.pdf

Questions

For any questions please contact jcjonsson@lbl.gov or igdb@lbl.gov.
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