

CGDB Interim File format v1.06

This document defines the interim file format that is used for submission of diffuse façade layers that are characterized by specular and diffuse component.

The file format is based on the IGDB definition. The file consist of a header section with key information about the layer, and a data section with the measured optical data. For detailed description of definitions of header elements that are shared with the IGDB format, please consult that document: <https://windows.lbl.gov/sites/default/files/documents/IGDBFormatFiles/igdb-data-file-format.pdf>

Definition of new header elements

List of header elements that are completely new.

Header field	Explanation (Example value(s))
{Extrapolation }	Name of extrapolation method to obtain properties at oblique angles of incidence. (specular glazing, shading)
{AERC ID}	[Optional] ID number for use with AERC database
{Specularity}	Boolean indicating if the sample is specular or not (true for specular, false for diffuse layers)
{Permeability factor}	Air permeability factor. 0 for solid glass samples

Extension of existing header elements

List of header elements that are extending existing elements.

Header field	Explanation (Example value(s))
{Type }	Type of product. Use laminate for laminates with diffuse interlayers, coated for glazing with surface treatment, e.g. sand-blasted, acid etched, fritted. Applied film for diffuse applied films. New types: Fabric for data that describes a stand-alone flat shade product, Coupon for data that characterizes a material that is only to be used in a model of a geometrically complex product, e.g. a venetian blind slat.

This file format stores all the measured data while we wait for the IGSDDB to be ready and that data format to be complete.

Optional header elements

List of header elements that are optional, but can be helpful for humans working with the data files.

Header field	Explanation (Example value(s))
{ wavelength Tf_n-dir Tf_n-dif Tb_n-dir Tb_n-dif Rf_n-dir Rf_n-dif Rb_n-dir Rb_n-dif }	Labeling of the columns, this is strictly informational and software is not guaranteed to parse to see if the ordering is different than described in this specification

Data definition

The data is given in a matrix of 9 columns defined by wavelength, 4*transmittance, 4*reflectance.

The transmittance and reflectance groups are ordered according to :

normal-direct front,
normal-diffuse front,
normal-direct back,
normal-diffuse back.

The front side is defined as the side of the glazing normally facing exterior (outside), the back side is defined as the side of the glazing normally facing the interior (inside). When a shade material is used in a cellular shade simulation, the simulator is controlling the geometry of the shade.

Note that integrating sphere instruments measure normal-total and normal-diffuse properties. The normal-direct component is obtained by subtracting the normal-diffuse from the normal-total.

Reflectance is typically measured near-normal (less than 10 degrees) which is sufficiently close to the normal reflectance for most materials.

Example Shade file

```
{ Units, Wavelength Units } SI Microns
{ Thickness } 0.8
{ Conductivity } 0.2
{ IR Transmittance } TIR=0.031
{ Emissivity, front back } Emis= 0.881 0.878
{ }
{ Product Name: Generic fabric }
{ Manufacturer: LBNL demo}
{ AERC ID: 113 }
{ Type: Fabric }
{ Permeability Factor: 0.03 }
{ Extrapolation: shading }
{ Specularity: false }
{ Appearance: Hazy}
{ wavelength Tf_n-dir Tf_n-dif Tb_n-dir Tb_n-dif Rf_n-dir Rf_n-dif Rb_n-dir Rb_n-dif }
0.300 0.0000 0.0229 0.0067 0.0104 0.0014 0.0460 0.0047 0.3445
0.305 0.0000 0.0182 0.0086 0.0091 0.0004 0.0441 0.0043 0.3477
0.310 0.0068 0.0106 0.0108 0.0081 0.0002 0.0430 0.0043 0.3539
...
2.495 0.0041 0.0826 0.0000 0.0908 0.0063 0.3200 0.0049 0.5468
2.500 0.0110 0.0801 0.0050 0.0896 0.0011 0.3243 0.0065 0.5443
```

Example fritted glass

```
{ Units, Wavelength Units } SI Microns
{ Thickness } 6
{ Conductivity } 1
{ IR Transmittance } TIR=0.000
{ Emissivity, front back } Emis= 0.860 0.860
{ Product Name: Generic frit 38mm aperture }
{ Manufacturer: LBNL demo}
{ Type: Coated }
{ Coating Name: Generic clear frit }
{ Coated Side: Back }
{ Substrate Filename: CLEAR_6.DAT }
{ Extrapolation: specular glazing }
```

```
{ Permeability Factor: 0.0 }S
{ Specularity: false }
{ Appearance: Hazy}
{ wavelength Tf_n-dir Tf_n-dif Tb_n-dir Tb_n-dif Rf_n-dir Rf_n-dif Rb_n-dir Rb_n-dif }
0.250 0.0010 0.0020 0.0060 0.0760 0.0110 0.0870 0.0060 0.1310
0.255 0.0020 0.0010 0.0030 0.0510 0.0110 0.0880 0.0030 0.1090
...
40.000 0.0000 0.0000 0.0000 0.0000 0.1330 0.0000 0.0000 0.0000
```