

Candidate Application Information sheet

Certification Date 2001-05-23

Application Name and Version

IFCtoIDF BSClient for EnergyPlus Beta 5

Software Company & Contact info

Lawrence Berkeley National Laboratory

1 Cyclotron Road, Berkeley, CA 94720 USA

www.lbl.gov and <http://eetd.lbl.gov/btp/btp.html>

Contact: Rob Hitchcock (email: RJHitchcock@lbl.gov)

Availability

Publicly available with EnergyPlus www.eren.doe.gov/buildings/energy_tools/energyplus/

Application Description

IFCtoIDF is a utility that imports the geometric description of a building envelope and its interior spaces from an existing IFC project file, and creates an input data file (IDF) for EnergyPlus. The IFCtoIDF utility is a batch process one-way mapping, importing an IFC project file and creating an EnergyPlus input file, without user interaction. The IFCtoIDF utility is a client to the BSPRO COM-Server developed by Olof Granlund Oy, Finland.

View

Architectural design to thermal load calculations and HVAC system design

IFC Implementation Type

Read-only (based on BSPRO COM-Server)

IFC Data Import

The IFCtoIDF utility imports project, site, building, building story, space, wall, window, door, floor, and roof slab instances and maps the relevant geometry for these objects to the EnergyPlus input data dictionary (IDD) format. An input data file (IDF) for EnergyPlus is created that can then be simulated. At this point, material thermal characteristics for the building construction elements are defaulted to allow an hourly thermal load simulation of the building with no HVAC system installed, calculating the free-floating thermal performance of the building. For an accurate thermal simulation to be performed, IFCtoIDF expects the IFC object instances to be contained in the appropriate hierarchical organization (e.g., project->site->building->building story->space->wall, etc.). However, some flexibility in this requirement has been built into IFCtoIDF, with appropriate warnings written to the EnergyPlus IDF and subsequently reported by EnergyPlus during simulation.

IFC Data Export (if relevant)

No data export

Other

1. EnergyPlus requires building envelope elements such as walls to be associated with thermal zones within the building. Since no current IFC-based software implements the concept of thermal zones, IFCtoIDF currently maps each space instance within an IFC file to a separate thermal zone within the EnergyPlus IDF.
2. The material thermal characteristics of elements such as walls and windows is currently defaulted since these data are not yet supported in IFC-based software implementations.
3. IFC project files that do not contain object instances within the expected hierarchy may not be properly mapped between the IFC and the EnergyPlus IDD. For example, IfcWall instances that are not contained within an instance of IfcSpace may not be correctly oriented since it is impossible to determine which face of the wall is “inside” a thermal zone, and which face is “outside” the zone.