

# A Tutorial on *IFCdiff* and *IFCdiff* viewer

Xin Shi, Yu-Shen Liu, Ge Gao, Ming Gu, Haijiang Li  
School of Software, Tsinghua University, Beijing 100084, PR China

E-mail: [liuyushen@tsinghua.edu.cn](mailto:liuyushen@tsinghua.edu.cn), [coolstone712@126.com](mailto:coolstone712@126.com)

*IFCdiff* implements a content-based automatic comparison algorithm for detecting differences between two IFC files. In order to visualize the compared models and their differences. *IFCdiff* viewer can pop up two imported IFC models, where the matching building elements are highlighted with the same color. This enables users to check the visual differences and changes between IFC models quickly.

## *Availability*

The executable program for Windows platform and tested models are available from <http://cgcad.thss.tsinghua.edu.cn/liuyushen/ifcdiff/>

## *System Requirements*

Source code was written to perform tracking differences or detecting changes between two IFC files, as well as visualizing the results.

The code was developed and tested using Microsoft Visual C++ 2010 on a Windows 8 system.

REQUIRED INSTALLATIONS:

-Microsoft Visual C++ 2010

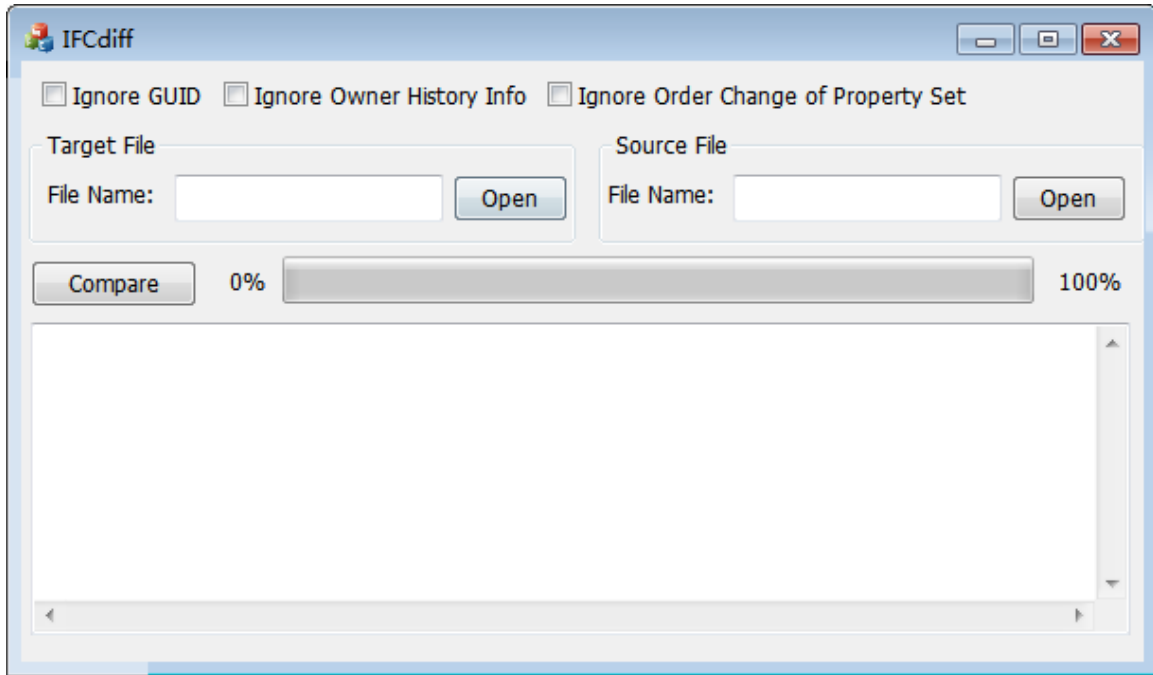
-MICROSOFT FOUNDATION CLASS (MFC) LIBRARY

## *Data set*

For showing how our algorithm works, we provided some examples. See <http://cgcad.thss.tsinghua.edu.cn/liuyushen/ifcdiff/>.

## Operation IFCdiff

### 1. Execute IFCdiff.exe

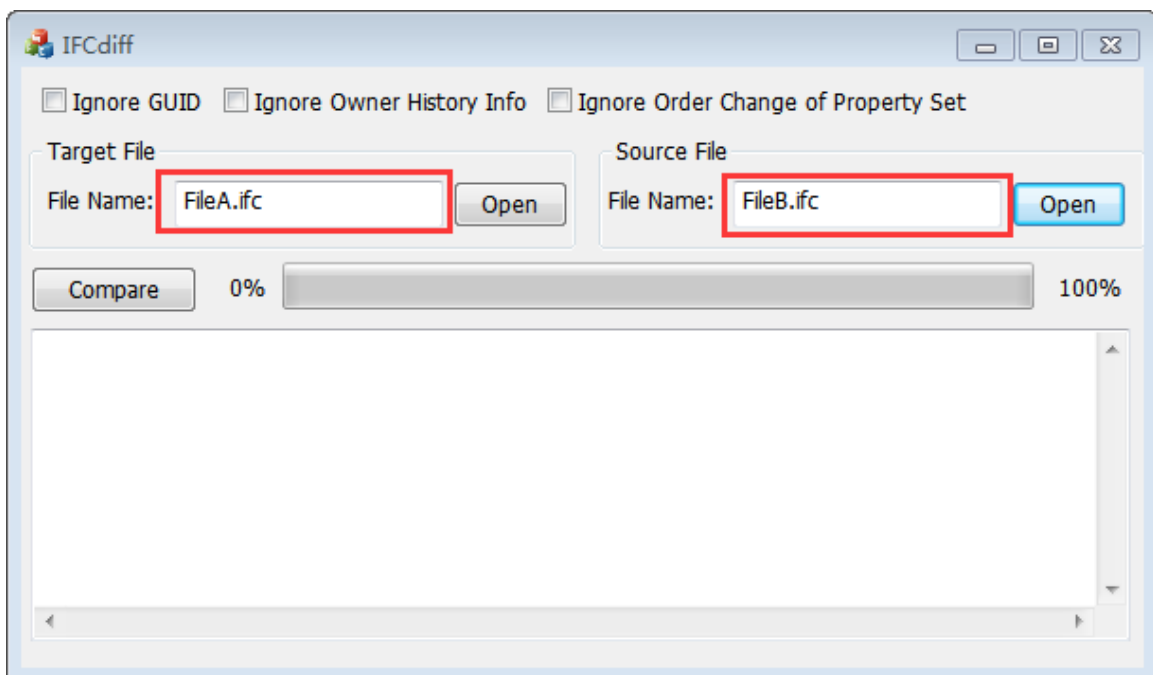


### 2. Open two IFC files to be compared.

**Target File:** File Name → Open.

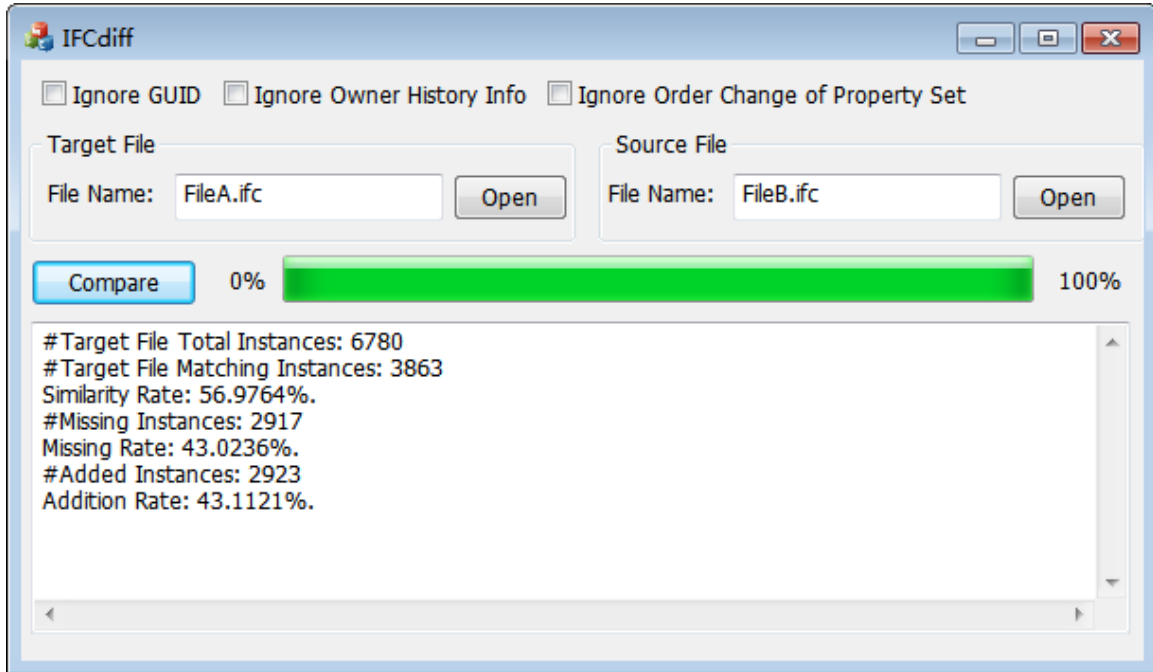
**Source File:** File Name → Open

For example, open 'FileA.ifc' and 'FileB.ifc'.



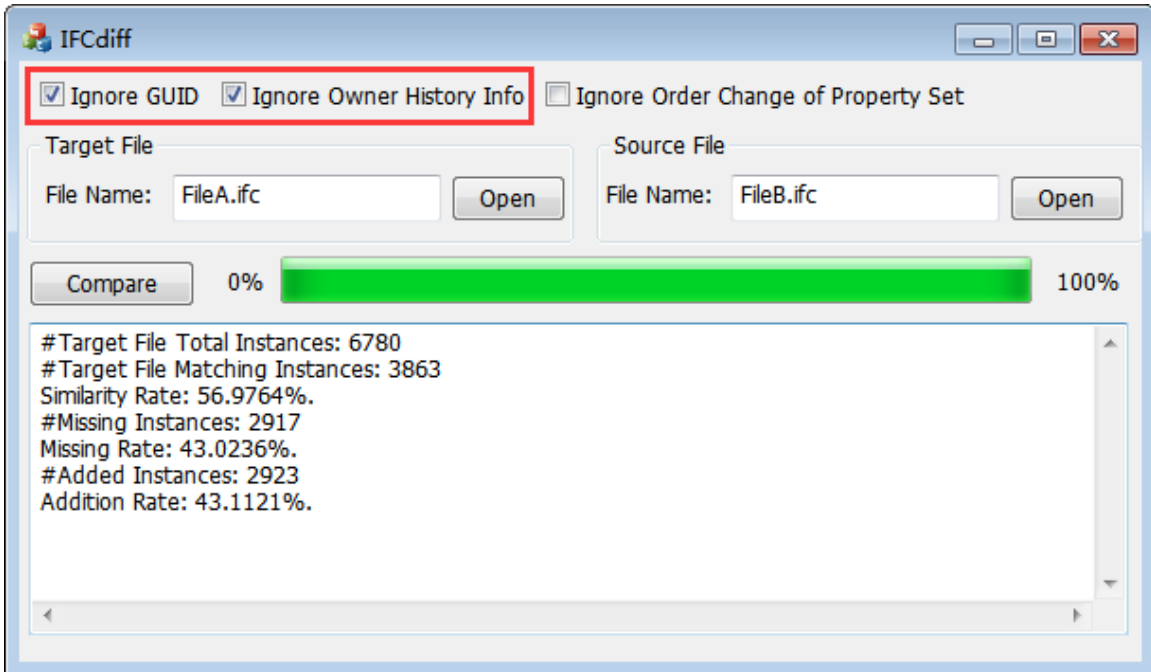
### 3. Compare these two IFC files.

Click the button “**Compare**” to begin the comparison between two imported IFC files.



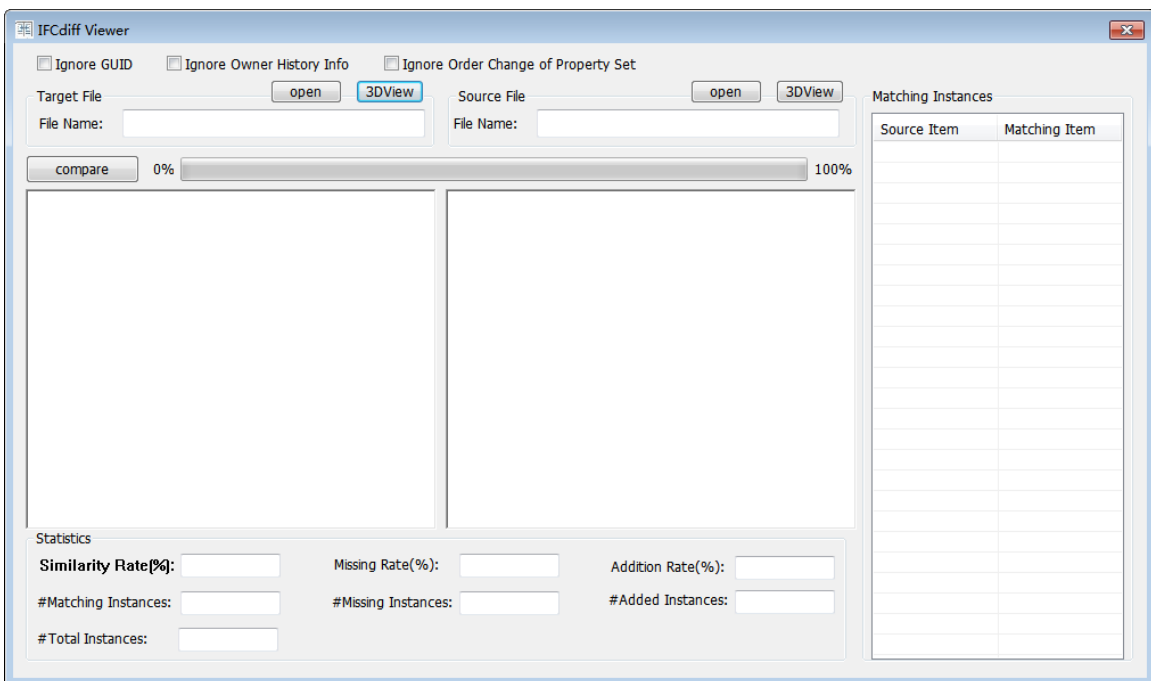
### 4. Compare two IFC files while ignoring GUID, Owner History Information, or Order Change of Property Set

To improve the robustness of our algorithm, the tool can complete the comparison while ignore GUID, Owner History Information, or Order Change of Property Set. The user can click the checkbox to ignore the corresponding items.



## *Operation IFCdiff viewer*

### **1. Execute “IFCdiff viewer.exe”**

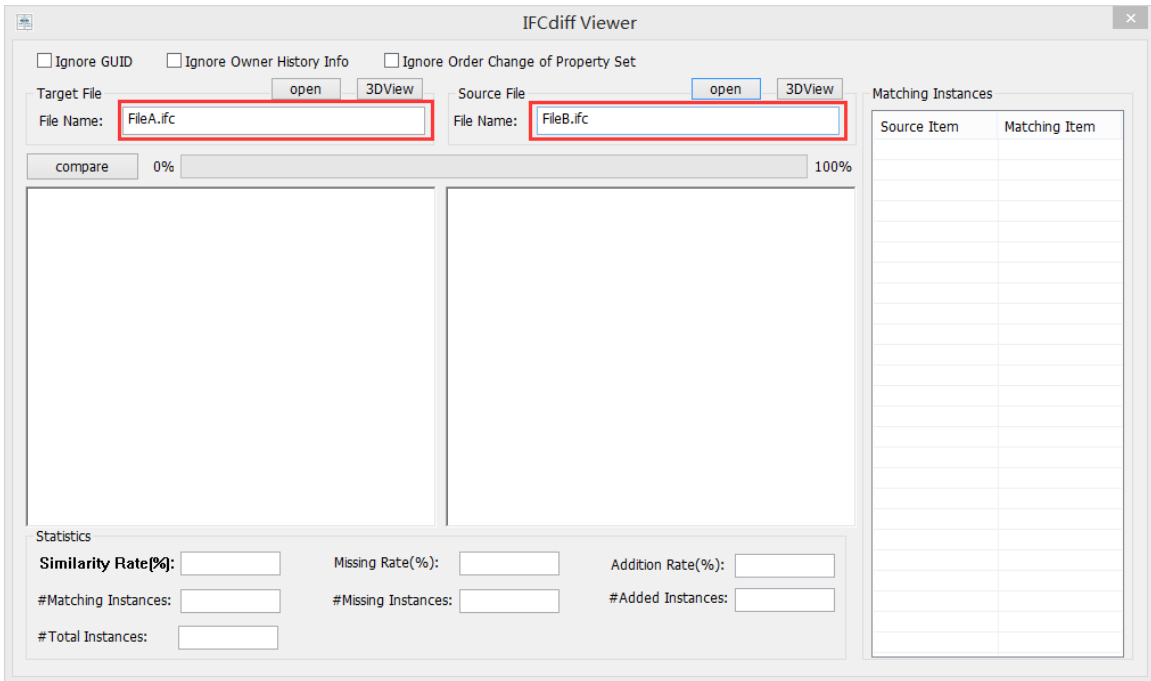


### **2. Open two IFC files to be compared.**

Target File: File Name → Open.

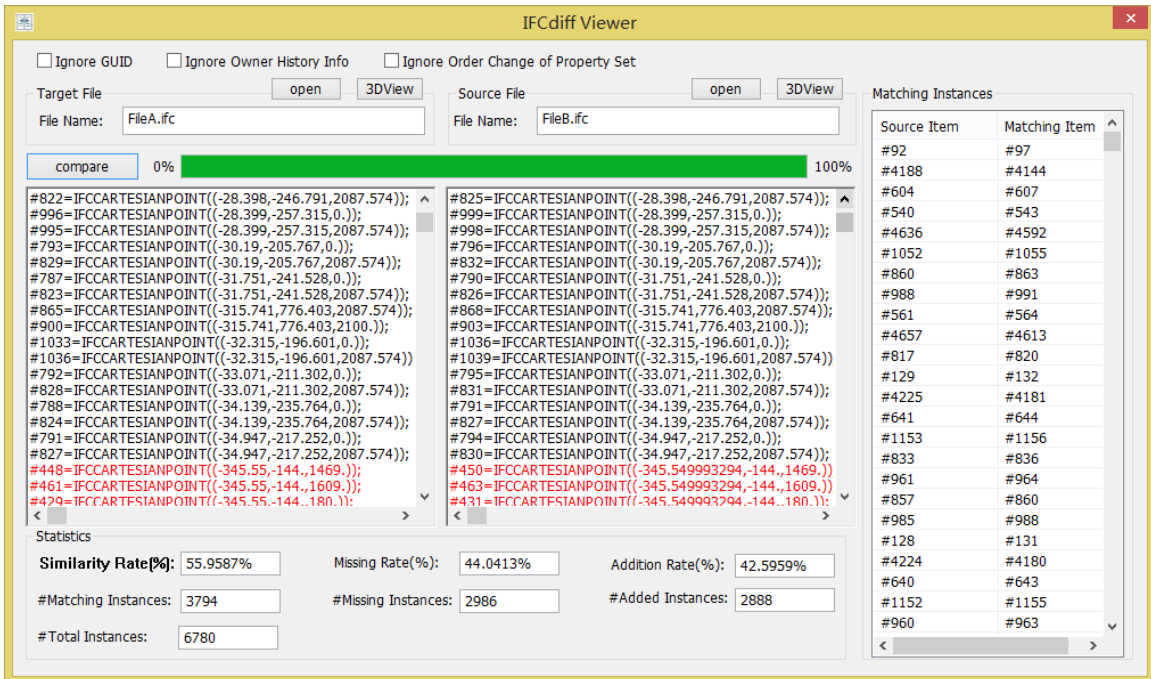
Source File: File Name → Open

For example, open ‘FileA.ifc’ and ‘FileB.ifc’.



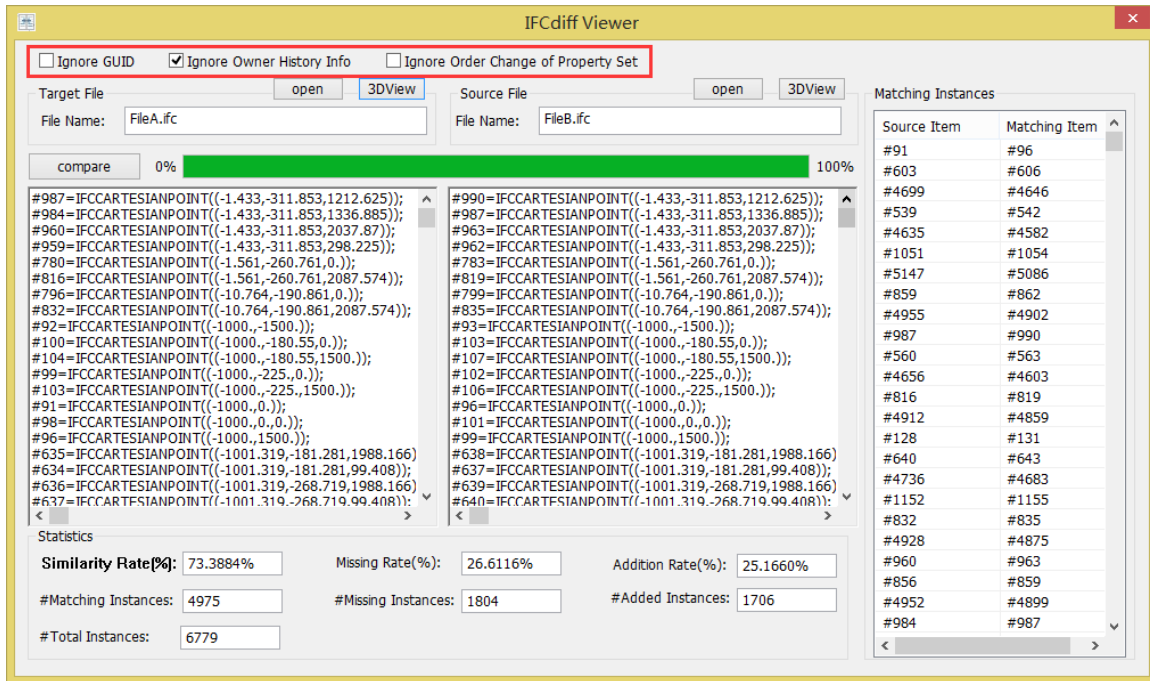
### 3. Compare these two IFC files.

Click the button **Compare** to begin the comparison between two imported IFC files.



In the main interface of *IFCdiff* viewer, the corresponding differences of two input IFC files are highlighted in the text boxes in the middle, the similarity metrics and a summary of the analysis are given at the bottom, and the matching data entities between two files are listed on the right.

#### 4. Compare while ignoring GUID, Owner History Information, or Order Change of Property Set



Similar to *IFCdiff*, *IFCdiff viewer* can also achieve the comparing results while ignoring GUID, Owner History Information, or Order Change of Property Set by clicking the corresponding checkbox.

#### 5. Click the button 3DView to see corresponding 3D models.

By clicking the button **3DView** of each file, the viewers of 3D models will pop up, where the matching building elements are highlighted with the same color. This facilitates users to locate the differences of these two IFC files in model level.

IFCdiff Viewer

Ignore GUID   
 Ignore Owner History Info   
 Ignore Order Change of Property Set

Target File:   **3DView**   
Source File:   **3DView**

  
0%  100%

```

#988=IFCCARTESIANPOINT((-1.433,-311.853,1212.625));
#985=IFCCARTESIANPOINT((-1.433,-311.853,1336.885));
#961=IFCCARTESIANPOINT((-1.433,-311.853,2037.87));
#960=IFCCARTESIANPOINT((-1.433,-311.853,298.225));
#781=IFCCARTESIANPOINT((-1.561,-260.761,0.));
#817=IFCCARTESIANPOINT((-1.561,-260.761,2087.574));
#797=IFCCARTESIANPOINT((-10.764,-190.861,0.));
#833=IFCCARTESIANPOINT((-10.764,-190.861,2087.574));
#93=IFCCARTESIANPOINT((-1000.,-1500.));
#101=IFCCARTESIANPOINT((-1000.,-180.55,0.));
#105=IFCCARTESIANPOINT((-1000.,-180.55,1500.));
#100=IFCCARTESIANPOINT((-1000.,-225.,0.));
#104=IFCCARTESIANPOINT((-1000.,-225.,1500.));
#92=IFCCARTESIANPOINT((-1000.,0.));
#99=IFCCARTESIANPOINT((-1000.,0.));
#97=IFCCARTESIANPOINT((-1000.,1500.));
#636=IFCCARTESIANPOINT((-1001.319,-181.281,1988.166));
#635=IFCCARTESIANPOINT((-1001.319,-181.281,99.408));
#637=IFCCARTESIANPOINT((-1001.319,-268.719,1988.166));
#63R=IFCCARTESIANPOINT((-1001.319,-268.719,99.408));

```

```

#991=IFCCARTESIANPOINT((-1.433,-311.853,1212.625));
#988=IFCCARTESIANPOINT((-1.433,-311.853,1336.885));
#964=IFCCARTESIANPOINT((-1.433,-311.853,2037.87));
#963=IFCCARTESIANPOINT((-1.433,-311.853,298.225));
#784=IFCCARTESIANPOINT((-1.561,-260.761,0.));
#820=IFCCARTESIANPOINT((-1.561,-260.761,2087.574));
#800=IFCCARTESIANPOINT((-10.764,-190.861,0.));
#836=IFCCARTESIANPOINT((-10.764,-190.861,2087.574));
#94=IFCCARTESIANPOINT((-1000.,-1500.));
#104=IFCCARTESIANPOINT((-1000.,-180.55,0.));
#108=IFCCARTESIANPOINT((-1000.,-180.55,1500.));
#103=IFCCARTESIANPOINT((-1000.,-225.,0.));
#107=IFCCARTESIANPOINT((-1000.,-225.,1500.));
#97=IFCCARTESIANPOINT((-1000.,0.));
#102=IFCCARTESIANPOINT((-1000.,0.));
#100=IFCCARTESIANPOINT((-1000.,1500.));
#639=IFCCARTESIANPOINT((-1001.319,-181.281,1988.166));
#638=IFCCARTESIANPOINT((-1001.319,-181.281,99.408));
#640=IFCCARTESIANPOINT((-1001.319,-268.719,1988.166));
#641=IFCCARTESIANPOINT((-1001.319,-268.719,99.408));

```

Source Item	Matching Item
#92	#97
#4188	#4144
#604	#607
#540	#543
#4636	#4592
#1052	#1055
#860	#863
#988	#991
#561	#564
#4657	#4613
#817	#820
#129	#132
#4225	#4181
#641	#644
#1153	#1156
#833	#836
#961	#964
#857	#860
#985	#988
#128	#131
#4224	#4180
#640	#643
#1152	#1155
#960	#963

**Statistics**  
**Similarity Rate(%):**    
**Missing Rate(%):**    
**Addition Rate(%):**

**#Matching Instances:**    
**#Missing Instances:**    
**#Added Instances:**

**#Total Instances:**

IFC Viewer

Read/Write IFC | View

Read IFC file  
FileA.ifc           
Detected IFC version: FILE\_SCHEMA('IFC2X3')  
File loaded: 48438 entities in 0.67 sec.

100%

0.000, 0.000, 0.000

IFC Viewer

Read/Write IFC | View

Read IFC file  
FileB.ifc           
Detected IFC version: FILE\_SCHEMA('IFC2X3')  
File loaded: 44908 entities in 0.79 sec.

100%

0.000, 0.000, 0.000