

usBIM.clash

User Manual

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1 usBIM.clash

usBIM.clash is an on-line service integrated with Clash Detection's usBIM for the verification of interference and the management of conflicts between different 3D models, such as architectural and structural or plant design.

Simply define a few basic parameters (type of comparison, type of collision, tolerances) to automatically perform the interference check according to the type of preferred analysis (*hard clash*, *clearance clash*, etc.) and the degree of precision that you're looking for.

1.1 Creating a new usBIM.clash document

A new usBIM.clash document can be created by all users who have Edit permission on the folder.

To create a Clash Detection document, you need to click the “New Document” button (Figure 1).

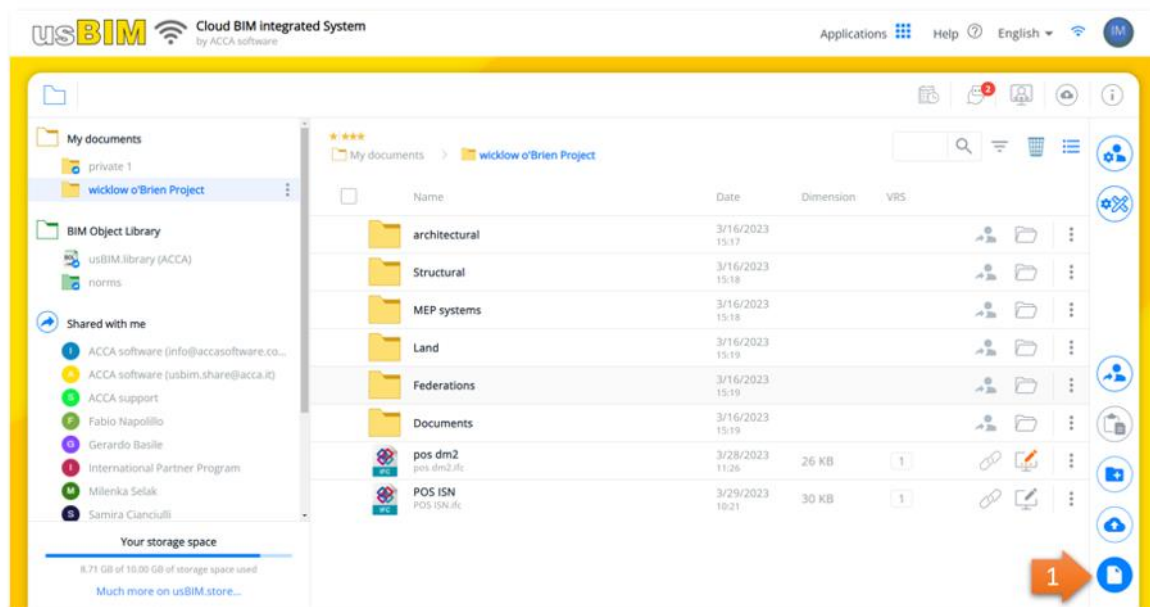


Figure 1. New document

After clicking on the button, the modal window shown in will open Figure 2, in which you can select the Clash Detection item of usBIM.clash (arrow 1 Figure 2); it is mandatory to indicate the Name of the file and it is possible to differentiate the Title (Arrow 2 and Arrow 3 Figure 2) as described in the paragraph.

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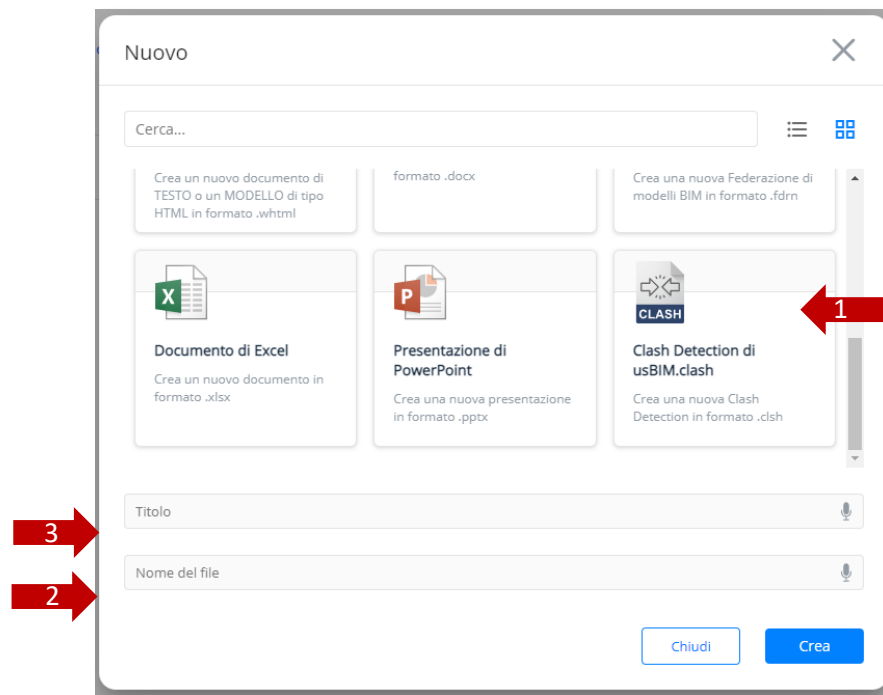


Figure 2. Creating a new usBIM.clash document

To confirm the operation, simply click on the "Create" button.

In the new modal that opens (Figure 3), you can enter a template or a federation of templates.

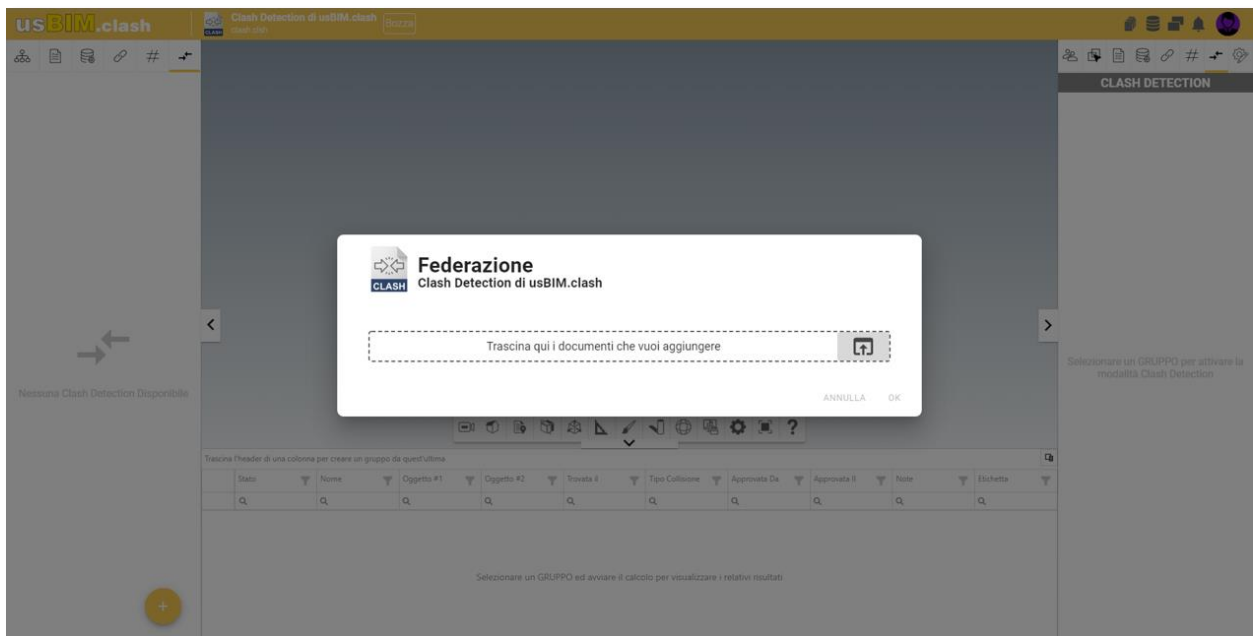


Figure 3. Forms for model federation

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1.2 Creating a group

After having federated the various models, to create a group it is necessary to click on the "collision filter" icon (arrow 1 Figure 4), select the "+" button (arrow 2 Figure 4) and then "Add manual SELECTION GROUP".

A "Group Name" is required in the new method (arrow 3 Figure 4).

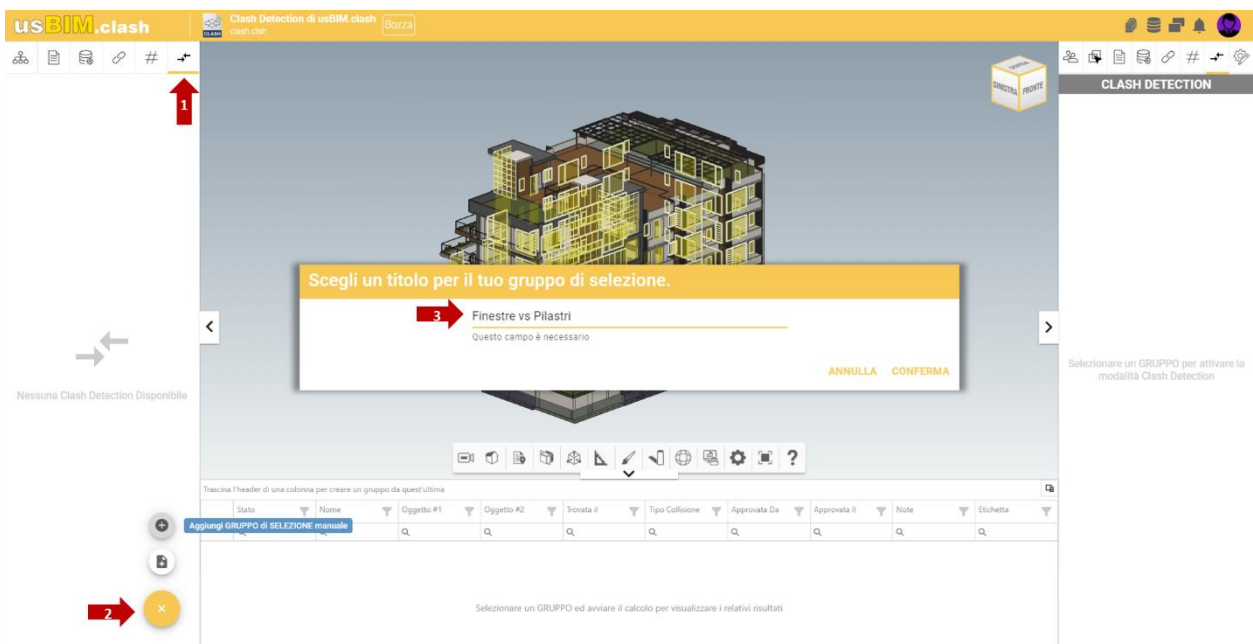


Figure 4. Creating a group

At this point, you must select the objects to be verified. To do this you have several possibilities using the filter tab:

- Structure (arrow 1 Figure 5), allows you to select objects using the different classes of an IFC model.
- Properties (arrow 2 Figure 5), allows you to filter the objects of an IFC model using the properties associated with them.
- usBIM.data (arrow 3 Figure 5), you can filter objects using the information entered in usBIM.data
- Documents (arrow 4 Figure 5), you can filter the objects of an IFC model using the document links associated with them.
- #TagBIM (arrow 5 Figure 5), you can filter objects by using the tags associated with the objects themselves

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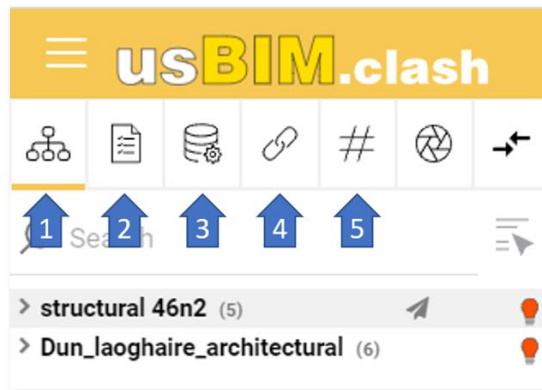


Figure 5. Filter Tab

You can also manually select entities directly on the model by selecting the individual object, or by creating a selection rectangle by holding down the left mouse button. (Figure 6)

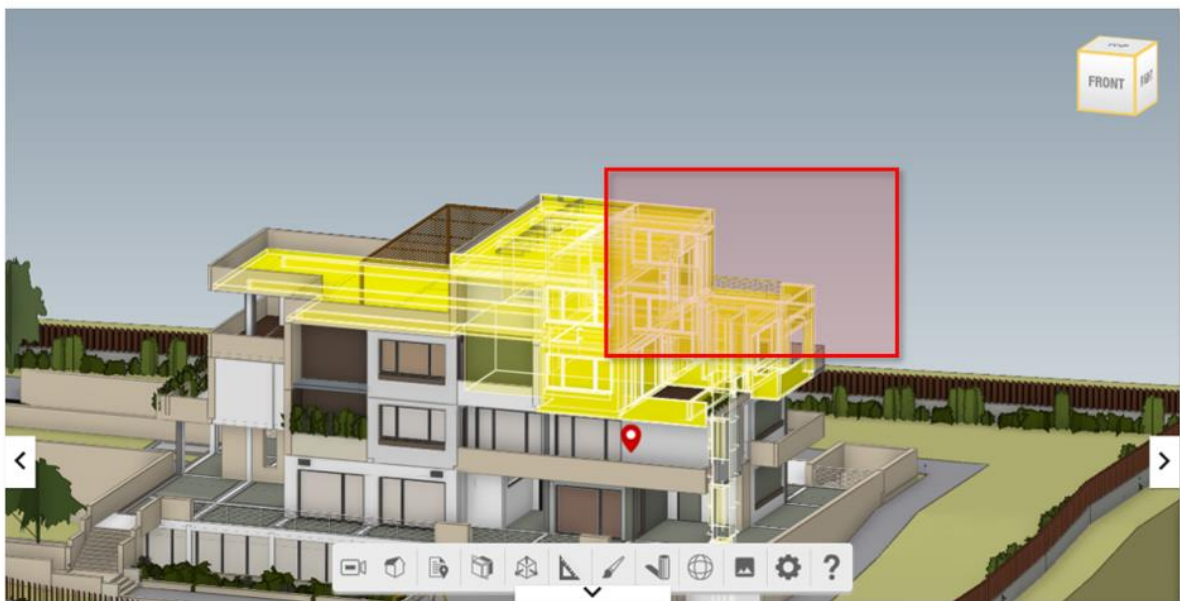
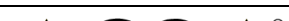


Figure 6. Manual Selection

Once this operation has been completed, the selection objects must be added to the group created, by opening the context menu (arrow 1 Figure 7) and clicking on "Add selection objects" (arrow 2 Figure 7)

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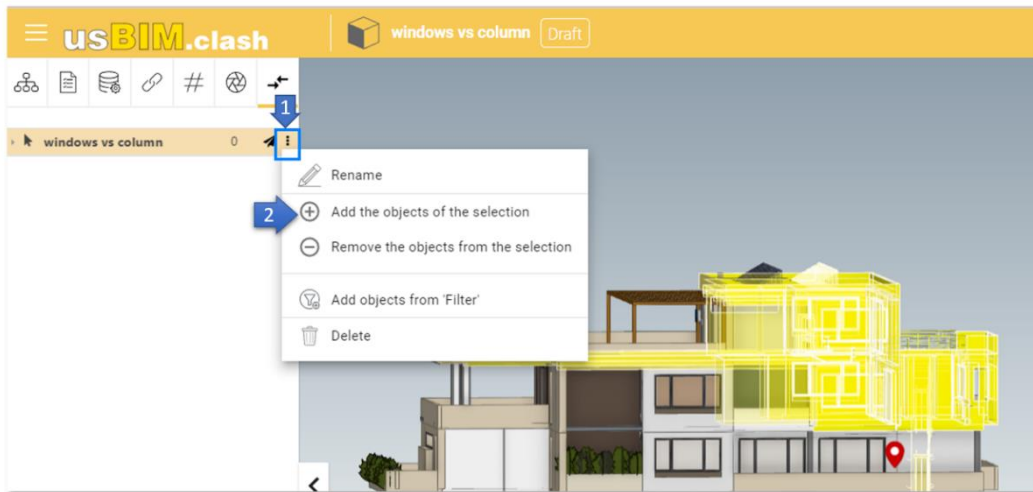


Figure 7. Group Management

After that, you can always add other objects to the selection set, as shown above.

You also have the option to create Selection Groups from "Filter" (arrow 1 Figure 8). After entering the name of the group, a new window will open that is divided into three sections:

- Requirements List: allows you to set the number of actions to be taken on the models to be verified. You can add more checks to the list of requirements by clicking the "+" button (arrow 2 Figure 8). You can import/export template lists (arrow 3 Figure 8). The checks can be selected/deselected so as to leave freedom of choice to the user in the different scenarios, in the case in which multiple checks are selected, the logical operator AND comes into play (implies the satisfaction of both propositions)
- Object Selection Filters: Allows the user to set the filter criteria for the objects of the models to be tested. The selection criterion within usBIM.clash allows you to create capillary selection logics.

You can characterize selection filters by using the OR logical operator (satisfying at least one of the two operations). (arrow 4 Figure 8)

- Templates included in selections: (arrow 5 Figure 8) You can indicate which templates to apply the configured filtering to.

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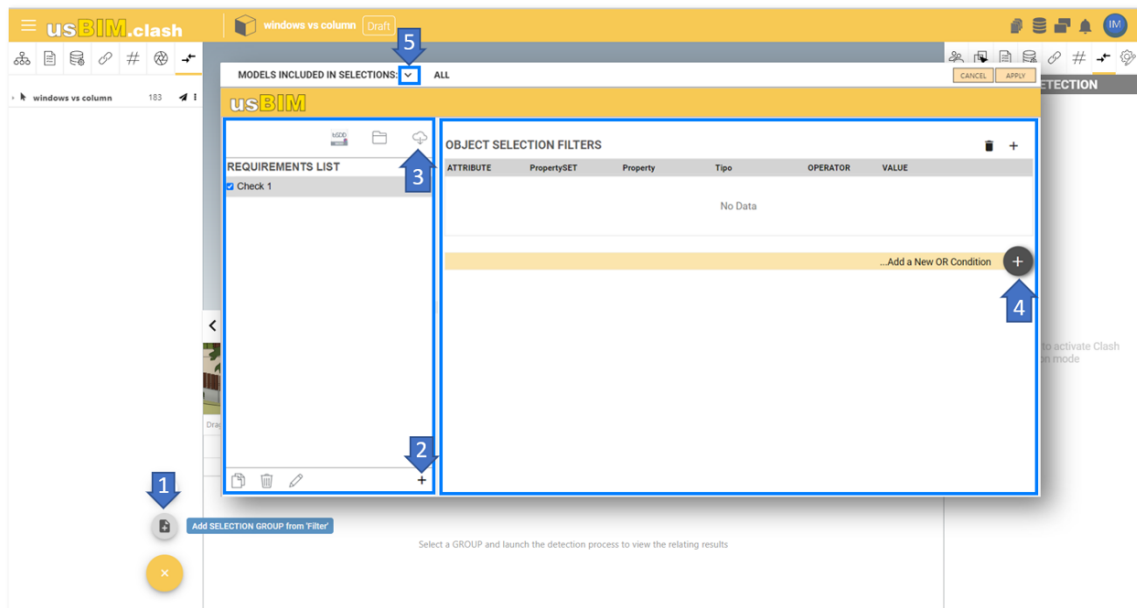


Figure 8. Group from Filter

Clicking on the "Add row" icon (arrow 1 Figure 9) will open a new window, in which you can detail the selection filter. In particular, you can filter by using the attributes (arrow 2 Figure 9):

- IfcProperty: is an IFC data schema entity that generalizes the concept of properties that can be associated with a model object.
- IfcClass: Defines the class of homogeneous products within an IFC model, such as IfcWall, IfcWindow, etc.
- IfcGlobalID: consists of a 22-character alphanumeric string, used to uniquely identify an object within an IFC model;
- IfcClassification: is used to qualify entities within a specific category based on a specific purpose or common characteristics;
- IfcEntityName: attribute associated with each object that shows the name used by the software that creates the object or set by the user;
- IfcEntityDescription: attribute associated with each object that reports the description provided to exchange additional information;
- IfcObjectType: This attribute finds a particular type that specifies the object in detail. The use of this attribute is expected for the object;
- IfcTypeName: attribute associated with each IfcTypeObject that shows the name used by the software that creates the type or characterized by the user;

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- IfcPredefinedType: This attribute finds a particular type that specifies the object in detail. The use of this attribute is expected for the IfcTypeObject entity and is defined from a list of values provided by different standards for each IfcClass;
- IfcBuildingStorey: corresponds to the floor/level concept of a building. It is usually related in a hierarchical way to all objects belonging to the specific plan;
- IfcGroup: Corresponds to a logical, non-hierarchical collection of objects. A group is an aggregation of objects of a non-geometric/topological nature. It can include construction products, processes, controls, resources or even other groups;
- IfcZone: represents a non-hierarchical aggregation of spaces/compartments or other zones. It is intended as a subtype of the IfcGroup entity;
- IfcSystem: represents a non-hierarchical collection of construction products functional to offer a service within a work. MEP System

Also fill in the fields:

- Operator: allows you to choose between different operators both mathematical and textual that allow you to structure the selection in an appropriate way;
- Value: is the field within which the expected value must be indicated.

Now click on Confirm (arrow 3 Figure 9)

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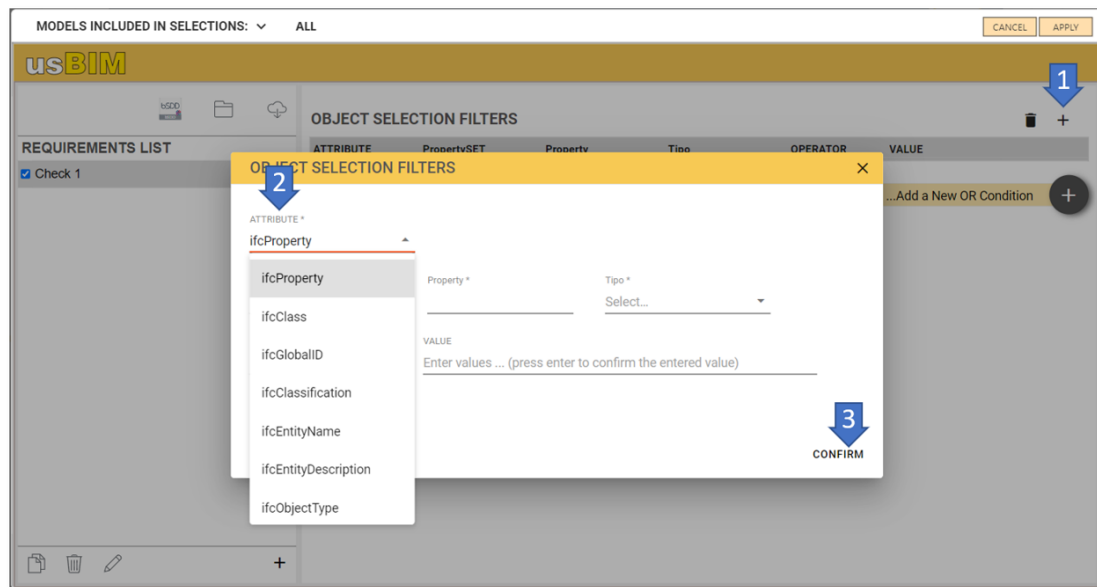


Figure 9. Object selection filters

After setting the selection criteria and completing all the operations indicated above, you will have to click on "Apply".

N.B. this selection mode is only applicable to IFC files.

Logical Operator Usage Example

Let's imagine that we want to make this type of selection: *"I would like to select all the walls and all the windows present in my model"*.

Let's see how to set a selection filter that can meet these conditions:

- Set the attribute field to the IfcClass value
- Set the operator field to the same value
- Set the value field to IfcWall
- Select the OR operator
- Add a new operation
- Set the attribute field to the IfcClass value
- Set the operator field to the same value
- Set the value field to IfcWindow

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This is the correct way to handle a selection of this type. In fact, an object within a model can never be both a wall and a window at the same time and therefore, in this case, the OR operator must be used.

1.3 Group management

After you add the objects, you can manage the group. From the contextual menu (arrow 1 Figure 10) you can set the various objects to compare them. In particular, once the objects have been selected, three types of settings can be made from the contextual menu: "Invert elements A-B", "Set ALL elements A" and "Set ALL elements B".

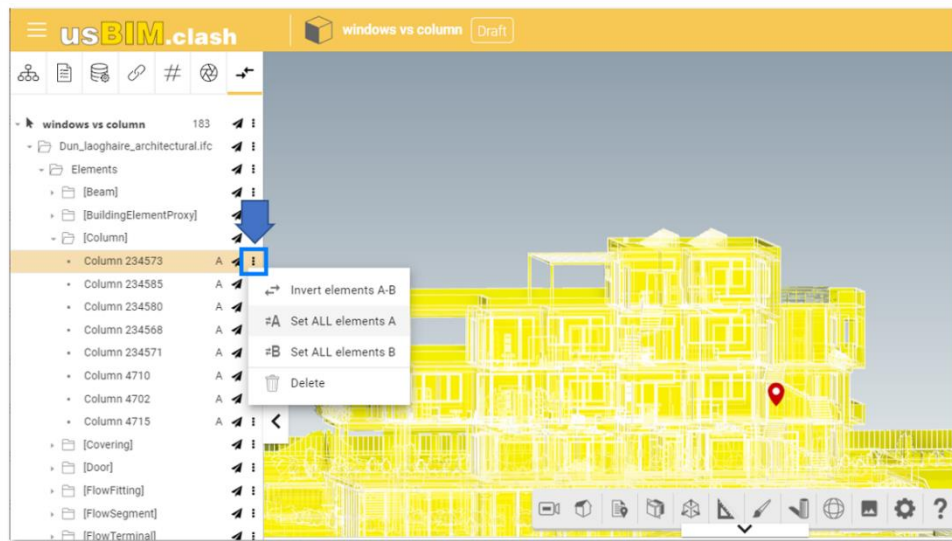


Figure 10. Group Management

1.4 Setting Clash Detection

From the tab on the right, in the "CLASH DETECTION" section (Figure 11 arrow1), you can set and detail the settings related to the verification of clashes. Specifically, in the "Settings" section (arrow 2 Figure 11) you can set:

- "Comparison Type", selecting from the drop-down menu which groups of elements to compare. In particular, you can choose to compare elements A vs A, A vs B and B vs B respecting the settings set on the various objects as explained in the previous paragraph.
- "Collisions (Hard Clash)", by checking the elements that occupy the same physical space are requested to be verified.
- "Verification of Tolerance", by checking the comparison is requested by setting a tolerance.
- "Tolerance Value", (field that is activated only if the Tolerance Check is requested) the tolerance value that the software will take into account at the time of calculation can be set.
- "Minimum Distance (Clearance)", by checking the minimum distance between the elements is required.
- "Minimum Distance Value (m)", (field that is activated only if the Minimum Distance check is required) you can set a value that will affect the calculation of the check.

Finally, by clicking on the settings icon (arrow 3 Figure 11) you can start the calculation.

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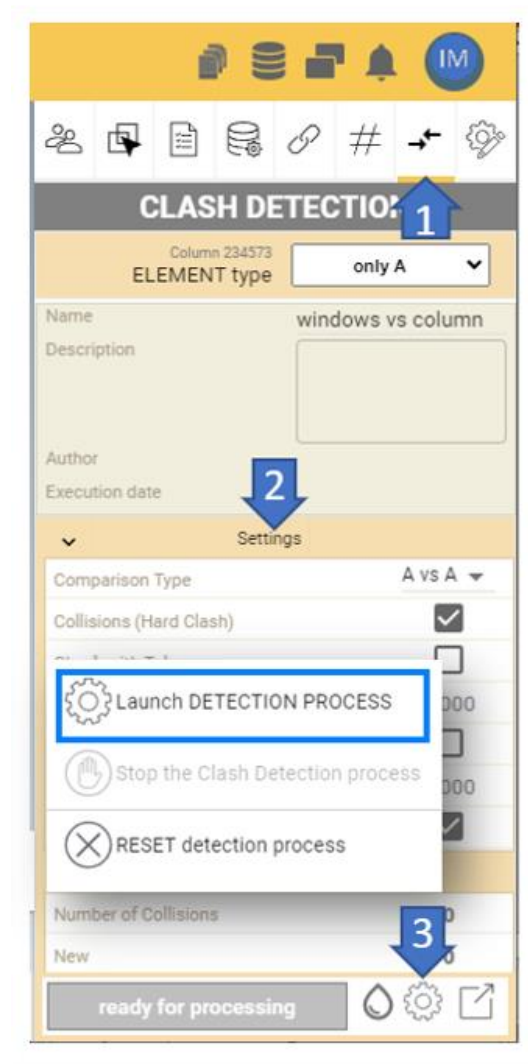


Figure 11. Clash Detection Settings

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1.5 Read the result

In the "COLLISION SUMMARY" section (arrow 1 Figure 12) you can view a summary report on the result of the verification. While, in the central panel (arrow 2 Figure 12) there is a list of collisions, by selecting the **Fly To** icon (arrow 3 Figure 12) a zoom is made on the elements subject to the collision. Using the "Filter Columns" (arrow 4 Figure 12) you can rearrange the report table by dragging a column into the pane to hide it. Finally, by clicking on the "Colours" icon (arrow 5 Figure 12) you can change the colors of the objects.

The status of the verification can be:

- New, when it is detected during the last clash analysis performed;
- Active, when the collision was already present in the previous clash analysis;
- Examined, when it is present in the current clash and has been taken over by the designer;
- Approved, when present, but has been accepted;
- Fixed when he's gone.

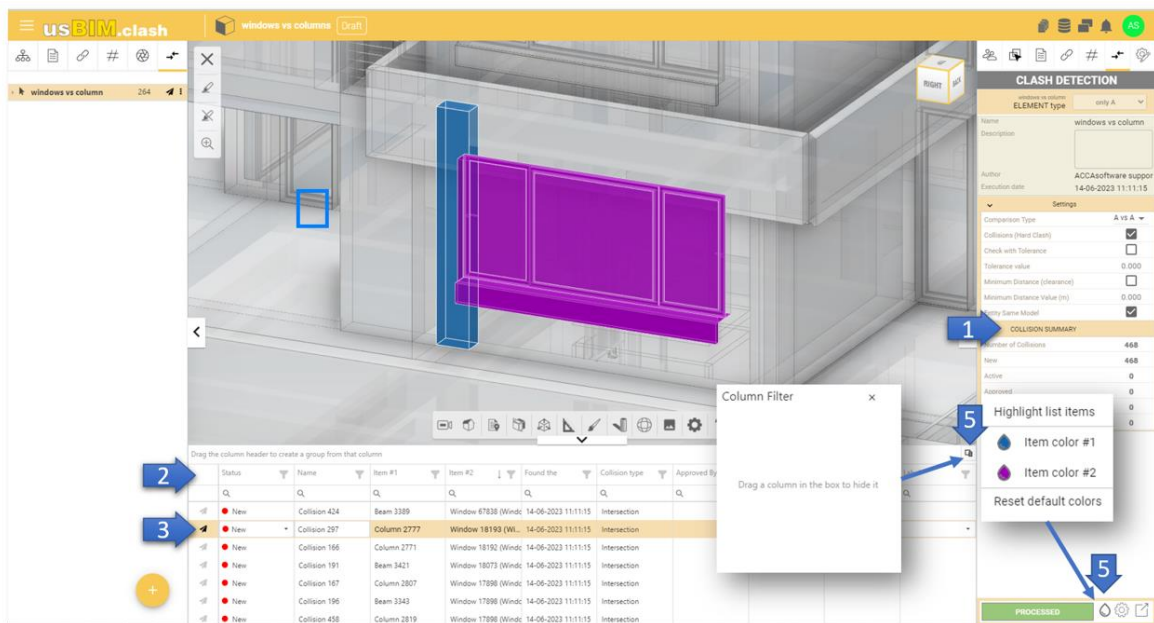


Figure 12. Verification results

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1.6 Exporting reports

After completing the Clash Detection, you can export the result of the verification. By clicking on the "Export Data" icon (arrow 1 Figure 13) you have the possibility to export it in three formats: CSV, BCF and EXCEL.

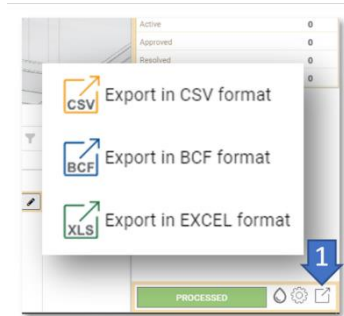


Figure 13. Report Export

A user with view-only permission who opens the document displays it as read-only. More specifically:

- Navigate through the model
- view the result of the verification;
- reorganize the collision table using the "Column Filter";
- change the colors of the verified objects.
- export data using the three different formats (CSV, BCF and EXCEL)

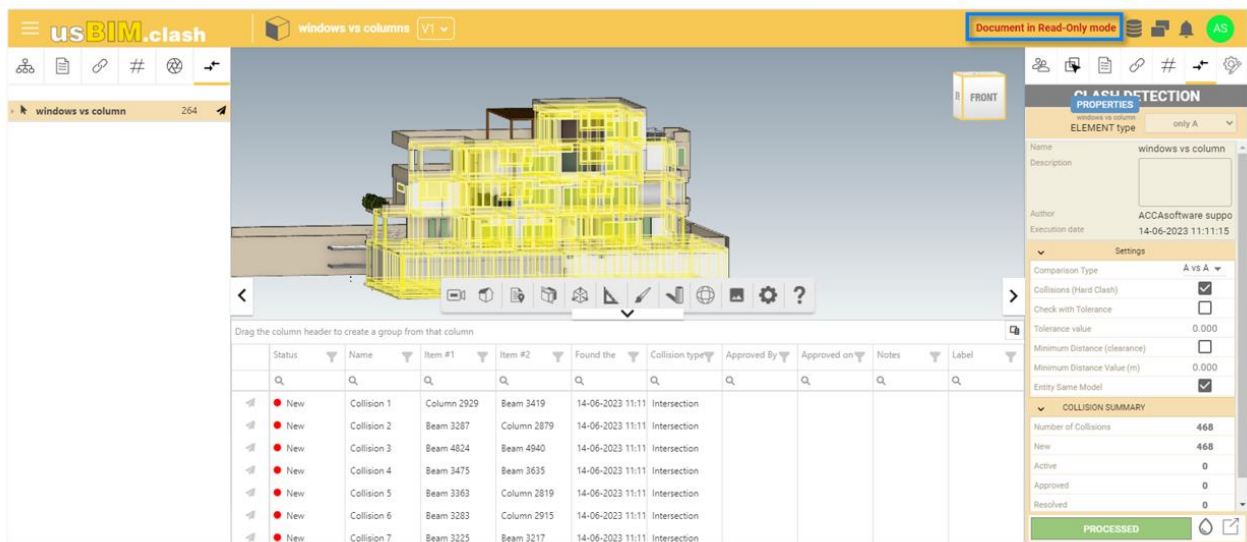


Figure 14. Viewing usBIM.clash document