

# Step-by-step IFC import plan

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## Objectives

The purpose of this memo is to briefly explain the steps that need to be taken in order to be able to use IFC files successfully in the creation of a Material Passport in Madaster. In addition to IFC files, it is also possible to import information to Madaster via an excel template. The use of this option falls outside the scope of this memo.

The step-by-step plan consists of the following steps:

1. Commission
2. Choice of IFC models
3. Choice of materials/products
4. Creating materials/products in Madaster
5. Defining the mapping process
6. Control and supplement IFC models
7. Upload models to Madaster
8. Control and enrichment in Madaster
9. Activate model

## Step 1 Commission

To create a Materials Passport from a 3D BIM model, it is important that all elements are 3D modeled and provided with a material and NL-Sfb coding. In principle, Madaster asks the IFC models to be made in accordance with the BIM BasisILS ([www.bimloket.nl/BIMbasisILS](http://www.bimloket.nl/BIMbasisILS)).

For this, all elements must be provided with a material. When naming Materials, preferably use identical names from the "Madaster Material List NL UK".

For Revit, we refer to the NLRS (Dutch Revit Standard).

In Archicad, materials are defined in the "Building Materials" (new materials are allowed). These materials can be hung directly on an object or element or can be used in a composite where a composition of materials is made. Later, these will be saved as separate materials via the checkbox "Explode Composite and Complex Profile elements into parts\*" in the IFC export.

In order to be able to import the quantities correctly, the so-called "Base Quantities" must be included in the IFC export. For renovation projects, it is also important to determine the "building process" phase: "Existing / Demolish / New". In Madaster there is a representation of the materials and products in the different phases of a renovation process: Current / Demolish / Casco / New / Final. The latter is the final result of the renovation process to be completed. Also: for new buildings the phasing has to be entered correctly (all "new").

## **Step 2 Choice of IFC models**

In a BIM process, most of the time there are “design models” (architectural-, structural-, and service advisors) and “production models” (builders and suppliers). Many parts are therefore worked out in duplicate in both the design model and the supplier's model. Not all components are modelled in 3D BIM by a supplier. It is wise to make an early choice as to which parts will be used for which model. It is not desirable to upload things twice. Parts that use the production model will have to be removed from the design model to prevent this duplication. Production models often contain more rich, specific information. Therefore it is preferable to use as many production models as possible.

## **Step 3 Choice of materials/products**

In this step, an inventory is made of the products and materials present in the building model. Within Madaster, it is possible to link elements as a product or as a material. Use the material name, in the BIM-, or Excel source files, as used in the Madaster database (list of materials).

For a more precise passport, it is recommended to combine as many elements as possible as a product (see step 4). It is advisable to think carefully in advance about which elements will be linked as a product and which as a material. As a rule, it can be stated that material "in bulk" also remains Material (e.g. "in situ concrete"), the rest is included as Product, even if it consists for 100% of one material.

## **Step 4 Creating materials/products in Madaster**

If suitable materials are available in the Madaster database, it is preferable to use this (name) in the source files as described. This Madaster database contains materials, but these are 100% "virgin" materials, where there is no recycled content (100% virgin, 0% recycled content) and a bad waste scenario (100% incineration or landfill). In order to achieve a reasonable score in "Circularity", it is therefore necessary to create materials that are specific to the project. The extent to which recycled components have been used by suppliers and the specific waste scenario of the material in question will also have to be investigated. Ideally, you also want to substantiate this information, by means of a "Product sheet" or "EPD" of the product that can be uploaded into the Building Dossier.

In the mapping process (a step when importing the source files), the model can be enriched. Here, you can also select or copy a material from the Madaster database. Also, the properties (such as recycled content) can be changed immediately. This new material is stored in the company's own account database.

Note: if a modified model is uploaded, this enrichment will also have to be performed again. The process becomes more efficient if it is ensured that the naming in the source file matches the naming of a material or product from the Madaster database. Then the next import cycle will match better, correctly.

## **Step 5 Defining the mapping process**

The next step is to capture the mapping of the material or product in Madaster, and the element in the IFC model. The document "Madaster Import Process" explains how a model is imported into Madaster. To make sure that an element from the IFC file is linked to the right material or product, it is possible to set the property value to be searched for in the model in the case of self-created materials and products.

Especially in the design phase it is recommended to use the material name of the Madaster database in the BIM models. Madaster Material List can be downloaded from [www.docs.madaster.com](http://www.docs.madaster.com).

### Step 6 Control and supplement IFC models

The next step is to prepare the IFC files for upload in Madaster. Now you need to make sure that all the necessary parameters have been entered correctly. Design models must be separated to avoid duplication of elements. If models do not contain the correct information, this will first have to be adjusted in the source software used to produce the model, and a new IFC file will have to be created. Alternatively, you can edit the IFC file yourself. This can be done using SimpleBIM. Not all modeling software is able to put all the information in the right place in IFC. By using the custom propertyset "Pset\_Madaster" you can directly control that certain information is read directly in Madaster. See also the document: "Madaster Import process".

Checking the Madaster properties can be done in IFC checkers such as Solibri, or BIM-Collab Zoom. The latter is a free application, for which so-called "smart-views" are available, which make it easy to visually check the parameters of Madaster, or of the BIM Basis ILS. <https://www.bimcollab.com/en/ZOOM/zoom>

The IFC checkers can also be used to check if there are duplicates in the models. The combination of IFC models must be free of double counting in order not to calculate twice the volume in Madaster.

### Step 7 Upload models to Madaster

The next step is to upload the IFC files to Madaster. In the dialog box, "tags" can be added to the file to make searching and filtering easier, if many source files are going to be used.

It is important to first use only the sources of your own account (in this example "Madaster Demo") and those of Madaster. The Madaster database only has materials (as they appear in the NMD).

Users of Archicad (Material Catalog materials) or Revit may still be able to choose those sources, if they know that that naming is included in the IFC export.

Use the other databases only for more specific purposes.



Picture: Upload source file (IFC/Excel) in Madaster

In order to make this automated matching process as effective as possible, prior to processing the source files, a selection can be made and priority given to relevant data sources in the Madaster platform. The selected sources are used during the automated matching process.



Picture: Select and prioritise datasets in Madaster

### **Step 8 Control and enrichment in Madaster**

The next step is to check whether the link between the IFC model and the Madaster has been made correctly. In Madaster you can see whether the model has been properly linked. The following links can be checked:

Quality model:

- Whether elements have a material description
- Whether elements to the right building layer (location, construction, envelope, technical installations, finishing or interior) are linked on the basis of the NL-SfB coding.
- Whether all elements contain geometric information.

Matching:

- Whether all elements are linked to material or product.
- Whether the mass of elements is known
- Link to construction process (current, demolition, hull, new materials)

At element level, it is then possible to check which material or product an element is linked to. It is only possible to create or modify the link between element and material or product manually. All missing NL-SfB codes, or missing quantities, can only be solved by uploading a custom IFC into Madaster.

### **Step 9 Activate model**

When an IFC model is properly matched in Madaster, it can be activated. At that moment it is included in the passport and information becomes clear in the tabs Building, Construction Process, Circularity and Financial.