



Madaster User Manual

General user guide of the Madaster Platform

Made for
Madaster User

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1 Getting started.

1.1 What is Madaster?

Madaster is the brand name of the Madaster Foundation. The aim of the Madaster Foundation is to keep materials available in all economic cycles, by registering these materials and thus facilitating their availability at the highest possible level. The Madaster Foundation wants to realize this goal by offering a digital platform in which the built environment can be fully documented. Madaster is an independent Platform that is accessible to everyone: individuals, companies, governments, and the scientific community. Madaster is the "land register of materials".

In our closed system, the earth, raw materials are limited and scarce. To keep materials available indefinitely, they need to be documented/registered in use. With the help of a Materials Passport, materials retain their identity, so that they are not lost anonymously, as waste. Madaster thus acts as a library of materials in the built environment: it links the material identity to the location and records this in a Materials Passport.

1.2 What is a Materials Passport?

A Materials Passport is based on the entered materials and products of a building or building section, as created from one or more source files. In this Materials Passport, the quantities of the materials used are made transparent within the so-called 'building framework'. The materials in the various layers of the building are shown based on the NL/SfB classification coding applied in the Netherlands, and these can be classified according to seven 'material families' or according to the NL/SfB table 3 categorization.

1.3 How does it work?

To register a new or existing building in Madaster, information (data) of this building is needed. The more extensive and complete this data is available (input), the more detailed and complete the report (output) is displayed in the Madaster Platform and specifically in the Materials Passport.

The Madaster Platform can process two types of source files:

1. IFC files (based on a 3D/BIM model).
2. a Madaster Excel template (if no 3D/BIM model of the building is available).

The various 3D CAD applications in which buildings are currently modelled digitally use their own file format but communicate with each other using the universal IFC file format. This IFC format can therefore be exported by all 3D CAD applications. For more information about the export possibilities of the 3D CAD application you are using, please contact your software supplier.

If a building is not modelled in 3D or certain elements are not worked out in the 3D model, an Excel template can be used in Madaster. The latest version of this template is always available in the Madaster Platform under: "Dossier" tab >> "Upload" button >> select classification method.



ADD FILE

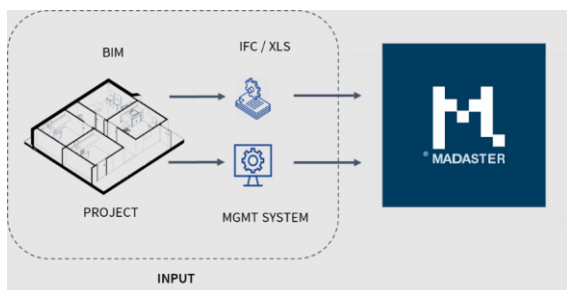
File type *
Source file (BIM or Excel) ▼

Classification method *
NL-SfB ▼

Are you using Excel? Then use [this template](#).

Picture 1: Download Madaster Excel template.

Based on this secondary source of information, a building can still be registered in Madaster (without a 3D/BIM model), where the materials and products used in the building are recorded in a Materials Passport.



Picture 2: Madaster input data (various options).

Madaster then categorizes and summarizes the information contained in the source files, so that for a building or for each building section it is possible to see where and how much of which material is in the building. Madaster does not calculate quantities itself; all geometric information and quantities are imported directly from the IFC model.

The quality (completeness) of the source files is validated by Madaster and displayed in the system after the source file has been read. All calculations within Madaster take place within these frameworks. Missing or incomplete information in the source files leads directly to inaccuracies of the result compared to 100% accuracy.

1.4 What do you need?

A Materials Passport is created based on the available information (data) that the user uploads into so-called 'source files' in the Madaster Platform. These source files (in IFC and/or Excel file format) are automatically validated for completeness when imported into Madaster in terms of material description, classification code and geometric data.



Madaster focuses on the use of IFC files as source files as they can be exported in 3D CAD applications such as Autodesk Revit, Archicad, etc. This usually happens in the design phase of a building or during its renovation. If this type of source file is not available (e.g., for an existing building), the Materials Passport can be created in Madaster based on an Excel template.

More information about collecting and preparing the required building information (source data) is described in the Manual '[Madaster Action plan Materials Passport](#)' (see Step 2).

1.5 Workflow Madaster Materials Passport

You can get started with the Madaster Platform using the manual '[Madaster Action plan Materials Passport](#)'. This manual describes these necessary process steps in more detail and refers to other specific Madaster documentation or reference works for additional information.

* You can register your Madaster account via the [Madaster website](#).

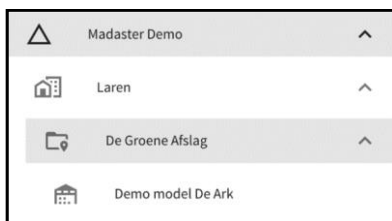


2 Workflow

2.1 Flexible folder structure

The Madaster platform works from "Accounts" - usually the owner of the property or the primary, leading party in a particular phase (e.g., the architect in the design phase, the contractor in the execution phase, or a designated building manager in the use phase).

You can set up your account structure in Madaster as you wish. Within your account, "Folders" can be created containing buildings or other folders (e.g., a region, department, or subsidiary). A folder contains the "Buildings", the existing real estate properties, or projects or those under development. This structure is flexible and allows you to configure your Madaster environment according to your needs.



Picture 3: Madaster folder types (navigation).

"Users" can be assigned different roles in Madaster with specific management, write & read or read-only rights. These rights can be granted by an account manager to other users who have access to one or more folders, folders and/or buildings in the Madaster Platform.

2.2 Type of folders

In the "Type Folders" tab, different types of folders can be created. Think of the above examples of regions, subsidiaries, or another definition of your (desired) organizational structure.

NEW FOLDER TYPE

Name *	Description
Plural Name	
<input type="checkbox"/> Foldertype allowed directly under account?	Icon
<input type="checkbox"/> Buildings can be added in this folder type	Logo
<input type="checkbox"/> Does folder of this folder type requires an address?	
<input type="checkbox"/> Folder of this type is a region defined by spatial coordinates?	
<input type="checkbox"/> Specify owner in passport	

Picture 4: Define Madaster folder types.



A few examples:

- A large construction company has several companies and subsidiaries. The projects for the different clients can now be organized per company/subsidiary.
- A nationally operating developer has divided his company into regions, with a department for "residential construction" and "non-residential construction" for each region. Various projects or area developments are underway in which the buildings are registered.
- An architectural firm wants to organize the projects per year and per sector (care, education, offices). Within the sectors there are projects with several buildings.

Each account is completely free to decide what the structure of leaflets will look like. By means of the different rights and roles of users, it is possible to determine per level who sees what and who can do what.

2.3 Users

On account level, different users can be invited with different roles and permissions. Madaster has three types of users:

- **Administrator:** the account holder who is the owner of one or more portfolios and the buildings located within them; the owner can also delete them and has all the features of the role Manager and Reader.
- **Manager:** a person who is enabled by an owner to manage his portfolios and buildings. In addition, the Manager has all the features of a Reader.
- **Reader:** a person who can upload (source) files, use information, and generate Material passports.

AVAILABLE ROLES AND RIGHTS AT THE ACCOUNT LEVEL:

Account level	Administrator	Manager & contributor to database	Manager	Reader
Creating and modifying folder types	Yes	No	No	No.
Creating folders	Yes	Yes	Yes	No
Creating database	Yes	No	No	No
Contributions to database created on account or shared with account with at least contribution rights	Yes	Yes	No	No

Picture 5: Available Madaster roles & rights (account level).



Folder level	Administrator	Manager & Contributor to database	Manager	Reader
Create folders and subfolders	Yes	No	No	No
View brochure and underlying buildings	Yes	Yes	Yes	Yes
Modify folder and underlying buildings	Yes	Yes	Yes	No
Delete folder and underlying buildings	Yes	No	No	No
Add building to a folder	Yes	Yes	Yes	No
Add and remove users	Yes	No	No	No
Add database (folder level)	Yes	No	No	No
Contribute to database created at folder level or shared with folder with at least contributions rights	Yes	Yes	No	No
Export Material Passport	Yes	Yes	Yes	No
Download Material Passport to PDF	Yes	Yes	Yes	No

Picture 6: Available Madaster roles & rights (folder level).

2.4 Features

At a company account level, the Madaster user can activate, use and evaluate new (example) functions ('features'). These functions will be further developed based on user feedback. Features can be activated directly by the user or are available by invitation and/or subject to conditions.

GENERALDOSSIERUSERSMATERIALS & PRODUCTSSETTINGSFEATURES

PREVIEW FEATURES
The following preview features are available for your evaluation. Help us make them better!

MADASTER INFRA
The Infra feature enables other objecttypes (such as kunstwerk etc) in addition to buildings in accordance with the BGT-classification.
This feature is available by invitation only, contact Madaster if you are interested.

☐ Off

CIRCULARITY INDICATOR V2
Circularity Indicator V2: new CI calculation including Unknown layer elements in calculation + new Building Input/output flows and detachability indicator

☒ On

EMBODIED CARBON OVERVIEW
Embodied Carbon Overview

☒ On

2BA DATABASE
2BA database
This feature is available by invitation only, contact Madaster if you are interested.

☐ Off

SPLIT BUILDING
Enables to split building based in ifcElements building Numbers
This feature is available by invitation only, contact Madaster if you are interested.

☒ On

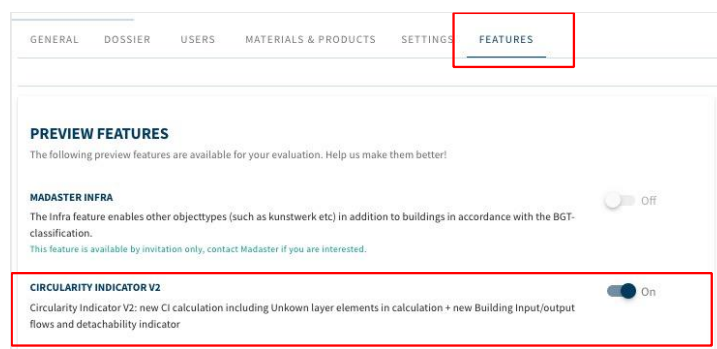
Picture 7: Madaster features).



2.4.1 Circularity Indicator Version 2

The 'CI V2' feature (to be activated directly by the user) offers Madaster users the following additional insights:

- Adjusted circularity calculation, where elements without a classification code are no longer excluded.
- Input flow (primary vs. secondary material sources) and output flow (available for reuse and recycling) of materials in kilograms and percentages on building level and on building layer, such as: Structure, Skin, Services etc. (see section 4.2. for details).
- Degree of detachability (% detachability index) of the building, including index quality score (see section 4.2 for details).

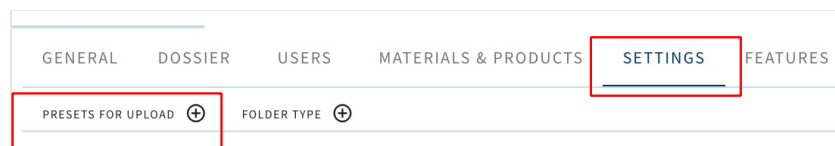


Picture 8: Madaster CI V2 feature.

2.4.2 Split building feature

The 'Split buildings' preview function (available by invitation only) allows Madaster users to create individual building dossiers and passports based on a prepared IFC file with several buildings/homes. This makes it more efficient to split up (IFC) models per real estate object prior to being uploaded into Madaster.

To use this function, an individual building number must be available for each IFC element in the IFC file. The property set and property name for this building number are flexible. This and other settings (see section 2.2 for details) can be specified in Madaster at company account level as an upload setting.



Picture 9: Madaster presets for upload.

It can be defined by clicking on the 'Presets for upload' button.



UPLOAD PRESET

Upload preset * ☐ Is default

Classification method

PropertySet for Buildingnumber Property Name for the buildingnumber

Languages for enrichment

Indicate to which sources in the Madaster platform the elements in the file to be uploaded should automatically be linked and in which order this should be done per element. To add or remove a source, select the '-' or '+' sign at the end of a source name.

Available sources Selected sources

Picture 10: Set Madaster upload settings.

When the data upload process in Madaster is completed, the user can manually link unlinked elements in the “Enrich” tab, adjust these elements (if desired) and consequently activate the relevant IFC files. Subsequently, via the button 'Split the building' (on the building's 'General' tab), the user can automatically create individual building dossiers in Madaster (from a source file model with several buildings) on the basis of an assigned building number.

GENERAL DOSSIER USERS BUILDING CIRCULARITY

EDIT BUILDING MOVE ARCHIVE THE BUILDING SPLIT THE BUILDING

Picture 11: Split building function.

2.5 Types of files

Within the Madaster Platform a distinction is made between two types of files, namely:

- **Source files:** the files with which the materials and products and the quantities of a building are delivered to be registered in Madaster. These include the IFC files and the Excel template of Madaster.
- **General files:** static files that contain information about the building and can be added to the building file in Madaster, but which cannot be used to serve as a source file.

2.6 Source files

The Madaster Platform primarily uses IFC files (4 or 2x3) of the buildings to provide insight into the quantities of materials used. As an alternative, Madaster offers an Excel template. This template is made available on the Madaster Platform.

The elements in these two types of source files should, as far as possible, include:

- **Geometric properties** (so-called 'base quantities') of the CAD objects; information about the quantities in volume and weight.



- A **material description**, on the basis of which the Madaster system can provide insight into the materials used in the building.
- A **classification coding** (in the Netherlands the NL/SfB code is common) on the basis of which the Madaster Platform can assign the elements to the building envelope in which the element is located (location).

Multiple source files can be uploaded in Madaster per building. For example, construction, installation, and architecture. You decide which file is made active. If multiple source files are active, they will be added together in the different tabs of Madaster (e.g., 'Building'-tab, 'Financial'). **Attention:** duplications can occur! This can be displayed in specialized 3D-viewers, such as Solibri, BIMCollab Zoom, etc. The latter functionality is not available in the Madaster system.

A source file can be made active or inactive at any time (depending on user rights).

2.7 IFC-source file manuals

- The manual “[Madaster IFC guidelines](#)” outlines the Madaster guidelines for setting up the BIM model and exporting the IFC file.
- The manual “[Madaster BIM IFC import](#)” describes in detail how to prepare an IFC file for processing within Madaster. It explains, among other things, how the geometric properties, classification coding, construction phase and material use is determined.
- The manual “[Madaster BIM - IFC export](#)” describes in more detail how to export an IFC file (from Archicad and Revit).

2.8 General files

This includes files that provide information about the building or its design, e.g., digital drawings of the building in 2D CAD formats (e.g. .dwg, .dxf), PDFs, photographs, and scans of building drawings (in JPG, PNG, TIFF formats).

2.9 Data and information

Because the Information Delivery Manual (IDM) is already widely used in the Netherlands, we recommend using it. For more information see the [BIMloket](#). Here you will also find very extensive manuals to comply with the ILS with your specific BIM software. In the IFC check section, you can also see whether your files comply with the IDM standards. This manual discusses what is specifically required for Madaster. This is less extensive than the full IDM standard and is mainly focused on materials and NL/SfB coding.

2.10 Geometric data

Madaster obtains all geometric data (e.g., volume, surface, length, weight) from the source files (IFC/Excel) that are uploaded by the user or from products that are available in its databases and that are linked to elements of a source file. This means that Madaster does not perform any



calculations itself. Only the summation of the different quantities of the obtained information is used.

2.11 Material Classification

Madaster distinguishes six material categories and one that contains elements for which a material is unknown. In addition, it is possible to display the materials categorization on the “Building” tab based on the NL-SfB table 3 classification.

	STEEN	GLAS	HOUT	PLASTIC	ORGANISCH	METAL	ONBEPaald
TOTALEN	2.788,84 m³ 3,4 Mj	28,78 m³ 40,78 t	47,51 m³ 34,33 t	22,88 m³ 770,83 kg	81,2 m³ 10,97 t	288,24 m³ 1,2 Mj	1.259,22 m³ 0

Picture 12: Material groups (“Building” tab).

Via the Materials & Products tab (in the left vertical navigation menu) you can view available materials and products from different data sources. If desired add your own materials and products to a database (on account, folder type or building level). By adding search criteria to your material/product the Madaster Platform can link these automatically to elements in the source file(s).

If the “Madaster” database is used, the “[Madaster Materials List](#)” can be used when preparing source files (IFC/Excel) (column B of this list contains the exact English search criteria). The materials in the “Madaster” database also contain the NAA.K.T material naming (Dutch abbreviation for name attribute, application) as search criteria. As a result, in a source file (IFC/Excel) an element containing a NAA.K.T material name will be automatically recognized and linked to a corresponding material in the “Madaster” database.

Home > Madaster > Madaster > Zoekcriteria

LOOFHOUT - ESSEN

MATERIAL INFORMATION	CIRCULARITY	ENVIRONMENT	SEARCH CRITERIA	DOSSIER	FINANCIAL
EDIT					
Search criterium		Matching type		Language	
Ash		Contains		All languages	
Essen hout		Contains		Dutch	
Bois de frêne		Contains		French	
Legno di frassino		Contains		Italian	
Madera de fresno		Contains		Spanish	
Eschenholz		Contains		German	
Asketre		Contains		Norwegian	
hout_essen_				Dutch	

Picture 13: Material (example search criteria).



2.12 Standard Classification (NL/SfB)

In the construction sector, the NL/SfB code indicates the building section in which a building section or material is located. This coding is given to objects in the IFC file. This allows Madaster to categorize the materials. In this way it is made clear how many materials are located where in the building. Preferably use the NL/SfB code with 4 digits. Madaster then assigns these to the building envelope (e.g., Construction, Enclosure, etc.).



Picture 14: Classification (building layers).

In addition to the NL-SfB classification, the Madaster Platform also supports the: NL/SfB table 1 (NL-SFB V201912), the international OmniClass (table 21) and its own “shearing layers” classification. The content of these classification methods can be viewed in the Madaster Platform under “Administration” (in the left vertical navigation drawer).

2.13 Building process – renovation phases

Many building projects consist of the renovation of existing buildings. Part of an existing building is demolished; a shell remains and is built in and attached with new materials. This construction phase (Current-Demolition-Casco-New-Final) is supported by Madaster from the information that can be provided in a source file (IFC and/or Excel template).

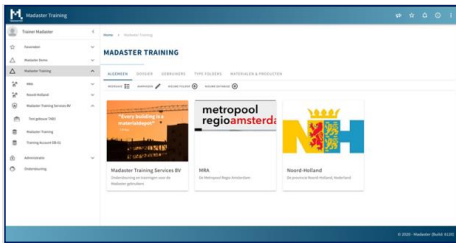


Picture 15: Building process (renovation phases).

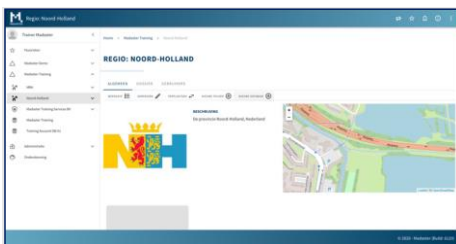
This tab will be displayed as the “Building phase” is marked as: ‘Existing’, ‘Renovation’ or ‘Demolition’.

2.14 Databases

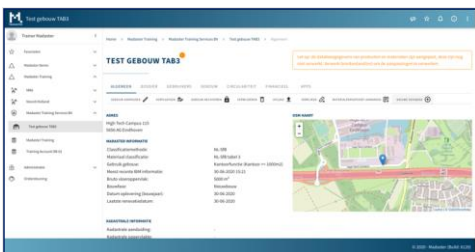
In Madaster it is possible to create and use multiple databases at different levels (e.g., project, portfolio and/or building level) within one's own account. A created database can be found in the navigation drawer on the left-hand side of the screen. The images below show several levels on which a new database can be created in the platform.



Picture 16: Database creation at account level.

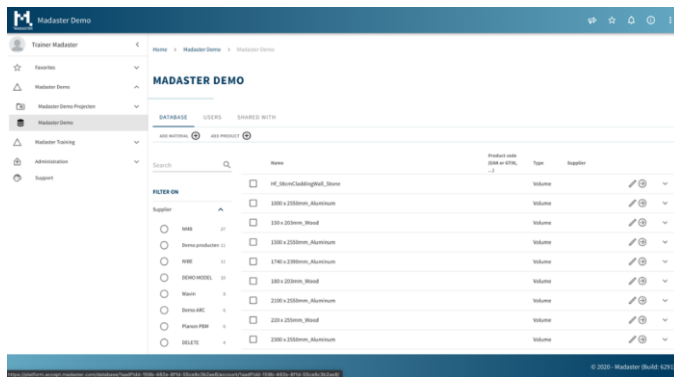


Picture 17: Database creation at folder level.



Picture 18: Database creation at building level.

It is also possible to create multiple databases at a level (folder or building). These databases are always visible in the navigation drawer on account, (sub)folder or building level.



Picture 19: View/find created databases.

2.15 Database properties

A database has minimal properties: a name and the possibility to use this database as a standard selected database when uploading a source file. If a database is shared, several properties are added, which relate to the use of the (shared) database.

2.16 Users

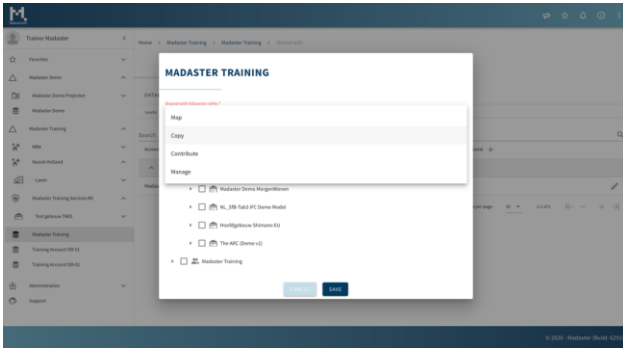
Just as with accounts, folders and buildings, databases can also be used by several people or by another IT system using an API token. Users can now be invited and receive rights as administrator or contributor. The latter role can only create or modify materials and products in the platform.

2.17 Sharing databases with other accounts, folders, buildings

A database can be shared with multiple accounts, folders or buildings. This makes it possible, for example, for a company to set up your own database and then make these materials and products available to another user working under a different account.

2.18 Sharing a database: rights

When sharing a database, it is necessary to determine the rights with which the users -of the account/folder/building with which you share it- can use the materials and/or products.



Picture 20: sharing databases (rights).

A database can be shared with four different rights, properties:

Map – elements can be linked to the materials and products in this database.

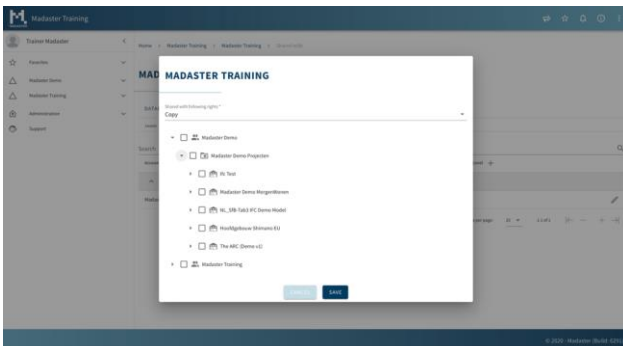
Copy – the materials and products from this database can be copied.

Contribute – new materials and products can be entered into this database by the users with whom this database is shared.

Manage – the database can be managed by the users with the rights, on the account/folder/building with which this database is shared.

2.19 Sharing a database: account, folders, buildings

A database can be shared with multiple accounts, folders or buildings. This makes it possible to create a central database that supports multiple folders and buildings or specific databases for certain types of buildings. After sharing a database, you get the choice to determine which accounts, folders, buildings have access to the shared database.



Picture 21: A database can be shared with other account(s), and/or one or more folders and/or buildings.

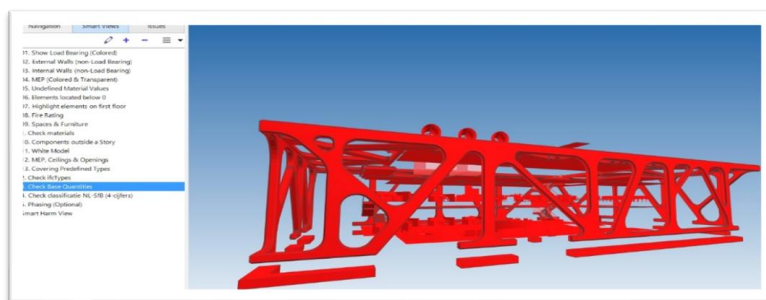


2.20 Share and use

The materials and products in a shared database are "synchronized": it is the same database, accessible from multiple accounts, folders and/or buildings. Changes and additions made by one user are also available to all other users of this database.

2.21 IFC check (BIMCollab Zoom)

Before reading an IFC file into the Madaster system, you can perform a validation to determine whether the basic settings, such as materials and NL/SFB classification, are correct and complete. For this purpose, a Madaster smart view is available, which can be used with the free version of the "view" program BIMCollab Zoom. This public viewer and the Madaster smart view can be downloaded [here](#).



Picture 22: IFC checker (BIMCollab Zoom).

After loading your IFC model in BIMCollab Zoom, you can load the Madaster smart views under smart views. Now several pre-programmed views are loaded with which you can quickly scan elements that are missing a NL/SFB coding or do not yet have a material allocation. After this check and any adjustments in Archicad, Revit, etc. the IFC models can be uploaded into the Madaster Platform.

2.22 Upload source files

The Madaster platform can handle two types of source files: an IFC file (based on a 3D / BIM model) and a Madaster Excel template (if no 3D / BIM model is available). In the tab "Dossier", within the relevant building in the Madaster platform, one or more source files can be added (at the same time) consisting of, for example, construction, technical services and architecture.



ADD FILE

File type *
Source file (BIM or Excel) ▼

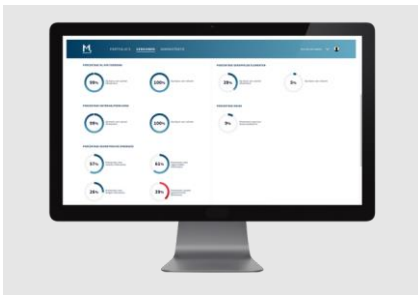
Classification method *
▼

Select file(s) *
▼

Select folder *
Source files ▼

Picture 23: Upload files (Dossier tab).

For more details about the upload process, please refer to Step 4 “Uploading the source data into Madaster” in the manual “[Madaster Action Plan Materials Passport](#)”.



Picture 24: Upload results source files (Dossier tab).

2.22.1 Upload settings

On different levels (account, folder type & building) within the Madaster platform, default upload preferences can be set and selected regarding classification method, language(s) for enrichment, selection of source files (incl. priority) and property settings for building numbers (for 'split building' feature).

Upload settings created at a higher level in the navigation tree (e.g., account, folder type, building) are made available by default at the lower levels as well, but this inheritance can also be broken at a lower level.



GENERAL DOSSIER USERS MATERIALS & PRODUCTS **SETTINGS** FEATURES

PRESETS FOR UPLOAD

UPLOAD PRESET

Upload preset * ☐ Is default

Classification method

PropertySet for Buildingnumber Property Name for the buildingnumber

Languages for enrichment

Indicate to which sources in the Madaster platform the elements in the file to be uploaded should automatically be linked and in which order this should be done per element.
To add or remove a source, select the "+" or "x" sign at the end of a source name.

Available sources Selected sources

Picture 25: Define Madaster upload settings.

The upload setting is then selected in the building's "Dossier" tab.

GENERAL **DOSSIER** USERS BUILDING

UPLOAD

ADD FILE

File type *
Source file (BIM or Excel)

Upload preset Classification method *

Select file(s) *

Select folder *
Source files

Picture 26: Select Madaster upload preset.

2.22.2 Replace existing IFC file (keep linked elements)

It is also possible to replace an existing IFC file, of which elements have already been automatically or manually linked, with a new version of the IFC file while retaining the linked elements. Instead of the usual IFC upload procedure, this function starts via the upload icon (in Dossier tab) located behind the IFC file to be replaced.



Picture 27: Upload new version of source file (while retaining linked elements).

Subsequently, the regular upload process steps must be followed (as described at the beginning of this chapter). The system then processes the new IFC file and, if a unique element occurs again and was linked in the previous IFC file, will maintain this relationship. Ultimately, only 1 version of the IFC file can be activated in the building dossier. By activating the most recent version, the system will automatically deactivate the former (replaced) version.

2.23 Enrichment process

It is recommended to link as many elements as possible or at least link elements with the most volume to a material or product in Madaster. Unlinked elements can be linked manually by the user. This can be done in the “Enrich” tab (click on the source file (IFC/Excel) in the dossier).

If desired, use the search function or the predefined filters on the left side of this screen to select IFC elements. After selecting one or more elements, the user clicks on the 'Link' button (paperclip icon). Then select the material/product from the available databases and subsequently click on the 'link' button. The selected elements are then linked by the Madaster system. A maximum of 500 elements can be linked to a material/product in Madaster at the same time. For more details about the enrich process, please refer to Step 5 “Check & enrich source data in Madaster” in the manual “[Madaster Action Plan Materials Passport](#)”.



Picture 28: Linked elements (Enrich tab).

In addition to linking materials and products in Madaster, a user also has the option to adjust elements in the Madaster platform. This too takes place in the “Enrich” tab. After selecting one or more elements, the user clicks on the 'Edit' button (pen icon).



Picture 29: Adjust elements (Enrich tab).



2.23.1 Adjust classification code per element (incl. bulk edit)

Subsequently, it's possible to adjust the classification code of one or more elements (material and product) at the same time (bulk).

× Edit: NLR5_31_GM_WPB_SH_prefab beton raamdorpel recht_gen_KG:RD160C-GRIJS:10175090 SAVE

Phase
Casco

Classification
31.20 - buitenwandopeningen; gevuld met ramen, algemeen (verzamelniveau)

☐ Edit building numbers

Picture 30: Adjust classification code of element (Enrich tab).

Click this field and then select the desired classification code from the defined list. Finally, click on the 'Save' button to save the changes.

2.23.2 Adjust phasing per element (incl. bulk edit)

Subsequently, it's possible to adjust the phase (e.g., demolition, casco, new materials) of one or more elements (material and product) at the same time (bulk).

× Edit: NLR5_31_GM_WPB_SH_prefab beton raamdorpel recht_gen_KG:RD160C-GRIJS:10175090 SAVE

Phase
Casco

Classification
31.20 - buitenwandopeningen; gevuld met ramen, algemeen (verzamelniveau)

☐ Edit building numbers

Picture 31: Adjust phase of element (Enrich tab).

Click this field and then select the desired classification code from the defined list. Finally, click on the 'Save' button to save the changes.

2.23.3 Adjust building number per element (split building function)

Subsequently, it is possible to adjust the (degree of) building number allocation of one or more elements (material and product) at the same time (bulk).



×

Edit: NLR5_31_GM_WPB_SH_prefab beton raamdorpel recht_gen_KG:RD160C-GRIJS:10175090

SAVE

Phase

Casco

Classification

31.20 - buitenwandopeningen; gevuld met ramen, algemeen (verzamelniveau)

Edit building numbers

Building number	Ratio (%)	
18	100%	<div><div></div><div></div></div>

Picture 32: Adjust building number of element (Enrich tab).

To do this, activate the function 'Edit building numbers' and then allocate the desired ratio (%) to the available building numbers. Finally, click on the 'Save' button to save the changes.

2.23.4 Adjust Reuse (Feedstock input & Output)

Subsequently, it is possible to adjust the degree of reuse in the construction phase (Feedstock input) and at the end-of-life phase (output) of one or more elements (product only) at the same time (bulk).

SAVE

FEEDSTOCK INPUT

Reuse

%

DETACHABILITY

Connection type (product default value: Connection with added elements)

Connection with added elements

Connection detail

Spring connection

Connection accessibility (product standard value: Accessible with additional operations with fully repairable damage)

Accessible with additional operations with partially repairable damage

Intersections (product default value: No intersections - modular zoning of products or elements from different layers)

No intersections - modular zoning of products or elements from different layers

Product edges (product default value: Open, no obstacle to the (intermediate) removal of products or elements)

Overlap, partial obstruction to (intermediate) removal of products or elements

OUTPUT

Available for reuse

%

Product value: 0%

Picture 33: Adjust Reuse (Enrich tab).

If desired, complete the fields 'Feedstock input Reuse' (in %) and 'Output available for reuse' (in %). Finally, click on the 'Save' button to save the changes.



2.23.5 Adjust detachability per element (incl. bulk edit)

Subsequently, it is possible to adjust the detachability parameters of one or more elements (product only) at the same time (bulk).

The screenshot shows a web interface for 'FEEDSTOCK INPUT'. At the top right, there is a 'SAVE' button with a floppy disk icon, highlighted by a red rectangle. Below the header, there is a 'Reuse' field with a '%' symbol. The 'DETACHABILITY' section is highlighted by a red rectangle and contains several dropdown menus:

- Connection type** (product default value: Connection with added elements):
Selected: **Connection with added elements**
- Connection detail**:
Selected: **Spring connection**
- Connection accessibility** (product standard value: Accessible with additional operations with fully repairable damage):
Selected: **Accessible with additional operations with partially repairable damage**
- Intersections** (product default value: No intersections - modular zoning of products or elements from different layers):
Selected: **No intersections - modular zoning of products or elements from different layers**
- Product edges** (product default value: Open, no obstacle to the (intermediate) removal of products or elements):
Selected: **Overlap, partial obstruction to (intermediate) removal of products or elements**

Picture 34: Adjust Detachability (Enrich tab).

Adjust the desired detachability parameters. Clicking the 'Save' button will save the adjusted parameters. Detachability parameters cannot be edited when the selected building elements are matched to different products.

2.24 Activate source files

After enriching (as many) elements, a source file in Madaster can be made 'active' (in the 'Results' tab). This ensures that the results of the source file are also shown in the 'Building' tab, 'Building process' tab, etc. Based on this, it becomes clear (per building layer) how complete the source data of the building is. A source file can be made active or inactive at any time (depending on user rights). The goal is to get 100% completeness before a source file is activated in the system.

2.24.1 Activate/Deactivate/Delete multiple source files

In the building's "Dossier" tab, a Madaster user can activate, deactivate, or delete multiple source files simultaneously. To use this function, first select the tick boxes of the appropriate source files. Subsequently, click the activate, deactivate, or delete button in the menu that becomes available.



Picture 35: Activate/deactivate/delete multiple source files simultaneously.



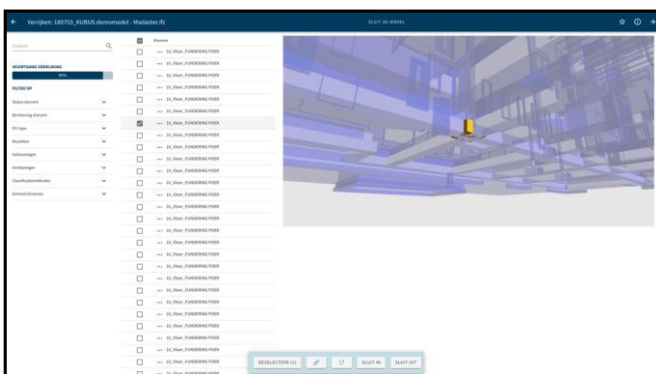
2.25 3D model viewer

After uploading your IFC source file, you can also view it in the Madaster 3D viewer. This allows you to see which IFC file contains which parts of the building. Note: this functionality is dependent on the user's browser settings, available CPU memory and works best with files under 100 MB.

After selecting one or more elements, those elements can be displayed in 3D, in the screen itself. Because of this, it is also possible to use the functionalities of the "candy bar" (the menu in light blue color at the bottom of this screen).

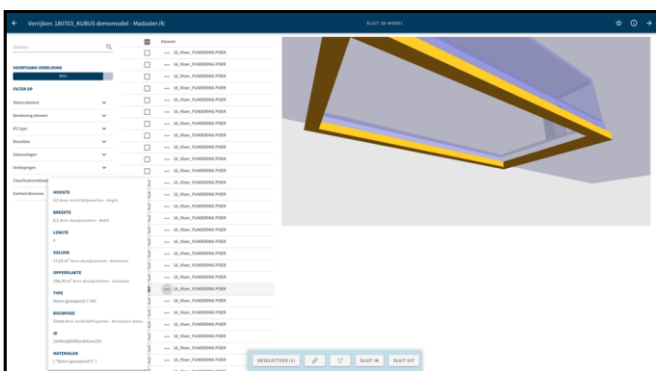
Commented [SG1]: @Richard Greil : should we mention here a warning that 3d viewer requires a lot of memory and might fail on large IFC files.

Commented [RG2R1]: @Stéphanie Guyot > heb ik toegevoegd. Al je het eens bent met deze toevoeging, mag dit document gepubliceerd worden.



Picture 36: Selecting elements (Madaster 3D viewer).

After selecting one or more elements in the 3D window itself, where they will then be displayed, these elements are also selected in the list. This makes it also possible to use the functionalities of the "candy bar", after information about the element in question via the "three dots" (visible before the name of the document).



Picture 37: Selecting elements in viewer: possibility to connect/disconnect.



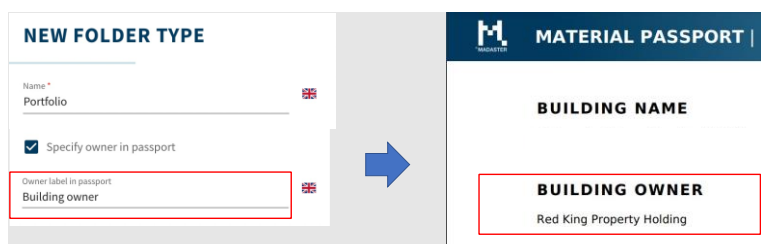
3 Materials passport

3.1 A Materials Passport

A Building Materials Passport displays the building's information as shown in the 'building tab' on the Madaster Platform. The Materials Passport consists of the selected source files uploaded into the Madaster Platform of which the user has indicated to use the results with the building information.

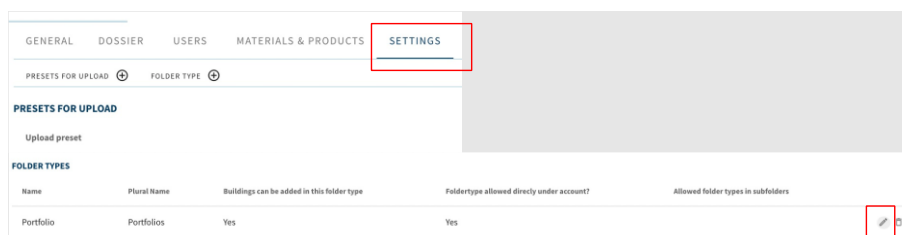
3.1.1 Owner label in Materials Passport

In Madaster it is possible for Administrator users to add and define a text label on a folder type (portfolio, region, etc.). The label and the entered value are then shown on the front page and General page of the material passport (PDF & Excel file).



Picture 38: Result Owner label.

To define a text label by folder type, go to 'Settings' at company account level. Then select the folder type (see section 2.1.1 for more details) and click on the 'Edit' button (pen icon) behind the relevant folder type.



Picture 39: Adjust folder type (owner label).

Then select the option 'Specify owner in Passport' and define the label, as it should be displayed in the material passport.



NEW FOLDER TYPE

Name *	Portfolio	Description
Plural Name	Portfolios	
<input checked="" type="checkbox"/> Foldertype allowed directly under account?	Allowed folder types in subfolders	
<input checked="" type="checkbox"/> Buildings can be added in this folder type	Icon mdi-folder-home-outline	
<input type="checkbox"/> Does folder of this folder type requires an address?	Logo	
<input type="checkbox"/> Folder of this type is a region defined by spatial coordinates?		
<input checked="" type="checkbox"/> Specify owner in passport		
Owner label in passport	Building owner	

Picture 40: Define folder type (owner label).

Subsequently, in the left (vertical) navigation structure of Madaster the user can click on the folder type (portfolio, etc.) that is adjusted in the previous step. Then click the 'Edit' button (on the "General" tab of the folder type. Subsequently, insert the owner's name in the previously defined label and click on the 'save' button.

PORTFOLIO BUILDINGS

Name *	Portfolio Buildings
Building owner	Red King Property Holding

Picture 41: Insert owner label.

All material passports created in this specific folder type will have this owner label on the front page and General page.

3.1.2 Generate & download a Materials Passport

Go to the tab "General" in the building. By clicking on the "Create Materials Passport" button, the user can create a Materials Passport based on the active source files. This Materials Passport will be created in a PDF and Excel format and saved directly in the 'Dossier' tab, under the 'Passports'



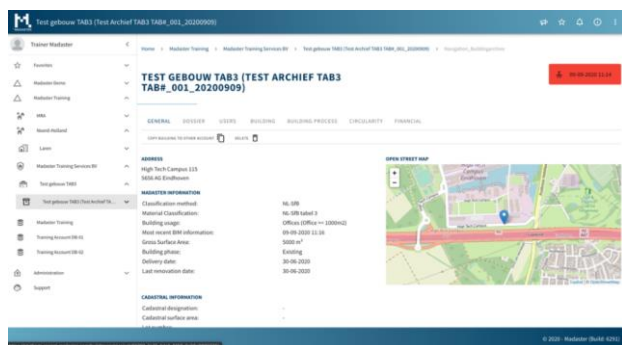
folder. Each time a new Materials Passport is generated it will be added as a new file. The previous Materials Passports will remain available and accessible. By clicking on the download icon, the Materials Passport file will be downloaded to your computer.

3.2 Archiving of buildings

To preserve a fixed, certain state of a building or to transfer a building to another Madaster account, the "archive a building" functionality is available. This functionality is available on the "General" tab of a building. By archiving a building, the platform creates a collection of all the files of a building, with the active source files at its core. The archive is given a Version Name and a Version ID when it is created (entered by the user).

All materials and products linked to these active source files are copied to a new database belonging to the archive. This includes all general documents from the Dossier. Finally, a new materials passport is generated. The archived building receives a time stamp and is available as a separate archive at the building (in the navigation drawer on the left side of the screen).

For more details about the archiving process, please refer to Step 7 “Archive building” in the manual “[Madaster Action Plan Materials Passport](#)”.



Picture 42: Archive building (General tab).

3.3 Transfer Archive

After the building file (including building passport) has been archived, it can be transferred in Madaster to the account of the building owner or client. Prior to this, the building owner, to whom the archived building file is transferred must have an active account in the Madaster Platform and should grant the transferring party (Madaster Enterprise license holder) access in Madaster to transfer the archived building to a specific location (folder) in its account.

For more details about the archiving process, please refer to Step 8 “Transfer Building Archive” in the manual “[Madaster Action Plan Materials Passport](#)”.



4 Circularity

4.1 Circularity indication

The value of the data stored in the Madaster Platform increases as the value of the products and materials in the building is better preserved. The Madaster Circularity Indicator has been developed to gain an idea of how a building score in the field of circular construction. This Madaster CI gives an indication of the degree of circularity of the building. A fully circular building achieves a score of 100%.

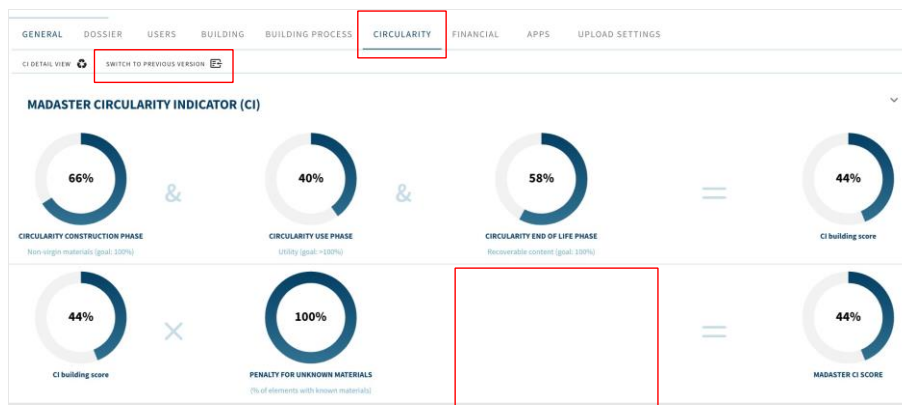
More information and details, including the applied methodology, is described in the reference work [“Madaster Circularity Indicator explained”](#).

4.2 Circularity indication Version 2

By activating the 'CI V2' preview feature (see section 2.4), Madaster offers its users additional insights on the buildings Circularity tab:

4.2.1 Adjusted Circularity calculation (V2)

In version 2 of the Circularity Indicator (compared to V1) in Madaster, elements in the imported source file (IFC/Excel) without classification code are no longer excluded. In other words, elements whose location (building layer) is unknown, are included in the circularity calculation of the building.



Picture 43: Adjusted CI calculation (Circularity tab).

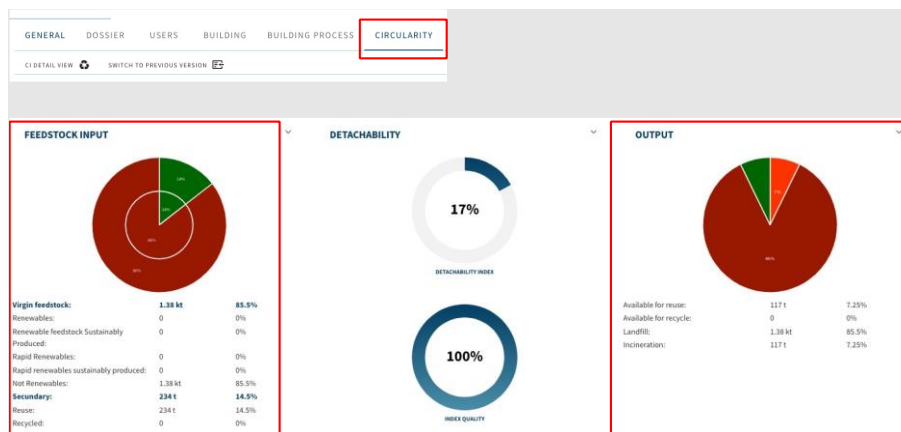
By activating the 'CI V2' feature, the user always has the possibility to switch between the building's default (V1) and the adjusted (v2) “Circularity” level at any time using the 'Switch to previous version' button. to switch circularity calculation.



By clicking on a pie chart of the circularity indicators, the detail view becomes active, in which the details are displayed per building layer (e.g., Structure, Skin, etc.). More specifications can be seen by expanding this view further (via the menu on the right).

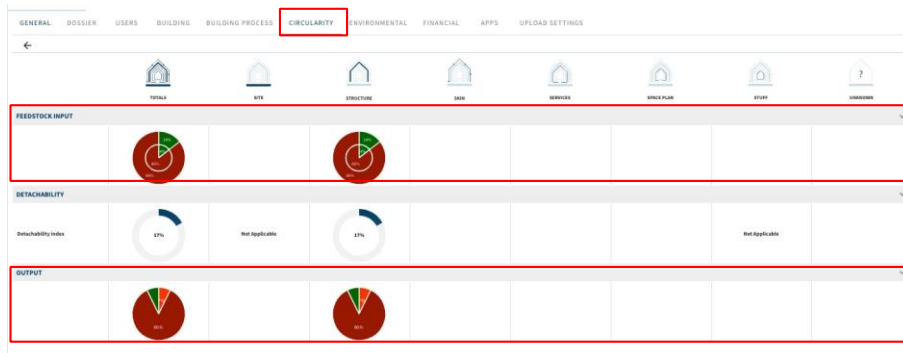
4.2.2 Feedstock input & Output

By matching elements from a source file with materials/products in a Madaster dataset, the Madaster platform can provide insight into the “feedstock input” flow and “Output” flow of materials. The feedstock input flow indicates the amount (in weight) and ratio (in %) of primary (virgin) and secondary (reused/recycled) materials used in the building’s construction phase. The output flow shows the amount (in weight) and ratio (in %) of materials released at the building’s end of life stage, categorized according to materials available for reuse, recycling, landfill and incineration.



Picture 44: Feedstock input & Output flow (building level).

By clicking the (feedstock input or output flow) pie chart on the building’s Circularity tab, a more detailed view is displayed, in which these indicators are visible per building layer (e.g., Structure, Skin, etc.). Even more specs are displayed when the user expands the feedstock input and/or output rows in this view (via the menu on the right-hand side).



Picture 45: Feedstock input & Output flow (building layer level).

4.2.3 Detachability (index & quality score)

Madaster offers users the option, in addition to the building's circularity level, to also display the degree of detachability on building and building layer level. As such, it should indicate how detachable a building (shell) is and the products contained within it.

This detachability indication in Madaster is based on the revised (2.0) version of the uniform measurement method for detachability, as described in the report '[Circular Buildings](#) – a measurement method for detachability 2.0'. This methodology has been developed and tested by a consortium of Alba Concepts, Dutch Green Building Council, etc. on behalf of the Dutch Ministry of the Interior and the Transition Agenda Circular Building Economy.

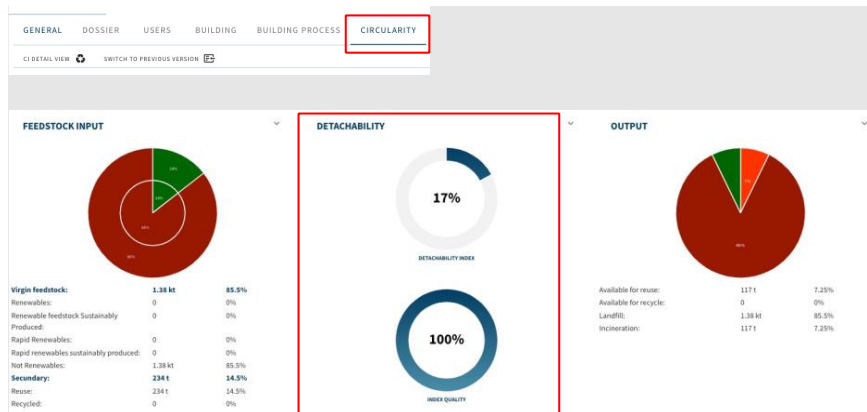
The following detachability factors are considered:

- **Connection type:** where dry connections are being preferred over connections with added elements and direct, integral connections taking precedence over soft and hard chemical ones.
- **Accessibility of the connection:** how easily you can (physically) reach the connecting elements and to what extent this causes damage to nearby objects.
- **Intersections:** indicates the extent to which products overlap or are integrated with each other. The higher the integration, the more actions required to disassemble an element at the end of its life.
- **Product edges inclusion:** assessment of how products are placed in a composition and whether it is open or closed. A 'locked up' product can only be dismantled in the reverse order of construction.

The building's detachability index (in %) is displayed on the Madaster "Circularity" tab when the "CI V2" feature is active (see section [Error! Reference source not found.](#)). This index is the sum of the number of individual elements within the building, which are linked to a product in Madaster, that



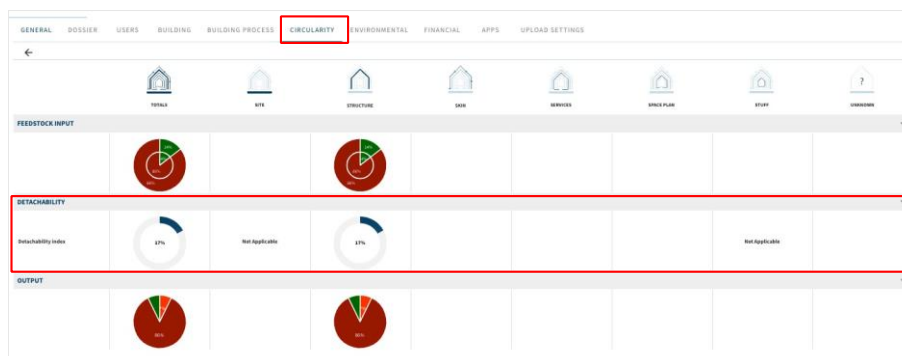
(1) has the aforementioned four detachability factors filled in (or taken over from the IFC element) and (2) where the shadow costs per product unit are available (in the product's "Environment" tab).



Picture 46: Detachability index (building level).

The "Index Quality" shows the ratio (in %) of the number of products for which a releasability index has been calculated compared to the total number of elements linked to a product on the Madaster platform.

By clicking on the detachability pie charts, a detail view per building layer is displayed (excluding Site and Stuff). Even more specs are displayed when the user expands the detachability row in this view (via the menu on the right-hand side).



Picture 47: Detachability index (building layer level).



5 Financial

5.1 Financial value and residual value

In addition to documenting the materials in a building, Madaster wants to link a financial value to the documented materials. The rationale behind this, is that if you really want to stimulate the circular economy, there must be a financial trigger attached to it. Therefore, the residual value of materials is calculated in the Financial tab. This data can be used to make circular propositions in the market and to determine more precisely what the final value is based on material value as an absolute minimum value. The more detachable and with sustainable materials are built, the higher the residual value. The financial module is therefore a driver for the circular economy and translates circularity into money.

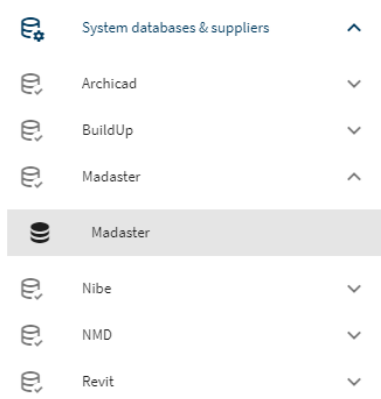
The Financial module shows what the residual value of a building is at the end of the various lifetimes of products expressed in terms of material value. In addition, it shows the financial material value at this moment (current value) and the predicted development in the future.

More information and details, including the applied methodology, is described in the reference work "[Explanation Madaster Financial Model](#)".



6 System databases & suppliers

Here you will find the databases of materials and products, which are platform-wide available for the Madaster users according to their country.



Picture 48: System databases & suppliers (left vertical navigation).



7 Administration

Administration is the place where you find Information about:

7.1 Classification methods

A detailed overview of the classification structures (e.g., NL-SfB, eBKP and Omniclass) that are known for countries within Madaster. Per classification, a view of all codes and their mapping to the shearing layers of Brand is available.