



# Di-Plast - Digital Circular Economy for the Plastics Industry

## Matrix Tool Guidelines

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Version from 14 September 2022

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# 1 General Information

This information sheet should help with the different use-cases and how to interact with the Matrix Tool in general.

To get access to the Matrix Tool, an account creation needs to be requested from [M.Bonnema+matrix@polymersciencepark.nl](mailto:M.Bonnema+matrix@polymersciencepark.nl)



## 2 First Login

After your request for an account was accepted you will receive two emails. One containing your randomly generated password and the other contains your Username and confirmation code:

[Matrix Tool 2.0] Password Change - do not reply

Your password was changed! For the next login please use the following password: **Q6mFp)-61Y**

[Matrix Tool 2.0] Mail Confirmation - do not reply

Username: **Example** Please insert the following code after your login to confirm your account: **868575**

Please use the shown username or your email address in combination with the send password for the first login. Afterwards use your confirm code to activate your account

### Confirm Email Code

Code:

[→ Confirm](#)

[Logout](#)

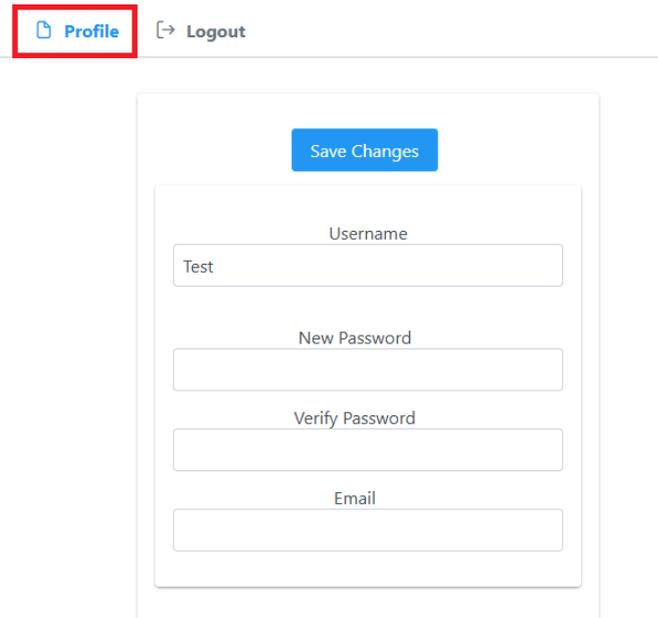
[Re-send Code](#)

You will be greeted by the home-page, however you will be forced to go to the profile to accept the user agreement and to change your password.



## 3 Own Profile

Under the “Profile” tab, the users account information as username, password or e-mail can be changed or viewed.



[Profile](#) [Logout](#)

**Save Changes**

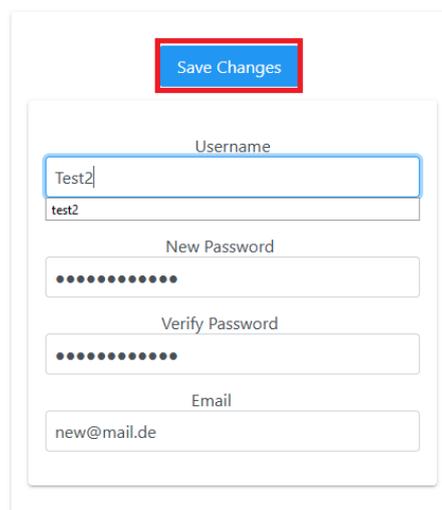
Username  
Test

New Password

Verify Password

Email

Press the “Save Changes” button to save all edited account information. If the password is changed, the “New Password” and “Verify Password” need to be identical.



**Save Changes**

Username  
Test2  
test2

New Password  
●●●●●●●●

Verify Password  
●●●●●●●●

Email  
new@mail.de



Besides editing your user information, it is further possible to select the preferred units for different properties. By selecting the desired unit, the value of the property will be automatically converted into this selection in all other views.

E-Modulus
MPa
Tensile Strength at Yield
MPa
Density
g/cm <sup>3</sup>
Bulk Density
kg/m <sup>3</sup>
HDT
°C
Vicat
°C
Charpy Impact Strength
kJ/m <sup>2</sup>
Flexural Modulus
MPa
Izod Impact Strength
kJ/m

[Save Unit Changes](#)



## 4 Table Interactions

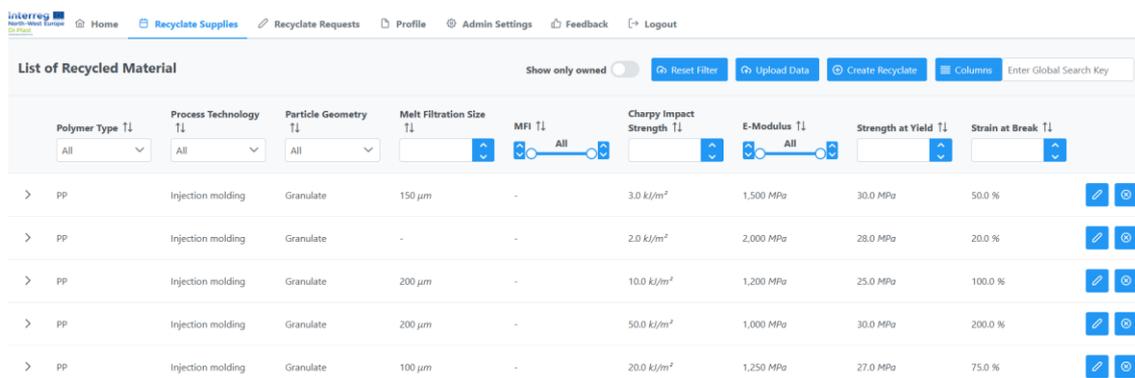
The Matrix Tool provides information about offered recycled material and requested recycled material inside of two table structures. In this section it is shown how to handle the search filters, how to get suggested alternative recycled material and how to get into contact with the table item (recycled or request) creator.

### 4.1 Recycled and Requests Tables

The two tabs “Recycled Material Provider” and “Recycled material Requests” both contain a table to handle information.



The “Recycled Material Provider” includes all known and offered recycled material information. The included table can be used to find recycled materials with specific properties or to get suggestions for alternatives; when switching from virgin material to recycled material.



The screenshot shows a web interface for 'List of Recycled Material'. It features a navigation bar with 'Home', 'Recycle Supplies', 'Recycle Requests', 'Profile', 'Admin Settings', 'Feedback', and 'Logout'. Below the navigation bar, there are buttons for 'Reset Filter', 'Upload Data', 'Create Recycle', 'Columns', and a search input 'Enter Global Search Key'. The table has several filter columns: Polymer Type (All), Process Technology (All), Particle Geometry (All), Melt Filtration Size, MFI (All), Charpy Impact Strength, E-Modulus (All), Strength at Yield, and Strain at Break. The table contains five rows of data for PP material, all using Injection molding and Granulate. The properties for each row are as follows:

Polymer Type	Process Technology	Particle Geometry	Melt Filtration Size	MFI	Charpy Impact Strength	E-Modulus	Strength at Yield	Strain at Break
PP	Injection molding	Granulate	150 µm	-	3.0 kJ/m <sup>2</sup>	1,500 MPa	30.0 MPa	50.0 %
PP	Injection molding	Granulate	-	-	2.0 kJ/m <sup>2</sup>	2,000 MPa	28.0 MPa	20.0 %
PP	Injection molding	Granulate	200 µm	-	10.0 kJ/m <sup>2</sup>	1,200 MPa	25.0 MPa	100.0 %
PP	Injection molding	Granulate	200 µm	-	50.0 kJ/m <sup>2</sup>	1,000 MPa	30.0 MPa	200.0 %
PP	Injection molding	Granulate	100 µm	-	20.0 kJ/m <sup>2</sup>	1,250 MPa	27.0 MPa	75.0 %

The “Recycled material Requests” tab contains all known requests for recycled material and can for example be used to see what kind of properties are in demand right now.



Interreg North-West Europe Di-Plast | Home | Recycle Supplies | **Recycle Requests** | Profile | Admin Settings | Feedback | Logout

List of Requested Material | Show resolved requests  | Show auto generated  | Show only owned  | Reset Filter | Upload Data | Create Request | Columns | Enter Global Search Key

Target Product Group	Polymer Type	Process Technology	Particle Geometry	Melt Filtration Size	MFI	Charpy Impact Strength	E-Modulus	Strength at Yield	Strain at Break	
> Flexible packaging	PE-LD	Blown film	Granulate	-	1.00 g/10min	-	-	-	-	
> Flexible packaging	PE-LD	Blown film	Granulate	-	2.00 g/10min	-	350 MPa	11.5 MPa	300.0 %	
> Flexible packaging	PE-LD	Blown film	Granulate	-	3.00 g/10min	-	-	-	-	
> Flexible packaging	PE-LD	Blown film	Granulate	-	0.50 g/10min	-	-	-	-	
> Flexible packaging	PE-LD	Blown film	Granulate	-	1.00 g/10min	-	300 MPa	15.0 MPa	250.0 %	

In the following section the search, ranking and contact functions will be described in more detail.

## 4.2 Search Form

The tables included search function inside the header, which show the most common properties for plastic materials.

**Particle Geometry**  $\updownarrow$

**Melt Filtration Size**  $\updownarrow$

**MFI**  $\updownarrow$

By setting the filters to specific values, the shown material can be searched and limited to a filter selection. It is to note, that the smart filtering is including expert knowledge for each property to also include, for example, bigger values for the “Tensile Strength at Yield”; because a larger Tensile Strength (than the desired one) does typically not matter. Therefore, some properties also show smaller or larger values than the selected filtered value. This functionality is not to be confused with the ranking of alternative suggestions (described later).

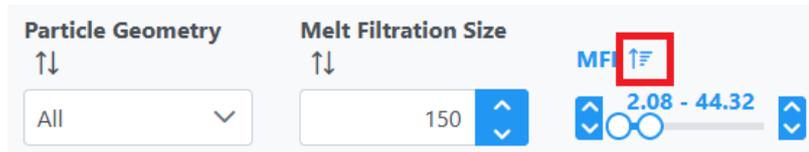
**Particle Geometry**  $\updownarrow$

**Melt Filtration Size**  $\updownarrow$

**MFI**  $\updownarrow$



Ordering for specific properties is also possible, by clicking on the column name.

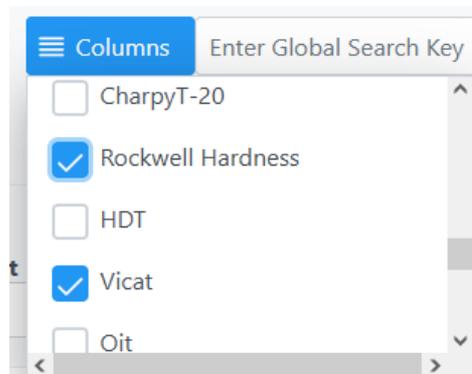


#### 4.2.1 Selecting Search Properties

If the desired filtering properties are not shown, the columns of the tables can be changed by using the “Columns” button in the top right corner of the view.



In the following menu, the desired columns can now be selected or deselected.



Because of the limited space, it is recommended to only select the desired properties. It is important to keep in mind that deselecting a property does not reset its filter. Therefore setting a filter for one property and switching to another to add more filter limitations is a valid strategy.



### 4.2.2 Details View

By pressing the triangle on the left of an item, a detailed view will be shown with all known properties of the selected item.

PE-HD      Extrusion      Granulate      150  $\mu\text{m}$       3.00 g/10min      13.0 kJ

[Get in contact per mail](#)

**Material Details:**

<b>Supplier</b>	Test supplier	<b>Polymer Type</b>	PE-HD
<b>Particle Geometry</b>	Granulate	<b>Melt Filtration Size</b>	150.00 $\mu\text{m}$
<b>Charpy Impact Strength (Notched 23°C)</b>	13.0 kJ/m <sup>2</sup>	<b>E-Modulus</b>	1,000 MPa
<b>Strain at Break</b>	100.0 %	<b>Recycling Content</b>	100 %
<b>Bulk Density</b>	600 kg/m <sup>3</sup>	<b>Ash Content</b>	1.000 %
<b>Pollution</b>	1.00 %		

To reduce the detailed view, the “Show Unknown Properties” toggle can be deactivated to only show known properties of an item or vice versa.

**Show Unknown Properties**

<b>Plastics Marked</b>	recyclaat
<b>Recycling Content</b>	95.0 %
<b>Density</b>	0.915 gr/3cm
<b>Tensile Strength at Yield</b>	26.0 Mpa
<b>Ash Content</b>	2.0 %

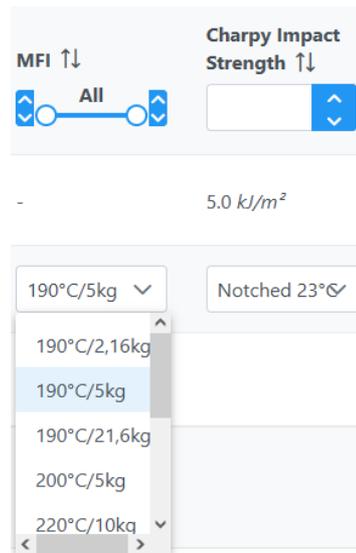
Beside those option, a general search function is included in the top right corner, which filters all elements for one specific text input regardless of the selected columns.

Show only owned    [Reset Filter](#)    [Upload Data](#)    [New Recycled](#)    [Columns](#)



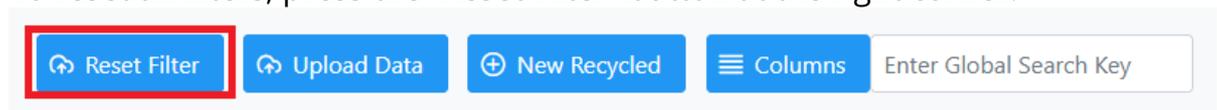
### 4.2.3 Measuring Conditions

A few properties can be measured under different conditions, where the results can't be converted between conditions. Thus, it is important to select the correct measuring condition per property.



### 4.3 Resetting Filter

To reset all filters, press the “Reset Filter” button at the right corner.



### 4.4 Ranking Alternatives

At the end of the recycled material view, a suggestion table is presented. This table shows alternatives for the given filter, while considering expert knowledge, the target contexts and previous requests, to provide a ranking of similar materials. While the upper table shows only recycled materials which fits the filters, this second table provides a ranking with alternatives that are as close as possible to the filter (based on expert knowledge).



**Context Options** ⓘ

Target Market:

Target Product:

Ranking Algorithm:

**Ranking for Alternative Recyclates** ⓘ

Ranking	Polymer Type	Process Technology	Polymer Modifications	Modification Content
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Create filters to rank data on

By selecting a “Target Market” or “Target Product” a context can be given, to for example provide more relevant alternatives from the infrastructure market.

By pressing “Do Ranking” the ranking using the current filter and context will be generated, showing the most suitable alternative (based on expert knowledge and the current data inside of the tool) in a top to bottom order.

**Ranking for Alternative Recyclates** ⓘ

Ranking	Polymer Type	Process Technology	Polymer Modifications	Modification Content
> 0.00	PA 66	Injection molding	Glas fiber	30.0 %
> 1.00	PE-LD	Blown film	-	-
> 27.84	PP	Injection molding	Talcum	20.0 %



## 4.5 Contact Recycled/Requester of interest

When a recycled material or material request of interest is found, the creator of the item can be contacted via the “Get in contact per mail” button in the details view.

	0.00	PA 66	Injection molding
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**Material Details:**

<b>Supplier</b>	Test supplier
<b>Recycling Content</b>	50 %

**Comments**

 [Get in contact per mail](#)

A short questionnaire will be shown. Please select your context of the request, to help further improve the tool.

**Provide the context of your search** ×

What is your industrial context?

Automotive ▼

For which kind of product do you want to use this plastics for?

Automotive exterior ▼

By pressing submit you accept that your email address will be send to the to be contacted company. When and how they respond is not something in our responsibility.

[Submit](#) [Discard](#)

By pressing the “Submit” button, your account’s e-mail will be sent to the creator of the selected item. With this e-mail address, the item creator can get in contact with you. If or when the creator of the selected item will get in contact with you is not up to us, neither all communication which can happen between both parties.



## 5 Data Handling

In this section the general data handling will be described, as in how to create, delete or update recycled materials or requested materials.

### 5.1 Create Data

By pressing the “New Recycled” or “New Request” button, a dialog window can be opened.

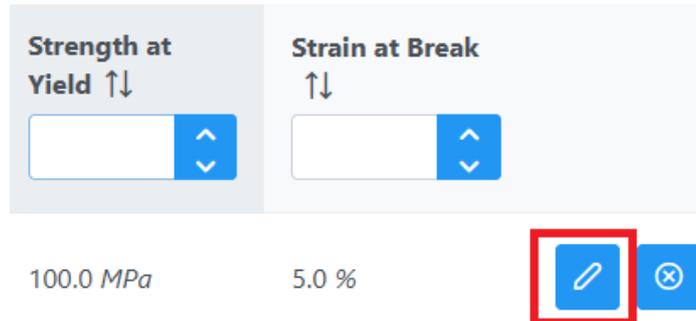
The screenshot shows the 'New Request' dialog window. The header contains buttons for 'Reset Filter', 'Upload Data', 'New Request' (highlighted with a red box), 'Columns', and a search bar labeled 'Enter Global Search Key'. Below the header is the 'Recyclate Edit' section, which includes a 'Show Unknown Properties' toggle. The main area contains several input fields: 'Supplier', 'Tested By', 'Polymer Type', 'Particle Geometry', 'Process Technology', 'Melt Filtration Size', 'Modification Content', and 'Polymer Modification'. Each field has a dropdown menu or a text input. The 'Melt Filtration Size' and 'Modification Content' fields have additional units and tolerance indicators. At the bottom, there are 'Save' and 'Discard' buttons.

This window includes all supported material properties, which can be selected as needed. By pressing the “Save” button at the bottom of the dialog, the new item can be saved. By pressing the “Discard” button, all entries will be discarded and NOT saved! The first column is always the name of the property, the second is the measuring condition, third is the unit of the provided value and lastly the values can be set depending on the property.



## 5.2 Update Data

To update any item (only admins and the item's owner can update or delete items) the edit button of the desired item needs to be selected.



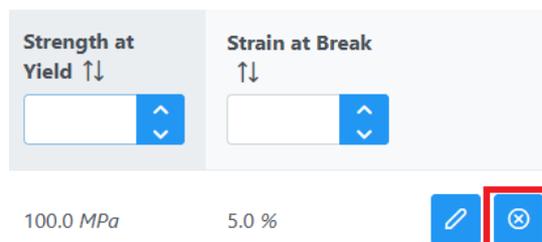
By pressing the button, the Dialog with the same functionality from the "Create Data" section will pop-up; but now showing the properties of the selected item. After editing the information, the changes can be again saved or discarding via the corresponding buttons.

To help find owned items, the "Show only owned" toggle can be selected, at the top of the view.



## 5.3 Delete Data

To delete any item (only admins and the item's owner can update or delete items) the delete button of the desired item needs to be selected. Afterwards, by confirming the delete process, the selected item is deleted.



If your created request was complete, please do not delete the request, but resolve it by following the steps in the next section.



## 5.4 Resolve Requests

If your created request was successfully resolved, please resolve the request rather than deleting it, so it can be used to improve the ranking. This can be done by pressing the resolve button at the right of your request.

<b>Strength at Yield</b> ↑↓ <input type="text"/>	<b>Strain at Break</b> ↑↓ <input type="text"/>	
-	-	  



## 6 Funding Information

The Matrix tool is funded by the Interreg North-West Europe program (Interreg NWE), project Di-Plast - Digital Circular Economy for the Plastics Industry (NWE729, <https://www.nweurope.eu/projects/project-search/di-plast-digital-circular-economy-for-the-plastics-industry/>). For more information visit the Di-Plast Knowledge Hub via: <https://di-plast.sis.cs.uos.de/Wiki.jsp?page=Main>