

The material passport



Working together
towards a circular
economy

alliander

Alliander & Sustainable Business Practice



In the transition towards a sustainable society, it is important to jointly look for sustainable solutions, not only from an economic and social perspective but also from an ecological point of view. That is why Alliander is making socially responsible choices on the basis of a number of key elements. Apart from, for example, CO₂ reduction and labour participation, *the circular economy* is one of those key elements.



The circular economy

The circular economy is a way to achieve sustainable development. It forces us to re-organize our economy with focus on the efficient use of raw materials and the reduction and ultimately elimination of waste.

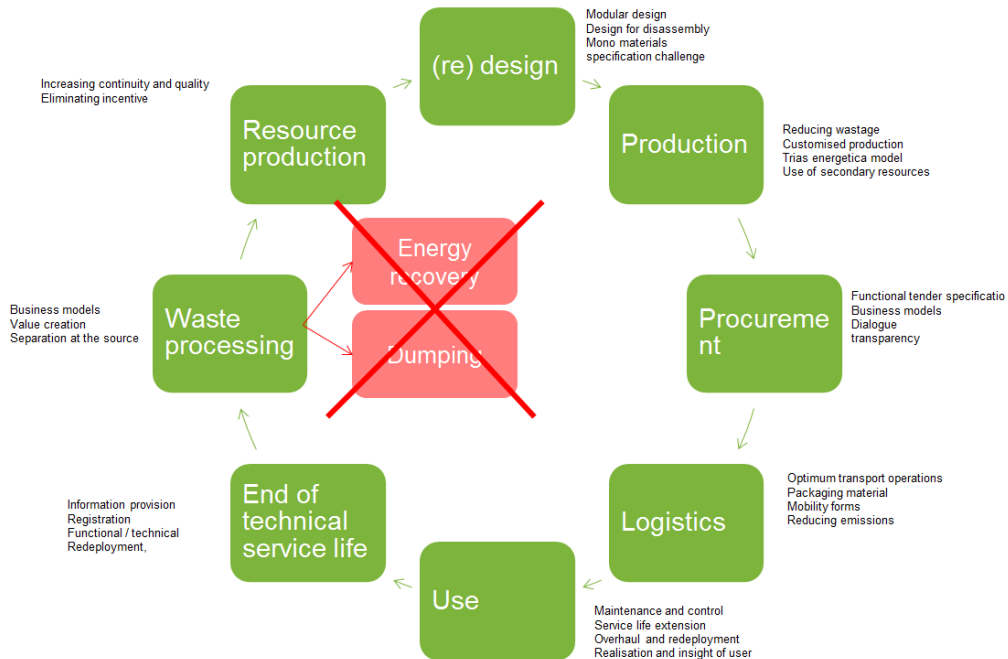
Alliander contributes to the circular economy by:

- Optimally using existing assets;
- Procuring assets as circular as possible;
- Preventing waste of raw materials in our operations;
- Recycling the remaining waste with the highest quality possible.

The composition of assets currently purchased by Alliander is often unknown. There is also little transparency in the origin of the resources.

Moreover, when designing a product and deciding on its composition often little thought is given to the disassembly potential at its end-of-life. A circular design contributes to higher quality waste recycling in which pure components and resources can be recovered and the waste processing process requires less energy.

Circular business operation in the Alliander chain



Product transparency in the chain is therefore essential for encouraging circular development. The circular business operations pursued by Alliander are set out in the diagram above. The recently developed resource passport is a tool for increasing transparency in the chain.

The material passport

The first version of the material passport was drawn up by Alliander, KIWA Technology, AVK Nederland and AVK Plastics. This version was used as the base for the current version, which has been further developed in collaboration between Alliander, Enexis, Stedin Group and TenneT. The passport records the raw material composition of a product and which part of it consists of recycled and recyclable material.

The passport therefore gives specific insight into how a product could be made more sustainable. If the resource composition of a product is known, it encourages thinking about how it can be changed and promotes recyclability. In addition, the resource passport makes it possible to report on, and steer towards, sustainable ambitions in daily business operations.

When purchasing assets Alliander keeps requesting transparency in resource composition, recycled and recyclable content and origin of material. This means that the quality and speed of the provision of this information will be included in our weighting models.

Three important principles were used in developing the material passport: First, the passport is an addition to existing Corporate Social Responsibility (CSR) measures and is not intended to unite or replace these instruments. As a result, matters that are already included in current CSR instruments, are not included in the passport; just as information that can already be derived from the technical specifications of the product.

Secondly, the passport serves as a testament for the product and stays relevant over time. This makes reuse after the first (long) lifespan possible. For this reason, no time-dependent elements are included in the passport, such as CO2 emissions. However, the content of the material passport can serve as a basis for a life cycle analysis, in which knowledge about, for example, CO2 emissions during production and use can be gathered.

Thirdly, There is a good balance between ease of filling out for the supplier and level of detail for the grid operator. To optimize the ease of filling out for the supplier, the material passport is nearly identical for the grid operators and differs only in nuances.

Filling out the material passport is therefore not a goal in itself, it is mainly a means to create more insight in and awareness about the material we use; to determine together how we can be more sustainable. Naturally, the preservation of quality, safety and functionality of our assets are preconditions for sustainability. In addition, we have set the precondition that all information filled out in the passport is treated with confidentiality. If desired, an NDA can be drawn up or additional agreements can be made about sharing the content of the material passport.

How does the material passport work?

The material passport is an Excel file in which the raw material composition of the delivered asset is recorded in a structural and uniform manner. See figure 2.

You can download the Excel file [here](#). The format contains four tabs. The first tab contains an introduction to the material passport. The second tab provides the legend which gives a description of the requested data, for example, weight and percentages of recycled and recyclable material. The third tab is the actual material passport, where the materials and their information are entered. The fourth and final tab gives an overview of the most used raw materials and their likely recyclability. These percentages have been drawn up in collaboration with suppliers and waste processors.

Instructions

A product often consists of multiple components which consist of multiple raw materials. In the passport all these raw materials need to be specified. The data per raw material has to be filled out on tab 3: Material passport.

Part	Material	Unit	Measurement	Weight (g)	Recycled (%)	Re/Down in	Recyclable (%)	Re/Down out	Supplier/Producer		Supplier/Producer		(Base)
									Tier1	(Base) Product	(Tier 2)	Source	material
Part X1	PE			58,00	100%	R	100%	R	Diversen (NL/DE)	Frisdrankdoppen	Niet traceerbaar	Oliewinning	HDPE virgin

3 Figure 2: Template material passport tab 3

This instruction explains how the material passport should be filled out based on a raw material from 'Product X'. This material is *polyethylene (PE)* in part X1.

PE			58,00	100%	R	100%	R	Diversen (NL/DE)	Frisdrankdoppen	Niet traceerbaar	Oliewinning	HDPE virgin
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At the top of tab 3, first enter your company name, the name of the product and the date of filling out the material passport. In colom B from row 11 onwards are the different parts that make up 'Product X' requested. Column C:O request several specifics of the purchased asset, including the amount of material used per product part.

General information	
Supplier:	
Product name:	Product X
Start date:	
Type number:	

In column C, see the red marked cell below, the type of material is requested. Dit materiaal kan geselecteerd worden uit een drop down menu. The material can be selected from a drop down menu. If the material is not listed, you can select 'other'. If you don't know what type of material it is, select 'unknown'.

Part	Material	Unit	Measurement	Weight (g)	Recycled (%)	Re/Down in	Recyclable (%)	Re/Down out	Supplier/Producer (Tier1)	(Base) Product	Supplier/Producer (Tier 2)	Source	(Base) material
Part X1	PE			58,00	100%	R	20%	R	Diversen (NL/DE)	Frisdrankdoppen	Niet traceerbaar	Oliewinning	HDPE virgin

Column F requests the amount of grams of material in the product. In the case of the example, part X1 contains 58 grams PE.

Part	Material	Unit	Measurement	Weight (g)	Recycled (%)	Re/Down in	Recyclable (%)	Re/Down out	Supplier/Producer (Tier1)	(Base) Product	Supplier/Producer (Tier 2)	Source	(Base) material
Part X1	PE			58,00	100%	R	20%	R	Diversen (NL/DE)	Frisdrankdoppen	Niet traceerbaar	Oliewinning	HDPE virgin

Column G asks which percentage of the material is recycled. In other words, which percentage of the weight of PE comes from a secondary (recycled) material. In the example this is 100%. Column H asks whether the material has been recycled or downcycled. Downcycling means that the material is used at a lower quality than its previous 'life'. Column I asks for the portion of recyclable material of the PE. In other words, what percentage of the weight of the PE can be recycled at the end of the product's life span. In the example this is 20%. Column J asks for the type of recyclability after lifespan; recyclable or downcyclable.

Part	Material	Unit	Measurement	Weight (g)	Recycled (%)	Re/Down in	Recyclable (%)	Re/Down out	Supplier/Producer (Tier1)	(Base) Product	Supplier/Producer (Tier 2)	Source	(Base) material
Part X1	PE			58,00	100%	R	20%	R	Diversen (NL/DE)	Frisdrankdoppen	Niet traceerbaar	Oliewinning	HDPE virgin

Column H and J concern the quality of the recycled and recyclable material of the concerning material, respectively. These materials are either recyclabale (R), dowcyclable (D) or non recyclable (N.A.), see also the included legend below.

Categories of Re/Down

R	Material either recycled or recyclable on the same or higher level. This is a theoretical measurement from the perspective of recyclability and no actual agreements have to be made to actually effectuate the recyclability.
D	Material either recycled or recyclable at a lower level than the original one. Downcycled or downcyclable materials within the product will receive 50% of the score of a recycled or recyclable material stream. I.e. if a product consisting out of 1 material is 100% made from downcycled material, and it is 0% recyclable the total score for the product will be 25%. Downcycling does not include thermic recycling for energy generation purposes.
N.A.	Either no recycling or thermic recycling takes place.

These categories list the recycle potential of the resource in this product. Although it relates to the recyclability of the individual resource, it is important to take into account how this is processed into the product and whether that affects the recyclability. The recyclability category may possibly be tested by a processor. The degree of recyclability is therefore based on the current state of the art.

The next columns ask after the origin of the material. For the (recycled) resource PE caps regrind, the basic product is soda bottle caps. These caps originate from the Netherlands and Denmark. In the event of a limited number of suppliers, these suppliers can be specified. If there are several suppliers it is possible to enter 'various' under Supplier/Producer (Tier 1), as in the example.

The next two columns ask after the Supplier/Producer (Tier 2). This is a reference to the source of the material in Tier 1 (soda bottle caps). In this example, the producer of these soda bottle caps cannot be traced. The source is known however (oil extraction) and the base material (HDPE Virgin).

Part	Material	Unit	Measurem	Weight (g)	Recycled (%)	Re/Down in	Recyclable (%)	Re/Down out	Supplier/Produ	(Base) Product	Supplier/Produ	Source	(Base) mat
Part X1	PE			58,00	100%	R	100%	R	Diverse (NL/GE)	Bottle caps	Non traceble	Oil extraction	HDPE virgin

Results of the material passport

Alliander and Stedin Group use the material passports as input to calculate their KPI Circular Purchasing. Column P shows the circularity score of each material per part. Alliander en Stedin gebruiken de grondstofpaspoorten als input voor het berekenen van hun KPI Circulair Inkopen. Kolom P laat de circulariteitsscore per materiaal per onderdeel zien. The KPI is calculated as follows:

$$Circularity\ (\%) = \left(\frac{Recycled_{corrected}(\%) + Recyclable_{corrected}(\%)}{2} \right)$$

Where:

- Recycled_{corrected} (%): the percentage recycled material corrected for recycled or downcycled.
- Recyclable_{corrected} (%): the percentage recyclable material corrected for recycled or downcycled.

Columns Q and R show the weight in grams of respectively recycled and recyclable material of that specific material in that specific product part.

Columns S and T show the probability that Alliander wants to investigate the percentage of recycled and recyclable material. The follow classification for the probability is made, which is included in the legend:

Categories of grading	
+	No issues, recycled and recyclability scores are within known margins
?	The score is higher than the market average and implies best practices. Not impossible but ambitious.
-	Either an impossibility (e.g. a recyclable or recycled score higher than 0% for "other" or "unknown") or a percentage that is higher than the technology currently being known by Alliander.

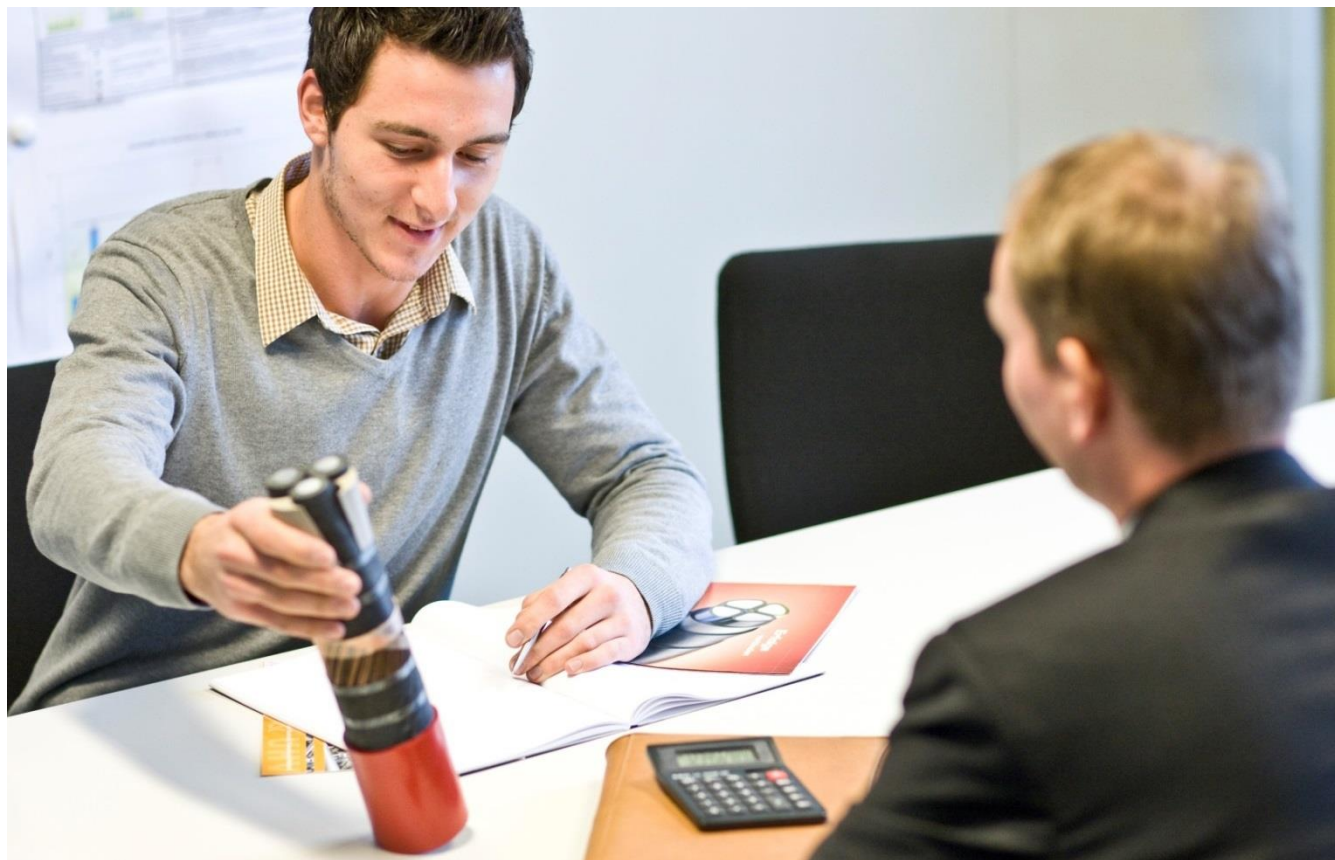
At 'max recycled/recyclability' on the tab 'Material list' you can regularly see 100% is stated. We realize that in practice it is not possible to recycle 100% of a material because of losses in the production process. However, we notice that this is often filled out by suppliers when there is the intention to fully recycle the used material. To avoid errors in the excel file, we therefore decided to include '100%' in the overview on the tab 'Material list'.

Validity of the material passport

Filling out the material passport is a first step in getting insight in our material use. We assume that the passport have been completed per asset and to the best knowledge of our suppliers. If desired, the provided information can be verified. To confirm validity and for internal reporting purposes, we ask our suppliers to sign the material passports. If requested, Alliander expects the supplier to cooperate in an audit of correctness and completeness of the information provided.

At Alliander, we made the agreement that the material passport is valid when it is signed by a member of the board at the supplier. There is space included in the material passport to do so.

Validation	
Name	
Function	
Signature	



How to continue?

We truly believe that the material passport is the next step in achieving our social sustainability goals. However, we cannot do this alone. A circular economy is build in collaboration. We therefore ask our suppliers to contact us if they have any questions or comments, when they see areas of improvement in the format of the passport or if they have ideas for increasing the circularity of their products. We are always open to discuss the sustainable improvement of the assets that connect us.

