NTA

NTA 8080-2 (en)

Sustainably produced biomass for bioenergy and bio-based products – Part 2: Chain-of-custody requirements

Netherlands technical agreement

Replaces NTA 8080:2009 (en), together with NTA 8080-1:2015 (en)

ICS: 03.100.50; 13.020.20; 27.190; 71.100.99; 75.160; 83.140.99

December 2015

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Normalisatie: de wereld op één lijn.

Netherlands technical agreement

NTA 8080-2

(en)

Sustainably produced biomass for bioenergy
and bio-based products –
Part 2: Chain-of-custody requirements

Duurzaam geproduceerde biomassa voor
bio-energie en biobased producten –
Deel 2: Eisen aan ketenbeheer

Replaces NTA 8080:2009 (en), together with NTA 8080-1:2015 (en)

ICS 03.100.50; 13.020.20; 27.190; 71.100.99; 75.160; 83.140.99

December 2015

NEN

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Foreword

Ambitious objectives for the share of renewable energy in the total energy consumption are being set all over the world. In many countries the use of biomass plays an important role in generating electricity and heat and in producing transport fuels. An important social consideration for the use of biomass for energy purposes is that the biomass can be demonstrated to have been produced sustainably. This is the reason why in 2009 the first edition of NTA 8080 was published. The sustainability requirements in this NTA were derived from the final report *Testing framework sustainable biomass*, that was drawn up by the “Sustainable production of biomass” project group, chaired by Jacqueline Cramer.

NTA 8080 has been used as the basis to develop a certification system that offers organizations an instrument to demonstrate that they comply with the sustainability requirements of NTA 8080. Organizations can show their compliance with NTA 8080 through a certificate issued by a certifying body following a positive assessment. The European Commission has recognized the NTA 8080 certification system as a voluntary scheme to demonstrate that the sustainability requirements for biofuels and bioliquids as laid down in Directive 2009/28/EC are fulfilled.

NTAs are reviewed at least once every three years for their being up to date and valid. In this regard, various interested parties indicated that NTA 8080 should be reviewed. The following considerations, which are presented in a random order, are some of the reasons why NTA 8080 was revised:

— The scope of NTA 8080:2009 was sustainably produced biomass for application in bioenergy. The increasing use of biomass in the chemicals and fine chemicals industries to replace fossil resources has also created the need in this sector to be able to demonstrate that the biomass to be used was produced sustainably. Keeping in mind that, in principle, the same biomass can be used for bio-based products as for bioenergy, it would be easy to extend the scope of NTA 8080 to sustainably produced biomass for application in bio-based products.

— To further the recognition of the NTA 8080 certification system by the European Commission, as referred to earlier, interpretations of the text of NTA 8080:2009 were necessary to make it fully comply with the statutory provisions of Directive 2009/28/EC. It is desirable that these interpretations should become an integrated part of NTA 8080 instead of having been laid down in an interpretation document.

— In the European context, CEN/TC 383 ‘Sustainably produced biomass for energy applications’ developed the four-part EN 16214 series for biofuels and bioliquids. All CEN members are under the obligation to adopt European standards as national standards and to withdraw any conflicting national standards. The scope of, and the sustainability aspects in, the EN 16214 series are more limited than those in NTA 8080. However, it is important that NTA 8080 is compatible with, and makes use of, European standards. As the scope is being expanded to bio-based products, the standards published and under development by CEN/TC 411 ‘Bio-based products’ should also be taken into account, acknowledging that the standards under development might be subject to changes.

  NOTE This NTA includes references to EN standards. These standards are adopted as national standard by all countries that are a member of CEN, and are available as such (e.g. as NEN-EN in The Netherlands, DIN-EN in Germany, NF-EN in France and BS-EN in the United Kingdom).

— In international context, ISO/PC 248 ‘Sustainability criteria for bioenergy’ has developed ISO 13065 that specifies principles, criteria and indicators to facilitate assessment of environmental, social and economic aspects of sustainability of the bioenergy supply chain. This international standard should be taken into account.

— NTA 8080:2009 referred to calculation tools to calculate greenhouse gas emissions, which have since been replaced by calculation tools that were developed for the purposes of the Biograce I and Biograce II projects. In addition, it is preferred to specify the calculation method for greenhouse gas emission calculations with an informative reference to the calculation tools that can be used.

— Various projects, including pilot projects, have revealed that the requirements for some sustainability aspects in NTA 8080:2009 could be defined more concretely. For example, this concerned requirements in which it was stated that practices should be implemented according to ILO conventions and the *Universal Declaration of Human Rights*. Some aspects from that have been clarified by means of an interpretation. It was therefore recommended to draw up NTA 8080 to be more unambiguous, so that organizations know better what is expected of them and so that auditors have more actual points of reference with which to assess organizations' compliance with the requirements. The interpretations have been taken into account.

— NTA 8080:2009 included a clause on certification requirements. In principle, certification requirements should be described in another document, which is compatible with the ISO practice. NTA 8081 describes the requirements for certification based on NTA 8080 and this has made the relevant clause in NTA 8080:2009 redundant.

— The traceability requirements were briefly described in NTA 8080:2009. When developing the certification system, the traceability requirements were elaborated in detail and laid down in the interpretation document linked to this system. It is desirable that these interpretations should become an integrated part of NTA 8080 instead of only being laid down in an interpretation document.

— The applicable sustainability requirements for biomass flows on the list of exceptions (residual flows) in Annex A to NTA 8080:2009 did not match those of Directive 2009/28/EC as regards primary flows. This has been resolved by means of an interpretation which should preferably become an integrated part of NTA 8080. As the use of residual flows is increasing, it was recommended to study the list of exceptions more closely as well.

— There is new understanding and there are new developments as regards sustainability aspects that should be considered. These concern issues such as cascading, indirect land-use change, carbon debt, how sustainable forest management certificates are handled and laws on the illegality of woody biomass.

A working group, composed of a broad spectrum of members, drew up the second edition of NTA 8080 considering the above and other points. During the revision, the working group found that, given the nature of the requirements and the strong link with certification as regards chain of custody, the sustainability requirements and the chain-of-custody requirements should be laid down in two separate documents. This is why NTA 8080 has been divided into two parts. This part of the NTA describes the requirements on chain of custody; part 1 of the NTA describes the sustainability requirements.

During the revision an expert group as part of the Dutch Energy Agreement [1)] started to develop sustainability criteria for solid biomass for co-firing in coal plants, as agreed in the Energy Agreement. The working group has decided to adopt the results of this expert group to ensure that this NTA can also be used to demonstrate compliance with the sustainability criteria of the Energy Agreement.

Although book and claim is referred to in this NTA as one of the three common chain-of-custody models, this NTA excludes the application of this model from the chain of custody for bioenergy or bio-based products. The full decoupling from the physical product and the sustainability claim that forms part of book and claim is not considered to be desirable. This explains why no requirements on a book and claim system have been formulated.

This NTA is intended for all organizations in the biomass chain for bioenergy and bio-based products, regardless of the size, geographical location and types of raw materials. This NTA offers organizations room to decide for themselves what shape they will give the actions they should take in order to comply with the requirements while considering the nature and extent of their activities. The organization is expected to justify its choices. This is also important if the organization chooses to have a third party assess its compliance with the requirements of this NTA.

1) The Energy Agreement is an agreement for sustainable growth that has been endorsed by more than forty organizations including government, employers and unions, nature conservation and environmental organizations, and other civil-society organizations and financial institutions. The core feature of the Energy Agreement is a set of broadly supported provisions regarding energy saving, clean technology, and climate policy.

The following verbs are used in this NTA:

— ‘shall’ indicates a requirement;

— ‘should’ indicates a recommendation;

— ‘may’ indicates permission;

— ‘can’ indicates a possibility or suitability.

The text of this NTA was drawn up by the “Herziening NTA 8080:2009” (NTA 8080:2009 revision) working group. A draft version of the NTA has been presented to a wider group of people for their comments, such as to the members of the “Duurzaamheidscriteria voor biomassa” (Sustainability criteria for biomass) standards committee and representatives of industries that are also focussing on the primary or other production of biomass, both internationally and on a small-scale level. When publishing this NTA, the working group consisted of the following members:

— Jeannette Hofman-Züter (chair person), NEN

— Chris Arthers, Essent

— Silvan de Boer, Eneco

— Corné Boot, E.On

— Arjen Brinkmann, Branche Vereniging voor Organische Reststromen (‘Dutch Association of Biowaste Processors’; BVOR) and Brinkmann Consultancy

— Jorn Bronsvoort, Quality Services Certification

— Harry Croezen, CE Delft

— Bart Dehue, Vattenfall

— Eric Evers, DEKRA Certification

— Timo Gerlagh, Netherlands Enterprise Agency (RVO)

— Marieke Harteveld, IUCN-NL

— Lawrence van Hevelingen, CNG Net

— Ria Kalf, Platform Bio-energie (‘Platform Bioenergy’)

— Miriam Knörzer, GDF Suez

— Harold Martina, GMSP Sustainability & Management Consultants

— Roel Nozeman, FSC Netherlands

— Leo Posthuma, National Institute for Public Health and the Environment (RIVM)

— Bianca Rombout-Hage, Vereniging Afvalbedrijven (‘Association for Waste Companies’)

— Arjette Stevens, World Wildlife Fund the Netherlands (WNF)

— Leo van der Vlist, Netherlands Centre for Indigenous Peoples (NCIV)

— Henk Wanningen, Staatsbosbeheer (‘State Forest Service’)

— Harmen Willemse, NEN

— Willem Wiskerke, Greenpeace

— Jarno Dakhorst (secretary), NEN

Sustainably produced biomass for bioenergy and bio-based products – Part 2: Chain-of-custody requirements

1 Scope

This part of this NTA describes the requirements on the chain of custody from biomass production to final application as bioenergy or bio-based products in order to assure the traceability of the origin of the biomass. Biomass or products made from biomass can occur in a solid, liquid or gaseous state.

This NTA applies to organizations that:

— wish to produce biomass or collect residual flows for application in bioenergy or bio-based products and wish to sell such products as sustainably produced products (also referred to as ‘producer’);

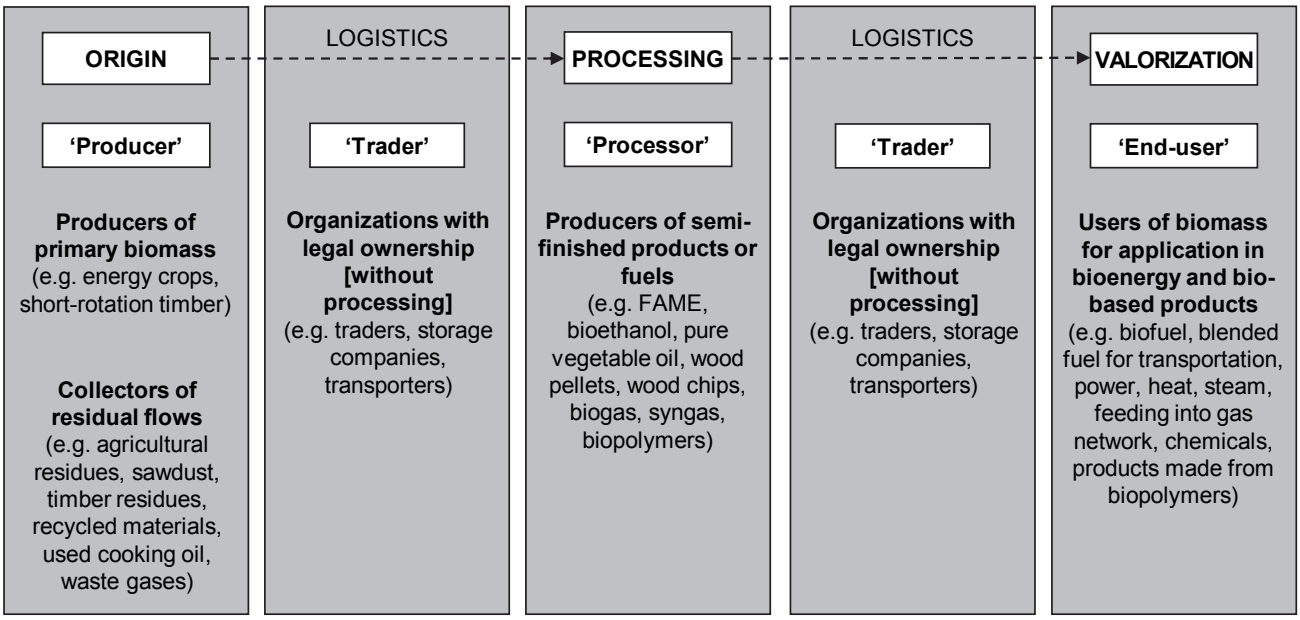
— wish to process biomass and wish to market this as sustainably obtained and sustainably processed (also referred to as ‘processor’);

— wish to trade (processed) biomass while having to be able to demonstrate that (part of) the biomass delivered has been produced, processed and obtained sustainably (also referred to as ‘trader’);

— wish to use (processed) biomass for application in bioenergy or bio-based products while having to be able to demonstrate that (part of) the biomass has been produced, processed and obtained sustainably (also referred to as ‘end-user’).

NOTE Organizations that only transport produced and or processed biomass, but do not own this material, are not included in the scope of this NTA.

Figure 1 shows the scope of this NTA and provides examples across the supply chain.



NOTE 1 This diagram is a simplified representation of the supply chain. Often more processing steps ('processors') and thus logistics ('traders') between the origin of biomass ('producer') and the final valorization ('end-user') are involved. Chains can be long and complex, and in the case of bio-based products the 'end-user' will be less clearly to determine than in the case of bioenergy. EN 16760 can be applied for conducting life cycle assessments for bio-based products.

NOTE 2 Organizations that only transport produced or processed biomass, but do not own this material, are not included in the scope of this NTA.

Figure 1 — Schematic representation of scope

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NTA 8080-1:2015 *Sustainably produced biomass for bioenergy and bio-based products — Part 1: Sustainability requirements*

3 Terms and definitions

For the purpose of this standard the terms and definitions given in NTA 8080-1 and the following terms and definitions apply.

3.1
book and claim
chain-of-custody system where, from the production of raw material to the final product for consumption, the information on compliance with sustainability aspects is decoupled from the physical product

Note 1 to entry: The system allows for the product itself and attributes of compliance with sustainability aspects to be traded separately.

[SOURCE: ISO 13065:2015, 3.5, modified – 'sustainability' has been changed to 'compliance with sustainability aspects'.]

3.2
chain of custody
chain of responsibility for or control of materials as they move through each step of the process or product system under assessment

[SOURCE: ISO 13065:2015, 3.7]

3.3
carbon dioxide equivalent
CO_{2eq}
unit for comparing the radiative forcing of a greenhouse gas to carbon dioxide

Note 1 to entry: The carbon dioxide equivalent is calculated using the mass of a given greenhouse gas multiplied by its global warming potential.

Note 2 to entry: Annex V in Directive 2009/28/EC includes the global warming potentials that are used for the calculation of greenhouse gas emissions.

[SOURCE: ISO 14064-1:2006, 2.19, modified – 'CO_{2e}' has been changed to 'CO_{2eq}', and note 2 to entry contains the reference to the relevant source for global warming potentials.]

3.4
consignment
transaction of one or more portions of products with the same characteristics

3.5
mass balance
chain-of-custody system where, from the production of a raw material to the final product for consumption, the information on compliance with sustainability aspects can be traced to a specific production quantity

Note 1 to entry: The system allows for mixing of products with differing information on compliance with sustainability aspects or with no information on compliance with sustainability aspects.

[SOURCE: ISO 13065:2015, 3.32, modified – 'sustainability' has been changed to 'compliance with sustainability aspects'.]

3.6
segregation
chain-of-custody system where, from the production of a raw material to the final product for consumption, the information on compliance with sustainability aspects remains traceable to the physical product

Note 1 to entry: The system does not permit mixing other products with differing information on compliance with sustainability aspects or with no information on compliance with sustainability aspects with the segregated product.

[SOURCE: ISO 13065:2015, 3.44, modified – ''sustainability' has been changed to 'compliance with sustainability aspects'.]

3.7
transaction certificate
document with details that accompanies a consignment made by one organization to the next organization in the chain of custody

Note 1 to entry: A transaction certificate is not a document that demonstrates that the requirements of NTA 8080 are complied with.

4 Chain-of-custody models for traceability

4.1 Description of chain-of-custody models

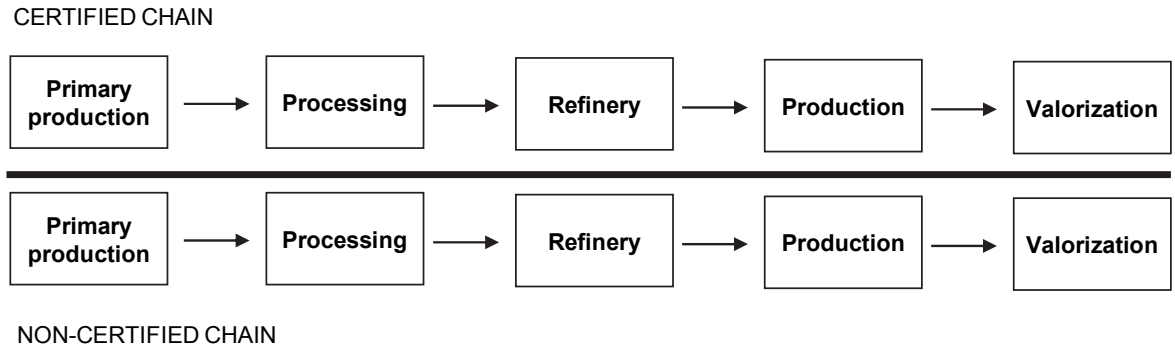
4.1.1 To enable the organization at the end of the chain of custody to rightfully declare that the final product complies with the applicable sustainability requirements, a traceability system is necessary for the entire chain of custody from biomass production to final application. Three different chain-of-custody models for traceability systems tend to be differentiated, i.e. segregation, mass balance and book and claim. These three chain-of-custody models set different requirements on the infrastructure, logistic approach and administrative systems, and result in different sustainability claims. Table 1 summarizes the characteristics of the three chain-of-custody models for traceability. Figure 2 shows a schematic view of the chain-of-custody models.

Table 1 — Summary of the characteristics of the three common chain-of-custody models for traceability

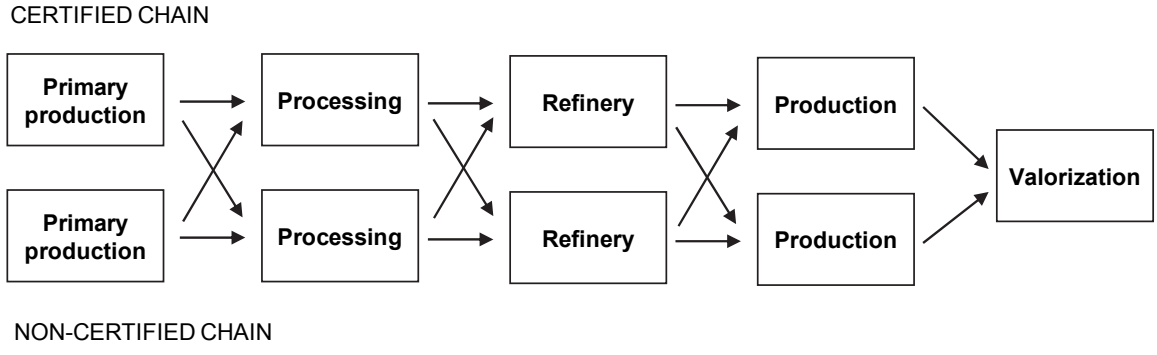
	Segregation [a]	**Mass balance** [b]	**Book and claim**
Mixing certified and non-certified materials is possible	No	Yes	Yes
Sustainability claim for the final product	100 % of the product is certified material	A part of the product is certified material. The declaration depends on the type of mass balance system applied	The product does not have to physically consist of certified material, but an equal amount of certified material of the same kind has been produced somewhere and the corresponding certificate has been sold to the supplier of this product
Scope	The entire chain from primary biomass to final product that may have undergone several processing steps	The entire chain from primary biomass to final product that may have undergone several processing steps	Part of the chain where no processing takes place
Physical requirements	Systems separated in place or time for certified and non-certified materials	A system that does not rule out mixing	A system where measures to achieve separation are not relevant
Administrative requirements	Tracking every certified consignment through the chain of custody	Tracking every certified consignment and every non-certified consignment that is mixed with certified material	The certificate issued at the source can only be claimed once in the chain of custody in order to substantiate sustainability claims
Allowed in this NTA	Yes	Yes	No

[a] There are two forms of segregation: ‘Simple segregation’ allows mixing certified biomass from different sources. ‘Identity preservation’ is aimed at the traceability of the final product to a unique source and requires segregation of certified material from different sources.

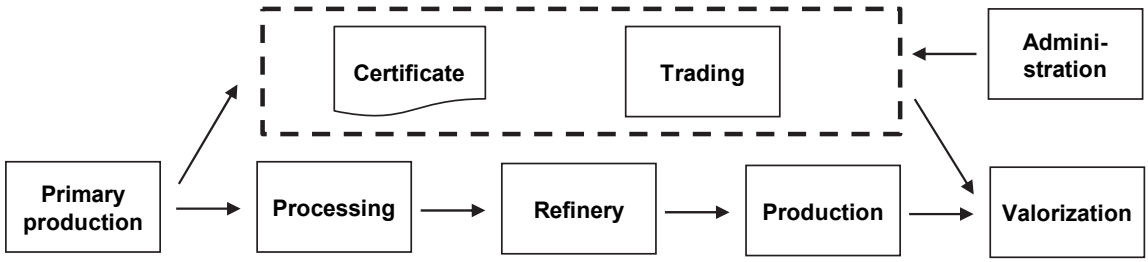
[b] Different forms exist for mass balance. These forms are described in more detail in 4.1.2.



a) Segregation



b) Mass balance



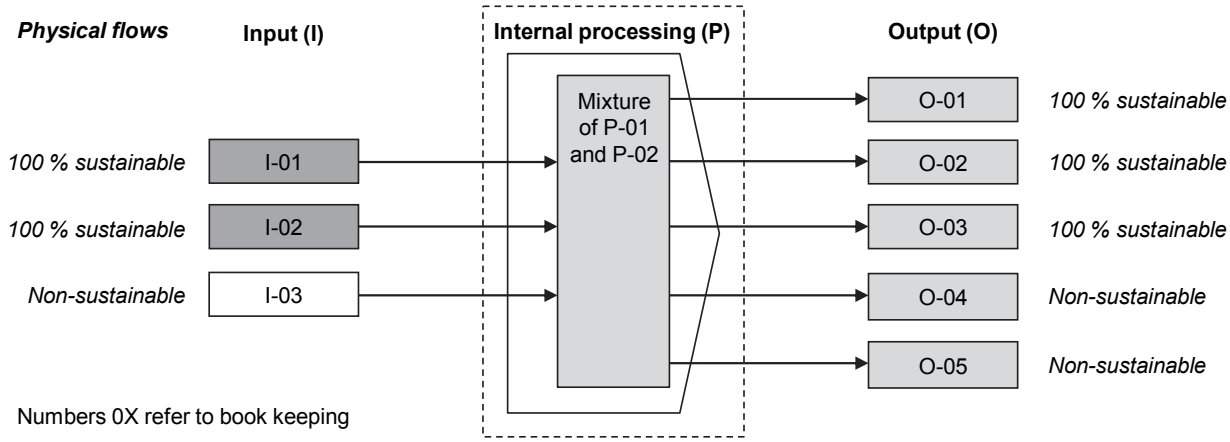
c) Book and claim

Figure 2 — Schematic views of the three common chain-of-custody models

4.1.2 Different approaches for applying the ‘mass balance’ chain-of-custody model exist. They can be subdivided as follows:

a) The claim no longer follows the physical flow and may be transferred to other biomass products, but not to fossil products.

In this approach to mass balance, sustainable and non-sustainable certified materials are mixed and the sustainability claim is awarded to a share of the products that are sold as fully sustainably certified. The share of the products that is sold as sustainably certified equals the share of sustainable certified material that has been put into the process. It is not allowed to award the sustainability claim to fossil products. Figure 3 illustrates this approach to mass balance.



Book keeping

Input		
Batch	**Type**	**Amount**
I-01	100 % sustainable	500
I-02	100 % sustainable	1.500
I-03	Non-sustainable	1.000
Total		**3.000**

Internal processing		
Batch	**Type**	**Amount**
P-01	100 % sustainable	2.000
P-02	Non-sustainable	1.000
Total		**3.000**

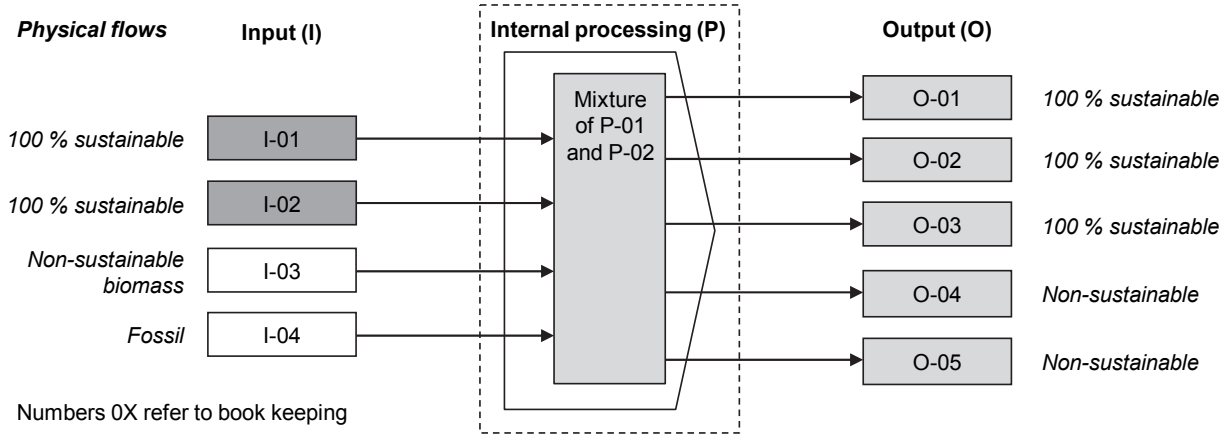
Output		
Batch	**Type**	**Amount**
O-01	100 % sustainable	700
O-02	100 % sustainable	800
O-03	100 % sustainable	500
O-04	Non-sustainable	600
O-05	Non-sustainable	400
Total		**3.000**

NOTE For the sake of convenience, the accounting example assumes a conversion factor of 1,0. In practice, this factor is lower due to conversion losses.

Figure 3 — Illustration of approach to mass balance in which the claim no longer follows the physical flow and may be transferred to other biomass products, but not to fossil products

b) The claim no longer follows the physical flow and may be transferred to other biomass products and to fossil products.

In this approach to mass balance, sustainable and non-sustainable certified materials are mixed and the sustainability claim is awarded to a share of the products that are sold as fully sustainably certified. The share of the products that is sold as sustainably certified equals the share of sustainable certified material that has been put into the process. The sustainability claim may be awarded to fossil products. Figure 4 illustrates this approach to mass balance.



Book keeping

Input		
Batch	**Type**	**Amount**
I-01	100 % sustainable	500
I-02	100 % sustainable	1.500
I-03	Non-sust biomass	500
I-04	Fossil	500
Total		**3.000**

Internal processing		
Batch	**Type**	**Amount**
P-01	100 % sustainable	2.000
P-02	Non-sustainable	1.000
Total		**3.000**

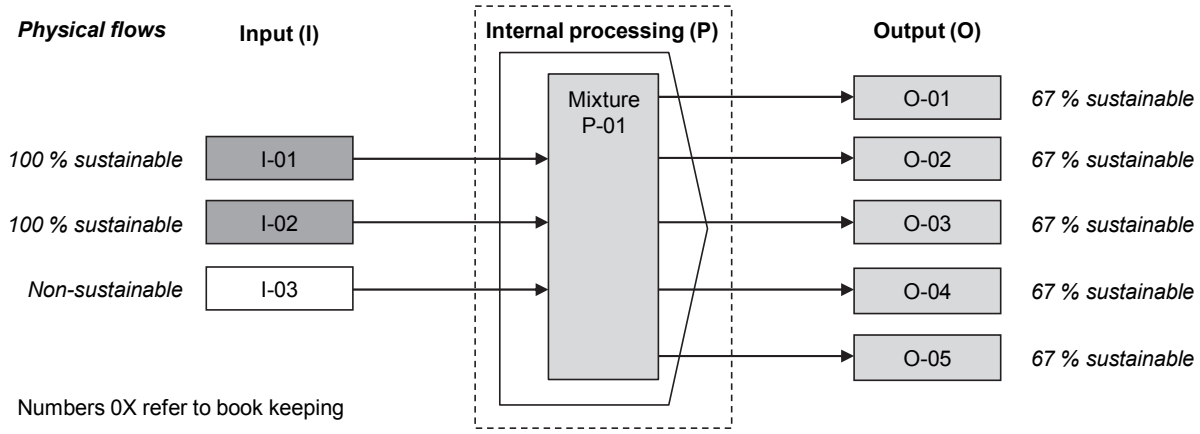
Output		
Batch	**Type**	**Amount**
O-01	100 % sustainable	700
O-02	100 % sustainable	800
O-03	100 % sustainable	500
O-04	Non-sustainable	600
O-05	Non-sustainable	400
Total		**3.000**

NOTE For the sake of convenience, the accounting example assumes a conversion factor of 1,0. In practice, this factor is lower due to conversion losses.

Figure 4 — Illustration of approach to mass balance in which the claim no longer follows the physical flow and may be transferred to other biomass products and to fossil products

c) The claim follows the physical flow as a percentage in the mixture.

In this approach to mass balance, sustainable and non-sustainable certified materials are mixed and the sustainability claim is made based on the physical percentage of sustainable certified material in the product. Figure 5 illustrates this approach to mass balance.



Book keeping

Input		
Batch	**Type**	**Amount**
I-01	100 % sustainable	500
I-02	100 % sustainable	1.500
I-03	Non-sustainable	1.000
Total		**3.000**

Internal processing		
Batch	**Type**	**Amount**
P-01	67 % sustainable	3.000
Total		**3.000**

Output		
Batch	**Type**	**Amount**
O-01	67 % sustainable	700
O-02	67 % sustainable	800
O-03	67 % sustainable	500
O-04	67 % sustainable	600
O-05	67 % sustainable	400
Total		**3.000**

NOTE For the sake of convenience, the accounting example assumes a conversion factor of 1,0. In practice, this factor is lower due to conversion losses.

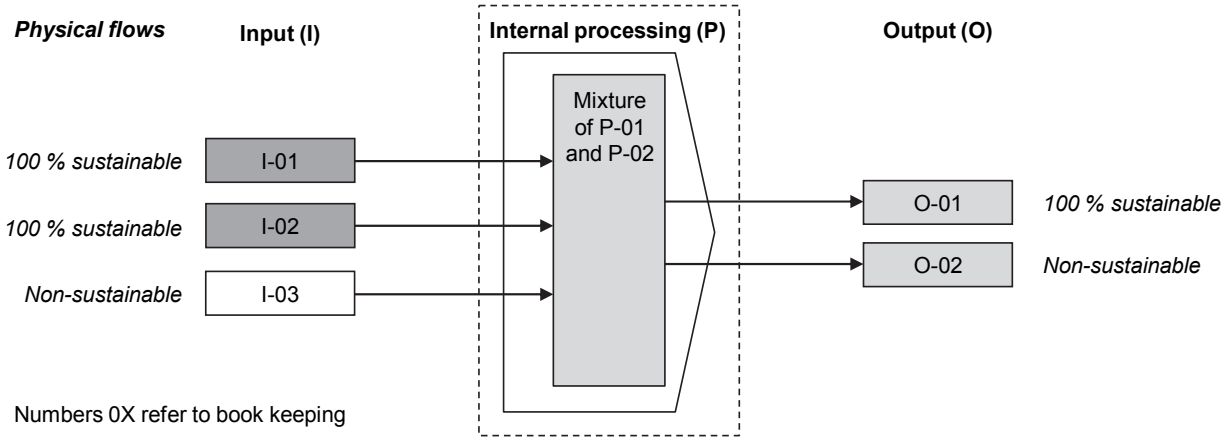
Figure 5 — Illustration of approach to mass balance in which the claim follows the physical flow as a percentage in mixture

NOTE 1 Other approaches to mass balance or combinations thereof are possible.

NOTE 2 Additional information on mass balance can be found in CEN/TS 16214-2 as regards biofuels and liquid biomass and EN 16785-2:— as regards bio-based products.

If the mass balance contains biomass flows that have different caloric values [expressed in MJ/kg], the mass balance will be managed based on energy content as well in order to continue relating the sustainability claim to the sustainable certified material on the basis of caloric value. Figure 6 illustrates the approach to mass balance based on energy content.

NOTE 3 An example is biomass digestion to produce biogas, in which several biomass flows that have different caloric values are used as input material for the digestion installation to produce biogas. For each biomass flow the share in the biogas produced based on energy content is considered. In this way, the share of sustainably produced biogas can be calculated taking into account the sustainably certified material(s) that is (are) used as input for the digestion installation.



Book keeping

Input			
Batch	**Type**	**Amount**	**Energy content**
I-01	100 % sustainable	500	20
I-02	100 % sustainable	1.500	5
I-03	Non-sustainable	1.000	10
Total		**3.000**	

Internal processing			
Batch	**Type**	**Amount**	**Energy content**
P-01	100 % sustainable	2.000	8,75
P-02	Non-sustainable	1.000	10
Total		**3.000**	

Output			
Batch	**Type**	**Amount**	**Energy content**
O-01	100 % sustainable	1.909	9,17
O-02	Non-sustainable	1.091	9,17
Total		**3.000**	

NOTE For the sake of convenience, the accounting example assumes a conversion factor of 1,0. In practice, this factor is lower due to conversion losses.

Figure 6 — Illustration of approach to mass balance in which the claim no longer follows the physical flow and may only be transferred to biomass products based on energy content

Annex A lists examples of mass balance systems for application in bioenergy and bio-based products.

4.2 Applicability of chain-of-custody models

4.2.1 For the application in bioenergy, the organization may use the chain-of-custody models of segregation and mass balance according to approaches a) and c) under 4.1.2; mass balance according to approach b) under 4.1.2 is not allowed The combination of sustainability requirements of the input material shall equal those of the output material. The information about the sustainability characteristics shall remain assigned to the mixture and the greenhouse performance values may not be averaged.

4.2.2 For the application in bio-based products, the organization may use the chain-of-custody models of segregation and all mass balance approaches.

4.2.3 Different chain-of-custody models can be used across the supply chain. Table 2 provides an overview of the chain-of-custody models that may be used mutually and those that may not be used mutually.

Table 2 — Mutual use of chain-of-custody models across the supply chain

Chain-of-custody model [a]	Other chain-of-custody models [a] that are allowed	Other chain-of-custody models [a] that are not allowed
Segregation		Mass balance a), mass balance b), mass balance c)
Mass balance a)	Segregation, mass balance c)	Mass balance b)
Mass balance b)	Segregation, mass balance a), mass balance c)	
Mass balance c)	Segregation	Mass balance a), mass balance b)

[a] See 4.1.2 for descriptions of the approaches to the mass balance.

5 Chain-of-custody requirements

5.1 General

5.1.1 All organizations in the biomass chain shall have a valid NTA 8080 certificate or equivalent for conclusive traceability throughout the chain.

5.1.2 If the organization wishes to demonstrate that it complies with Directive 2009/28/EC, only certificates may be applied that have been assessed as at least equivalent to NTA 8080 [2)] and that belong to a voluntary scheme with a corresponding scope and version as recognized for this purpose by the European Commission.

5.1.3 When setting up chain-of-custody management, the organization shall take the chain-of-custody models that may be applied, as referred to in 4.2, into account.

5.2 Transaction certificate

To be able to assure traceability, every organization shall at least provide the following details in a transaction certificate for every individual consignment:

a) name, address details and identifier of the organization;

b) unique identifier of the consignment, also in order to retrace the certificate issued in the internal traceability system;

c) the certificate number belonging to the certificate that has been used to demonstrate that the organization complies with NTA 8080 or equivalent and the certifying body that has issued this certificate;

d) quantity of consignment [in tonnes] and, in case of mass balance, its share that is ‘sustainable’ in accordance with NTA 8080 or equivalent;

e) amount of carbon equivalents [as gCO_{2eq}/MJ] (either applicable default values or actual values);

f) date of consignment;

2) Assessment is done by the Committee of Experts for the NTA 8080 certification scheme in accordance with established procedures for conducting benchmarks.

g) product description:

   — nature of the raw material,

   — origin of the raw material;

h) in the event of bio-based products: the physical biogenic content in the product;

   NOTE 1 The organization can determine the biogenic content by using one of the methods contained in CEN/TR 16721 and specified in CEN/TS 16640, EN 16785-1:— and EN 16785-2:—.

i) in the event of bio-based products: the assigned share of biogenic content in the product;

j) information about the chain-of-custody model applied with a corresponding declaration that the conditions that apply to the type of chain-of-custody model have been complied with;

   NOTE 2 For segregation, this involves a declaration that no mixing with material that is not certified in accordance with NTA 8080 or equivalent has taken place, and where, in the event of 'identity preserved', the declaration also includes that no mixing of materials from different sources has taken place.

k) declaration of whether production processes have been assessed for the purposes of, and comply with, Directive 2009/28/EC.

   NOTE 3 Including the declaration on assessment under the scope of Directive 2009/28/EC shows whether the product is suitable or unsuitable for the production of sustainable biofuels and liquid biomass according to this Directive.

NOTE 4 The transaction certificate states the administrative amount of biomass in accordance with NTA 8080 or equivalent. Overall, it is not possible to remove more biomass in accordance with NTA 8080 or equivalent from the chain than has been introduced into the chain, taking into account any conversion losses and differences in opening and closing stock per period.

5.3 Records

5.3.1 The organization shall be able to provide at least the following information when requested, without all the data having to be registered in records set up for such purpose, but this data shall be demonstrable or reducible:

a) all transaction certificates received and issued;

b) all agreements with suppliers and buyers, to the extent that they concern the biomass flow;

c) proof of calibrated measuring equipment used;

d) records per consignments received that shall at least include the details of the transaction certificates referred to under a);

e) records of the raw materials stored (including consumables), with at least the following information being included for every individual storage facility:

   — the description of the storage facility including location and maximum capacity;

   — the description of the raw materials stored (including consumables);

   — if the segregation system is applied, the assurance that no mixing with raw materials that are not certified in accordance with NTA 8080 or equivalent takes place, and where, in the event of 'identity preserved', it is also assured that no mixing of materials from different sources takes place;

   — the amount of raw materials stored (including consumables);

f) description of the internal processes, at least describing:

- the raw materials (including consumables) used in the process;
- the processing steps that these substances undergo during the process;
- if the segregation system is applied, the assurance that no mixing with raw materials that are not certified in accordance with NTA 8080 or equivalent takes place in the process, and where, in the event of 'identity preserved', no mixing of raw materials from different sources takes place;
- the main products, by-products and residual flows that occur during the process, including the common yields or conversion losses;

g) records of the final products stored (main products, by-products and residual flows), with at least the following information being included for every individual storage facility:

- the description of the storage facility including location and maximum capacity;
- the description of the final products stored;
- if the segregation system is applied, the assurance that no mixing with final products that are not certified in accordance with NTA 8080 or equivalent takes place, and where, in the event of 'identity preserved', it is also assured that no mixing of final products from different sources takes place;
- the amount of final product stored;

h) registrations per consignment sent, which shall at least include:

- the details of the transaction certificates referred to under a);
- the identifier of the organization that is the buyer of the consignment.

5.3.2 The organization at the beginning of the chain of custody does not receive transaction certificates but only issues them. The organization at the end of the chain of custody does not issue transaction certificates but only receives them. The valorized biomass in accordance with NTA 8080 or equivalent shall be traceable in the balance. If valorization comes with a sustainability declaration, this sustainability declaration shall be linked to the corresponding biomass.

NOTE A sustainability declaration can be: proof of consignment of green electricity, green gas, renewable heat, or biofuel for transport.

5.3.3 The organization's records shall demonstrate unambiguously that the supplied, stored and delivered amount of biomass in accordance with NTA 8080 or equivalent is in balance, taking into consideration any conversion losses. If the organization uses several sustainability systems, it shall be shown unambiguously that the corresponding sustainability claims are conclusive in order to avoid double claiming of biomass flows. The balance shall not show any temporary shortages of biomass according to NTA 8080 or equivalent because more biomass according to NTA 8080 or equivalent has been delivered than has been supplied and stored. Different influential factors can cause minor weight variations at the point of issue and at the point of intake. An increase in weight is not allowed for the purpose of chain-of-custody management.

5.4 Production location

5.4.1 If the organization applies the segregation system, the system shall be designed for each production location such that consignments with different sustainability characteristics would not be in contact with each other.

5.4.2 If the organization applies the mass balance system, the system shall be designed for each production location such that a mixture can take on any form, with the consignments would be in contact, such as in a container, processing or logistical facility or site (defined as a geographic location with precise boundaries where products can be mixed).

6 Declarations

6.1 Declarations in the case of application in bioenergy

In the chain-of-custody management context for the application of this NTA, the chain of custody for bioenergy ends when the product is valorized, e.g. in order to generate electricity, to heat or to cool, to blend it with petrol or diesel, or to feed it into the gas grid. The product is still fully biogenic and, in accordance with the chain-of-custody models to be applied, the sustainability characteristics have been fully awarded to the product. The organization at the end of the chain of custody for application in bioenergy may issue a declaration that the product has been made from sustainably produced biomass in accordance with NTA 8080 or equivalent.

6.2 Declarations in the case of application in bio-based products

In the chain-of-custody management context for the application of this NTA, the chain of custody for bio-based products cannot be established unequivocally due to the large variety in production chains. The product at the end of the chain of custody does not have to be entirely biogenic, given the processing steps that take place in the chain (possibility for mixing with fossil flows) and the chain-of-custody management models that may be applied. The organization at the end of the chain of custody for the application of bio-based products shall issue a declaration that at least includes:

a) the biogenic content of the product (the physical share of biogenic substance in the product);

   NOTE 1 The organization can determine the biogenic content by using one of the methods contained in CEN/TR 16721 and specified in CEN/TS 16640, EN 16785-1:— and EN 16785-2:—.

b) the assigned share of biogenic substance in the product (the accounting share of biogenic substance in the product);

c) the share of sustainably produced biomass according to NTA 8080 or equivalent in the assigned biogenic share in the product.

NOTE 2 Additional requirements can be established for providing indications on bio-based products, which are beyond the scope of this NTA. CEN/TC 411 “Bio-based products” is developing tools for issuing declarations with bio-based products.

Annex A

(informative)

Examples of mass balance systems

A.1 General

This annex gives a number of examples of mass balance systems for various applications with different complexity. The examples are adopted from several sources and are for illustration only. The organization should establish a mass balance system that fits to the purpose of its operations.

A.2 Example of mass balance for biofuels

Table A.1 gives an example of a mass balance for biofuels [source: CEN/TS 16214-2:2014, Table E.1].

Table A.1 — Example of a mass balance for biofuels

Incoming biomass	**From incoming product declaration**							
Internal reference	**Previous economic operator**	**Previous economic operator consignment unique reference #**	**Quantity** (t)	**Date of delivery**	**GHG intensity** (kg CO_{2eq}/t rapeseed)	**Land-use criteria met?**	**Feedstock**	**Quantity from heavily degraded land** (t)
2015–001	Oper1	66	105,000	2015-01-02	1 200	Yes	Rapeseed	
2015–002	Oper1	67	25,000	2015-01-02	1 150	No	Rapeseed	
2015–003	Oper2	24	30,000	2015-03-02	1 100	Yes	Rapeseed	20
2015–004	Oper3	149	35,000	2015-03-10	1 200	Yes	Rapeseed	
2015–005	Oper3	150	65,000	2015-03-20	Default	Yes	Rapeseed	
2015–006	Oper4	29	50,000	2015-03-20	Default	Yes	Soy	

Incoming biomass	**From own processing documentation**			
Internal reference	**Conversion factor** (t oil produced/ t feedstock)	**Energy allocation from feedstock to oil**	**Conversion factor** (g CO_2/gCO_2)	**Own energy consumption for processing** (kg CO_{2eq}/t feedstock)
2015–001	0,6	61,30 %	1,022	50
2015–002	0,6	61,30 %	1,022	50
2015–003	0,6	61,30 %	1,022	50
2015–004	0,6	61,30 %	1,022	50
2015–005	0,6	61,30 %	1,022	50
2015–006	0,4	63,00 %	1,575	50

Internal balance							
Internal reference	**Quantity of oil produced** (t)	**Date of delivery**	**Land-use criteria met?**	**Feedstock**	**Quantity from degraded land**	**GHG intensity for feedstock** (kg CO_{2eq}/ t oil)	**Energy for crushing** (kg CO_{2eq}/ t oil)
2015–001	63,000	2015-01-02	Yes	Rapeseed	0,0	1 226,0	51,1
2015–002	15,000	2015-01-02	No	Rapeseed	0,0	1 174,9	51,1
2015–003	18,000	2015-03-02	Yes	Rapeseed	12,0	1 123,8	51,1
2015–004	21,000	2015-03-10	Yes	Rapeseed	0,0	1 226,0	51,1
2015–005	39,000	2015-03-20	Yes	Rapeseed	0,0	Default	51,1
2015–006	20,000	2015-03-20	Yes	Soy	0,0	Default	78,8

Checks				
Internal reference	**GHG total** ($kgCO_{2eq}$/t oil)	**GHG total for meal**	**GHG recheck** (kg $CO2_{eq}$/t rapeseed)	**Judgement**
2015–001	1 277,1	1 209,375	1 250	OK
2015–002	1 226,0	1 161	1 200	OK
2015–003	1 174,9	1 112,625	1 150	OK
2015–004	1 277,1	1 209,375	1 250	OK
2015–005	Default cultivation + 51,1			
2015–006	Default cultivation + 76,6			

Outgoing balance of oil								
Unique ref # as stated on outgoing product declaration	**Next economic operator**	**Date of delivery**	**Quantity** (t)	**GHG intensity** (kg CO_{2eq}/ t oil)	**Sus-tain-able**	**Feedstock**	**Quantity from heavily degraded land** (t)	**Comment (for understanding only)**
1	OperNext 1	2015-02-01	80,000	1 277,1	Yes	Rapeseed		(Batch 001 + 17 t from 004) can be aggregated because batches have similar sustainability characteristics including GHG intensity
2	OperNext 2	2015-02-05	4,000	1 277,1	Yes	Rapeseed		Remainder of batch 004
3	OperNext 2	2015-02-05	18,000	1 123,8	Yes	Rapeseed	12	Batch 003
4	OperNext 3	2015-03-21	15,000	1 174,9	No	Rapeseed		Batch 002, non-sustainable material has not impacted other batches

In stock at end of period	Processing status	t oil or t oil equivalent	GHG intensity	Sustainable	Feedstock
2015–005	Feedstock	39,000	Default cultivation + 51,1	Yes	Rapeseed
2015–006	Oil	20,000	Default cultivation + 76,6	Yes	Rapeseed

Mass balance check at end of period (2015-03-31)	
Mass balance result (sum of oil equivalent from all stock at start of the period and incoming batches minus sum of oil equivalent of all outgoing batches)	59,000 t
Volume of oil equivalent in stock at end of period	59,000 t
Balance matching:	Yes

A.3 Example of mass balance for biogas

Mass balance for a digester that accepts certified and non-certified substrates [source: *Handbook sustainability certification of biogas* (NL Agency)].

A digester accepts 60 t of substrate A. This substrate is NTA 8080 certified, and has a specific biogas production of 10 m^3/t. In addition, this digester accepts 40 t of substrate B. This substrate is not NTA 8080 certified, and has a specific biogas production of 20 m^3/t. Table A.2 summarizes these metrics, which shows that 43 % of all biogas produced is produced from NTA 8080 certified substrate, and thus can be NTA 8080 certified.

Table A.2 — Example of a mass balance for digester

Substrate	Sustainability claim	Quantity (t)	Specific biogas production (m^3/t)	Biogas production per substrate (m^3)	Percentage of total biogas production
A	NTA 8080 certified	60	10	600	43 %
B	Not certified	40	20	800	57 %
Totals		100		1 400	100 %

A.4 Example of mass balance for bio-based products

Products obtained by biological or chemical synthesis (Group I) or by formulation or assembling (Group II) [source: prEN 16785-2:2015, 6.1 and 6.2].

Calculation of bio-based content

The bio-based content by total mass can be determined for the semi-finished or final product by using formula (A.1):

$$x_{\text{bio}}^{\text{mass}} = 100 \cdot \frac{M_{\text{bio,in}} - M_{\text{bio,loss}}}{M_{\text{mass,prod}}} \quad \text{(A.1)}$$

where

$x_{\text{bio}}^{\text{mass}}$ is the bio-based content by total mass expressed as a percentage;

$M_{\text{bio,in}}$ is the total bio-based content, by mass, introduced as raw materials into the process;

$M_{\text{bio,loss}}$ is the total bio-based content, by mass, lost during processing;

$M_{\text{mass,prod}}$ is the mass of the semi-finished or final product.

PBS (biological synthesis)

PBS, polybutylene succinate, can be produced by a lipase catalyzed esterification reaction of 1,4-butanediol and succinic acid. PBS is produced in a semi-batch process within an identified batch period. Raw materials are characterized (code, producer, technical characteristics including bio-based content). The bio-based content of each raw material is certified.

The quantities and proportions of raw materials introduced into the process are guaranteed by the quality assurance process (production procedures, weights records, quality control).

The wastes of the process are negligible; taking into account chemical conversion and stoichiometric rules, esterification of 1,4-butanediol and succinic acid will result in the release of water, whereas the oxygen in water molecule will be regarded as coming from the acid.

A typical biological synthesis for the production of PBS is given in Table A.3.

Table A.3 — Example of a mass balance for bio-based products: PBS (biological synthesis)

Raw material	**Bio-based content** %	**Mass of raw material** kg		**Loss** kg	**Bio-loss** kg	**Mass of raw material fraction in the product** kg	**Mass of the bio-based content in the product** kg
1,4-butanediol	0	524		(12)	(0)	512	0
Succinic acid	100	695		(207)	(207)	488	488
By-products				219			
Total		1 219		219	207	1 000	488
Bio-based content and masses are expressed by weight of dry matter.							

Using the metrics in Table A.3, the bio-based content of the PBS is calculated as follows:

$$M_{\text{bio,in}} = (695 \cdot 100\ \%) + (524 \cdot 0\ \%) = 695$$

$$M_{\text{bio,loss}} = (695 - 488) \cdot 100\,\% = 207$$

$$x_{\text{bio}}^{\text{mass}} = 100 \cdot \frac{M_{\text{bio,in}} - M_{\text{bio,loss}}}{M_{\text{mass,prod}}} = 100 \cdot \frac{695 - 207}{1\,000} = 48{,}8\,\%$$

Bio-based ethyl acetate (chemical synthesis)

Ethyl acetate can be produced by an acid catalyzed reaction of ethanol and acetic acid. Production of ethyl acetate is a continuous process, producing partly bio-based ethyl acetate within an identified batch period. Raw materials are characterized (code, producer, technical characteristics including bio-based content). The bio-based content of each raw material is certified.

The quantities and proportions of raw materials introduced into the process are guaranteed by the quality assurance process (production procedures, weights records, quality control).

The wastes of the process are small, and will occur mainly during the continuous process; taking into account chemical conversion and stoichiometric rules, esterification of ethanol and acetic acid will result in the release of water, whereas the oxygen in water molecule will be regarded as coming from the acid.

A typical chemical synthesis for the production of ethyl acetate is given in Table A.4.

Table A.4 — Example of a mass balance for bio-based products: Ethyl acetate (chemical synthesis)

Raw material	**Bio-based content** %	**Mass of raw material** kg		**Loss** kg	**Bio-loss** kg	**Mass of raw material fraction in the product** kg	**Mass of the bio-based content in the product** kg
Ethanol	100	524,7			(13,7)	511	511
Acetic acid	50	686			(98,5)	489	244,5
By-products				210,7			
Total		1 210		210,7	112,2	1 000	755,5
Bio-based content and masses are expressed by weight of dry matter.							

Using the metrics in Table A.4, the bio-based content of the ethyl acetate is calculated as follows:

$$M_{\text{bio,in}} = (524{,}7 \cdot 100\,\%) + (686 \cdot 50\,\%) = 867{,}7$$

$$M_{\text{bio,loss}} = (524{,}7 - 511) \cdot 100\,\% + (686 - 489) \cdot 50\,\% = 112{,}2$$

$$x_{\text{bio}}^{\text{mass}} = 100 \cdot \frac{M_{\text{bio,in}} - M_{\text{bio,loss}}}{M_{\text{mass,prod}}} = 100 \cdot \frac{867{,}7 - 112{,}2}{1\,000} = 75{,}55\,\%$$

Water based decorative flat paint (formulation)

Paints are produced by mixing raw materials in a vessel according to a precise and fixed formulation by weight. No covalent chemical reaction happens, but only dissolution and mixing operations. Paints are produced by individual and identified batch. Raw materials are characterized (code, producer, technical characteristics including bio-based content). The bio-based content of each raw material is certified by the producer.

The quantities and proportions of raw materials introduced in the mixing vessel are guaranteed by the quality assurance process (production procedures, weights records, quality control).

The produced paint is packaged in individual cans and identified.

The wastes of the process occur during the packaging process; they do not affect the bio-based content of the paint.

The typical formulation of a water based decorative flat paint is given in Table A.5.

Table A.5 — Example of a mass balance for bio-based products: Water based decorative flat paint (formulation)

Raw material	**Bio-based content of the raw material** % (by mass)	**Mass of raw material** kg	**Mass of raw material** kg [dry content]	**Mass of the bio-based constituents in the paint** kg
Water	0	(300)		0
Biocide	0	2	2	0
Dispersing agent	50	5	5	2,5
Rheological agent	80	3	3	2,4
White pigment	0	150	150	0
Wood filler	95	120	120	114,0
Calcium carbonate	0	120	120	0
Alkyd emulsion	94	300	300	282,0
Total		(1 000) 700	700	400,9
Bio-based content and masses are expressed by weight of dry matter.				

Using the metrics in Table A.5, the bio-based content in the finish paint is calculated as follows:

$$x_{\text{bio}}^{\text{mass}} = 100 \cdot \frac{M_{\text{bio,in}} - M_{\text{bio,loss}}}{M_{\text{mass,prod}}} = 100 \cdot \frac{400,9 - 0}{700} = 57,27\,\%$$

Flexible insulation panel made from wood fibres (assembling)

Characteristics of a panel:

— Size: 100 mm × 1 220 mm × 575 mm

— Mass: 3,50 kg

— Constituents: wood fibres, polyolefin fibres

Example for one batch production: 1 425 panels (997 m^2).

The typical composition of panel is given in Table A.6.

Table A.6 — Example of a mass balance for bio-based products: Flexible insulation panel made from wood fibres (assembling)

Raw material	Bio-based content %	Mass of raw material kg	Mass of raw material losses kg	Total mass of the final batch kg
Wood fibre	100	3 852	112	3 740
Polyolefins	0	1 284	36,5	1 247,5
Total		5 136		4 987,5

Using the metrics in Table A.6, the bio-based content is calculated as follows:

$$x_{\text{bio}}^{\text{mass}} = 100 \cdot \frac{M_{\text{bio,in}} - M_{\text{bio,loss}}}{M_{\text{mass,prod}}} = 100 \cdot \frac{3\,852 - 112}{4\,987{,}50} = 74{,}9\,\%$$

Bibliography

NOTE This NTA includes references to EN standards. These standards are adopted as national standard by all countries that are a member of CEN, and are available as such (e.g. as NEN-EN in The Netherlands, DIN-EN in Germany, NF-EN in France and BS-EN in the United Kingdom).

CEN/TS 16214-2, *Sustainability criteria for the production of biofuels and bioliquids for energy applications – Principles, criteria, indicators and verifiers – Part 2: Conformity assessment including chain of custody and mass balance*

CEN/TS 16640 [3], *Bio-based products – Determination of the bio based carbon content of products using the radiocarbon method*

CEN/TR 16721, *Bio-based products – Overview of methods to determine the bio-based content*

EN 16785-1:— [4], *Bio-based products – Bio-based content – Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis*

EN 16785-2:— [4], *Bio-based products – Bio-based content – Part 2: Determination of the bio-based content using the material balance method*

ISO 13065, *Sustainability criteria for bioenergy*

ISO 14064-1, *Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

ISO/IEC 17021-1, *Conformity assessment – Requirements for bodies providing audit and certification of management systems – Part 1: Requirements*

COM(2010)11, Report from the Commission to the council and the European parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling

Directive 2009/28/EC of the European parliament and of the council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

Handbook sustainability certification of biogas, *NL Agency*, November 2013

3) When publishing this NTA, CEN/TS 16640 was in the process of being transformed to EN 16640.
4) When publishing this NTA, this European standard was not published yet.

Waarom betaalt u voor een norm?
Normen zijn afspraken voor en door de markt, zo ook deze norm. NEN begeleidt het gehele normalisatieproces. Van het bijeenbrengen van partijen, het maken en vastleggen van de afspraken en het bieden van hulp bij de toepassing van de normen. Om deze diensten te kunnen bekostigen betalen alle belanghebbende partijen die aan tafel zitten voor het normalisatieproces, en u als gebruiker voor normen en trainingen. NEN is een stichting en heeft geen winstoogmerk.

Wat is nu precies de toegevoegde waarde van normen?
Stelt u zich eens voor … u wilt in het buitenland geld pinnen, maar uw bankpas past niet. Of uw nieuwe telefoon herkent uw simkaart niet. De samenstelling van de benzine over de grens is anders, waardoor u niet kunt tanken. Het dagelijks leven zou zonder goede afspraken over producten, processen en diensten een stuk complexer zijn.

Het maken en vastleggen van afspraken door belanghebbende partijen noemen we het normalisatieproces. Normalisatie had vanouds betrekking op techniek en producten. Nu worden steeds vaker normen voor diensten ontwikkeld. Zo zijn er afspraken op het gebied van gezondheidszorg, schuldhulpverlening, kennisintensieve dienstverlening, externe veiligheid en MVO.

Normen zorgen voor verbetering van producten, diensten en processen; qua veiligheid, gezondheid, efficiëntie, kwaliteit en duurzaamheid. Dit ziet u op de werkvloer, in de omgang met elkaar en in de samenleving als geheel. Organisaties die normalisatie onderdeel van hun strategie maken, vergroten hun professionaliteit, betrouwbaarheid en concurrentiekracht.

Wat doet NEN?
NEN ondersteunt in Nederland het normalisatieproces. Als een partij zich tot NEN richt met de vraag om een afspraak tot stand te brengen, gaan wij aan de slag. We onderzoeken in hoeverre normalisatie mogelijk is en er interesse voor bestaat. Wij nodigen vervolgens alle belanghebbende partijen uit om deel te nemen. Een breed draagvlak is een randvoorwaarde. De afspraken komen op basis van consensus tot stand en worden vastgelegd in een document. Dit is meestal een norm. Afspraken die in een NEN-norm zijn vastgelegd mogen niet conflicteren met andere geldige NEN-normen. NEN-normen vormen samen een coherent geheel. Een belanghebbende partij kan een producent, ondernemer, dienstverlener, gebruiker, maar ook de overheid of een consumenten- of onderzoeksorganisatie zijn.

De vraag is niet altijd om een norm te ontwikkelen. Vanuit de overheid komt regelmatig het verzoek om te onderzoeken of er binnen een bepaalde sector of op een bepaald terrein normalisatie mogelijk is. NEN doet dan onderzoek en start afhankelijk van de uitkomsten een project. Deelname staat open voor alle belanghebbende partijen. NEN beheert ruim 30.000 normen. Dit zijn de in Nederland aanvaarde internationale (ISO, IEC), Europese (EN) en nationale normen (NEN). In totaal zijn er ruim 800 normcommissies actief met in totaal bijna 5.000 normcommissieleden. Een goed beheer van de omvangrijke normencollectie en de afstemming tussen nationale, Europese en internationale normcommissies vereisen dan ook een zeer goede infrastructuur.

Betalen kleine organisaties net zoveel als grote organisaties?
Het uitgangspunt is dat alle partijen die deelnemen aan het normalisatieproces een evenredig deel betalen. De normcommissieleden kunnen onderling andere afspraken maken. Zo worden er wel eens afspraken gemaakt dat de grote partijen een groter deel betalen dan de kleinere bedrijven. De prijzen voor normen zijn voor iedereen gelijk. De kosten voor licenties zijn afhankelijk van de omvang van een organisatie en het aantal gebruikers.

Voordelen van normalisatie en normen
Gegarandeerde kwaliteit | Veiligheid geborgd | Bevordert duurzaamheid | Opschalen en vermarkten van nieuwe innovatieve producten | Meer (internationale) handelsmogelijkheden | Verhoogde effectiviteit en efficiëntie | Onderscheidend in de markt.

Voordelen van deelname
Invloed op de (internationale en Europese) afspraken | Als eerste op de hoogte van veranderingen | Netwerk; ook op Europees en internationaal niveau | Kennisvergroting.

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