

FACTSHEET BIO-BASED CLIPS AND BINDERS

Procurement of Innovative Products: Bio-Based Products in Procurement

Why bio-based clips and binders?

What is (bio-based) clips and binders?

Clips and binders are used within the gardening and landscaping sector to secure and support developing plants and trees. Clips and binders come in a wide variety of shapes, forms and applications for different crops. Clips and binders can be used by private users, in the public sector or in large applications in the agricultural or horticultural sector. In this factsheet, anchoring systems are included in the category clips and binders. Clips and binders are conventionally made from polypropylene or polyester. Conventional anchoring systems often consist of wooden poles drilled around a newly established tree to which the tree is connected using ties. Bio-based clips and binders can be made of various bio-based materials derived from agricultural products and waste streams. This factsheet provides information on bio-based clips and binders and how to take these into account in procurement.

Why should organisations consider bio-based shuttering in procurement?

Organisations could consider bio-based clips and binders in procurement if they would benefit from one or more of the capabilities attributed to the bio-based clips and binders. Bio-based clips and binders potentially have different capabilities. Aspects to keep in mind are environmental impact over the life cycle of the product (this could be determined through Life Cycle Assessment in accordance with ISO 14040) and the sustainable sourcing of the input material (this could be assessed in accordance with the sustainability criteria for biobased products from EN 16751 in combination with CEN/TR 16957 - Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase). With this kept in mind, several potential benefits can be attributed to bio-based clips and binders¹.

- *Resource efficiency*: For the production of bio-based clips and binders, often use is made of agricultural by-products and waste streams. This switch in material use could improve resource efficiency and in addition stimulate the market for secondary raw materials and the circular economy in general.

- *Reduced Greenhouse Gas (GHG) Emissions*: The greenhouse gasses emitted during the production of bio-based products have the potential to be lower than their petrochemical equivalent². Reduced greenhouse gas emissions will in turn contribute to combating climate change.

- *Avoidance of GHG Emissions*: By using bio-based products which replace petrochemical products, GHG emissions can also be avoided. Fossil feedstock need to remain in the ground to achieve the limit of a temperature increase less than 2°C³ as is included in the COP 21 agreement and ratified by UN-countries including the EU.

Reduced GHG Emissions

Biobased PLA has the potential to reduce GHG emissions approximately 30% compared to its petrochemical counterpart. This comparison takes into account CO₂ uptake from the atmosphere, polymer production and incineration but excludes GHG avoidance. Future PLA production could amount to 80% savings. Source: 'Bio-based economy and climate change', Nova Institute, 2017-01.

- *Biodegradability and compostability*: Some bio-based products have the capability of being biodegradable and/or compostable including biodegradable in the soil⁴. Assuming a baseline in which aboveground used polypropylene or polyethylene clips and binders are either landfilled or burned, switching to clips and binders which are biodegradable or compostable, could result in waste reduction and improved resource efficiency. Anchoring systems have a baseline in which wooden poles or plastic anchors remain in the soil. In this case, products which are biodegradable in the soil could remain in the soil and reduce plastic pollution or wasted resources.

¹ These benefits can differ between products and should always be confirmed by the supplier.

² Bio-based economy and climate change', Nova Institute, 2017-01

³ McGlade C. and Ekins, P. (2015) 'The geographical distribution of fossil fuels unused when limiting global warming to 2 °C', Nature 157.

⁴ Biodegradation is a natural chemical process in which materials are being transformed into natural substances such as water, carbon and biomass with the help of microorganisms. Compostability is a characteristic of a product that enables biodegradation under specific conditions (i.e. a certain temperature, timeframe, etc.). (Source: ISO 472:2013 Plastics - Vocabulary)

How to take into account specific capabilities of street furniture in procurement?

Procedures and purchasing strategies

Procurement within the gardening and landscaping sector often implies procurement of services or works. Clips and binders are likely to be procured as part of a service or works contract or form part of a supply contract for other products, such as plants. The capabilities of the bio-based clips and binders in procurement could be described in terms of GHG emissions, compostability and biodegradability.

Example 1. GHG Emissions

The potential capability of reducing GHG emissions would be an important benefit and could therefore be confirmed as part of the procurement criteria.

Minimum Requirement: The carbon footprint of the raw material used for fabrication of the clips and binders should be less than the carbon footprint of an appropriate reference raw material.

Additional information: The carbon footprint of the raw material

should be conducted in accordance with ISO 14067 or equivalent. An example of a reference raw material could be polypropylene or polyethylene.

Verification: The tenderer shall provide information on the raw materials used and the carbon footprint results, which shall be reported according to ISO 14067 or equivalent. The comparison with the reference raw material shall be included in the report as well as a motivation for the choice of reference material.

Example 2. Compostability

This criterion can be used if the procurer wishes to compost clips and binders. Compostability should be determined for either industrial or home composting conditions.

Minimum Requirement: The clips and binders should be compostable under home OR industrial composting conditions (to be selected by the procurer).

Additional information: All materials used in the clips and binders must be compostable in accordance with EN 13432:2000 or an equivalent standard. In the case of home composting, the French Standard 'NF T51-800:2015-11: Plastics – Specifications for plastics suitable for home composting' could be used. This standard is based on EN 13432 but has adapted the timing for biodegradability and the temperature at which biodegradability

should take place to match home composting conditions. The manufacturer could also prove compliance with EN 13432 and include an explanation of the testing procedure used to determine biodegradability under home composting conditions.

Verification: Products holding a relevant label fulfilling the listed requirements will be deemed to comply. A technical dossier of the manufacturer or a test report demonstrating that these requirements have been met is also accepted. The following labels comply with the EN 13432:2000 standard (made applicable for home composting) (or equivalent) and can be used for verification:

- Vincotte: OK compostable
- Din Certo: DIN Geprüft compostable
- Blauer Angel: weil compostierbar

Example 3. Biodegradability

If the procurer wishes to purchase clips and binders which biodegrade in the soil, this criterion should be used as an alternative to the criterion on compostability.

Minimum Requirement: The clips and binders should be biodegradable in soil.

Additional information: All materials used in the clips and binders must be biodegradable in the soil. To prove this, in practice often use is made of standard EN 13432:2000. When using this standard, the medium in which the biodegradation should take place changes, as well as the timing of biodegradation. Following this information, biodegradability could be proven in accordance with EN 13432:2000 or an equivalent standard such as the French Standard 'NF T51-800:2015-11: Plastics – Specifications for plastics suitable for home composting'. Other standards that can be used are 'ISO 17556:2012 Plastic – Determination of the ultimate aerobic biodegradability of plastic materials in soil', or 'ASTM D5988-12 Standard test method for determining

aerobic biodegradation of Plastic Materials in Soil'. Moreover, French standard 'NF U52-001 Biodegradable materials for use in agriculture and horticulture- Mulching products' and the Italian standard 'UNI 11462 Plastic materials biodegradable in Soil', include specifications defining the test methods and criteria (minimum pass levels) to designate a material as biodegradable in soil

An explanation of the testing procedure used to determine biodegradability under soil conditions should be included by the manufacturer.

Verification: Products holding a relevant label fulfilling the listed requirements will be deemed to comply. A technical dossier of the manufacturer or a test report demonstrating that these requirements have been met is accepted. The following labels comply with the EN 13432 (or equivalent) and can be used for verification:

- Vincotte: OK biodegradable soil,
- Din Certo: DIN-Geprüft biodegradable soil

What bio-based clips and binders are available?

The following databases contain information on the availability of bio-based clips and binders:

- The 'Datenbank FNR' database (Germany) provides an overview of bio-based clips and binders. Information on the product, supplier and whether the product is certified is available within the database.
- The 'Agrobiobase' database (France) provides an overview of bio-based clips and binders, as well as product specifications and whether the product is certified.
- The 'CoE BBE' database (the Netherlands) provides an overview of bio-based products amongst which clips and binders. Information about the producer, product characteristics and whether the product is certified is specified.

Points of attention

The following potential barriers and bottle necks have been identified by procurers, policy makers and professionals that work with bio-based products in procurement. The relevance of each of these potential barriers is discussed for the product group 'clips and binders':

- **Costs:** We found a bio-based anchoring system to be competitive in price with non-bio-based anchoring systems (approximately €20 per tree). An example of bio-based clips and binders found the initial costs to be higher (€0.015 per bio-based and biodegradable clip versus €0.005 per conventional clip), but the total costs of ownership to be lower because waste disposal fees could be reduced. The costs of (bio-based) clips and binders are only a small part in relation to the costs of the service, work or goods (plants) to be procured.
- **Level of development:** Products from at least six producers were found to be commercially available. These producers have already sold significant amounts of their bio-based products. The level of development is therefore considered mature and is not expected to be a barrier for the procurement of bio-based clips and binders.
- **Availability:** Bio-based clips and binders are found to be available in Germany, the Netherlands and France.
- **Quality of the products:** The quality of bio-based clips and binders is found to differ. Some products are in quality comparable to the petrochemical alternatives, while others have a reduced lifetime.

