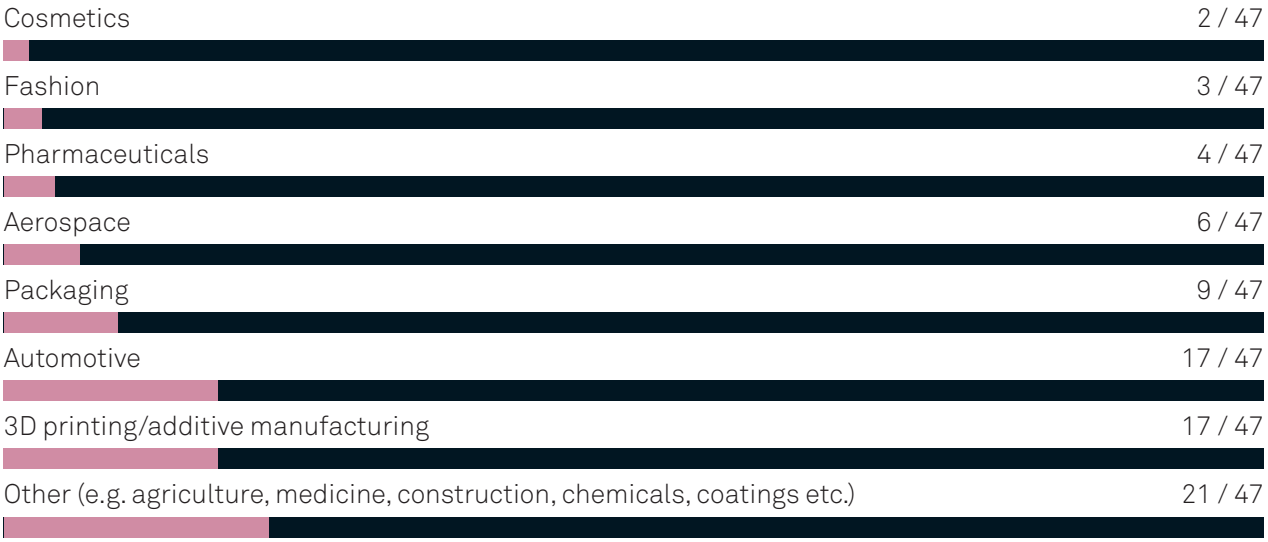
DG survey on bioplastics: enormous response, informative findings

To develop the perfect customised plastic powders, Dressler Group is involved in its customers' processes from the very beginning. One of the most important R&D tools is asking the right questions – and listening very carefully. This is precisely why DG conducted a survey among customers, partners and universities in May 2022 on the topic of "Bioplastics - the material of the future?". The response rate is exceptionally high at almost 50 per cent – and the findings are very valuable.

In which sector do you work? (multiple answers possible)



In which area do you work at your company?

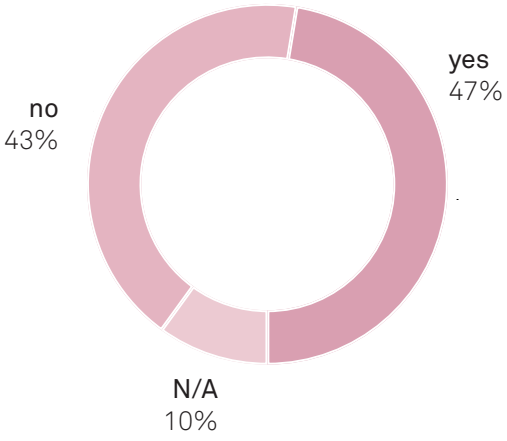
What position do you hold at your company?

Key questions and answers at a glance

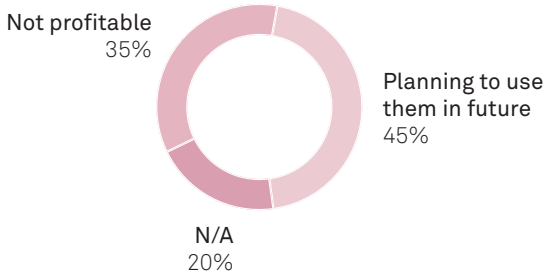
Commentary from Holger Leonards

graduate chemist (polymers) + doctorate in engineering (RWTH Aachen). Before joining Dressler Group: project engineer and team leader at the Fraunhofer Institute for Laser Technology, over 10 years of experience in additive manufacturing. Since April 22 at DG as Team Manager "Research and Development" in the areas "Innovation + Application Technology"

Do you use bioplastics?

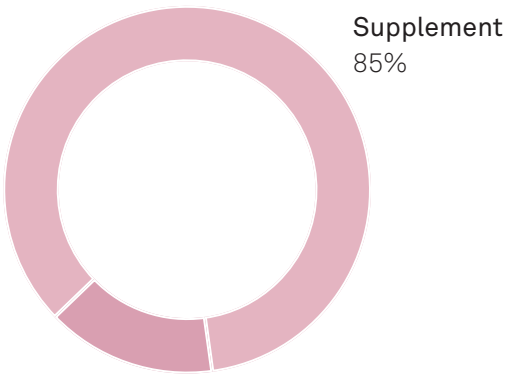


If not (yet), why not?



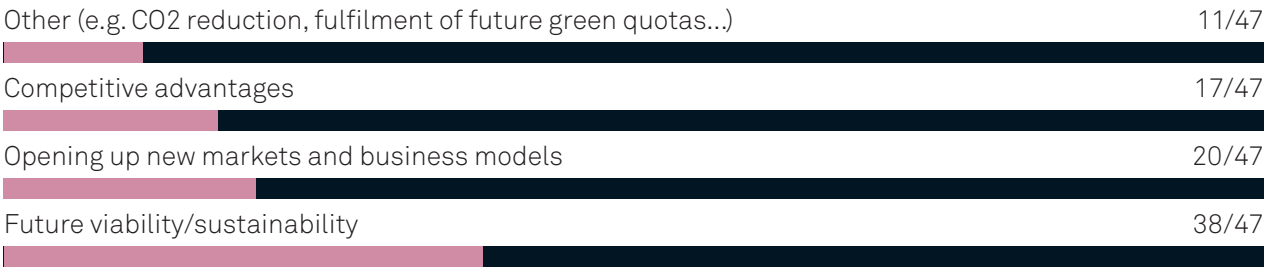
The higher price still seems to be the hurdle for companies to use bioplastics for their products. The importance of sustainability/ customer expectations will continue to rise and prices will fall. This will also pave the way for the introduction of bioplastics.

Are bioplastics more likely to replace or supplement conventional plastics?



It comes as no surprise that companies initially see these new types of plastics as an expansion of their portfolio. Especially if the focus is on "green production". Substitution will increase as quality improves and prices fall.

What are the advantages of using bioplastics? (multiple answers possible)



The trend compass is pointing towards bioplastics. In future, customers will pay more attention to the materials used and their sustainability. Besides, there are likely to be legal requirements. So it is no wonder that companies (have to) see biopolymers as the future. The pioneers may benefit from a competitive advantage. Others will then simply have to follow suit.

What are the disadvantages of using bioplastics? (multiple answers possible)

The mechanical properties of bioplastics have to measure up to those of conventional plastics. That's a condition that must be fulfilled for companies – at least as far as possible. Of course, the manufacturing process needs to be reconfigures. That brings additional costs, alongside the inherently higher prices of bioplastics. Many other aspects such as "ethical conflicts, food competition, unresolved issues of actual sustainability" are of course points that need to be clarified in the medium and long term. Crude oil has provided easy access to plastics for many years, and it still does today. However, those plastics were not developed overnight. Large-scale plastic production has a long history going back to the start of the 20th century.

Free-form answers to the questions:

What are a) the greatest risks and b) the greatest opportunities associated with the use of bioplastics (as a supplement or replacement for conventional plastics)? 47 Answers

Examples of risks

- Unclear ageing resistance or durability/quality with long-term use
- Performance compared to conventional plastics
- Regulation is not yet finalised, short-term changes could jeopardise investments
- Regulation is out of touch with practice
- Investments or material costs could prove to be uneconomical/uncompetitive
- Insufficient availability of bioplastics and the necessary raw materials
- Unrealistic expectations (e.g. from customers, legislators, etc.)
- Inconsistent understanding or definitions of what exactly is meant by “bioplastics” (e.g. made from organic material vs. biodegradable etc.)
- Reduced choice of suppliers
- Competition with food production (raw materials, arable land, resources)
- Energy requirement compared to conventional plastics

Examples of opportunities:

- Compliance with future regulations and limit values with regard to the environment, sustainability, pollutants etc.
- Smaller ecological footprint
- Development of new markets and business models
- Development of new processes and production methods for manufacturing bioplastics themselves, as well as utilising them (e.g. using bioreactors made from algae or bacteria)

Which obstacles must first be removed or problems solved before bioplastic use can get off the ground or grow (in general)? 22 Answers

Examples:

- Customers are not yet convinced
- Material is not yet available in sufficient quantities
- Lack of experience over a longer period of use
- Higher/too high costs compared to conventional plastics
- Processing remains more challenging or is not possible

Conclusion

Quotes, outlook, summary etc.

- Many companies still use the term bioplastics rather arbitrarily, without defining it precisely: Is the plastic itself bio-based, is it "only" biodegradable, and so on. Under no circumstances should bioplastics be used purely as a marketing term (no greenwashing!).
- Currently, fewer than half of the respondents use bioplastics – and some of them still have to overcome obstacles in practical use, such as limited availability, necessary compatibility with conventional materials or the price level.
- However, everyone is convinced that bioplastics, depending on the area of application, will become firmly established as an alternative or supplement with regard to sustainability objectives (some of which are already prescribed by law).
- Respondents don't take an "either/or" perspective; they see unique combinations of both conventional and bioplastics.
- From a research point of view, I would like to stress the importance of distinguishing between various uses of bioplastics. I know that colleagues from industry take a similar view." (Response from a university / R&D institution)
- "Where they can be used sensibly, bioplastics can offer great opportunities to stand out from the competition and develop new markets."

Positions/statements for or by DG:

- The market is still too young/too new/too underdeveloped for a clear direction to be recognisable.
- According to the survey, the risks/obstacles still outweigh the opportunities for actual use on a large scale or for replacing conventional plastics (and this is likely to remain the case for some time), for the detailed reasons mentioned above.

<u>But:</u>

- The theoretical and practical know-how and process expertise for customers worldwide from all key industries make DG the ideal partner, thanks to its Technical Centre, Innovation Lab, Innovation Campus: "Making the impossible possible" (see the beginnings of patented cryo-grinding by DG, first grinding of valerian = "plant-based"...)

<u>Crucial:</u>

- DG's experience means you are never starting from square one, even with apparently completely new topics (previous processes, knowledge transfer, R&D, curiosity, passion for innovation, customer focus, involvement of customers/partners from the outset etc.)
- Risk minimised through trial grinding and documentation, maximum efficiency, reproducibility at all times.
- DG powder comes with added value – that also goes for bioplastic powders, when the time is right.