

One hundred fifty six Sustainable Materials

Seven categories

Re-imagine

The title of this chapter does not invite us to re-imagine the use of a material but the use of machinery and knowledge in connection with a material. Sometimes, it is not enough to look at a material on its own, but to look at it in context. Facilities and machinery are huge investments; but sticking with existing machinery does not necessarily mean stagnating on product level. Innovative producers show how, with the right mindset, existing facilities can be adapted.

Re-organise

Every product manufactured, and the resulting waste at the end of its life cycle, comes in different shapes, sizes, composition and nature. One of the most convenient and common strategies for obtaining raw material from post-consumer or post-industrial waste is to shred it into uniformly sized fragments. With the help of agents (like binders), or in case of more elegant solutions, without binders, these fragments can be formed into a new material.

Re-appropriate

To appropriate means to allocate something to a specific use. The material featured in this section does not have a history as a primary product serving as a base for creating new material. It has long been discarded and treated as waste for a long time. It is striking that most of the materials that were initially retained in this category are linked to food production. From an industrial and demographic point of view this is obvious. Food production is becoming increasingly industrialized in order to feed more and more people and animals. There are certainly many downsides to this development. However, using the food production as a basis to develop materials has huge potential.

Re-direct

Mankind has always tried to re-direct nature. Often with disastrous outcomes. In material science however, re-directing nature might be an opportunity. The possibility of producing products without generating waste has always been a dream, economically and from a sustainability point of view. With the emergence of future-minded producers experimenting with bio-based high-tech materials, new possibilities arise which were unthinkable not long ago. What if we no longer manufactured our materials anymore, but grew them instead?

Re-consider

This section deals with “old materials – new processes”. Amid all the hype about new materials, it is often forgotten that many of the classic materials, like wood or wool, have excellent qualities which have been proven over centuries. While wood or wool may seem old fashioned to some, new technologies have the power to revive these materials and take them to a whole new level.

Re-combine

Many materials have an outstanding material quality. But not always multiple ones. When materials get combined in a smart way, the amount of beneficial qualities increases. This can happen by layering materials or by putting them together in any way that makes sense for a specific application.

Agents

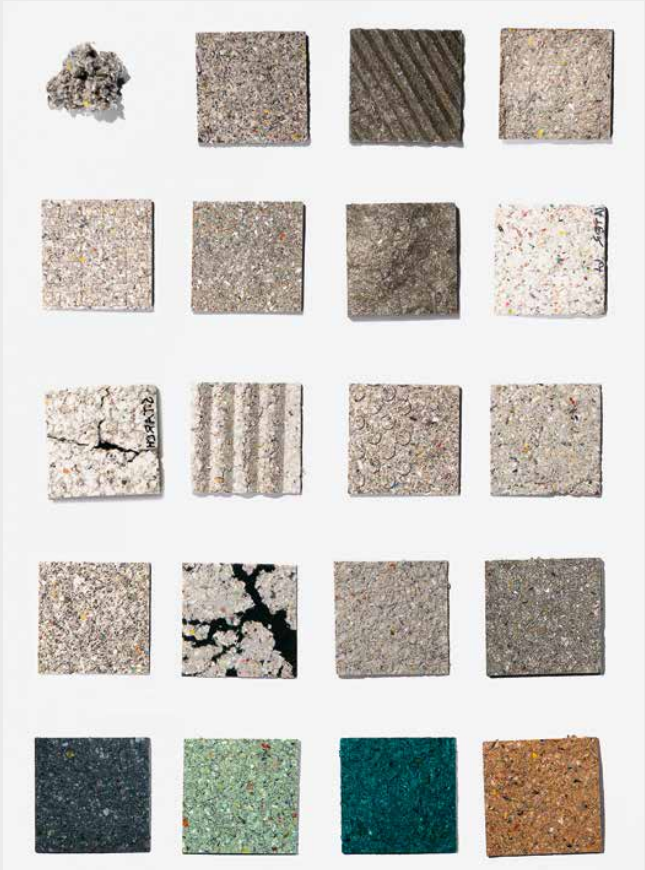
A reality which cannot be ignored is that many sustainable or recycled materials cannot exist on their own. What is a sustainable granulate worth alone? What if a sustainable material needs to be given a different colour from its natural one? When researching the current generation of materials, it has become obvious that third-party agents like binders, glues and dyes are ever-present. If the sustainable nature of these products does not keep up with the development of the raw material, this risks nullifying all our good intentions.

Fourteen case studies



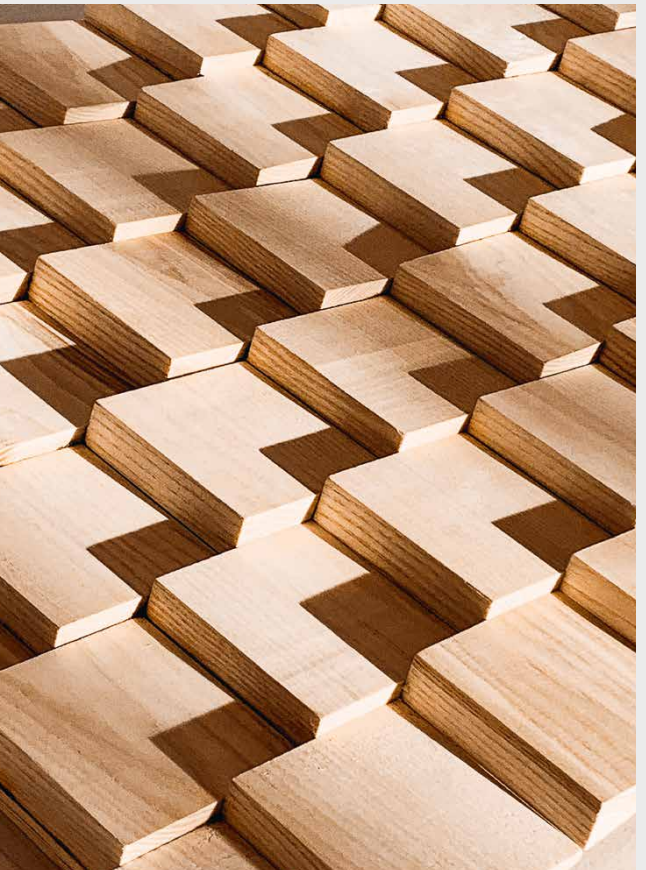
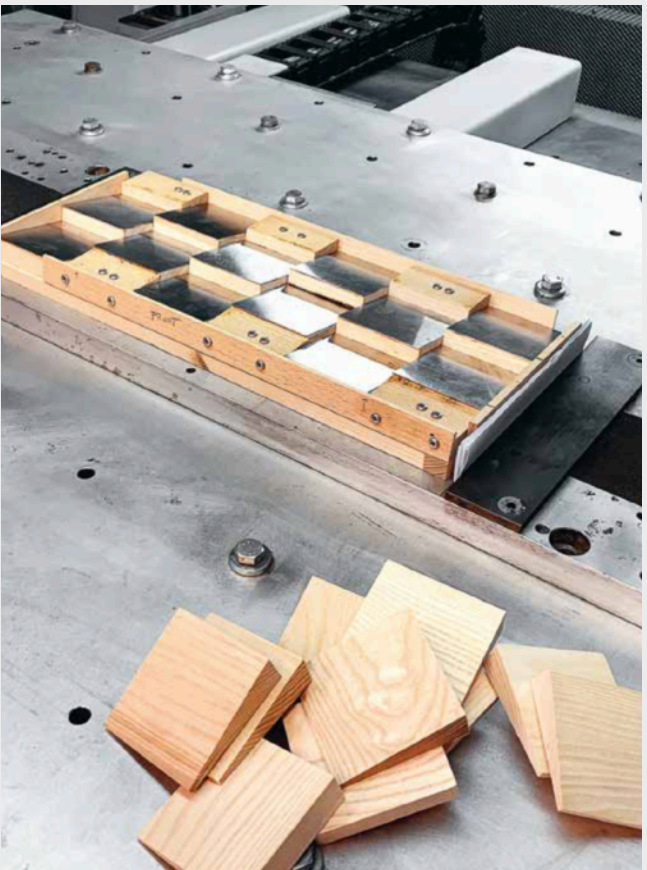
Re-organise

Isofloc LM
Fritz Jakob Gräber



Re-consider

Welding of Wood
Johannes Valentin Breuer



Re-appropriate

Rice Husk
Xinyi Jiang



Re-combine

FlaxTape™
Nikola Gaytandjiev

