

SPACE FOR BIOMATERIALS _____
GUIDE: Plant-Dyed Case



S _____ BY _____

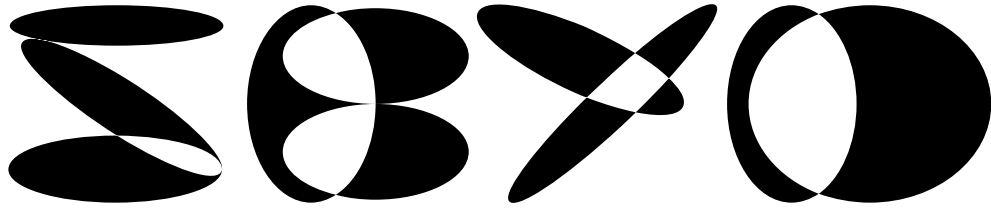
D SUSTAINABILITY
BY DESIGN

 SBYD AND THE SPACE
FOR BIOMATERIALS

 UTENSILS AND
INSTRUCTIONS

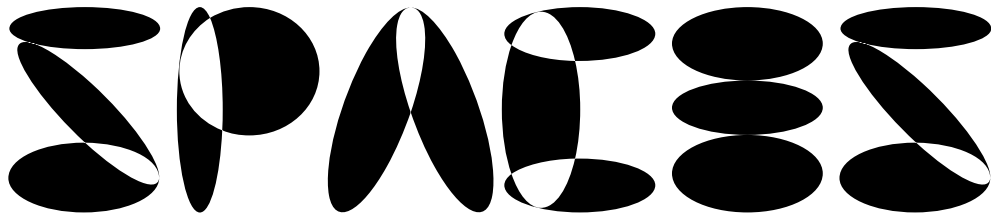
 ASSEMBLY

 PATTERN



SBYD.SPACE explores new climate-neutral and resource-light ways of living and production. It transfers knowledge from sustainability research into society and the economy through design. The capability of design in making theories and abstract concepts tangible – and transferring them into everyday life – is used to explore, discuss, and test these theories and ideas in practice.

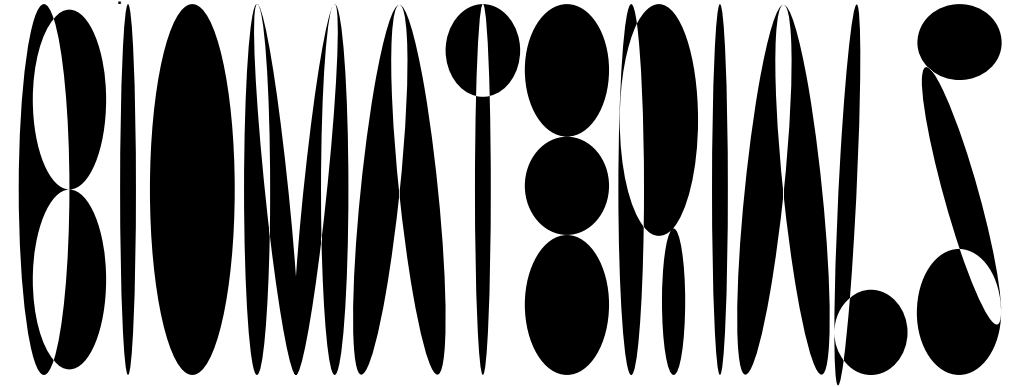
SBYD.SPACE engages with diverse audiences and collaborators through a range of formats, including workshops, international symposia, exhibitions, an artist / designer in residence program and support for entrepreneurial endeavors. It is located at Folkwang University of the Arts' North Campus at the UNESCO World Heritage Site Zollverein, a former coal mine in Germany's Ruhr region – a location that could not be more symbolic for the transformation of industries, ways of life, and entire regions.



SBYD.SPACE creates SPACES of possibility for exploring sustainable alternatives. Each SPACE is composed of a different set of interdisciplinary team members – akin to a working group. In different and continuously evolving SPACES, such as the SPACE FOR REPAIR, the SPACE FOR BIOMATERIALS, and the SPACE FOR TEXTILES, room is created for projects that pursue a circular, resource-light, and regenerative design approach. The SPACES form a thematic and conceptual structure within SBYD, around which activities such as interdisciplinary workshops, design projects, and exhibitions are clustered.

Each SPACE approaches sustainability with a slightly different perspective, definition, and way of working, creating a multiperspective approach within SBYD that makes different possibilities of sustainable living and production visible and tangible.

The SPACE FOR BIOMATERIALS works at the intersection of design and materials science. It experimentally develops and explores bio-based materials. How can the use of bio-based materials foster regenerative design approaches, for example through the use of waste materials or materials from paludiculture? How can designers engage with microbiology to develop alternative materials and colours?



The following instructions explain how to make a paper leather wallet. Paper leather is a vegan alternative to animal leather and can be dyed using natural dyes. By experimenting with different plant-based dyes, a wide range of colour combinations can be achieved.

What are natural dyes? All plants contain pigments; however, only certain dye plants have proven to be particularly suitable for dyeing due to their material properties. Their pigments are especially strong and durable, making them ideal for colouring textiles, food, and cosmetics. Beyond these applications, natural pigments are also used in various industrial processes, such as the production of wall paints and varnishes.

Examples of native dye plants: madder root (*Rubia tinctorum*), birch (*Betula pendula*), stinging nettle (*Urtica dioica*), lady's mantle (*Alchemilla vulgaris*), dyer's knotweed (*Persicaria tinctoria*), and dyers's woad (*Isatis tinctoria*).

The use of natural dyes can be traced back to the Stone Age and is found across many cultures. The oldest known dyed textiles date to around 3000 BC. During the 19th century, synthetic dyes increasingly replaced natural dyes due to economic factors, availability, and standardised quality. These synthetic dyes are typically derived from petroleum or coal and require resource-intensive production processes. In addition, their manufacture generates by-products and waste that contribute significantly to environmental pollution on an industrial scale. In response to these impacts, the growing focus on resource-efficient and sustainable ways of living has led to a renewed interest in plant-dyed textiles and materials.





NATURALLY DYED WALLET

Lorena Droste

UTENSILS

Paper leather, colourless, 240 mm x 200 mm

Pattern or laser file

Scissors and scalpel or laser cutter

10 g potassium alum

40 g dye plants

Water

Pot

Spoon

Thermometer

Hot plate

Gloves

INSTRUCIONS

CUTTING

1. Print the pattern from pages 11 and 12 on a DIN A4 page.
2. Transfer the pattern for the three parts of the wallet onto the paper leather with a pencil.
3. Cut out the three parts of the wallet. Cut the marked incisions with the scalpel. Or laser cut the laser file.

MORDANT

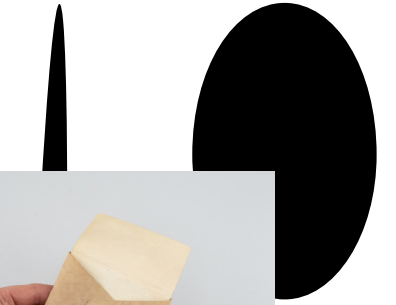
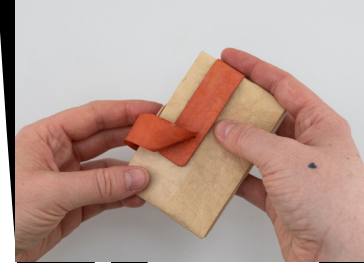
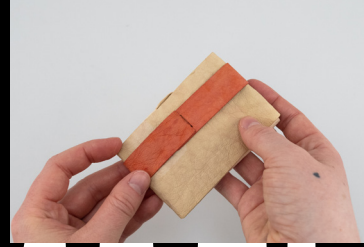
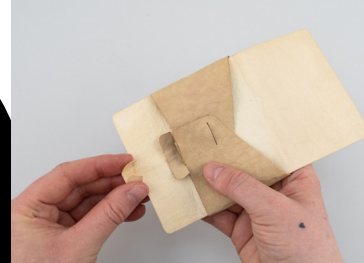
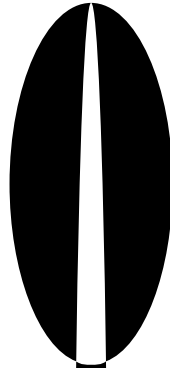
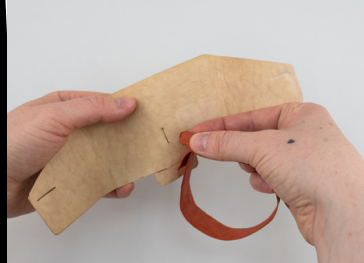
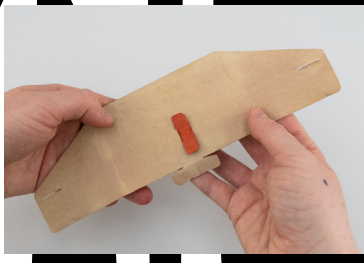
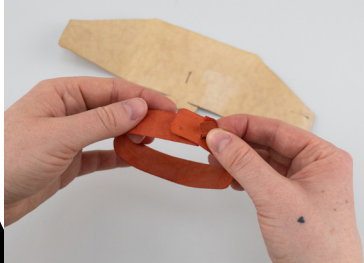
1. Dissolve 10 g of potassium alum in 50 mL of hot water.
2. Then stir this solution into 1 L of cold water.
3. Place the wallet pieces in the mordant and slowly heat to approx. 40 °C.
4. Remove the pot from the hotplate and allow to cool.
5. Leave the wallet parts in the mordant overnight, stirring from time to time.
6. Remove the wallet parts and rinse well with water.
7. The mordant can be disposed of in the usual drain.

DYING

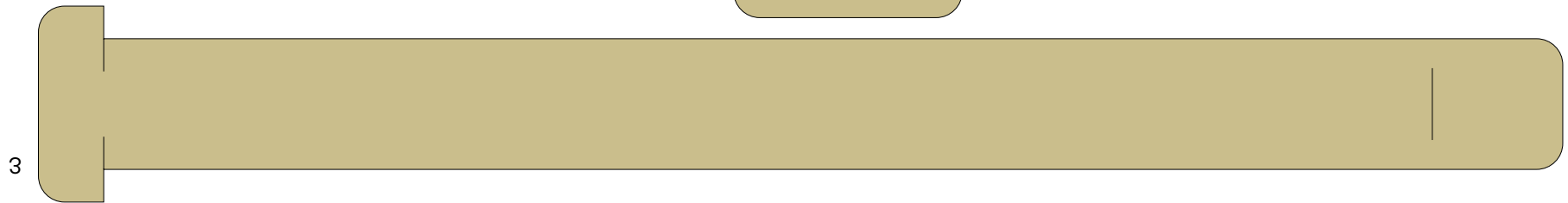
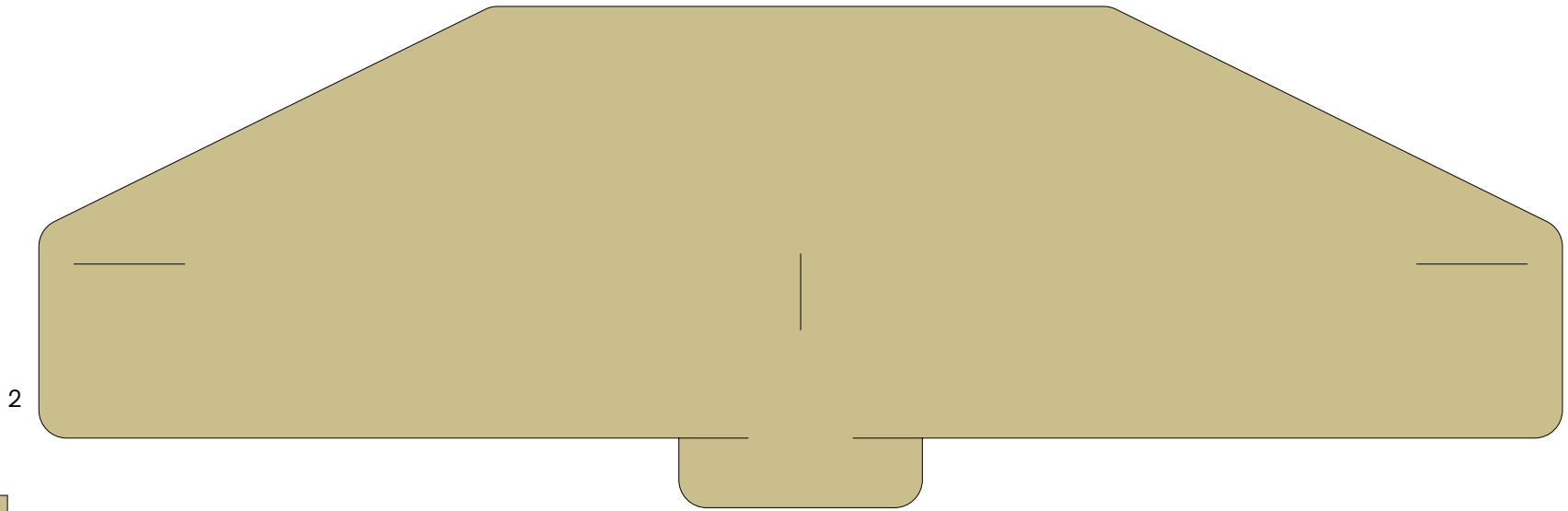
1. Boil 40 g of dye plants in 1 L of water.
2. Remove the pot from the heat and leave to steep overnight.
3. Place the pretreated wallet parts in the plant decoction and heat to 70 °C.
4. Remove the pot from the heat and stirring occasionally, leave the wallet parts to steep until the desired colour is achieved.
5. Remove the wallet parts, rinse with water and leave to dry.
6. The plant remains can be disposed of in the household waste. The liquid can be disposed of in the usual drain.

ASSEMBLY

1. Assemble the wallet parts as shown on p. 7.
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Published by

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SBYD.SPACE is part of the
“Innovative University” funding line
and is supported by the German
Federal Ministry of Research,
Technology and Space (BMFTR) and
the Joint Science Conference (GWK).

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