



Materials Revolution 2021

High-advanced materials for a digital and circular world

- **WEARpure**
3D printing filament with mineral compound to mineralize greenhouse gases (Noumena, Barcelona)
<https://wearpure.tech>
- **MAMBO**
Motor Additive Manufacturing Bicycle with endless glass fiber reinforcement (moi composites srl, Milan/Italy; Autodesk, Copenhagen/Denmark)
<https://www.moi.am/projects/mambo>
- **Multec4Move**
Printing Head for 4 filaments (Multec, Germany)
<https://multec.de/3d-drucktechnik/4-fach-druckkopf-fuer-multimaterialdrucke>
- **Printed OLED** - smart label (INURU, Germany)
<https://www.inuru.com>
- **Ultraleggera** the lightest chair in the world from blown-up metal (Oskar Zieta, Poland)
<https://www.zieta.pl/ultraleggera>
- **Stand-up-Paddleboard** from renewable lightweight materials (Fraunhofer WKI, Germany)
<https://www.fraunhofer.de/de/presse/presseinformationen/2021/august-2021/stand-up-paddleboard-aus-nachwachsenden-leichtbau-materialien.html>
- **Phase change materials** for thermal management in electric batteries (Fraunhofer IWU, Germany/Chemnitz)
<https://www.hybridleichtbau.fraunhofer.de/en/research-projects/thebate.html>
- **Metal foam for lightweight batteries** (Fraunhofer IWU, Germany/Chemnitz)
<https://www.iwu.fraunhofer.de/en/metal-foam-center.html>
- **Shimmering Wood** - structural colours 100% from wooden colour just structured nano-cellulose surface (Aalto University, Finland)
<https://www.aalto.fi/en/events/shimmering-wood-by-structural-colour-studio>
- **Urban Taraxagum Bicycle tube** from Dandelion roots (Continental, Hanover)
<https://www.continental.com/en/press/press-releases/2020-04-23-urban-taraxagum>

- **SonoWood** densified solid wood as metal alternative (Swiss Wood Solutions, Zurich)
<https://www.swisswoodsolutions.ch/en>
- **Printed OLED** - smart label (INURU, Germany)
<https://www.inuru.com>
- **SLM Inductor** from copper (PROTIQ, Germany)
<https://www.protiq.com>
- **Brake Pad** with reduced fine dust
(Sigma Materials, Germany; Applied Nano Surfaces, Sweden)
<https://www.sigma-materials.de>
- **Urban Taraxagum** bicycle tube from dandelion roots (Continental, Hanover)
<https://www.continental-reifen.de/specialty/unternehmen/sustainability/taraxagum>
- **Lithography-based Micro Metal Printing** (Incus 3D, Vienna)
<https://www.incus3d.com>

Total list of InnoDex Materials 2021

Digital and Smart Materials

- SonoWood densified solid wood as metal alternative (Swiss Wood Solutions, Zurich)
- Micro Motor with wooden gears (Swiss Wood Solutions, Zurich)
- SensoVeneer with touch sensitive quality (Swiss Wood Solutions, Zurich)
- Wooden Credit Card (Swiss Wood Solutions, Zurich)
- Direct wireless power transfer (Ryszard Dzikowski, Berlin)
- Plastic-bonded magnets (Barlog Plastics, Overath)
- Thermally conductive and electrically insulating for e-mobility as a battery cell holder (Barlog Plastics, Overath)
- Electrically conductive with steel fiber filling for shielding electromagnetic fields in EMC and a lightweight alternative to metallic housings (Barlog Plastics, Overath)
- Printed OLED - label for bottles and transport carries (INURU, Germany)

3D Printing Materials

- 3D printed carbon composites (9T Labs, Zurich)
- Biobased Sand Printing (Weizmann Institute of Science, Israel)
- High Speed Sintering (Fraunhofer IPA, Uni Bayreuth/Germany)
- 3D printed record clamp with vibration dampening properties (Fraunhofer IPA, Uni Bayreuth/Germany)
- Unclean Plastics (Bauhaus Universität Weimar, Felix Stockhausen, Friedrich Gerlach, Germany)
- Bras Industrial 3D Printing (PROTIQ, Germany)
- SLM Inductor from copper (PROTIQ, Germany)
- Zamak 5 Druckmaterial (PROTIQ, Germany)
- Lithography-based Micro Metal Printing (Incus 3D, Vienna)

- WEARpure 3D printing filament with mineral compound to mineralize greenhouse gases (Noumena, Barcelona)
- Functional printing for the automotive industry (Fraunhofer IWU, Germany)
- 3D Screen Printing (Fraunhofer IFAM, Germany)
- Multec4Move: Printing Head for 4 filaments (Multec, Germany)
- MAMBO - Motor Additive Manufacturing Bicycle (moi composites srl, Italy)

Resource Efficiency & Lightweight Solutions

- 3D printed cores for CFRP components (Fraunhofer IPA, Uni Bayreuth)
- Flat carbon loudspeaker for mobility solutions (Innfa, Stuttgart)
- Revolve Air Wheelchair (Andrea Mocellin, Italy)
- Super Lightweight Board from flax, balsa, cardboard & PLA (Institut für Flugzeugbau, Stuttgart)

Circular Materials

- Urban Taraxagum bicycle tube from dandelion roots (Continental, Hanover)
- 3D printed lamp from orange peels (Krill Design, Italy)
- ID.EIGHT shoes from fruit residues (ID.Eight, Italy)
- Cactus Leather (Desserto, Mexico)
- Appleskin: Leather alternative from apple trestler (Frumat, Italy)
- Brake Pad with reduced fine dust (Applied Nano Surfaces, Germany)
- Shift Phone: Modular sustainable smart phone (Shift, Germany)
- GreenPad: Brake Pad for motor cycles without copper or nickel (Fraunhofer IFAM, Dresden; SBS Friction, Denmark)