



SMART-Plant

*Scale-up of low-carbon footprint
material recovery techniques in existing
sewage treatment plants*



SMART Materials

*Cellulose, Bioplastic
and Biocomposites*

Innovative processes of SMART-Plant enable the recovery of valuable materials from municipal wastewater. Extracted raw materials can be used as intermediates for processing into commercial end products or as feedstock for different industrial applications. A primary intermediate is recovered cellulose, which can be extracted from municipal wastewater by fine-sieving (Cellvation® process) and drying into fluff fibres or compressed pellets (Recell®). Cellulose fluff can be applied in the chemical or construction industry. Cellulose pellets serve as structural material in the production of bio-composites, which are extensively used as sustainable building material for garden furniture, decks, facade covering or yard fencing. A second recovered material is bioplastic in the form of poly-

hydroxy-alkanoates (PHA), which is produced by selected bacteria growing on the organic content of wastewater. This PHA-rich sludge can either be dried and used directly as bioplastic input for low-grade applications, or PHA can be chemically extracted from the sludge, yielding a pure PHA powder with higher market value. PHA can also be used for the production of bio-composites, replacing fossil-based polymers in the value chain.



Cellvation®



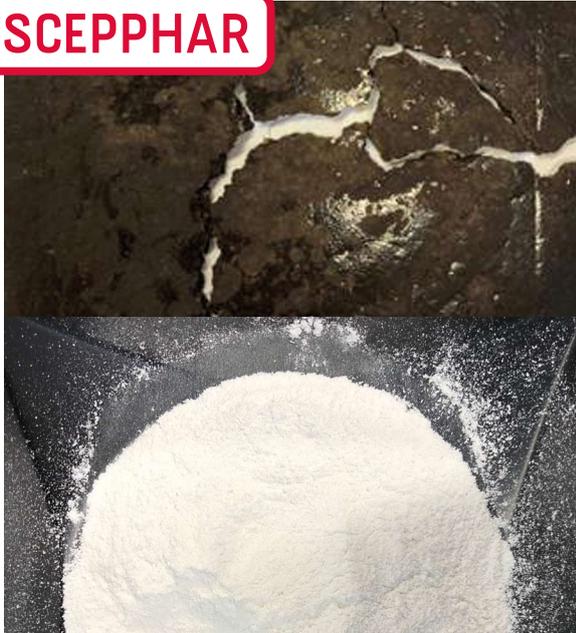
Cellulose Fluff

- Light-weight structural material
- Hygienically safe (EPA class A)
- Odour-neutral
- Use as insulation material or asphalt binder
- Organic residue < 10 %

Cellulose Pellets

- Dry pellets easy to handle
- Structural material for bio-composites
- Cellulose content: 60-80 %
- Reaching EPA class A rating

SCEPPHAR



PHA-rich Sludge

- PHA-rich organic material
- PHA content < 40 % of dry matter
- Recovery of 1 kg of PHA per pe and year
- Suitable as bio-based ingredient for bio-composites

PHA Powder

- Dry PHA powder
- PHA content > 95 %
- Pure product with high market value
- Suitable for bio-composite production

Bio-Composites



Bio-Composites

- Bio-composite for outdoor use
- Suitable for benches, fences and decking
- High water resistance and stability
- Low potential for slip
- Made from recycled materials such as r-HDPE