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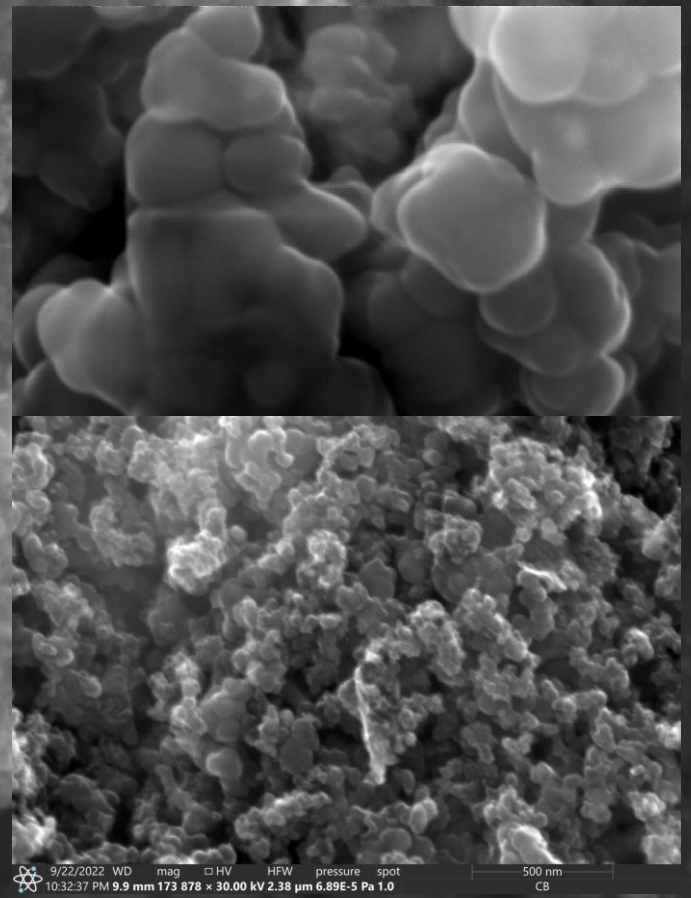
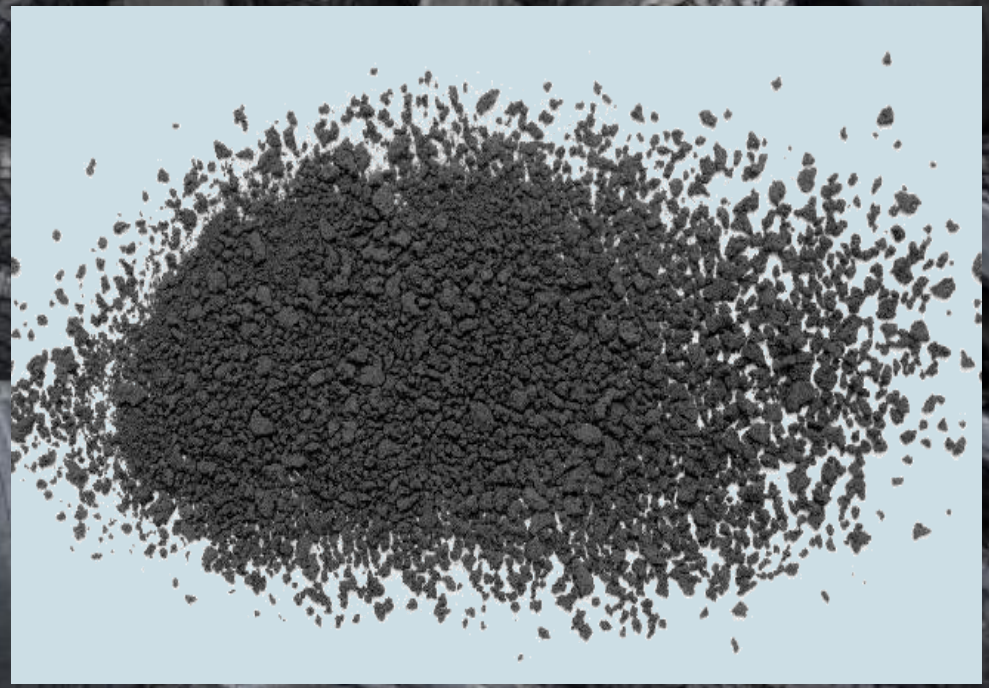
Herausforderungen und Hürden bei der (Rück)Gewinnung von Industrie-Ruß (Carbon Black) aus Altreifen

Challenges and hurdles in the recovery of industrial carbon black from waste tires



Recycling & recovering of „Carbon Black“

Pyrolysis | Raw rCB



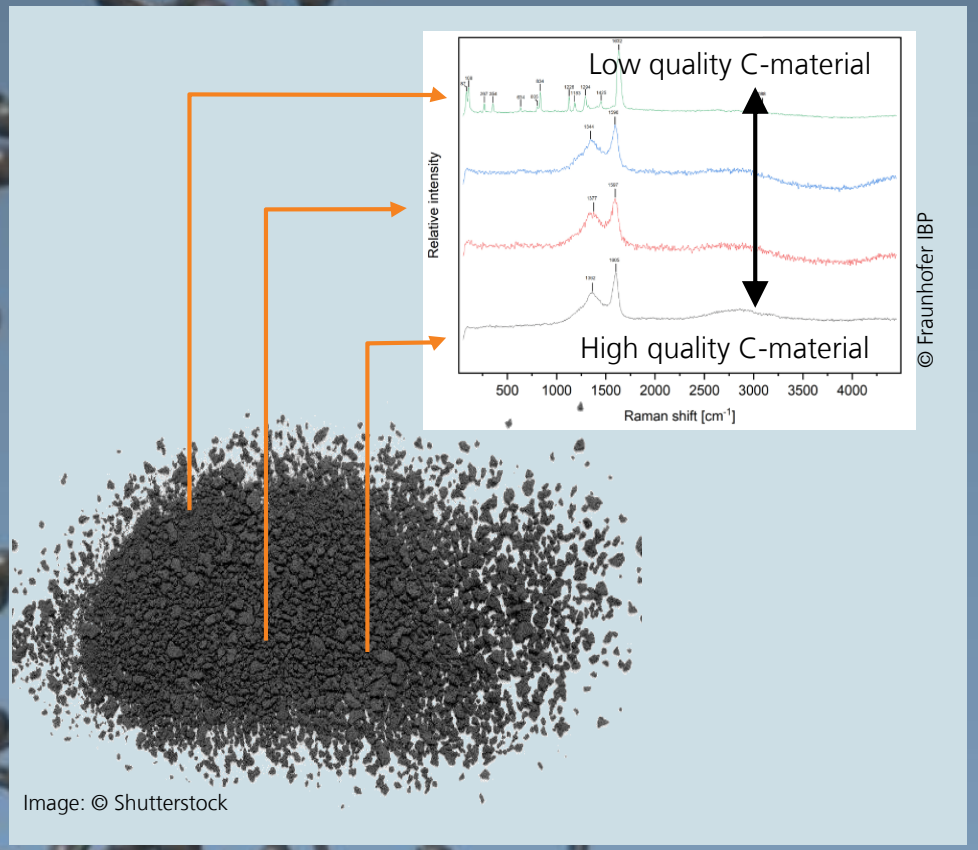


Image: © Shutterstock

Raw rCB | Quality

Characteristics of the carbon content

Image:© Fraunhofer IBP

Image: © Shutterstock

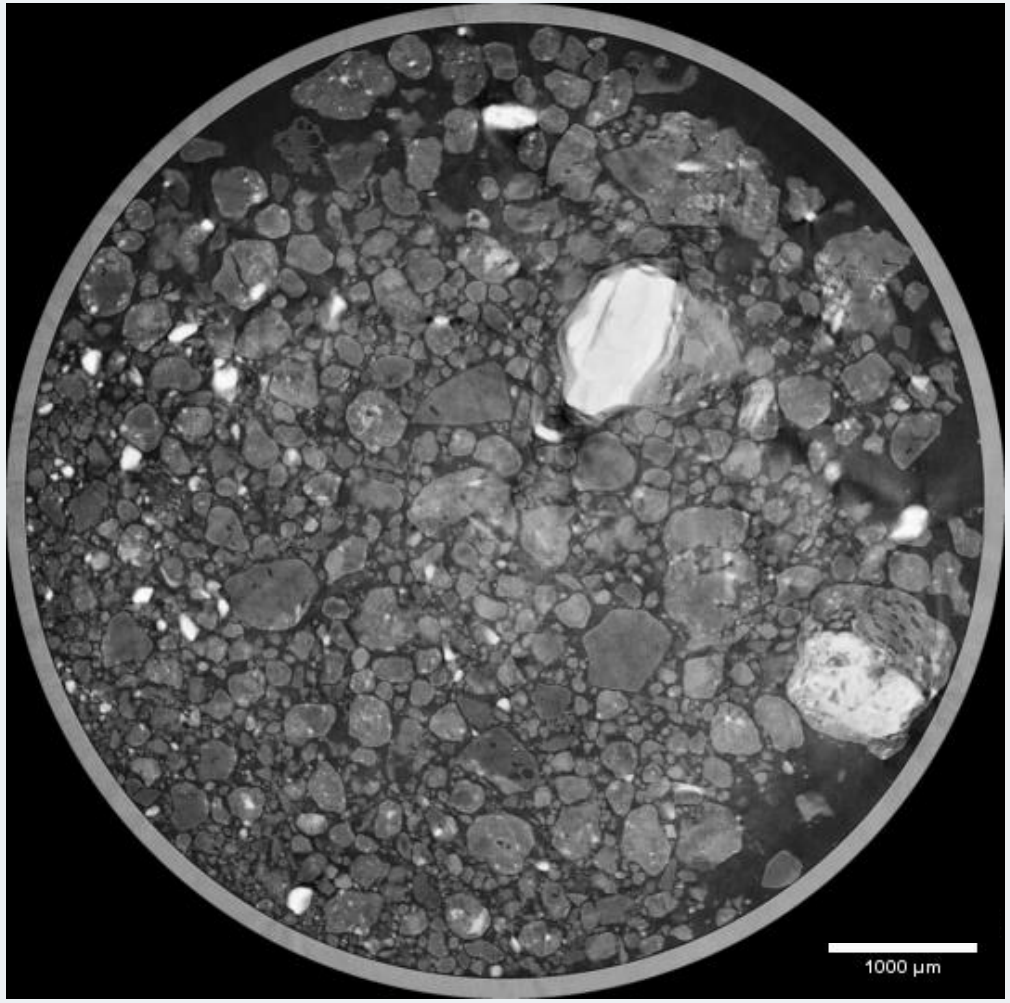
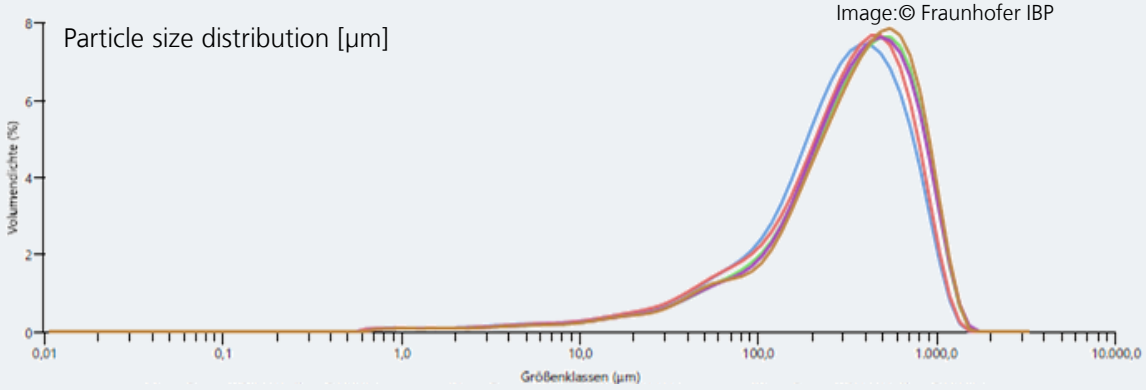


Image:© Fraunhofer IBP



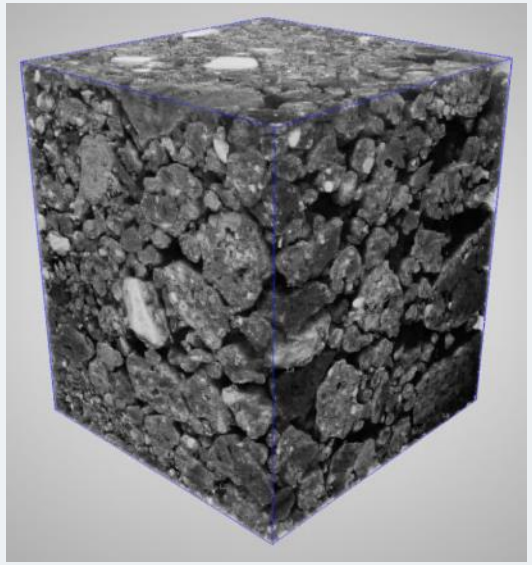
Raw rCB | Quality

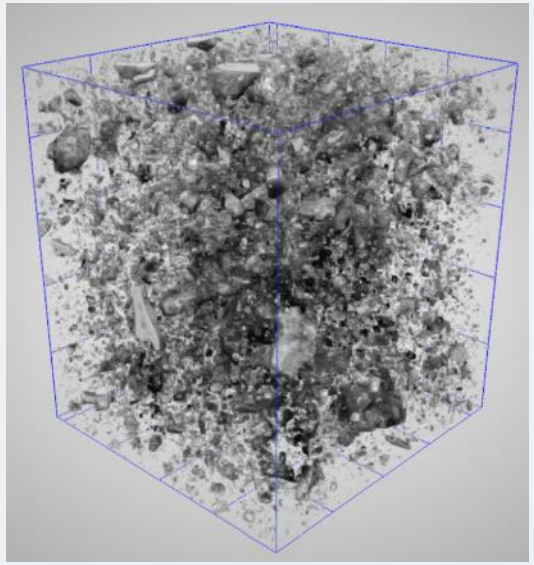
Particle morphology | Components

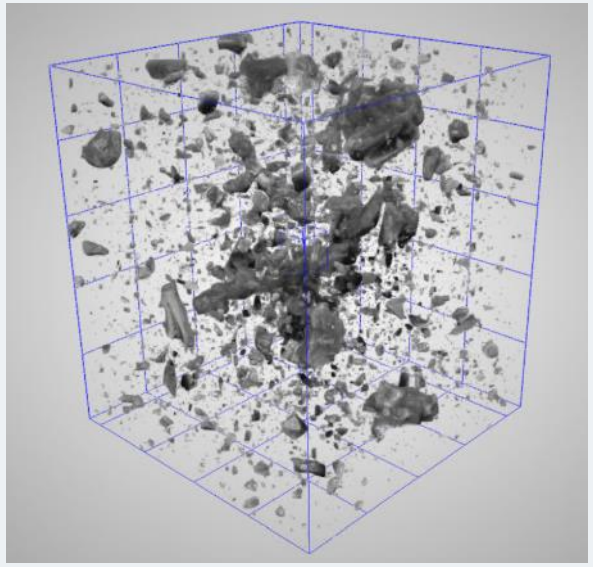
void, pores | carbon | gypsum, calcite, silicates | quartz, metal oxides | steel wire

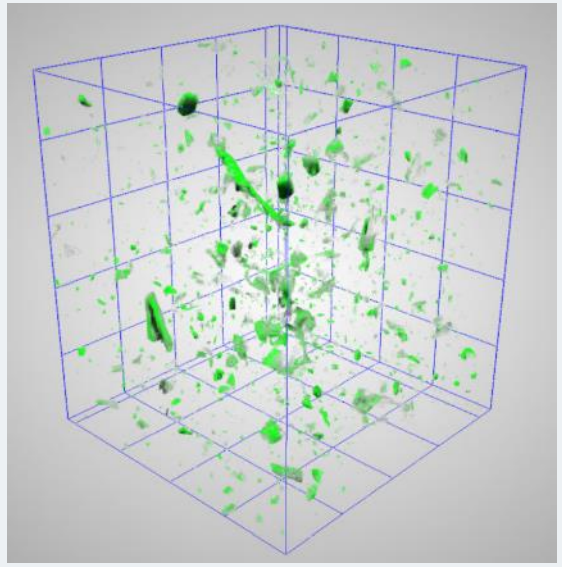
Low **Attenuation** **High**

Influenced by different parameters (source energy | thickness | particle size | density | etc.)





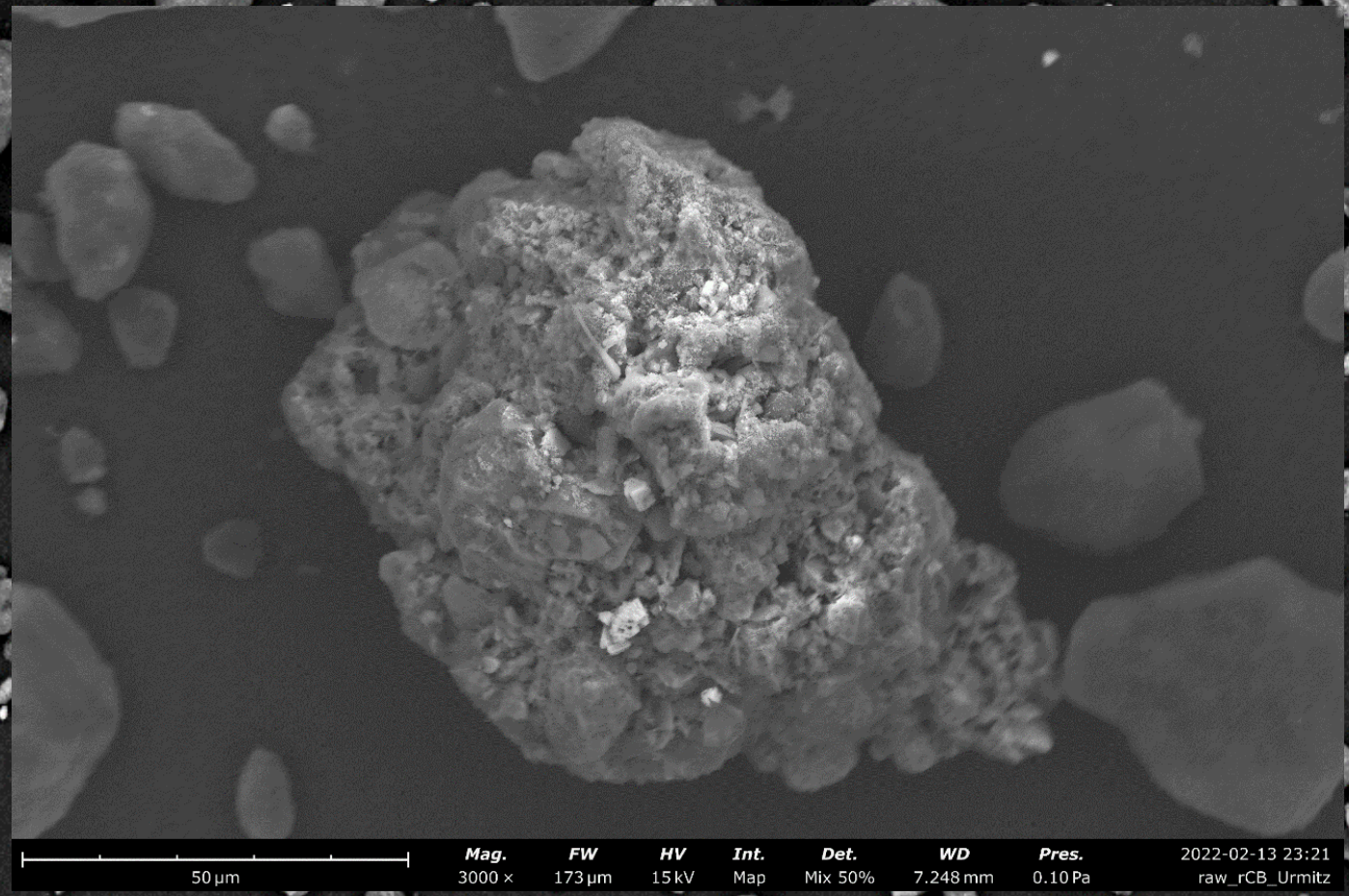




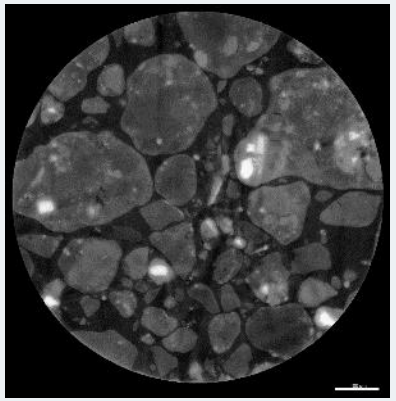
CT resolution 2,5 µm, 4,1x 4,1 x5 mm

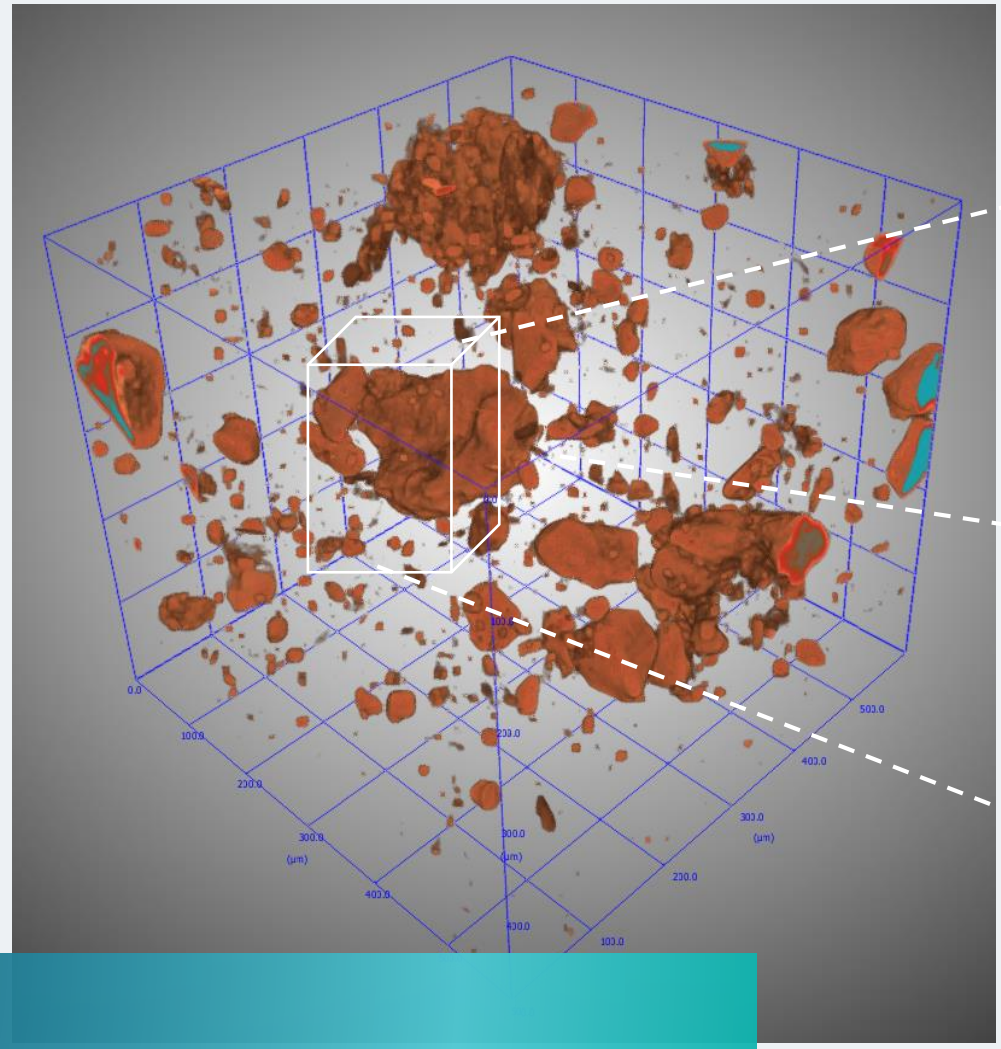
CT scan | raw rCB

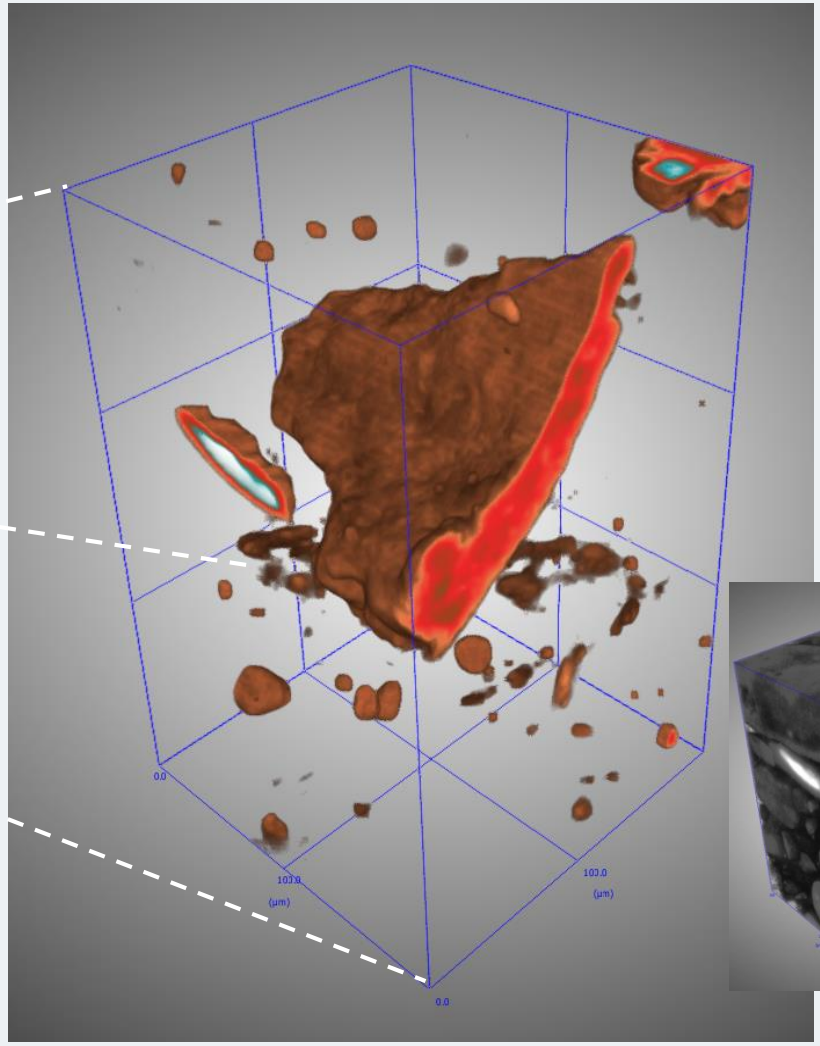
Segmentation of the components

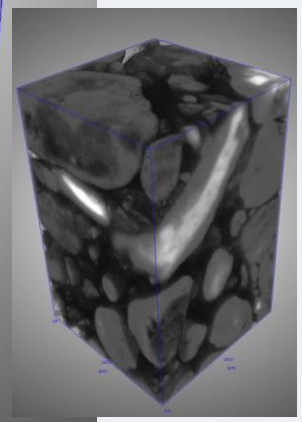


Details





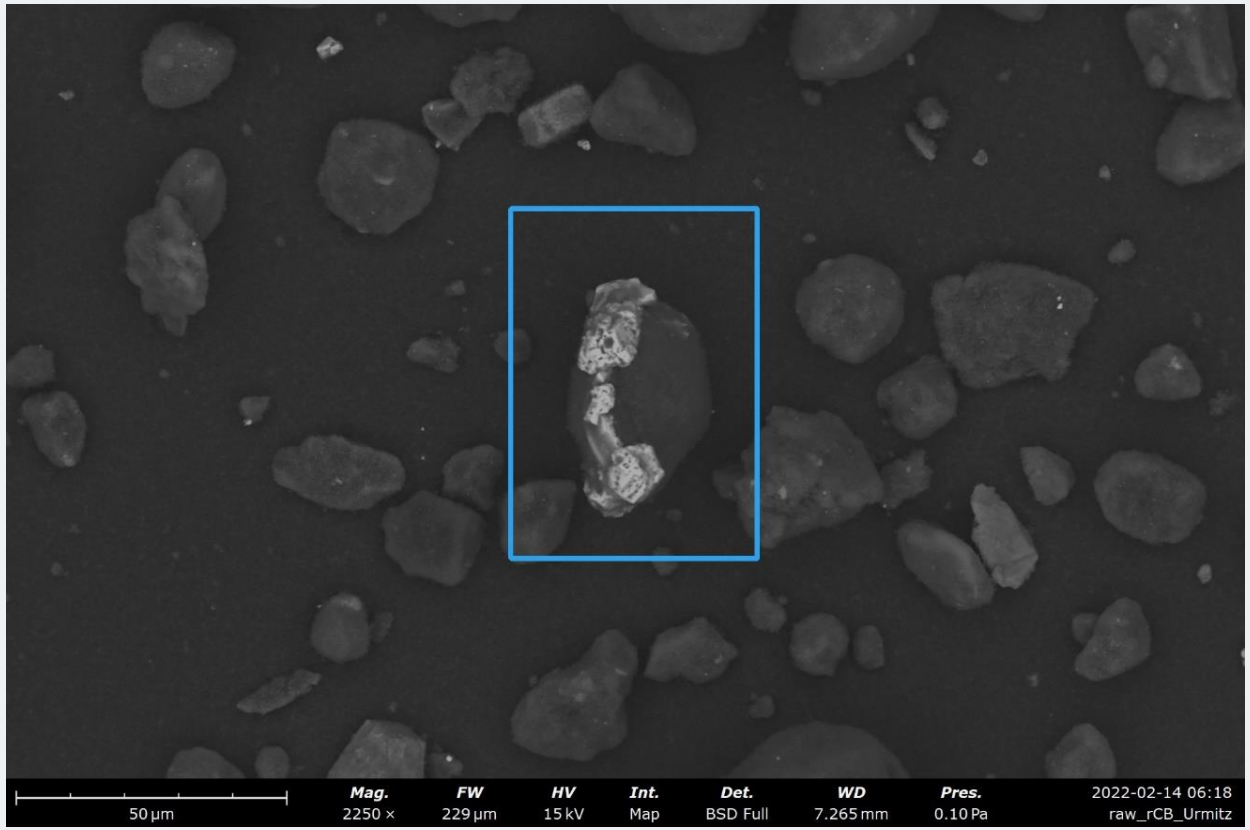


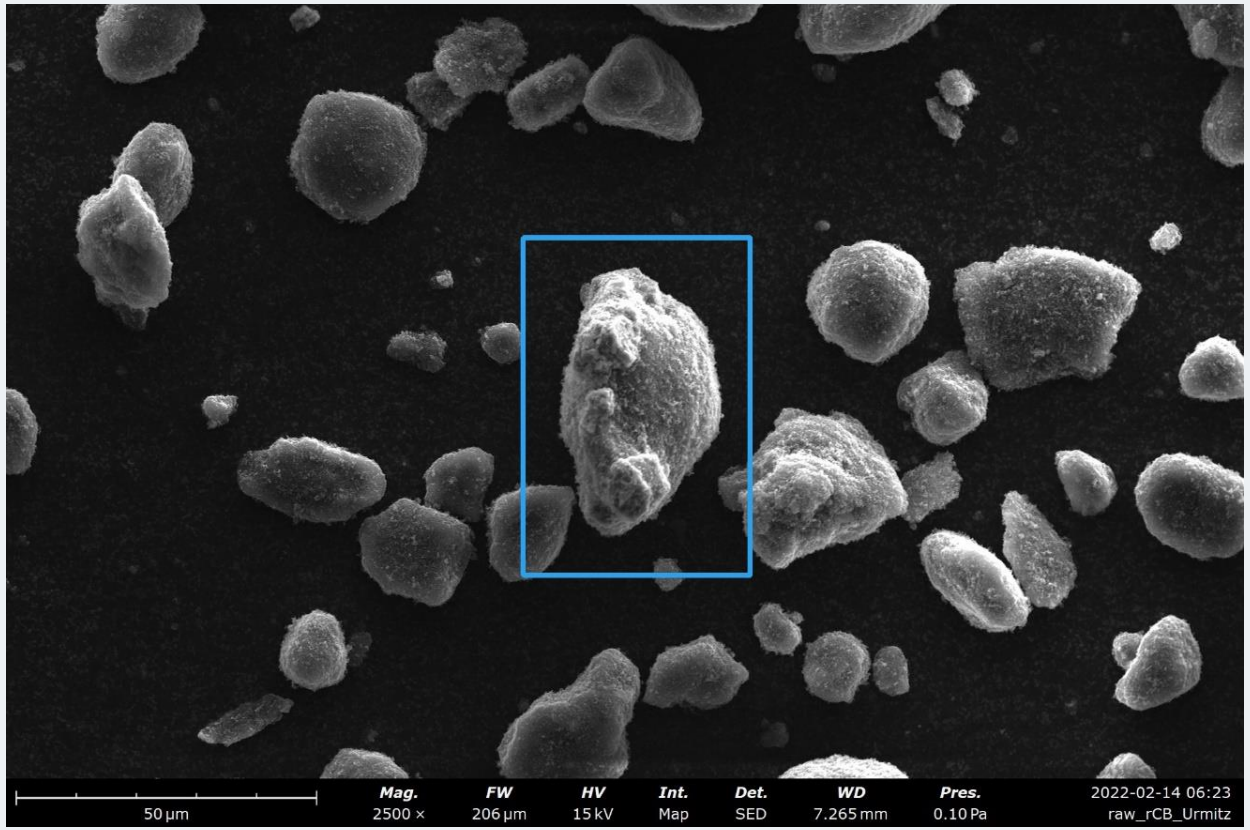


CT scan of raw rCB

Agglomerates & particle morphology | heterogeneous

CT resolution 0,5 µm





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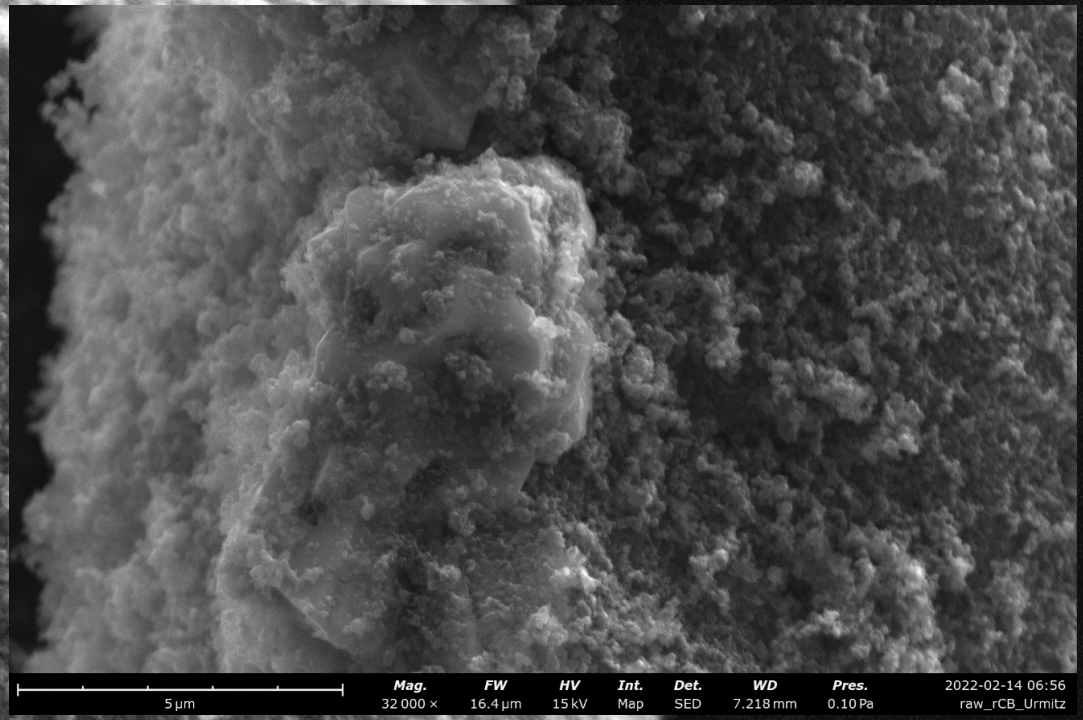

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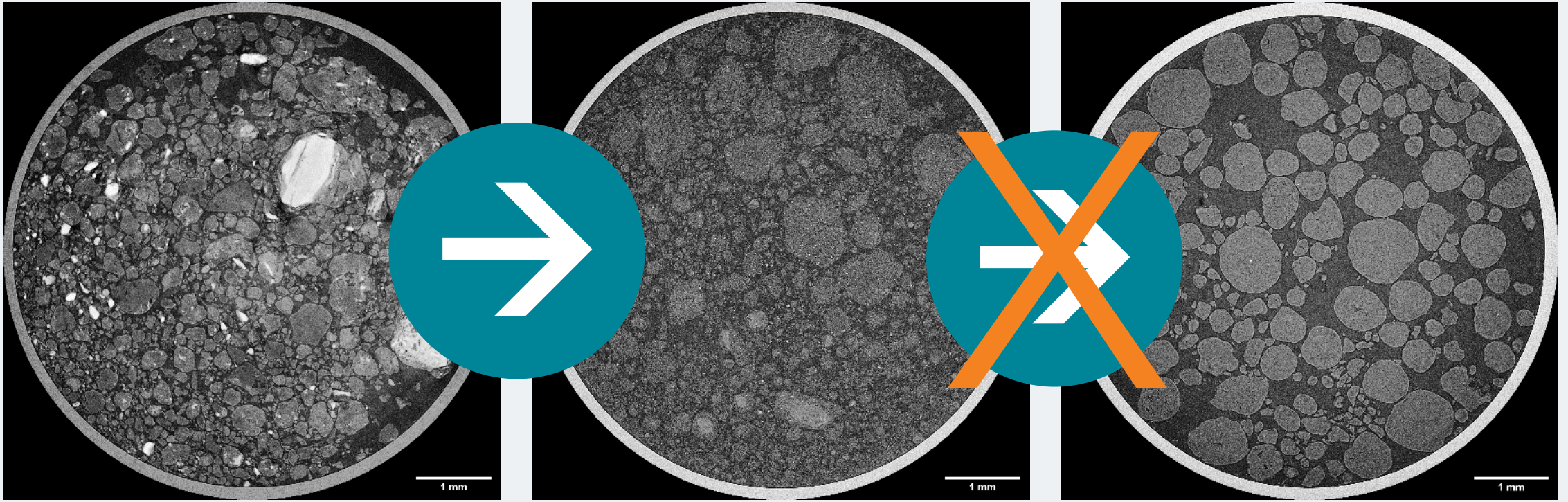
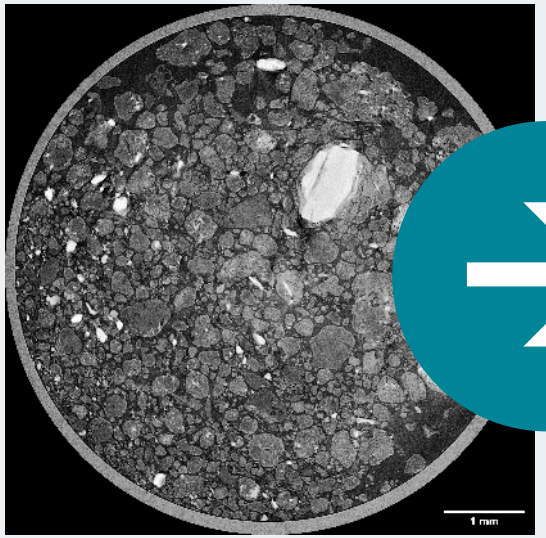


raw rCB **milled raw rCB** **required quality**

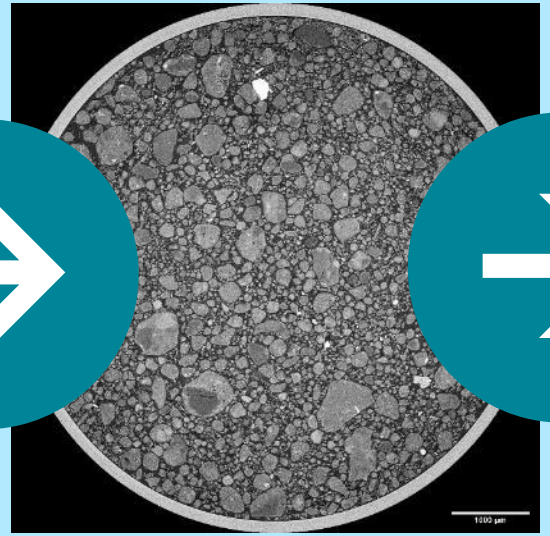
Current refinement of raw rCB

Quality boundaries

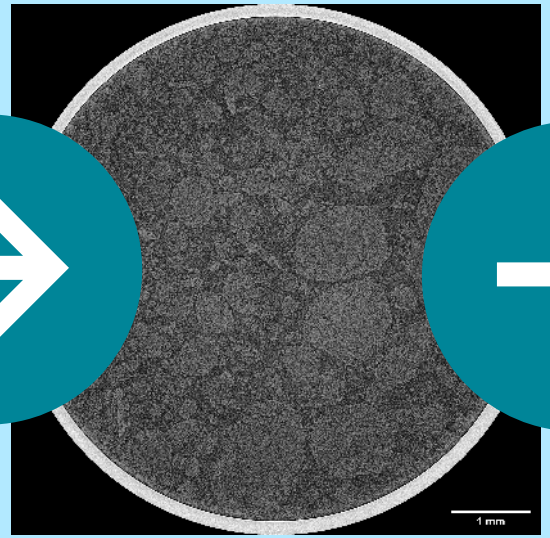
Physical and chemical treatment processes



raw rCB

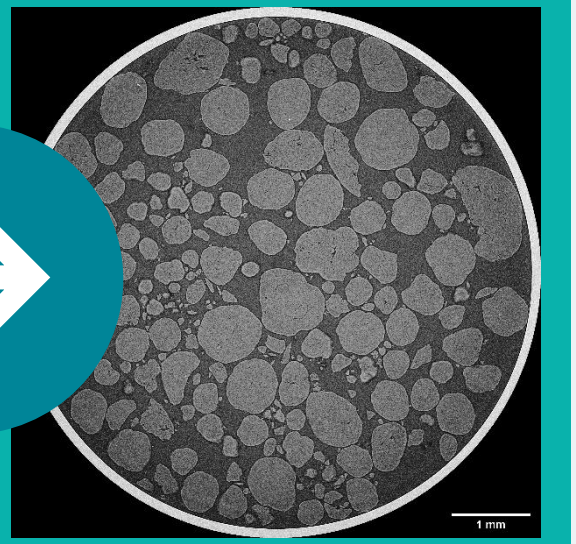


treated rCB



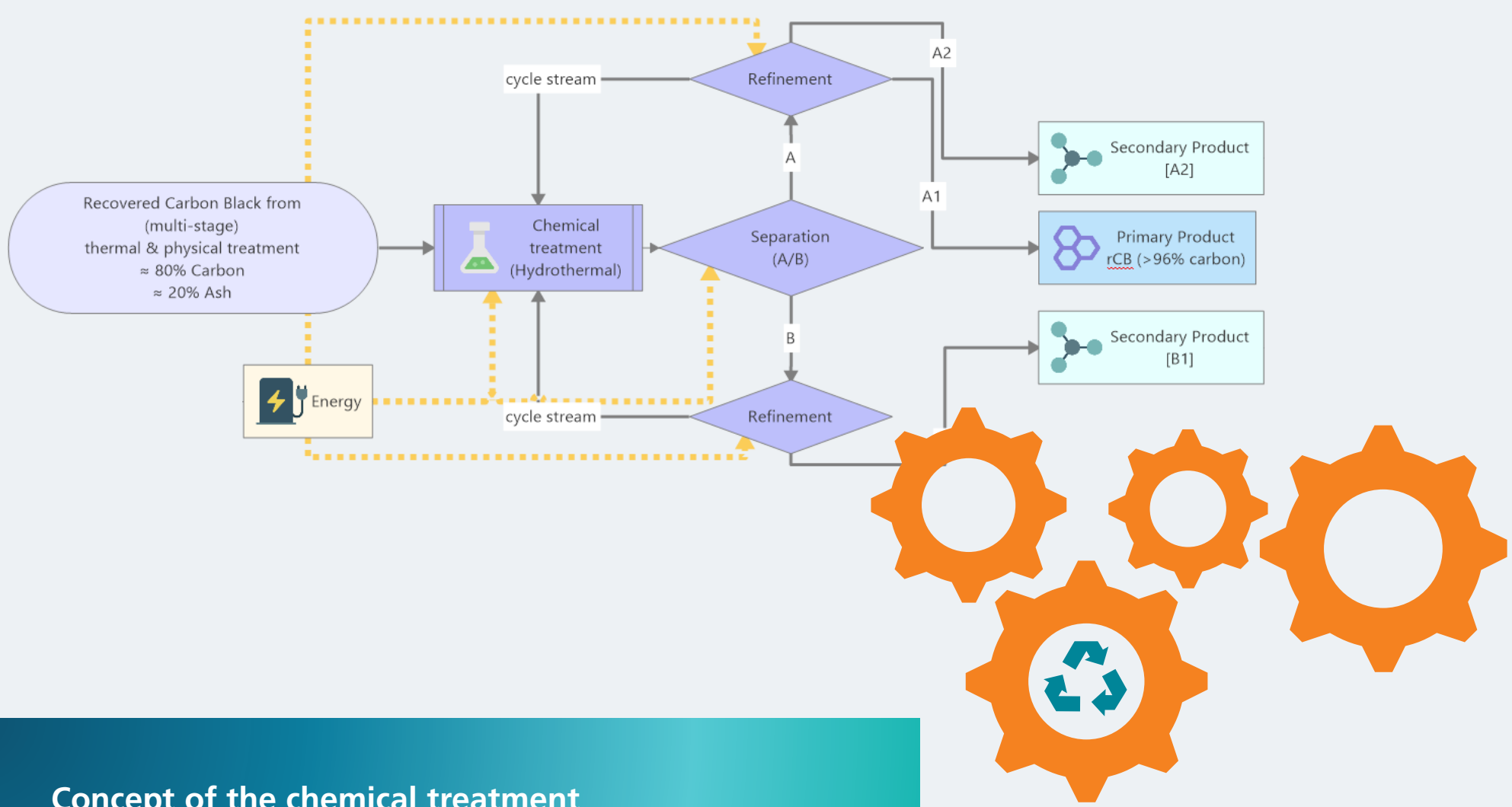
cleaned rCB

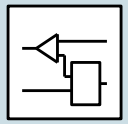
required quality



granulated rCB
properties comparable
to CB

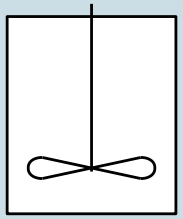
Refining process for rCB



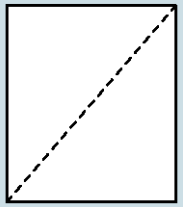


Plant Design

Control & Measurement



Mixing & Reactor Design



Separation & Membranes

Materials (e.g. stainless steel etc.)

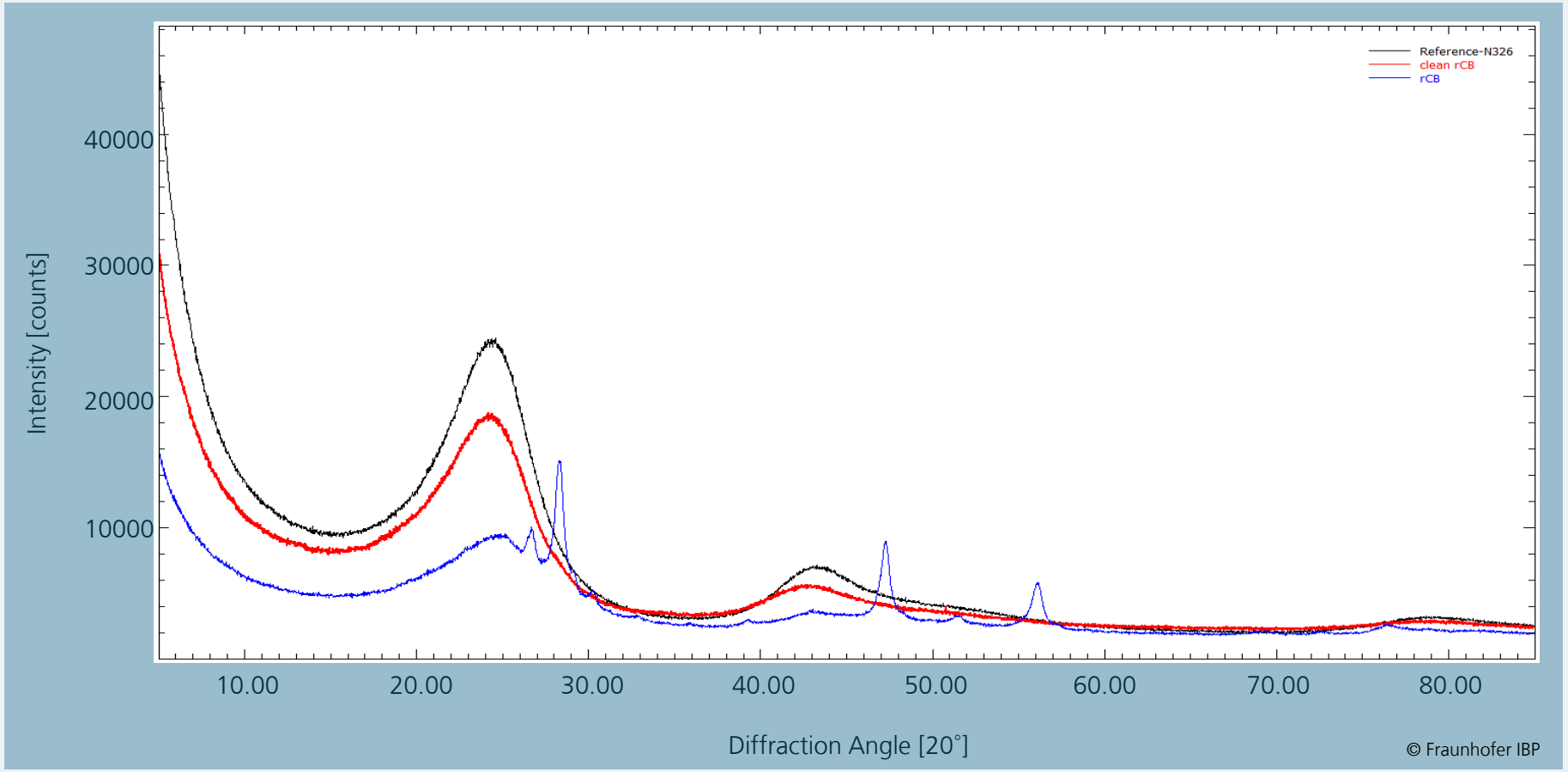
Concept of the chemical treatment

Process & Plant design

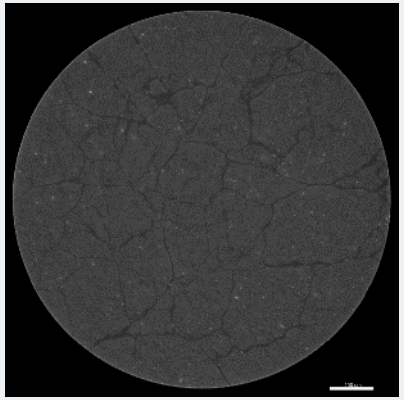
Reference
pure Carbon Black

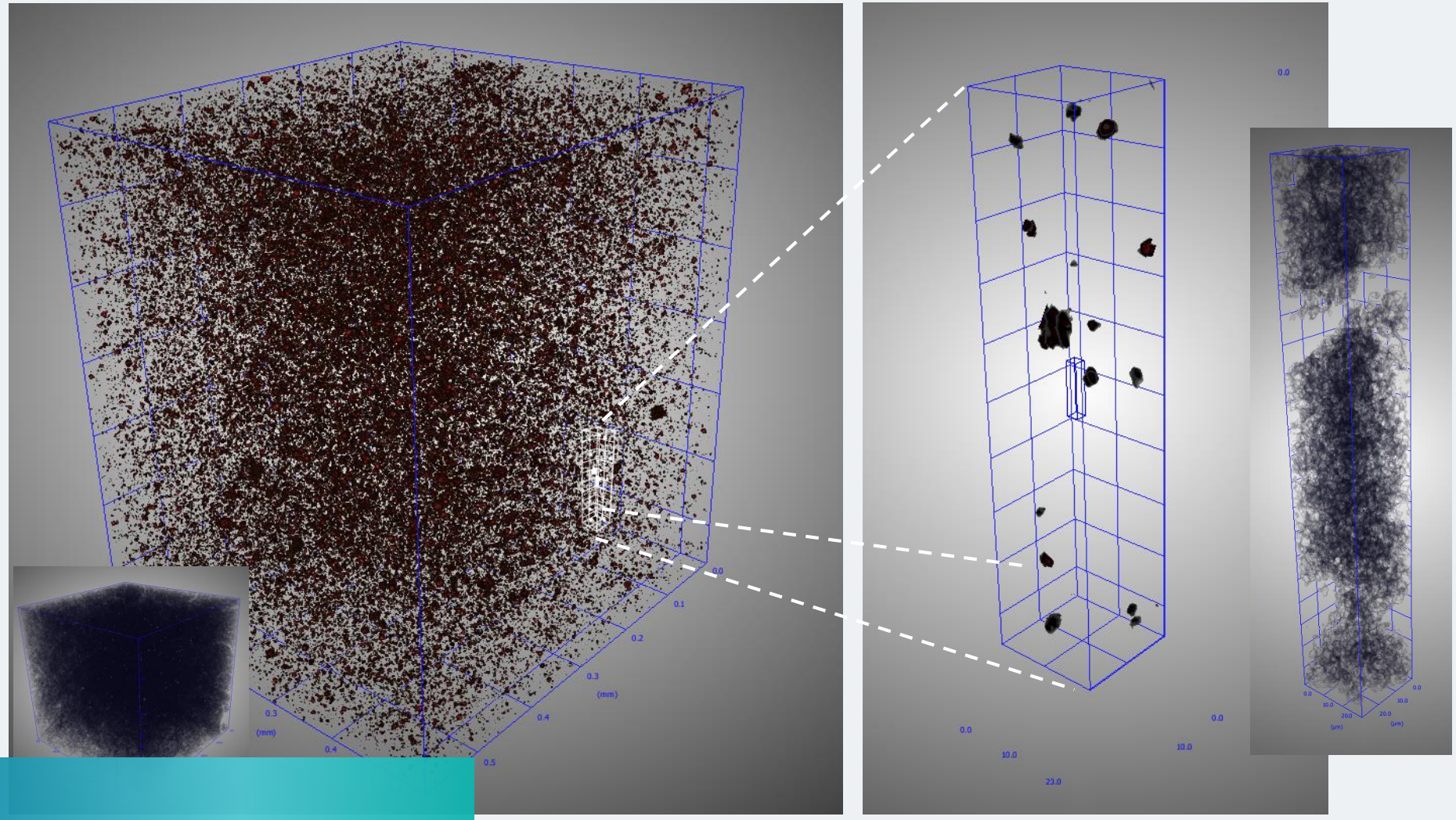
Recovered Carbon Black

Clean Recovered Carbon Black



Quality Evaluation





CT scan | cleaned rCB

Agglomerates & particle morphology | homogeneous

CT resolution 0,5 µm

Images: © Fraunhofer IBP

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