



ADVANCED
MATERIALS

MAGNIFIN

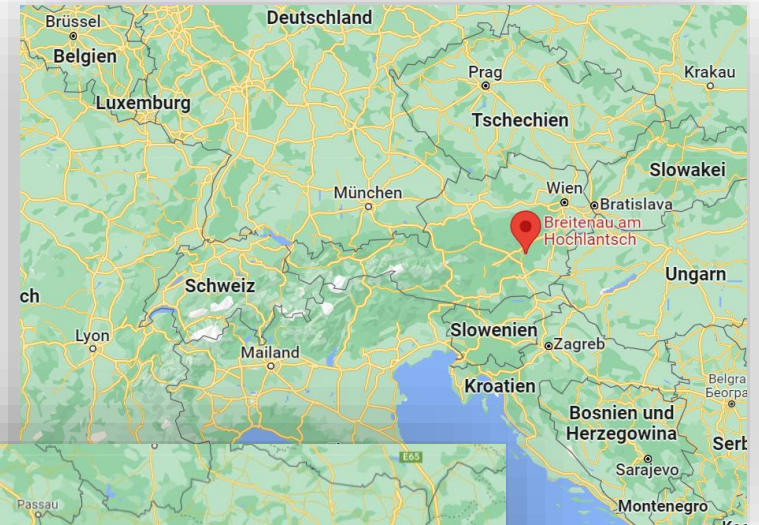
18.06.2026

Digitale Strömungsanalyse durch KI-gestützte
3D-Modelle in der Verfahrenstechnik



Magnifin – Willkommen in der Steiermark

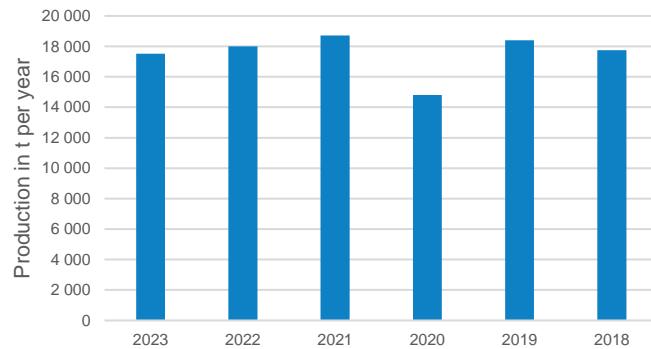
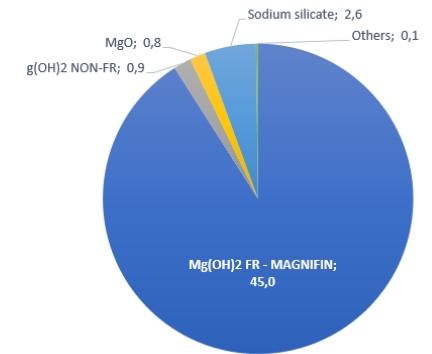
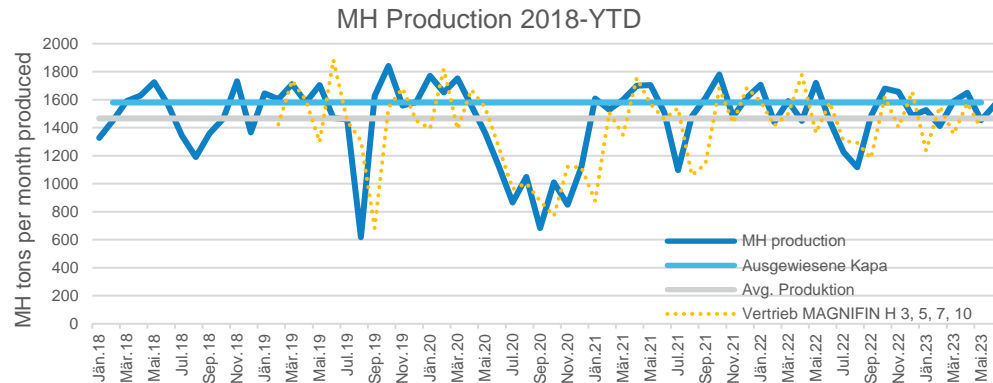
Company	MAGNIFIN Magnesiaprodukte GmbH & Co KG
Location	A-8614 Breitenau am Hochlantsch, Magnesitstr. 40
Foundation	October 1 st , 1990 as 50/50 JV Since 2021 100% J.M. Huber Corp./USA
Products	Magnesium hydroxide Magnesium oxide Sodium silicate Silica Functional refilling product



Operating figures

Net Sales 2023 ≈ 49Mio EUR

Mg(OH)₂, MgO, sodium silicate, functional refilling product



Mg(OH)₂ nameplate capacity ≈ 19.000tpy

Mg(OH)₂ proven capacity ≈ 18.000tpy

IMS certified elements

Quality ISO 9001:2015

Environmental ISO 14001:2015

Health and safety– ISO 45001:2018

Huber Advanced Materials Global Presence

800+

employees at plants

2

R&D Centers

30

people in sales and technical support

6

Manufacturing plants

400K+

MT Capacity

3

Customer Care Centers



North America

Fairmount, GA
Atlanta, GA
Kennesaw, GA
Marblehead, IL
Bauxite, AR

Europe

Bergheim, Germany
Breitenau, Austria

Asia

Qingdao, China

Part of J M. Huber Corporation A Portfolio Management, Family-Owned Company with Diverse Businesses



1883

J.M. Huber
founded in 1883

20

Operations in more
than 20 countries

130

Family-owned business
since over 130 years

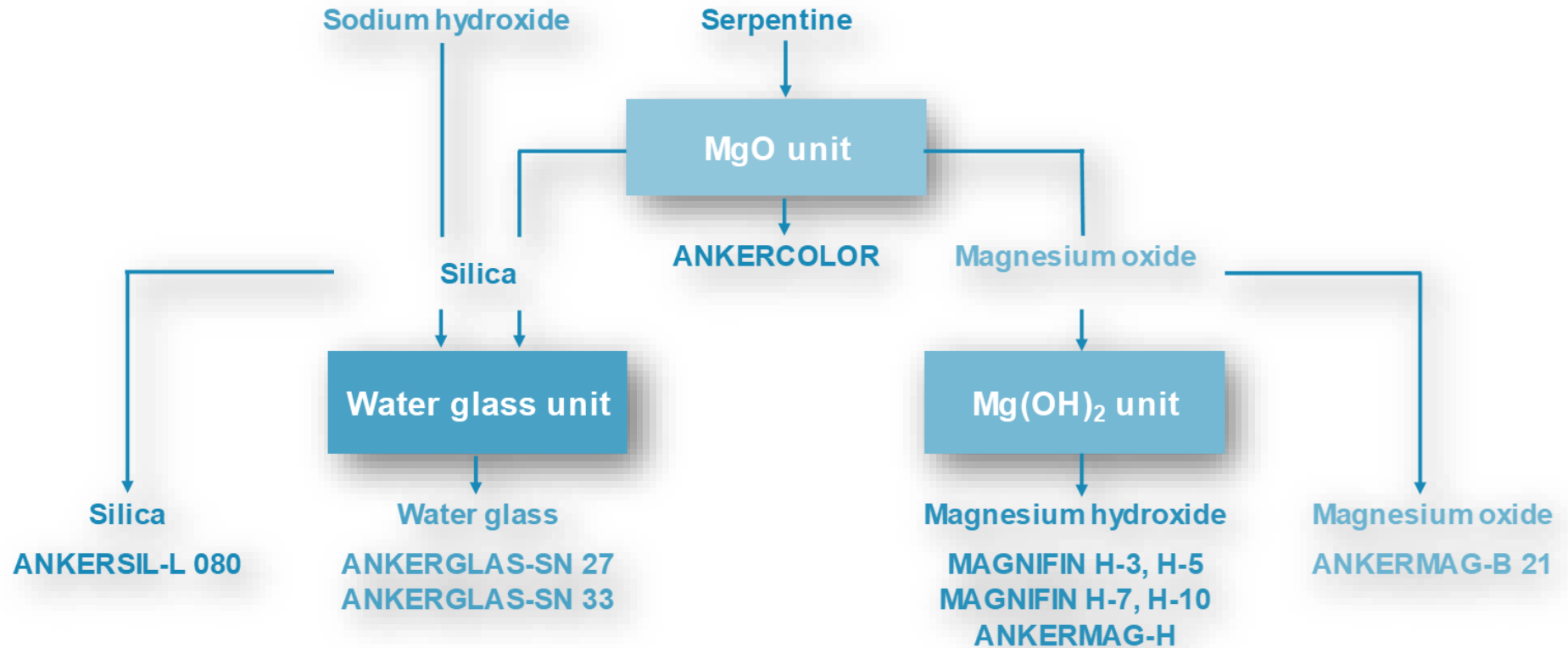
~ 4000

Over 4.000 employees
in 20 countries

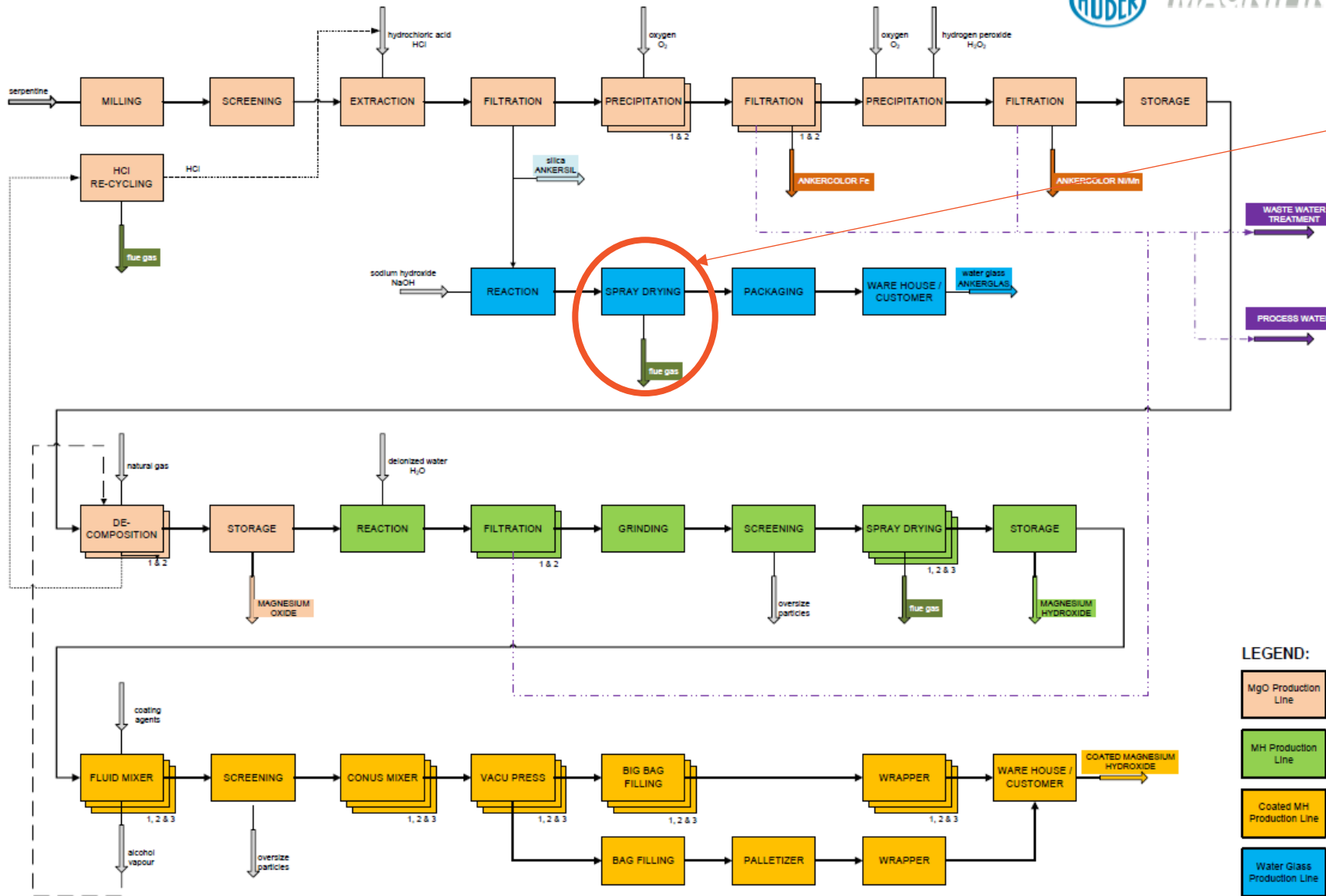
\$3.4

\$3.4 billion in
annual revenue

Material Flow



Process Flow

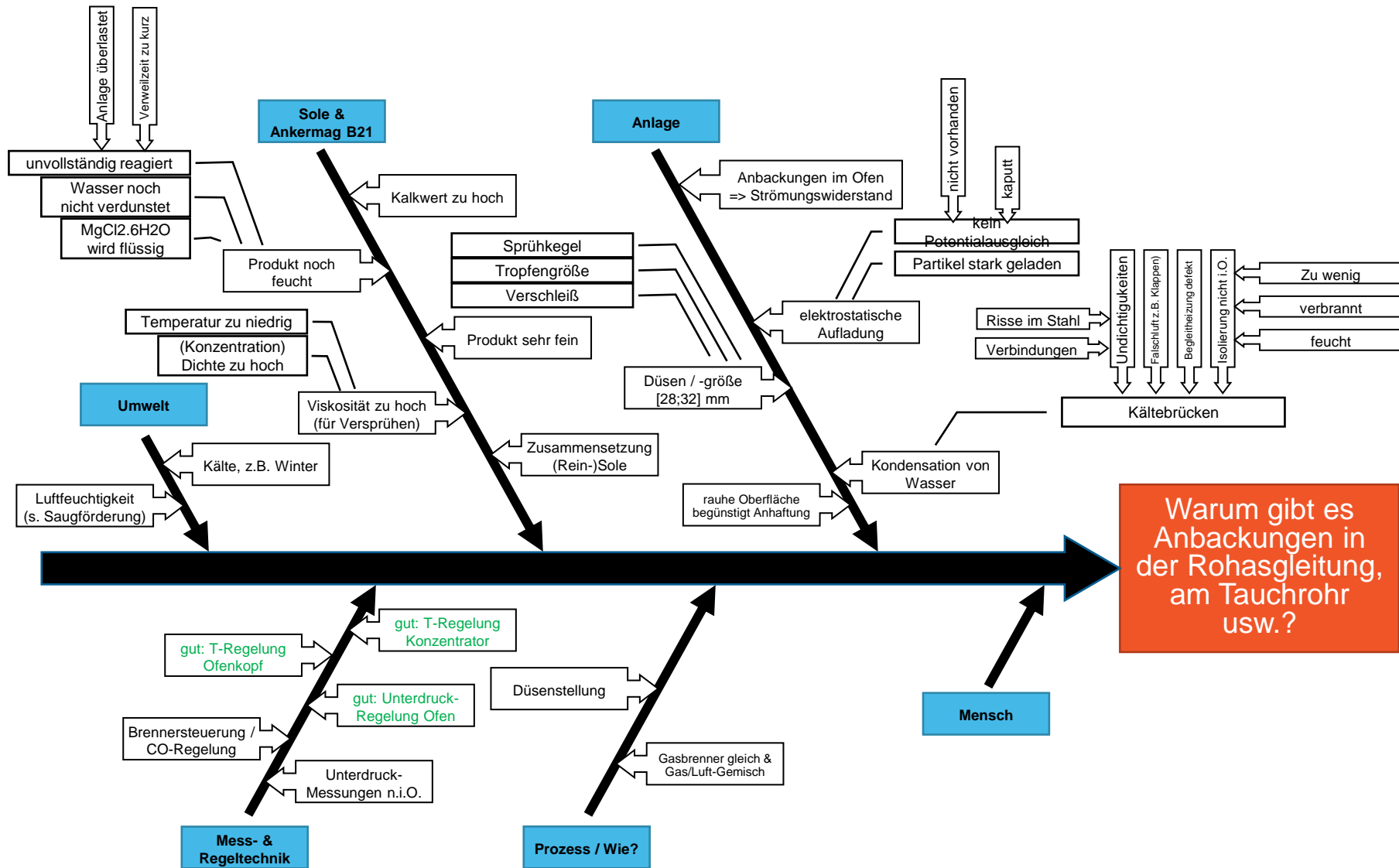


Spraydryer 1
Cleaning
every week

LEGEND:

- MgO Production Line
- MH Production Line
- Coated MH Production Line
- Water Glass Production Line

Problem Analysis



Application 3D – Modell Step1

Challenge:

- SRO1 has to be cleaned 4 times more often compared to SRO2
- aim is to increase availability with a capacity gain of 1000t MgO (= 1390t MDH) / year

Method:

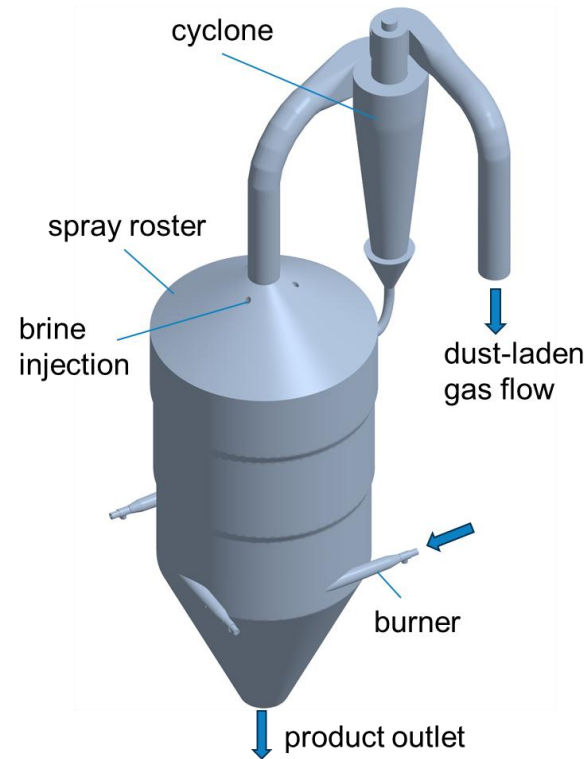
- use spray roaster digital twin to calculate the coupled momentum, energy and species transport in a reactive fluid flow system

Recent results:

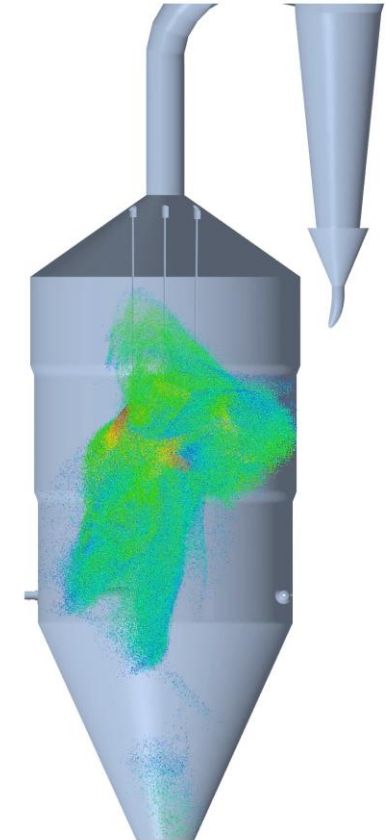
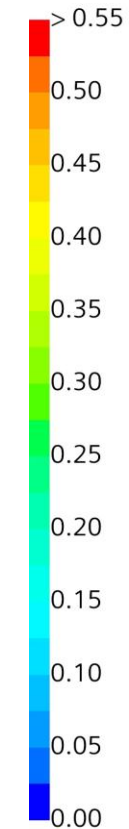
- digital twin adequately replicates the behavior of the real device
- unstable flow field in spray roaster results in non-periodic transport of moist particles towards cyclone
- reduced moist particle transport by equalizing single burner load
- system is highly sensitive to boundary condition changes

Next steps:

- Implementation of results from digital spray roaster twin to reality (manually)
- Automation of burner controls for both spray roasters
- Optimization of spray roaster availability
- Implementation of KI with Data for analysis and adaptation



Particle Mass Fraction of H₂O



Application 3D – Modell Step2

Method:

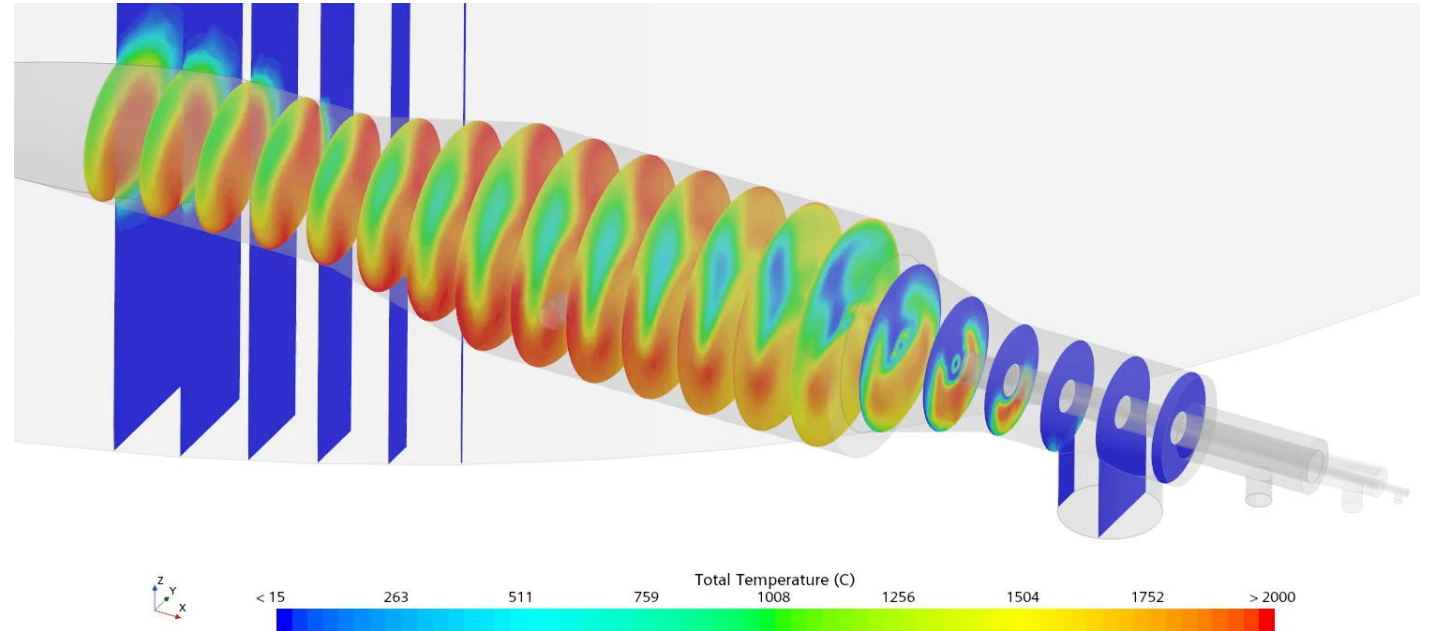
- Use of Digital Twin for Burner Temp and Flow analysis

Recent Results:

- The burner simulation indicates the presence of cold zones that prevent the gas-air mixture from being transported in the desired flow direction.

Next steps:

- Automation of burner controls for both spray roasters
- Optimization of spray roaster availability
- Implementation of KI with Data for analysis and adaptation



KI - Implementation

Data Quality

- Retrofitting der Sensorik, um hier die Qualität zu erhöhen
- Spitzen erkennen
- Messdaten mit Modell abgleichen
- Daten aus verschiedenen Quellen zusammenführen
-

Root Cause Analysis

- Wirkungsgrad Analyse
- Welche Betriebszustände zu Abweichungen führen
- ...

Virtuelle Experimente

- Simulationsläufe selbstständig durchführen
- Parameterkombinationen vergleichen
- Optimum finden
- ...

Predictive Maintenance

Prozessoptimierung in Echtzeit

Generative Design

Hybrid Digital Twin