

## Main project objectives

The main objective of our project is to determine the relationship between the rheological properties of solutions and the drying rate as well as the morphological properties of powders produced by spray drying. The project was divided into individual steps:

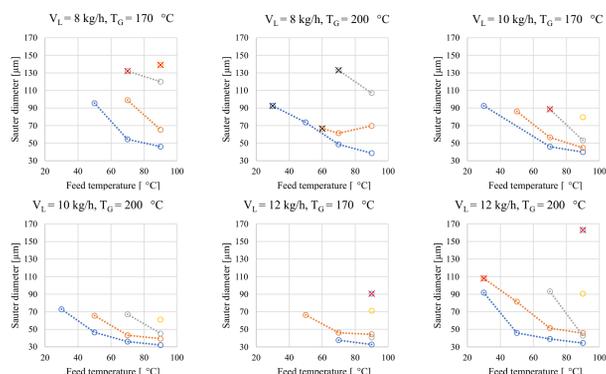
- Carrying out measurements of the rheological properties of solutions intended for spray drying in a wide range of concentrations and temperatures.
- Carrying out spray drying experiments on a semi-industrial co-current drying tower and analyzing the obtained powder samples.
- Design and construction of a station to determine the kinetics of the drying of droplets in free fall.

## Spray drying experiments results

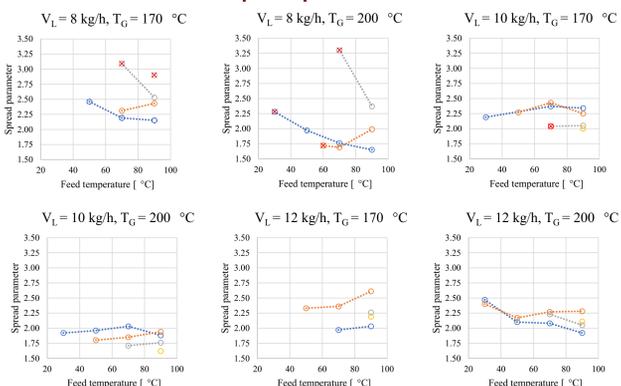
Initial feed concentration:

30% 35% 40% 45% 50%

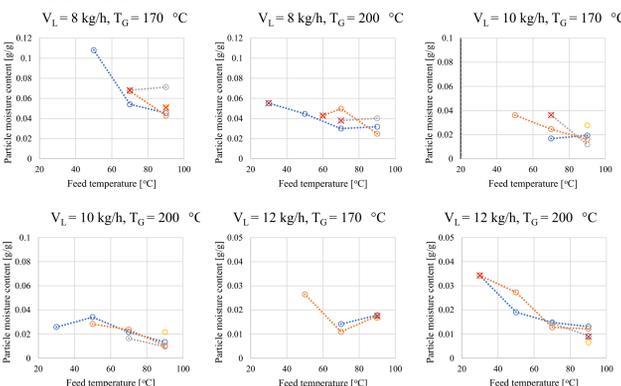
### Mean Sauter diameter



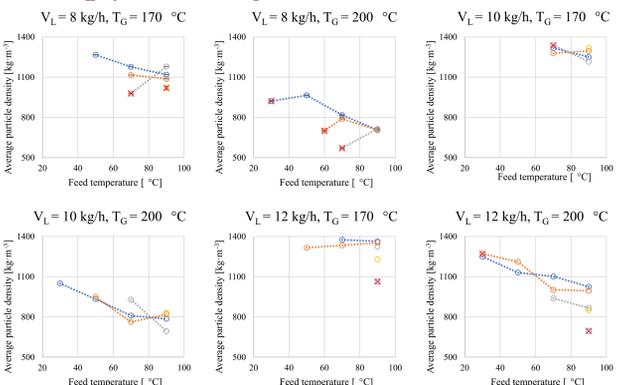
### RR size distribution-spread parameter



### Moisture content



### Average particle density

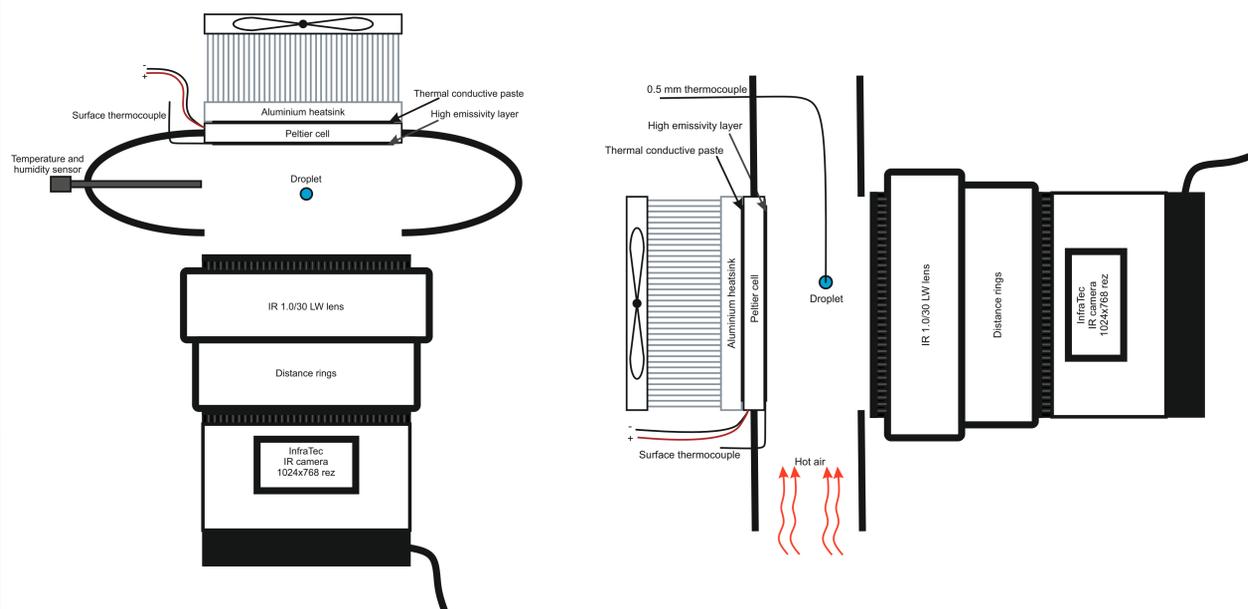


## Next steps

- In the near future, we want to focus on:
- construction of a column to study drying kinetics by IR.
  - conducting studies to determine drying curves for DE12 maltodextrin solutions with different initial concentrations and droplet diameters.

## IRTUC

(InfraRed Temperature for Unknown Coefficients)

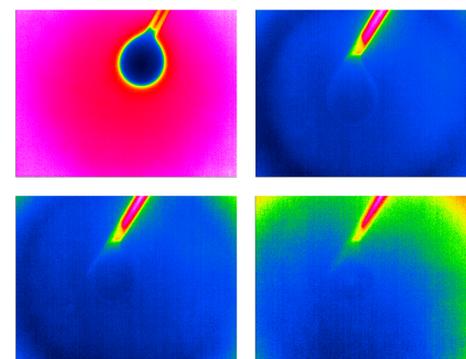


Lab air:  
temperature = 22.3 °C  
Humidity = 31.2 %

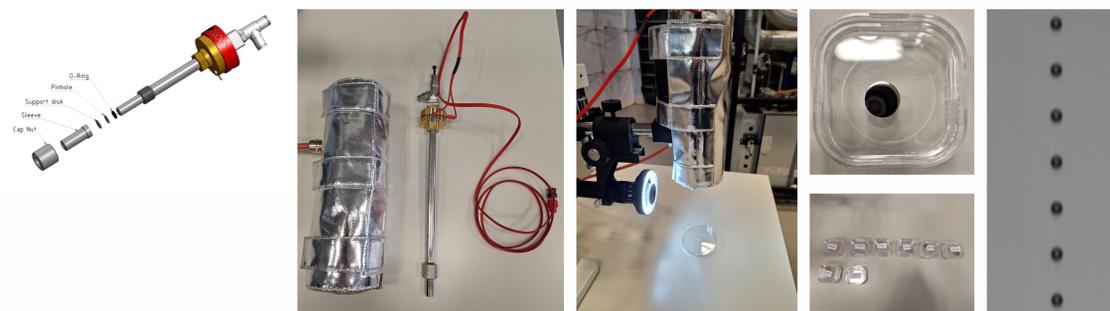
wet-bulb temperature = 12.8 °C  
Droplet temperature: = 14.1 °C  
Peltier surface temperature: = 12 °C

Lab air:  
temperature = 100 °C  
Humidity < 1 %

wet-bulb temperature = 40.9 °C  
Peltier surface temperature: = 41.2 °C



## Monodisperse droplet generator



Tests of new droplet generator, plate with pinhole, generated droplet chain.

## Microscopy analysys

	30%	35%	40%	45%	50%	30%	35%	40%	45%	50%
8 kg/h 200° C										
8 kg/h 170° C										
12 kg/h 200° C										

