

Supplementary Materials

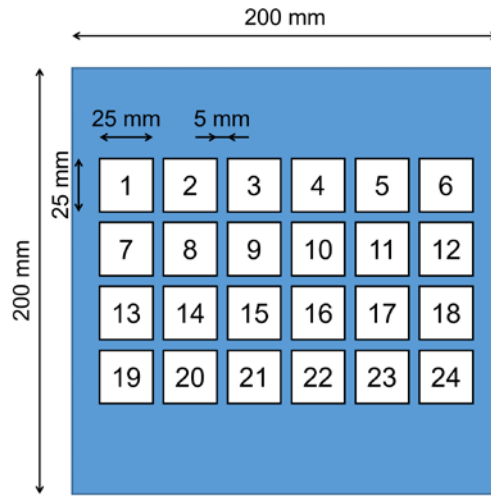


Figure S1. Schematic top view of the arrangement of the 24 samples of tylose gel (white) on the product support (blue).

Table S1. Average forward power and average chamber pressure in the experiments comparing termination criteria.

Experiment	Average forward Power \bar{P}_f / W	Average Chamber Pressure \bar{p}_c / mbar
Partial drying - run 1	28.57	0.47
Partial drying - run 2	29.22	0.47
Partial drying - run 3	28.34	0.46
Complete drying	20.61	0.50

Table S2. Average forward power and average chamber pressure in the experiments of the parameter study on chamber pressure.

Experiment	Average Forward Power \bar{P}_f / W	Average Chamber Pressure \bar{p}_c / mbar
$p_{set} = 0.2$ mbar - run 1	16.86	0.19
$p_{set} = 0.2$ mbar - run 2	13.52	0.19
$p_{set} = 0.2$ mbar - run 3	15.03	0.19
$p_{set} = 0.5$ mbar - run 1	17.36	0.47
$p_{set} = 0.5$ mbar - run 2	18.02	0.47
$p_{set} = 0.5$ mbar - run 3	17.90	0.47
$p_{set} = 1.0$ mbar - run 1	14.26	0.87
$p_{set} = 1.0$ mbar - run 2	16.17	0.87
$p_{set} = 1.0$ mbar - run 3	14.59	0.87

Table S3. Average forward power and average chamber pressure in the experiments of the parameter study on microwave power.

Experiment	Average Forward Power \bar{P}_f / W	Average Chamber Pressure \bar{p}_c / mbar
$r_{on} = 0.25$ - run 1	17.36	0.47
$r_{on} = 0.25$ - run 2	18.02	0.47
$r_{on} = 0.25$ - run 3	17.90	0.47
$r_{on} = 0.50$ - run 1	42.02	0.47
$r_{on} = 0.50$ - run 2	46.21	0.46
$r_{on} = 0.50$ - run 3	24.64	0.47
$r_{on} = 0.75$ - run 1	42.49	0.47
$r_{on} = 0.75$ - run 2	53.15	0.47
$r_{on} = 0.75$ - run 3	48.17	0.47
$r_{on} = 0.75$ - run 4	36.74	0.47
$r_{on} = 1.00$ - run 1	35.13	0.47
$r_{on} = 1.00$ - run 2	46.83	0.47
$r_{on} = 1.00$ - run 3	46.88	0.47
$r_{on} = 1.00$ - run 4	40.64	0.47

Table S4. Average forward power and average chamber pressure in the experiments of the parameter study on microwave frequency.

Experiment	Average Forward Power \bar{P}_f / W	Average Chamber Pressure \bar{p}_c / mbar
1MF - run 1	19.00	0.46
1MF - run 2	18.14	0.47
1MF - run 3	18.31	0.46
1RF - run 1	27.53	0.45
1RF - run 2	28.05	0.47
1RF - run 3	26.59	0.47
6EF - run 1	28.57	0.47
6EF - run 2	29.22	0.47
6EF - run 3	28.34	0.46
6RF - run 1	32.95	0.47
6RF - run 2	33.31	0.47
6RF - run 3	31.25	0.47

Table S5. Applied frequencies during the parameter studies on chamber pressure and microwave power.

Set Chamber Pressure			
$p_{c,set}$ / mbar	0.2	0.5	1.0
Frequency f_1 / MHz	2441.3	2449.6	2449.6
Frequency f_2 / MHz	2450.0	2456.2	2456.1
Frequency f_3 / MHz	2456.3	2467.3	2464.6
Frequency f_4 / MHz	2468.4	2470.7	2472.5
Frequency f_5 / MHz	2470.2	2475.1	2475.2
Frequency f_6 / MHz	2475.9	2497.2	2497.1

Table S6. Applied frequencies during the parameter study on microwave frequency.

Control Concept	1MF	1RF	6EF	6RF
Frequency f_1 / MHz	2432.0	2449.8	2400.0	2449.7
Frequency f_2 / MHz	-	-	2420.0	2456.2
Frequency f_3 / MHz	-	-	2440.0	2465.2
Frequency f_4 / MHz	-	-	2460.0	2466.4
Frequency f_5 / MHz	-	-	2480.0	2472.5
Frequency f_6 / MHz	-	-	2500.0	2474.8

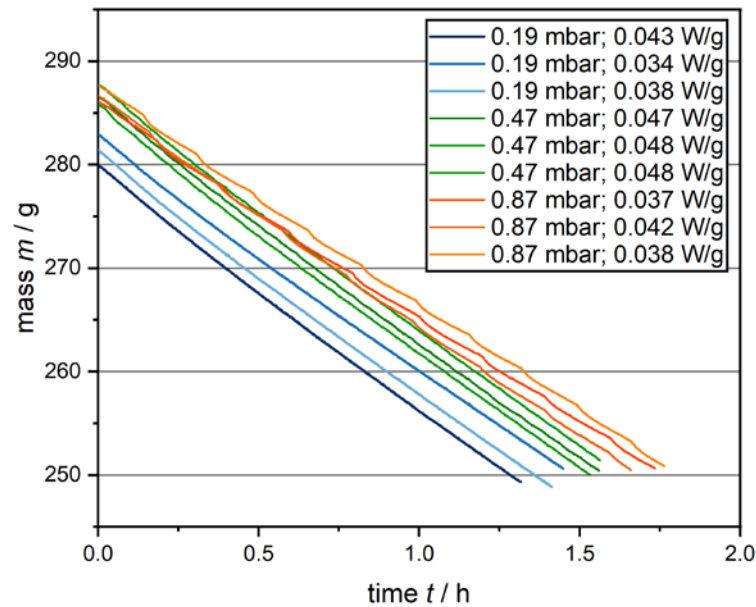


Figure S2. Drying kinetics for experiments of the parameter study on chamber pressure. The values in the legend represent the average chamber pressure and the average specific dissipated power for the experiments.

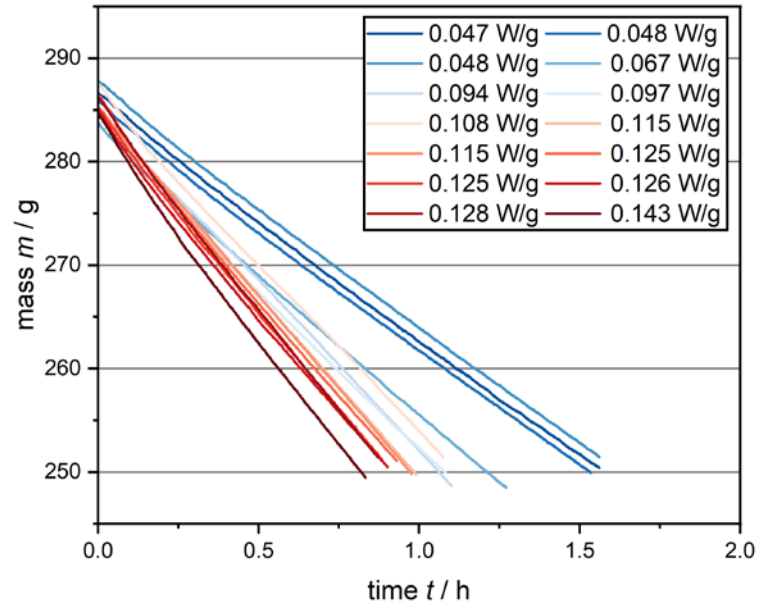


Figure S3. Drying kinetics for experiments of the parameter study on microwave power. The powers in the legend are the average specific dissipated power for every experiment.

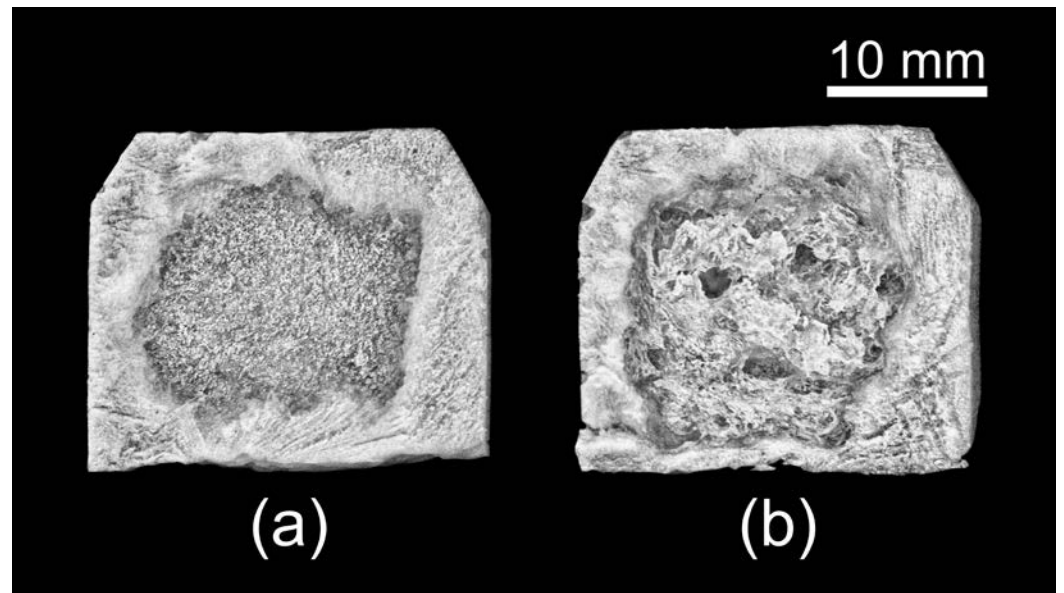


Figure S4. Exemplary pictures of tylose gel samples in gray-scale: (a) Intact sample, (b) puffed sample. While both samples show a fine-pored structure in the dried outer layer, large pores in the center of the sample can only be observed for the puffed sample.

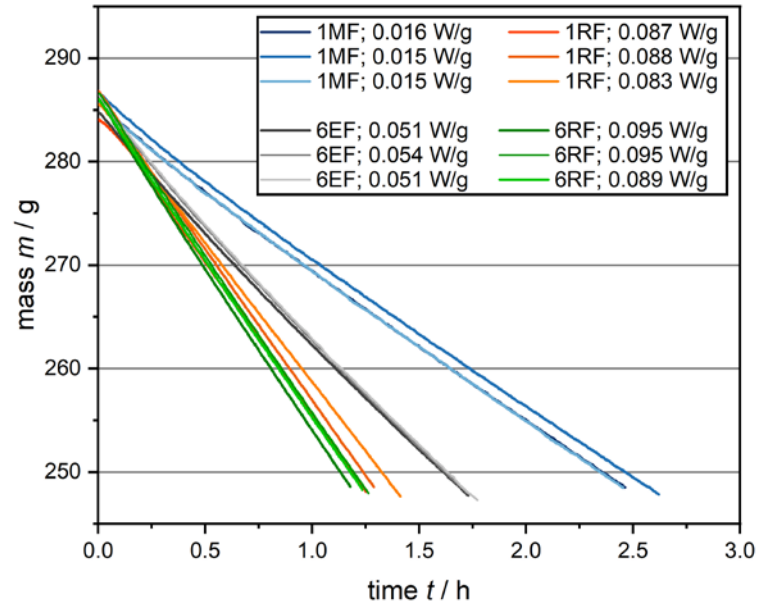


Figure S5. Drying kinetics for the frequency-based control concepts in the parameter study on microwave frequency. The legend contains the frequency-based control concepts and the average specific dissipated powers for every experiment.