FhG ICT – Pulping technologies

Fraunhofer ICT has several high-pressure batch and continuous reactors up to 40 dm^3 volumes and up to 12 dm^3/h volume flows, up to 650 °C and up to 450 bar which can be used in pulping. Fraunhofer ICT has also different tools to analyze pulping fractions especially lignin and lignin derivatives.

Table 3. **Fraunhofer ICT reactors for pulping.**

Volume [L]	**Reactor type**	**Brand**	**Agitator**	**p_{max} [bar]**	**T_{max} [°C]**
0,1	100 mL Autoclave		Turbin	200	300
0,3	250 mL Hydrogen autoclave	Parr	Turbin	400	500
0,5	500 mL Berghof Autoclave	Berghof	Anchor & Gas injection	200	300
2,0	2 L Autoclave	Hofer Hochdrucktechnik	Propeller	325	400
13,0	13 L Autoclave	Sigmar Mothes	Double turbine & Gas injection	250	400
15,0	2x15 L Duoraf	Parr	Turbine	50	250
0,3	291 mL Packed bed reactor	Sitec		350	650
0,3	250 mL Autoclave		Magnetic stirrer	350	200
2,0	Colon	Sitec		450	200
1,9	Autoclave	Sitec			
5,0	5 L Reactive Extractor 1	Sitec			
5,0	5 L Reactive Extractor 1	Sitec			

Fraunhofer ICT has also extensive available analysis tools such as: HPLC, GC-MS-FID, GPC/SEC, ICP-OES, CHNOS- and TOC analysers, Emission analysis chamber, TEM, DSC.

Table 1. **Fraunhofer ICT reactors for pretreatments.**

Volume [L]	**Reactor type**	**Brand**	**Agitator**	**p_{max} [bar]**	**T_{max} [°C]**
0,1	100 mL Autoclave		Turbin	200	300
0,3	250 mL Hydrogen autoclave	Parr	Turbin	400	500
0,5	500 ml Berghof Autoclave	Berghof	Anchor & Gas injection	200	300
2,0	2 L Autoclave	Hofer Hochdrucktechnik	Propeller	325	400
13,0	13 L Autoclave	Sigmar Mothes	Double turbine & Gas injection	250	400
15,0	2x15 L Duoraf	Parr	Turbine	50	250
0,3	291 mL Packed bed reactor	Sitec		350	650
0,3	250 mL Autoclave		Magnetic stirrer	350	200
2,0	Colon	Sitec		450	200
1,9	Autoclave	Sitec			
5,0	5 L Reactive Extractor 1	Sitec			
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