

# M/K Systems Laboratory Pulp Digesters – ASME/CE/CRN Compliant High Temperature Liquor Circulation Systems

Reliable cooks • Black Liquor Sampling • H-factor Cooking • Easy to use • Patented

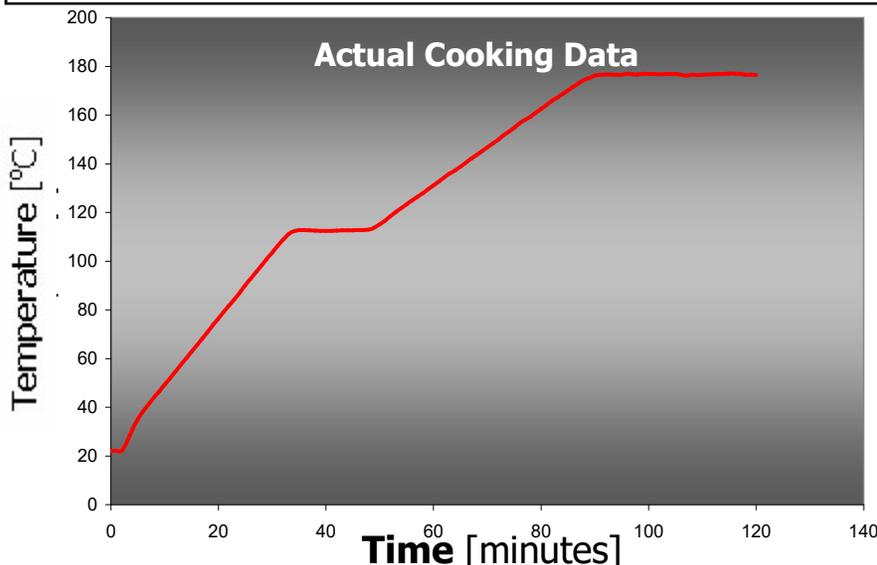
## Single Vessel System



## Dual Vessel System



The M/K laboratory digester system is designed to cook all types of wood chips, bamboo, biomass materials, etc, or any cellulose-based material. Easily control by your cook by temperature/time profiles, H-factor, or even system pressure. Our anti-turbulent design allows the user to rapidly circulate liquor through our patented mixing module, resulting in the best liquor penetration of any high pressure cooking system. Steam inlets for external boilers are also included for flash heating methods. The 2019 systems now reach 175°C in *less than an hour* and hold the set point temperature with accuracy within 0.1C. Rapid cooling is included in every system, allowing multiple cooks per day.

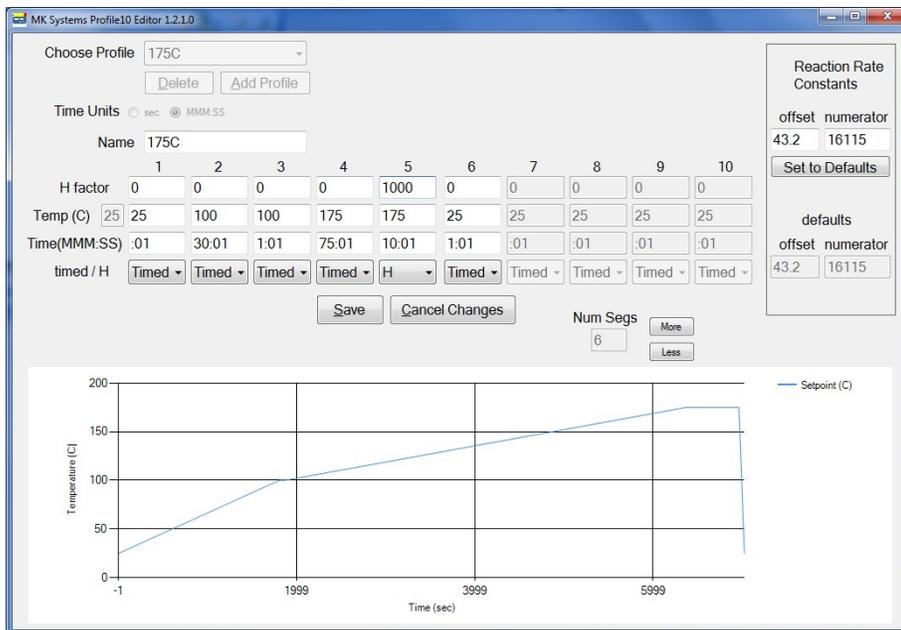


- Uniform cooking
- Various vessel sizes available
- Safely condense vapors
- Rapidly cool the system
- Obtain repeatable cooks
- Anti-turbulence design
- US Patent# 7,811,416
- US Patent# 8,172,984
- Run vessels independently

### System Requirements

1. Power: 220 Volts, 50 amps
2. Floor drain is recommended
3. 1.5 meter x 1.5 meter space

## M/K Digester: Reliable, accurate, easy to use, and safe.



Running the M/K Digester is easy and safe. The software displays a clear graph of the programmed cooking profile before starting, avoiding errors. Control each cooking segment by temperature, heating rate, H-Factor, time, or pressure. Each step is monitored and is recorded in excel with values of liquor temperature, vapor temperate, system pressure, as well as all the heater temperatures. Run one or both vessels at the same time.



The M/K Digester uses several types of heaters and sensors to accurately controlling the cooking process. Both liquor and vapor temperatures are recorded, as well as all heater temperatures and system pressure. Each cooking vessel contains our unique chip basket which is designed to work with softwoods, hardwoods, straw-based materials, and even granular materials. Our easy to use sampling condenser is ideal for extracting black liquor (while cooking) from your cellulose products. Obtain reliable cooks, safely and easily.

### Worldwide M/K Digester Industry References/Patents/Publications

1. (United States), "**Composition for the production of Improved Pulp**", Patent # US 6,890,404.
2. (United States), "**Phenols as Additives in Kraft Pulping**", Patent Application Publication US 2019/0112757.
3. (United States), "**Controlled Flocculation of Lignocellulosic Hydrolyzates**", Publication US 2016/0083808 A1.
4. (Canada), "**Method for obtaining cellulose from biomass comprising lignocellulose**", Canadian # 2,758,038.
5. (Australia), "**Liquid co-extraction process for production of sucrose, xylo-oligosaccharides and xylose from feedstock**", Australian Pat. App. AU 2015252695 B2, World Wide Application # 2015/164948 Al.
6. (United States), "**Tobacco-derived cellulose material and products formed thereof**", Patent # US 9,950,858.
7. (United States), "**Method to separate lignin-rich solid phase from acidic biomass suspension at an acidic pH**", Patent # US 9,751,781.
8. (International Application), "**Composition for inhibiting calcium salt scale formation**", Patent Application AU 2,010,224,861.
9. (Portugal), "Method and aqueous composition for the production of improved pulp", Patent # PT 1,392,914.
10. (United States), Publication: "Comparison of Oxidative Alkaline Extraction Reaction's Impact on Pulp Properties and the Environment". T.M. Runge and A.R. Ragauskas, International Pulp Bleaching Conference, Helsinki.