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M/K Systems Laboratory Pulp Digesters – ASME/CE/CRN Certified

High Temperature Liquor Circulation Systems To Produce Pulp

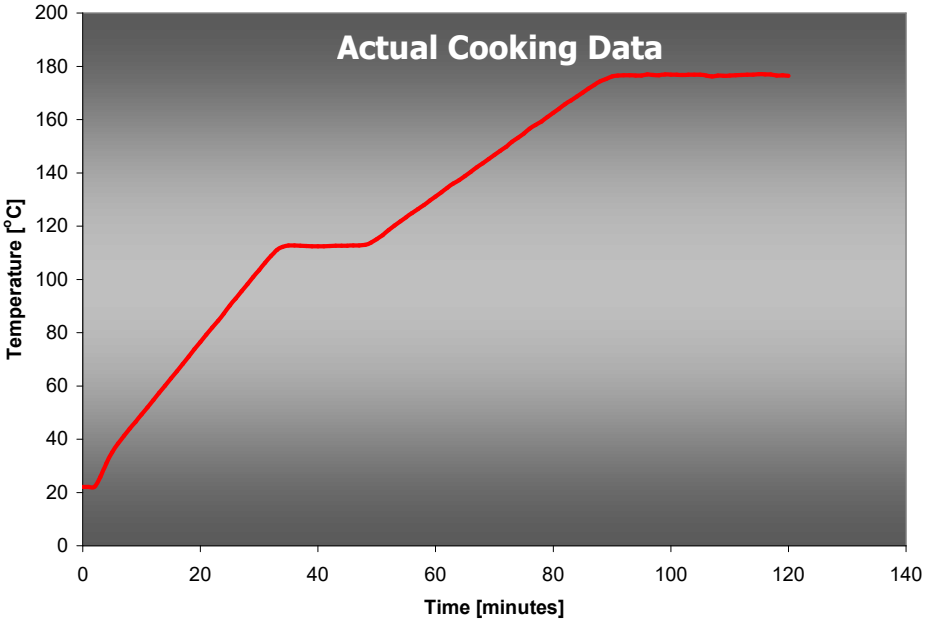
Reliable cooks • Black Liquor Sampling • H-factor Cooking • Easy to use • Patented

Single Vessel System

Dual Vessel System

About the M/K Laboratory Digester

This laboratory cooking system gives the user a simple, precise method to cook all types of wood chips, biomass materials, straw materials, as well as fine granular substrates. Place your substrate in the chip basket, load into the cooking vessel, add liquor, and you are ready to cook. Each vessel cooks independently, allowing you to run different cooking profiles at the same time. Use our software to easily write your cooking profile. Control by temperature/time profiles, H-factor, or even system pressure. Steam inlets for external boilers are included. The temperature control is +/- 0.1C of the set point. Easily extract black liquor. Efficiently rinse your pulp inside the vessel after cooking.



- Uniform cooking
- Various vessel sizes available
- Run 2 cooks independently
- Safely condense vapors
- Rapidly cool the system
- Obtain repeatable cooks
- Anti-turbulence design
- US Patent# 7,811,416
- US Patent# 8,172,984

System Requirements

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

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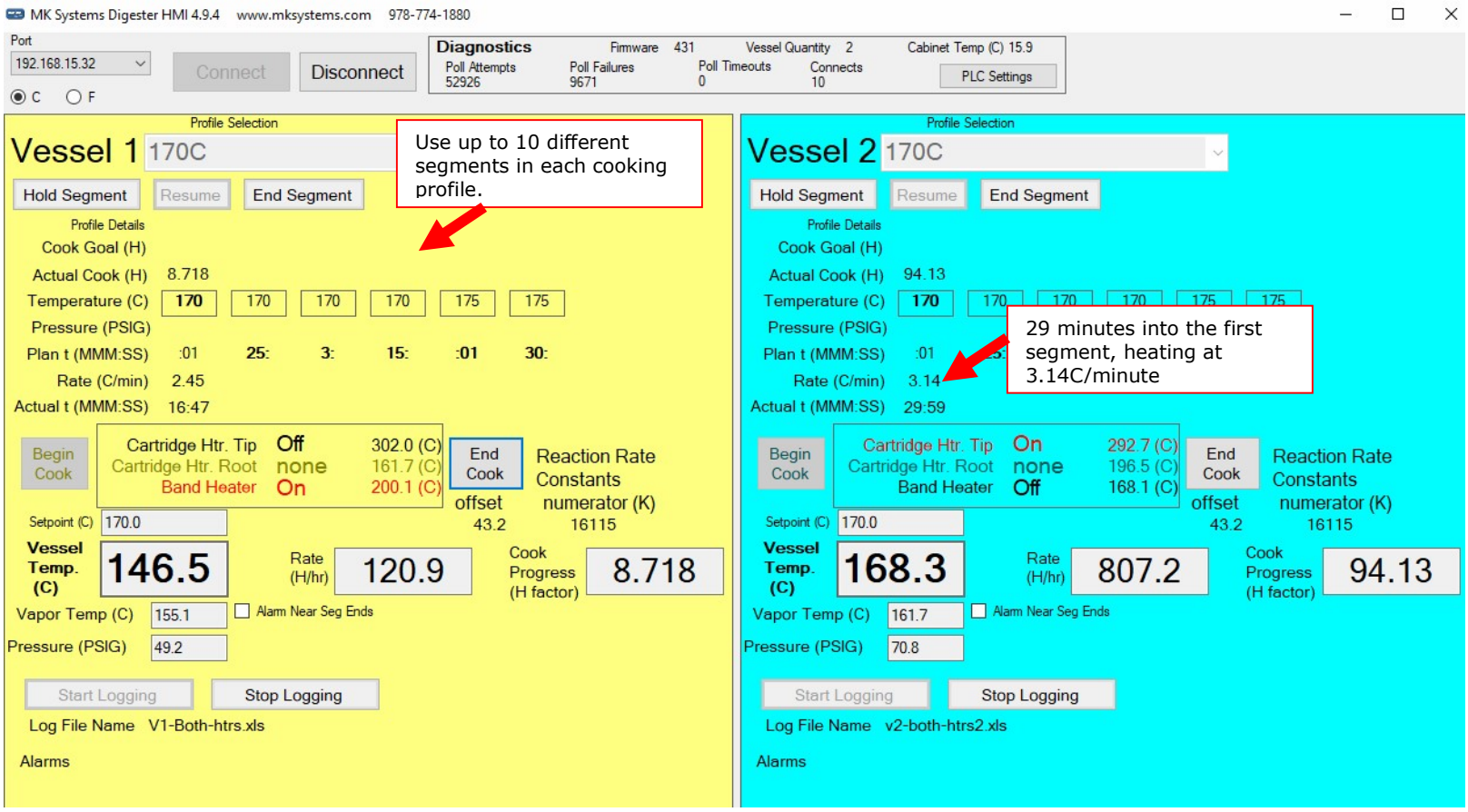
The M/K System Digester is reliable, accurate, and easy to use.

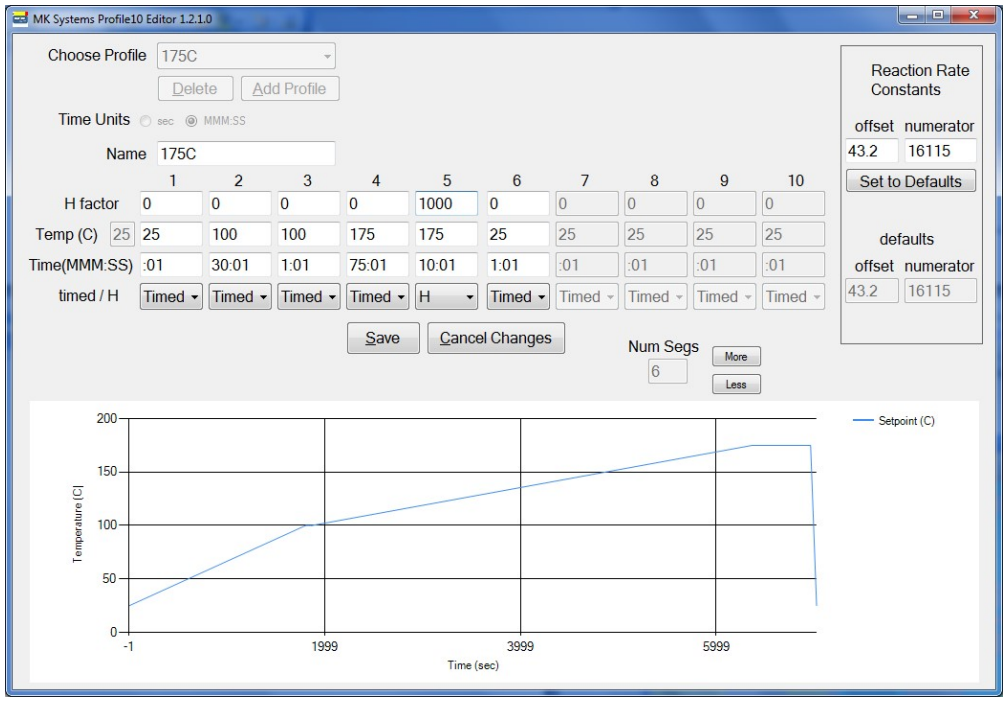
Heat one or both vessels simultaneously. The below screenshot shows two independent cooks started at different times. Use up to 10 different segments in every test. Compare your actual pressures against Steam Table values for added confidence.



Visually model your cook before you start. Every cook you run has valuable materials.

Running the M/K Digester is easy. The software displays a clear graph of the programmed cooking profile before starting, avoiding errors. Choose the temperature, rate, and temperature set point. Choose to end the segment by H-factor or time.

Each step is monitored and is recorded in excel with all true values of liquor temperature, vapor temperate, system pressure, as well as all the heater temperatures against time.



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The M/K Digester uses several types of heaters and sensors to accurately control 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.

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 thereo**f", 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 Environmen**t". T.M. Runge and A.R. Ragauskas, Int'llPulp Bleaching Conference. Helsinki, Finland.

M/K Systems' Digesters are built with ASME certified vessels (CE certified vessels for Europe, and CRN certified systems for Canada), UL/CUL certified electronics, and smart software offer unmatched precision and ease-of-use.

Data is recorded and stored in an Excel file. Each segment is begun with a description and target temperatures, time, and other data. Multiple heaters work in unison for precise control, as well as minimizing the inline heater temperatures to protect the cooking liquor. The vessel temperatures are monitored at **both the bottom (liquor) and top (vapor) of the vessel**. This design allows the user to understand how close the cook is to equilibrium. Data has shown the importance of monitoring both upper and lower temperatures help the user better understand equilibrium states, and avoid pump issues. The pressure is recorded by a separate pressure transducer.

Contact M/K Systems to obtain options to model continuous digester capabilities. External "blow tank" options and white water injection options are available.

Cook wood chips, biomass, shells, or almost any material in the M/K Digester over a wide pH range.

**** New in 2026 ****

The system is now plated with **additional anti-corrosive materials to extend pump life**, which is particularly important for Biomass cooks that typically generate weak acids during the cooking cycle.

System requirements:

Single vessel systems require 208V-240V, 35 amps.
Dual vessel systems require 208V-240V, 70 amps.
Nearby water source and drain are recommended.
All tubing and inline heaters are covered in insulation.
All rupture disks and pressure relief valves are channeled away to an external location away from the user for added safety.

Trust M/K Systems. Reliable data with a 57 year perfect safety record.