Commercial steam and vacuum treatment systems for logs

- Established in 2011
- Development of commercial systems for Phyto sanitation of logs and other products to eliminate chemical fumigation
- Partnering with a world-class manufacturer in the field of vacuum steam treatment
- Web site phytovac.com

- Established in 1856 in Germany
- World wide leading manufacturer of Vacuum/Steam machinery for Textiles, Plastics, Sanitation, Sterilization
- Location: Neustadt a/W Germany
- More than 2,000 Installations World Wide
From Lab prototype to commercial unit
• Fully automated process control
• Insulated vessel
• Pre-assembled and tested
• Automatic condensate collection
• Factory start-up
Examples of WELKER Systems
Requirements for a commercial unit

- Treatment of Full Size 40 FT. Containers
- Fully Automatic Process Control
- State of the art Vacuum Pump System
- Automatic Steam Distribution from local boiler
- Automatic Condensate recovery for process optimization
- 316 Stainless steel construction of chamber interior to prevent salt corrosion
- Automatic loading platform for container loading/unloading
- Bar code Identification of Container, Print-out and electronic logging of treatment protocol
- Wireless Temperature Sensors
Commercial System for logs in 2 x20 or 1 x 40 feet containers
System Description: Multiphase Process Cycle

- Feed water
- Air Inlet
- Temperature Control
- BOILER Gas or Electric
- Vacuum Pump
- Condensate Outlet

Legend:
- Open position
- Closed position
Phase 1 - High Vacuum

Feed water

BOILER
Gas or Electric

Temperature Control

Air Inlet

Vacuum Pump

Condensate Outlet

Open position

Closed position
Phase 2 – Steam Inlet and Heating Up

Feed water

BOILER
Gas or Electric

Temperature Control

Air Inlet

Vacuum Pump

Condensate Outlet

Open position
Closed position
Phase 3 - Keeping The Temperature

- Feed water
- BOILER Gas or Electric
- Temperature Control
- Air Inlet
- Condensate Outlet
- Vacuum Pump

Legend:
- Open position
- Closed position
Phase 4 - Ending The Process

- Feed water
- Temperature Control
- Air Inlet
- Vacuum Pump
- Condensate Outlet

BOILER (Gas or Electric)

Open position
Closed position
Phase 5 - Automatic condensate collection

Feed water

BOILER
Gas or Electric

Temperature Control

Air Inlet

Vacuum Pump

Condensate Outlet

Open position
Closed position
Phase 6 - Unloading

- **Feed water**
- **BOILER**
  - Gas or Electric
- **Temperature Control**
- **Air Inlet**
- **PHYTOVAC**
- **Vacuum Pump**
- **Condensate Outlet**

Legend:
- Open position
- Closed position
Multiple Chambers with Central Vacuum and Steam System

3 x TYPE TWIN 40 for 6 40 FEET HIGH CUBE Containers

Boiler

Pump Station

~500 containers/month
Environmentally safe and sustainable system

• None chemical treatment
• Waterless vacuum pumps
• Energy produced by gas, or electricity, or hot water from renewable energy.
• Opportunity to feed Boiler with warm water from solar system.
Thank you for your attention

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