

# Ethanol Process System

Educational Training Equipment for the 21st Century

Bulletin 132-130C

## H-ETS-1

### Ethanol Production Process System

#### Purpose

The Hampden **Model H-ETS-1** Ethanol Production Process System is designed to facilitate the instruction of students on the process required to produce ethanol for experimental purposes. Ethanol is a very promising fuel alternative to oil since sources are widely available and ethanol is clean-burning. The student will be able to observe and control the process of producing ethanol from corn, sugar, sorghum, fruits or several other sources. When using this unit along with the **Model H-6150-TT** Liquid-to-Liquid Extraction Demonstrator option, it is possible to produce ethanol with high purity.

#### Description

The Hampden **Model H-ETS-1** Ethanol Production Process System utilizes a mixture called a “mash” which is produced when the ground material is mixed with water. This unit consists of:

- Mobile Steel frame and panel assembly
- Cooling water reservoir w/ sight glass (10 gallon)
- Cooling water supply pump
- Heated water reservoir w/ sight glass and 1000W heater (3 gallon)
- Heated water supply pump
- Grinding mill w/ speed control
- Cyclone transport system
- Cooker/Fermenter w/ sight glass
- Mixer, 20–2000 rpm
- Boiler w/ sight glass and 1000W heater
- Bottoms drum w/ sight glass
- Material transfer pump w/ solenoid dirrectional control
- Condensate drum w/ sight glass
- Tool kit
- Vapor condenser
- Control panel
- Temperature control (2)
- Pump control (3)
- Digital temperature display
- Thermocouple selector switch (4-position)
- Thermocouples (4)
- 240 VAC input

**MODEL H-6150-TT**  
Tabletop Liquid-to-Liquid Extraction Demonstrator



**MODEL H-ETS-1** Ethanol Production Process System  
Dimensions: 72"H x 79"W x 24"D  
Shipping Weight: 925 lbs

#### Experiments

- Effect of temperature on ethanol purity
- Use of different raw materials to produce ethanol
- Effect of type of yeast added on fermentation time
- Effect of fermentation time on ethanol yield

#### Options

- ◆ Tabletop Liquid-to-Liquid Extraction Demonstrator (**H-6150-TT**)
- ◆ Measurement Equipment
- ◆ “CDL-L” Add-on Package consisting of:
  - Analog Input Module, Thermocouple
  - Isolated USB/RS415 coverter Module
  - Power Supply — 24 DC
  - Dual Thermocouples, (6)
  - 6-ft Computer Cable

Computer is not included. Templates for LabVIEW® control software are included.

Specify **H-ETS-1-CDL-L** when ordering

All Hampden units are available for operation at any voltage or frequency

**Hampden**  
ENGINEERING CORPORATION