

The Engineering Fundamentals renewable energy range is designed specifically for the High school and Technical college curriculums.

The equipment prepares students via practice-oriented experiments relating to the theory and practical implementation of renewable energies.

The modular tray based kit is supplied with a plug and play base unit which allows the students to create a variety of supplied experiments.

INTRODUCES STUDENTS TO THE FUNDAMENTALS OF BIOETHANOL AND BIODIESEL PRODUCTION

“EF-6.5 Biomass Fuel Technology tray covers the entire process of producing biofuels. It starts with the biological step of alcoholic fermentation. Afterwards the produced mash will be distilled with the help of the supplied condenser.

The final stage is the conversion of the produced biofuel into usable energy, such as electrical energy, using the provided Ethanol-fuel cell.

The Armfield EF-6.5 additionally covers production of biodiesel through transesterification of fats.”

1 tray supplied with EF-6.5



Features / benefits

- ▶ Tray based solution that can be easily stored in the EF-WS workstation
- ▶ Simple plug and play operation
- ▶ Includes bioethanol and biodiesel production
- ▶ Includes an Ethanol-fuel cell for the generation of electrical energy out of biofuel
- ▶ Includes fundamentals of basic electronic circuits
- ▶ Supplied with comprehensive teachers and students manual

Experimental content

Part 1: Biodiesel production

- ▶ Transesterification from fat to Biodiesel (FAME)
- ▶ Determination of fat parameters
- ▶ Extraction of fats from foods and oil plants

Part 2: Alcohol fermentation

- ▶ Production of a mash/alcoholic fermentation
- ▶ Fermentation of different sugar types (including catalytic splitting of starch)
- ▶ Proof of fermentation gases

Part 3: Distillation and production of Bioethanol

- ▶ Distillation of mash
- ▶ Characteristics of the produced Ethanol

Part 4: Ethanol fuels

- ▶ Introduction Ethanol fuel cell
- ▶ I-V curve of Ethanol fuel cells
- ▶ Dependency of Ethanol fuel cells on concentration and temperature
- ▶ Energy balance of the whole process

Requirements

Scale

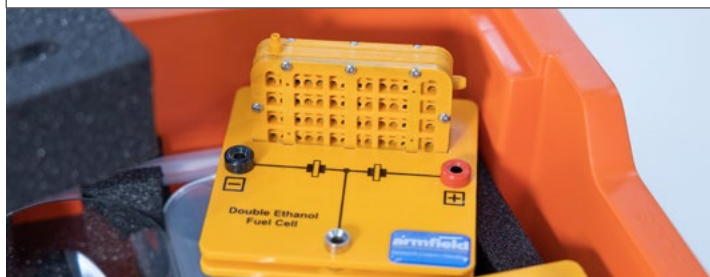


Experiment tray scale



Electrical supply: 110-230V AC 50-60Hz

- ▶ Level and stable work surface
- ▶ Laboratory Clamp and Stand
- ▶ Bunsen Burner



Related products

- ▶ **EF-6.1:** Engineering Fundamentals - Photovoltaic Energy
- ▶ **EF-6.2:** Engineering Fundamentals - Wind Energy
- ▶ **EF-6.3:** Engineering Fundamentals - Anemometer
- ▶ **EF-6.4:** Engineering Fundamentals - Hydrogen Fuel Cell Technology
- ▶ **EF-6.6:** Engineering Fundamentals - Battery Technology
- ▶ **EF-6.7:** Engineering Fundamentals - Renewable Energy
- ▶ **EF-6.8:** Accessories Kit

Overall dimensions

Tray	
Length	0.435m
Width	0.315m
Height	0.15m
Packed and crated shipping specifications	
Volume	0.021m ³
Gross weight	2.7Kg

Related curriculums

- ▶ Physics
- ▶ Chemistry
- ▶ Biology
- ▶ Electrical Engineering
- ▶ Renewable Energies

Essential accessories / equipment

- ▶ **EF-6.8** Accessories Kit
- ▶ Clamp Stand (Not supplied by Armfield)
- ▶ Bunsen Burner (Not Supplied by Armfield)

Recommended accessories / equipment:

- ▶ **EF-WS** Engineering Fundamentals Work Station

Ordering specification

- ▶ 1 x Potentiometer module
- ▶ 1 x Motor module without gear
- ▶ 1 x Ethanol fuel cell module
- ▶ 1 x Plug with hose
- ▶ 1 x Yeast
- ▶ 4 x Bumpon transparent 5.0 mm height X 11.1mm diameter
- ▶ 1 x Propeller
- ▶ 1 x Laboratory thermometer
- ▶ 1 x Distilling head, 2 cores 75°, NS 19/26
- ▶ 1 x Condenser
- ▶ 1 x Alcoholmeter
- ▶ 1 x Erlenmeyer flask 1000ml
- ▶ 1 x Airlock
- ▶ 1 x Rubber stopper
- ▶ 1 x Areometer
- ▶ 1 x Beaker 250ml
- ▶ 3 x Test tubes
- ▶ 1 x Grip stopper
- ▶ 3 x Pasteur pipette
- ▶ 1 x Measuring cylinder 100ml
- ▶ 1 x Syringe 2ml
- ▶ 1 x Silicone ring

Operational conditions

- ▶ Storage Temperature: -10°C to +70°C
- ▶ Operating temperature range: +10°C to +50°C
- ▶ Operating relative humidity range: 0 to 95%, non-condensing

Ordering codes

- ▶ **EF-6.5:** Engineering Fundamentals -Biomass Fuel Technology
- ▶ **EF-6.8** Accessories Kit
- ▶ **EF-WS** Engineering Fundamentals Work Station

Armfield standard warranty applies with this product

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



armfield.co.uk

Aftercare

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Support: armfieldassist.com