

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.

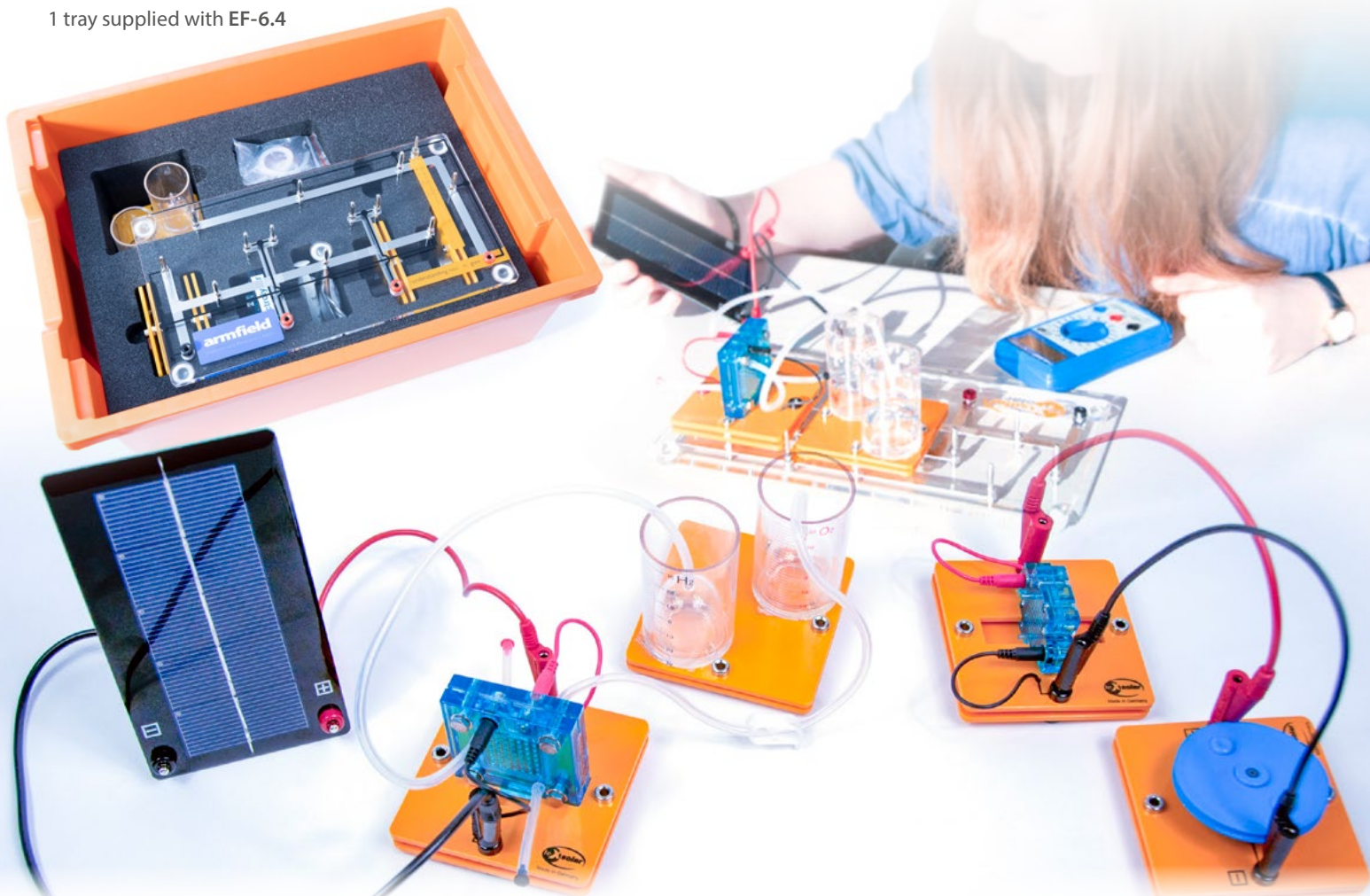
The modular tray based kit is supplied with a plug and play base unit which allows the students to create a variety of supplied experiments.

INTRODUCES STUDENTS TO THE FUNDAMENTALS OF ELECTROLYSIS AND FUEL CELLS

“EF-6.4 Hydrogen Fuel Cell Technology kit covers the principles of electrolysis and fuel cells. Containing PEM-fuel cells and the components of a complete solar-hydrogen cycle (electrolyzer, PEM fuel cell and solar module), The electrical consumer (motor) allows for realistic and demonstrative experiments.

The product can be expanded with two additional PEM-fuel cells to illustrate the stacking of fuel cells. Can be optionally expanded with an SOFC cell to demonstrate a second fuel cell technology.”

1 tray supplied with EF-6.4



Features / benefits

- ▶ Tray based solution that can be easily stored in the EF-WS workstation
- ▶ Simple plug and play operation
- ▶ Two different fuel cell technologies
- ▶ Includes qualitative and quantitative experiments
- ▶ Includes fundamentals of basic electronic circuits
- ▶ PEM-fuel cells and the components of a complete solar-hydrogen cycle (electrolyser, PEM fuel cell and solar module)
- ▶ Optional SOFC-fuel cells
- ▶ Supplied with comprehensive teachers and students manual

UK office - email: sales@armfield.co.uk tel: +44 (0) 1425 478781 (for ROW)

USA office - email: info@armfield.inc tel: +1 (609) 208-2800 (USA only)

Issue: 1

URL: <http://www.armfield.co.uk/ef>

Applications

ME ChE CE IP

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Experimental content

- ▶ Set up of an electrolyzer and the different fuel cells
- ▶ Characteristics of an electrolyzer
- ▶ Operation of an electrolyzer
- ▶ Characteristics of a PEM-Fuel cell
- ▶ Operation of the PEM-Fuel cell
- ▶ Faraday and energy efficiency of the electrolyzer
- ▶ Faraday and energy efficiency of the PEM-fuel cell
- ▶ Properties of SOFC fuel cells (optional with EF-6.4.1)
- ▶ Powering a motor with the SOFC fuel cell (optional with EF-6.4.1)
- ▶ Characteristics of the SOFC fuel cell (optional with EF-6.4.1)

Requirements

Scale

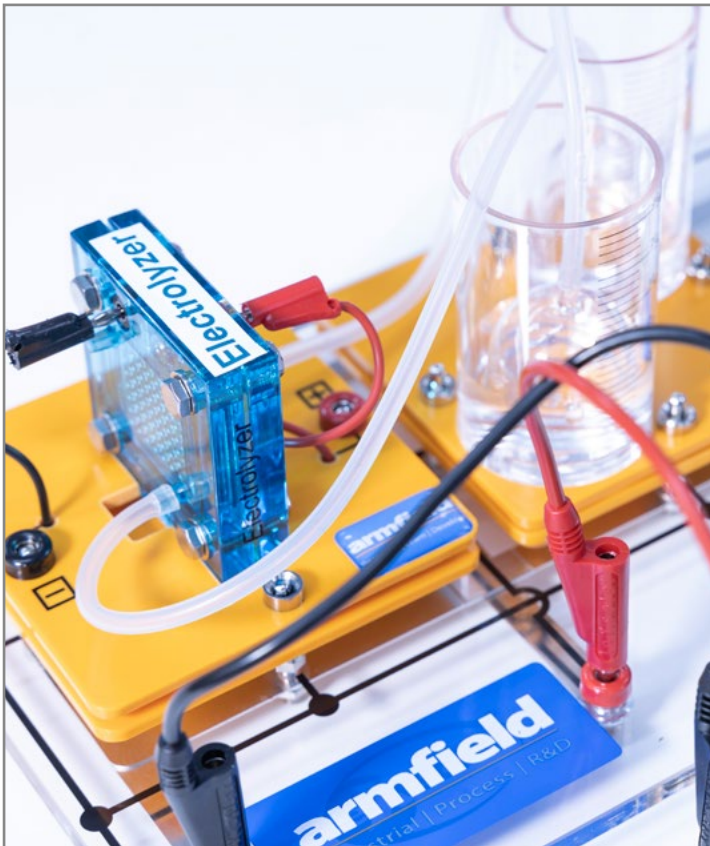
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Experiment tray scale



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

- ▶ Level and stable work surface



Overall dimensions

Tray

Length	0.435m
Width	0.315m
Height	0.15m

Packed and crated shipping specifications

Volume	0.021m ³
Gross weight	3.5Kg

Related curriculums

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

Essential accessories / equipment

- ▶ **EF-6.8** Accessories Kit

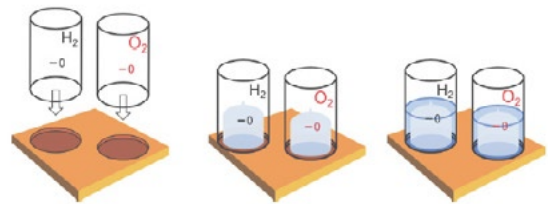
Recommended accessories / equipment:

- ▶ **EF-6.4.1** SOFC Fuel Cell Extension
- ▶ **EF-WS** Engineering Fundamentals Work Station

Ordering specification

- ▶ 1 x PEM-Fuel cell module
- ▶ 1 x Electrolyzer module 2.0
- ▶ 1 x Potentiometer module
- ▶ 1 x Motor module without gear
- ▶ 1 x Solar module 2.5V, 420mA
- ▶ 1 x Gas storage module
- ▶ 1 x Base unit large
- ▶ 1 x Propeller

Easy to follow handbook and exercises



Related products

- ▶ **EF-6.1:** Engineering Fundamentals - Photovoltaic Energy
- ▶ **EF-6.2:** Engineering Fundamentals - Wind Energy
- ▶ **EF-6.3:** Engineering Fundamentals - Anemometer
- ▶ **EF-6.5:** Engineering Fundamentals - Biomass Fuel Technology
- ▶ **EF-6.6:** Engineering Fundamentals - Battery Technology
- ▶ **EF-6.7:** Engineering Fundamentals - Renewable Energy
- ▶ **EF-6.8:** Accessories Kit

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-6.4:** Engineering Fundamentals - Hydrogen Fuel Cell Technology
- ▶ **EF-6.4.1** SOFC Fuel Cell Extension
- ▶ **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



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Aftercare

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Training
Service and maintenance
Support: armfieldassist.com