

armfield

Develop with us

Miniature-scale research & development technology

NEUTRALISER/WASHER/BLEACHER

FT66

explorearmfield.com



© Armfield Ltd. 2011
armfield

ISO 9001:2008
2YR EXTENDED WARRANTY

FEATURES

- Simple Controls
- Surfaces in contact with the process fluid are stainless steel
- Agitation by variable speed flat blade impeller (variable to 1800rpm)
- Working vacuum of 75mm Hg (ABS) with liquid ring vacuum pump
- Pressure leaf filter designed to BS5500
- 25 litre vessel designed to BS5500
- Compact and self-contained
- Cooling coil
- Extraction pump
- Electrical heating element

BENEFITS

- Ease of use
- Small quantities of oil can be processed
- No consumable filter elements required

ISSUE - 3



Scan to learn more



The Armfield FT66 Neutraliser/Washer/Bleacher is a floor-standing batch processing vessel capable of performing these stages on small quantities of crude edible oils and facilitates practical research and development.

Description

The main reactor vessel, reagent vessels, filter pump and filter are constructed from stainless steel and are mounted within a floor-standing, stainless steel framework. A variable speed agitator, electrical heating element, cooling coil and observation port are incorporated in the Bleacher reactor, which is a vertical cylindrical vessel designed to process a 25 litre batch of oil.

A liquid ring vacuum pump, also mounted within the framework, is used to create the desired vacuum in the vessel.

Processing under reduced pressure prevents oxidation of the oil and promotes drying. Vacuum suction is also used to charge the reactor with crude oil and to add reagents and bleaching earth from the appropriate vessels. The reagent tank is used to make up caustic solutions and other additives and to preheat to the desired temperature prior to addition to the reactor. Water for the washing process is also preheated in this vessel. The heating element in the reagent tank is controlled automatically by an electronic controller in the control console. The desired operating temperature of the reactor vessel contents is achieved using an immersed electrical heating element with a maximum power input of 3kW.

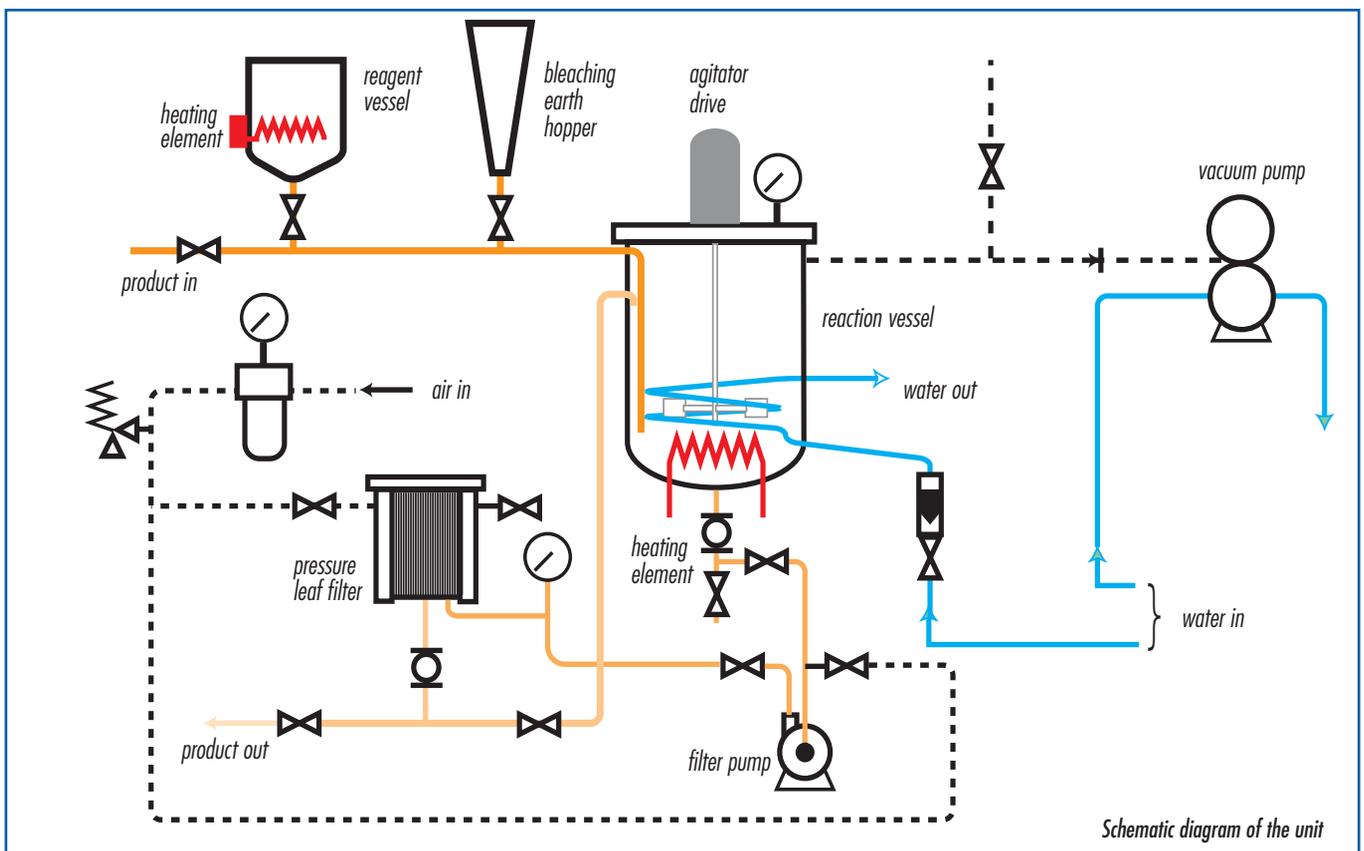
The heating operation is controlled using a digital display electronic controller, which automatically maintains the temperature.

Cooling of the hot oil is achieved by circulating cold water through a submerged coil. A flat blade agitator in the reactor is driven by a geared electric motor and the speed of the motor can be adjusted up to a maximum of 1800rpm using a potentiometer on the console. Agitation of the oil charge promotes mixing of reagents and adsorbents with the oil as well as increasing heat transfer efficiency of the heating and the cooling cycles.

The bleaching earth hopper is a steep sided conical vessel designed to enable dosing of the required amount of bleaching earth into the reactor. It is also used for the addition of other adsorbents such as activated carbon. Diatomaceous earth as an aid for the filtering process can be charged from this hopper.

A stainless steel centrifugal pump is used to transfer the oil to the filter in order to filter out any solids previously added.

The filter is a pressure leaf type, which is designed for repeated use with no consumable filter elements required. By recirculating the oil/adsorbent mixture through the filter, a layer of solids is built up on the filter mesh screen upon which the remaining solids are deposited. When the oil is clear, it is discharged from the reactor through the filter after which the 'filter cake' is dried using compressed air so that it can be removed easily from the filter screen.

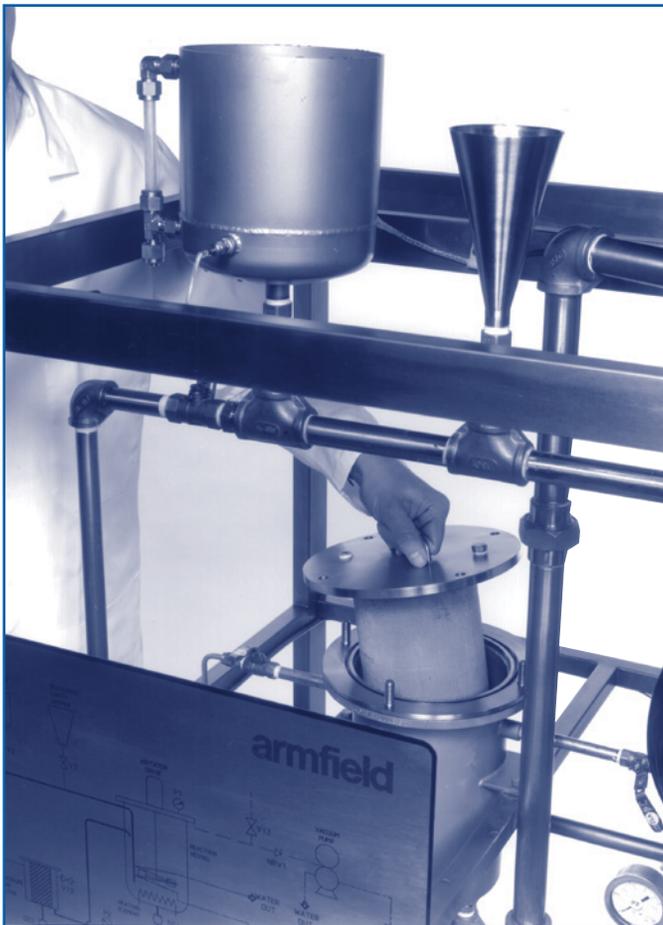


Schematic diagram of the unit

Performance:

Independent tests carried out by Manchester Metropolitan University, Hollings Faculty using crude Rapeseed oil gave the following analytical results:-

	Crude Oil	Neutralised	Bleached
Iodine value	117	117	117
Free fatty acid	1.5%	0.12%	0.1%
Colour	70 Yellow 7 Red	50 Yellow 3.3 Red	20 Yellow 0.5 Red
Soap in oil	3.2 Blue —	< 100ppm	nil
Peroxide value	0.4 mequiv/kg	nil	nil



Removing the element of the pressure leaf filter

CAPABILITIES

- Effect of variation of operating parameters such as temperature, vacuum and degree of agitation
- Selection of the correct amount and strength of caustic solution for the particular oil
- Selection of the type and quantity of adsorbent for the bleaching operation
- Optimization of operation of a pressure leaf filters

Modes of Operation

Crude oil, freshly extracted from seed contains undesirable impurities, which must be removed. These include free fatty acids, phosphatides, colour pigments and fine particles. Using the FT66, the crude oil can be refined by operation in the following modes:-

Neutralisation/Washing:

Free fatty acids are removed by neutralising them with a strong base such as caustic soda, which forms a water-soluble soap. The soap is then removed by a combination of thorough washing, gravity settling and draining. Phosphatides are also removed by washing, settling and draining after the addition of phosphoric acid to form water-soluble gums. Any water remaining in the oil is dried by heating the oil under vacuum.

Bleaching:

Colour pigments are removed or reduced by the addition of an adsorbent such as Fullers Earth. The desired colour of the oil can be obtained by adjusting the amount and type of earth used and the physical conditions under which the bleaching operation is carried out.

Filtration:

After bleaching, an efficient filtering process ensures that the earth and other particulates are removed leaving a clean, refined oil ready for further processing such as hardening and deodorising. The filter used for this is a pressure leaf type, which is commonly used in the edible oil industry for the removal of adsorbent.

armfield

Develop with us

Armfield R&D products include:

316 Stainless steel



CE certification



Extended warranty
as standard



An ISO 9001 Company

Head Office:

Armfield Limited
Bridge House, West Street,
Ringwood, Hampshire.
BH24 1DY England

Tel: +44 1425 478781

Fax: +44 1425 470916

E-mail: sales@armfield.co.uk

U.S. Office:

Armfield Inc.
9 Trenton - Lakewood Road
Clarksburg NJ 08510
Tel/Fax: (609) 208-2800
E-mail: info@armfieldinc.com

follow us



twitter.com/Armfield_LFT
facebook.com/Armfielduk
linkedin.com/companies/armfield-limited
youtube.com/user/armfieldUK
explorearmfield.wordpress.com



Specifications

Reactor vessel:

Material: stainless steel
Total volume: 45 litres
Working volume: 25 litres
Diameter: 0.30m
Height: 0.65m
Heating element: 3.0kW
Cooling coil area: 0.12m²
Agitator speed: 250-1800rpm

Reagent vessel:

Material: stainless steel
Working volume: 3 litres
Diameter: 0.165m
Height: 0.20m
Heating element: 1kW

Earth hopper:

Material: stainless steel
Volume: 0.3 litre

Pressure leaf filter:

Material: stainless steel
Filter volume: 3.8 litres
Filter cake capacity: 1 litre
Filtering area: 0.09m²
Filter screen: 110 mesh (0.3mm wire)
Maximum pressure: 3.0 bar

Vacuum pump:

Type: liquid-ring
Sealant: water
Working vacuum: 75mm Hg (ABS)
Sealant flow rate: 8 l/m

Requirements

Electricity supply: Three phase (see ordering codes)
Water supply: 30l/m @ 3.0 bar min/5.0 bar max
Compressed air: 20l/s @ 3.0 bar min/10.0 bar max

Ordering codes

FT66-C: 415V/3ph/50Hz, (14kW)
FT66-D: 208V/3ph/60Hz, (10kW)
FT66-E: 380V/3ph/50Hz, (13kW)
FT66-F: 220V/3ph/60Hz, (10kW)

Shipping specification

Volume: 2.0m³
Gross weight: 500kg

Overall dimensions

Height: 1.90m
Width: 1.28m
Depth: 0.75m

The Armfield range includes HTST/UHT/aseptic systems, carbonator/filler/cappers, spray dryers/chillers, multifunction batch processors, ice cream freezers, margarine crystallisers, extractors, edible oils processors and more. For further information about our products and services, or to book a trial at one of our trials facilities, please contact us.