

armfield
Develop with us

Miniature-scale research & development technology

DEODORISING UNIT FT68



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ISO 9001:2008
2YR EXTENDED WARRANTY

FEATURES

- Stainless steel pressure vessel
- Comprehensive control panel and instructions
- Liquid ring vacuum pump
- Steam ejector
- Condenser
- Electrical heating of the oil
- Internal cooling coil
- Extraction pump
- Polishing filter
- Vacuum in the processing vessel down to 6.5 mbar absolute
- Temperatures to 250°C
- Internal steam sparge

BENEFITS

- Only 25 litres of oil to be processed
- Safe and easy to use
- Economical

ISSUE - 5



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The Armfield Deodorising Unit is a floor-standing batch processing vessel suitable for steam stripping of fatty acids from edible oils.

Description

The deodorising process vessel has a batch size of 25 litres and is mounted in a floor-standing stainless steel framework, which also houses the high vacuum equipment, control console, discharge pump and polishing filter.

A 3.0kW electrical heating element is incorporated in the vessel to heat the oil to temperatures of up to 250°C. The vessel also contains a special steam distribution tube, which enables the thorough steam/oil mixing required.

Operating temperature is selected on an electronic temperature controller and is recorded on a continuous chart recorder both of which are housed in the control console.

An immersed cooling water coil provides a means of reducing the oil temperature on completion of the process.

A multi-stage vacuum system incorporates a steam ejector, condenser and liquid ring vacuum pump to achieve vacuum levels less than 5mm Hg (ABS), 6.5 mbar in the process vessel. Accurate indication of the vessel pressure is achieved using an electronic pressure transmitter, which indicates the vacuum level down to one Torr on a digital display in the control panel.

Fatty acids and other compounds carried over with the steam are condensed in a spray type condenser and they pass to drain with the sealing water of the liquid ring vacuum pump.

On completion of the deodorising process, the oil is pumped out of the vessel through a 'polishing' filter, which removes any remaining particles in the finished oil.

The deodoriser vessel is designed in accordance with the BS 5500 code for pressure vessels.

All materials in contact with process fluid are of stainless steel.

Modes of Operation

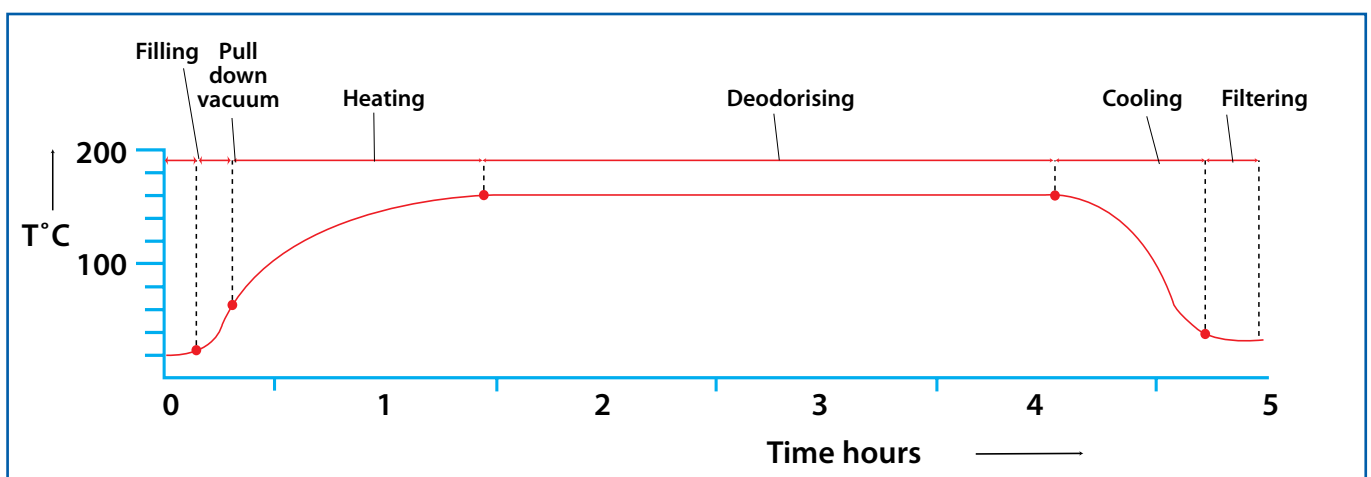
Removal of free fatty acid, ketone and acetaldehyde traces in edible oils is an important stage in the refining procedure as it is these compounds that impart an unpleasant odour to the oils. The method used for this removal is vacuum steam distillation under very high temperature and vacuum conditions. The Armfield Deodoriser achieves this using a unique steam mixing/contactor and multi-stage vacuum system.

Deodorising:

The oil is heated under vacuum using direct steam to provide the agitation for good heat transfer. When the desired temperature and pressure are achieved, the direct steam injection is adjusted to impart a high degree of turbulence to the oil, which ensures good physical contact of the steam with the oil. The impurities are carried over in the vapour and condensed in the vacuum condenser, the resulting condensate blending with the liquid ring vacuum pump sealant to be discharged to drain.

Polishing:

After deodorisation, the oil refining process is complete and the oil can be consumed or used in the manufacture of other products. It must therefore be free of any trace of contaminants and, to achieve this, it is pumped through a fine 'polishing' filter, which removes particles down to 6.0 micron giving a bright oil as product.



Typical printout of process temperature recorder

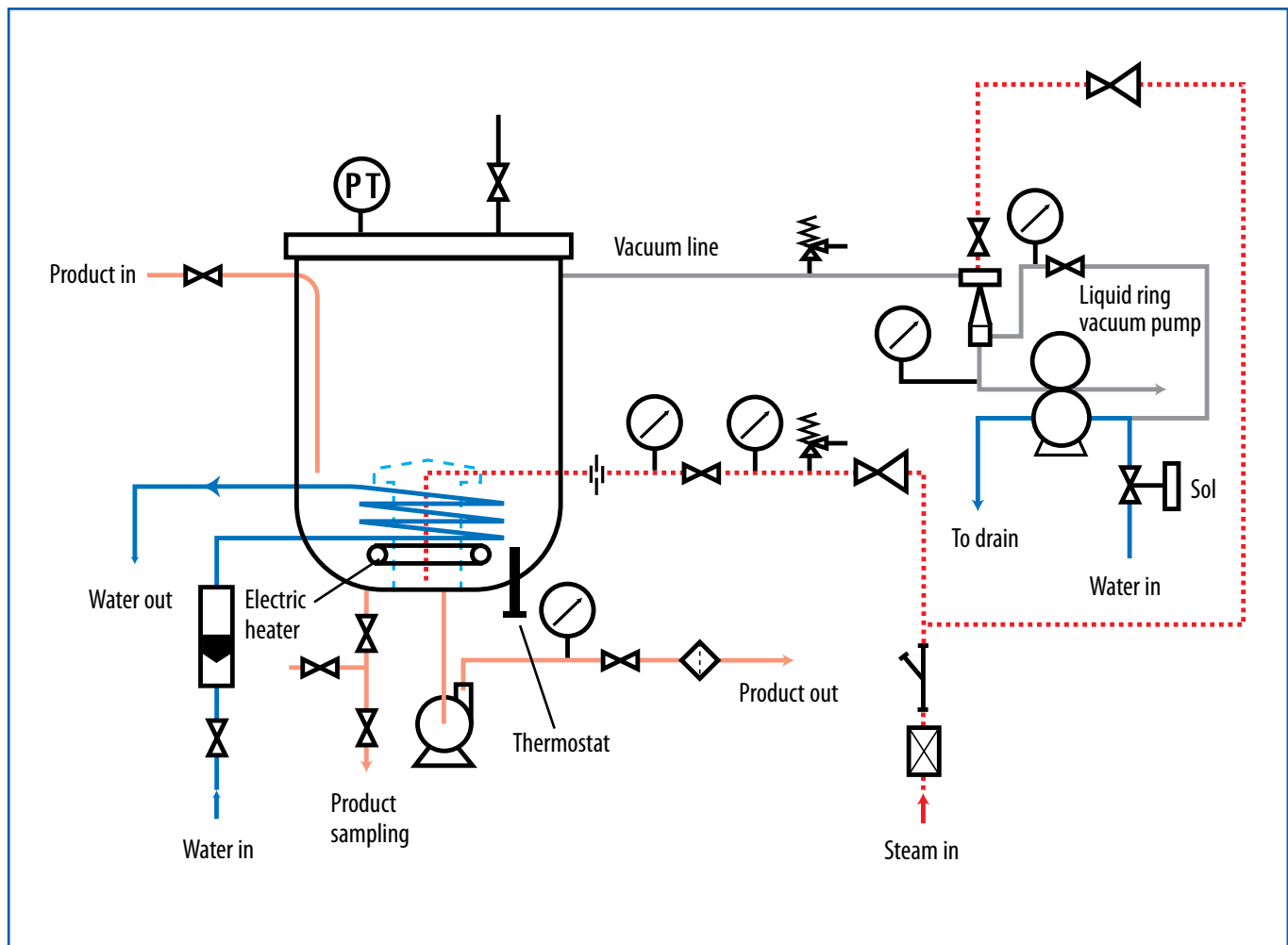
Performance:

Independent deodorisation tests carried out by:
Manchester Metropolitan University, Department of Food and
Consumer Technology, using refined and bleached rapeseed oil
gave the following analytical results:-

	Refined bleached oil	Deodorised oil
Free fatty acid	0.1%	0.04%
Soap in oil	nil	nil
Colour	20 Yellow 0.5 Red	10 Yellow 0.4 Red

CAPABILITIES

- Operation of small-scale version of the industrial process
- Determination of optimum process conditions for different oil types
- Effect of variation of process temperature
- Effect of variation of process pressure
- Effect of variation of quantity of direct steam added
- Effect of variation of overall process time.



FT68 Schematic diagram

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Armfield R&D products include:

316 Stainless steel



CE certification



Extended warranty
as standard



armfield
An ISO 9001 Company

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Specifications

Deodoriser vessel:

Overall volume: 60 litres

Working volume: 25 litres

Product temperature
maximum:

250°C

Working pressure: less than 5.0mm Hg (ABS),
6.5mbar

Heating element: 3.0kW

Cooling coil area: 0.1m²

Direct steam

flow rate: 0-1 kg/hr

Vacuum system:

Ejector steam: 4.1 bar, 4kg/hr

Vacuum pump:

Type: liquid ring

Number of stages: two

Motor power: 2.0kW

Sealant: water

Sealant flow rate: 10.0lpm

Pressure leaf filter:

Material: stainless steel

Filter volume: 3.8 litres

Filter cake capacity: 1.0 litre

Filtering area: 0.09m²

Filter screen: 110 mesh (0.3mm wire)

Maximum pressure: 3.0 bar

Polishing filter:

Type: replaceable cartridge

Filter element size: 6.0 micron

Requirements

Electricity supply: Three phase (see ordering codes)

Water supply: For cooling
20 l/m @ 3 bar min/5 bar max
pressure @15°C

Steam supply: 4 bar minimum; 10kg/hr

Ordering Codes

FT68-C: 415V/3ph/50Hz, (11kW)

FT68-D: 208V/3ph/60Hz, (7kW)

FT68-E: 380V/3ph/50Hz, (11kW)

FT68-F: 220V/3ph/60Hz, (7kW)

Shipping specification

Volume: 2.5m³

Gross weight: 500kg

Overall dimensions

Height: 1.58m

Width: 1.28m

Depth: 0.68m

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.