

Mobile Pilot ARFA

Petrie's Pilot ARFA is ideal for the development of new product textures and properties. Essentially, heat transfer to the surface of the product by convective hot air is assisted by a quantity of radio frequency heating (RF) applied directly throughout the volume of the product, hence 'ARFA' - Air Radio Frequency Assisted heating.

The principle of the ARFA heating system is that the plenum chambers or nozzles used to deliver the hot air are used as the electrodes of the RF system to achieve simultaneous surface (hot air) and internal RF heating. The combined effect can overcome problems such as case hardening, cracking and irregular moisture profiles.

With the RF heating turned off, the machine performs as a conventional high velocity convection oven with good heat transfer. Equally, with minimal air flow (enough to prevent condensation of moisture inside the machine) the heating is provided predominantly by the RF energy alone. Typically, in the ARFA mode of operation, the RF energy may be less than 10% of the total energy supplied.

The challenge for product R&D is to identify the appropriate combination of surface and volumetric heating to give the desired product characteristics.

Moulding

Drying

Curing

Baking

Forming



Mobile Pilot ARFA Specification



The specification of an ARFA oven or dryer will depend on the characteristics of the product to be heated. In particular, the amount of installed RF energy compared to that available from the hot air, may vary considerably.

Machine Type

Single section 50 ohm ARFA test machine

Heat Sources

RF - 5 kW 50 ohm RF generator

Hot Air - 54 kW electric element heater

Operational Frequency

13.56 MHz

Fans

1.5 kW direct driven

L x W x H

3.82 x 2.1 x 2.02 m

Weight

2.5 tonnes (oven only)

Conveyor

Belt type stainless steel mesh, 0.47 m wide

Height above floor - 0.915 m

Maximum product height through machine - 125 mm

Maximum linear speed - 4.25 m per minute

Drive

Rossi gearmotor 0.25 kW

Electrical

415 V, 3 phase

Supply

125 amps

