

LANEMARK INTERNATIONAL

Lanemark Burner Systems & Applications Presentation

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Process Heating Burner



TANK HEATING TX BURNER SERIES
AIR HEATING DB BURNERS SERIES (MIDCO)
OVEN HEATING FD BURNERS SERIES

Petrochemical Burner



Lanemark Tank Heating Burner Systems

Lanemark TX series high efficiency, small diameter immersion tube tank heating systems can be used in many areas of industry:

Typical Applications

- **Product finishing**
 - Pre-treatment and treatment processes
 - Dip tanks
 - Spray systems
 - Hot water supply systems
- **Cleaning (industrial washing machines)**
 - Plastic/metal tray/crate washer
 - Parts washers
 - Bottle washers
- **Food and drink preparation**
 - Hot water tanks
 - Mini brewery wort copper
 - Cleaning in place (CIP) tanks
 - Animal scalders
 - Blanchers
 - Fryers




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Product Finishing

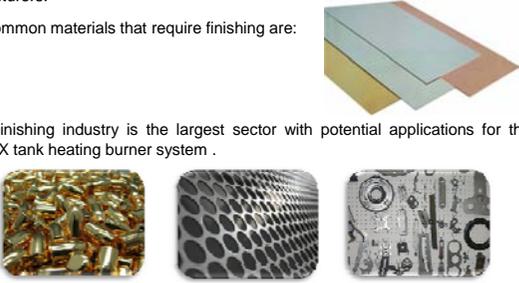
The prime market place for the Lanemark TX tank heating burner system is in the product finishing industry, which is split into two main areas:

1. Those manufacturing companies that utilise "in-house" product finishing processes.
2. Specialist product finishing companies who act as sub-contractors to manufacturers.

The most common materials that require finishing are:

- Metals
- Wood
- Plastics

The metal finishing industry is the largest sector with potential applications for the Lanemark TX tank heating burner system .

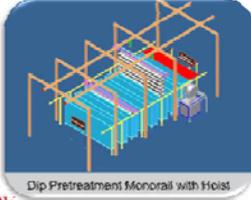



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Product Finishing – Pre-treatment

The purpose of a pre-treatment process is:

- To clean the surface for oil, physical contamination and rust prior to surface treatment
- Create a surface condition which has superior adhesion to paint
- Reduce the chances of reaction of paint with the base metal
- Add to corrosion resistance



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Cleaning (Industrial Washing Machines) – Plastic/Metal Tray/Crate Washers

Plastic/metal tray/crate washing machines are used in many different areas of industry, which typically include the following:

- Food industry
- Drinks industry
- Distribution warehouses
- Agricultural (plants/flowers) industry

The optimum cleaning of plastic/metal trays and crates utilised in food and drink production and distribution processes, relies on the performance of Lanemark tank heating burner systems – in use on machines supplied by many leading manufacturers of industrial plastic/metal trays and crate washers around the world.




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Cleaning (Industrial Washing Machines) – Plastic/Metal Tray/Crate Washers

Example of a distribution centre which includes plastic/metal tray/crate washing machines.




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Tray/Crate Washing Installation: Norbert Dentressangle, UK



2 off TX40N each rated at 286kW max gas input
1 off TX60N rated at 689kW max gross input



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Tray/Crate Washing Installation: MTV Pebock, Germany

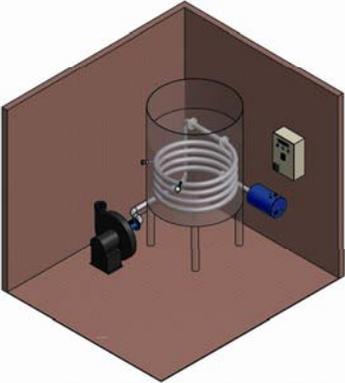


1 off TX30N each rated at 145kW max gas input
1 off TX30N each rated at 121kW max gas input
1 off TX20N each rated at 60kW max gas input



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Food & Drink Preparation – Brewing



Brewing

- Suitable for vessel capacities from 5 to 80 UK barrels (8 to 130 hectolitres).
- Firing into stainless steel immersion tube heat exchangers from 1½" to 6" n.b., providing heat inputs from 15 kW to 700 kW.
- "Helical coil" immersion tube heat exchangers ideally suited for cylindrical vessels.
- The selection of optimum combination of burner system and heat exchanger design using Lanemark's own TxCalc®.




Pheasantry Brewery, UK

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Food & Drink Preparation – Fryers

Fryers – Machines can be supplied to meet varying process demands, for example volume of product, types of foodstuffs to be cooked and of-course budget.

An automatic continuous fryer will be made to be as compact as possible to minimise its plant footprint. It has advantages of full automatic continuous production, thus saving on labour costs. Machines will be produced in food-grade stainless steel, and the automatic control system realizes full automatic control of frying time and temperature. This assures a steady performance and high quality of fried products.

Note: Care must be exercised when heating liquids like cooking oil. The heat exchanger pipe surface temperature must remain within specified limits so as to avoid any breakdown of the heated liquid. **Specific guidance MUST be sought from Lanemark International Ltd, UK before proceeding.**



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Food & Drink Preparation – Fryer Installation: Country Style Foods, UK



2 off TX20N each rated at 80kW
2 off TX25EN each rated at 115kW

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Lanemark Oven Heating Burner Systems

FD Burner Systems Introduction

What do FD burners do? They preheat, heat, dry, stove, cure or bake products.

Where are FD burners used? They are used in forced air convection ovens or dryers.

What alternative systems are there?

- a) Convection ovens or dryers that are heated by steam batteries, thermal oil, hot water heat exchangers, electric elements or outdated gas or oil burner systems
- b) Radiation ovens heated by gas or electric radiant elements
- c) Conduction drying

What types or product areas could benefit from the use of FD burners? The main markets are associated with:

- 1. Product finishing – metals, wood, plastic etc.
- 2. Textiles and paper drying
- 3. Pottery, ceramic and glass production
- 4. Plastic moulding and rubber goods manufacture
- 5. Crops and food production
- 6. Clothes drying (laundries)



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Product Finishing

Final Treatment – Following pre-treatment and drying, components receive their final treatment which often involves the application of various types of paint finish (e.g. powder coating).

Most paints used for industrial finishes can be dried or cured at temperatures up to around 200°C (350°F). Newer "lower bake" paint technology will allow this to be reduced to 100°C (210°F).

The aim of paint drying is to achieve a high quality finish and so cleanliness and uniformity are of prime importance.

The most popular methods of paint drying, curing or baking use convection, radiation or convection/radiation combination methods..

Direct gas fired process heating methods are popular and the recirculation of hot main process air flows can be employed to reduce energy consumption. Recirculation rates vary from 10 – 90%, depending on the anticipated concentration of contaminants.



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Lanemark Oven Heating Burner Systems

Pre-treatment Installation: Coopers Lighting, UK



Drying Oven - 1 off FD10C(GA)N rated at 298kW max gas input
Curing Oven - 2 off FD10C(GA)N rated at 298kW max gas input



Lanemark Oven Heating Burner Systems

Pottery, Ceramic, Glass Production

Direct gas fired convection ovens are commonly used in the production of these items in. The processes can be of the "batch" type or semi-continuous with a conveyor oven.

In pottery and ceramics, drying a clay "body" is prepared by mixing various raw materials with water to give a plastic material. This material is then moulded to the required shape.

To be of any use, the ceramic ware must be hardened by "biscuit" firing at 1,100 – 1,200°C (2,000 – 2,200°F). But first the "green" ware must be carefully dried to a very low moisture content to avoid shrinkage cracks, warping or bursting caused by steam developed in the material. **Drying is a critical operation of the manufacture of ceramic wares and pottery.**

Drying usually takes place in batches, the popular method being hot floor – i.e. the natural convection of warm air from steam pipes in the floor. For large scale production of standard articles, continuous drying methods are required in conveyor type ovens.




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Pottery, Ceramic, Glass Production

To minimize damage during drying, the mass of the wares is heated to an even temperature in very humid air. No drying takes place in this pre-heating zone of the conveyor. The humidity is then progressively reduced, speeding up towards the end of the oven.

Direct gas fired air heaters provide an economic answer for drying "green" ware before "biscuit" firing.

The advantages of:

- Cleanliness
- Accuracy
- Controllability, are of vital importance.

Infrared drying is not usually employed unless the ware is very thin




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Plastic Mouldings and Rubber Goods Manufacture

Rotational moulding - A heated hollow mould is filled with a charge or shot weight of material, it is then slowly rotated (usually around two perpendicular axes) causing the softened material to disperse and stick to the walls of the mould. In order to maintain even thickness throughout the part, the mould continues to rotate at all times during the heating phase and to avoid sagging or deformation also during the cooling phase.

Rotary moulding machines for the production of plastic goods generally use direct fired convection techniques. There are many different types of rotational moulding machines:

1. **Rock and roll machine**
2. **Clamshell machine**
3. **Vertical or up & over rotational machine**
4. **Shuttle or swing arm machine**
5. **Carousel machine**

Rubber products require drying, and curing at various stages of their manufacture. Hot air direct fired process heating systems offer a:

- Flexible
- Economic
- Responsive solution to these heating problems



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Plastic Mouldings and Rubber Goods Manufacture

A typical rock and roll machine:



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Rotational Moulding Installation: Rototek, UK



4 off FD15C(GA)N-3 rated at 500kW max gas input
(Note: These replaced 4 off Maxon Ovenpak 400 burners)

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Crops and Food Production

The principle aim of crop drying is to facilitate storage. This applies particularly to perishable items.

A further advantage often arises from crop drying. Most crops and foods in their fresh state, contain between 60 – 90% water and drying reduces their weight and volume considerably. This in turn reduces the costs of handling, packaging, transport and storage.

The main problem in food drying is to remove only the water and to retain the food's appearance, flavour and vitamin value.

Crop dryers can be of the pneumatic conveyor, tray or rotary types. Often propane is used as the fuel selection due to the remoteness of the locations. Direct gas fired air heaters usually have no adverse effects on the crop quality.

Food dryers fall into similar categories.



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Crops and Food Production

Food Drying - The method of food preservation that works by removing water from the food, which inhibits the growth of microorganisms and hinders quality decay. Water is usually removed by evaporation.

Bacteria yeasts and moulds need the water in the food to grow. Drying effectively prevents them from surviving in the food.

Typical foods include:

1. Fruit
2. Vegetables
3. Meat
4. Fish
5. Nuts and Pulses
6. Crisps
7. Biscuits
8. Cereals



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Food Drying Installation: Dodman Ltd, UK



FD5CN-3 rated at 220kW max gas input



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Clothes Drying (Laundries)

Direct gas fired convection dryers can significantly reduce the overall energy consumptions in laundries where the "traditional" heating medium is steam.

Areas of industry with high clothes/laundries drying requirements include:

1. Prisons
2. Large hotels
3. Army bases
4. Hospitals



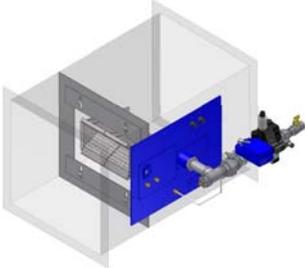

Lanemark Midco HMA2A & DB Duct Burner Systems

Major applications include:

- Paint spray booth air heating
- HVAC air replacement schemes for factories, warehouses distribution centres
- Crop dryers

Also can be used to heat:

- Paint drying and curing ovens
- Print media dryers



Lanemark Midco HMA2A & DB Duct Burner Systems

Paint Spray Booths



Automotive – Small and medium sizes for cars and trucks



Lanemark Midco HMA2A & DB Duct Burner Systems

Paint Spray Booths



Automotive – Large size for buses and coaches



Lanemark Midco HMA2A & DB Duct Burner Systems

Heating, Ventilating & Air Conditioning (HVAC)

Direct compensating ventilation/heating is where conditioned air is delivered to the immediate vicinity of an exhaust – for example welding fume extractors, commercial kitchens, garages, transport depots.

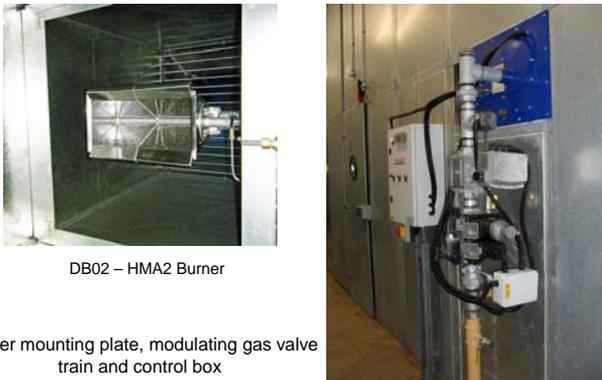
General area ventilation/heating is where conditioned air is delivered into the total building to compensate for many exhausts – introduced in cleanest part of the building and flows to negative pressure areas of the building collecting any contaminated air (dust, vapours).

Door heaters introduce warm air - commonly known as a "door curtain", across large door openings to prevent cold air entering a building.



Lanemark Midco HMA2A & DB Duct Burner Systems

Heating, Ventilating & Air Conditioning (HVAC)



DB02 – HMA2 Burner

Burner mounting plate, modulating gas valve train and control box

