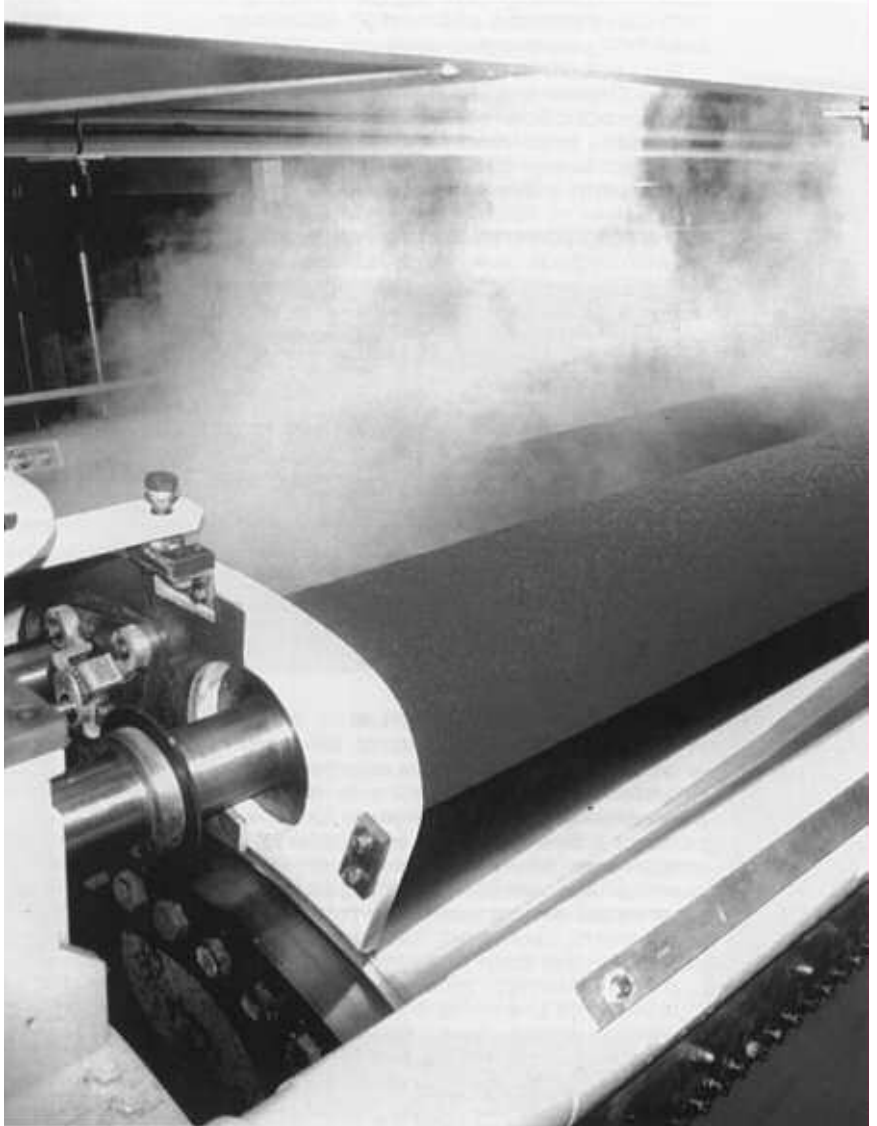


DRUM DRYER



SIMON DRUM DRYERS

R. Simon (Dryers) Limited,

based in Nottingham, are the leading UK manufacturers of Drum Dryers with over 100 years experience.

Drum Dryers are used extensively for the production of cereal based 'instant' breakfast products, dry powder baby food, pre-gelatinised starch, and many other products.

OPERATION/MAINTENANCE

Drum Dryers are simple, robustly designed and engineered machines which do not require specially trained operators, neither do they require any special maintenance

INVESTMENT

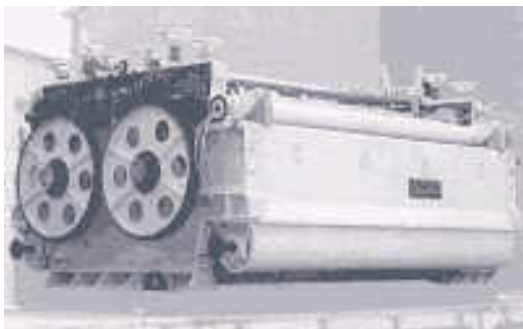
Installation of a drum dryer requires low investment due to the compact design of the dryer in relation to other drying methods

ENVIRONMENTAL ASPECTS AND ENERGY CONSUMPTION

Drum Drying is an environmentally friendly drying method with low consumption of energy and energy costs

WORKING PRINCIPLE

A thin layer of the product to be dried is applied to the outside of a rotating cylinder (drum). The drum is heated internally by means of steam. Once in contact with the heated surface, liquid evaporates from the thin layer very quickly. The remaining dried product is, after an almost complete rotation of the drum, scraped off the drum surface in the form of a film or powder.



CONSTRUCTION

The Simon Drum Dryer is designed and built to give many years of trouble free service.

The heart of the dryer is the drum, constructed in cast iron and designed to accommodate high steam temperatures and pressures, precision machined to provide even heat transfer and hence reproducible performance over long periods. For products which may not come into contact with cast iron the drum may be hard chrome plated or chrome plated over nickel for more arduous process conditions.

The drum rotates in either grease or oil lubricated heavy duty roller bearings which may be split to facilitate bearing replacements.

Materials may be fed to the dryer drums by a variety of mechanisms ranging from simple spray pipes for double drum dryers to traversing feed mechanisms with single or multi feed pipes for single cylinder feed roll dryers.

Product is removed from the dryer drum by means of an alloy steel doctor blade or knife rigidly clamped in a cast iron knife bar assembly. The knife is applied to the surface of the drum by pneumatic cylinders located at each end of the dryer. For improved life and reduced drum maintenance an oscillating knife system may be fitted with either conventional or disposable knives.





After removal from the drum the product is collected by a screw conveyor specially designed to break up the product film or flakes into easy-to-handle particles. For products that may require cooling after removal from the drum, e.g. those with high sugar contents, air knives and film take-off rollers are fitted.

To prevent leakage of the feed slurry from the dryer, pneumatically loaded damplates faced with suitable seal materials are provided at each end of the dryer drum or drums.



To minimise mechanical damage to the surface of the dryer drums, applicator (feed) rolls are mounted in spring loaded bearing slide assemblies designed to allow the rolls to lift in the event of a foreign body passing between the roll nips and dryer drum and return to their original position. In cases of twin cylinder dryers, one drum is fixed in position, the other is spring loaded to give the same degree of protection.



Dryers for food applications are generally provided with vapour canopies and extract systems to remove the vapours from the operating area. Dryers for hazardous materials may be provided with complete dust and fume tight enclosures whilst heat sensitive products may require full vacuum casings.

For double or twin cylinder drum dryers, the drive is provided by means of spur pinion and gear wheels mounted on the dryer drum drive end trunnions. In the case of drum dryers with multi feed or applicator rolls, each applicator roll is rotated by a pinion driven by the drive spur gear wheel. In the case of drum dryers with simple applicator rolls the applicator roll is often driven by a completely separate drive train. All drives are variable speed, type and configuration to suit each particular application.

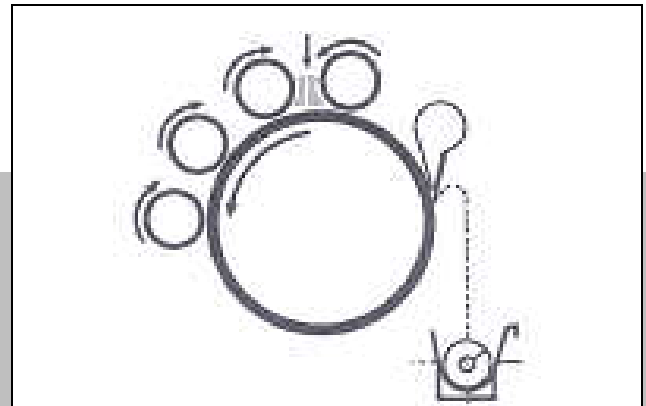
SIMON DRUM DRYERS

SINGLE DRUM DRYERS WITH APPLICATOR ROLLS

The wet product is applied to the drum by means of applicator rolls. According to the number of the applicator rolls used the layer formed on the drying drum is thicker or thinner.

This arrangement is suitable for the processing of pulpy or pasty products.

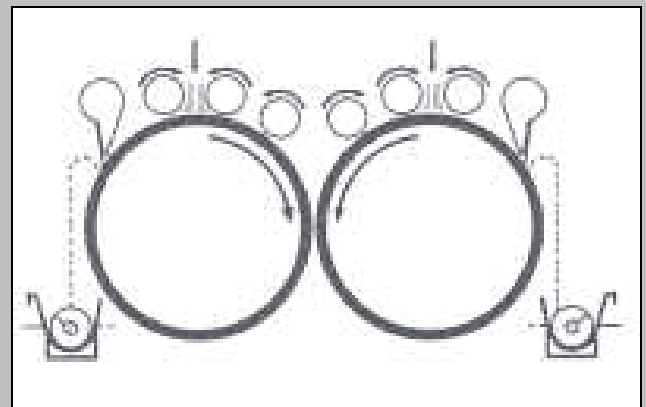
*Typical applications are:
Cereal based breakfast foods,
Babyfood products, Pre-gelatinised
starches, Fruit pulp and pastes,
Potato flakes.*



DOUBLE DRUM DRYER WITH FEED ROLLS

This is a special 'Hybrid' system used to impart certain physical properties, particularly density, to specific products

*Principle applications are:
Cereal based breakfast foods,
Baby food products,
Fruit pulp and pastes.*

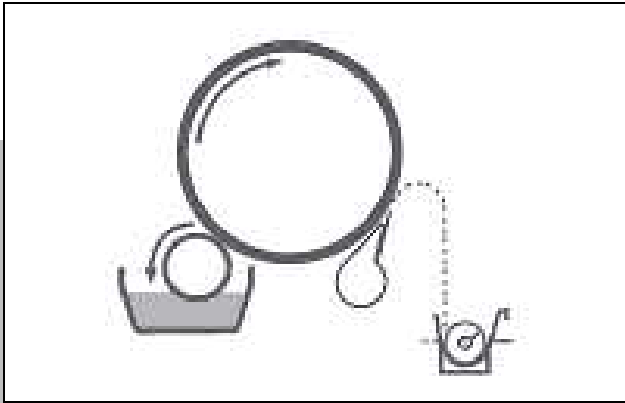


TWIN CYLINDER DRYER WITH NIP FEED

The material to be dried is pumped, either directly or through spray nozzles, into the nip formed between two drying drums. This is the oldest and simplest form of drum dryer. The thickness of the product film may be varied by adjustment of the gap between the drying drums or cylinders.

*Typical applications are:
Drying of Yeast, Milk products,
Detergents, Dyestuff manufacture.*

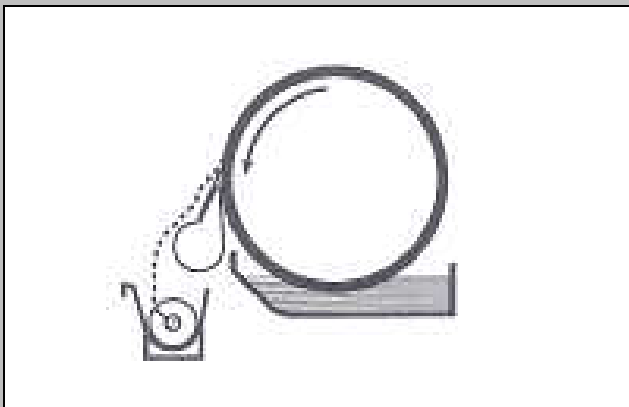




SINGLE DRUM DRYER WITH APPLICATOR ROLL

This is a more specialised type of drying, for example in the Chemical Industry. The applicator roll is located underneath the drum dryer and dips into the product. A liquid film is then transferred to the drying drum.

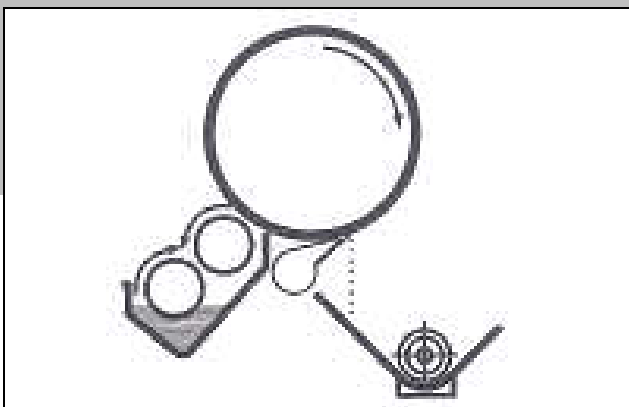
*Typical applications are:
Animal based glue,
Gelatine, Pesticides.*



DIP FEED DRUM DRYER

One of the most basic forms of the drum dryer, where a film of the product to be dried is picked up on the surface of the dryer drum as it rotates through a feed tray mounted below. The feed tray may be cooled or fitted with a recirculation system to prevent overheating or settling out of product from suspension.

*Typical applications are:
Drying of cereals,
Spent Yeast.*



SINGLE 'FINE FILM' DRUM DRYER

A system developed for drying of heat sensitive materials. The tray containing the feed to the dryer drum and product film is applied by an intermediate applicator roll which may also be cooled.

*Typical applications are:
Milk products, Fine Chemicals e.g.
Sodium Benzoate, Plant Extracts.*

SIMON DRUM DRYERS

OPTIONAL EQUIPMENT

TESTING FACILITIES

We have a fully equipped Test House in which the drying capabilities of materials can be assessed by our fully qualified test technicians.

OSCILLATING KNIFE

For products that are sometimes difficult to remove from the dryer drum or where the drum has been chrome plated, we would recommend our mechanical knife bar oscillating system. This system gives greatly improved knife life and reduces the wear on the drum surface.

JET COOKER

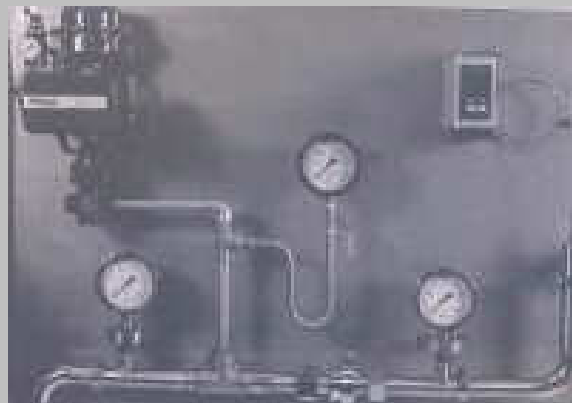
For food or related food products, it is sometimes necessary to preheat the feed to the dryer to obtain a higher degree of pregelatinisation or a sterile feed to the dryer. Pre-heating is achieved by using a jet cooker, the temperature is checked and controlled electronically.

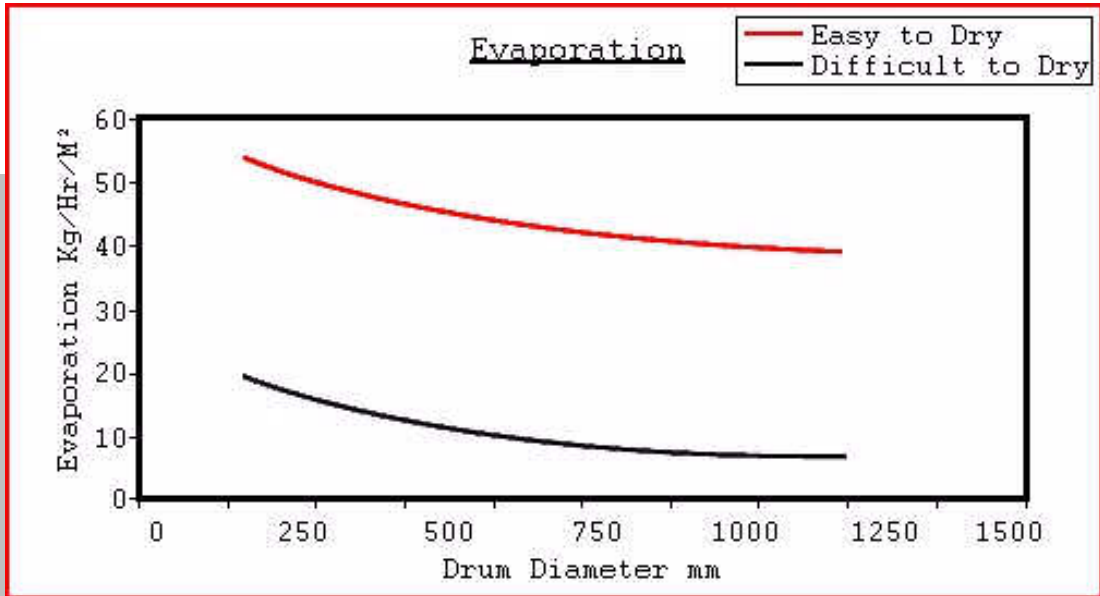
KNIFE GRINDER

Designed for regrinding of our standard cast steel knives in your own workshop. The unit comprises a grinding head with 1.1 Kw motor mounted on a traversing carriage running on a cast iron slide base and is supplied complete with 0.37 Kw traversing drive electric motor drive and controls.

ADDITIONAL EQUIPMENT

- 1 Batch Mixing systems for feed slurry preparation
- 2 Automatic weighing and ingredients blending system
- 3 Product milling, sifting and blending systems
- 4 Product storage and packing system.





The above chart shows the typical evaporation rates when drum drying most materials. The steam pressure used is 7 bar g.

The two curves show that there can be a large difference between materials easy to dry and those difficult to dry.

This is why we recommend performing tests on new products, so that we can accurately size production dryers.

DRUM DRYERS

Standard Sizes

diameter (mm)	length (mm)	effective area (M ²)
450	450	0.6
	900	1.0
700	1500	2.5
	2000	4.0
900	2500	6.0
	3000	8.0

diameter (mm)	length (mm)	effective area (M ²)
1200	3000	11
	3500	16
1500	4500	20
	2000	24
2000	4000	24
	5000	29
2000	6000	35

300mm x 200mm Test Machines also available

MATERIAL PROCESSED.

Food:

Baby Food & Infant Food
Batter Mix
Breakfast Food
Buttermilk
Cereal (Infant Food)
Casein
Corn Syrup
Essence
Flour
Mealie Meal
Milk (Skim and Whole)
Oats
Oat Cereal (Instant)
Oat Flour
Onion Puree
Pease Pudding
Potatoes
Potato Sludge
Rice (Starch)
Semolina
Starch and Flour
Tapioca Starch
Vegetable Protein
Whey
Wheat Starch
Yeast

Chemical:

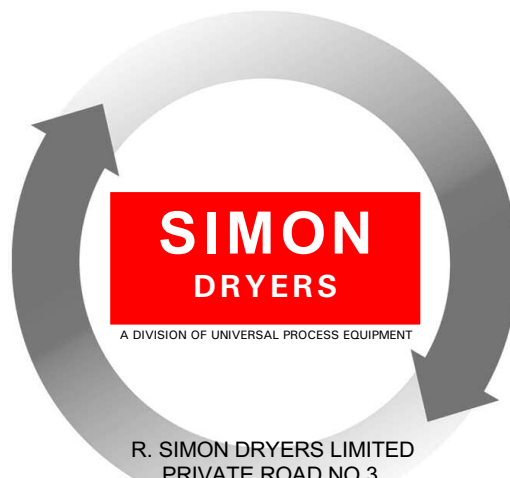
Alkyl Aryl Sulphonate
Alumina Slip
Anhydrous Sodium Sulphate

Barium Hydrate
Barium Sulphate
Calcic Sulphite
Calcium Acetate
Calcium Pantothenate Solution
Calcium Propionate
Ceramic
Chromium Sulphate
Detergent
D.D.T.
Dyestuffs
Fatty Alcohol Sulphates
Fermentation Broth
Ferric Ammonium Citrate
Syrup
Ferrous Sulphate & Ferrous Ascorbate Solution
Gelatine
Glaubers Salts
Glue
Iron Oxide Slurry
Lead Sulphate
Lithopone
Magnesium Carbonate
Magnesium Oxide
Metal Chelates
Metallic Stearate
Polymer Gel
Resin
Sodium Acetate

Sodium Benzoate
Sodium Caprylate
Sodium Dichromate
Sodium Formaldehyde Bisulphite
Sodium Hypophosphite
Sodium M.B.T.
Sodium Nitrate
Sodium Octanoate
Sodium
Pentachloropentate
Sodium Selenate
Sodium Sulphate
Sodium Toluene Sulphonate
Streptomycin Sulphate
Sulphonated
Naphthalene
Tripolyphosphate

Others:

Blood
Effluent (Distillery)
Fish Meal
Maize Gluten
Molasses Fermentation Residue
Starch - all types
Seaweed Extract
Steep Liquor
Whale Solubles
Yeast (Extracted)



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PRIVATE ROAD NO.3,
COLWICK INDUSTRIAL ESTATE
NOTTINGHAM NG4 2BD, ENGLAND.

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Web Site: <http://www.simon-dryers.co.uk>

OTHER SIMON PRODUCTS

- Drum Flakers
- Indirect Calciners
- Rotary Louvre Dryers and Coolers
 - Tubular Dryers
- Laboratory and Pilot Machines