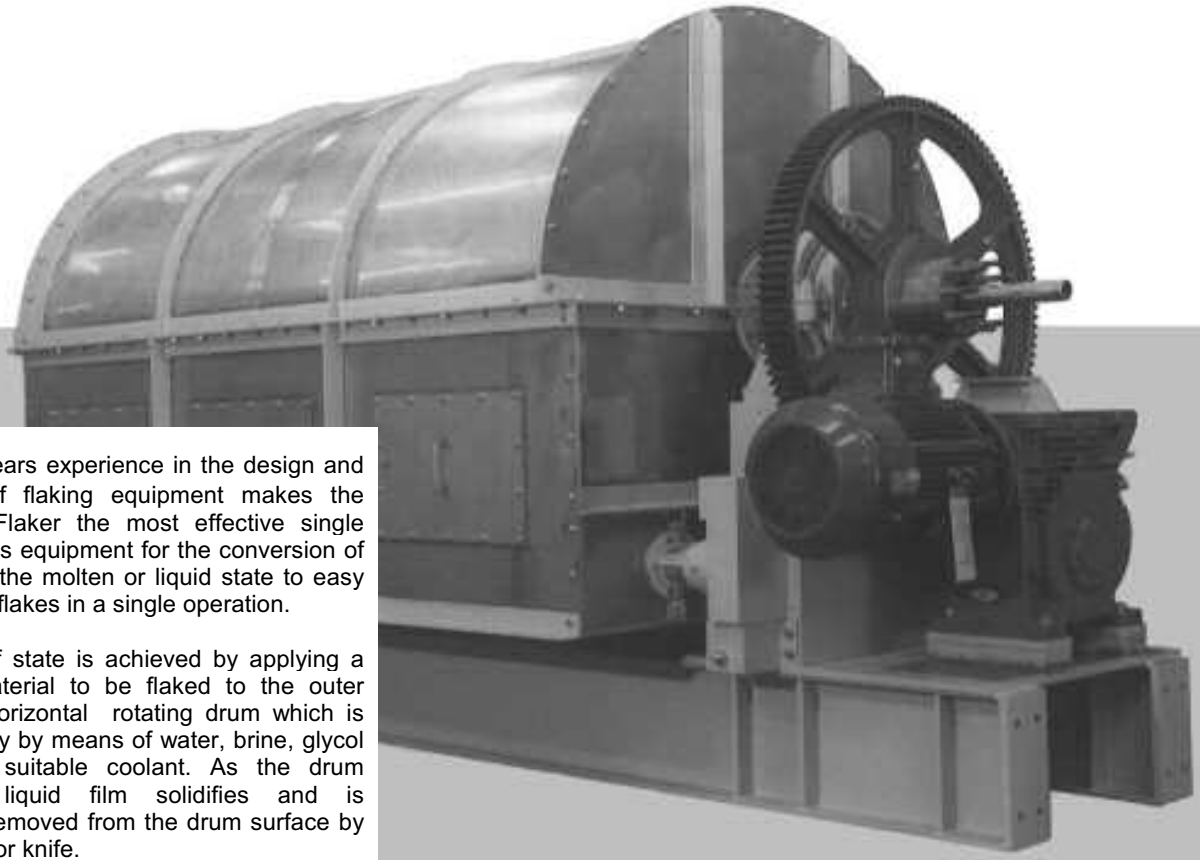
simondryers
Process Drying Technology

FLAKERS

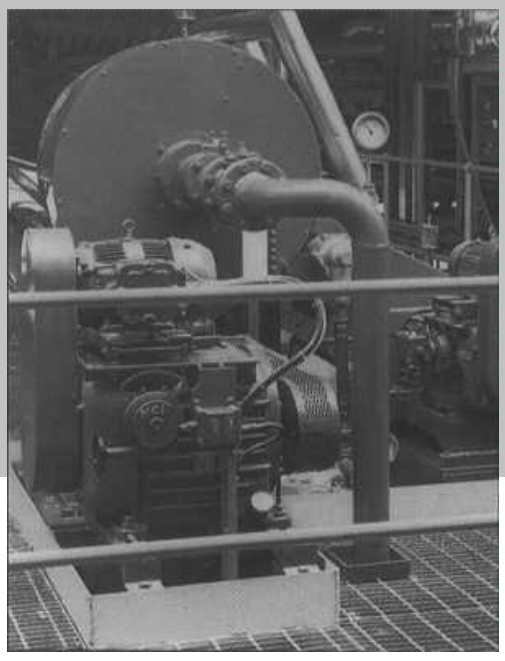


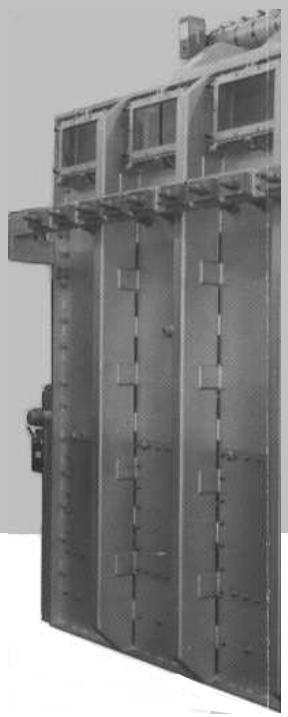
Over eighty years experience in the design and manufacture of flaking equipment makes the Simon Drum Flaker the most effective single piece of process equipment for the conversion of materials from the molten or liquid state to easy to handle solid flakes in a single operation.

This change of state is achieved by applying a film of the material to be flaked to the outer surface of a horizontal rotating drum which is cooled internally by means of water, brine, glycol or any other suitable coolant. As the drum rotates, the liquid film solidifies and is subsequently removed from the drum surface by a doctor blade or knife.

The liquid film may be applied to the flaking drum in many different ways, depending upon the physical properties of the material being processed. Typical feed systems are (a) Dip Tray, where the flaking drum is mounted in a tray of molten product, (b) Applicator Roll, where the liquid film is applied to the surface of the flaking drum by means of an auxiliary roll, (c) Top Feed, where the molten product is poured into a feed box mounted over the flaking drum. For materials with supercooling properties, various modifications to or combinations of these feed systems may be used.

The present generation of Simon Drum Flakers provide an economic, both in terms of running costs and space requirements, easy to operate and maintain system for flaking a wide range of organic and inorganic chemicals with melting points ranging from little more than ambient to in excess of 300 degrees C.





Flaking drums can be manufactured in a wide range of materials including carbon steel, cast iron, chrome/nickel plated cast iron, stainless steel, nickel alloys and even bronze.

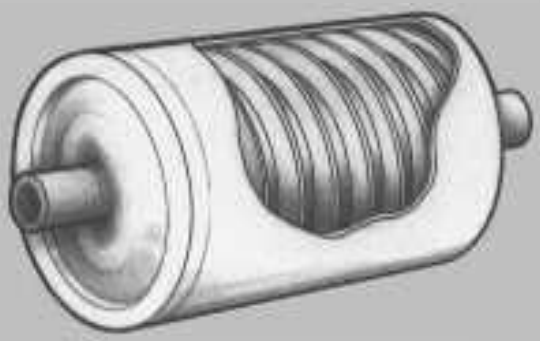
There are three main types of flaking drums classified by the method of cooling, 1) spray cooled drums, where the coolant is sprayed onto the inner surface of the drum 2) water or other coolant filled drums and 3) flaker drums with the Simon Annulus Cooling System.

In the Simon Annulus Cooling System, the flaker drum consists of two cylinders, the inner and outer cylinders being separated by a spiral rib or ribs creating an enclosed channel through which the coolant flows. This type of construction gives higher heat transfer rates than either spray or water filled drums and operating problems, caused by dirty or blocked spray nozzles or poor circulation of coolant due to fouling of syphon pipes, do not occur.

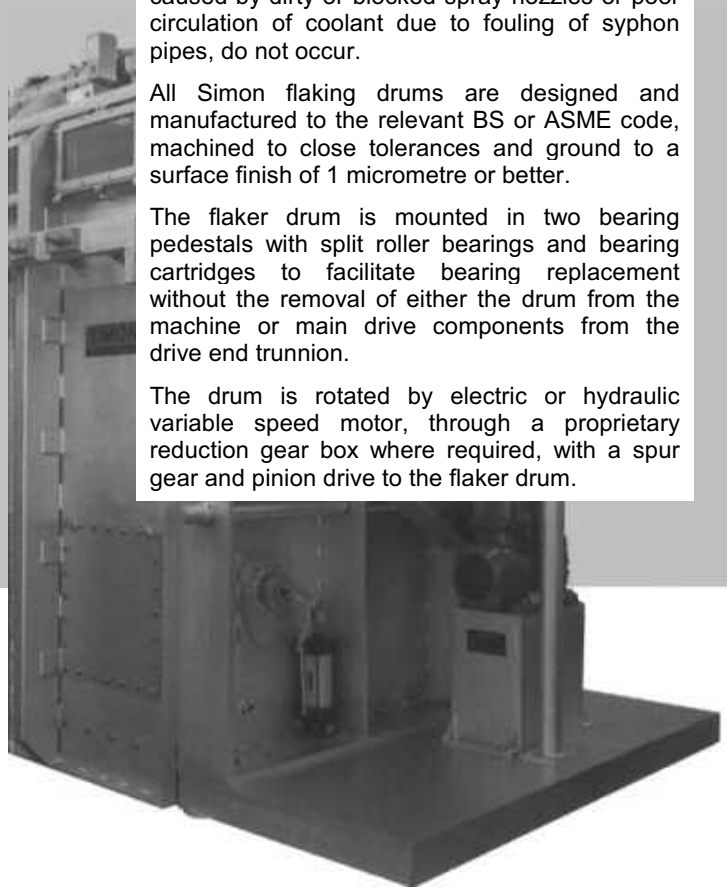
All Simon flaking drums are designed and manufactured to the relevant BS or ASME code, machined to close tolerances and ground to a surface finish of 1 micrometre or better.

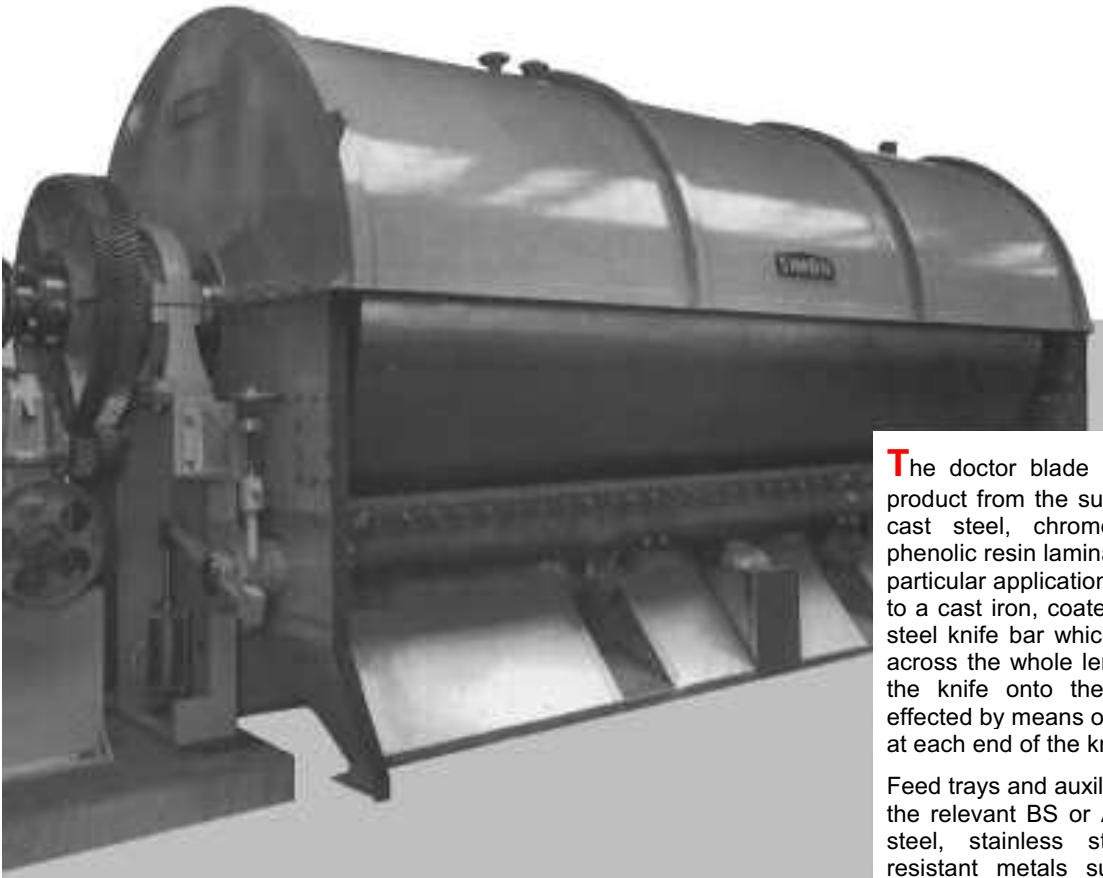
The flaker drum is mounted in two bearing pedestals with split roller bearings and bearing cartridges to facilitate bearing replacement without the removal of either the drum from the machine or main drive components from the drive end trunnion.

The drum is rotated by electric or hydraulic variable speed motor, through a proprietary reduction gear box where required, with a spur gear and pinion drive to the flaker drum.



Flaker Drum with
Simon Annulus Cooling System



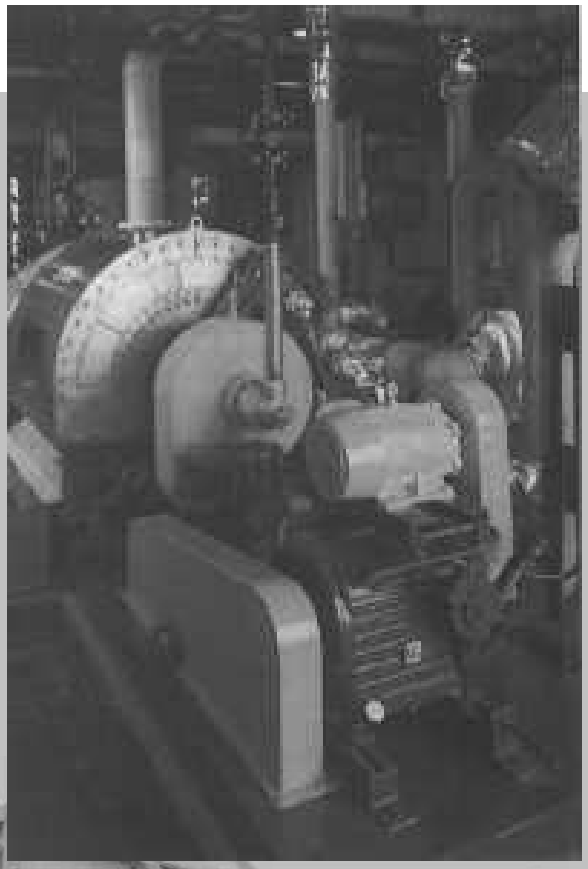


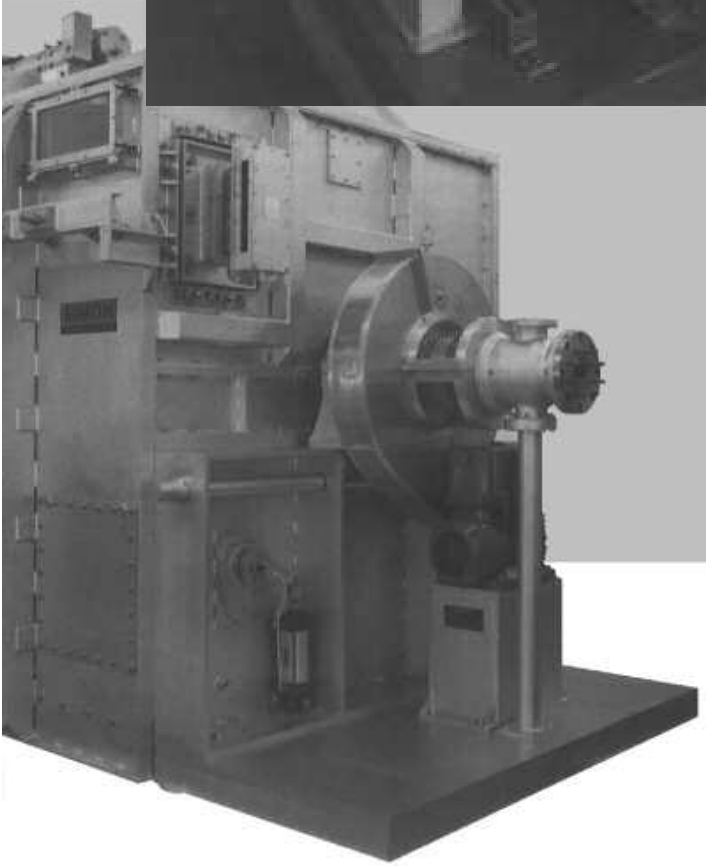
The doctor blade or knife which removes the product from the surface of the drum may be of cast steel, chrome steel, beryllium copper, phenolic resin laminate, etc., depending upon the particular application. The knife is rigidly clamped to a cast iron, coated cast iron, or cast stainless steel knife bar which is mounted in front of and across the whole length of the drum. Loading of the knife onto the drum surface is normally effected by means of pneumatic cylinders located at each end of the knife bar.

Feed trays and auxiliary rolls are manufactured to the relevant BS or ASME code in either carbon steel, stainless steel, or special corrosion resistant metals such as nickel/chrome alloy steel or titanium. For the majority of applications where the feed tray or box has to be heated to prevent solidification or the product, heating may be provided by steam, thermal oil, or electricity.

Simon Drum Flakers are supplied either as open units, for non-toxic materials, or totally enclosed. Enclosures range from simply "dust tight" to pressurised casings, complete with bursting discs, capable of operating under inert atmospheres. Materials of construction range from carbon steel to nickel/chrome alloy steels. All enclosures are provided with access/inspection panels with the necessary safety interlocks for safe operation and ease of maintenance.

Units can be supplied complete with feed control and distribution systems, flaked product chutes and breakers, product conveyors, product and/or coolant temperature controls and fume removal systems.





The size of a flaker for any particular duty depends upon the heat load. The total heat load is the sum of the required reduction in sensible heat of the liquid phase to reach the temperature at which the material changes state plus the latent heat of solidification plus the required reduction in sensible heat of the solid phase to achieve the desired final flake temperature.

Using heat transfer coefficients based on previous experience or test data it is then possible to calculate the effective surface area of the flaking drum. Due allowance is then made for the type of feed system and knife position as the relative position of doctor blade to liquid film pick up point limits the effective heat transfer area.

Another critical factor is the length to diameter ratio for the flaking drum which is often dependent upon the characteristics of both liquid and solid phases and only arrived at by experience. In practice length to diameter ratios vary from less than one up to a maximum of three.

Our test data covers more than two hundred different materials and to date we have supplied over one hundred and fifty flakers to chemical, pharmaceutical, paint and resin manufacturers worldwide.

Simon Drum Flakers are available with flaking drums manufactured in a wide range of materials from carbon steel to nickel alloys and in a standard range of diameters from 450mm to 2500mm and from 450mm to 2500mm long.

MATERIALS PROCESSED.

Acetanilide
Alpha-Naphthylamine
Anthracene
Barium Hydroxide
Benzoic Acid
Bitumen
Bromo-Propylene
Butyl Carbazole
Calcium Chloride
Caprolactam
Carbamite
Caustic Soda
Cetyl Alcohol
C.M.P.P.
D.D.T.
Dichloroaniline
Dimethyl Terephthalate (D.M.T.)
Diphenylamine
D.N.T.
Ethylene Glycol
Fatty Acids
Fatty Alcohols
Iodine
Lanthanum Nitrate
Lauric Acid
Lead Stearate
Maleic Acid
Maleic Anhydride
M.A.P.
Monochloroacetic Acid
Monoglyceride
Naphthalene
Nickel Catalyst
Olive Acid
Palm Oil
Paraffin Wax
Para-phenyl Phenol
Phenol
Phenolic Resins
Phosphorus Pentasulphide
Phthalic Anhydride
Picric Acid
Polyester Resin
Polyethylene Glycol
Polyvinyl Chloride
Sodium Bisulphate
Stearic Acid
Stearine
Sodamide
Sulphur
Tallow
T.N.T.
Water
Waxes

simondryers
Process Drying Technology

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OTHER SIMON PRODUCTS

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