



## Flaked Breakfast Cereals

Satisfying flavour and healthy appeal have made flaked cereals a breakfast tradition.

Another tradition is extrusion of flaked cereals by Clextral twin screw extruders.

Breakfast cereal makers value the quality, consistency and economy of the extruded flakes, and consumers around the world confirm their preference with their buying selection.

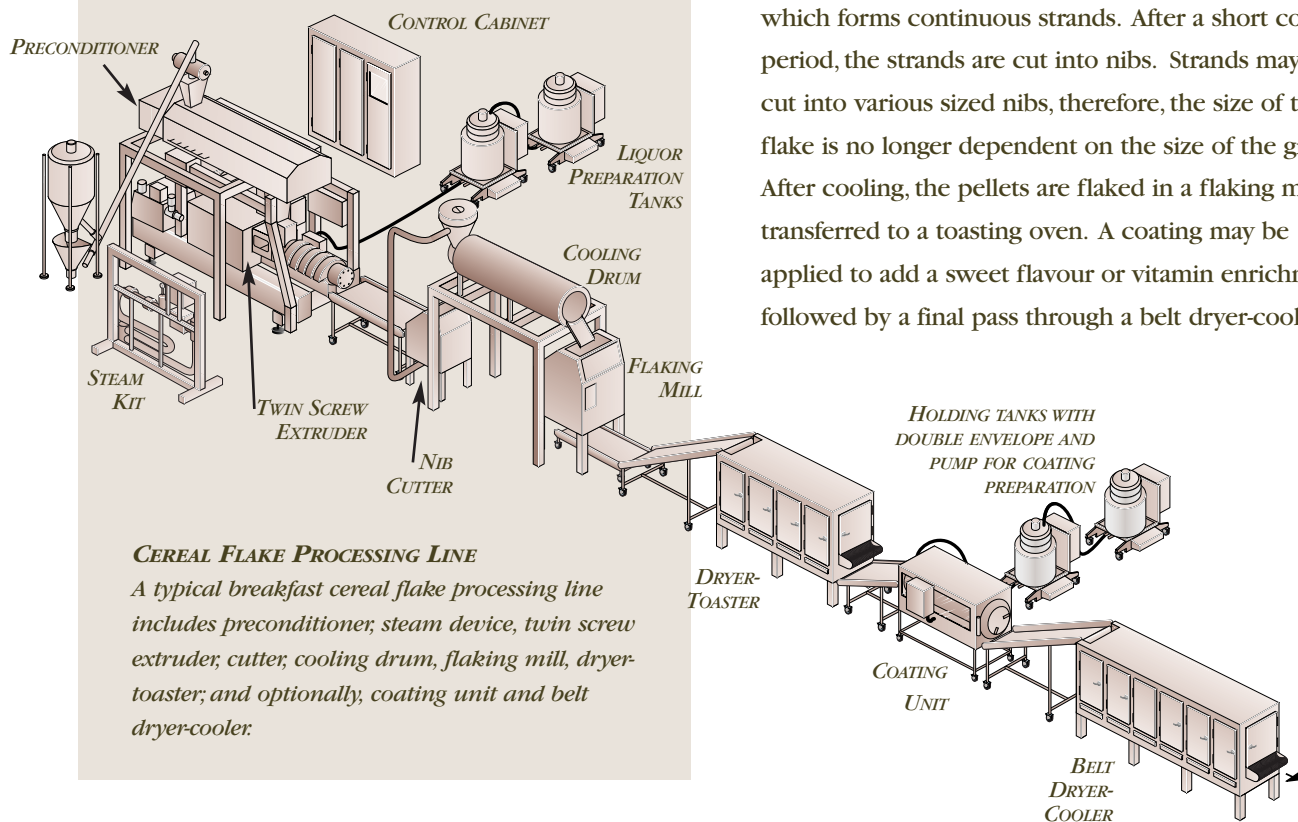


Clextral pioneered the process for extruded breakfast flakes in the early 1970's, introducing a process that was faster, simpler and more economical than the traditional batch process. Since that time, Clextral has commissioned over 150 units in thirty countries, providing the equipment, experience and support for successful and profitable breakfast flake processing lines. Advantages of Clextral's cereal flake extrusion process include:

- Lower raw materials costs
- Greatly reduced processing time, from 7 hours with traditional batch process to 20 minutes by extrusion
- Expert process control produces high quality product with quality/flavour profile of traditionally produced flakes
- Flexibility to process many cereal grains: Corn, wheat, bran, oats and rice
- Clextral offers complete breakfast cereal processing lines including design, equipment, commissioning, product specifications, on-site training and maintenance.
- Automated control systems can supply programmed start up and shut down, monitor line performance, generate production reports and provide automated recipe storage and recall
- Output from 100 to 2,000 kg/h



*Dense strands of processed grits exit the extruder. After a brief cooling period, the strands are cut into nibs, and flaked to form the finished product.*



#### **CEREAL FLAKE PROCESSING LINE**

*A typical breakfast cereal flake processing line includes preconditioner, steam device, twin screw extruder, cutter, cooling drum, flaking mill, dryer-toaster; and optionally, coating unit and belt dryer-cooler.*

## **Flaked Cereal Production**

Dry ingredients, including grits, sugar, and salt, are mixed and conveyed to a preconditioner which hydrates and heats the mixture to commence gelatinization. The partially cooked product is fed to the twin screw extruder. Inside the extruder, the twin rotating screws mix the extrudate, creating heat and shear to perform complete gelatinization. Malt syrup is injected directly to the extrudate through ports in the extruder barrel. Processing temperatures are precisely controlled by heating and/or cooling circuits in each section of the extruder barrel. This process forms a dense phase extrudate which will mimic traditional grits when processed through a flaking mill. The fully cooked product is forced through a die which forms continuous strands. After a short cooling period, the strands are cut into nibs. Strands may be cut into various sized nibs, therefore, the size of the flake is no longer dependent on the size of the grit. After cooling, the pellets are flaked in a flaking mill and transferred to a toasting oven. A coating may be applied to add a sweet flavour or vitamin enrichment, followed by a final pass through a belt dryer-cooler.

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