

Overall process.

Tailor-made customer solutions.



System types

The core components of all FHT systems (heat retention screws and thermopneumatic conveyors) for the hydrothermal and thermal processes are identical. The two processes can be combined in one single system.

This produces maximum production flexibility, since it is possible to produce

- flours with gelatinized starch
- baking flours with strengthened gluten
- dried flours
- stabilized germ and bran

on a single system. A system may also be designed to meet specific process requirements.

The system capacities are related to the specific product and may vary according to

- the process (thermal/hydrothermal)
- the heat retention time in the retention screws
- the intensity of treatment.

The process and the system size are matched to the customer's specific needs.

Control system

A PLC control system controls and monitors the entire process. Operation, data gathering, and recipe management are performed by the Buhler WinCoS process control system.

The recipe-oriented control system is based on

- the routing recipe, which defines the process sequence
- recipe (product formula) with the actual process parameters
- the production job with the data relevant to production.

The administration authorizations for the various recipe levels can be defined on a user-specific basis.

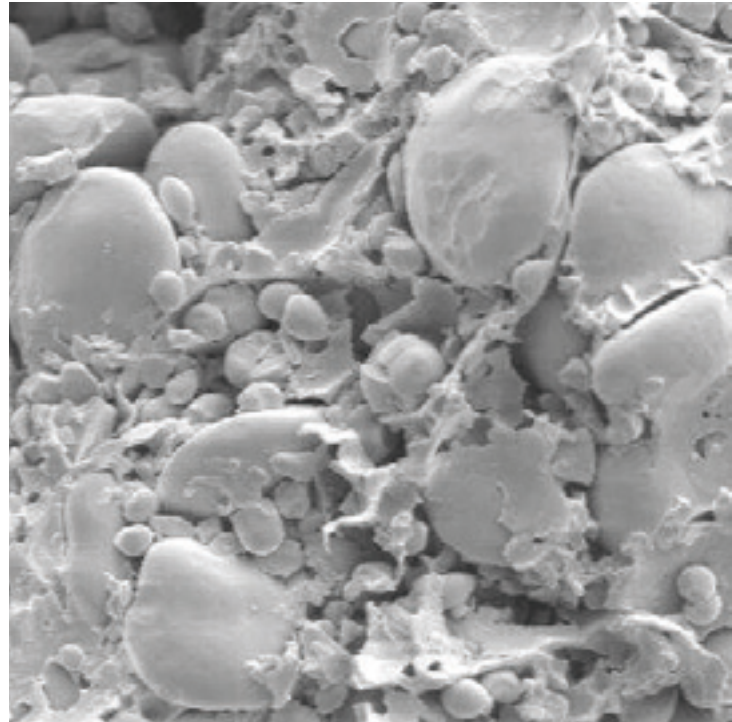
Product traceability is ensured by

- permanent recording of the parameters relevant to the process
- a job-oriented operating mode of the control system.

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FHT – Flour Heat Treatment.



Flour Heat Treatment.

Modification of grain product properties.

Definition of FHT

Flour Heat Treatment is a process designed to modify the properties of flour, germ, and bran. FHT can be divided into two basic processes: hydrothermal treatment and thermal treatment.

Applications

FHT products can be applied in a large number of different ways in the food industry:

– Coatings

Hydrothermally treated flour is excellently suited for preparing batters for coating fish, meat, and vegetables. Thanks to its optimized cold viscosity,

- batters or breadings adhere perfectly to the food
- dripping of the batter is reduced.

– Bakery products

Thermally treated flours are used for cakes with high sugar and fat contents. These flours are characterized by their

- strengthened gluten properties
- fine granulation.

In order to achieve a long shelf life of fresh dough, raw materials with low microbiological contamination are required. Heat treatment sanitizes the flour by inactivating a large proportion of the microorganisms.

– Binders

FHT flour is applied, among other things, as a thickener for soups and sauces. Heat treatment

- increases the hot viscosity of these flours
- dries the product to prevent moisture from migrating to the other substance components
- inactivates microorganisms and enzymes.

– Other applications

The FHT process allows bran, germ (e.g. of wheat) as well as rice bran to be stabilized, enabling them to be preserved by

- essentially inactivating fat-splitting enzymes
- reducing a large proportion of the microorganisms by heat
- optimizing the product moisture.

These grain byproducts can, for example, be used in muesli mixes or in cereal bars.



Coatings.



Soup and sauce flours.



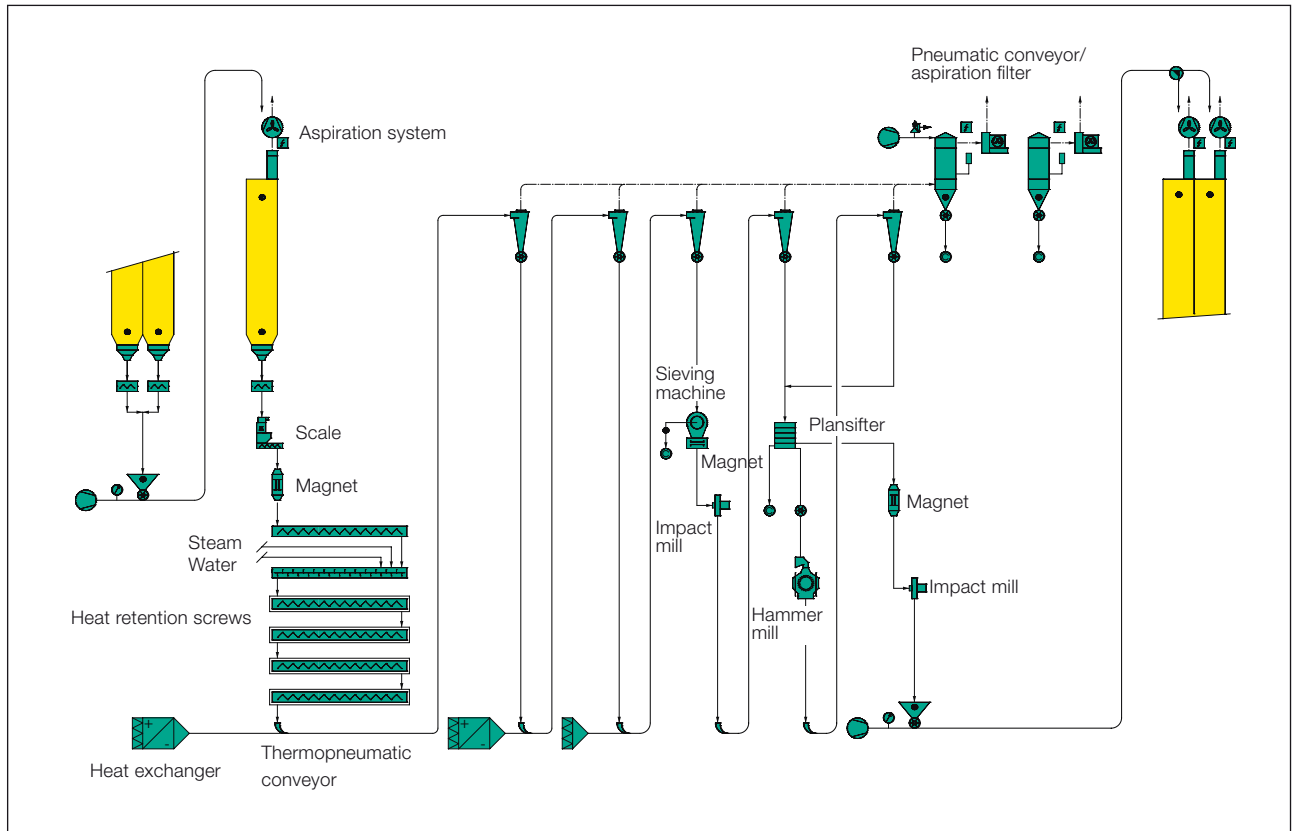
Cakes.



Stabilized bran and germ.

Hydrothermal flour treatment.

Moisture and heat.



Hydrothermal process

The term “hydrothermal process” refers to the treatment of flour by heat and moisture in the form of water and steam. The goal of this process is to modify the flour substance components such as starch and gluten. In addition, enzymes and microorganisms are inactivated.

Principle

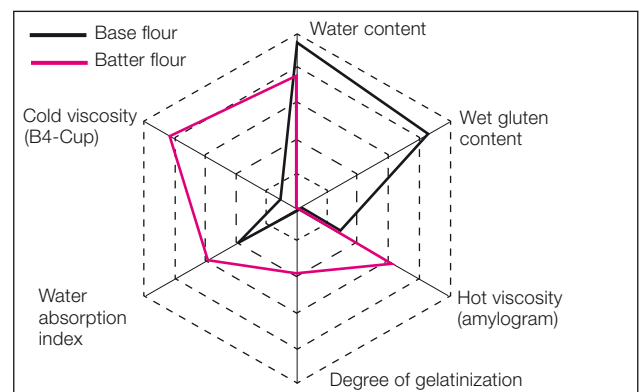
FHT is a continuous process with a throughput capacity up to 2500 kg/h. Hydrothermal flour treatment can be divided into three steps:

- hydrothermal treatment: injection of steam and water into the flour, followed by a retention time in the heat retention screws
- gentle drying by hot air in thermopneumatic conveyors
- removal of agglomerated particles by sieving, which are then ground

Product properties

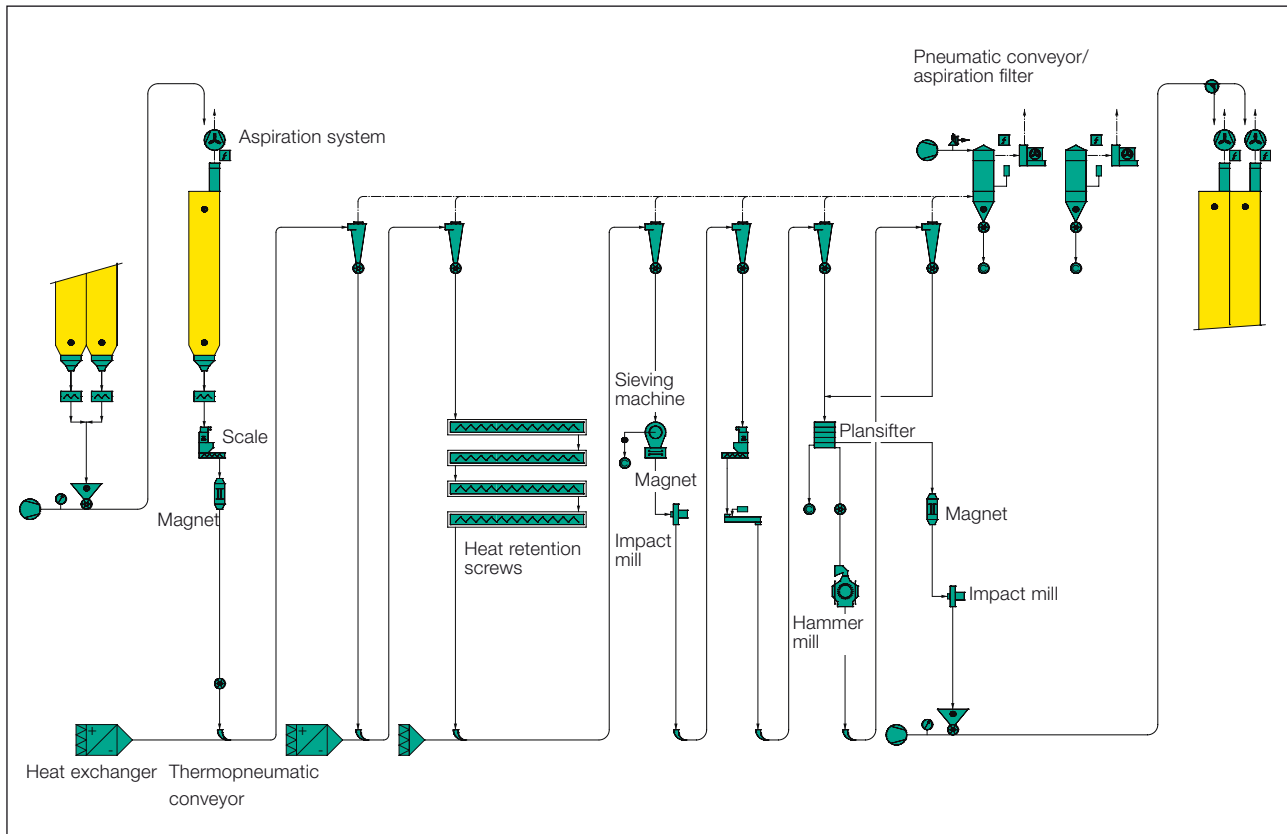
The goal of hydrothermal treatment is to

- increase the hot and cold viscosity by gelatinizing the starch
- improve the water solubility by denaturing the gluten
- inactivate enzymes in grain byproducts such as germ and bran to improve the shelf life



Thermal flour treatment.

Heat and retention time.



Thermal process

The term “thermal process” refers to the treatment of flour by heat, followed by an appropriate retention time. This process is less intensive than the hydrothermal process. The flours thus retain their baking characteristics. The heat acts particularly upon the gluten and the microorganisms.

Principle

The thermal process allows a throughput capacity up to 2000 kg/h of product. The process can be divided into the following discrete steps:

- gentle heating in a current of hot air in thermopneumatic conveyors
- temperature retention in heat retention screws
- moisture addition to adjust the water content
- screening and grinding to adjust the particle size

Product properties

Unlike hydrothermally treated flours, thermally treated flours retain their baking characteristics. Such flours are applied as

- cake flour with strengthened gluten framework, for cakes with very high sugar and fat contents
- soup flours with increased hot viscosity and a low moisture content

