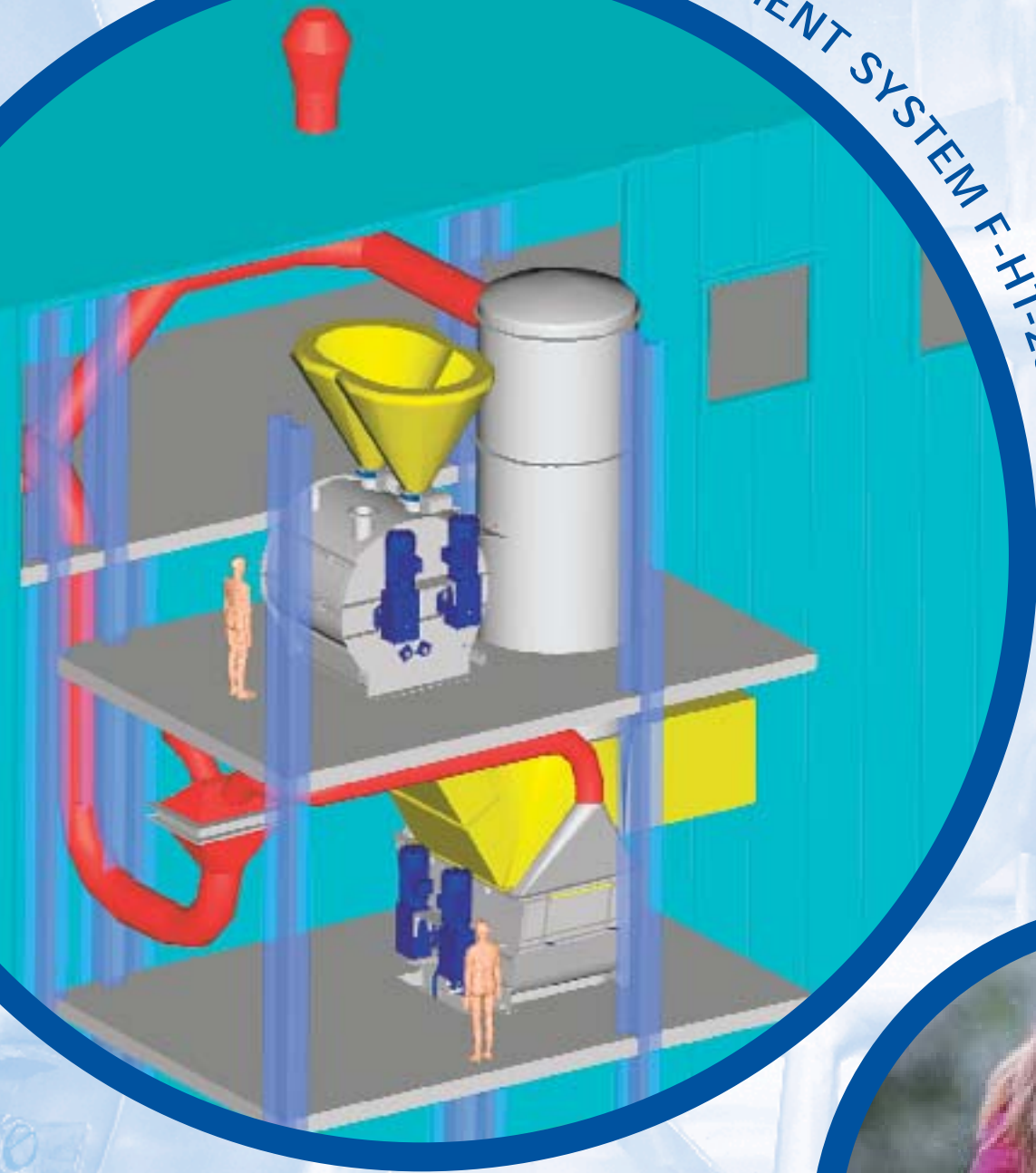


FORBERG HEAT TREATMENT SYSTEM F-HT-2500



# HEAT TREATMENT SYSTEM

## STATE OF THE ART TECHNOLOGY FOR THE FEED INDUSTRY

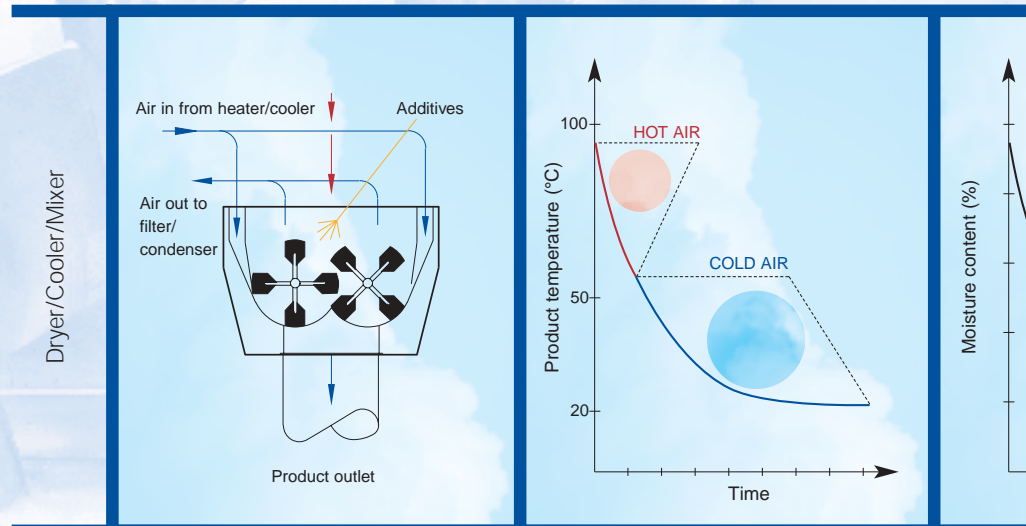
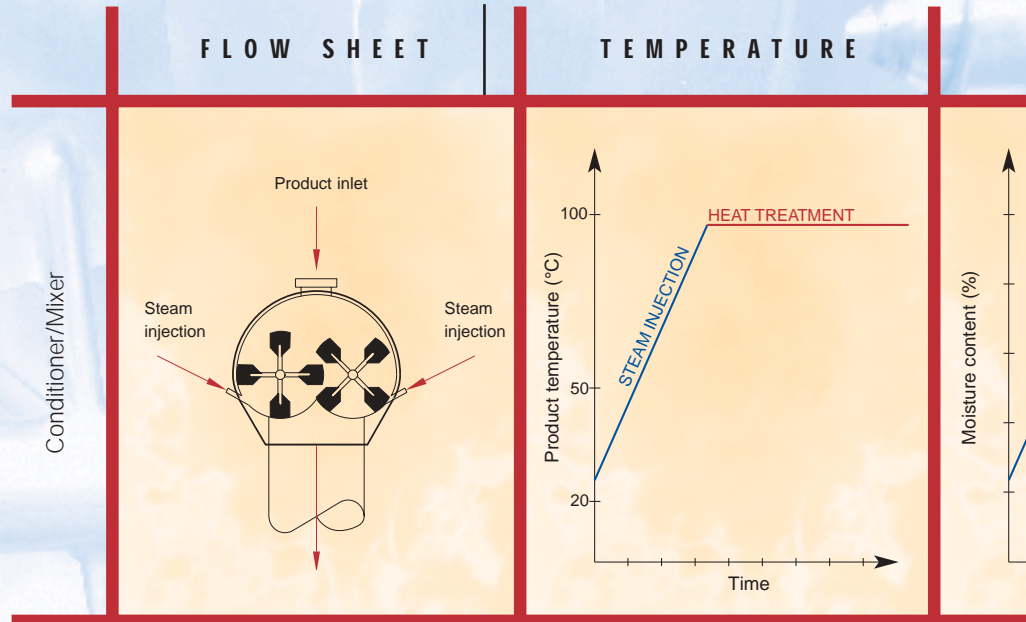
### Introduction

More and more antibiotics are banned from animal feed, due to resistant bacteria. The Forberg Heat Treatment System is then the answer for the high requirements of the feed industry. Intelligent heat treatment combines efficiency, quality, and high capacity with the possibility to add heat sensitive additives at the latest stage of the process. Cross contamination is reduced to a minimum.

### The Process

In the first step of the process the conditioner/mixer is charged with the feed, which has to be treated. The feeding can take place out of a single bin or different components can be mixed with the Forberg high speed mixing process. Then steam is injected into the mixer to heat up the product to the desired temperature. Now the temperature is maintained over a certain period of time to kill salmonella and certain kinds of bacteria. In this stage of the process liquids, which are not initially hygienic like molasses for example, can be treated as well. After the heat treatment the mixer discharges directly into a dryer/cooler.

The mixer and the chutes are heated to maintain a temperature over the dew point at all surfaces. As soon as the dryer is charged the conditioner can already produce the next batch. In the dryer, warm air is first introduced to extract some moisture from the product. In the second step ambient air is blown in to reduce the product temperature further. After the product has reached the desired temperature and moisture content, additives such as vitamins, enzymes, flavours, pharmaceuticals, etc., which are sensitive to heat can be added. The additives can be applied in powder or liquid form. They will be

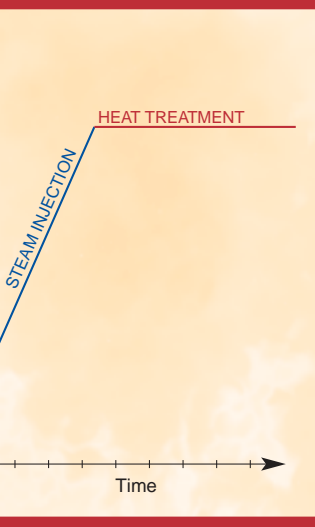


mixed to perfection with low CV values. The product is now ready to be stored, packed or transported. There is no segregation that has been observed like in many other processes because transport of the final mixture is very short. The air of the process goes through a filter unit before being released clean to the environment, or alternatively it is circulated to a water-cooled air cooler and used again in a closed loop system. After drying and cooling in a Forberg dryer/cooler/mixer the process ends. The mixture is now ready for packaging, bulk loading or intermediate storage.

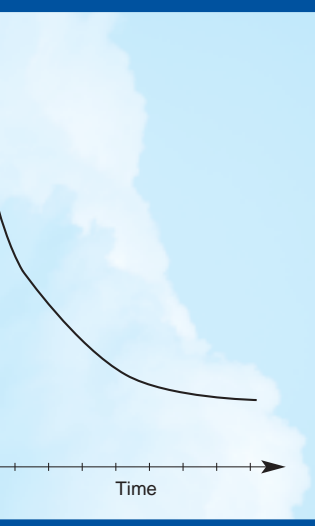


# HEAT TREATMENT SYSTEM

## MOISTURE



## MACHINES



## CAPACITIES

The Heat Treatment System is designed according to the customer's needs. While using Forberg components basically the following capacities are offered:

Type of plant	Batch size	Plant capacity *
F-HT-500	500 l	2-3,5 to/h
F-HT-750	750 l	3-5,5 to/h
F-HT-1000	1000 l	4-7,5 to/h
F-HT-1500	1500 l	5,5-11 to/h
F-HT-2000	2000 l	7-15 to/h
F-HT-2500	2500 l	9-19 to/h
F-HT-3600	3600 l	13-27 to/h
F-HT-5000	5000 l	18-38 to/h
F-HT-8000	8000 l	28-60 to/h

\* Depends on product properties.  
Other sizes are available on customers request.

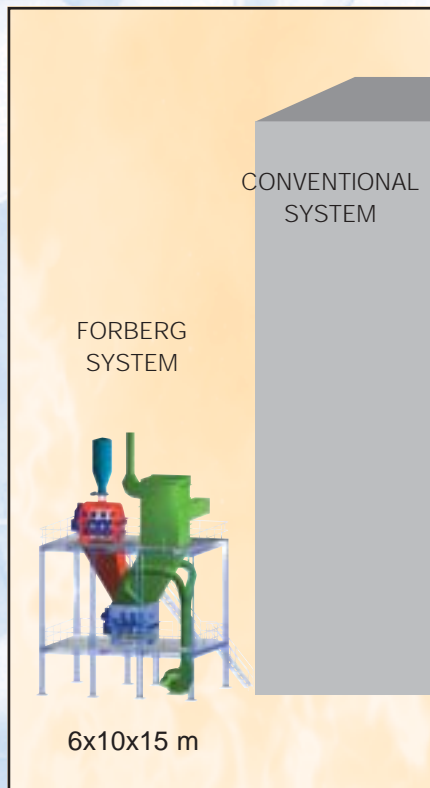


# ADVANTAGES

- ✓ **HIGH THERMAL EFFICIENCY**  
of the whole process. As an option Forberg offers a closed loop system to increase the efficiency even more.
- ✓ **MICRO AGGLOMERATION**  
The injection of steam leads to micro agglomeration of the treated product, which reduces the risk of segregation and minimises dust.
- ✓ **HIGHEST MIXING HOMOGENEITY**  
The mixing quality (homogeneity) of the end product is maintained throughout the process.
- ✓ **ADJUSTABLE MOISTURE CONTENT**  
The moisture content can be controlled very precisely. The desired degree is adjustable.
- ✓ **NO LOCAL OVERHEATING**  
Due to the unique Forberg conditioner/mixer the product is heated very uniformly with less than 0,5°C temperature difference throughout the batch. There is no local overheating.
- ✓ **MINIMISED CROSS CONTAMINATION**  
Cross contamination is minimised due to the batch process and very short transport of material.
- ✓ **CONTINUOUS OUTPUT/ HIGH CAPACITY**  
High capacity due to quick cycles. Multiple batching leads to continuous output.
- ✓ **GOOD FOR HEAT SENSITIVE ADDITIVES**  
Heat sensitive additives such as vitamins, enzymes, pharmaceuticals, medicines, colours, flavours, etc. can be added in the latest stage of the process and will be mixed to perfection. Additives may be powders or liquids.



Forberg F-500 conditioner/mixer with steam injection



Comparison of sizes

- ✓ **FLEXIBLE RECIPE CHANGE**  
Highest flexibility of the production if the recipes are changing. Quick and easy changing of formulas.
- ✓ **EASY TO CLEAN**  
With automatic wash as an option the cleaning is easy. Access to the machine is optimized, maintenance is very comfortable.
- ✓ **ENVIRONMENTAL FRIENDLY**  
Environmental friendly due to state of the art filter technology.
- ✓ **FOR NEW AND OLD PLANTS**  
Adaptable to many existing systems. Old and new feed mills can be upgraded with the Forberg Technology.
- ✓ **COMPACT LAYOUT**  
Very compact design allows the integration of the system in existing factories. The overall height of new plants is significantly lower than other systems; therefore the overall building costs are greatly reduced. Very often this is also a benefit while asking for building permissions.
- ✓ **PROVEN COMPONENTS**  
Combination of high quality Forberg components, result in a very reliable system.
- ✓ **FORBERG SERVICES**  
Forberg provides engineering with the possibility to carry out the civil works manufacture the steel structures and silos locally. This lowers the overall investment costs for the benefit of the customer.

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