

Safesteril[®]

steam sterilization



EQUIPMENTS & PROCESS FOR THERMAL TREATMENT

Safe & Natural

How Safesteril was born ?

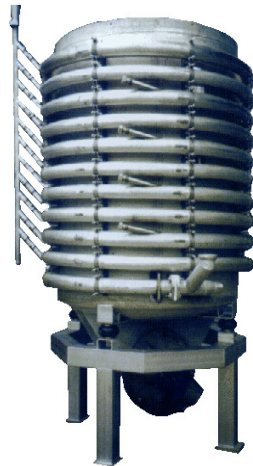


Since 1989, ETIA is **specialized in the continuous heat treatment** of dry & wet food products.

Safesteril®, is our natural **dry sterilization process** for dry or wet products, based on a steam and ohmic heating

1st generation

With Sterigran



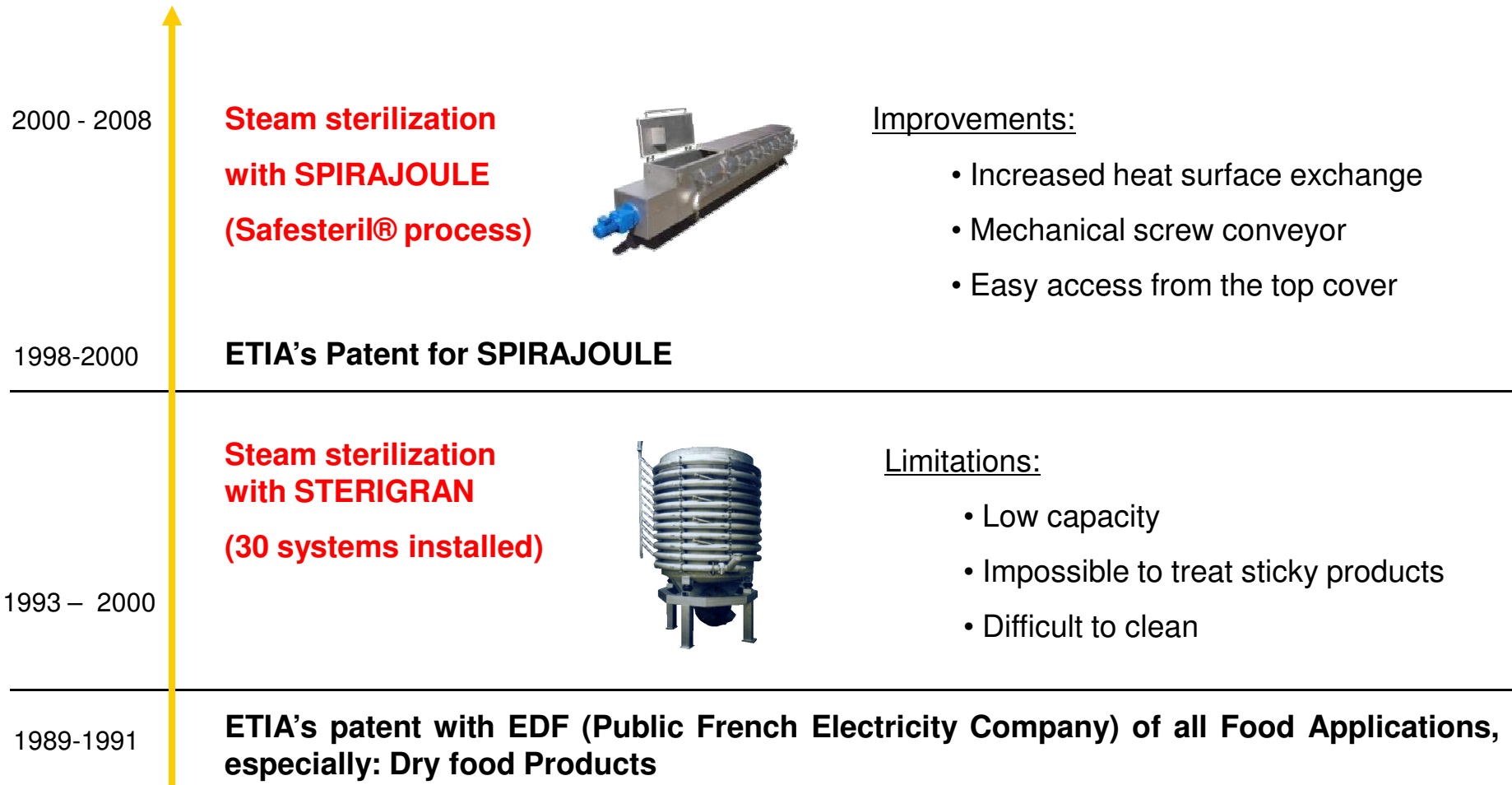
2nd generation

With Spirajoule



Safesteril® *steam sterilization*

How Safesteril was born ?



Process

- Continuous heat process
- Bi-energie: electricity + steam (No condensation process)
- Safesteril is 100% organic: using no chemical, no irradiation
- Pasteurization, sterilization, desinsectization

Products



Dozens lines have been already installed for:

- Spices, whole or ground (up to the size of a nutmeg)
- Dehydrated vegetables (flakes, ground)
- Herbs and botanicals: roots, leaves, flowers, powders
- etc...

Capacity : 50- 4000 kg/hour



Microbial effectiveness

2 MODES ARE AVAILABLE:

Pasteurization

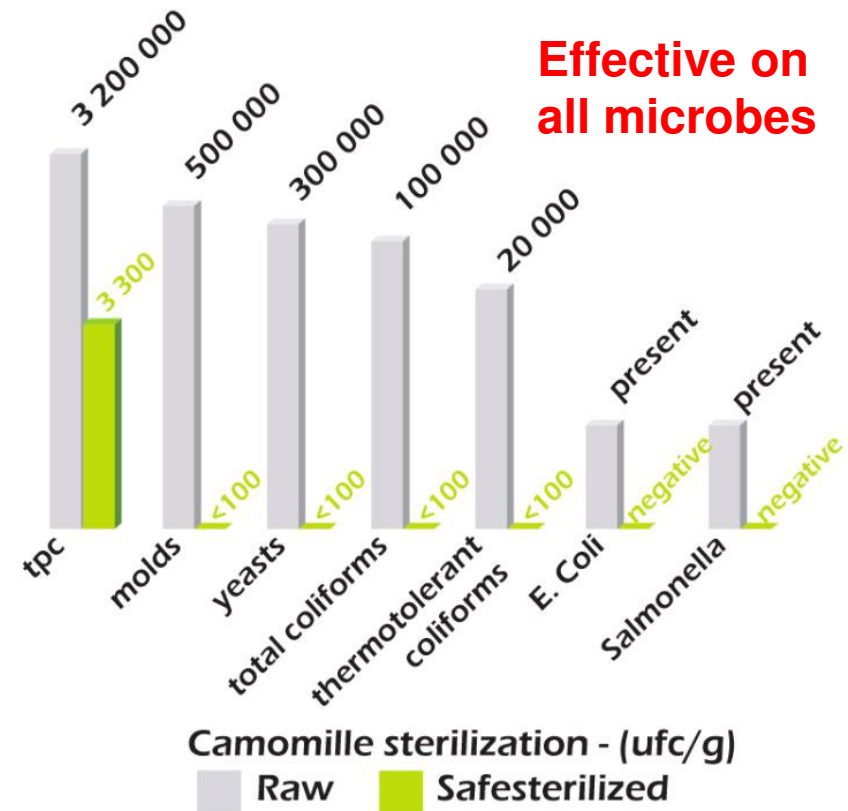
= final product free of **Salmonella** or **E. Coli**

- Reduces TPC, Coliforms, Yeast, molds
- Has no impact on product's properties

Sterilization

= **Pasteurization + deep TPC reduction**

- Reduces TPC from 1 to 5 logs
- Effective on Spores
- Reduces Coliforms, Yeast, Molds (final <10)
- Impact on product's properties is minimum and depends
 - its heat tolerance
 - Its micro flora



Performances

**Minimal alteration
of key components:**

| | Turmeric powder | Chili powder | Paprika powder |
|-----------------------|----------------------------|---------------------------|------------------------------|
| Key component | Curcumin | Heat value SHU | Colour value ASTA |
| Raw | 2.40% | 27881 | 120 |
| Safesterilized | 2.39% | 27495 | 117 |

Impact of Safesterilisation on color and other heat sensitive properties

→ Minimum loss of Volatile oil

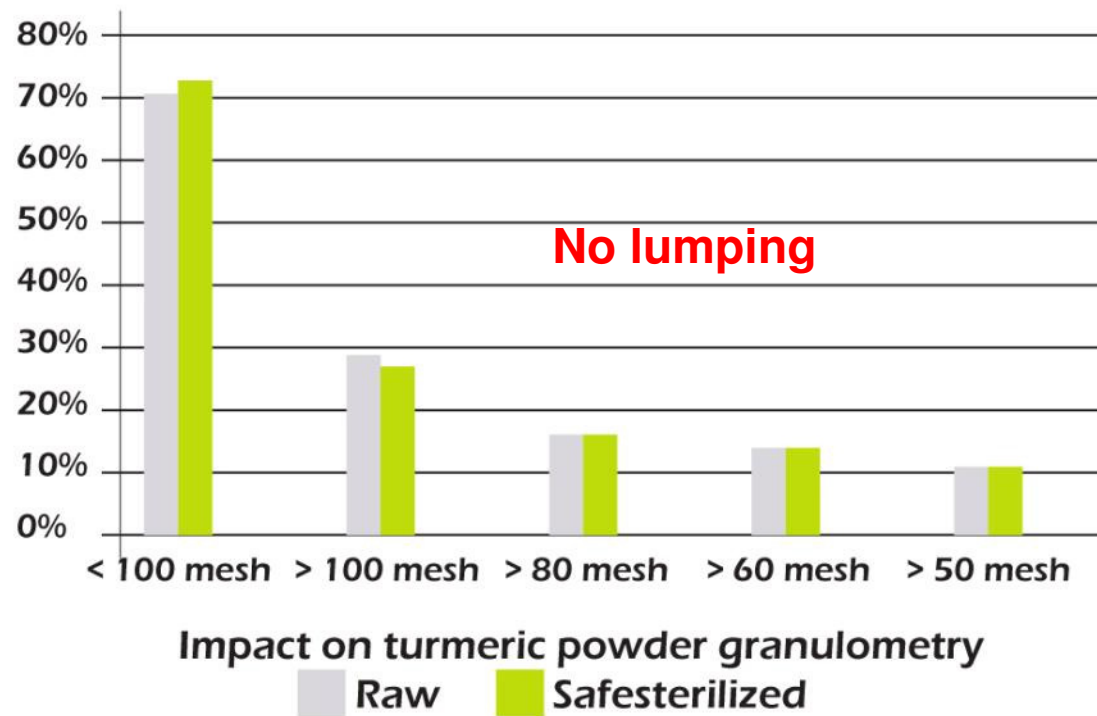
**→ Moisture under control: can be
adjusted on demand**

| | Volatile oil | Moisture |
|-----------------------|---------------------|-----------------|
| Raw | 0.37% | 10.8% |
| Safesterilized | 0.35% | 10.3% |



Powders

Powder steam sterilization



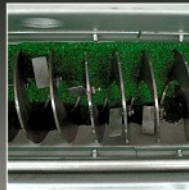
The process

FEED HOPPER AND DOSING SCREW

INLET :
all shapes
can be treated

STEAM OUTLET

DRY STEAM STERILIZATION



AIR OUTLET

ANNEXES



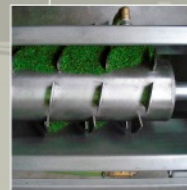
POWER
SUPPLY

SMART PLC
INTERFACE

BY PASS SCREW

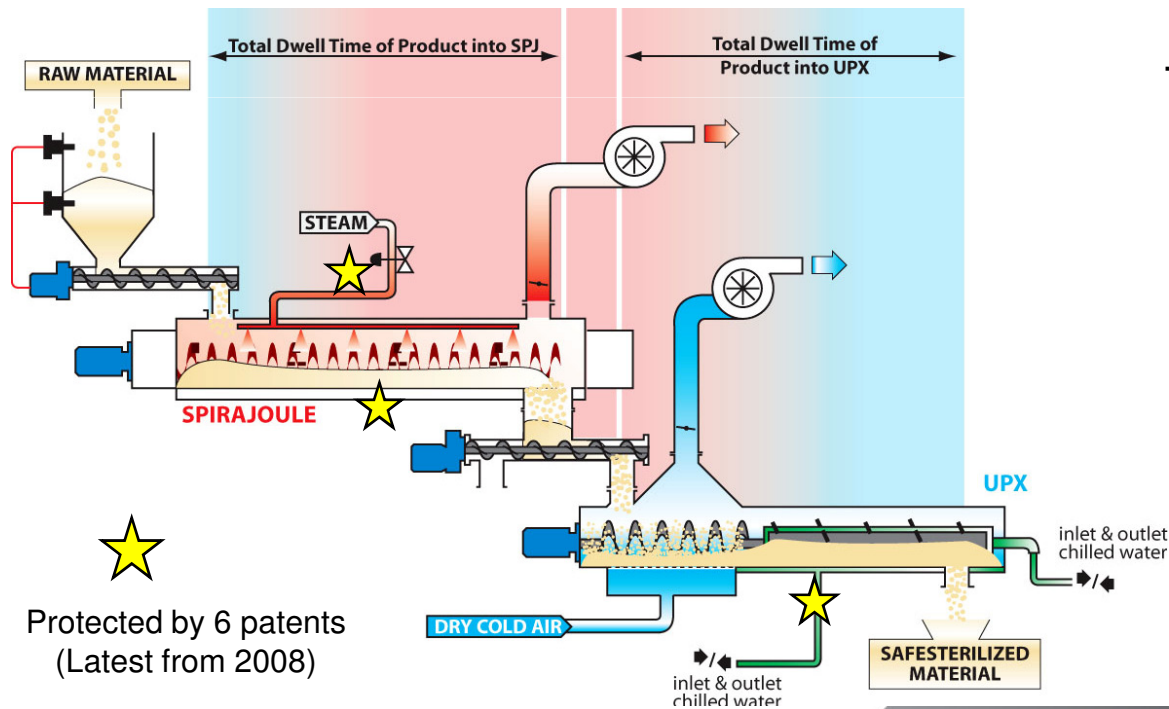
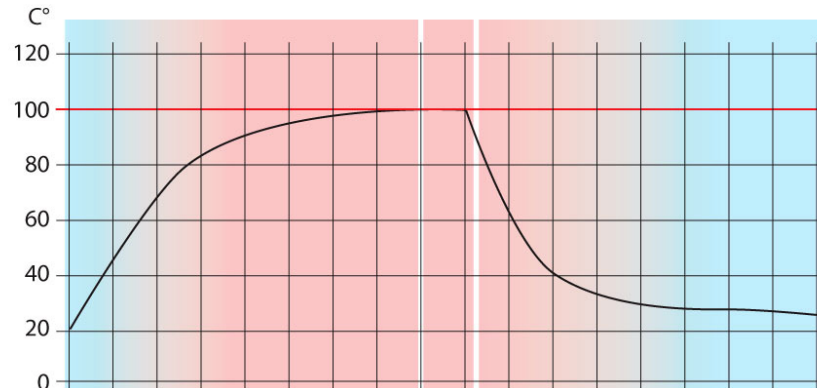
OUTLET :
- online packing
- no need to regrind
powders

DRY FLASH COOLING



Safesteril® *steam sterilization*

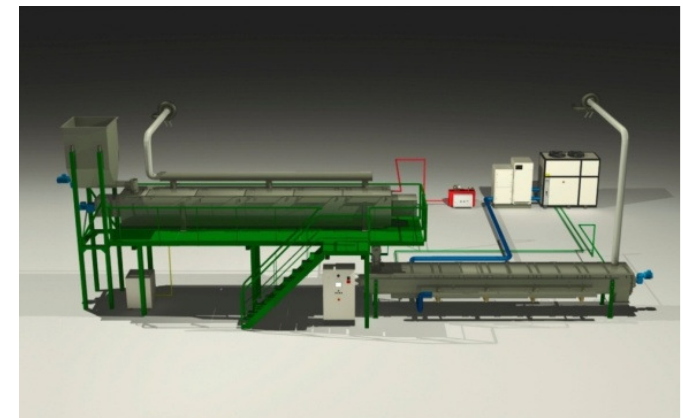
The process



Protected by 6 patents
(Latest from 2008)

Safesteril controls:

- Treatment time
(by screw rotation speed)
- Screw temperature
(by electrical power)
- Chamber humidity
(by steam temperature and flow)



Micro reduction simulator

SAFESTERIL
Regulation parameters

INPUT DATA

Initial ← 1 Input the microbes load (here: 12 000 000/g)

Final ← 2 Input the final specification (here: 1 000/g)

Coefficient

CALCULATION MODE

← ! System will tell you the parameters to apply !

RESULT ← ! System will tell you the parameters to apply !

Available for: Salmonella, E. Coli, S. Aureus, B. Subtilis, B. Licheniformis, B. Cereus, ...



Start up procedure

1- Pre-heat the system (15 min)

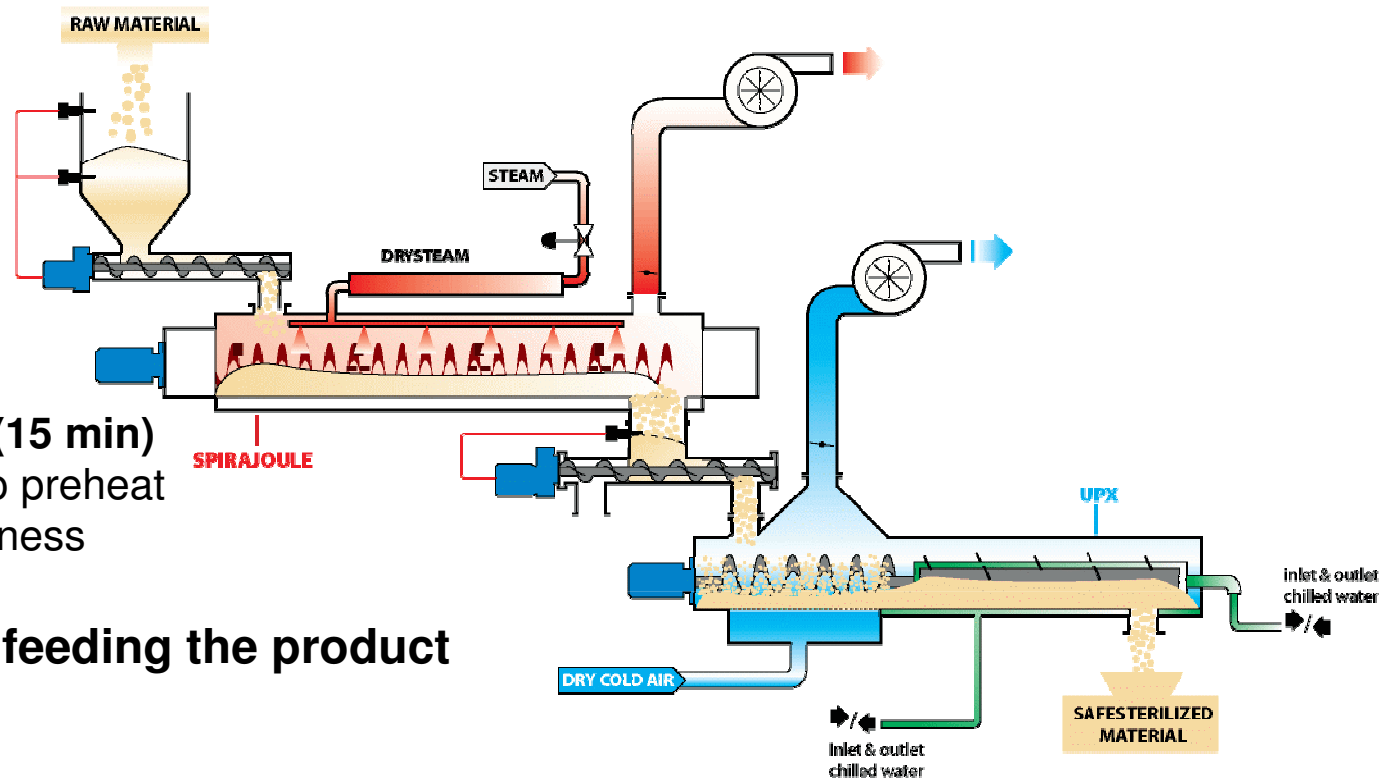
- System can be set up to preheat automatically before business hours

2- Start feeding the product

3- Heat the product up to the cruise temperature (15 min)

- Start feeding the product
- All the product which is not treated is automatically bypassed and recycled

4- Run the line for hours or days !



Safe packaging

Product is packed online

- No risk of recontamination
- Low labor intensity
- Automatic, semiautomatic or manual



Change over and cleaning

Dry cleaning procedure (15 to 30 min)

→ Every new product

- Process automatically removes 97% of product
- Remaining product is removed by vacuum cleaner

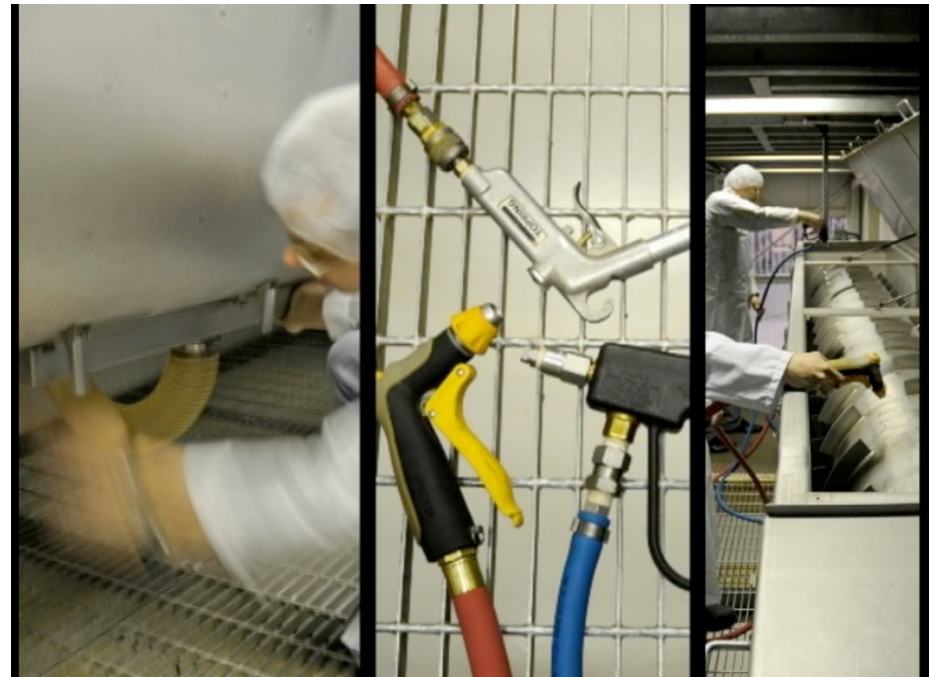
Complete washing procedure (2 to 4 h)

→ Once a week

- Washing soda (detergent)
- Bactericide solution
- Dry



Acids, Washing soda, bactericides, sporicids, and fungicides can be used.

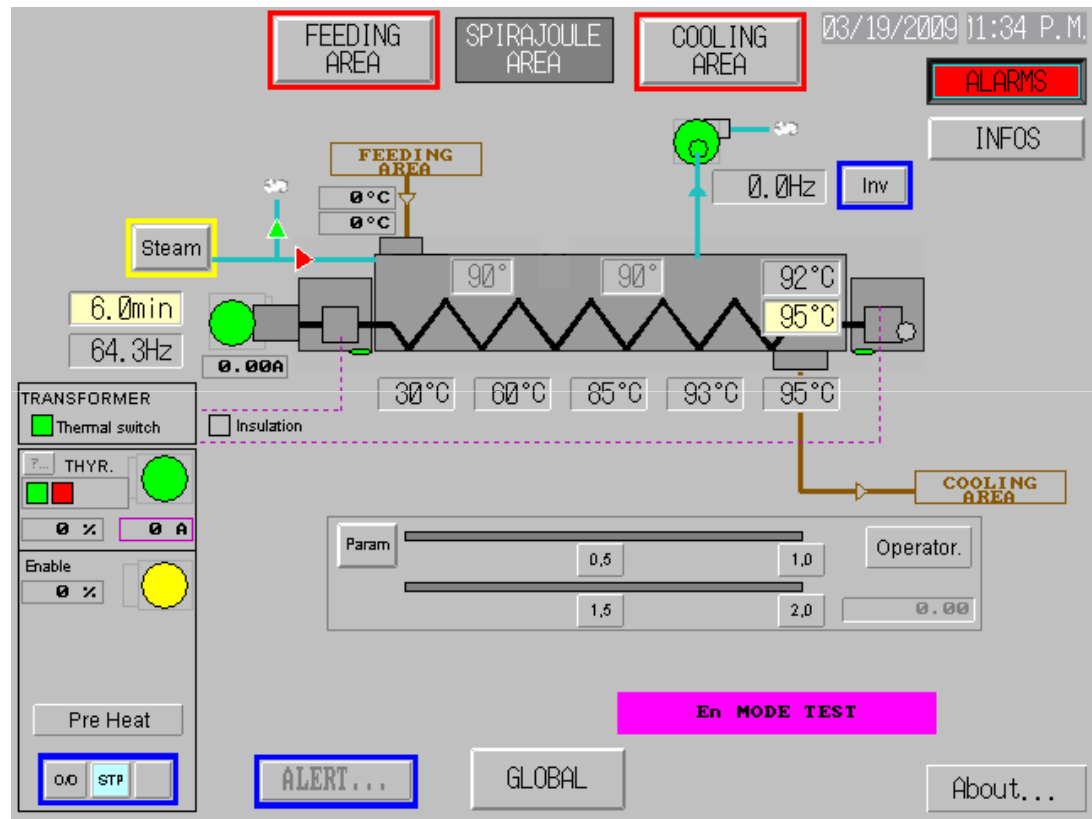


Note : Cleaning in place (CIP) is available on demand



PLC and HACCP

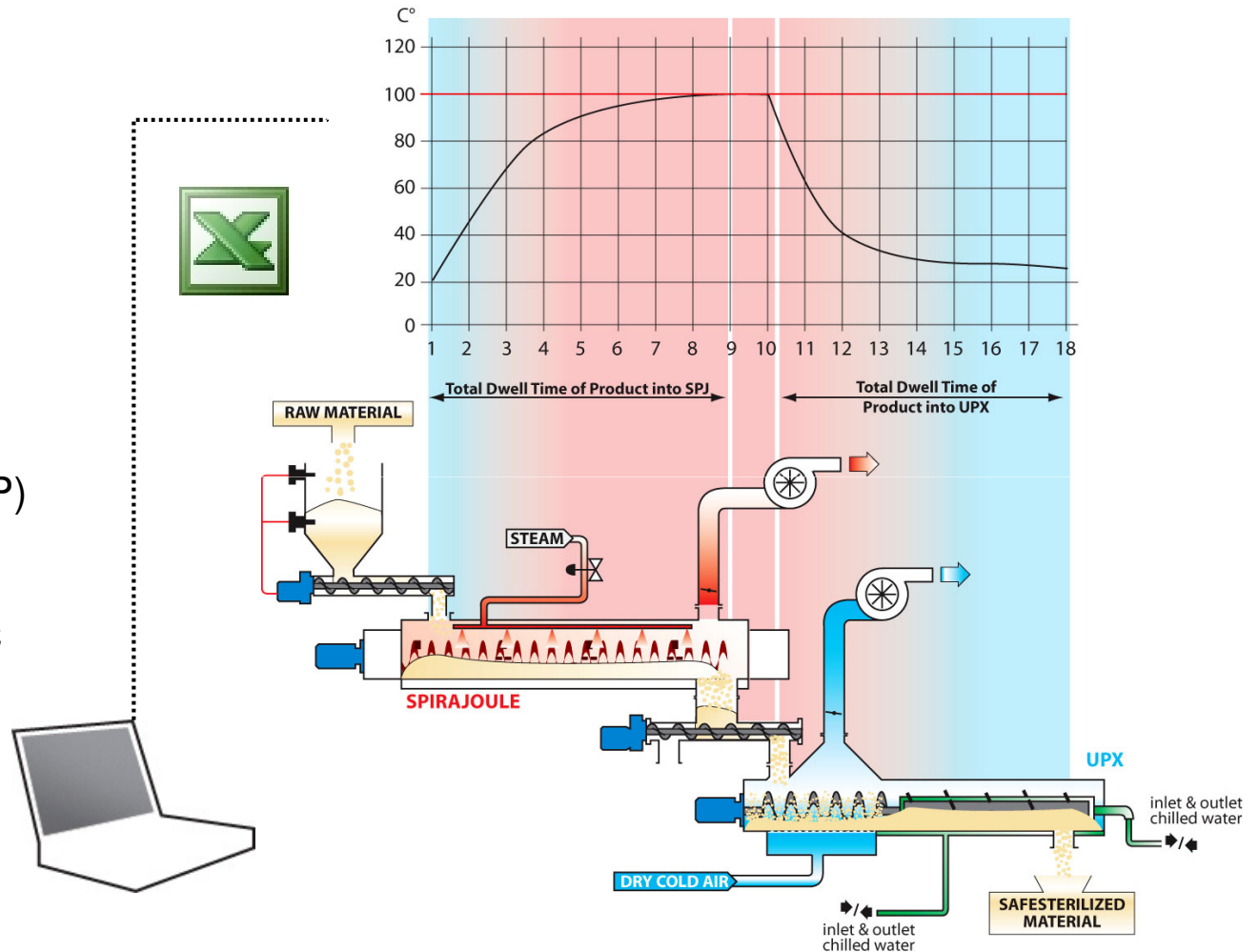
- Global PLC monitoring
- Product AND atmosphere temperatures are monitored AND recorded
- CCP alarm management for HACCP procedure



Management and traceability software

Safesteril software:

- Recipe database
- Continuous traceability
- Critical Control Points (CCP) follow up
- Data acquisition in your PC



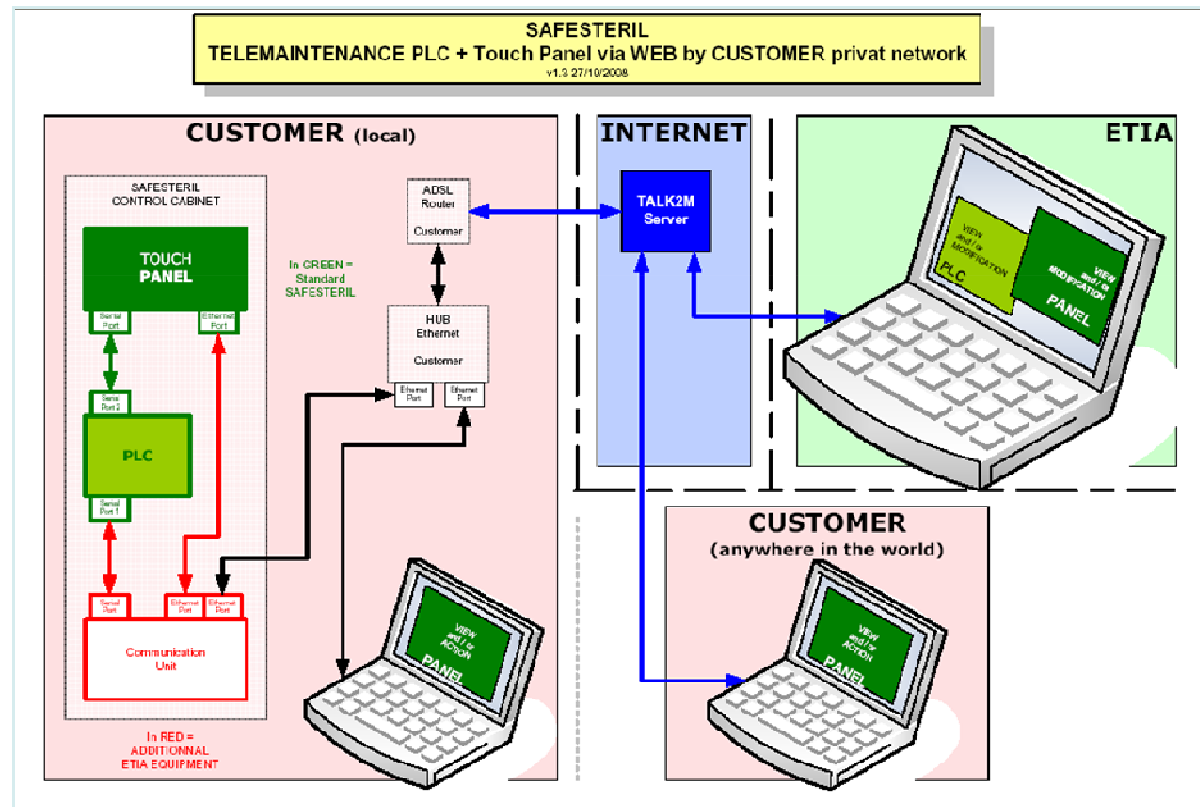
E- Remote control and Maintenance

Remote control

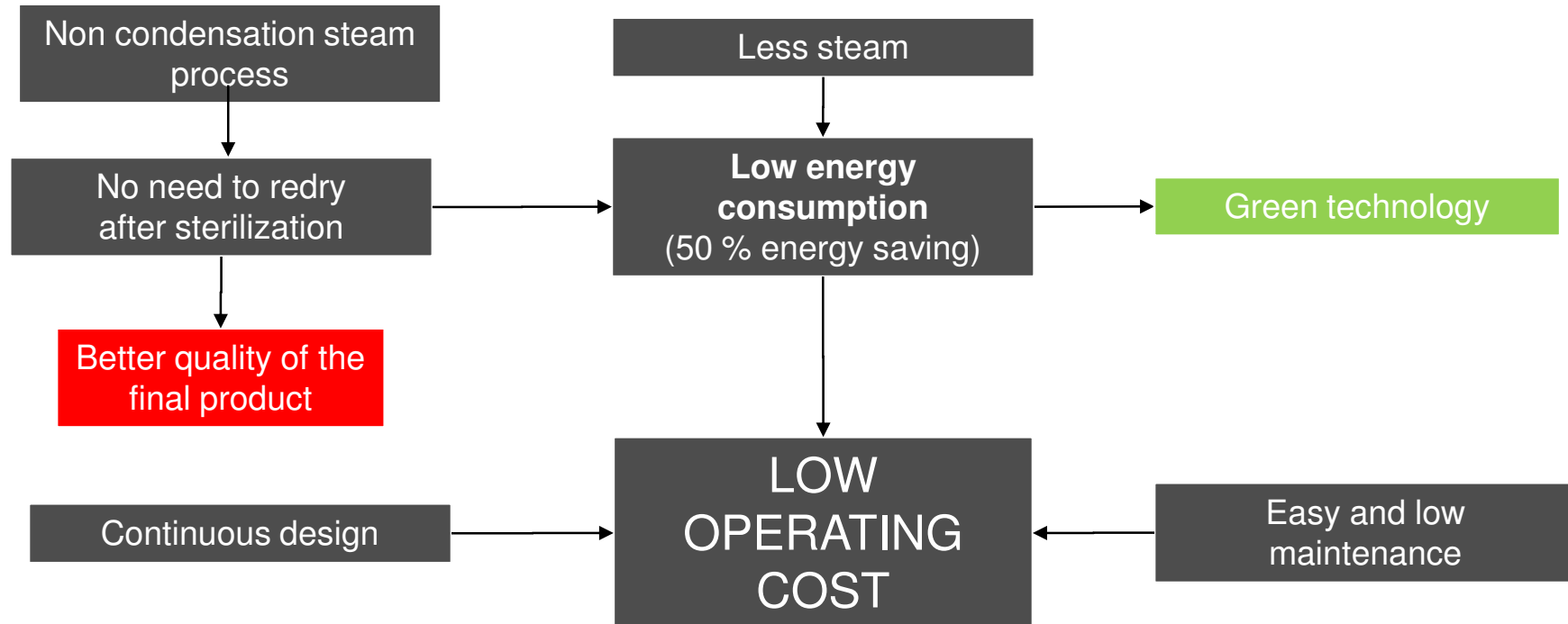
- Control of the line status on the internet
- From anywhere in the world

Remote maintenance

- “Online” maintenance
- Instant diagnosis from our engineers
- PLC and Software free update



Economics



- Total cost (operating, depreciation, maintenance) **from 0,04 \$/kg**
- Different sizes of equipments (50 to 4000 kg/h) are available to match your needs
- **Financing solutions available**



References and toll processors worldwide

| Country | Spices Dehydrated vegetables | Herbs Botanicals | Others Cereals, Nuts... |
|----------------|---------------------------------|---------------------|----------------------------|
| USA & Canada | | | |
| France | | | |
| Morocco | | | |
| Other (Europe) | | | |
| Asia | | | |

More than 50 units in 18 countries



Facilities in North America

3 lines in North America:

- **CELL FOODS, Montreal, Canada**
 - Dealing with spices, herbs and dehydrated vegetables
 - Since 2006
 - Toll processing available !



- **SILVA, Momence, ILL**
 - Dealing with spices, herbs and dehydrated vegetables
 - Installed in 2009
- **BIOACTIVE RESOURCES, Plainfield, NJ**
 - Dealing with spices, herbs and dehydrated vegetables
 - To be installed in 2009
 - Toll processing available soon !



For more information
Safesteril process and services

1- Catch up during the congress:

- On our booth during the show on Monday
- During an individual meeting in our private room
- Around a drink ?

2- Visit a unit in USA with our representative

3- Visit us in France (1h from Paris)

Your Contacts

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