NovaFrit GmbH

Founded: 29.02.2000

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Presentation: Bernd Nockemann

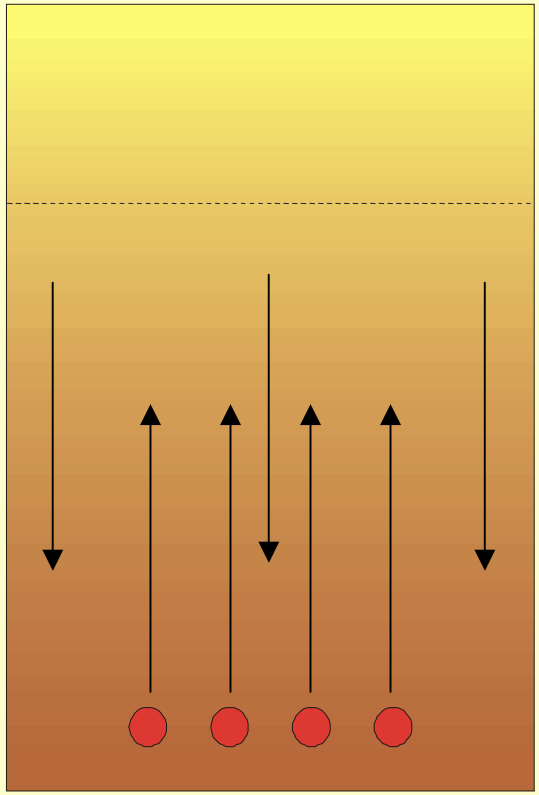
Circulation Deep-Fryer

- A New Method of Deep-Frying
- Composition and Function of a Circulation Deep-Fryer
- First Results

Target Ambience:

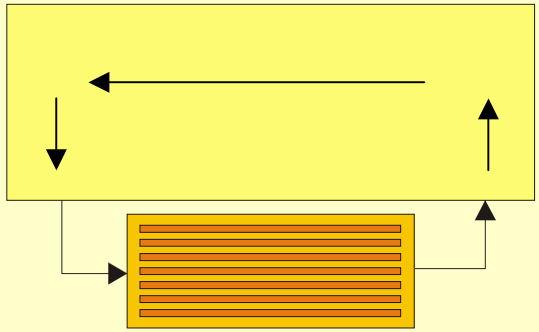
- Temperature as close as possible to the desired value
- Homogenous distribution of the energy
- Overall heat exposure to the fried product

Conventional Deep-Fryer



Natural Convection

Circulation Deep-Fryer



Forced Convection

Conventional Deep-Fryer:

- Natural convection
- Small heating surface
- Needs high energy storage / plenty of fat = high ratio fat: food
- High pyrolyse

Circulation Deep-Fryer:

- Forced convection
- Large heating surface
- Needs low energy storage / small amount of fat = low ratio fat: food
- Low pyrolyse

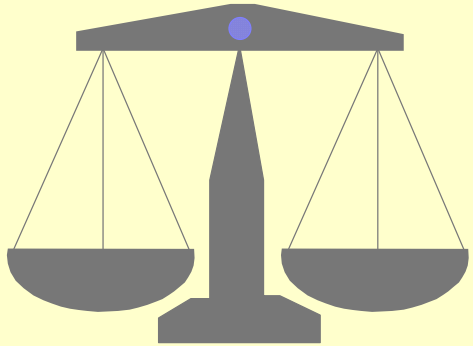
- Other options and effects ⟶

Circulation Deep-Fryer: Other options and effects

- Flexible, easy regulation of temperature caused by optimum forced convection
- Optimised cooking and heating time with low thermal load
- Permanent filtering
- Well defined end of the frying process by leading the fat to a storage reservoir
- High grade automatisation requires low grade attention of the operator
- Built-in model possible, space saving, easy to maintain, easy to clean
- High system compatibility
- Low energy consumption
- Low amounts of acrylamide

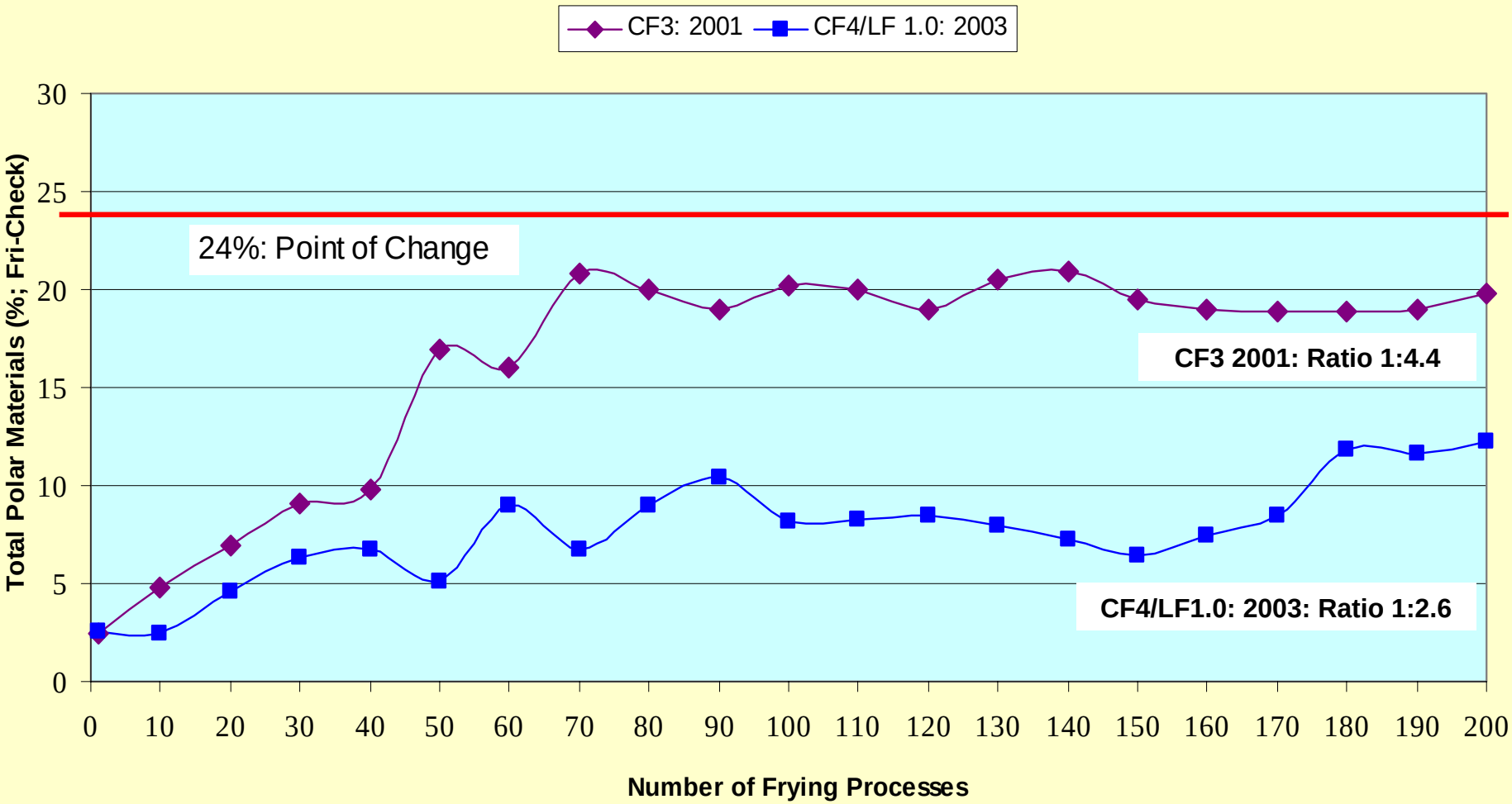
- Automatic refreshment →

Automatic refreshment:



- Fat and solved substances are carried out with the fried product.
- Fresh fat is added continuously.
- The amount of solved substances moves to an equilibrium.

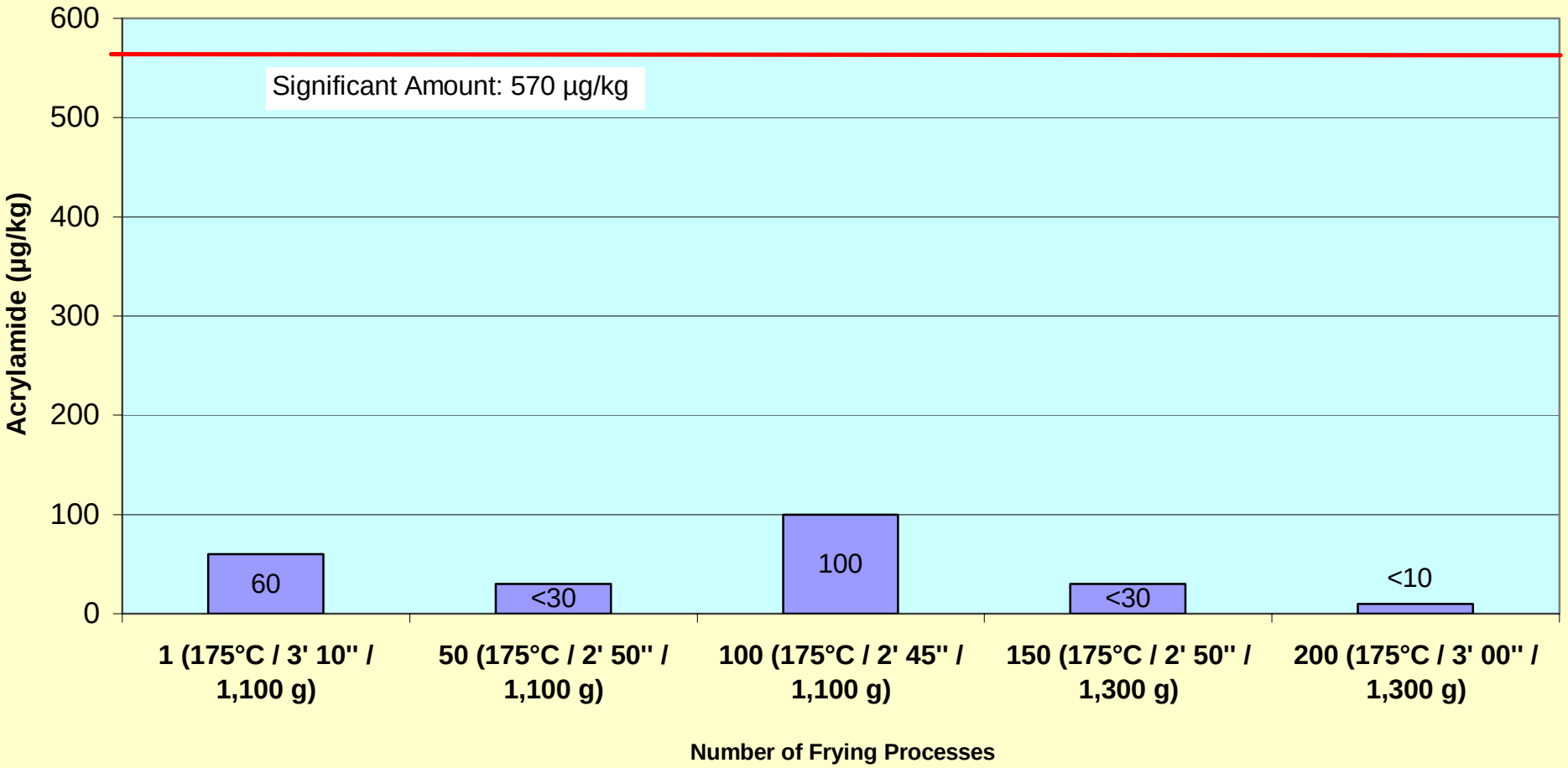
The quality of the fat remains constantly on a very good level:



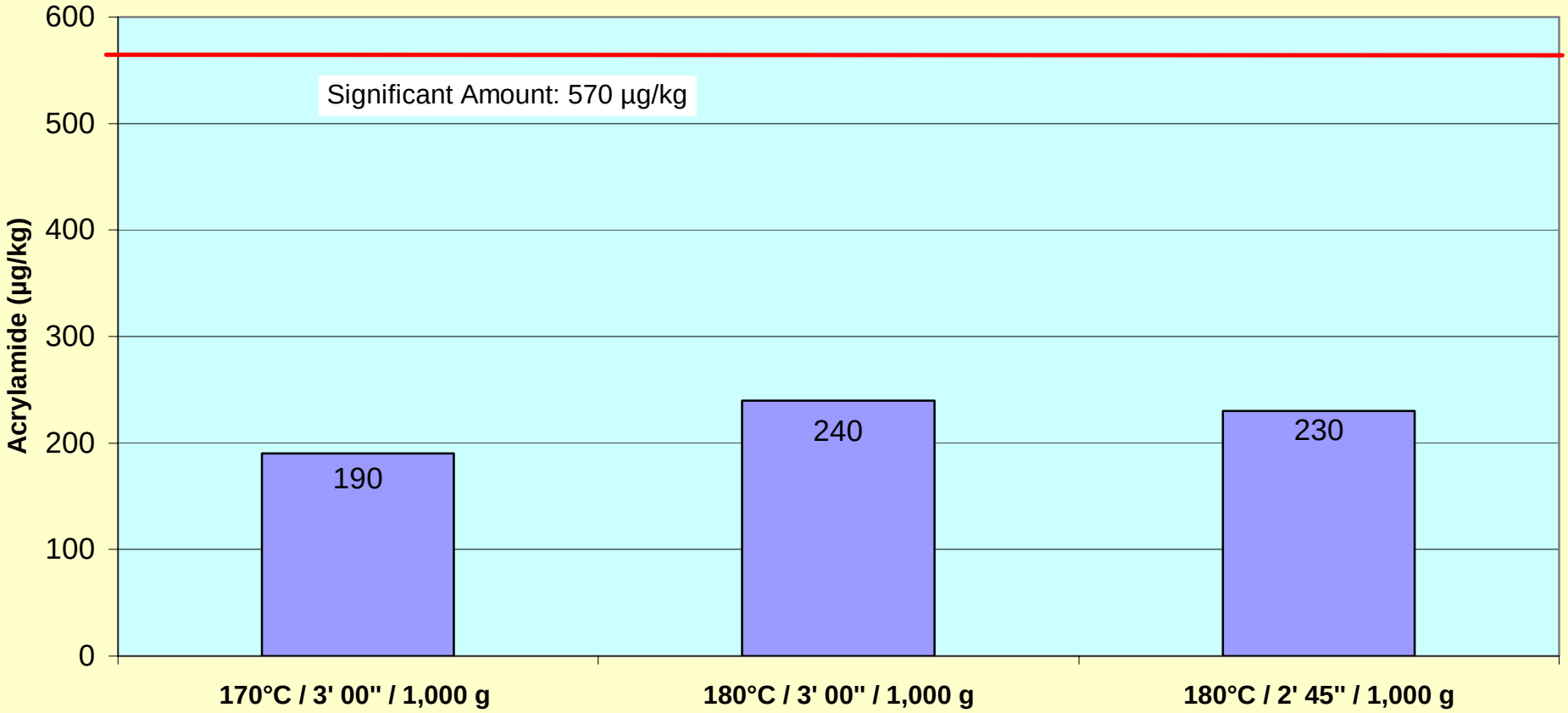
Implications of the automatic refreshment:

- Change of the hole quantity of fat no longer necessary
- Fat consumption reduced to 1/2 or even to 1/3 (if there isn't any fat quality management)
- No disposal of fat, compatible with environment
- Attention to fat quality no longer required,
  first time complete process reliability
- Deep-frying in spoiled fat is no longer possible with this method

Acrylamide Content in French Fries: Spot Checks

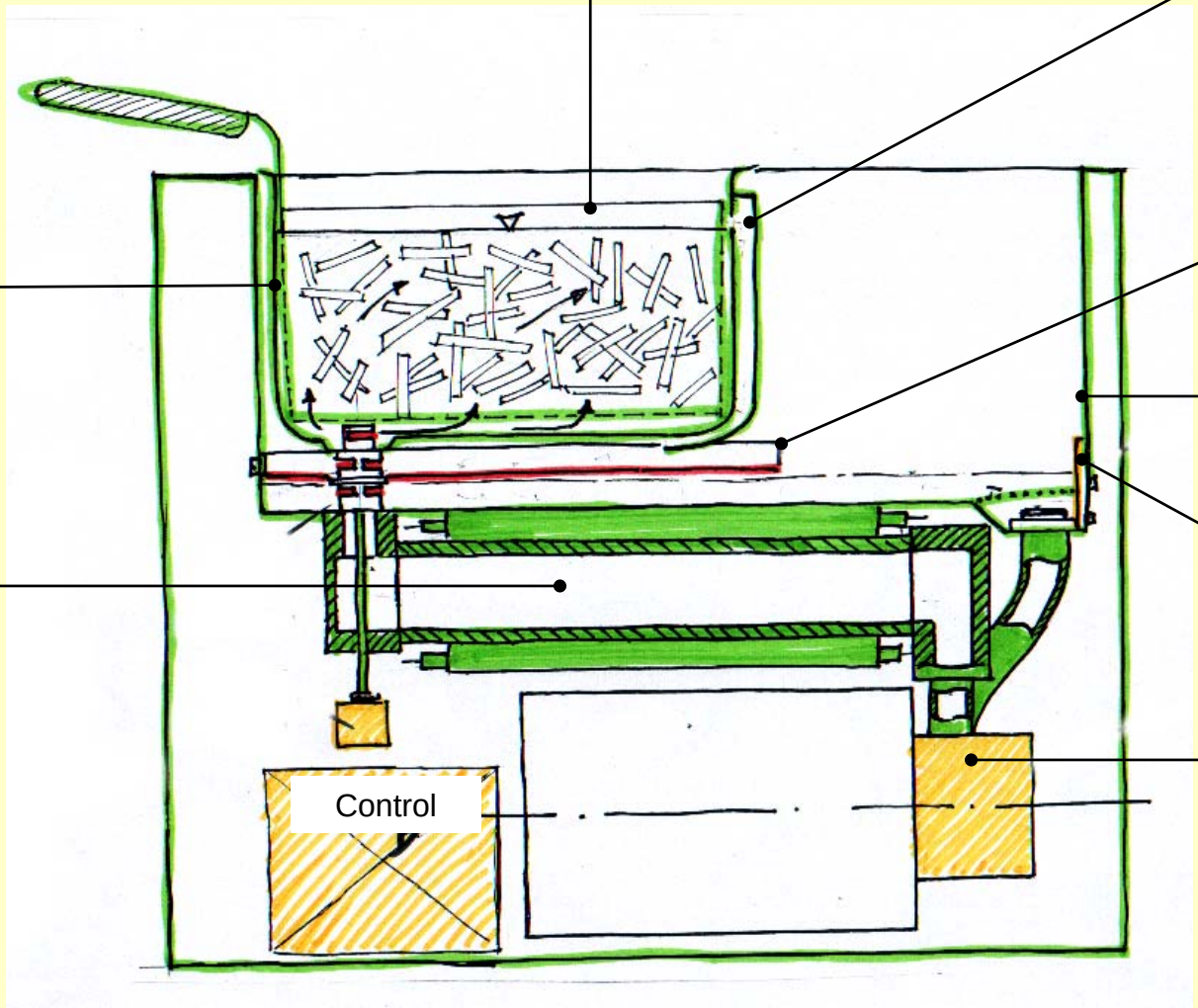


Acrylamide Content in French Fries: Higher Temperature



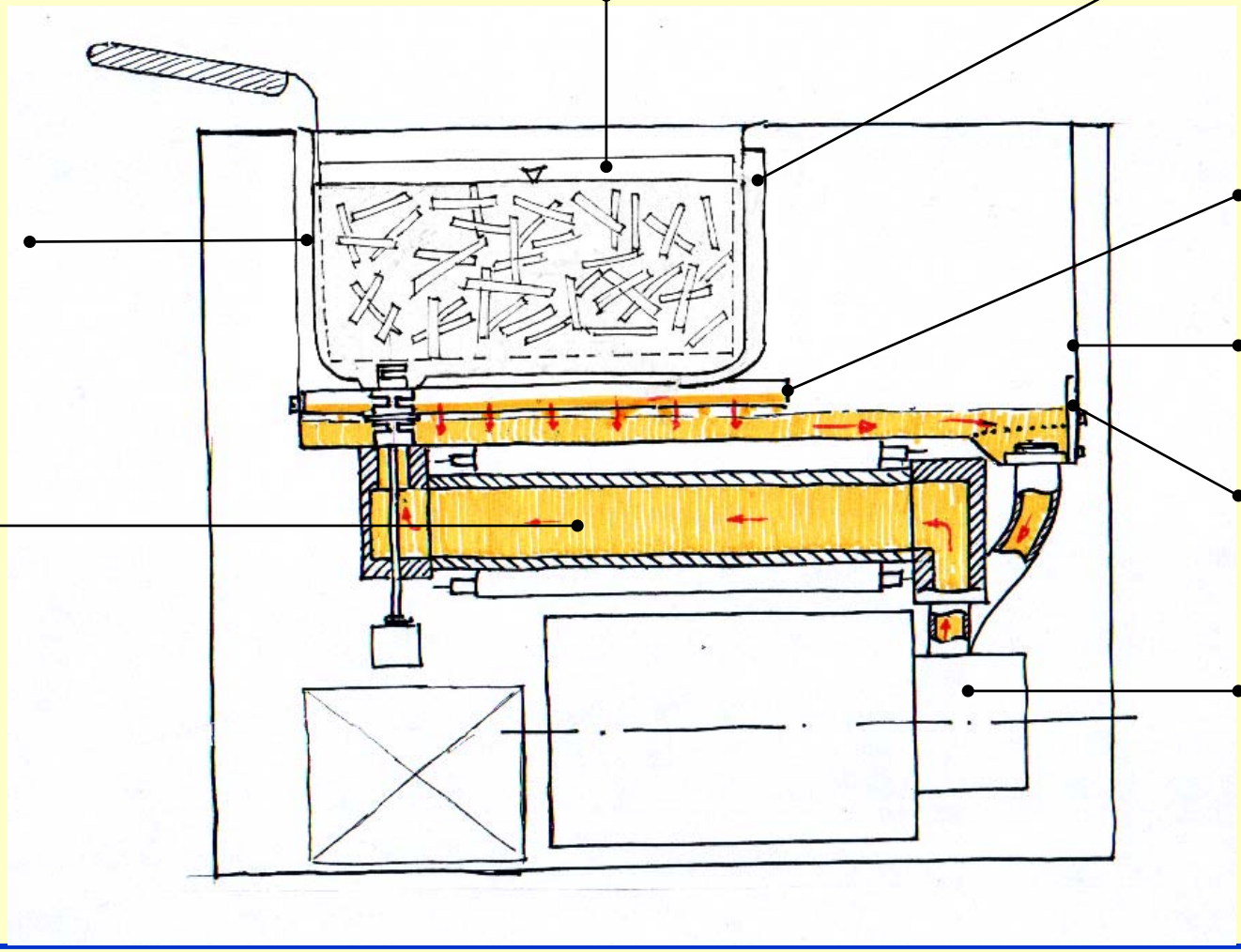
Construction and function:

- Construction



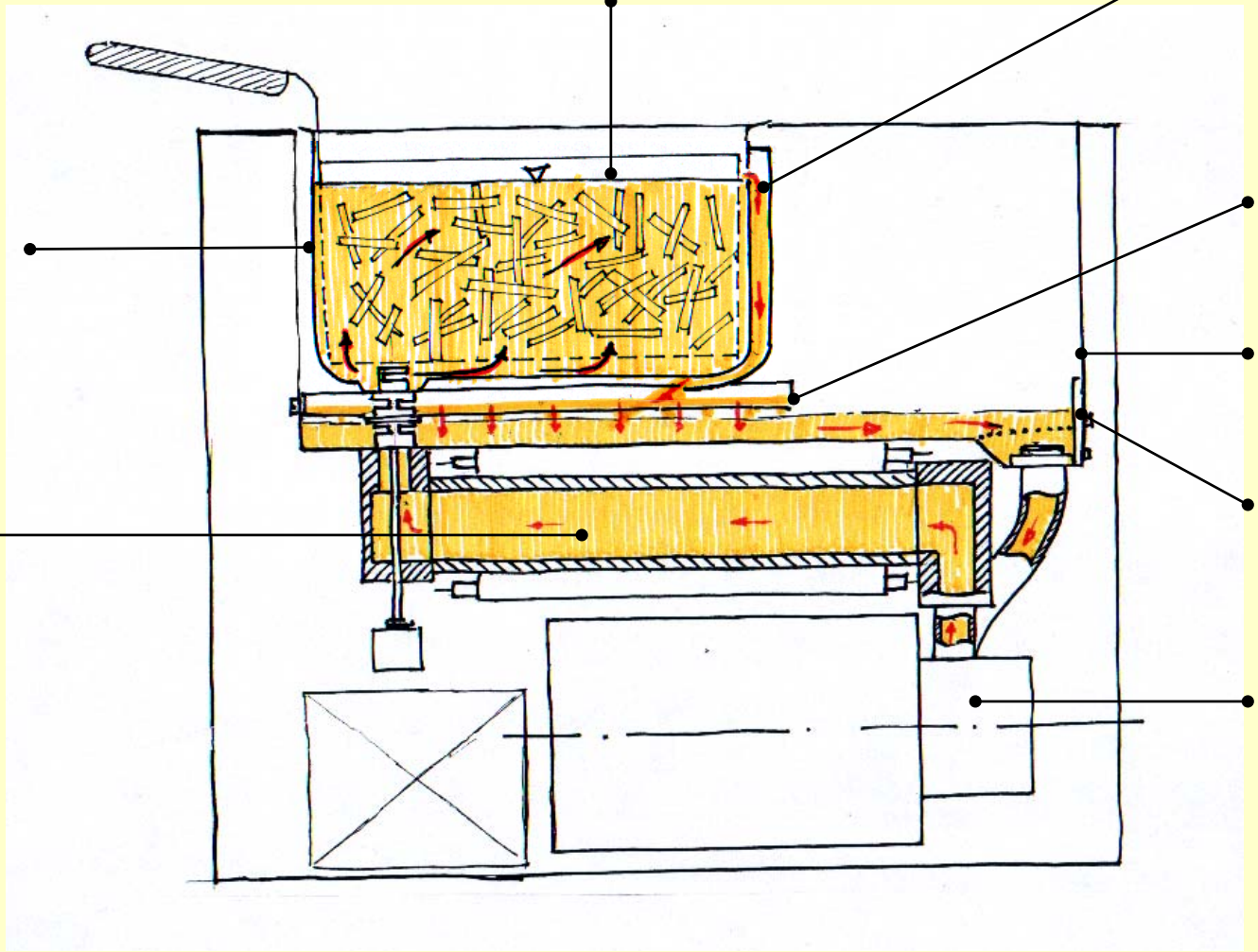
Construction and function:

- Heating up / small circulation



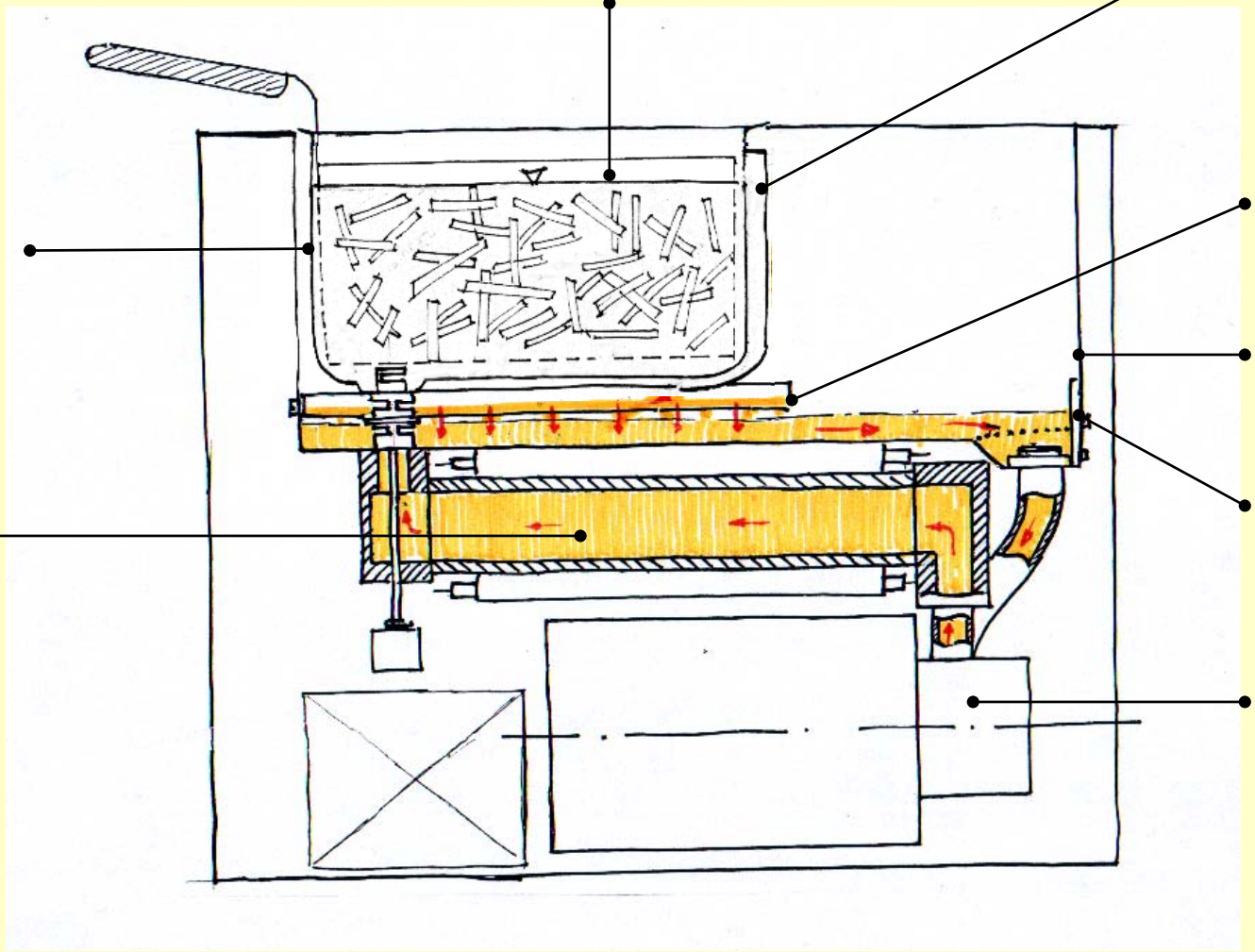
Construction and function:

- Deep-frying process

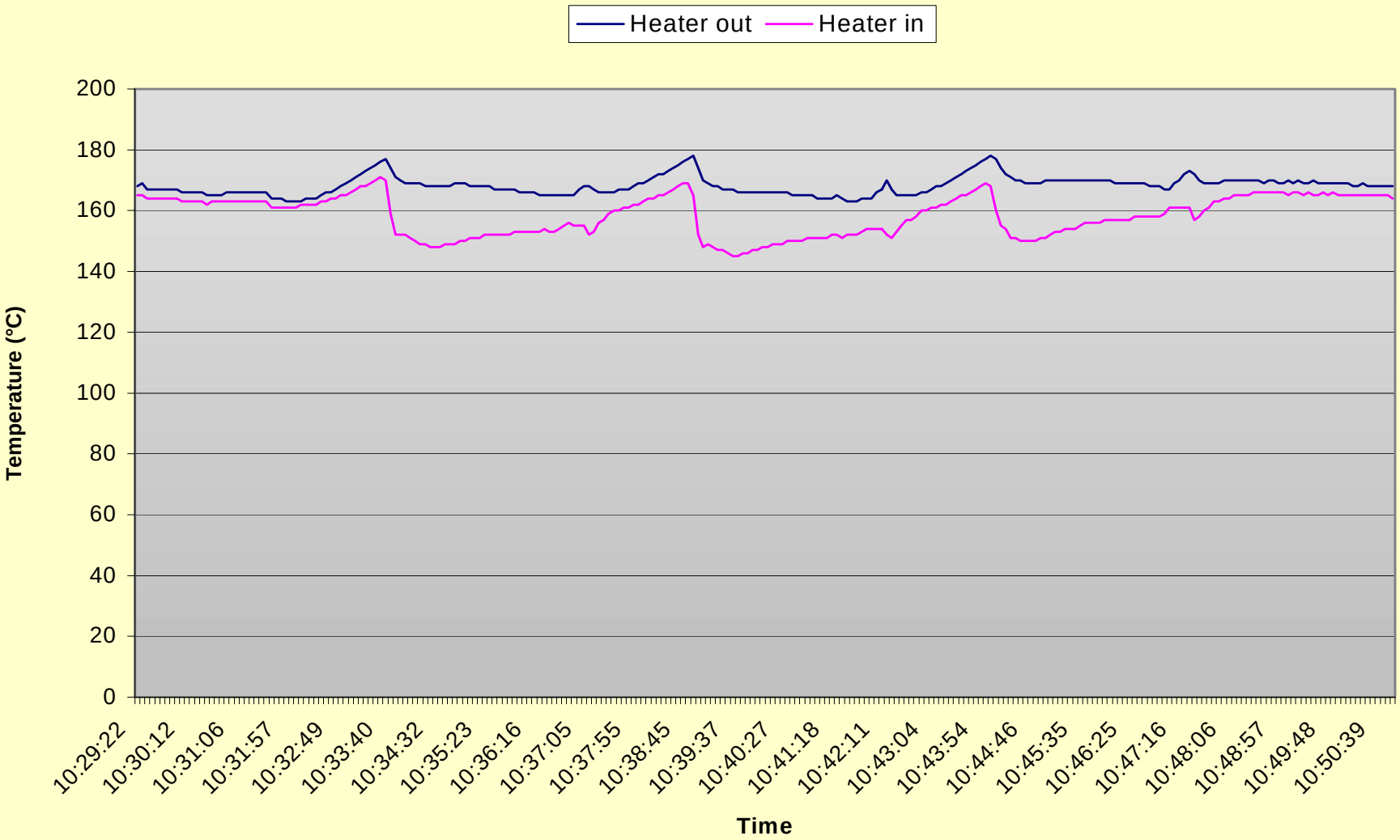


Construction and function:

- End of frying process: Fat flows off to a storage reservoir



Example for progression of temperature



Time requirements:

Heating up (20 - 175°C):	9 min.
Deep-frying process:	2.5-3 min.
Flow off:	15 sec.
Heating up for next frying process:	40-70 sec.
Heating up from stand by (140 - 175°C):	2.5 min.

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