

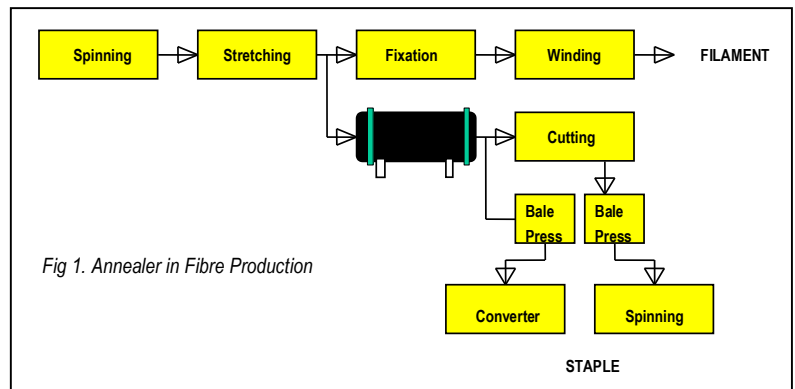
POLYAMIDE OR ACRYLIC FIBRE PRODUCTION WITH VAPOMAT HT



Tow Annealers are integral part of Polyamide- or Acrylic staple production lines. Only the annealing process ensures the highest quality in both even fibre relaxation and shrinkage. Precise settings of temperature, pressure, times and the process sequence guarantee the desired thermofixation effect with reproducible results.

Since the development of vacuum heat-setting machines, WELKER SPINTECH has taken the technological leadership in the production of tow Annealers. VAPOMAT HT has proven to be the prime line equipment for this heavy duty type of man-made fibre manufacturing.

Subsequent production of various yarns or twist may require additional relaxation or twist setting. WELKER SPINTECH offers a variety of different VAPOMAT HT steamers suiting to every customers individual needs.



KEY DESIGN ELEMENTS

- **Annealer with 1 or 2 doors**
- **Automatic loading system**
- **Process control system**
- **Vacuum pumps for initial vacuum**
- **Condenser for final vacuum**
- **Steam inlet system**
- **Air inlet with silencer (Pressure compensation)**

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VAOMAT HT PROCESS OPTIONS

The design as **Tow Annealer** provides two different process options:

STEAM FLOW process for Polyamide fibres:
This process ensures even setting of each batch by means of individual temperature control in each can of the batch and controlled steam flow through each fibre package. This cycle offers minimised steam-/ energy consumption.

PRESSURE PEAK process for Acrylic fibres:
This process ensures even setting by means of rapid pressure changes in the

SHUTTLE LOADER

This loading system is featured by the absence of any mechanical devices inside the annealer vessel during process. Thus there is **no pollution by lubricants** etc. to the fibre.

The cans are loaded onto the rollers of the shuttle until a complete batch is ready for the cycle. Then the shuttle lifts up the cans by few centimetres and moves into the annealer vessel. The cans are lowered onto support rails and the shuttle moves out again. The doors close and the process starts automatically.

At the end of the cycle the exit shuttle moves into the annealer vessel to discharge the cans at the opposite (exit) side.

Shuttles with lateral movement are available to distribute fibre cans to different production lines at an annealer exit side.

Other loading systems are available upon request.

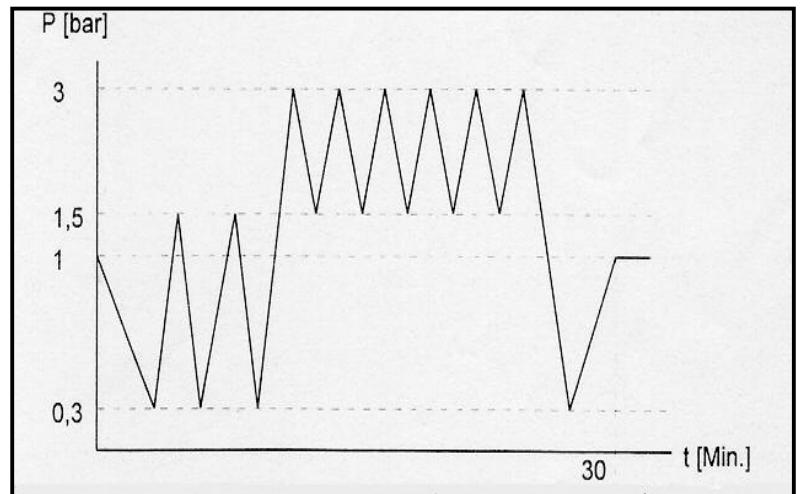


Fig 2. Pressure Peak Process

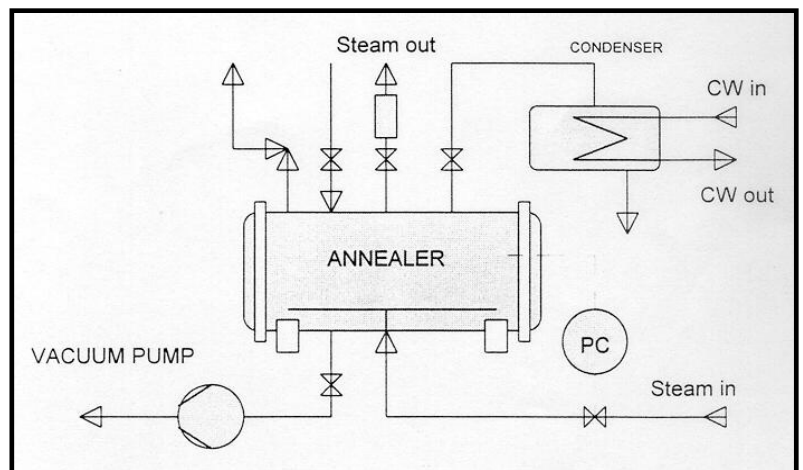


Fig.3 Tow Annealer for Pressure Peak process

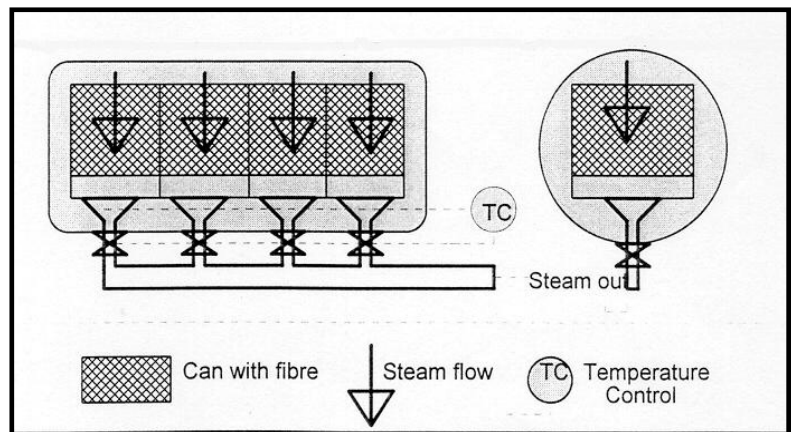
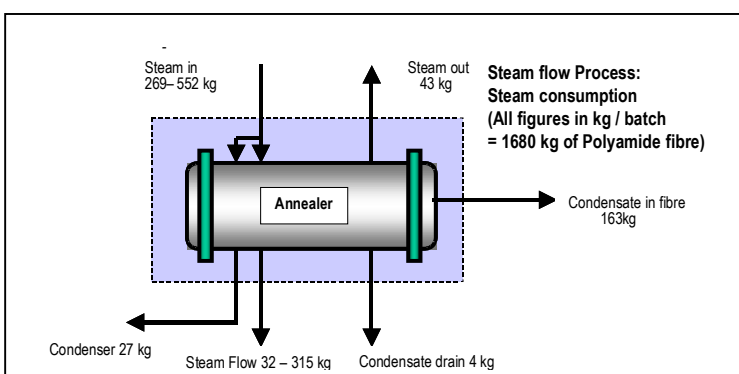
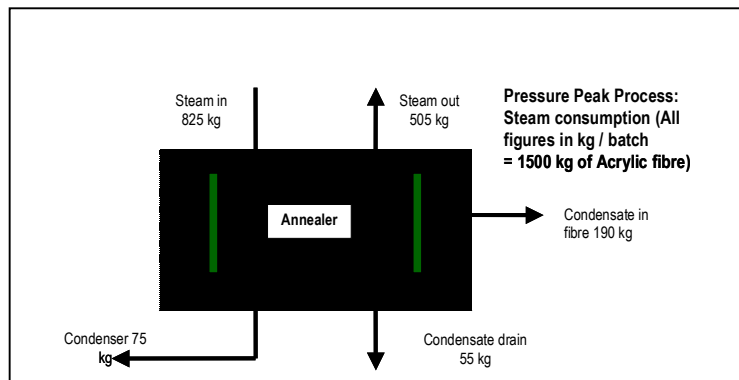


Fig.4 Principle of Steam Flow Process

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<i>Cycle for polyamide cable</i>	<i>Time [s]</i>
Loading of cans	120
Close doors	40
Initial vacuum 200 mbar	85
Steam inlet/Steaming 135 °C	500
Steam out/Pressure balance	30
Final vacuum 200 mbar	130
Pressure balance (Atmosphere)	30
Open doors	40
Total Cycle Time	975

<i>Cycle for acrylic tow</i>	<i>Time [s]</i>
Loading of cans	120
Close doors	40
Initial vacuum 200 mbar	90
Steam inlet / Steaming 1150 mbar	45
Vacuum 200 mbar	90
Steam inlet / Steaming 1150 mbar	45
Vacuum 200 mbar	90
Steam 3500 mbar	60
Steam out 1150 mbar	40
Steam 3500 mbar	60
Steam out 1150 mbar	40
Steam 3500 mbar	60
Steam out 1150 mbar	40
Steam 3500 mbar	60
Steam out 1150 mbar	40
Steam 3500 mbar	60
Steam out/ Pressure balance	50
Final vacuum 200 mbar	120
Pressure balance (Atmosphere)	30
Open doors	40
Total cycle time	1220



Advantages of Tow Annealing

- *Absolute even distribution of setting Temperature*
- *Precise setting of temperature and pressure*
- *Optimised reproducibility*
- *Vacuum process with exclusion of oxygen*
- *Tension-free shrinking up to defined level*
- *Optimal dyeability for the fibre*
- *Reduced temperature compared to hot air fixation*

REFERENCE LIST TOW ANNEALERS

AKZO - ENKA	6 units	ICI	3 units
BAYER	1 unit	MITSUBISHI	1 unit
COURTAULDS	2 units	MONSANTO	2 units
DUPONT	4 units	MONTEFIBRE	4 units
EMS CHEMIE	1 unit	SNIA FIBRE	2 units
FASERWERKE LINGEN	1 unit	CRESCENT PAN	1 unit
FISIPE	1 unit	INDIAN ACRYLICS	1 Unit
HOECHST	2 units		