

THE GUNT LEARNING CONCEPTS OF THERMAL PROCESS ENGINEERING

What does thermal process engineering involve?

The basis of thermal process engineering is thermal separation processes. In mixtures made up of at least two components, heat and material transfer processes are used to selectively change the composition (concentration) of the mixture. The motive forces for these transfer processes (temperature and concentration differences) are created by adding an opposite phase selectively for one or more components in the mixture. Both the

mixture of substances to be separated and the opposite phase can be in either solid, liquid or gaseous form. The processes are referred to as phase equilibrium processes and classified based on the combination of phases.

How can the unit operations in thermal process engineering be classified?

PHASE EQUILIBRIUM PROCESSES

LIQUID / GASEOUS	LIQUID / LIQUID	SOLID / LIQUID	SOLID / GASEOUS
<ul style="list-style-type: none"> ■ Evaporation ■ Distillation/Rectification ■ Absorption 	<ul style="list-style-type: none"> ■ Extraction ■ Membrane Separation Processes/Reverse Osmosis 	<ul style="list-style-type: none"> ■ Extraction ■ Crystallisation ■ Adsorption 	<ul style="list-style-type: none"> ■ Drying ■ Adsorption

Why are practical experiments indispensable for training purposes?

Modelling of thermal separation processes is based on the absolute laws of conservation for mass, energy and momentum, as well as phase equilibrium and kinetic methods for modelling heat and material transfer flows. The parameters in the kinetic methods must be measured and the heat and material transfer flows optimised. Practical experiments are essential to obtain a comprehensive understanding of the fundamental recurring process engineering principles such as

parallel and countercurrent flow, multi-stage processes, design of active surfaces and uniform progression of motive forces. Planning, setting up and performing experiments to determine modelling parameters is communicated most clearly and comprehensibly through the use of experimental units.



Prof. Dr.-Ing. habil. Kurt Gramlich (Anhalt University), our technical adviser on thermal process engineering

Prof. Gramlich advised us when we were setting up this range and contributed his many years of experience in the area of thermal process engineering. The text on this page was written by Prof. Gramlich.

THE UNIT OPERATIONS...	...AND THE APPROPRIATE GUNT UNIT
Evaporation	▶ CE 715 <i>Rising Film Evaporation</i>
Distillation / Rectification	▶ CE 600 <i>Continuous Rectification</i>
	▶ CE 602 <i>Discontinuous Rectification</i>
Absorption	▶ CE 400 <i>Gas Absorption</i>
	▶ CE 405 <i>Falling Film Absorption</i>
Extraction	▶ CE 620 <i>Liquid-Liquid Extraction</i>
	▶ CE 630 <i>Solid-Liquid Extraction</i>
Membrane Separation Processes	▶ CE 530 <i>Reverse Osmosis</i>
Crystallisation	▶ CE 520 <i>Cooling Crystallisation</i>
Adsorption	▶ CE 540 <i>Adsorptive Air Drying</i>
	▶ CE 583 <i>Adsorption</i>
Drying	▶ CE 130 <i>Convection Drying</i>



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