

The GUNT learning concepts of mechanical process engineering

What does mechanical process engineering involve?

Process engineering is the engineering science of material transformation.

Mechanical process engineering involves the changes in material properties (e.g. particle size), and composition (concentration), due to mechanical effects.

The mechanical effects are forces acting on the materials. These forces may include compression forces, friction forces, impulses, or forces triggered by flow resistances.

The material systems with which mechanical process engineering concerns itself are termed dispersed systems. They consist at least of a dispersed phase and a continuous phase. The dispersed phase usually comprises large numbers of individual particles which are finely distributed (dispersed) in the continuous phase. The dispersed phase largely involves solids, however, both phases may also be liquid or gaseous. Examples of dispersed systems are bulk solids such as sand, ore-bearing rock, suspensions, emulsions and dusts.

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

Unit operations in mechanical process engineering		
Involving change in particle size	Without change in particle size	
Comminution	Separation methods	Mixing
Agglomeration	Storage and flow of bulk solids	Fluidised beds and pneumatic transport

The processes can essentially be divided into two principal categories. In the comminution and agglomeration (particle size enlargement) processes, the size of solid particles is purposely altered. In the separation, mixing, storage and transport of bulk solids, the particle size usually remains unchanged. The separation methods in many cases involve the separation of solid, dispersed phases from fluids and the division of solid compounds into fractions with different particle properties.

In fluidised beds, mixing, separation or agglomeration processes may occur, depending on the application.

Prof. Gorzitzke advised us when we were setting up this range and contributed his many years of experience in the area of mechanical process engineering.



Prof. Dr. Wolfgang Gorzitzke (Anhalt University of Applied Sciences), our technical advisor on mechanical process engineering

Our training systems for mechanical process engineering

Comminution		CE 245	Ball mill
Agglomeration		CE 255	Rolling agglomeration
Separation methods	Classifying	CE 275	Gas flow classification
		CE 264	Screening machine
	Sorting	CE 280	Magnetic separation
	Separation in a gravity field	CE 115	Fundamentals of sedimentation
		HM142	Separation in sedimentation tanks
	CE 587	Dissolved air flotation	
	CE 588	Demonstration of dissolved air flotation	
	Separation in a centrifugal force field	CE 282	Disc centrifuge
		CE 235	Gas cyclone
		CE 225	Hydrocyclone
	Filtration	CE 116	Cake and depth filtration
		CE 117	Flow through particle layers
		CE 287	Plate and frame filter press
		CE 283	Drum cell filter
		CE 284	Nutsche vacuum filter
		CE 286	Nutsche pressure filter
		CE 579	Depth filtration
Mixing		CE 320	Stirring
		CE 322	Rheology and mixing quality in a stirred tank
Storage and flow of bulk solids		CE 210	Flow of bulk solids from silos
		CE 200	Flow properties of bulk solids
Fluidised beds and pneumatic transport		CE 220	Fluidised bed formation
		CE 222	Comparison of fluidised beds
		CE 250	Pneumatic transport