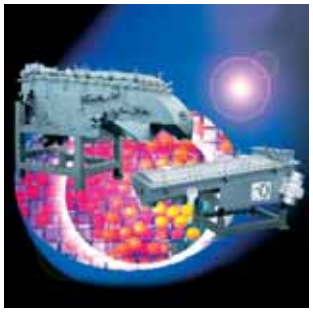
VIBRA SCHULTHEIS

Range of Products

Vibration Technology

conveying, screening,
batching, discharging,
sprinkling, vibrating,
compacting, testing



Process Engineering

drying, cooling,
instantizing,
calcining, roasting,
crystallizing

Plant Engineering

planning and delivery
of turnkey
processing and
drying systems

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Figure 1: Vibrating tube conveyors feeding a weighing hopper

Conveying

Figure 2: Vibrating trough conveyors in a chemical plant

Figure 3: Partial view of a vibrating conveyor plant with an overall length of 120 m used to convey potato chips at a rate of 60 m^3/W.

Figure 4: Vibrating spiral conveyors and trough conveyors in a food processing factory

Vibrating conveyors

The vibrating conveyors, driven by electromagnetic vibrators or synchronously contra-rotating vibrating motors, provide almost maintenance-free and low-wear operation. Our vibrating conveyors have now been used for horizontal and vertical conveying of countless products under the most varied operating and site conditions. Vibrating conveyors can be used even under extreme environmental conditions (e.g. handling of materials at 900°C, at ambient temperatures down to -50°C, under exclusion of air or in a vacuum).

Vibrating trough and tube conveyors

Open or enclosed troughs and tubes of various types made of standard or stainless steel, or of special materials such as Hastelloy or titanium, are used for materials handling.

Highly flexible coil springs or rubber cushion elements provide elastic support or suspension. High degrees of vibration insulation and smooth operation can be achieved by means of structure-borne noise elimination.

The conveying process itself is based on the vibration of the conveyor deck at a slight angle to the plane of conveyance. The material to be conveyed is moved in microscopic throws, if the vertical acceleration exceeds the acceleration due to gravity.

Although there are numerous investigations into the behaviour of bulk materials in vibrating trough conveyors and the governing laws, all essential product parameters are rarely known with sufficient accuracy, so that experimental studies are often indispensable despite many years of experience. A broad range of testing equipment is available for this purpose in our premises.

Free-swinging vibrating conveyors of simple design are available for conveying distances up to about 7 m. Distances up to 30 m are covered by our natural frequency conveyors of most modern and extremely silent design.

Vibrating spiral conveyors

Vibrating spiral conveyors move the products vertically on helical paths up to a height of 7 m.

Figure 5: Natural frequency conveyor, 300 mm wide x 12 m long, handling 10 t of detergent an hour

Screening

Figure 10: Screening plant for freeze dried fruits

Vibratory screening machines

The rapid vibrations of the screening deck convey the product across the screen in an efficient throwing motion providing separation of the bulk material into the desired particle size fractions. The optimum machine index (ration of screen acceleration to acceleration due to gravity) can be adjusted to each particular application by means of the variable out-of-balance force.

In addition to inclined screening machines we are manufacturing well-proven twin motor driven **horizontal screening machines** (screening trough conveyors) providing efficient screening at minimum mounting height.

Series G vibratory screening machines for general applications are of enclosed, easy to clean design with 1 to 3 stacked screening decks.

The screening machines can be equipped with quick-release screen and lid tensioners for use in continuously operating production lines to eliminate long production breakdowns due to screen changing.

The various types designed for general applications are supplemented by special contructions, e.g. **dewatering screening machines, circular screening machines or specially developed Series SRK screening machines** for plastic granulate featuring an adjustable angle of throw and optimum cleanability.

Type MA/DV and SA screening machines complete the series of machinery in the heavy-duty range.

Drive system, spring suspension and materials used are basically the same as in vibrating conveyors.

The screening surface areas range from 0.16 to 10 m^2.

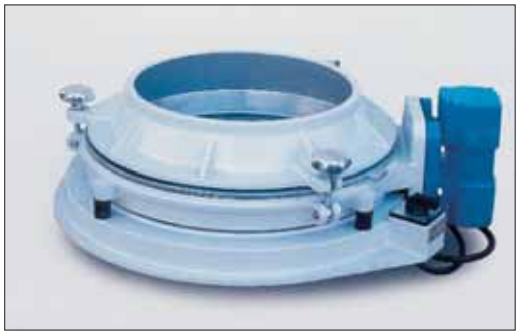

Figure 6: VIBRAPID screening machine

Figure 7: Series SRK screening machines for plastic granulate

Figure 8: Screening maschine suitable for CIP and sterilization (Works photo Schering AG)

Pharmaceutical design

Machines for use in the pharmaceutical and food industries are built to meet the most stringent hygienic standards.

Figure 9: SR 36/10 screening machine in a food processing factory

Figure 11: ER batching conveyors in special design for proportioning of catalysator granules

Batching, discharging, sprinkling

Figure 12: SX bin dischargers in a detergent factory

Figure 13: Bin discharging trough conveyors with electromagnetic vibrators

Figure 14: Bin discharging tube conveyors

Figure 15: Charging conveyor for furnace feeding

Type ER batching trough conveyors

In addition to **vibrating conveyors** used as batching system we also supply **ER batching trough conveyors** specially designed for even batching of bulk materials into mixers, grinders, weighers and processing equipment.

The Series ER features a modular design making it possible to combine driving block, trough and feed hopper in different ways.

The electromagnetic drive systems and vibrators mainly used in these applications provide almost maintenance-free and low-wear operation. The associated electronic control systems with linearized control characteristics and voltage stabilization can be driven by 4-20 mA or 0-10 V input signals for incorporation into control circuits.

Explosion-proof models are also available.

Bin discharging trough conveyors

Specially designed vibrating trough conveyors with electromagnetic or motor vibrators are available for the controlled discharge of bulk materials from bins and containers.

Our SX bin dischargers are primarily intended for **discharging** bulk materials of poor flow characteristics. The bulk material column in the bin can be optimally activated by a vibrating motor drive system with infinitely variable out-of-balance force. A vibrating outlet funnel considerably increases the fluidity zone within the bin. The large opening normally required for free flowing has been reduced here to a smaller convenient opening.

The flexible suspension of the discharger eliminates transfer of vibration to the bin structure.

Sprinkling devices

Vibrating sprinkling plates and troughs are available for sprinkling belt-conveyed products such as roofing felts, bakery goods or confectionery. Based on our wide experience, the requirements of the different properties of the material to be sprinkled can be optimally met.

Electromagnetic vibrators

These thyristor controlled vibrators withstand continuous operation and are mainly used as variable drive systems in bin discharging troughs and vibrating tube conveyors.

Vibrating, compacting

Motor vibrators

Most of the vibrating conveyors, screening machines, dischargers and other vibrating machinery are excited by our type DV motor vibrators incorporating vibration-proof, impact-resistant pearlitic iron housings and running on largely dimensioned, life-time lubricated roller bearings. The eccentric weights are continuously adjustable.

The MEMO disk and the two-point mounting system of the protecting caps are genuine VIBRA design and reflect VIBRA's experience gained over decades. Standard motor vibrators are available with centrifugal forces of more than 130 kN.

Figure 16: DV motor vibrator

Vibrating tables

In addition to bin shaking, current applications include shaking and compacting of bulk materials in shipping containers.

Precision vibrating tables equipped with electronic control and measuring systems are used for mechanical strength testing of precision mechanical and electronic equipment.

Figure 17: Vibratory equipment for discharging of big-bags and bags

Small vibrators

Our small vibrators are available for use with small hoppers and units. Small electromagnetic vibrators, small vibrating motors and compressed air ball vibrators produce up to 20,000 oscillations per minute and centrifugal forces up to 4,5 kN.

Our services cover **planning**, design and manufacturing of **bulk material handling systems** including all optional equipment and electrical control systems to suit the customers' requirements.

Figure 18: Vibratory frames for discharging of containers

Figure 19: ER vibrating feeders with hoppers

Figure 20: Vibrating table for mechanical strength testing

Figure 21: VF 40/10 vibrating fluid bed dryer in a food processing factory

Drying, cooling, crystallizing

Figure 22: Drying test in our pilot plant

Figure 23: Vibrating fluid bed dryer VF 40/3,5 in a development center

Figure 24: Natural frequency fluid bed dryer/cooler 22 m^2 area

Figure 25: Combined unit dryer/cooler/screener in a chemical plant

Vibrating conveyors combined with process engineering techniques form the basis of a sophisticated range of systems used for drying and cooling, crystallizing and calcining, instantizing, agglomerating, tempering and roasting of powdery and granular products.

Numerous systems have proven successful in the production of foods, instant coffee and tea, pharmaceuticals, detergents, chemicals, building materials etc.

Depending on the type of application involved we offer various designs for direct or indirect heat exchange.

Cooling and drying trough conveyors

Vibrating trough conveyors and vibrating spiral conveyors with pressure resistant double-walled deck using a special manufacturing technique operate with liquid and gaseous heat transfer media acting as coolers or dryers.

Calcining trough conveyors

Calcining trough conveyors with temperatures of more than 500°C are equipped with electrical tubular heaters of high power density.

Precise monitoring of the individual heating zones by measurement and control systems enables preselected temperature profiles to be accurately maintained.

Fluid bed technology

Optimum heat transfer is achieved in vibrating fluidized beds **(vibrating fluid bed dryers/coolers)**. The drying of cooling medium (gas or air) evenly penetrates the product bed which is being conveyed across the perforated plate. The large contact area in the fluidized bed provides a rapid heat transfer between solid particles and gas.

The advantage offered by vibrational excitation of the fluidized bed is mainly based on the fact that fluidization of the product bed and the resulting increased heat transfer are possible at low air velocity. The even air flow also eliminates the formation of clusters and ensures optimum energy utilization.

Instantizing, calcining, roasting

Units with fluid bed areas of more than 7.5 m^2 are designed as natural frequency dryers/coolers ranging up to 30 m^2 per unit.

Static fluid bed units are also produced for readily fluidizable products.

Proven hot gas generating, air heating, supply air cleaning and exhaust air dedusting systems are available for gas, air and heat supply.

In addition to dryers which meet the most stringent hygienic standards (pharmaceutical design) we also produce fluid bed units with auxiliary equipment e.g. for instantizing of milk powder based pro-ducts or crystallizing of plastic granulate.

Pressure resistant models are available for handling explosive materials.

Combined units

Units combining two or three functions such as drying, cooling and screening, dewatering and drying have been developed for numerous applications e.g. in the plastic industry and the tobacco and beverages industry.

The advantages offered, for example, by a combined screening and cooling unit are obvious since both investment and operating costs can be saved. The small space required as compared with separate machines is another benefit.

Vibrating batch dryers

Our vibrating batch dryers of circular design are ideal for long and slightly varying residence times. The material to be dried is conveyed in a circle through the directional vibration of the vibrating motor drive system and is discharged after having reached the desired degree of dryness.

Test systems

A number of test systems are available for checking the design parameters in our pilot plant or carrying out experiments in our customers' premises to make sure that testing is carried out under operational conditions taking account of all product properties.

Figure 26: Cooling spiral conveyors 1400 mm diameter width, with upstream screening machines for screening and cooling 3000 kg/h plastics granules each

Figure 27: Vibratory fluid-bed batch dryer for roasting chopped almonds

Figure 28: Fluid-bed dryer, fluid-bed area 26 m^2, with integrated slide-in steam coils for a detergent intermediate product

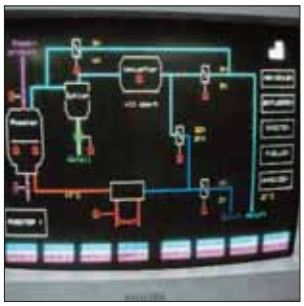

Figure 29: Diagram of the roasting process

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