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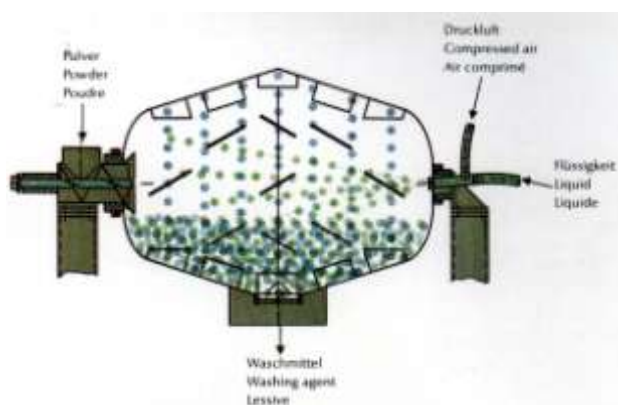
DIN EN ISO 9001 : 2000 certified

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POWDER PRODUCTION PLANT FOR PRODUCING POWDER DETERGENT BY OUR BEFA-SYSTEM

Plant Type B

(3600l/h – density 0,5 kg/l)



Introduction

The more economical production of detergents by the Befa spray mixing process has established itself as the only future-oriented alternative to spray drying in energy intensive spray towers. The unique Befa-System includes also the R & D of so called raw material compounds, that allow you to produce within short time tailor made powder-type detergents according to the demand in your country such as: Machine detergents, hand-washing detergents, dishwashing detergents, fine washing agents (wool etc.) and other cleaners

The simple, physical production process is energy-efficient and environmentally neutral. Spray mixer units possess flexibility of use and operation. They permit rapid changing for new products and easy handling. Furthermore the process sequence can be controlled using a random programmable control unit, microprocessor or process-control computer. The required floor space for the core construction is only 100 m² with an height of approximately 6 –8 m.

The relatively low investment costs and low energy consumption in combination with the optimised Befa raw material compounds are important economic advantages of the Befa production plant for powder-type detergents.

1 Detergent Production Plant

suitable for manufacturing powdery synthetic detergents and cleaning materials to our formulation.

Technical design to our Flow Sheet

Technical Data for the plant

Production Process: Spray mixing process in mechanical batch mixer, single stage operation

Capacity: 1.200 ltr/Batch, by 3 Batches/hour = 3.600 ltr/hour

Production output: 1.200 l/batch, max. 3 batches/hour, giving an output of approximately 1.800 kg/h at a bulk density of approximately 0,5 kg/l. The effective production output depends on the number of production batches and the bulk density.

Power requirement:

Electrical input power	:	34 kW
Uniformity factor	:	0,95 %
approx.		
Compressed air cleaned and de-oiled for pneumatic control unit	:	10 Nm ³ /h

Electrical supply:

Control voltage 3 phase	:	230 V AC
	:	24 V DC
Operating voltage 3 phase:	:	400 V
Frequency:	:	50 Hz
Motor protection:	:	IP 54
Motor insulation category:	:	F

Material: All product contact parts of the perfume liquid component spray equipment are made of material 1.4301 or suitable plastics. All other parts are made of material St. 37.2.

Surface finish for mild steel parts: All mild steel parts are painted in RAL 1015 (Ivory), sand-blasted to Grade SA 2.5.
base coat 40 my
top coat 40 my

SCOPE OF QUOTATION:

Item 1)	1	Bag Emptying Hopper with Dust-Extractor-Filter
Item 2)	2	Metering units
Item 3)	1	Elevator Type EVT-180
Item 4)	1	Down pipe system DN 150
Item 5)	4	Intermediate silos
Item 6)	4	Discharge screw conveyors
Item 7)	1	Weighing hopper incl. weighing cells
Item 8)	1	Rotary Spray Mixer Type RSM-1200/3
Item 9)	1	Complete Spraying System for Tenside / Perfume
Item 10)	1	Charging hopper
Item 11)	1	Elevator Type EVT-180
Item 12)	1	Vibratory Sieving Machine
Item 13)	1	Dust Filter unit with suction pipe line
Item 14)	1	Electric switching and control unit
Item 15)		Detail-Engineering

Option

Item 16)	1	Gravimetric Dosing Unit with weighing hopper
Item 17)	1	Gravimetric Dosing Unit with digital floorscale weigher
Item 18)	1	BIG-BAG-emptying and screw-conveying equipment for compound

SCOPE OF QUOTATION:

- Item 1) 1 Bag emptying hopper with Dust-Extractor-Filter**
- | | | |
|-----------------------|---|-----------------------|
| Filter Material | : | Polypropylene |
| Filter Area | : | F = 9 m ² |
| Air flow | : | 900 m ³ /h |
| Fan motor | : | P = 1,5 kW |
| Filter cleaning motor | : | P = 0,18 kW |
- 2 Access doors for filter and fan chamber with toggle-locks
- 1 Quick-acting flap for discharging sacks
- 1 Silencer mounted on top of filter housing. Noise-level: 78 dB(A), at 1 m.
- 1 Charging Hopper, made from mild steel with connecting flange or filter. Charging Hopper is of asymmetrical construction and leads to a discharge flange.
- Item 2) 2 Metering units**
- volumetric units for metering:
- 1 x for TAED, metering rate: 498 kg/h at 3 batches/h
- 1 x for Enzyme, metering rate: 150 kg/h at 3 batches/h
- | | |
|-------------------------------|-------------|
| Drive metering spiral: | 2 x 0,37 kW |
| Drive agitator spiral TAED: | 0,75 kW |
| Drive agitator spiral Enzyme: | 0,75 kW |
- Elastomer vat made of sintex, product contact parts and end plates made of stainless steel. Discharge pipe made of sintex.
- Item 3) 1 Elevator Type EVT-180**
- For vertically conveying bulk products
- Technical data:
- | | | |
|------------------|---|---------------------|
| Capacity approx. | : | 7 m ³ /h |
| Motor | : | 1,1 kW |
| Width | : | 180 mm |
| Height (total) | : | 14.400 mm approx. |
- Buckets similar to DIN 15231

Description

- 1 Base of Elevator with inlet opening, double sided tensioner, idler-roller: 400 mm dia.
- 7 Elevator chutes, with connecting flanges welded on to each end
- 1 Elevator head with detachable hood, 1 motor bracket, 1 geared motor with brake: 1,1 kW, 1 idling roller 400 mm dia, 1 Discharge opening to the following Intermediate Silos, Item 5.
- 1 Three-ply, elevator belt, inclusive of buckets, and attaching bolts + nuts.

Item 4) **1** **Down pipe system DN 150**
with 3 Two-way manifolds in electro-pneumatically execution incl. down pipes to connection with the 4 intermediate silos.

Item 5) **4** **Intermediate Silos**
capacity each 5 m³
for storage the detergent raw materials.
Silos in flexible design.

Accessories for each Silo:

- 1 raw material inlet connection
DN 150 with flexible sleeve
- 1 max. level indicator
- 2 pneumatic loosening system
for the cones from the silos
- 4 Manual Stop Valve for the outlet flanges.
Compressed air connection R 1"
(inside thread) for connecting
to side compressed air supply.

Item 6) **4** **Discharge and Metering Screw Conveyors**
for coarse/fine metering

1 x for compound 1	ME-MA = 1.600 m, 20°
1 x for sodium perborate	ME-MA = 1.000 m, 20°
1 x for sodium tripolyphosphate	ME-MA = 1.000 m, 20°
1 x for sodium sulphate	ME-MA = 1.600 m, 20°

The conveying capacity of each screw conveyor is 10 m³/h.
all information and prices are given without any obligation

- 4 pneumatically operated shut-off valve DN 150, mounted on outlet,
with pneumatic rotary drive, solenoid valve, limit switch with flexible connecting sleeve.

- Item 7)** **1** **Weighing Hopper incl. weighing cells**
to hold and weigh the 4 powder raw materials.
Accessories:
1 max. indicator
3 load cells
1 analyser with electronics for weighing cells
1 pneumatic vibrator
1 electro-pneumatically operated discharge valve DN 250.
- Item 8)** **1** **Rotary Spray-Mixer Type RSM 1200/3**
consisting of the following:
- 1 Machine frame, all welded from mild steel sections,
 - 1 Bearing Support, inlet side consisting of:
Inlet hopper with connection (300 mm dia.) for powdered raw-materials and opening (300 mm dia. complete with rubber lid) for minor components. Screw-conveyor for filling drum, complete with bearings and seals. Drive motor for screw-conveyor: 1.1 kW. Bearings and seals for drum.
 - 1 Double-cone Mixing Drum made from stainless steel
 - 2 Manholes in drum
 - 2 Pneumatically operated discharge flap-valve, 250 mm dia.
 - 1 Bearing support, spraying side consisting of:
Bearings for drum
Ring channel for compressed air for discharge flap-valve
Opening for spraying nozzle
 - 1 Discharge hopper, split construction, incl. brush-type seals and socket (100 mm dia) for connection to dust-extractor.
 - 1 Geared motor with soft-start facility for the main-drive to the drum, 7,5 kW, incl. chain-drive and guard
- Item 9)** **1** **Complete Spraying System**
for spraying the liquid components (Non-ionic and Perfume) into the powdered materials.

Consisting of:
- 1 Liquid tank for the Non-ionic (250 litres) incl. electric heating device with thermostat and outside insulation, 1 min. level-indicator.

1 Stirrer (slow speed) to fit into the liquid tank for non-ionic. Motor: 0,37 kW. Propeller type stirrer with 4 angled vanes.

1 Metering pump for Non-ionic, incl. mounting plate for the pump.

Capacity max.	:	600	litres/h
Viscosity	:	350	mPas
Pump pressure	:	6	bar
Motor	:	1,5	kW

1 Tank for perfume contents approx. 160 litres, incl. min. level indicator.

1 Metering pump for perfume incl. mounting plate for the pump.

Capacity	:	200	tres/h
Viscosity	:	100	mPas
Pump pressure	:	3	bar
Motor	:	0,75	kW

2 Complete pipe systems, 1 for Non-ionic, incl. ball valves, pipe-strainers, pipe-fittings, pressure-gauge, blow-out system, pipe-clips, electric trace heater with thermostatic control and insulation.

1 for perfume, incl. ball valves, pipe strainers, pipe-fittings, pressure gauge, blow-out system and pipe clips.

1 Set of controls and valves for the complete spraying system, filter-reducing valve, solenoid operated valves and fittings.

1 x for atomising air

1 x for non-ionic pipe line

1 x for perfume pipe line

1 Special spray nozzle, (atomising air, Non-ionic, perfume) for fitting into the spray-mixer.

The customer will have to supply suitable supports for the pipe systems

All parts of the spraying system in contact with the Non-ionic or perfume are made from stainless steel material 1.4301 (AISI 304), 1.4541 or a suitable plastic.

Item 10) 1 Charging hopper for finished product

Volume approx. 1.500 ltr.

Flexible container made from Trevira-Hochfest to contain approx. one batch of finished material, directly mounted under the Mixer-outlet. Container fitted with 4 support loops for hanging under the mixer frame incl. one discharge flange.

1 Maximum level indicator

1 Pneumatic loosening system fitted to the conical part of the hopper
Connection to customers compressed-air main, 1" internal thread.

Item 11) 1 Elevator Type EVT-180

For conveying the finished powder product to the sieving machine.

Technical data:

Capacity approx.	:	7 m ³ /h
Motor	:	1,1 kW
Width	:	180 mm
Height (total)	:	9.100 mm approx.
Buckets similar to DIN 15231		

Description

1 Base of Elevator with inlet opening, double sided tensioner, idler-roller: 400 mm dia.

4 Elevator chutes, with welded on connectingflanges
Elevator head with detachable hood, 1 motor bracket, 1 geared motor with brake: 1,1 kW, 1 idling roller 400 mm dia, 1 Discharge opening to the following Sieving Machine, Item 12.

1 Three-ply, elevator belt, inclusive of buckets, and attaching bolts + nuts.

1 Circular chute, dia. 150 mm, Length: approx. 0,9 m complete with sleeves, from 150 mm dia to 200 mm dia.

Item 12) 1 Vibratory Sieving Machine

For sifting out over-size particles from the finished washing powder:

Area of sieve	:	L x W = 800 x 400 mm
Mesh	:	5 mm square
Sieve material	:	Woven Cr-Ni steel-wire

Type of construction	:	Fully enclosed, all-welded construction
Material of construction	:	Mild steel, with hood
Support	:	Practically vibration-free, isolated by coiled compression springs at a 10 degree angle
Drive	:	0,8 kW electric vibrator motor, fitted at to IP 65
Inlet	:	200 mm dia.
Outlet (product)	:	200 mm dia.
Outlet (oversize part.)	:	150 mm dia.

Item 13) 1 Central Dust-Extractor-Filter unit

For fully-automatic, continuous operation consisting of:

Filter area	:	20 m ²
Filter material	:	Polyester needle-felt
Static pressure	:	100 daPa
Fan motor	:	3,0 kW
Cleaning cycle interval	:	20 secs.
Residual dust	:	20 mg/m ³

Filter cycle controlling electronically. Sheet steel housing, all welded construction with support feet, discharge hopper, inlet socket, dust-container (50 litres) with handles and quick-release clamps.

An acoustic hood is fitted over the fan to reduce noise emission to 75 dB(A) at 1 m.

A complete set of exhaust ducts will be supplied to connect this unit to all parts of the plant where dust is generated, complete with brackets, bends, reducers etc.

Item 14) 1 Electric Switch and Control Unit

for the plant as described above, all switchgear and controls are housed in a control cubicle made from steel-sheet.

All switchgear and controls are fully wired up functionally tested. The controls comply with the current VDE Regulations No.0113 and CE-Execution.

Where required for safety reasons, individual functions are interlocked. All the main functions of the complete plant can be initiated from the front panel of the cubicle, including the adjustable time

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relays. A Mimic Diagram with visual display of all the operations is also fitted to the front panel of the cubicle.

The following production cycles are controlled automatically, via timer:

- Filling of spray-mixer 0 - 180 secs.
- Dry pre-mixing 0 - 120 secs.

- Spraying of non-ionic
and perfume 0 - 600 secs.
- Final mixing 0 - 120 secs.
- Discharging of mixer 0 - 180 secs.

All legend plates in English. Furthermore, a programmable electronic controller is built into the control cubicle. This allows changes to the production cycle to be carried out quite easily. Controller Type S7, made by Siemens
Heaters and stirrers are controlled manually.

Electric controls: control circuit, 220 V AC
Electronic Controller: 24 V DC
Mains supply: 400 Volt, 3 phase, 50 c. p. s.
1 Operators Control Panel with re-set button, at Discharge Bag Hopper.

Item 15)

Detail-Engineering

for the complete plant, as follows:

- Provide a functional description with schematic diagrams
- Provide a set of General Assembly Drawings after the order has been placed and all technical details have been settled
- Foundation Drawings with details of floor loading for the complete plant, also, details of openings required in floor, walls or roof.
- Schematic Drawings for all pipe work, fittings and valves
- Full information on all connecting points between items supplied by BEFA or customer, incl. of drawings and dimensions.
- Detailed breakdown of energy requirements

- Supply 3 sets of Documentation for the complete plant. with operating, maintenance and service manuals, in French language

Not included in the Engineering supplied by BEFA are detailed drawings of plant to be supplied by customer. BEFA can supply all relevant technical information and data where they are relevant to connect to BEFA equipment.

Option:

Item 16)

1 Gravimetric Dosing Unit

for TAED and Enzyme consisting of:

- 1 Hopper, contents each approx. 100 ltr.
 - 2 Pneumatically Valves dia. 100 mm
 - 2 Dosing screws, each length 1.000 mm
 - 2 Flexible Connection Sleeve
 - 1 Weighing hopper with 3 weighing cells, 1 analyser with electronic for the weighing cells
- Dosing adjusting: +/- 25 gr

Alternative solution for Item 16)

Item 17)

1 Gravimetric Dosing Unit

for TAED and Enzyme
with following equipments:

- 2 Filling hoppers each 100 ltr for erection on top of the Volumetric metering units.
- 2 Digital Floor scale for the erection of the Volumetric metering units.
- 2 Analyser with electronic equipment. dosing adjusting 5 gr

Item 18)

1 BIG-BAG-Emptying Equipment

with mechanical screw conveyor
for compound-conveying consisting of:

- 1 BIG-BAG-Traverse for max. 1500 kgs lifting capacity
- 1 Input hopper for manual integration of the emptying valve of the BIG-BAG
- 1 Horizontal screw conveyor

length approx 2.0 m, dia outside 168 mm
conveying capacity 10 m³/h, gear motor 3,0 kw

- 1 add. electric part for the screw motor
in the main electric control unit

