

EMULSIFICATION-HOMOGENIZATION MACHINE EMU – MIX – VM

Standard Model

Applications: Emulsifying – Homogenizing – Mixing – Airing – Heating - Cooling



Application Examples:

Food: Mayonnaises – Salad Dressings – Baby Foods – Baking Flavorings – Fillers – Ketchup – Aromas – Pastes – Glazes – Sauces - Special Jellies – Flavored Lemonades – Bases - Soft Caramel Fondants – Hard Caramel Fondants – Aroma Mix Bases for Fillings and Creams

Cosmetics: Cosmetic and Pharmaceutical Salves and Creams – Lotions – Toothpastes in Gel Form – Acne and Sun Protection Lotions – Gel Face Cleansers - Bubble Baths - Shower Gels - Shampoos - Hand Cream - Sun Creams - Shaving Gels and Creams - Hydrating Face and Body Lotions - Hair Dyes and Colorants

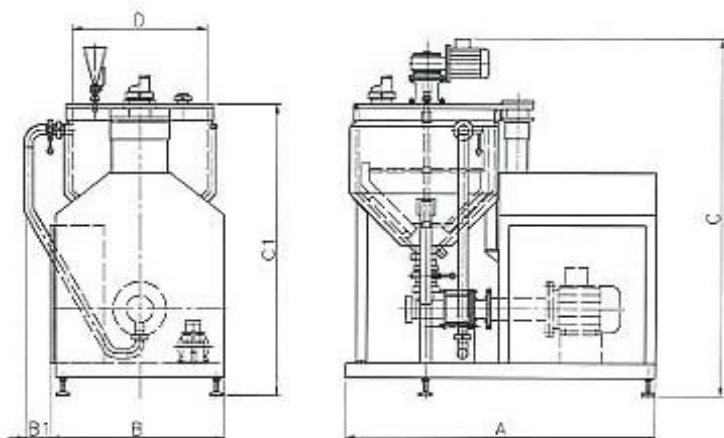
Pharmaceutics: Cosmetic and Pharmaceutical Salves and Creams – Lotions – Toothpastes in Gel Form – Acne and Sun Protection Lotions – Gel Face Cleansers - Bubble Baths - Shower Gels - Shampoos - Hand Cream - Sun Creams - Shaving Gels and Creams - Hydrating Face and Body Lotions - Hair Dyes and Colorants

Process Advantages:

- Closed production system – optimal hygiene standards
- Short product processing times - six product processing stages
- All work cycles handled by one machine
- Batch reproducibility

Machine with
open lidMachine description/design:

- Entire machine in stainless steel design
- Investment with lasting value
- Vertical mixer – closed cylinder – polished grain 300 (Special model is electropolished)
- Permissible overpressure in product room + 1 bar; permissible underpressure (vacuum) in product room – 1 bar.
- Can be sterilized in its entirety
- Container with double shell for heating (steam up to 2 bar, hot water) and cooling (water or cooling brine)
- Heat insulated with sealed outer liner made from stainless steel



Container wall scrapers: Detachable for easy and quick cleaning

Agitators (extractable from kettle):

- 1) Scraper agitators for kettle wall (Anchor mixer) – gap-free mixing with automated rotational direction change – interval switching
- 2) Inline homogenizing machine 2 speeds, high-frequency stator-rotor mixer head (2 levels), with recirculation line

Product evacuation by:

- Pumping out container with inline machine: suitable for flowable substances – closed system (compressed air support for creams with higher viscosity)
- Direct aspiration of pre-phases, liquid or powder
- Easy to operate machine
- Pneumatic lid opening system
- Mechanical lid locks
- Shafts seals: axial face seals
- Electronic mixed substances temperature indicator
- Vacuum pump – standard model
- Height adjustable machine supports

Type EMU-MIX-VM	100	200	400	700	1200
Cont. Full Vol. (l)	127	225	483	790	1330
Tare Weight (kg)	700	1100	1500	1700	2400
Dimensions (mm)					
A	1400	1730	2000	2500	2900
B	700	970	1200	1400	1600
C	2000	1970	2400	2600	3000
D	530	750	1000	1200	1400
B1	150	150	150	150	150
C1	1400	1600	1750	1850	1950
Connected Load (kW)	13	14	16	16	19

Technical Description of Standard Design

CONSTRUCTION/DESIGN AND FUNCTION

The **EMU - MIX - VM** machines are intended for producing liquid to viscose emulsions, dispersions, or suspensions. The machines consist of a vacuum-resistant container with double shell to heat or cool, a slow-speed, 3-winged scraper agitators with moveable Teflon scrapers, a high-speed homogenizer with interlocking homogenizing element (stator-rotor system), and a vacuum pump. The switching unit as well as the auxiliary aggregate is mounted in a rustproof equipment cabinet. All types are equipped with a laterally hinged lid opening system.

PRODUCT FEED:

All product feeder tubes are located in the lid flange in front of the homogenizer, which means that aspirated liquid components are immediately mixed with one another and aspirated powdered products are immediately moistened. An additional tube for feeding pellets or lumpy products or components can be requested and attached to the container lid.

PRODUCT EXTRACTION:

Once the final quality has been reached, the finished product is extracted by switching the flap valves of the conducting line. The pump effect of the homogenizing unit is here utilized.

MIXING, EMULSIFYING AND HOMOGENIZING:

The individual aspirated components are routed from the different feeder tubes directly into the homogenizer. Liquid droplets are distributed extremely finely and emulsified between the fixed interlocked stator and the rapidly rotating interlocked rotor. All **EMU - MIX - VM** machines are equipped with a slow-speed 3-winged scraper agitator unit, which allows for rapid and intensive mixing action as well a rapid heat exchange with the heating or cooling medium within the double shell. This prevents scorching at the hot inner wall of the container.

HEATING AND COOLING:

The components water, oils, etc. are usually aspirated into the vacuum container while cold. The formulation is usually heated from room temperature to 80 to 90° C as follows:

a) By directly blowing water vapor into the formulation or b) by circulating the heating medium within the double shell (steam, hot water). Cooling is also effected by the double shell using cold water.

VACUUM CONTAINER:

Conic-cylindrical container with vacuum-tight sealing lid. The following are installed on the lid:

- Drive for scraper agitator unit
- Vacuum connection tube with vacuum meter, bleeder valve, return valve, and overpressure valve
- View panel with electrical light

DOUBLE SHELL:

The vacuum container is equipped with a double shell for heating and cooling. A bleeder valve is used to fill the double shell with liquid without adding any air. The standard model features a double shell for 2 bar overpressure.

OPENING AND CLOSING LID:

The **EMU - MIX - VM** machines feature a device to easily open and close the lid (pneumatic cylinder to lift machine lid, manually swiveled to side).

VACUUM AERATION:

The homogenizer and the scraper agitator unit allow for a turbulent flow and a continuous mixing and recirculation of the product within the container. This ensures that all air bubbles within the container/product are continuously in contact with the vacuum at the upper area of the container where they burst. The released air is then suctioned off by the vacuum pump.

VACUUM SYSTEM:

A water ring pump is used as the vacuum pump. The vacuum system includes all required fittings.

ELECTRICAL SWITCHING UNIT:

The electrical switching unit is easily accessed and is ready for hookup. The following components are included:

- 1) Control points with snap switch (ON/OFF) for each motor, control lamps, as well as a main switch for all drives. The standard/base model utilizes a conventional relay control with a clear layout.
- 2) Switch box with main switch, fuses, contactors, and thermal motor shut-off relays for reach motor, as well as a transformer (220 V driving voltage). The switch box is integrated into a splash-proof (IP 55) equipment cabinet.

Rules and Regulations:

The entire electrical componentry and design conforms with rules and regulations of the European Union. Other designs and layouts customized to specific country requirements are available as well.

Motors:

All motors are completely sealed and splash-proof. System of protection: at least IP 55 according to DIN 40050. Other protection systems are available as an additional option.

INSPECTION, MEASUREMENT, AND CONTROL DEVICES:

The following are included in the delivery scope:

- View panel with light
- Manometer, vacuum indicator
- Thermometer to measure the product temperature in vacuum container, temp. range 0 - 120° C
- Safety relief valve (set to 1.2 bar overpressure)

GENERAL INFORMATION

Accident Prevention and Government Rules and Regulations:

All BALIK machines are designed and constructed based on the latest technology. Government and European Union rules, regulations, laws, and recommendations are observed when constructing and manufacturing these machines. Safety and accident prevention of the **EMU - MIX - VM** machines is ensured due to the safety mechanism that allows mixer/agitator only to be operated when the container is closed. A safety valve also prevents container overpressures.

Machine Construction:

All machine parts (vacuum container, stator-rotor system, vacuum pump, equipment cabinet, electrical switching unit) constitute one closed unit and are mounted on a shared rustproof standard frame. The driving motor of the stator-rotor system as well as the vacuum system (vacuum pump and fittings) are installed in a rustproof equipment cabinet.

Seals:

The shaft exits of the homogenizer and the agitator unit are fitted with robust and hardwearing seals.

Pipeworks, Connections, Couplings:

The external connections of the product feed as well as the internal couplings within the product area end with screw couplings according to DIN 11851. The water, vapor, or compressed air connections are equipped with Gas Whitworth threaded couplings DIN 259. Other screw connections can be provided upon request. The standard models feature product feed systems with glove valves.

Material Quality:

The entire machine, except for the motors, gears, and view panel, is made from rustproof nickel chromium steel quality 1.4301 (V2A/AISI 304) All motors and gears are enameled. Standard color is blue RAL 010. Elastomers in buna N (Nitril).

Finish:

All rustproof parts in contact with the product are polished and brushed with grain 300.

Cleaning/Sterilization:

BALIK machines were designed for easy and quick cleaning. All parts in contact with the product either can be disassembled quickly and completely or are easily accessed for cleaning. Joints, dead corners, and grooves are avoided since product usually collects in such spots. Machines can also be cleaned with the CIP cleaning process. A rotating sprayer is attached to the bottom side of the container lid. The entire interior can be sterilized using flowing, circulated steam. A valve is installed at the lowest point of the machine (at housing of homogenizer) used to completely evacuate the washer fluid or the condensate.

Maintenance and Upkeep:

The machine does not have to be serviced daily or weekly. Only the functionality of the parts subject to wear and tear has to be checked at regular intervals (floating ring seals, homogenizing elements). Furthermore, the gear lubricant of the scraper agitator unit has to be replaced as outlined in the operating manual.

Delivery:

The machine is delivered as a complete unit ready for immediate use. All mechanical parts are installed. All electrical components are wired and connected. The machine has to be set up on level ground. The customer provides the connections for the product components, electricity, water, compressed air (possibly steam, nitrogen, etc.)

Accessories:

1 set of essential tools

ADDITIONAL MODULES FOR THE BASE MODEL

ADDITIONAL MODULE 1 Frequency Transformer

- A) Gradual speed adjustment for homogenizer (stator-rotor tamping worm)
- B) Gradual speed adjustment for anchor scraper agitator unit

ADDITIONAL MODULE 2 Direct Steam Injection System

Consists of injection pipe with fittings, steam pressure reducer valve, manometer unit, stop valve, connecting flange (this is where the customer connects the existing steam or sterilization system with 2 bar)

ADDITIONAL MODULE 3 Additional Extractor Valve

Stainless steel design, nominal width of 100, with threaded coupling and drain pipe; pump can be connected here.

Many products, e.g. in the food industry, contains small or larger pieces of vegetable, mushrooms, meat, or fruit with a structure that is to remain unchanged by processing. Chunked product can be added to the container by stopping the stator-rotor system towards the end of the basic recipe cycle and closing the floor valve to the stator-rotor system. The lid of the machine is now opened and the chunked product is added and mixed in with the help of the scraper agitator unit. The finished mixed product can then be extracted at the side through the lateral extraction valve installed between container cone floor and floor valve. An additional product pump can be connected to this valve as well.

ADDITIONAL MODULE 4 Collection Preparation Container

Cylindrical container with 4 castors and cone-shaped floor, extraction tube DN25 with threaded screw connection.

Completely made from material 1.4301

The collection preparation containers are set up close to the machine and are usually connected to the existing connecting tube via suitable tube connections. The vacuum within the machine suctions the content of the collection preparation containers into the machine.

Machine with
collection preparation containers



ADDITIONAL MODULE 5 Clip-on Agitator Unit for Collection Preparation Container

Clip-on propeller mixer if individual components are to be premixed in the collection preparation container.

ADDITIONAL MODULE 6 Recipe Management, Weighing and Dosing System

Consists of the following:

a) Weighing unit manufactured by METTLER

Consists of the following:

- 2 x 3 units Weighing cells for collection preparation container (3 units per container)
- Multi-component dosing control processor type ID7 – DOS R

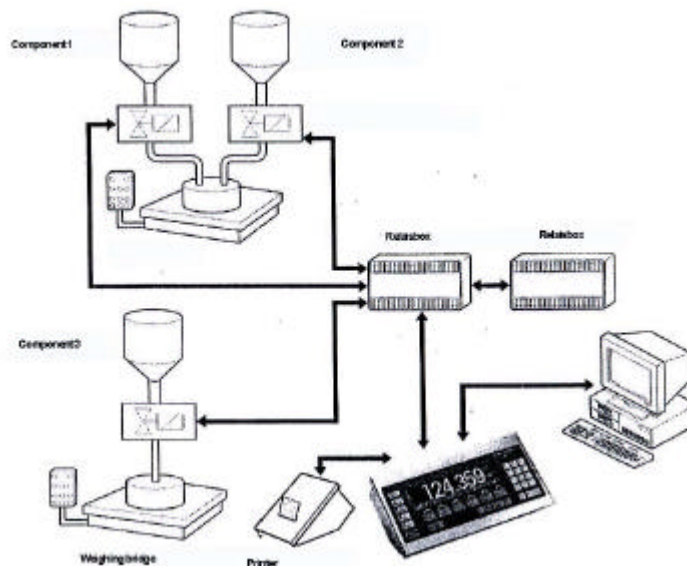
The input device is mounted at the machine.

Dosing processor is integrated into machine switching box, incl. wiring

b) METTLER PC Software: Recipe program “WIN REZ”

The software is installed on a PC provided by the customer and then linked with the machine processing unit.

Schematic example



ADDITIONAL MODULE 7 Machine Process Control for Automated Production Processes

a) Automatic process control

to control automated dosing processes of product valves, mixing time control, vacuum control, etc.

b) Automatic valves

controlled by the process system, nominal width DN 32, flap valve controlled electro-pneumatically.

c) Freely programmable SPC (Siemens S7), 24V DC, to control entire system

incl. motors, valves, and safety devices

ADDITIONAL MODULE 8 Barrel, Storage, Transport, and Fill System

The finished product can be filled directly from machine to storage containers. The pump effect of the homogenizing unit is here utilized. The finished product is thus stored in airtight containers until further processed (e.g., filling/packaging machine) using a fill funnel usually attached right to the filling machine.

Consists of the following:

Barrel lid, smooth, with arched floor, diameter of 560 mm, capacity of 200 liters, surface inside and out grain 320, material: Shell, floor, and lid 1.4435, bottom hoop and tension ring 1.4301, silicone seals

Extrusion ram, diameter of 560 mm, conductor pipe 750 mm long, material 1.4435/1.4571, silicone seals

Special lid, diameter of 560 mm, material 1.4435/1.4571, silicone seals

Tension ring with diameter of 560 mm, with safety bracket, material 1.4301

Air connection unit

Barrel rolling device, with 5 polyamide castors 80 mm, carrying capacity of max. 250 kg, material 1.4301

Product line NW 65, material 1.4301, silicone seals

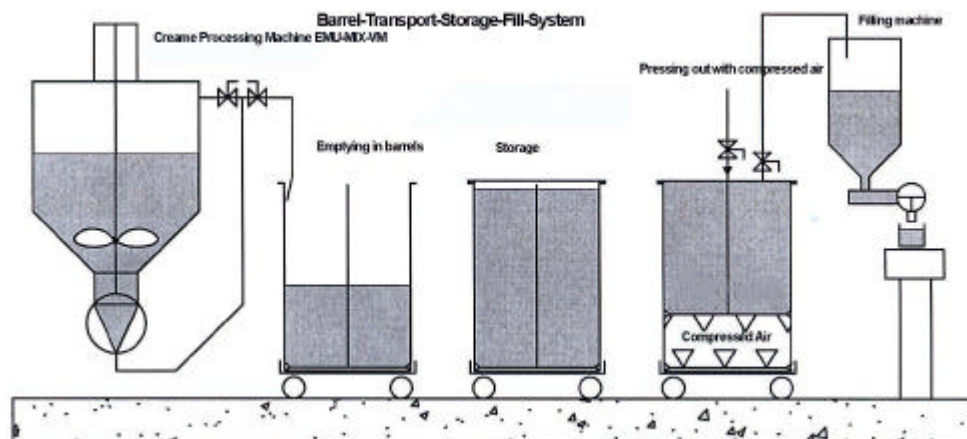
Consists of the following: Height adjustable stand, connector, flap with manual lever, line sections approx. 2 meters long, screw neck with grid, silicone cover 120 mm diameter cutout for NW 65, system pipe to weld to filling machine lid, scraping/pig station, scraper/pig for multi-lines, sickle spanner for installation

Lifting device for special lid 560 mm in diameter

Consists of the following: Three-legged cart, spindle lifting device, material 1.4301

Automatic evacuation consisting of 1 electro-pneumatic leveler and

1 globe valve with servomotor



ADDITIONAL MODULE 9 Electrical Heating of Double Shell

Warm water circulation system if heated water supply is unavailable, consisting of the following:

Heat exchanger part with electrical heating cartridge, circulating pump, pipes between the connections at the double shell of the machine, shutoff devices, and expansion system. With temperature controller directly installed in heating cartridge and with temperature sensor and digital display of the warm water flow temperature at machine control panel.