FOR TURBULENT ACTION

Vertical Mixers and Dryers

AVA Product Range

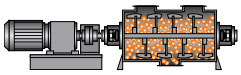
Mixing, Drying and Evaporating

Mixers

Batch Horizontal Mixers

Net capacity
Designed

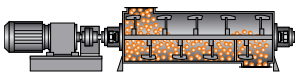
100 – 30,000 liters (25 – 8,000 gal)
as turbulent and distributive mixers with standard or product specific paddles



Continuous Horizontal Mixers

Throughput
Designed

0.1 – 1,000 m^3/h (0.45 – 4,500 gpm)
as turbulent and distributive mixers with product specific paddles

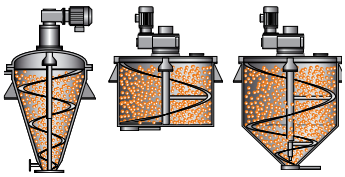


Vertical Mixers

Conical or cylindrical

Net capacity
Designed

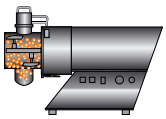
20 – 25,000 liters (5 – 6,500 gal)
with single or double helical ribbon agitator or central tube screw blender (not illustrated)



Laboratory Mixers

Net capacity

0.2 – 200 liters (0.5 – 50 gal)
tabletop, mobile,
or stationary designs

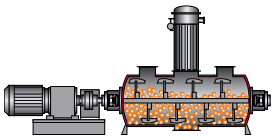


Dryers/Evaporators

Batch Horizontal Dryers

Net capacity

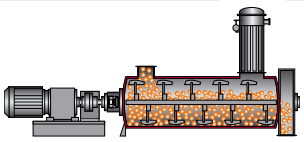
100 – 30,000 liters (25 – 8,000 gal)



Continuous Horizontal Dryers

Throughput

0.1 – 100 m^3/h (0.45 – 4,500 gpm)

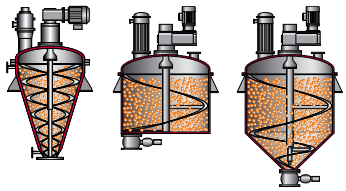


Vertical Dryers

Conical or cylindrical

Net capacity

20 – 25,000 liters (5 – 6,500 gal)



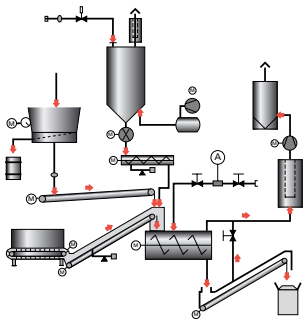
Conical Evaporators

Net capacity

20 – 25,000 liters (5 – 6,500 gal)

Installations

Systems and installations centering on AVA core products including weighing, conveying, heat transfer, vacuum, condensation, control systems, data recording and validation from initial concepts to final commissioning and future process optimization.



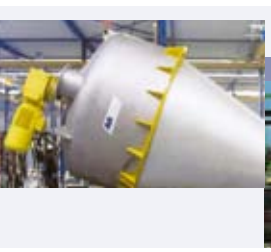
AVA Mixers and Dryers

The right ones for any application

AVA is a small to medium-sized enterprise with mixing and drying as core competence. AVA has clear structures and a size permitting to react flexibly to the needs and demands of its clients.
Profound knowledge of process engineering and many years experience guarantee successfully executed projects.

Range of applications

- Chemicals
- Pharmaceuticals
- Food
- Plastics
- Environment
- Building materials
- Nuclear industry
- Metallurgy





Cone Mixers and Dryers

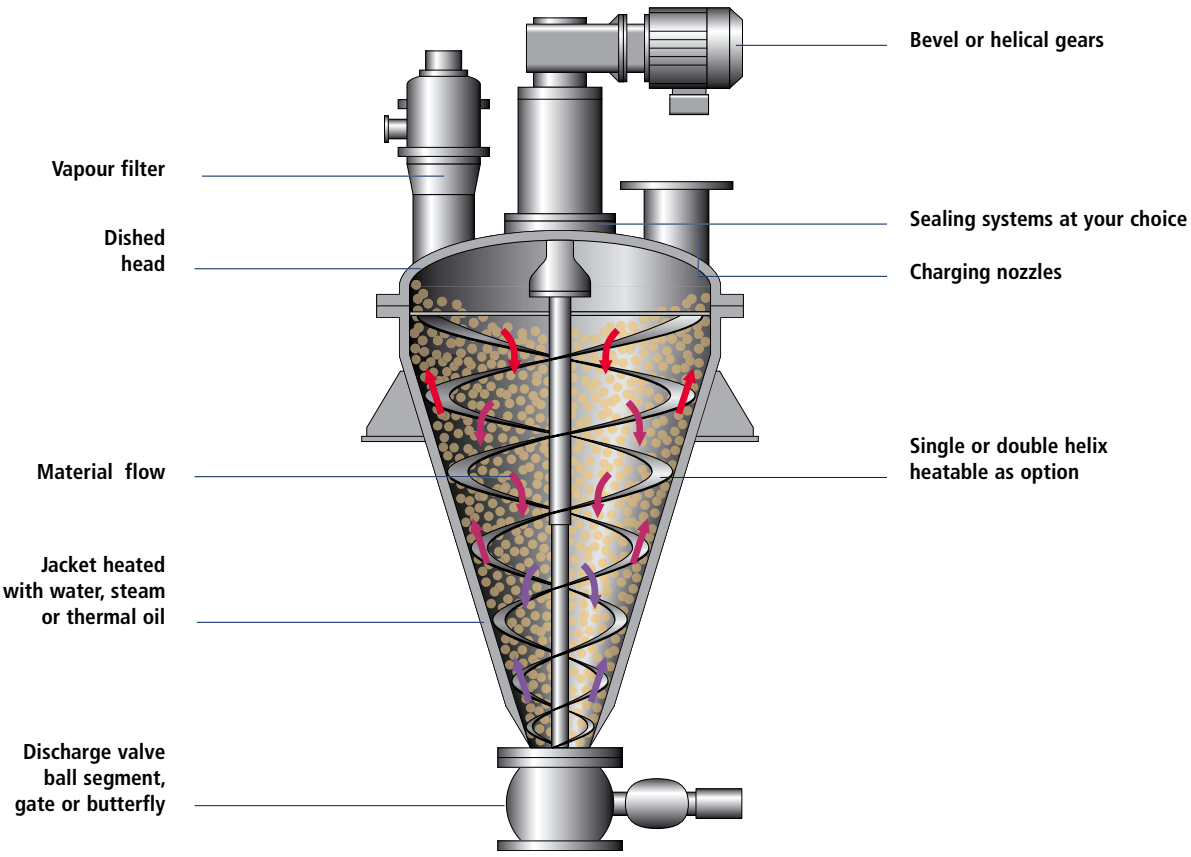
AVA cone mixers and dryers with their typical single or double helix have been developed in the late nineties as a solution to the problems frequently encountered with rotating auger cone dryers. One is the danger of product contamination from gears and bearings in the process area, the other their susceptibility to malfunction and the resulting high maintenance costs.
As an additional benefit came markedly shortened mixing and drying times and improved cleanability.
The helical agitator processes dry or humid, free flowing or sticky bulk materials, filter cakes, slurries and liquids of various viscosity. The cone mixers are ideally suited for nearly all mixing operations. With suitable heating they serve as dryers, reactors or evaporators.

Processes

- Mixing
- Humidifying
- Drying
- Cooling
- Reacting
- Homogenising
- Coating
- Heat treatment
- Evaporating
- Extracting
- Crystallising
- Moistening

A System with many Advantages

You profit from innovative technology



- **Minimal contamination risk**
  Shaft seal and bearings outside of process area
- **Mixing intensity can be adapted to product properties**
  Depending on agitator speed and design one can achieve a gentle rearrangement or a thorough blending.
- **Short drying time**
  A permanent blending and an intensive contact of the products with the heated wall result in a superior heat transition.
- **Short mixing time**
  The entire product volume participates in the blending process.
- **The dryer can operate as an evaporator**
  With small design changes the agitator is ideal for the concentration of liquids and slurries.
- **Increased drying and evaporating capacity with a heated agitator**
  The agitator can be heated and designed for very high levels of evaporation.
- **Complete discharge**
  The conical shape, a large discharge opening and a design without lower bearing facilitate a complete discharge.
- **Easy cleaning**
  Multi-layer, big radius weldings on agitator and body facilitate cleaning. The agitator turning at high speed supports the action of CIP cleaning nozzles.
- **Reliable and easy to maintain**
  The simple design minimises the occurrence of mechanical problems and allows maintenance with in-house personnel.

Cleaning and Safety

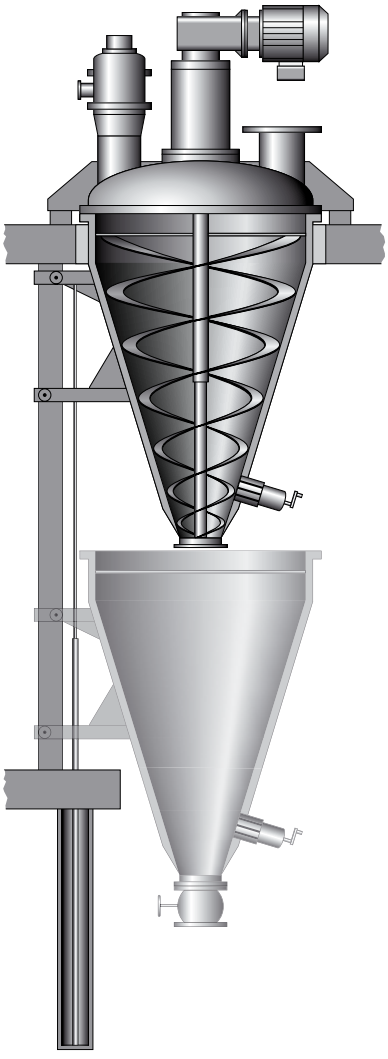
Designed for easy cleaning and maximum safety

The contamination of manufacturing installations and products may destroy entire batches and endanger patients.
AVA cone mixers and dryers are designed to facilitate cleaning procedures and inspections.

The absence of gear elements, bearings and sealing systems from the process area optimally protects the products and facilitates cleaning. Rounded edges and multi-layer, big radius weldings minimise deposits on the agitator. The conical shape allows a nearly complete discharge, which favours again easy cleaning.

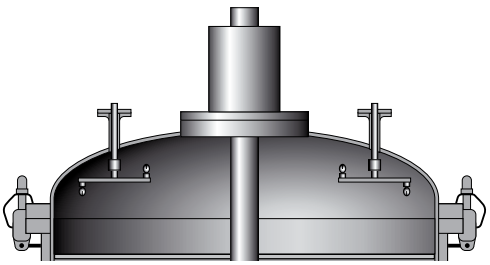
Properties

- Optionally automated and certifiable CIP cleaning in closed machines
- Elimination of contamination sources
- Pharmaceutical grade materials and seals
- Easy access to all product wetted parts
- Clean room installations as an option



Cleaning

Rotating CIP nozzles are integrated in the head. After partial filling of the vessel through the nozzles the fast turning agitator takes care of most of the cleaning. The cleaning process takes place in the closed vessel. The efficient cleaning speeds up and simplifies product changes.



Inspection

To facilitate maintenance and inspection mixers and dryers can be equipped with a lifting column.

The Periphery

From agitator to vapour filter – know-how in detail

We design our installations according to the process requirements of our clients. To comply with the various demands of the chemical and pharmaceutical industry we offer our mixers and dryers in different designs and with a wide choice of accessories.

Simple Helix
Double Helix

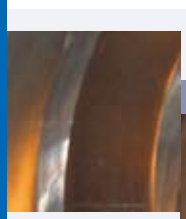
Sometimes high speed mixing is desirable, sometimes it has to be avoided. The agitator and the mixing speed of AVA mixers and dryers is adapted to the properties of the products to be processed.

Heated Agitator

The heat transition from a heated agitator exceeds the transition from the heated wall by multiples. Thus the small additional heating area leads to significantly shortened drying or evaporation times.

Central Tube

The low cost central tube screw blender is ideal for mixing or homogenising free flowing dry powders, e.g. steel and other metal powders.



Evaporator

To achieve a high evaporation capacity the helix can be designed with multiple tubes.

Lifting Column

With a lifting column one can move the entire machine, lift the cover or lower the vessel.
A lifting column also facilitates charging and discharge when the room height causes problems.

Vapour Filters

Gas tank inside or outside of the filter housing, with filter hoses, metal or textile cartridges

Sealing Systems

Maintenance free AVA multiple lip seals, mechanical seals

Chopper

For the disintegration of agglomerates, integrated in conical vessel

Discharge Valves

Ball segment, gate and butterfly valves in various designs

Tested and proven in Practice

Care from the start: Trials, Scale-Up and more

The modern installations of the AVA laboratory offer untold possibilities for trials on vertical or horizontal mixers, dryers or evaporators. Temperatures up to 320 °C and pressures down to 1 mbar abs permit testing of a wide range of process conditions.

Determination of optimal parameters for mixing or drying on vertical or horizontal machines.

Calculation of heat transition values for the scale-up of dryers and evaporators

Studies of product behaviour under mechanical and thermal stress

Determination of economically optimal process conditions

Reduction to a minimum of the risks inherent in any installation

Successful Applications – Proof of Reliability

Fine and Special Chemicals

- Herbicides
- Pesticides
- Polymers
- Textile dyes
- Cellulose derivatives
- Glass mixtures
- Colour pigments
- Industrial chemicals
- Electro chemicals
- Additives for cosmetics
- Recycling

Pharma and Food Industry

- Amino acids
- Antibiotics
- Cardiovasculars
- Lipid lowering agents
- Intermediates
- Auxiliary ingredients
- Vitamins
- Starch derivatives
- Plant extracts
- Proteins
- Spices, Tea, Cocoa



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