

Delicel™

High performance twin shaft disperser



Active as specialised engineering since more than 30 years, ABB propose solutions for dispersion and mixing such as the Delicel™, specially designed for the paint and coatings industry. The innovative design of this equipment enables an optimum dispersion quality and a maximum batch size flexibility. Today, the Delicel™ integrates Clean-In-Place technologies. In addition to its dispersion function the complete cleaning of its vessels and mixing tools is now possible. The Delicel™ responds perfectly to the production requirements of paint and varnish producers: run partial and non-compatible batches, requiring intermediate cleaning operations ... and taking into account economic and environmental constraints relating to waste limitation.

Applications

- production of paint,
- production of exterior wall-coating,
- preparation of filled polyester resin,
- production of glue,
- transformation of highly concentrated starch,
- paper coating colour with a high dry-matter content,
- all the dispersed products with a high solid content.

Advantages

- Wide viscosity range : from 100.000 to 300.000 mPa.s.
Dry-matter concentration from 20% to 80%
Specific density from 1.2 to 2.2.
- As the tank is conical, small batches can be processed, from 25% to 100% of the nominal capacity.
- Remarkably fine dispersion reducing or eliminating the need for bead mill grinding.
- Thanks to the shape of the tank, the circulation of the product is improved, resulting in efficient dispersion.
- Shell fitted with external half-coils for cooling.
- Can work under vacuum and under pressure.
- Can be fitted with an automatic high-pressure cleaning system
- The combination of the conical shape and the scrapers guarantee a very efficient draining.

High dispersion yield combined with...

The Delicel™ is a twin shaft disperser specially designed for the dispersion of pigments and fillers with high solids contents and viscosity.

The peripheral agitator rotates slowly, and the central agitator at high speed. This ensures an optimum performance of the mixing unit.

High-shear central unit

The central agitator comprises either three toothed turbines rotating at high speed for medium viscosity, or three pitched-blade turbines rotating at medium speed for highly viscous products. The rapid dispersion and circulation on the height is obtained through this three-stage mixing unit, ensuring according to the product viscosity:

- a high-shear treatment through tooth turbines (high radial pumping effect), up to 100 000 cp,
- a viscous attrition through four-blade impellers, up to 300 000 cp

Low-speed peripheral mixing unit

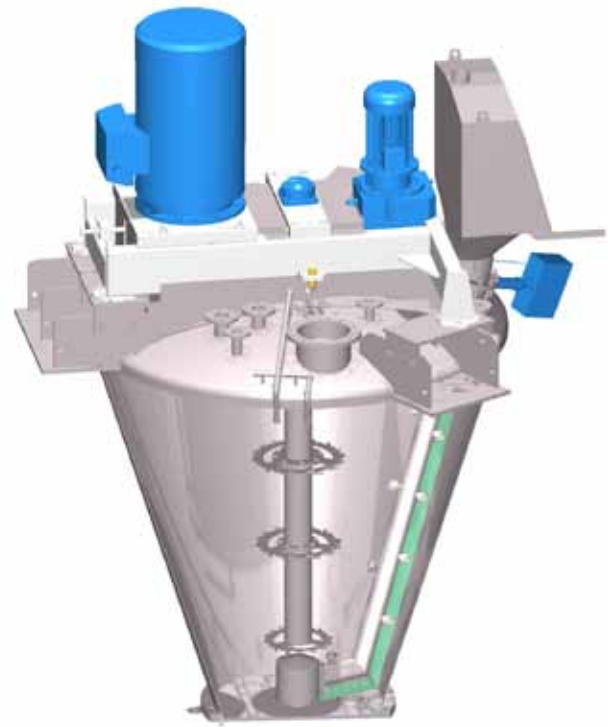
The peripheral scraping unit ensures the product homogenisation and an efficient thermal transfer. It stirs the mass of product to be mixed, scrapes the walls of the tank and forces the product back towards the middle of the tank, especially during powder loading.

Flexible batch size

The conical shape of the vessel enables the production of quantities adapted to your needs and a constant mixing efficiency whatever the size of the batch thanks to the turbines installed at different levels.

Reliable weighing system

The lowered gravity of the drive unit allows an excellent weighing precision.



Fine temperature regulation

The combined effect of the limpet coil (external thermal transfer) and of the scrapers (internal thermal transfer) enable a controlled manufacturing quality.

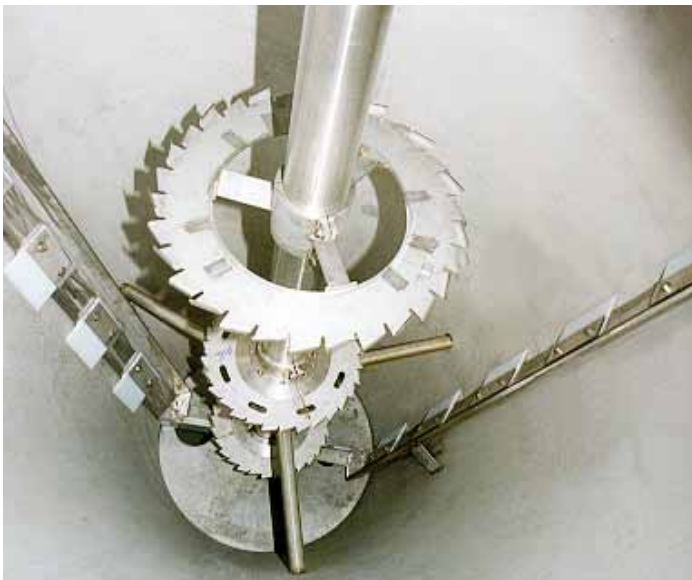
High standard construction

The use of stainless steel AISI 304L or 316L with an internal surface roughness of $Ra = 3.2 \mu m$ helps with the product discharge and a more efficient cleaning of the tank wall.

Process control

The management of the rotation speed, in addition to an improvement of the production time, ensures the optimisation of the dispersion according to the mixing phases.

1 | Inside view of the Delicel™ with dispersion toothed turbines 2 | Inside view of the CIP Delicel™ with cleaning nozzles on peripheral mixing unit



embarked automatic cleaning devices

Delicel™ with an up-and-down spray-lance

The spray-lance is installed on the external side of the Delicel™ top. During the spraying, the lance moves up or down inside the tank so as to cover the maximal surface of walls and internal parts. During the dispersing phase, the spray-lance remains outside. To reinforce the action of the spray lance, rotary spray nozzles can be installed on the tank top.

CIP Delicel™

The CIP Delicel™ (CIP : Clean-In-Place) is fitted with embarked cleaning devices which ensure the automatic cleaning of the inside of the vessel after each production batch. It differs from the manual conventional cleaning methods by:

- embarked high-pressure cleaning devices (located on the top and on the mixing arm),
- the combination of the mechanical effects of a peripheral arm fitted with scrapers and cleaning nozzles,
- the automatic control of cleaning sequences.

Efficient all-point spraying

The orientation and angle of the spraying nozzles are determined according to the targeted zone to allow the total cleaning of the vessel without blind areas.

Combined action of scrapers and spraying nozzles

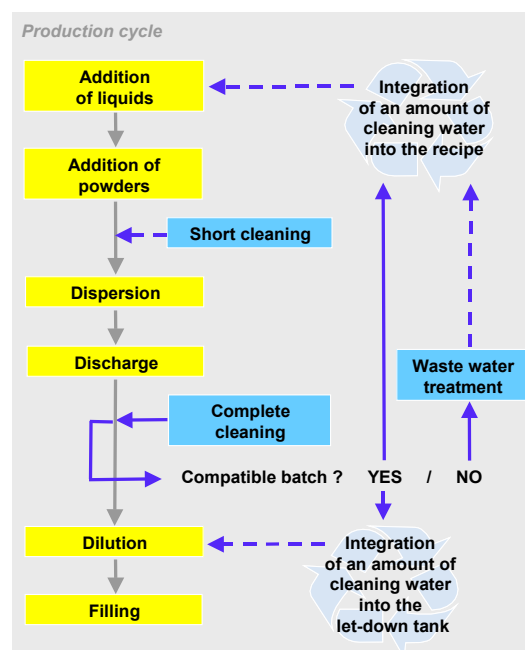
Scrapers on the peripheral mixing unit, sweeping both tank wall and bottom, are designed to improve not only the discharge of the product but also the effect of the sprayers by removing the product from the wall.

Sequencing of cleaning phases

Control valves aim at regulating the flow rate of the cleaning product inlet for a given number of nozzles so as to maximise their mechanical impact. The cleaning sequence is synchronised and phased accordingly (tank bottom, central mixing unit, tank cover).

Reduction of up to 50% of the cleaning cycle time

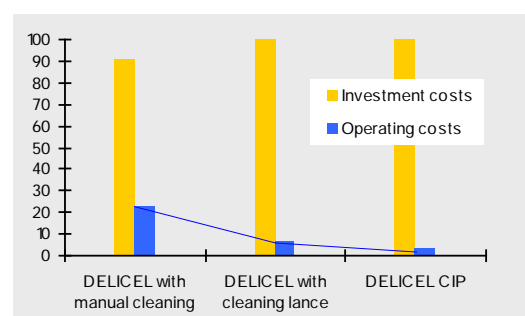
- Automation of the cleaning cycle
- Cleaning cycle integrated into the production cycle.
- Programmable cleaning, adapted to your specific requirements.
- No cross-contamination between the batches.
- Possibility of short cleaning sequences.
- Use of cleaning water/solvent in the finished product.
- Repeatability of cleaning quality.
- Operational maintenance reduced to a strict minimum.
- Increased ergonomics and safety.
- Flexibility: equipment producing products of various types.



- Maximised availability for production.

Reduction of up to 90% of the water or solvent consumption

- Optimisation of the operating costs.
- Control of cleaning cycle times.
- Reduction of cleaning water/solvent quantity.
- Waste limitation.
- Optimisation of cleaning and waste treatment costs.
- No production loss resulting from the contamination of a batch.
- Rapid return on investment.



Cellier Activity

For more than forty years, Cellier, as an Activity of ABB France, Division Process Automation, has been a process engineering company supplying turnkey production units worldwide. Cellier designs, engineers, assembles and starts up complete automated installations for the paper, lubricant, paint and specialty chemical industries. Cellier has acquired know-how in the various processes and techniques used by its industrial partners for the formulation of liquids and powders:

- receipt and storage of raw materials,
- transfer, dosing,
- dispersion, reaction, mixing (batch and in-line),
- filtration,
- pipe pigging,
- packaging and palletizing,
- treatment and recycling of waste,
- automation and control systems.

We take care of your project and ensure the audit, the training of users, the after-sale service up to the complete maintenance of your plant.

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