Metering Technology

Metering and Mixing Systems for the Production of Rotor Blades for Wind Energy Turbines

Hilger u. Kern / Dopag Group

compomix I

compomjx

A deviation of less than 1% of the mixing ratio can not only be achieved with the compomix I, but the output rate can also be modified during production. Depending on the system configuration, magnetically-coupled, leakage-free axial piston pumps are used, which due to the principle of construction present no internal leakage during changes in rotational speed. Additionally, they are hermetically sealed at the drive end which is important when feeding hygroscopic hardeners. The metering system range for the processing of unfilled infusion resins combines highly accurate metering pumps with extremely fast control engineering. Metering is carried out from a regulated bypass so that the normal initial process of filling the mixing tube is avoided. In addition, the output rate can be changed during the metering process almost at will - without exceeding the permitted tolerance limits of the mixing ratio.

Equipment

Standard

- 2K system
- Control cabinet and material pressure vessel mounted onto a completely enclosed, mobile chassis
- Metering pumps with overpressure protection
- Axial piston pump of the B-component with magnetic coupling and manual stroke adjustment
- Three-phase asynchronous motor with external fan
- Metering computer MR30
- Control and regulation of mixing ratio by use of volume counters

Optional

- 3K system
- Material pressure vessel with preparation for automatic refilling, level control and regulation of the mixing ratio in the bypass
- Axial piston pump with magnetic coupling for the A-component
- Feed pumps
- Transfer pumps to refill the optional material pressure vessel
- Heating via fan heater
- Cabinet cooling
- Touch-screen control system

gluemix

gluemix

The reliable bonding of both halves of the rotor blades is a fundamental aspect of the performance of a rotor blade. With the gluemix the adhesive used for bonding is provided via gear pumps. During the processing of high-viscosity, stable products, the metering of the A-component is carried out via a specially designed gear pump that is integrated directly into the follower plate for use with 200 litre size containers (FIP technology). Thus the gear pump is positioned closer to the medium to be delivered, allowing higher volumes and delivery pressures in comparison with other follower plate type metering systems. This system eliminates the usual feed pumps and the associated costs of control and regulation technology. All pumps are protected with a special sealing system against wear. The gluemix is available as a freestanding unit or as a mobile version.

Equipment

Standard

- 2K system
- Control cabinet and material pressure vessel mounted onto a mobile chassis
- Metering pumps with overpressure protection
- Mast and boom with mixing system mounted on the chassis
- High pressure pump rams or material pressure vessel with level control
- Three-phase asynchronous motor
- Metering computer MR30
- Control and regulation of mixing ratio by use of volume counters

Optional

- 3K system
- Automatic refill
- Transfer pumps for refilling
- Hose and cable reels
- Cabinet cooling
- Touch-screen control system

gelcomix

gelcomix

The gelcomix has been especially developed for processing highly thixotropic materials onto the untreated surfaces of rotor blades. Output rates of up to 5 l/min can be achieved with gear metering pumps, which are also suitable for abrasive fillers. Magnetically coupled axial piston pumps are used for the B-component. The material is supplied from material pressure vessels that are installed on the chassis of this mobile system. With gelcomix technology, materials with viscosities of up to the flow limit cannot only be applied but the mixing ratios are also adjustable within a wide range.

Equipment

Standard

- Control cabinet and material pressure vessel mounted onto a mobile chassis
- Material pressure vessel with level control
- Metering pumps with overpressure protection
- Metering pump of the A-component with glide ring seal and coated
- Three-phase asynchronous motor
- Control and regulation of mixing ratio by use of volume counters
- Metering computer MR15 (3 l-system)
- Metering computer MR30 (5 l-system)
- Mast, boom and balancer to handle the manual pistol mounted on the chassis (5 l-system)

Optional

- Metering pump of the B-component with magnetic coupling
- Automatic refill
- Heating system
- Cabinet cooling
- Touch-screen control system
- Hose and cable reels (5 l-system)

General Information

In the next few years, the proportion of electricity generated worldwide by wind power will steadily increase. However, effective conversion to this technology will only be possible if the systems involved can be assured of a long life span. That presupposes that production-related parameters are adhered to precisely during production.

Automated Metering and Mixing Systems for the production of rotor blades must fulfill the following requirements:

- Exact compliance to the specified mixing ratio
- Highly flexible output rates
- Rapid attainment of working conditions

For the three main production processes in the manufacturing of rotor blades in the wind industry (manufacturing, bonding and surface finishing of the rotor blade segments or rotor blade halves) the Hilger u Kern / Dopag Group offers the optimum in equipment technology:

compomjx for vacuum supported infusion (to impregnate the inserted fibre matting)

gluemjx to bond the rotor blades or blade segments

gelcomjx for coating the rotor blade surface

Technical Data

	compomjx	***gluemjx***	***gelcomjx***
Flow rate depending on mixing ratio and viscosity	2 - 20 l/min (60 l/min)	3 - 20 l/min	1 - 5 l/min
Mixing ratio	100:5 - 100:100, volumetric	100:10 - 100:100, volumetric	100:10 - 100:100, volumetric
Material supply	circular pipeline, orininal container, pressure vessels	Pressure vessels, original container (depending on viscosity)	Pressure vessels
Viscosity range	1 mPas - 50.000 mPas	10 mPas - 500.000 mPas	100 mPas - 80.000 mPas
Material characteristics	Unfilled	Unfilled, filled, abrasive MOHS hardness 7	Unfilled, filled, abrasive MOHS hardness 7
Power supply	3 × 400 V / 50 Hz	3 × 400 V / 50 Hz	3 × 400 V / 50 Hz
Max. air inlet pressure	6 bar	6 bar	6 bar
Dimensions L × W × H	1350 × 1850 × 2100 mm	3700 × 1100 × 4100 mm	2500 × 1100 × 4100 mm
Weight	approx. 1500 kg	approx. 1800 kg	approx. 1500 kg

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The Hilger u. Kern / Dopag Group, with more than 300 employees, 8 subsidiaries and 24 distributors, is one of the leading manufacturers of metering and mixing systems in the world for plural component polymers and single component media such as greases, oils and pastes. For more than 30 years the group has developed systems and components to suit your individual needs.