

Coating of synthetic fibre ropes

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Abstract: Within a co-operation between the InnoZug research team and MAGEBA Textilmaschinen GmbH & Co. KG, a machine for coating and thermosetting of ropes made of synthetic polymer fibres has been developed. Using this machine, ropes can be coated via dip coating with various polymeric dispersions for modifying the surface properties of these ropes. Also the coating with lubricants, such as oils or waxes, for decreasing the inter-strand abrasion is possible.

Because of the combination of several different drying technologies, an optimised adaption of the drying parameters to the properties of the polymer materials has been reached.

The microwave drying unit evaporates the water of the dispersion from the inside of the rope. This prevents from the appearance of a polymer film that may affect the further procedure of drying. Also, thermal damages of the polymer fibres can be avoided.

Following to the microwave drying unit, a infrared drying unit has been applied. This infrared unit consists of eight carbon infrared emitters that are divided into three zones that can each be regulated separately. The rope surface temperature is measured contact-free at the exit of the drying unit. With this, thermal damages of the coating and / or the rope can be prohibited. The infrared drying unit could also be used for hardening thermo-set coatings.

A holding and a stretching unit provide the possibility of applying force on the rope while it is moved through the air heated thermosetting unit. Thermosetting provides a possibility of increasing the strength of polymer fibre ropes by higher orientation of the fibres along the rope axis.

The deflection rollers have been profiled with a special radius for stabilizing the circular shape of the rope under strain.

Using a classic immersion bath as coating unit that has proved itself in coating textile belts in combination with the thermosetting unit provides a various amount of coating and modification processes combined in one production stage what not just saves one production stage and by this energy, but also allows the online adjustment of each of the parameters of the single processes for an optimized result of the modifications.



The System Provider for the Narrow Fabric Industry



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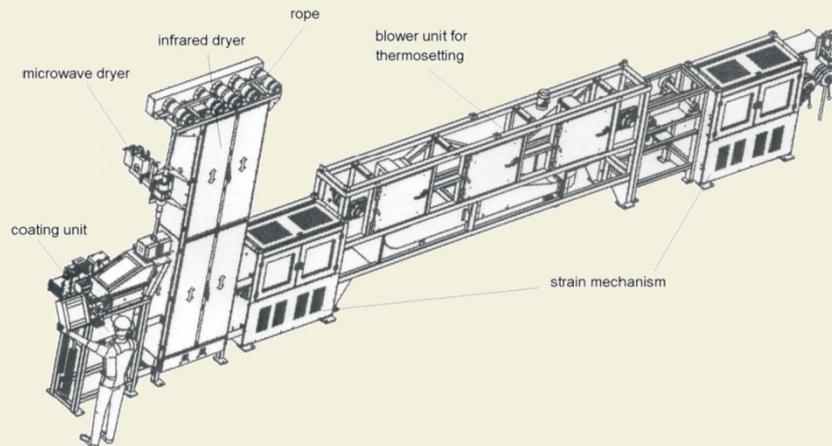
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COATING MACHINE PROVIDED BY MAGEBA



FEATURES

- coating unit with adjustable squeezing rollers and adjustable rope former
- 3 kW microwave dryer with separated cooler
- 24 kW infrared dryer (carbon infrared emitters)
- air heated thermosetting unit (forces up to 29 kN)
- pull-out unit
- touch screen control panel
- easy wiring by quick connectors

RESEARCH FOCUS

- influence of coating parameters on rope properties
- effects and influence of adhesion promoters on rope properties
- influence of different coatings on tensile strength and bending fatigue

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