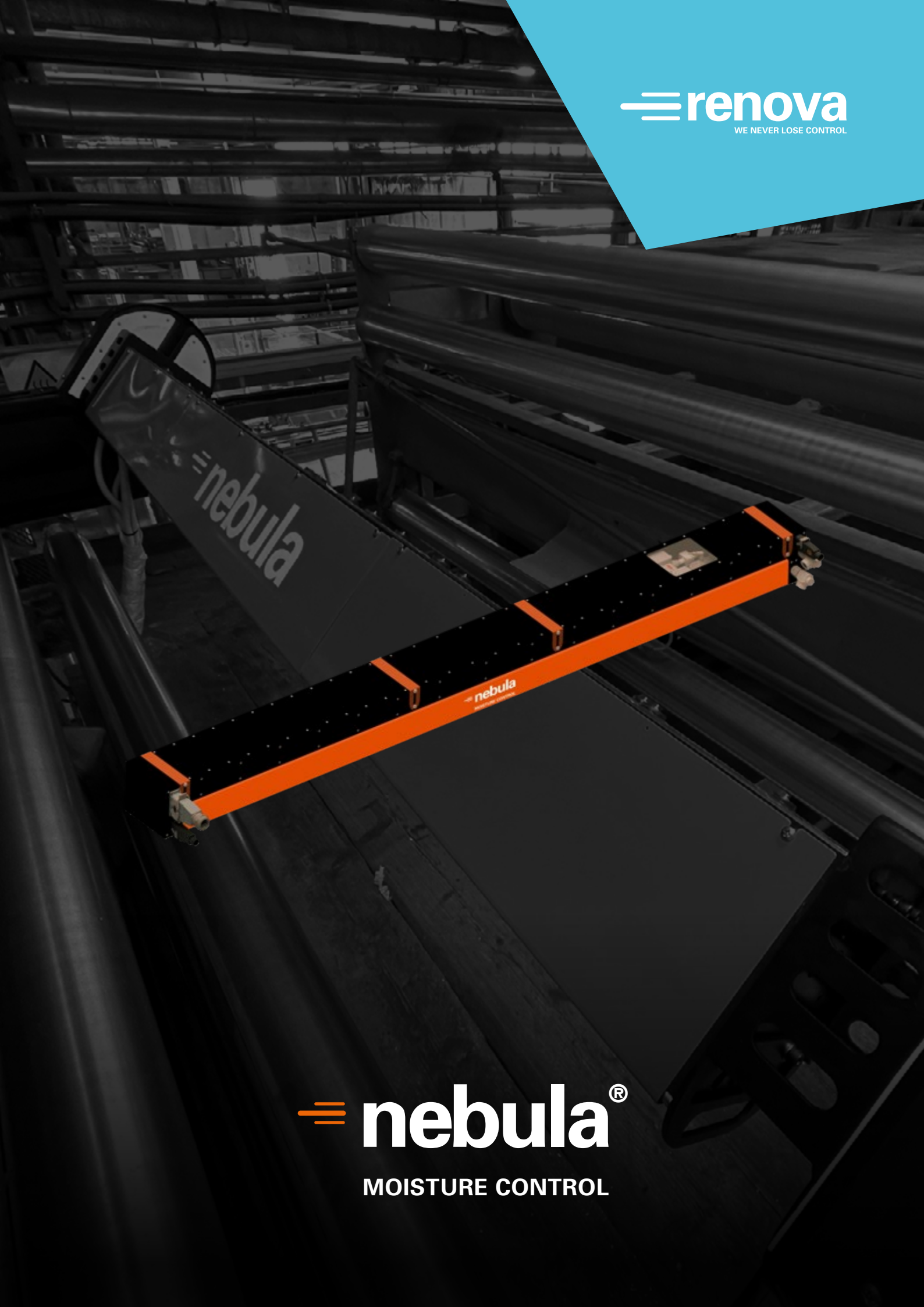
renova

WE NEVER LOSE CONTROL



nebula®

MOISTURE CONTROL

nebula®

Moisture control integrated system

Nebula's concept is born from the collaboration with the most important end-users in the industry. We have analyzed the problems that our customers encounter every day and thanks to the experience accumulated and field tests we have designed a solution that improves the cardboard planarity while reducing glue consumption.

Our experience confirms that better humidity control can solve both gluing and warping problems. Moisture is an influential parameter which needs to be monitored during the whole working process.

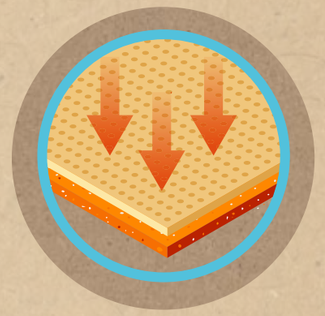
In order to not stress the cardboard and ensure a high quality product, humidity needs to be kept constant. Since the humidity and temperature parameters directly affect each other, we have created a solution to adjust and keep them constant through the whole process.

Click the PLAY button to watch the Nebula video

MOISTURE AND TEMPERATURE IN THE CORRUGATED BOARD PRODUCTION

The moisture and temperature of the paper at the beginning and at the end of the production process need to be the same and to not suffer high variations in order to not stress the cardboard and to ensure a high quality product.

THE MOISTURE AND TEMPERATURE PARAMETERS DIRECTLY INFLUENCE ONE ANOTHER:



To absorb the right amount of glue, the cardboard fibers must be open. This is normally achieved through heat

If the paper is not moist enough, the fibers won't hold the temperature

Dry fibers are more reluctant to absorb glue that will remain superficial

HUMIDITY IMPROVES HEAT TRANSFER, PROLONGS ITS DURATION, AND FACILITATES STARCH PENETRATION INTO CARDBOARD FIBERS BEFORE POPPING

CORRUGATED BOARD'S DEFECTS

Temperature and moisture imbalance lead to cardboard defects

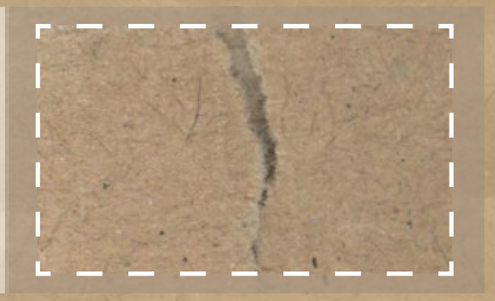
WARPING

Warping is a direct result of the temperature difference and the humidity of the papers used.

BAD BONDING

A low humidity level prevents the cardboard fibers from opening up and absorbing the glue properly. With the glue remaining on the surface, it does not enable the correct bonding of the cardboard layers.

CRACKING



Too low humidity levels cause a decrease in the elasticity of the cardboard fibers. As a consequence, the cardboard breaks more easily.

WASHBOARDING

Low moisture levels in the liner affect glue penetration. However, excessive dosing used as compensation causes a waviness effect on the surface.

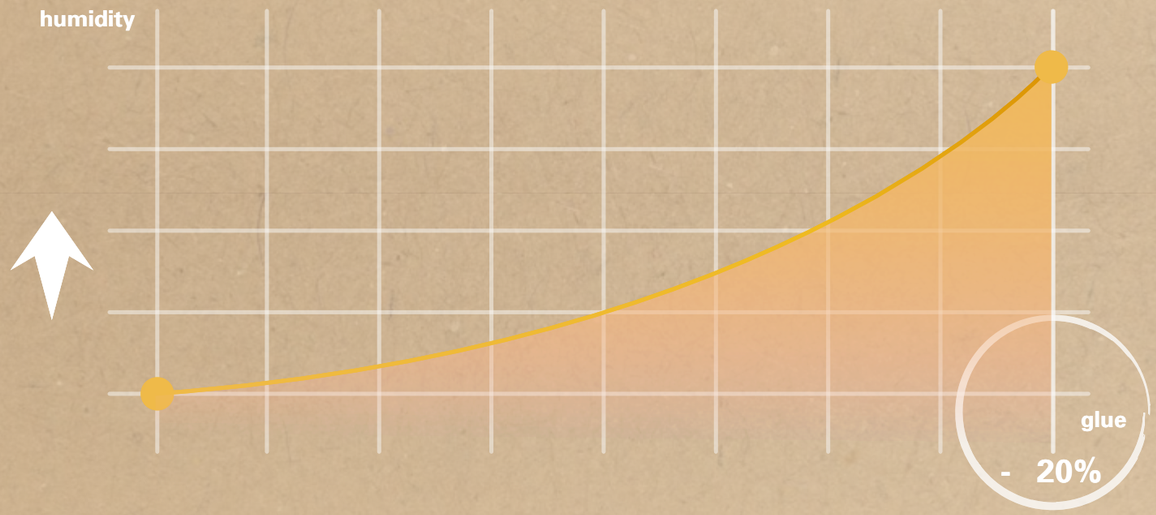
STARCH OVERCONSUMPTION DUE TO THE LACK OF MOISTURE

To compensate for the lack of moisture, operators increase the starch quantity.

However, starch is a wasteful solution with little impact on paper moisture.

Moisture enables the cardboard to heat without losing elasticity, allowing the glue to penetrate more easily, reducing its consumption, and improving the line speed.

Precisely optimizing humidity levels in paper production can lead to a significant reduction in the required amount of starch, up to 20%.

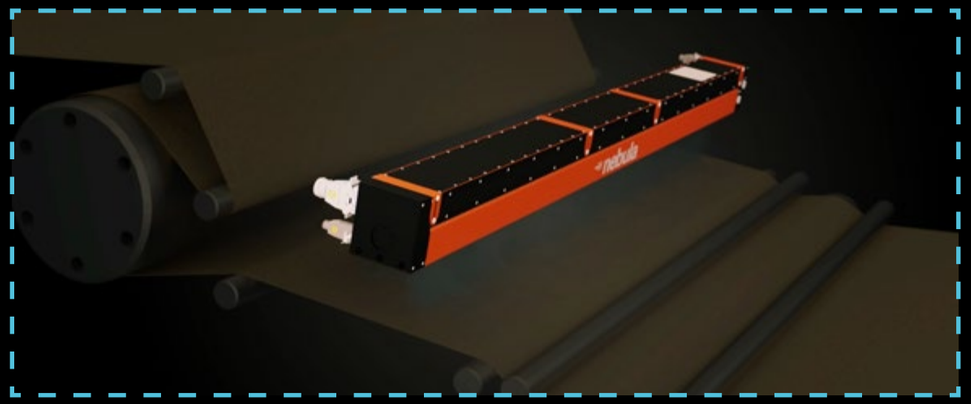


This production process variation results in better final product quality and significant cost savings, offering a notable economic advantage.

NEBULA®
MOISTURE CONTROL INTEGRATED SYSTEM

NEBULA MOISTURIZER

The Nebula moisturizer emits jets of air and heated water sprays that prevent the cardboard from over-drying during the heating process. Furthermore, moisture maintains constant temperatures for a longer duration across all layers of the cardboard.



NEBULA SCANNER

Humidity control scanner. With a "S" movement, the scanner measures the data both in transversal and longitudinal directions. Available also in fixed version.

CABINET

Cabinet with all the electronic components, power supply, control unit and water recovery system.

CONTROL PANEL

Through the panel it is possible to make all the required adjustments on the system's parameters and check the reports.

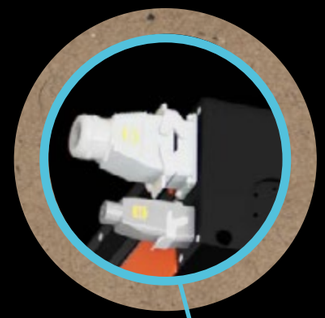
NEBULA WARP SCANNER

Scanner for Warp detection.

NEBULA® MOISTURIZER

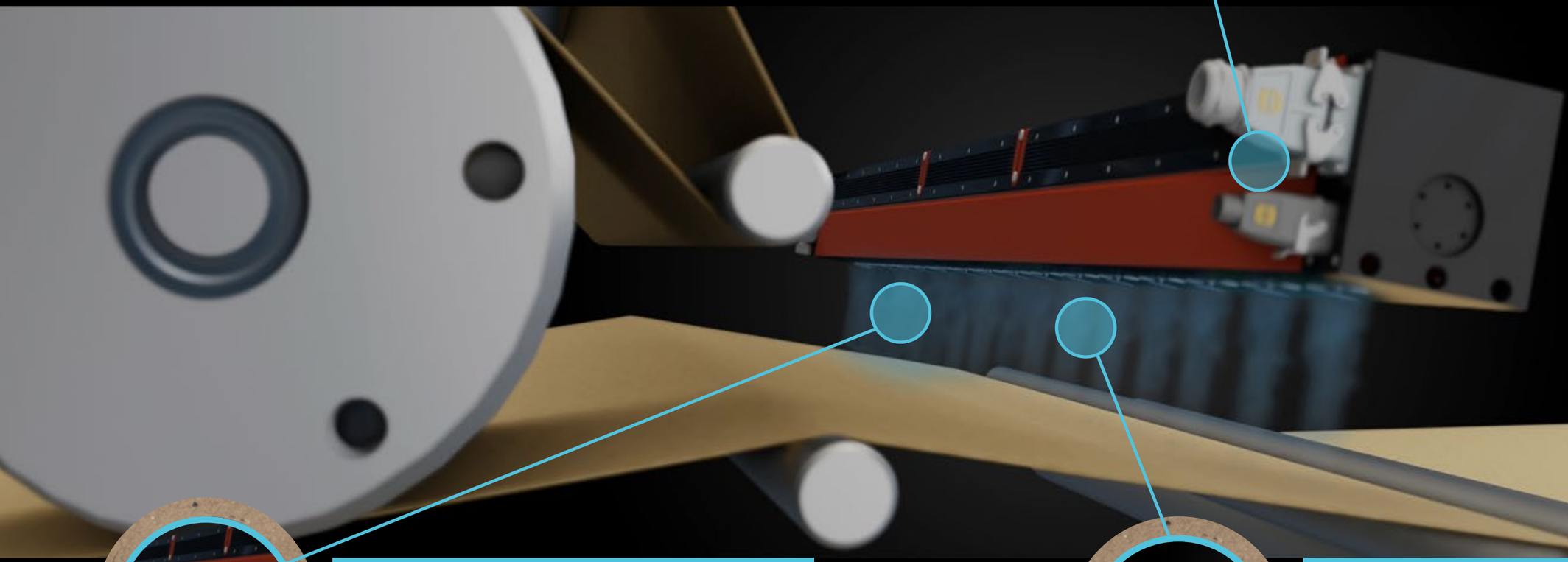
MODULAR SYSTEM
connected to the ERP

Nebula sprayboom sprays a mixture of air and heated water up to 60° C / 140° F.



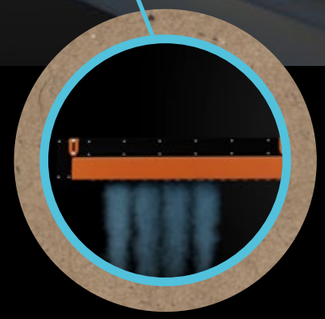
SIMPLIFIED CONNECTIVITY

A streamlined solution for essential connections, all in one connector, simplifies installation, accelerates component identification for future checks, and eliminates cable and tube confusion, ensuring continuous efficiency.



WATER FLOW RATE REGULATION

The flow rate of the spray is adjusted to adapt both to the speed of the line and to the characteristics of the cardboard.



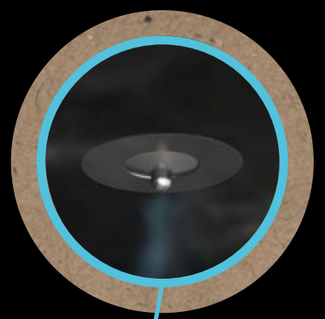
NOOZLE SINGLY ACTIVAILABLE

Nebula has 16 to 18 moisture management points according to the application width, and each can be activated separately.

NEBULA® MOISTURIZER

ANTI-DRIP SYSTEM and leak prevention

Nebula Moisturizer is equipped with advanced technology to operate in challenging environments. Its innovative anti-drip technology prevents excess moisture buildup: Nebula eliminates the risk of water drops falling on the line.



DROP SIZE REGULATION

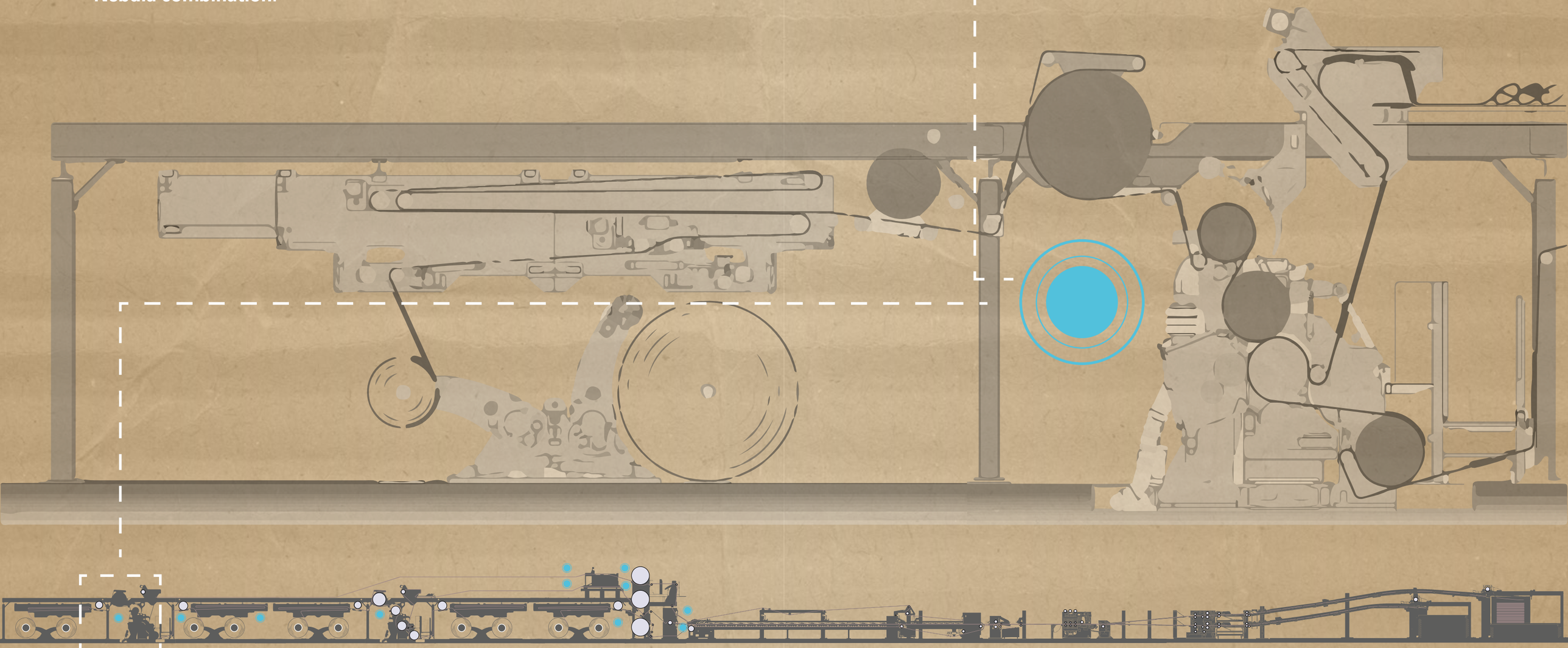
Thanks to the dynamic control of the mixture of air and water, it is possible to change the size of the released water particle to achieve the best result.

INSTALLATION

Nebula moisturizer can be installed in several points of the line. Together with the customer, we will study the application points best suited to the plant's needs and, based on the expected results on the final product, we will be able to suggest the best Nebula combination.

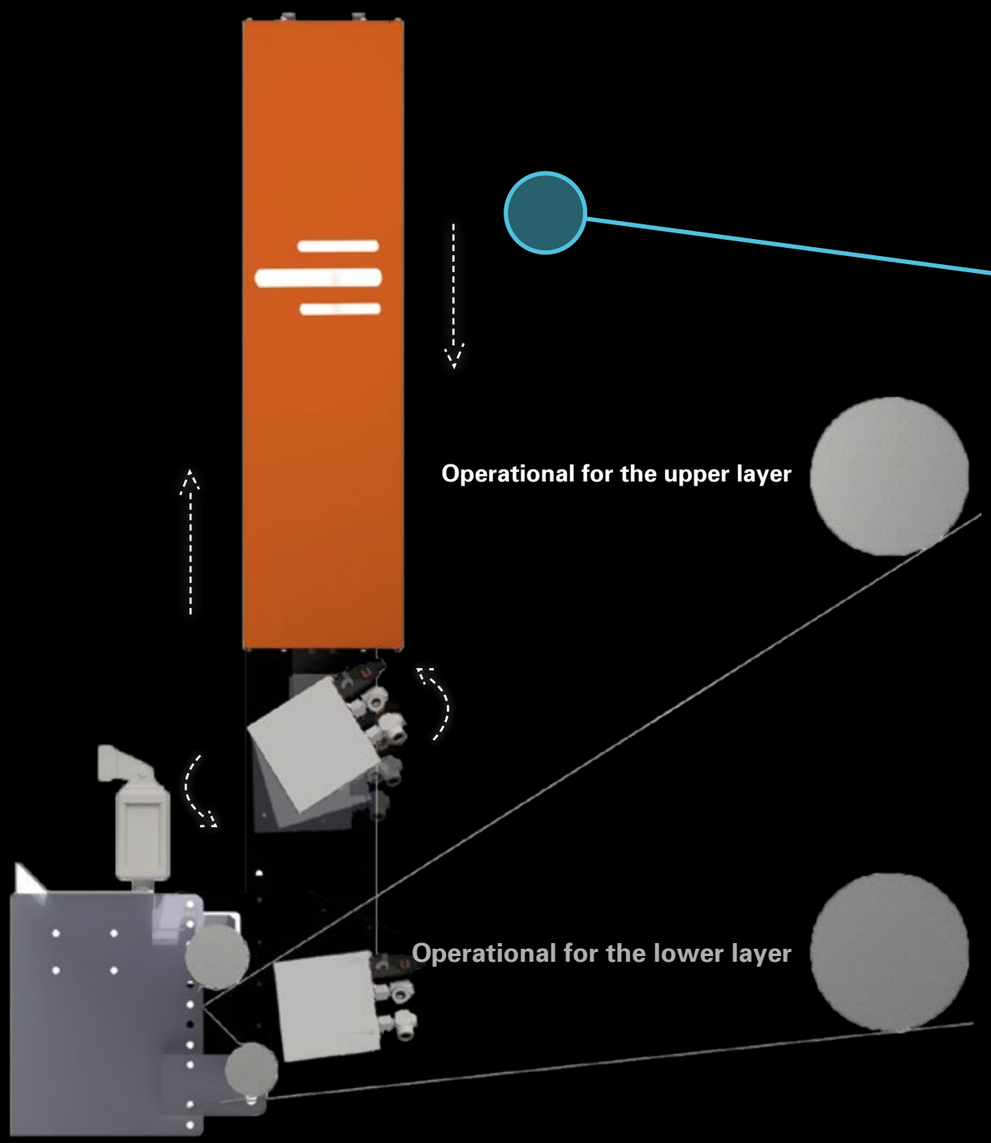
NEBULA MOISTURIZER

Illustrative example of a possible Nebula installation point.

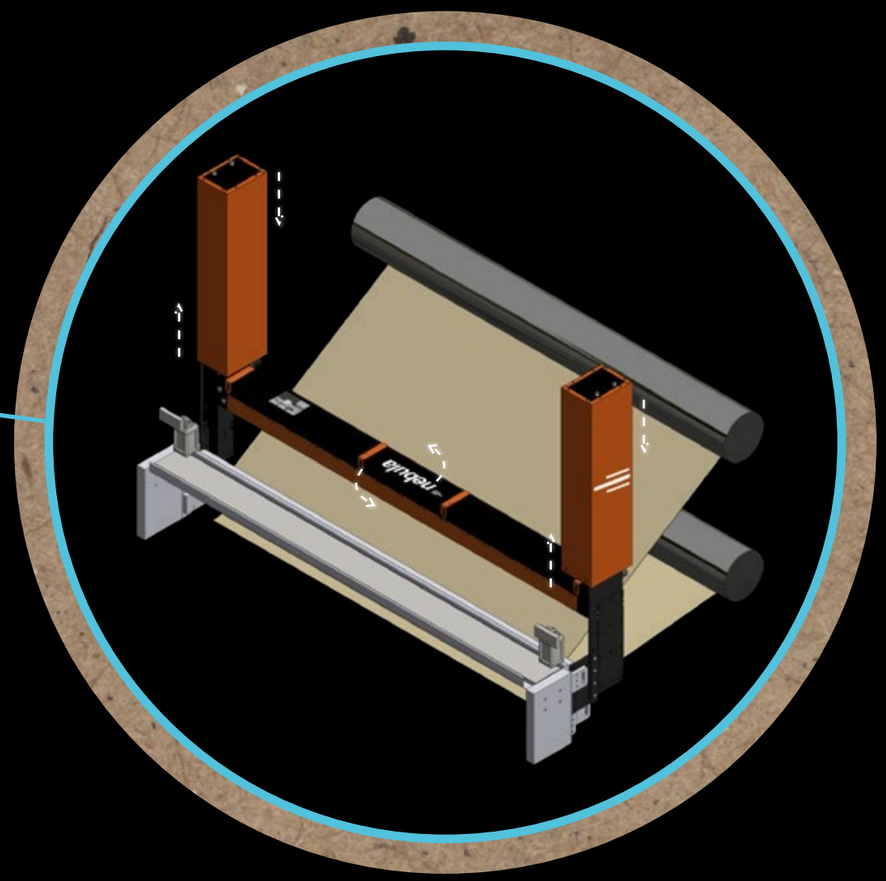


NEBULA® MOISTURIZER
HEIGHT AND ANGLE

The installation height and angle can be adjusted to suit any application.

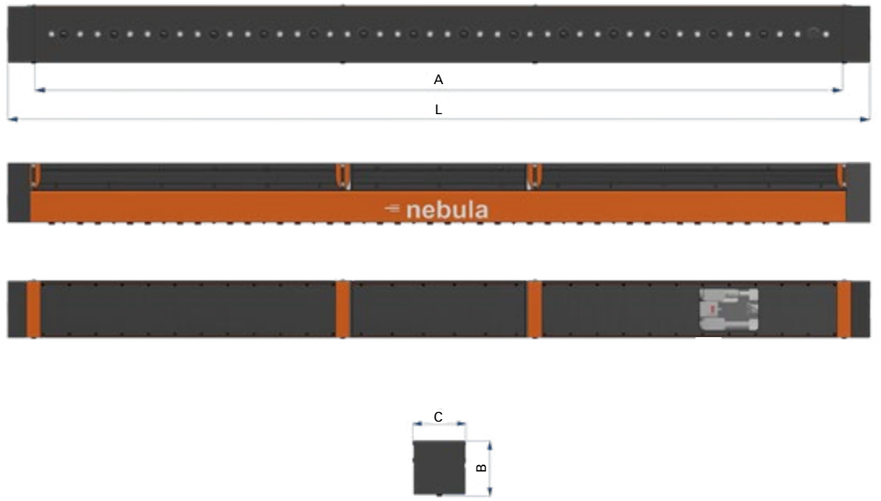


The automated drive system allows operation with a bar at two different heights, depending on production requirements. Furthermore, it is possible to adjust the bar's inclination easily and instantly via the control panel.



The automated motorized system enables you to work on various layers of cardboard, adapting to your production needs. With the ability to store work positions that can be easily recalled and optimized with a simple touch.

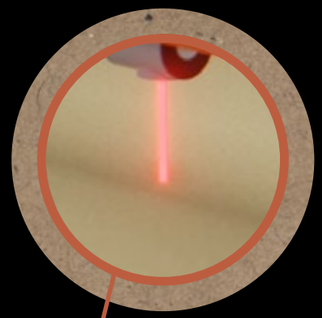
DIMENSIONS



dimensions	NB 16	NB 25	NB 28	NB 33
roll width	1600 mm	2500 mm	2800 mm	3300 mm
L	1880 mm	2780 mm	2980 mm	3580 mm
A	1700 mm	2600 mm	2800 mm	3400 mm
B	195 mm	195 mm	195 mm	195 mm
C	185 mm	185 mm	185 mm	185 mm

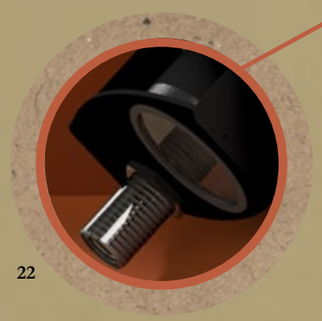
NEBULA® SCANNER
DETECTION TECH.

The scanner is equipped with a moisture and temperature sensor that allows a real-time reading of values on the line with controlled speed. Nebula Scanner also features an anti-intrusion system.



DATA DETECTION

Nebula scanner detects cardboard moisture and temperature data with an "S" movement at a controlled speed.



CONTACTLESS

For detection, the Nebula scanner employs a non-contact sensing system.

The scanner is also available in fixed version.

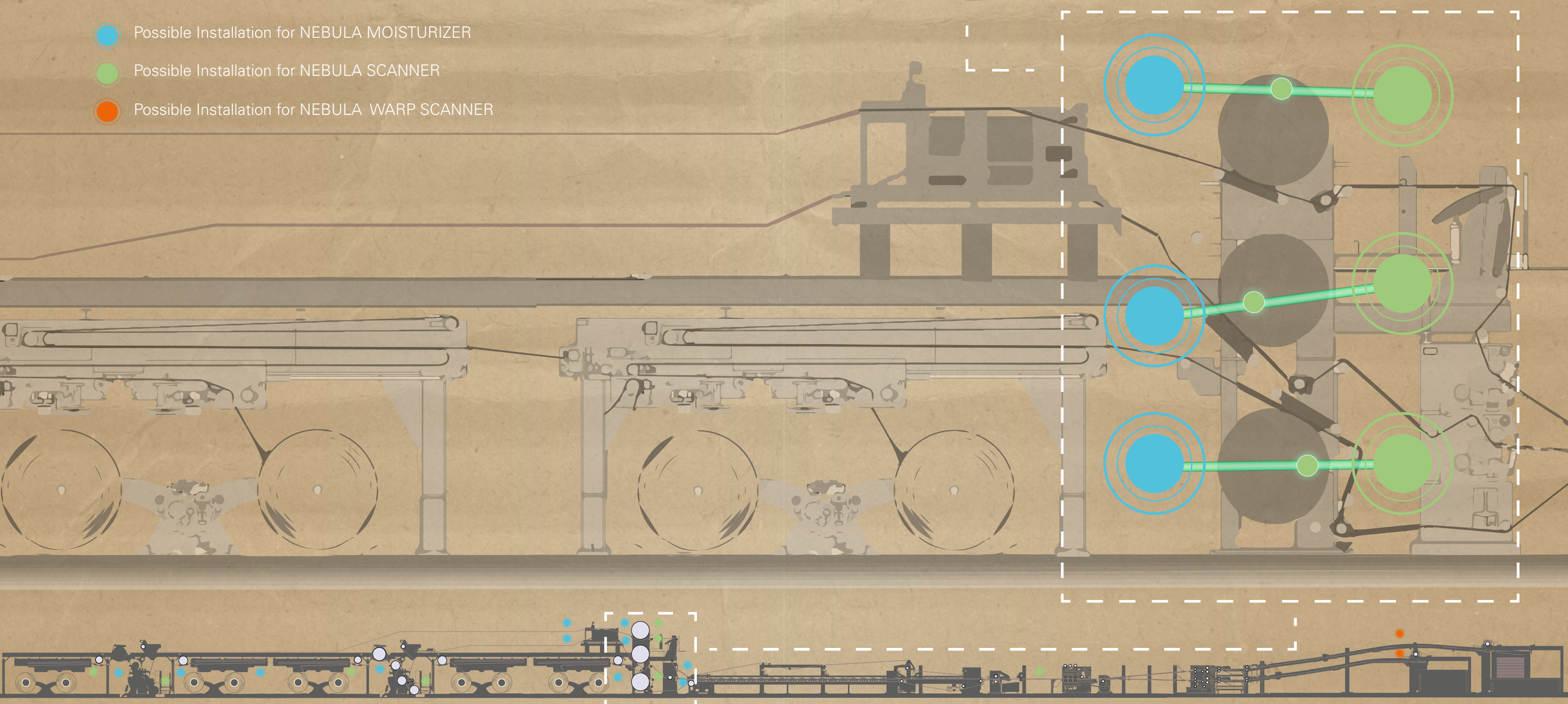
INSTALLATION

The Nebula scanner offers versatile installation options to accommodate various customer requirements.

- Possible Installation for NEBULA MOISTURIZER
- Possible Installation for NEBULA SCANNER
- Possible Installation for NEBULA WARP SCANNER

NEBULA SCANNER

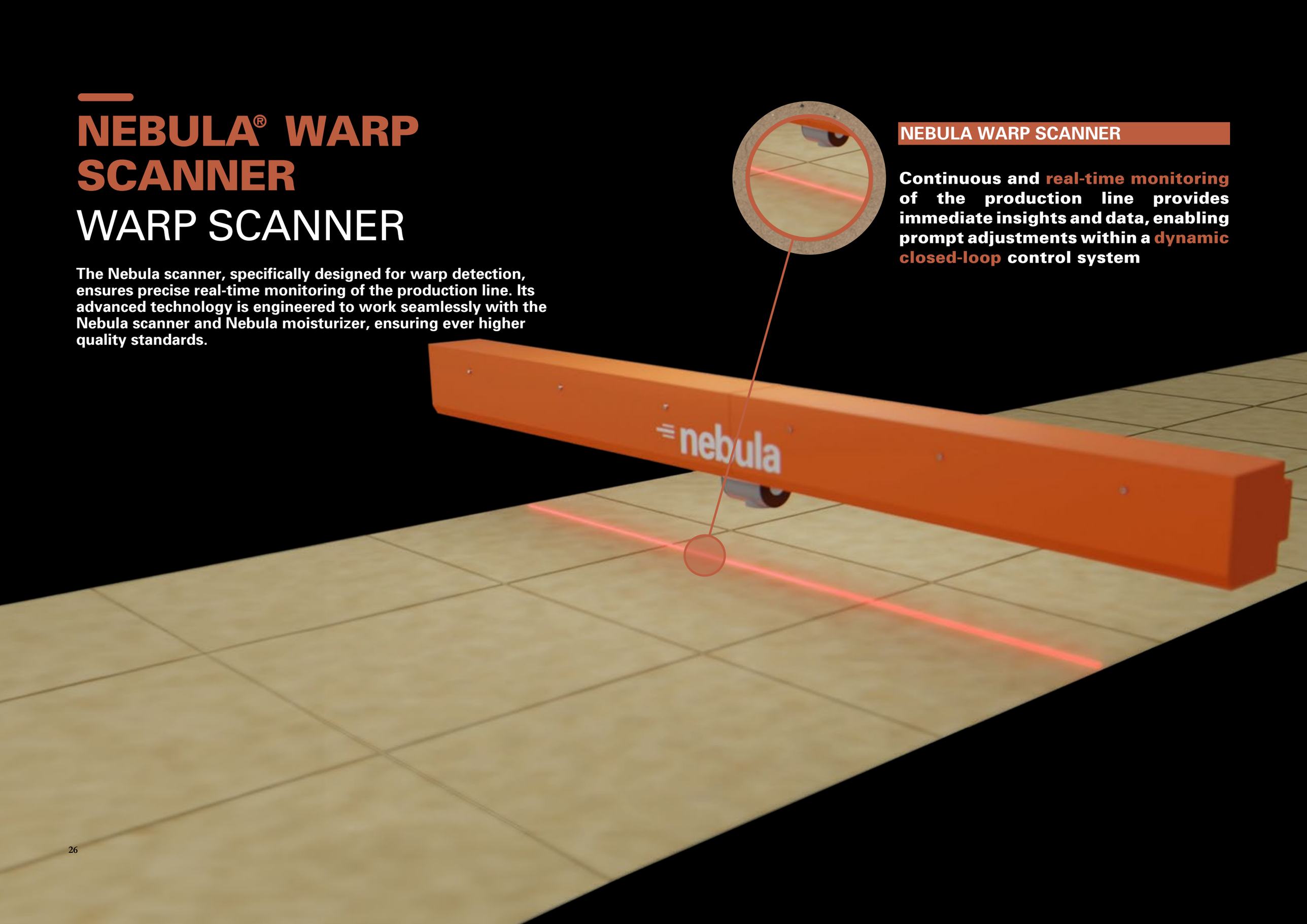
Dynamic control closed loop



NEBULA® WARP SCANNER

WARP SCANNER

The Nebula scanner, specifically designed for warp detection, ensures precise real-time monitoring of the production line. Its advanced technology is engineered to work seamlessly with the Nebula scanner and Nebula moisturizer, ensuring ever higher quality standards.



NEBULA WARP SCANNER

Continuous and real-time monitoring of the production line provides immediate insights and data, enabling prompt adjustments within a dynamic closed-loop control system

NEBULA® CABINET

Cabinet with all the electronic components, power supply, control unit and water recovery system. Each cabinet supports up to 3 Nebula moisturizers.
For the use of water, Nebula will adapt according to the treatment carried out in the plant..

INSTALLATION

The cabinet can have optional access from control room, allowing for direct system control and potential connection to the control room.

INDUSTRY 4.0

NEBULA ENABLES THE ESTABLISHMENT OF A DIRECT DIALOGUE WITH THE PRODUCTION SYSTEMS IN THE ERP

NEBULA® CONTROL PANEL

Through the panel it is possible to make all the required adjustments on the system's parameters and check the reports. Nebula can register the electricity and water consumes as well as keeping track of the humidity and temperature parameters on the cardboard.

INSTALLATION

Nebula control panel will be available:

- On the cabinet, next to the production machine;
- Using amovable tablet (optional);
- From the control room for management by the production supervisor;
- Remotely, for assistance and support.

USER INTERFACE WITH COLOUR TOUCH SCREEN

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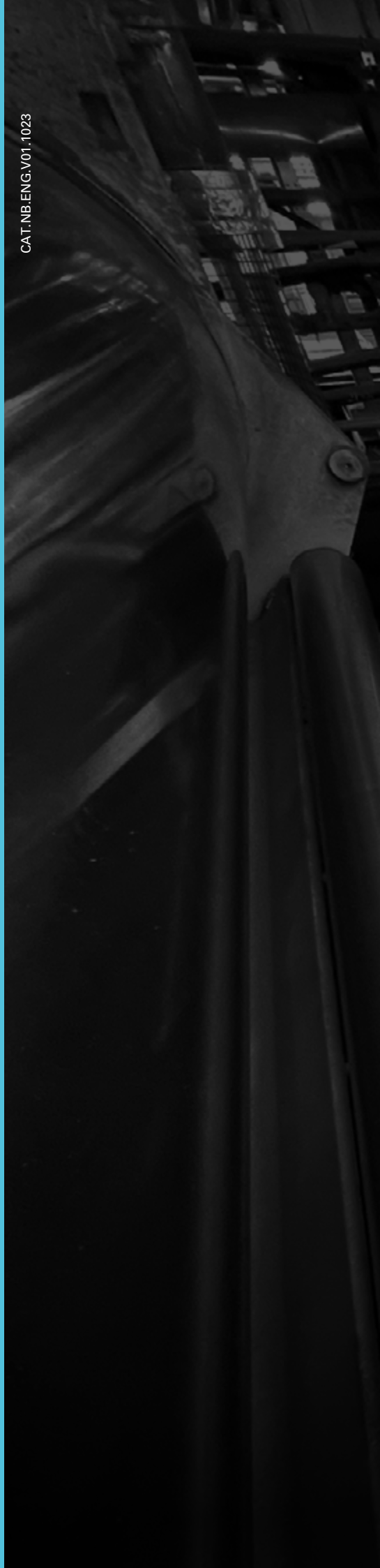
APPLICATION



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