

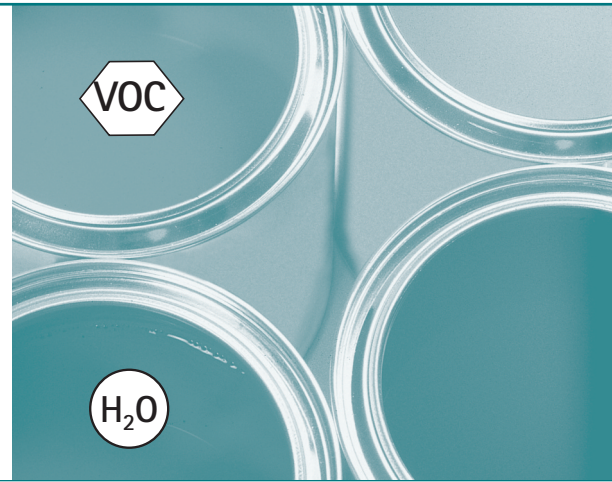


*Venjakob*<sup>™</sup>



THE RIGHT DRYING METHOD  
FOR EVERY LACQUER

VEN DRY



**BLUECOMPETENCE**

Alliance Member

Partner of the Sustainability Initiative of the Machine and Plant Manufacturing Industry

### PERFECT LACQUER DRYING RESULTS

The final surface result is in large part determined by the quality of the drying process. For this reason, careful and efficient drying of the substrate is of the utmost importance. Depending on the coating material, the wet lacquer film is cured either by a physical drying process or chemical hardening. Additional challenges are frequently encountered in automated production sequences as a result of tight spatial constraints or the fast availability of dried workpieces.

As a system manufacturer operating on a global scale, Venjakob knows what matters in order to optimally meet all framework conditions and legal regulations, such as the VOC directives, as well as ensure a reproducible and flawless surface quality. Our desire to achieve maximum sustainability and energy efficiency has been documented for decades by our high standard for the development of new technologies. For this reason, we have supported the Blue Competence Initiative of the VDMA with our partnership from the very beginning.

### FLEXIBILITY

A particularly effective drying method is often the result of a combination of various technologies. Designed with the objective of ensuring optimum energy efficiency, the customised system/plant solution is adapted to customer-specific requirements.

Recommendations VEN DRY	Solvent-based lacquers	Water-based lacquers	UV water-based lacquers	UV solvent-based lacquers
<i>OIR</i>	☹️	😊	😊	☹️
<i>AIR</i>	😊	😊	😊	😊
<i>MICRO</i>	☹️	😊	😊	☹️
<i>AIR JET</i>	😊	😊	😊	😊
<i>COLLECT</i>	😊	😊	😊	😊
<i>VERTICAL</i>	😊	😊	😊	☹️
<i>VARIO TIME</i>	😊	😊	😊	😊
<i>PAL</i>	😊	😊	😊	😊
<i>UV-SURROUND</i>	☹️	☹️	😊	😊
<i>UV-LED</i>	☹️	☹️	😊	😊
<i>COOL</i>	😊	😊	😊	😊

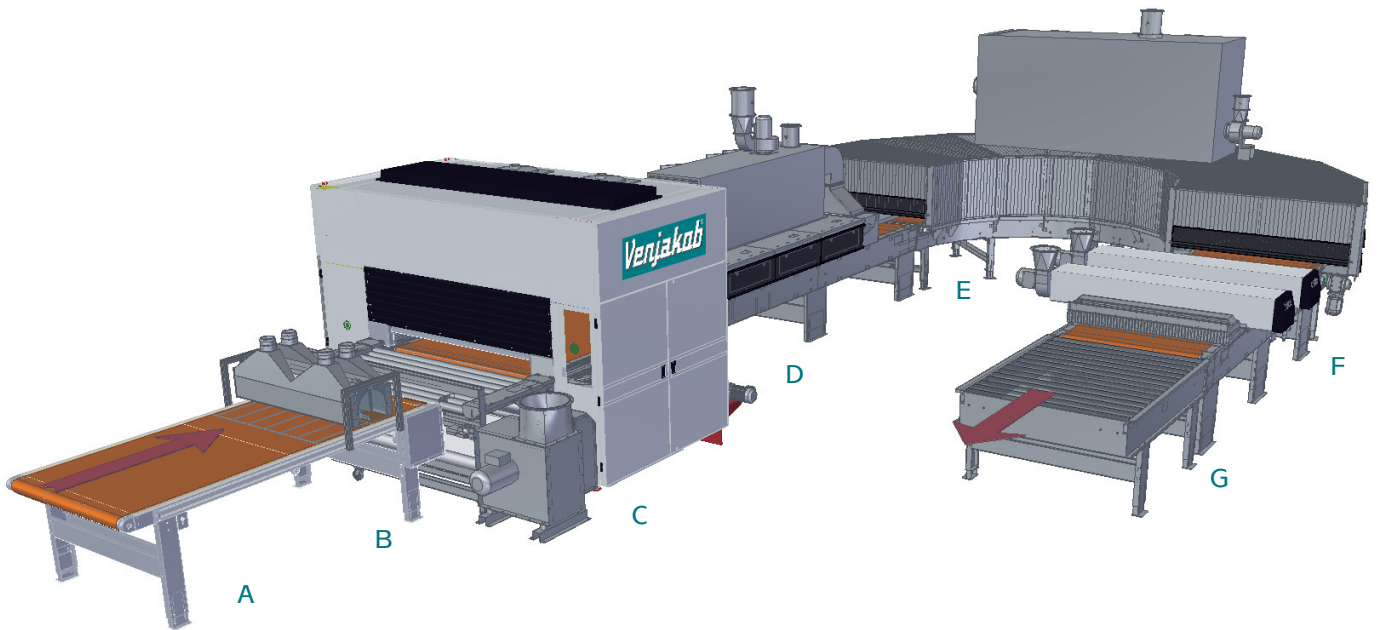
😊 recommended

😊 possible

☹️ not possible

## CUSTOMISED HIGH-TEMPERATURE DRYING UP TO 250°C (482°F)

- A VEN TRANS *BELT*
- B VEN CLEAN *SMART*
- C VEN SPRAY *COMFORT*
- D VEN DRY *OIR*
- E VEN TRANS *CURVE* + VEN DRY *AIR JET*
- F VEN DRY *UV*
- G VEN TRANS *ROLL*



<b>FLASHING OFF  </b>	VEN DRY <i>RACK</i>
<b>ACTIVATING</b>	VEN DRY <i>AIR</i> VEN DRY <i>OIR</i> VEN DRY <i>MICRO</i>
<b>DRYING</b>	VEN DRY <i>AIR JET</i> VEN DRY <i>COLLECT</i> VEN DRY <i>PAL</i> VEN DRY <i>VERTICAL</i> VEN DRY <i>VARIO TIME</i>
<b>CURING</b>	VEN DRY <i>UV-SURROUND</i> VEN DRY <i>UV-LED</i>
<b>COOLING</b>	VEN DRY <i>COOL</i> VEN DRY <i>COOL - COLD WATER</i>

### A WIDE VARIETY OF SERVICES

With VEN DRY system technologies all lacquer-specific requirements from flashing off | activating to drying, curing and cooling are possible.



**Venjakob**<sup>TM</sup>

### OUR BUSINESS APPROACH IS CHARACTERISED BY INDIVIDUALITY

Competent project planning begins with the comprehensive analysis of all customer-specific requirements. Which lacquer systems are in use, which materials are being coated, which formats are needed, which technical production considerations require flexibility, what is the layout of the premises? Explicit calculations such as dryer length (s) based on the planned infeed rate (vf) multiplied by lacquer drying time (t) result in detailed knowledge for future system/ plant designs.

For water-based lacquers, stains and dispersions, force drying techniques such as those used by VEN DRY *OIR* or VEN DRY *MICRO*, ensure the best surface results. In particular, the innovative VEN DRY *OIR* method achieves gentle drying with high efficiency due to the activation of the water molecules in the wet lacquer film together with targeted heat application to the interior of the lacquer layer. The sophisticated flashing off and activating technologies are impressive, especially in the areas of furniture, window, automobile, solar and glass manufacture.

**VEN DRY**  
*OIR*



**EFFICIENT:** By drying in a flat flow flash-off tunnel with optimised infrared technology, the surface quality of lacquered workpieces can be significantly improved while simultaneously reducing the drying times. The gentle application of energy ensures flawless results.

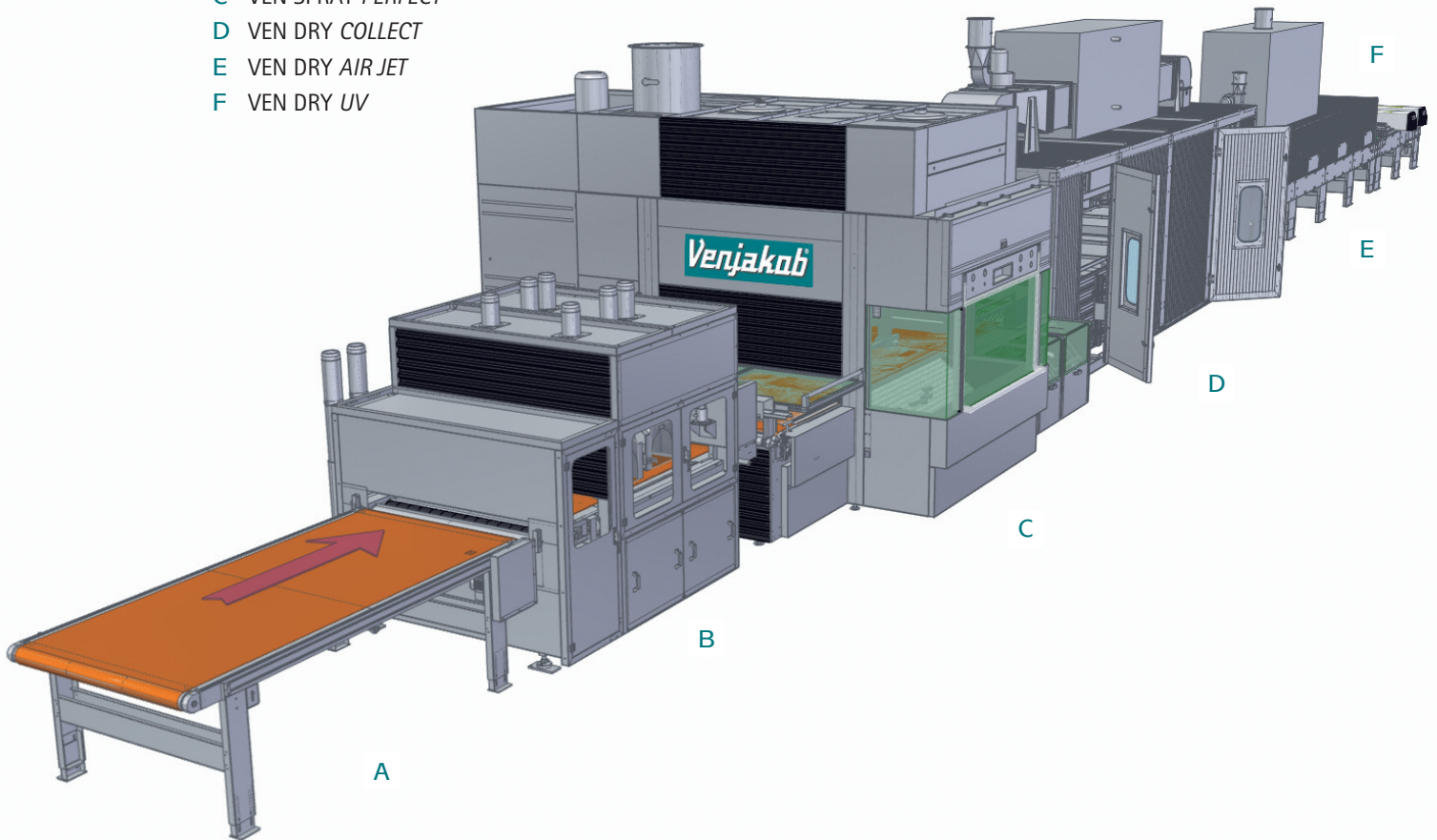
**VEN DRY**  
*AIR*



**PROFESSIONAL:** The laminar airflow dries gently yet intensely. Temperature, air speed, supply air and exhaust air can be adjusted manually or frequency-controlled. Flow meters monitor the exhaust air values, thus ensuring correct and fault-free functioning of the drying process.

OPTIMAL ENERGY INPUT ENSURES QUICK LACQUER DRYING

- A VEN TRANS BELT
- B VEN CLEAN PERFECT
- C VEN SPRAY PERFECT
- D VEN DRY COLLECT
- E VEN DRY AIR JET
- F VEN DRY UV



**CUSTOMISED:** The lacquered workpieces are sorted either manually or automatically into trolleys. There are three possible drying processes, depending upon the customer's wishes and type of lacquer. Drying can take place either directly in the production room, in a ventilated and heated drying chamber or in a special trolley throughfeed dryer.

**VEN DRY RACK**

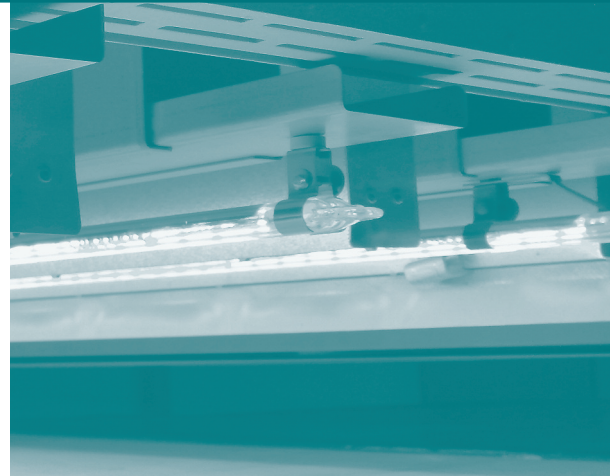
Upon request, we also automate trolley loading and transport using the VEN MOVE STACK.



**DEPENDABLE:** As an alternative to the VEN DRY OIR method, microwave radiation can be used to activate water evaporation with water-based lacquers. But with this process, the moisture distribution in the coating substrate, the nature of the base material and the positioning of the workpieces play a major role.

**VEN DRY MICRO**

**Venjakob**<sup>TM</sup>



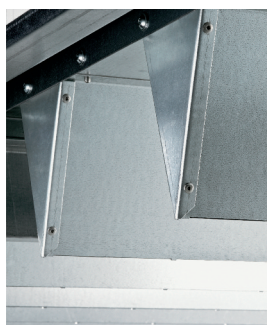
## EFFICIENT AND RELIABLE DRYING

The variety of special drying technologies available provides optimum solutions, which can be tailored to customer desires – from forced throughfeed drying, at high air speeds upon request, and space-saving solutions to infrared, UV or high-temperature dryers – as an individual machine or integrated in a machine line. The three plant designs presented here visually exemplify the challenge we face with each new task – to develop tailor-made process solutions competently and dependably.

Applications using solvent-based lacquering systems need the slowest and most gentle drying possible. But, often in production there is insufficient space for this. Moreover, the transportation of workpieces is cost-intensive and entails the risk of damage. To solve these issues, Venjakob has developed innovative drying equipment with varying conveyor systems, all of which are based on the principle of convection drying and take into consideration customer requirements.

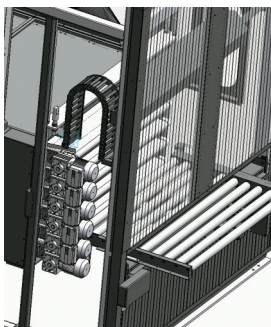
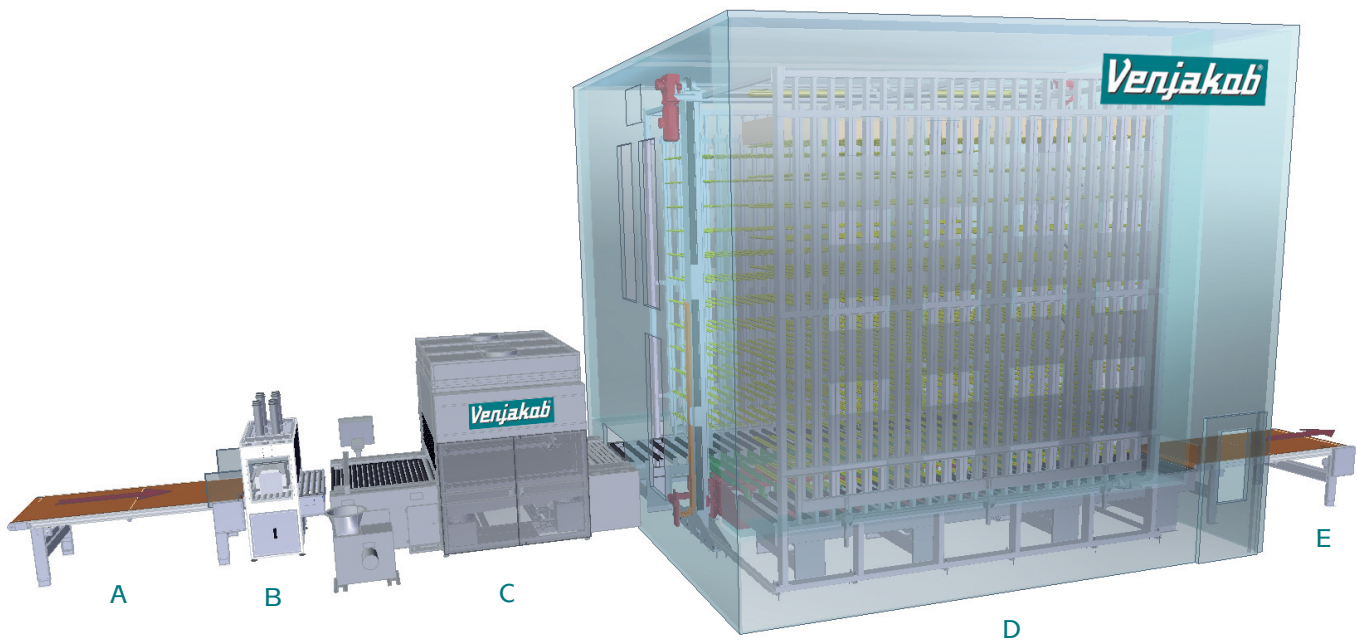
**VEN DRY**  
AIR JET

Energy-efficient due to the high percentage of circulating air – can be combined with different radiation sources as support for lacquer drying.



**INTENSIVE:** The jet dryer with special slotted jets realises intensive drying from 30 to 250°C (86 to 482°F) due to high air speeds and constant flow conditions across the entire working width. Heating is realised via hot water, heat transfer oil, gas, electrical current or steam.

- A VEN TRANS BELT
- B VEN CLEAN SMART
- C VEN SPRAY SMART
- D VEN DRY VARIO TIME
- E VEN TRANS BELT



**SPACE-SAVING:** The vertical dryer with cross-wise ventilation achieves a slow and gentle drying process. The built-in length can be reduced by the respective number of levels. If only solvent is used, the lower cost variant with longitudinal ventilation is available as an option.

**VEN DRY**  
COLLECT



**PERFECT:** Vertical pallet dryers using the pater-noster principle gently dry lacquered workpieces up to a maximum of 250°C (482°F). The hot air is guided crosswise to the transport direction across the workpiece to prevent ingress of dust and draught. Heating media: gas, steam, electricity, hot water, oil.

**VEN DRY**  
PAL

**Venjakob**<sup>TM</sup>

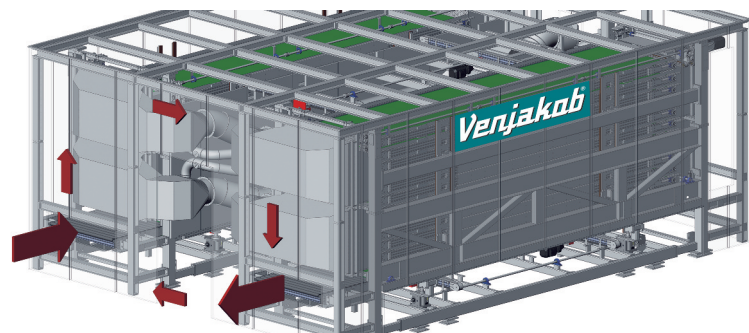


### SURFACE QUALITY THAT MAKES AN IMPRESSION

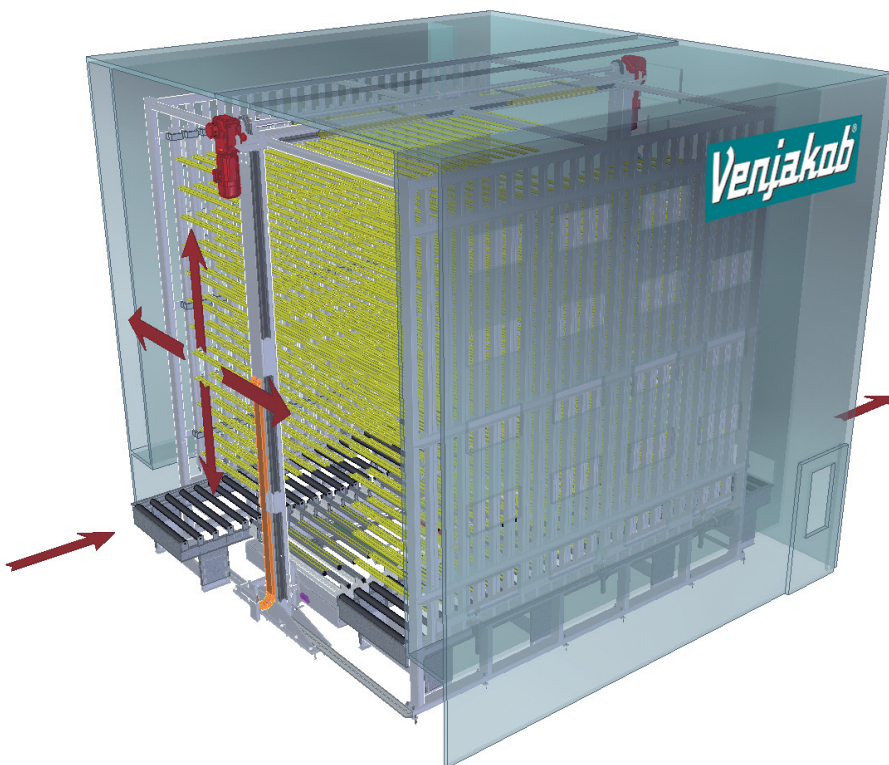
To guarantee a flawless product surface, it is crucial that the drying method optimally takes into account the individuality of the materials, lacquer systems, sizes and production requirements. At the **Venjakob Technical Centre** virtually every variation of dryer is available to experience the applications in action, to conduct trial runs on customer-based materials and to establish the specific requirements through intensive dialogue. Moreover, the Technical Centre provides ideal conditions for training the plant/system technicians.

Servo motors ensure uniform and gentle movements, in particular with multi-level vertical dryers. Flexibility accompanies all equipment, for instance the vertical dryer **VEN DRY VERTICAL** can be subdivided into zones as needed, thus enabling a customised drying of 12 to 60 pallets. These dryers are suitable for almost all lacquer systems and advantageous for draught sensitive lacquers such as high gloss.

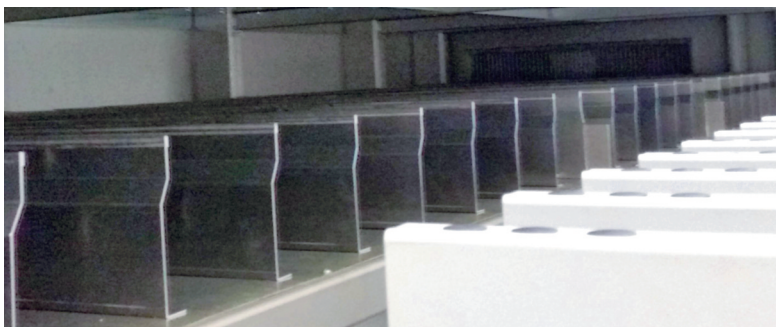
**VEN DRY**  
VERTICAL



**HIGH PERFORMANCE:** The high-performance vertical dryer consists of any desired number of belt pallets. The lacquered workpieces are lifted level by level into the dryer **without the need for chains**. The well thought out ventilation system ensures optimal ventilation. The pallet changeover times are minimal, free from vibration and there is no dust carry-over from abrading mechanical lift chains in the dryer.



- The alternative **vertical dryer without belt pallets** enables maximum flexibility in drying conditions. The workpieces are automatically stored by batch in two grid shelves by varying lengths, widths and heights.

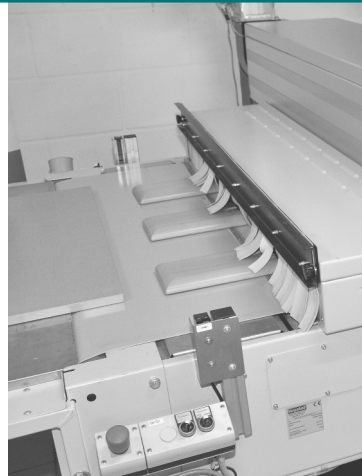


**CONVINCING:** The fully automatic operating vertical dryer offers maximum flexibility due to the tried and proven Venjakob feeding and discharging control system. Drying times can be individually set per batch from 1 to 45 minutes. The design enables storage and retrieval by batch and prevents dust ingress, since the workpieces are not moved during the drying process.

**VEN DRY**  
VARIO TIME



**Venjakob**<sup>TM</sup>



### FLEXIBILITY ENSURES A QUICK RESPONSE

Whether it is flashing off | activating, drying, curing or cooling – requirements in production processes are changing more frequently and faster than ever before. Which is why the adaptability of a new system/plant technology plays an important role in the investment decision. As an experienced specialist, Venjakob accompanies every project planning with a high level of dedication, a knowledgeable consultation and sound design and construction. It is essential not only to consider the current status, but also to include strategic and future-oriented considerations as well.

From the production and commissioning/start-up of the new drying equipment or a complete production line with priming, lacquering, conveyance and exhaust air technology, perfect solutions in control technology as well as multi-layered service features accompany every collaboration. As a strong partner, it is our aim to cater fully to all specific requirements, and over the long-term, to offer our customers a high level of investment security and a maximum amount of reliability and productivity.

**VEN DRY**  
UV

With the special Venjakob UV surround technology, suitable reflectors are used to avoid direct UV radiation of the workpieces. Here, good 3-dimensional radiation of the workpieces is achieved and simultaneously the smallest possible temperature increase of the parts is realised.



**WITH SURROUND UV TECHNOLOGY:** UV-curing lacquer systems use intensive UV-radiation to cure in a matter of just seconds. This system technology requires little space and supports short processes. The highly reflective and optimised radiators ensure perfect surface and edge quality with throughput, efficient use of energy and a long service life.



**VEN DRY**  
UV-LED

**EFFICIENT:** Venjakob has integrated innovative LED technology into high performance curing of 3D workpieces. The lower thermal stress of the workpieces and optimised energy consumption are compelling advantages. Unlike conventional UV technology, the LED lights prevent the generation of ozone and thus, optimise the energy balance. The energy consumption is roughly only 10% of that used by conventional equipment/technology.



**VEN DRY**  
COOL

**EFFECTIVE:** This method allows extremely fast workpiece cooling. When it is necessary to pack or stack workpieces immediately, VEN DRY COOL modules can be installed in all Venjakob drying equipment at any time. Whether with wood or glass, large elements such as windows, doors, furniture components or small products in the automobile sector, the flooring industry and profile strip production - VEN DRY COOL optimises production processes.

# Venjakob™



## SYSTEMATIC SURFACE COMPETENCE

As an internationally renowned and globally operating system manufacturer, Venjakob has been designing innovative surface coating machines for more than 50 years. Individual machine line solutions, optimisation of production processes as well as development of innovative system technologies are devised and realised on the basis of many years of experience and the profound expert knowledge of our employees. Our daily work is characterised by individuality, close dialogue with our partners in the various industry sectors and a conceptual way of thinking and acting.



**VEN BRUSH**  
BRUSHING | SANDING

**VEN CLEAN**  
CLEANING

**VEN MOVE**  
HANDLING

**VEN TRANS**  
CONVEYOR TECHNIQUE

**VEN SPRAY**  
COATING

**VEN DRY**  
DRYING

**VEN CLEAN AIR**  
EXHAUST AIR PURIFICATION

## PRODUCTION LOCATIONS

Venjakob Maschinenbau GmbH & Co. KG  
Augsburger Straße 2-6 | 33378 Rheda-Wiedenbrück | Germany  
Fon +49 52 42 9603-0 | [info@venjakob.de](mailto:info@venjakob.de)

Venjakob Umwelttechnik GmbH & Co. KG | Wellweg 97 | 31157 Sarstedt | Germany  
Fon +49 60 66 9806-0 | [umwelttechnik@venjakob.de](mailto:umwelttechnik@venjakob.de)

Nutro Inc. | 11515 Alameda Drive | Strongsville OH-44149-3099 | USA  
Fon +1 440 572 3800 | [usa@venjakob.de](mailto:usa@venjakob.de)

## INTERNATIONAL SUBSIDIARIES

The contact details please find on  
[www.venjakob.de/en/contact/locations/](http://www.venjakob.de/en/contact/locations/)

Venjakob Maschinenbau Division South  
Venjakob North America Inc. (Canada)  
Venjakob España  
Venjakob Russia  
Venjakob Finishing Solutions Pvt. Ltd. (India)  
Venjakob South East Asia (Kuala Lumpur)

