

# FAST AND RELIABLE DRYING.

CARBON AND ENERGY SAVING DRYING SYSTEMS  
WITH AIRGENEX<sup>®</sup> HEAT PUMP MODULE

EFFICIENT + SAFE + FAST + RELIABLE + EXHAUST AIR FREE

FOR BEST RESULTS AND CONSTANT PROCESSES

# FAST AND RELIABLE DRYING

Gentle and energy efficient, reliable and fast drying of any surface - our heat pump based condensation drying can do it. Our purpose-developed Airgenex® drying technique will improve your drying, and, as a result, your whole production process. We will be your

reliable technology partner to stand at your side. Several decades of experience and know-how obtained from hundreds of applications ensure the optimum solution to your challenge. Besides today's elemental energy and carbon saving, quality and reliability have top priority.

## PRODUCT QUALITY AND PROCESS RELIABILITY

- Short drying periods
- Reliable drying product including those with complex geometry
- Stain-free surfaces
- Low temperatures
- Gentle treatment
- Drying systems customized to the specific product and process
  - > meeting, or often reducing, cycle times
  - > integrated in existing lines
  - > increasing capacity
- Drying in a closed air system
  - > no exhaust air
  - > no interchange with ambient air
  - > reliable drying independent of the climate or the seasons



Three rack dryers with Airgenex® heat pump module

# OUR DRYING TECHNIQUE IS VERY SPECIAL

## VERY RELIABLE

The dehumidification process takes place in a closed air system. This is why our drying technique makes you independent of climatic or seasonal effects. There

will be no more rejects because our drying is reliable and stain-free. Do you intend to increase your capacity? With our technology you are on the safe side.

## VERY GENTLE

Airgenex® dries your products or materials at low temperatures within a defined range of 40 °C to 75 °C, as required for the specific application. Low temperature drying ensures that your materials and products remain as cool as possible.

## VERY FAST

Airgenex® condensation drying can save as much as 50 percent of the time required by conventional drying methods, such as hot air dryers or simple fan-based systems. You will be surprised how much you can reduce your drying time.

## VERY EFFICIENT

The heart of our drying systems is a highly efficient heat pump based dehumidification technology. Components installed are the best available, some of them purpose built for us, and are made from high grade materials. We combine air dehumidification with sophisticated air routing. Because

even the driest air is of no avail unless exactly directed to where it can absorb humidity. It is the perfect combination of these two components – air dehumidification and air routing – which makes our drying take full effect.

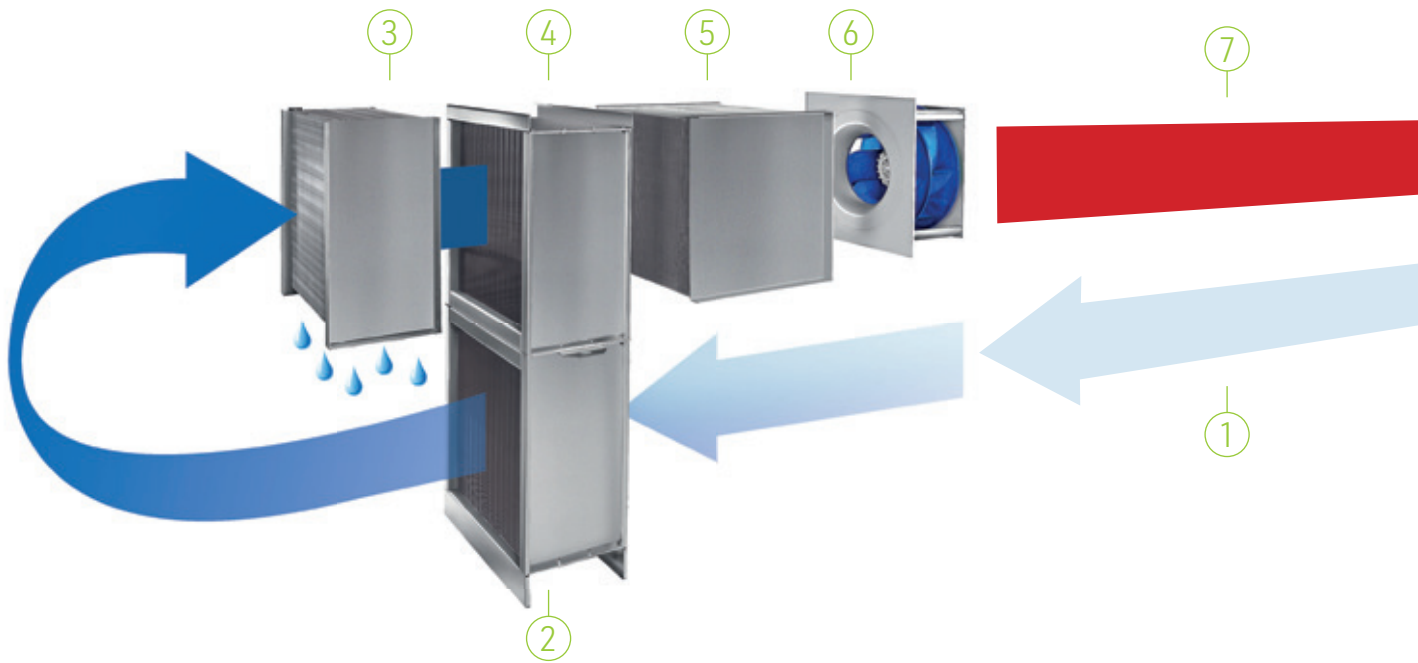


Energy efficiency is an issue that has always been lying close to our heart. Otherwise, we would not have trailblazed this drying technique in the first place and advanced it ever since. The ever-growing awareness for energy and limited resources is a very good and important trend. It is the only way to move into the future.

*Reinhold Specht, managing owner, Harter GmbH*



# AIRGENEX<sup>®</sup> – THE PROCESS



Our energy-saving drying systems can dry any product in a fast and reliable way. The heat pump and heat pipe help to significantly reduce energy consumption.

① Airgenex<sup>®</sup> heat pump module / dryer interface: humid air is extracted from the drying chamber and passed to dehumidification.

② The precooler, a part of the heat pipe, provides first-stage cooling of the air with no energy input.

③ Humidity precipitates on the air cooler fins, and the condensate water leaves the system through the condensate collector and the condensate drain.

④ The preheater, a part of the heat pipe, provides first-stage heating of the cooled, dehumidified air with no energy input.

⑤ The air heater raises the air temperature to the level required for the process.

⑥ The process air fan provides the required air circulation between the Airgenex<sup>®</sup> heat pump module and the drying chamber.

⑦ The dried, unsaturated air is now returned to the drying chamber.

The circuit is thus closed.



Airgenex<sup>®</sup> heat pump module



## STANDARD AND SPECIAL SOLUTIONS – SUITABLE FOR ANY APPLICATION

We design the drying system which best meets the requirements of your specific product and integrate it perfectly into your process. All our know-how and our experience are incorporated each time anew.

Our drying technique is a flexible system. You may combine it with any type of process. It goes without

saying that factors to be considered for drying of racked items differ from those for static drying of bulk material or for continuous processes.

And this is where we know the ropes. So, you will get from us a highly efficient drying process with excellent results.

## DRYING OF RACKED ITEMS

This is where our roots are. Airgenex® rack dryers have always dominated our engineering and manufacture. We have built hundreds of them.

You need a new rack dryer? Then you will get a system customized to perfectly accommodate the dimensions of your products and to fit in the space available at your site. Each of our rack dryers has an automatic lid system that opens only as workpiece carriers are inserted or removed. This keeps the precious energy inside the system.

The fans installed in our dryers feature EC motors as a standard. So, you may continuously vary the air speed as required for the products in your portfolio.



## NON-COMPRESSED AIR BLOW-OFF UPSTREAM OF DRYING

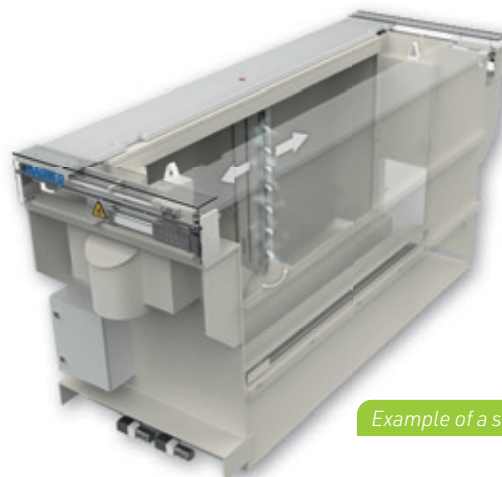
We offer optional non-compressed air blow-off upstream of drying proper in special situations. This appears reasonable for components with highly complex geometries where features such as blind holes, undercuts or perforation foster water entrapment. We developed special blow-off nozzles which may be used for this purpose.

Non-compressed means:

- Use of a high performance, high efficiency fan to produce high airflow rates
- There is uniform air output over the whole length of the air knife rather than spot type.
- Extremely low energy consumption as compared with compressed air and resulting largely reduced cost of operation

Components prone to water entrapment may have water blown off at the last rinse or inside the rack dryer. For components prone to high water entrapment, we recommend to use a separate blow-off station with movable nozzles. We are prepared to develop other, individual solutions for you.

Please refer to our separate air blow-off flyer for more information.



Example of a separate air blow-off station

## DRYING OF BULK MATERIAL

In-container drying of bulk material is a notion that is still unbelievable in quite a few circles. We built the first in-barrel dryer in 1996, many hundreds more ever since. Detrimental centrifugal spinning and incompletely dried bulk material have long been a thing of the past. In-container drying has long been state-of-the-art.

Air routing is, of course, critical for bulk material drying. The half-shell technique we developed enables uniform and complete drying of bulk material in barrels. This may be accomplished

with either no or minimum intermittent movement. For baskets and pans, we use other engineering approaches to obtain such major success.

Our drying systems use low process temperatures – which is ideal for temperature sensitive items and containers.

Unbelievable? Visit our pilot plant station to witness what our technology can do for you and your product.



*In-barrel drying*



*Continuous in-basket drying – cycle controlled*



*In-pan, in-basket and in-screen-basket drying – static*



*In-basket drying – vibrating*

## DRYING AFTER CLEANING

Do you intend to change from alcoholic to aqueous cleaning and need a dryer now? Or has the drying provision of your cleaning facility reached its performance limit? Are your items dried in a cleanroom with resulting special requirements? Or do you have a large portfolio and need a dryer capable of processing all your products?

Whatever the job to be done – we will provide the desired engineering solution whether semi-automatic or automatic, manually operated, continuous or batch type.



*Post-cleaning continuous dryer*

*By the way, it is quite simple to integrate a cooling station in our drying systems if required for the specific process.*

## PAINT DRYING

For paint drying, temperature is critical. Using low temperatures our heat pump based condensation drying is ideally suited for this purpose. Our technique dries paint coated surfaces uniformly and from the inside out.

Low temperatures combined with extremely dry air in a closed air system ensure efficient drying in your paint coating line. You save a lot of time and energy, and get high quality and reliability.



*Drying chamber for paint coated items*



## DRYING OF MINIATURE AND PRECISION COMPONENTS

Miniature components for electronic, sensor or medical device applications, components of jewellery or watches – what they all have in common is that they are very small and very sensitive. While the priority in other applications may often be the requirement to meet the cycle time, the priority here is very frequently the perfect result. What manufacturers demand for their high-end components is complete dryness and absolute freedom from staining. And rightly so.

Our compact chamber dryer is best suited for this special application. The dryer is a manually operated stand-alone system. The drying chamber may be loaded with racks, baskets, or individual items. Stored recipes for individual items ease the control of the drying process for large product portfolios.

An optional air blow-off provision may bolster drying. A motor to gently rotate a rack may also be integrated.

Please see our miniature and precision component drying flyer for more information.



*UTcompact with basket*

## CONTINUOUS DRYING

Continuous drying processes imply requirements and challenges of their own. Again, we customize our dehumidification technology to best meet the requirements of your product and output.

Air routing perfectly engineered to reflect the requirements of your product is critical to ensure continuous drying within the specified time. At the entry and exit points are, of course, required for continuous drying on a belt or in a tunnel. These openings are reflected when we calculate the water extraction rate. Moreover, it is essential to keep the precious energy inside the system. This is done by minimizing the entry and exit opening sizes.

For particularly complex components, we integrate an additional air blow-off provision into the drying system



*Dryer for continuous processing*

# OUR PILOT PLANT STATION – WHERE IDEAS ARE FORGED

*Our pilot plant station is unique | A room full of technical equipment and opportunities |  
A place full of creativity and innovation | Tinkers with experience and inventive spirit |  
Clients with faces in wonder*



Series of tests run in our pilot plant station provide valuable information and confidence. We test your product for response to temperature, time, humidity, air speed and airflow rate. We also look at the routing of the air inside the dryer because this is a critical factor on the way to success. To do all this, we have several multifunctional dryers which our engineers adapt to the specific application.



Sometimes, the solution is clear at hand after just one series of tests. Every now and then several series with varying parameters are required. This is the moment for our engineers. They think creatively and alternatively – and inevitably find a good solution.

We have run thousands of drying tests in our pilot plant station in more than 30 years. The experience gathered and the know-how obtained therefrom may not be valued high enough. And it is for your benefit.

## A DAY FILLED WITH MORE THAN JUST ENGINEERING MATTERS

You are welcome to witness our tests. See with your very eyes how powerful our heat pump dryers are and how we create viable solutions. We will give you an insight into drying issues relating to your product. We also cultivate hospitality and good company. So, your stay will be both be pleasant and informative.



## OUR SPECIAL SERVICE

It may appear reasonable to run drying test at your premises using a system provided on loan. We also build larger scale test set-ups as agreed.

# WHERE DRYING BECOMES A SPECIAL EVENT

## YOU ARE A MANUFACTURER AND WANT A BETTER DRYER?

You already have a product and a process but are less than satisfied with your existing drying system? Or the high energy consumption is no longer acceptable? You want to change something? Maybe you are unsure if our technology keeps what is promised? Our pilot plant station will provide answers to your questions. You tell us the ideal conditions under which your product should get dry. As an outcome of our tests, we will furnish a solution. The results are very often much better than expected by our customers. Our process, for example, will often be short of the specified cycle time. When it comes to drying bulk material, we can routinely stun our customers.



## YOU ARE PLANNING SOMETHING NEW AND ARE UNCERTAIN AS TO EXACTLY HOW?

Do you intend to change from alcoholic to aqueous cleaning? Or you intend to use water-soluble paint only? Perhaps you stop using solvent-based adhesive? Or you are planning to introduce an entirely new product?

Whatever the challenge to be met we will be glad to tackle it. It is our passion to find the best drying solutions. When running tests, our engineers quickly see which process is best suited to ensure successful drying. If products are

particularly demanding there is always an engineering trick to help us arrive at a solution.

## YOU ARE A SUBCONTRACT PROCESSOR OF A WIDE RANGE OF PRODUCTS?

Let us suppose you are a subcontract electroplating company processing a wide range of products. You might not know yet which products you will process in the future. In such situations, our tests will reflect the most complex items to be dried. We will allow for some extra margin to give you maximum assurance. This way we can ultimately ensure that our system will be capable of covering your whole range of products today and later.

# YOU ARE AN OPERATOR OF AN ELECTROPLATING FACILITY? THEN YOU ALSO HAVE SLUDGE TO DEAL WITH.

Using our Drymex® sludge drying technology will reduce the weight and volume of your sludge by as much as 60 percent. This means that your disposal cost will also be as much as 60 percent lower.

The drying process always runs in a closed system and is thus emission-free. The closed circuit further increases the efficiency of the process.

Dried sludge might also obtain a more favourable classification. Plus, some of the substances contained in the sludge might be recycled. What potential!

For more information, please refer to our sludge drying brochure.



Our carbon and energy saving drying technique was classified as future technology in Germany, Austria, and Switzerland in 2017. Our customers have applied for and received government subsidy ever since. Inquire about ways to obtain such subsidy.

*Regina Mader, Managing Director, Harter GmbH*



## MAKING PROFIT FROM DRYING

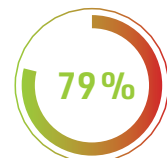
Our Airgenex® heat pump drying does not only offer environmental but also economic benefits:

- You get quality
- You get process reliability
- You save money
- You save resources
- You become independent of fossil energy and the effects of the climate

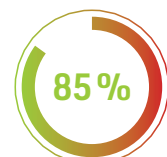
### POTENTIAL SAVINGS



Energy



Carbon



# ON THE SAFE SIDE LATER ON – OUR AFTER-SALES SERVICE

You want your drying system to permanently produce optimum results for your product?

You get highest quality, and it is surely in your best interest to maintain it. We offer a comprehensive service package for this purpose.



## PERFORMANCE SERVICE

Make use of the full potential of your system.

Our engineers will inspect all system components for reliability and performance upon periodic maintenance servicing. They will adjust the relevant parameters as required to ensure the continued full performance of your dryer.

## LIFETIME SERVICE

Quality always ensured.

Years of continued operation will inevitably result in wear and tear of components, even high quality ones. We ensure high availability of replacement and expendable components to safeguard your production – for the whole lifetime cycle of your drying system.

## SMART SERVICE

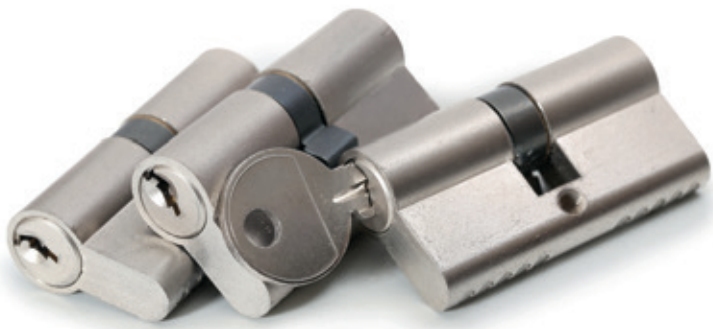
In case something changes.

You change your production for new products or sizes? You want to reduce the drying period or increase the output? Whatever you want to change – our experienced team will give support for upgrades, modification, or repair of existing systems.

## EXPERT SERVICE

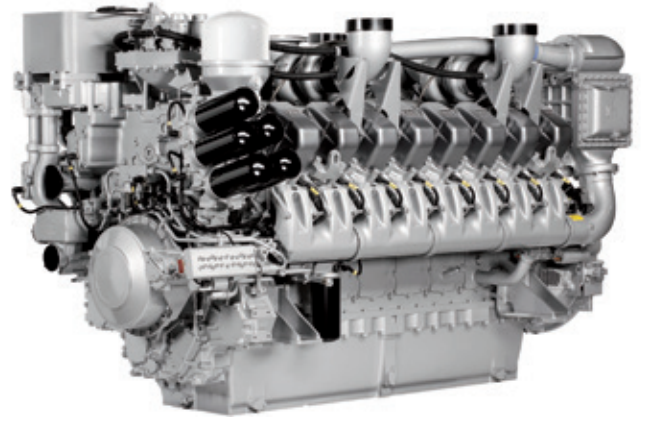
You need engineering advice?

Your dryer happens to fail to work properly? You should first turn to our After-Sales Service in acute situations. You will get competent assistance by our Technical Support including remote analysis and prompt evaluation if required.



## DRYING EXAMPLES





For more than 30 years, we have been committed to developing, designing, and building the best drying systems for your products. We have the innovative power to achieve optimum results for various products and materials.

Below are some examples of products dried in more than 2,000 Harter drying systems installed to date.





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