

# Welcome to Harter

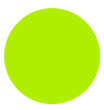


From heating  
to drying !

## The basics

# Introduction

- ➔ **Drying operations are often part of industrial manufacture and processing**
- ➔ **Drying after cleaning is often a bottleneck in the process**
- ➔ **Problems with**
  - **drying quality**
  - **cycle time**
  - **product heat-up**
  - **power requirement**
- ➔ **Heat pump based condensation drying is an alternative to conventional drying**



# Physical Principles

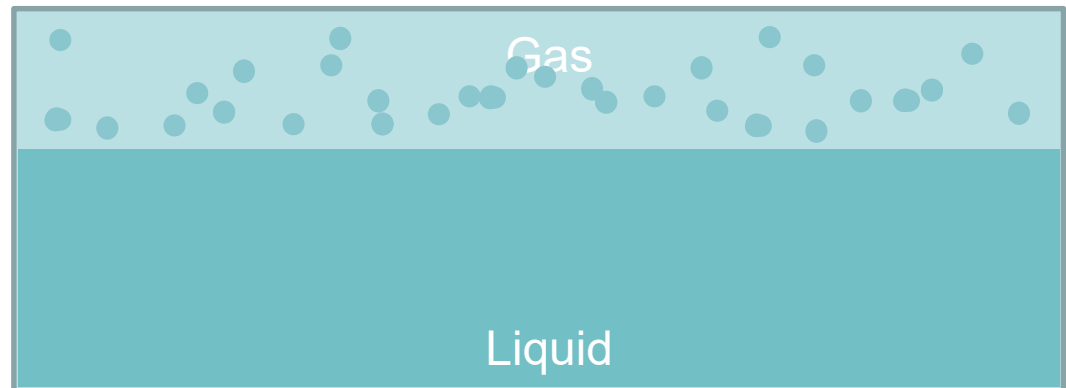
## Drying ... an interaction!

- The number of molecules escaping from the liquid is independent of relative humidity!

$$x=f(T, p)$$

- The number of molecules escaping from the air is largely dependent on relative humidity!

$$x=f(T, p, \mathbf{v}, \mathbf{F\%rel.})$$

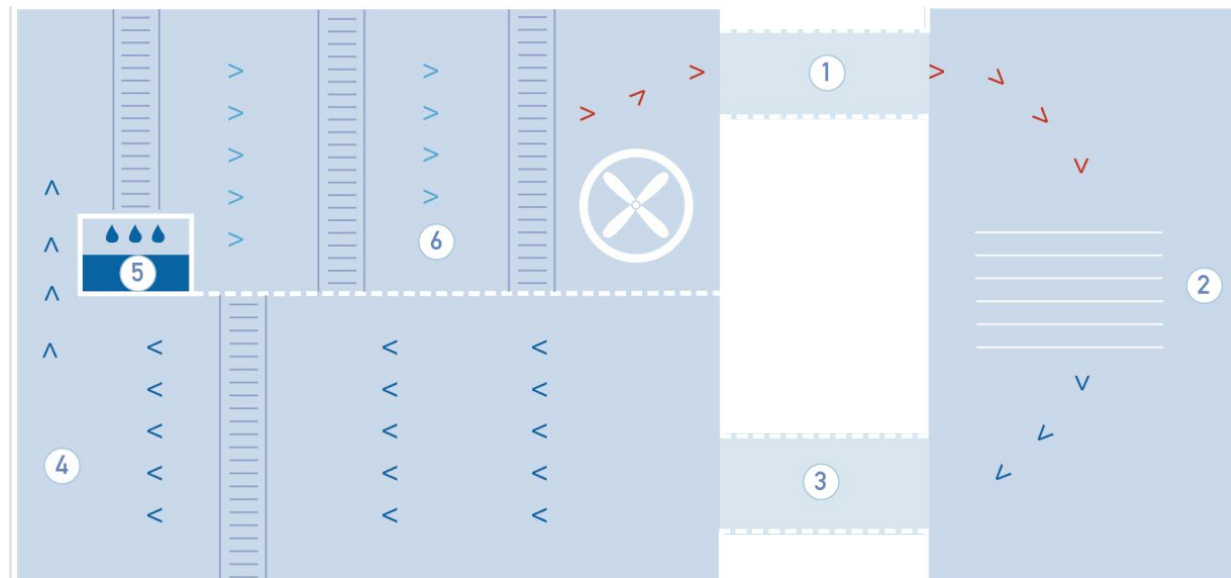


# Airgenex® - Drying system

5) Humidity condenses out at low temperature

6) Two-stage heat exchanger system to reheat the air again with energy recovery

1) Dry air into the dryer



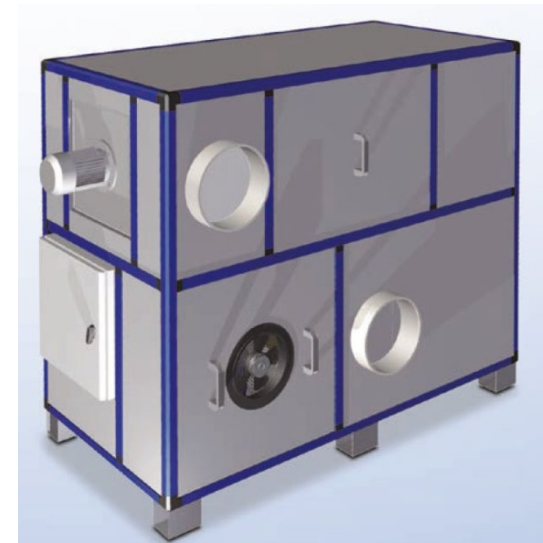
4) Pre cooling heat exchanger

3) Humid air is directed into the Airgenex®

2) The dry air absorbs the humidity from the surface

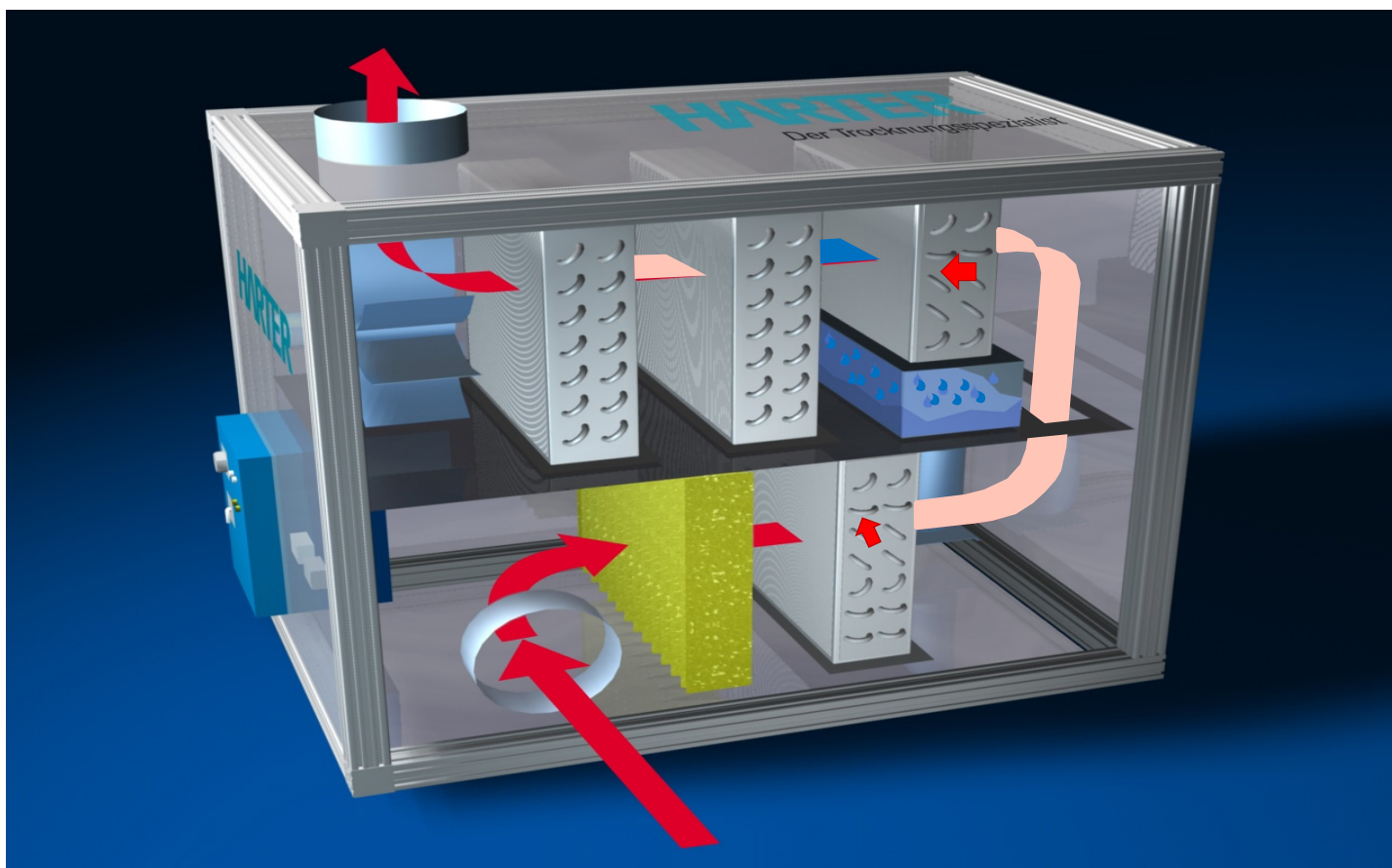
# Airgenex® - Dehumidification system

- **The Airgenex® is an optimized dehumidification system, specially for drying parts after rinsing or cleaning in plating processes.**
- **The size depends from amount of water we have to dehumidify, the kind and size of dryers, the maximum temperature of drying process and kind, weight and temperature of parts.**
- **More than 20 years of experience and high quality components guaranties an opimized drying result and long life time of the machine.**





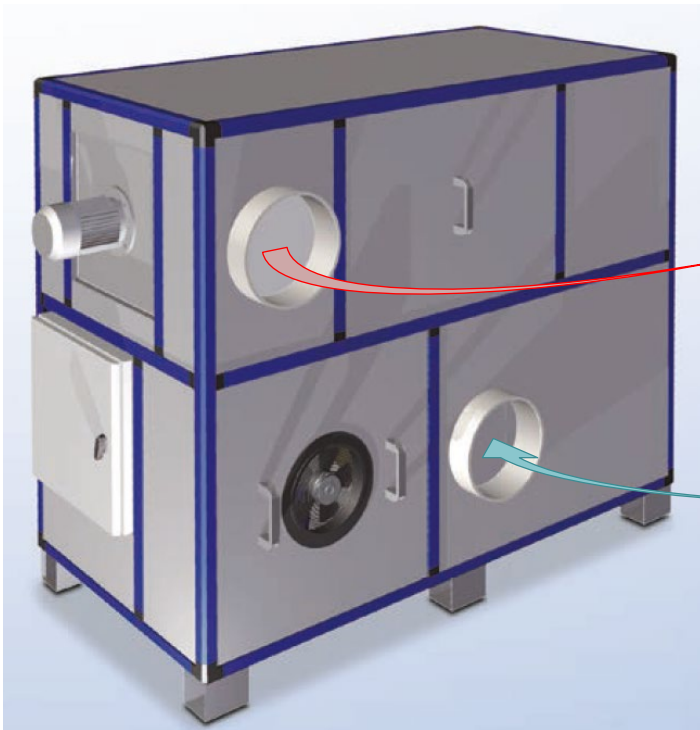
# Airgenex® - Dehumidification system



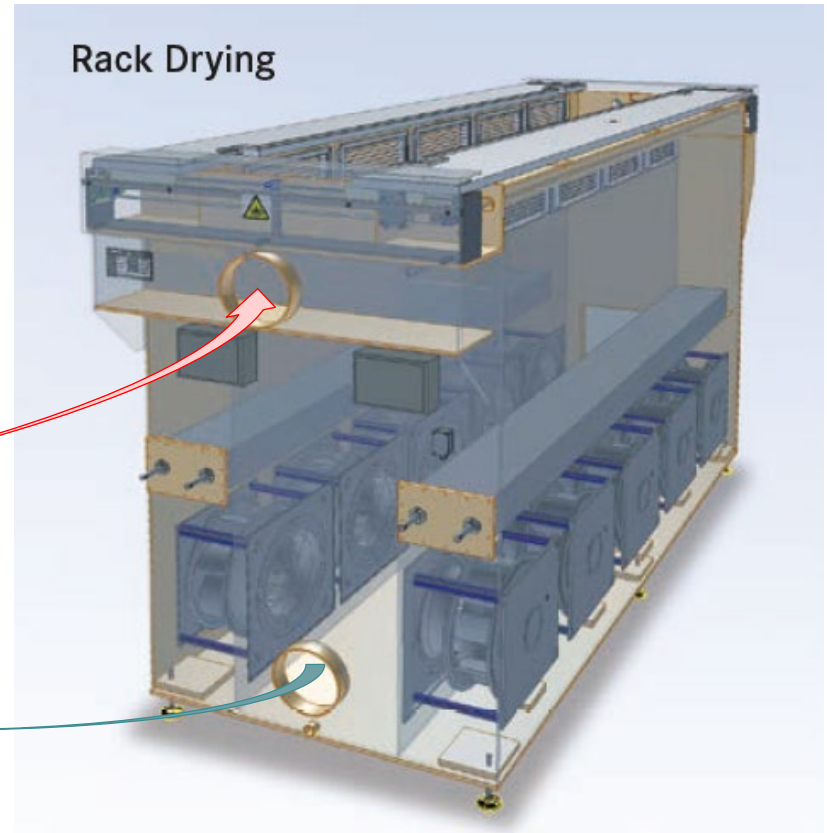


# Airgenex® - Drying systems

**Airgenex®  
dehumidification**

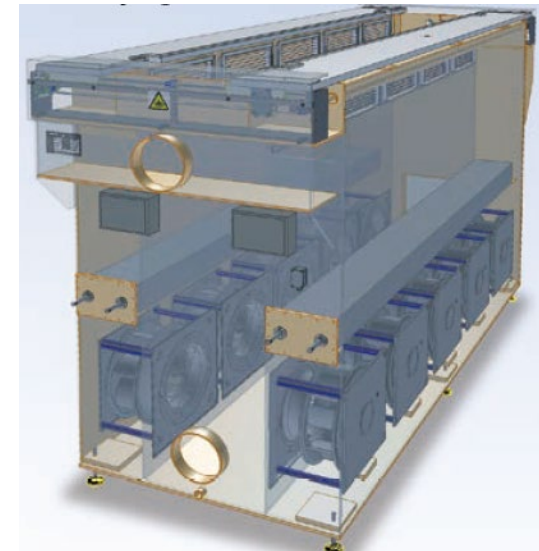


**Rack Drying**



# Airgenex® - Dryers

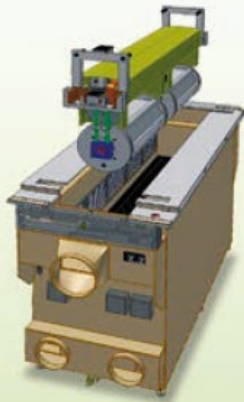
- Dryers are equipped with special Ventilators, optimized to your product
- We developed high end dryers for
  - single parts at racks
  - bulk in barrels
  - pipes
  - single parts on belts or in chambers
- The dryers are optimized to dry in combination with the Airgenex®
- Some kind of parts need a pre-drying with air-knife.  
Our Air-knife systems in combination with a Ventibox work with low energy costs – compared with preassure air – and guaranties a good result.



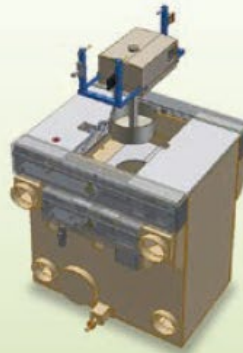


# Airgenex® - Drying systems

## Bulk Material Drying



Barrel



Vibarrel®



Screen Basket



Basket

## Continuous Drying



Passage while Suspended  
on Conveyor Chain



Passage while Resting  
on Conveyor Belt



Strip after Coating  
or Cleaning

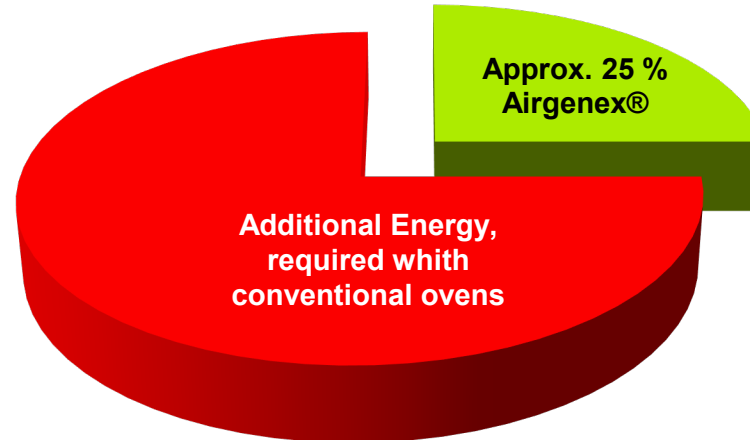
# Energy Efficiency

More than 1000 drying systems were installed in surface finishing applications over a period of 25 years. The average power requirement of each of these systems is 22 kW.

Considering an average 70 percent power saving achieved by each of these systems, the total annual power saving amounts to **450,000 MWh.**

# Your Benefits

➔ **Saving of energy**



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 **Saving of energy**

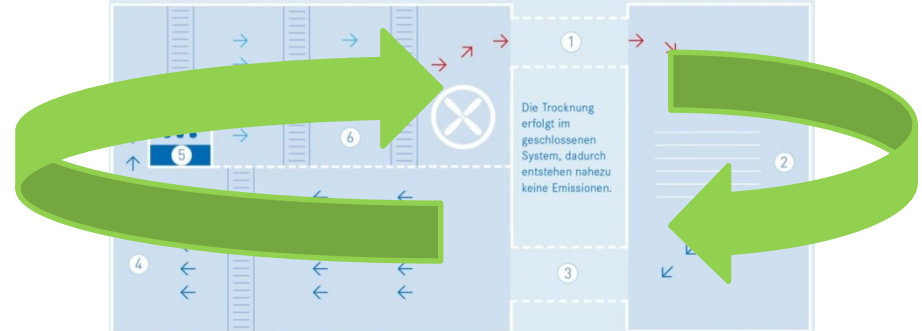
 **Fast, save drying**

The duration of drying depends on

- Temperatur
- Atmosphere-pressure
- Velocity of circulating air
- **Relative humidity**

# Your Benefits

- ➡ **Saving of energy**
- ➡ **Fast drying**
- ➡ **Same process parameters  
Independent from  
Environmental  
influences.**





# What does this mean for me?

## Let's discuss

