

# Thermal cooling with InvenSor ADSorption Chillers

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# Agenda

- Introduction InvenSor GmbH
- Cooling with heat
- Products
- Best Practices Industry cooling
- Best Practices Solar cooling

# Our company

**Leading manufacturer of  
ADsorption chillers**

Range of performance  
30 to 300 kW

Founded in 2006

2 production sites in  
Lutherstadt Wittenberg and  
Berlin

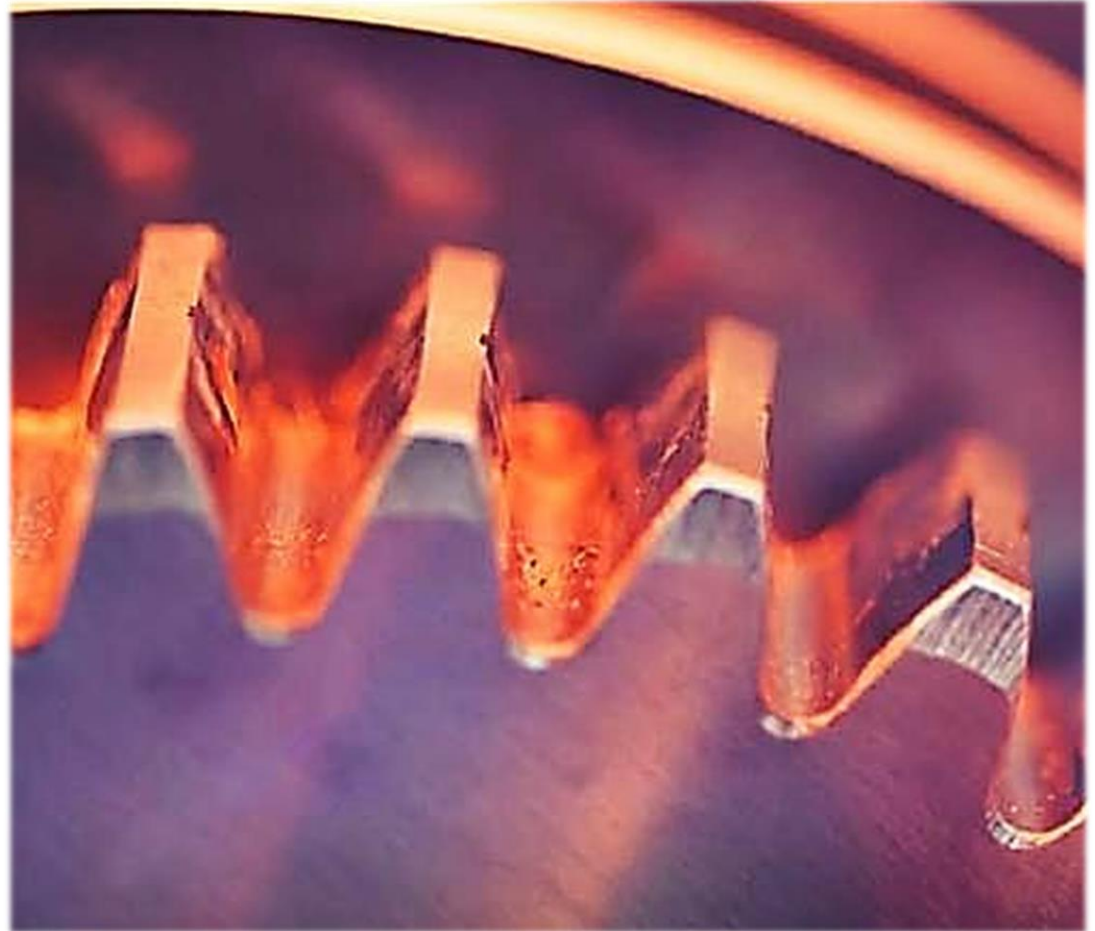


# Reliable cooling in 6 continents



# Efficient cooling

- **Use of excess heat for the cooling**
- **Save up to 70% on energy costs**



# Clean cooling

- **Refrigerant: Water**
- **Highly efficient technology**
- **High CO2 savings through electricity savings**





# Technologically leading



> 400 units sold

Maintenance-free refrigeration generator

Particularly efficient from 65°C

Best efficiency of the device class

First commercial zeolite machine worldwide

## Award-winning technology



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# Cooling with heat

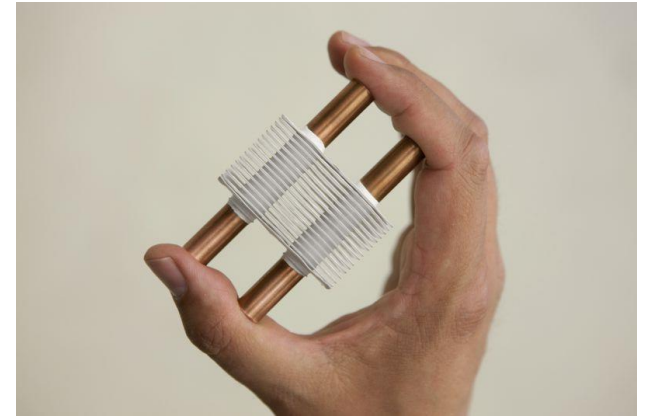
## Adsorbents

### Silica gel

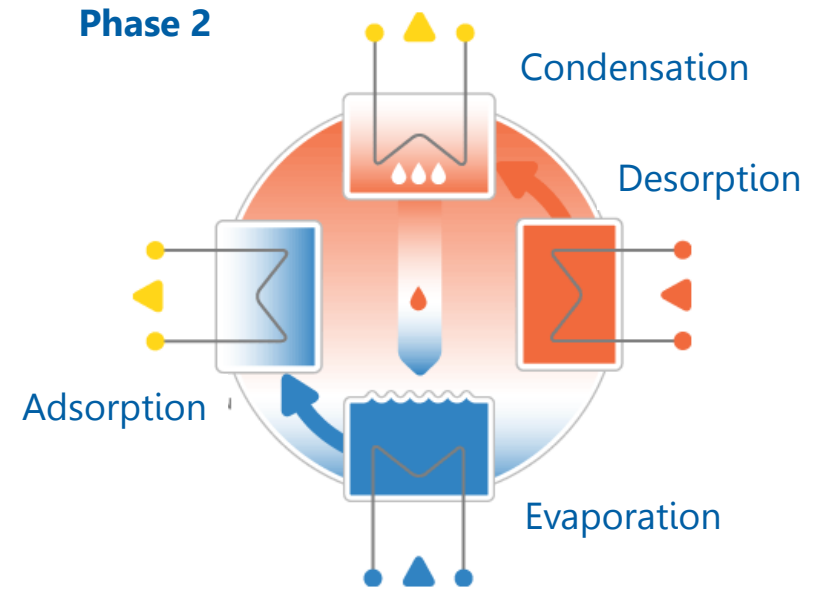
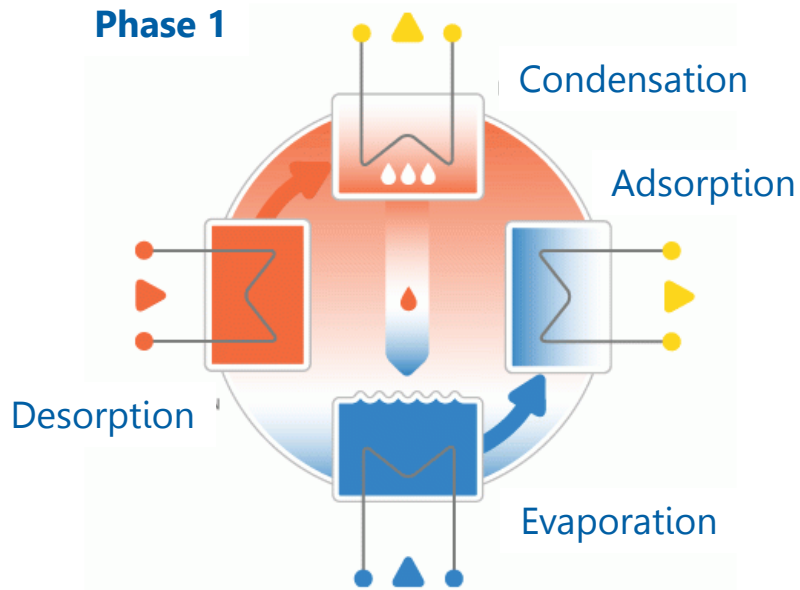
- amorphous  $\text{SiO}_2$
- very high internal surface:  $>600 \text{ m}^2 / \text{gram}$

### Zeolite

- Surface:  $>1000 \text{ m}^2/\text{gram}$
- Material specially designed for heating and cooling applications



# ADsorption process



- ▶ Cooling – Uptake of energy of the evaporation
- ▶ Thermal drive – Heating of the Adsorbers
- ▶ Recooling – Heat removal out of the system

# Possible heat sources for various cooling uses

## Using low-temperature heat sources...



### Waste heat

- production processes
- cogeneration



### District heating



### Solar heat



## ... for cooling:

Offices and stores



Industrial applications



IT and server rooms



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# Cooling machines of the LTC 30 e series

## Best values for power savings

- Powerful, highly efficient hydraulics and integrated Smart Controller
- Up to 70 % less power consumption compared to conventional compressors
- High efficiency mode can be activated on the display for optimum heat utilization
- Cooling capacities between 10 and 35 kW
- Internet interface, UDP interface



# Cooling machines of the LTC 90 e series

## Particularly wide range of services

- Cooling capacity between 30 and 105 kW
- Up to 70 % less power consumption compared to conventional compressors
- Incl. already installed hydraulics
- Ideal for industry
- Free cooling function at outside temperatures from approx. 15° C
- Internet interface, UDP interface





# Product range

## **ADsorption chillers (AdKMs)**

„LTC 30 e“ for cooling capacities up to 90 kW  
„LTC 90 e“ for cooling capacities up to 360 kW  
incl. recoler, hydraulic components,  
CHPs, installation, ...

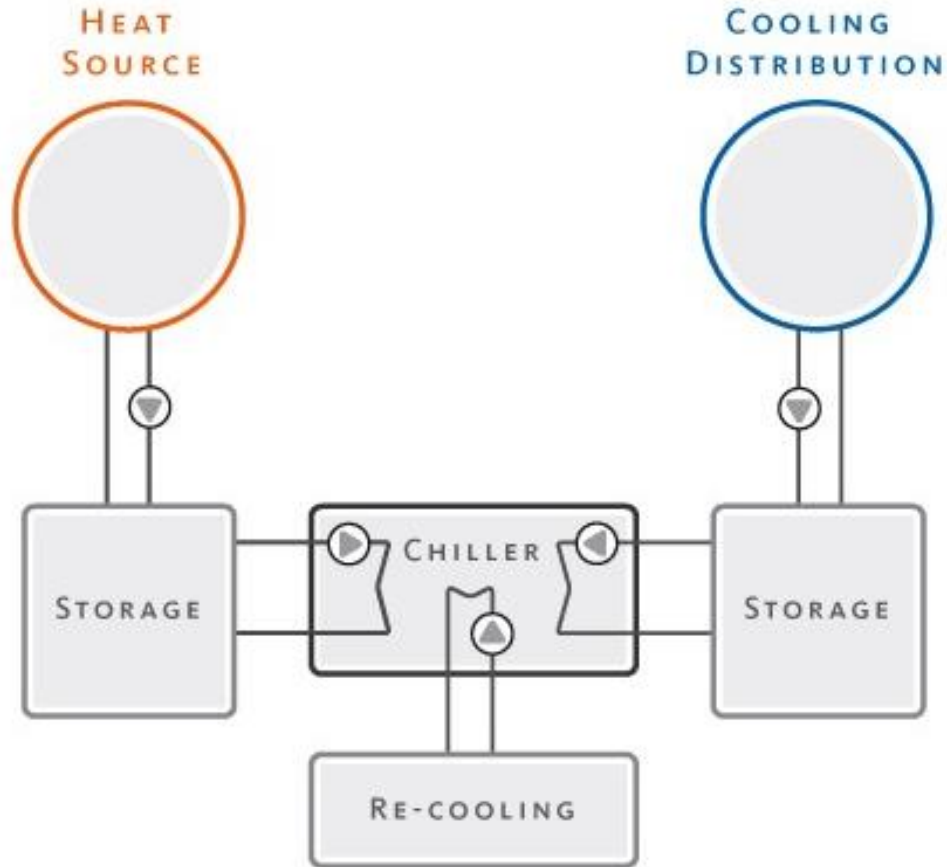
## **InvenSor is a system provider:**

- **complete cooling systems**
- **complete cogeneration systems**
- **turn-key container systems**



Look in the InvenSor Container

# Adsorption cooling systems



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# Plastic injection molding-cooling

## Bühler Motor GmbH, Monheim, Germany – 1st Project

Chillers	5 InvenSor LTC 10 plus
Chilling capacity	50 kW
Driving energy	4x Air compressors 120 kW th.
Cooling application	Tool cooling system



In operation since august 2015



# Plastic injection molding-cooling

## Schmidt Kunststoffverarbeitung GmbH & Co. KG, Emsbüren, Germany

Chillers	1 InvenSor LTC 90 e plus –
Chilling capacity	90 kW
Driving energy	CHP 2G
	123 kW th. / 100 kW el.
Cooling application	Tool cooling system



# Plastic injection molding-cooling

## Busch-Jaeger Elektro GmbH, Bad Berleburg, Germany

Chillers	4 InvenSor LTC 30 e plus 3 InvenSor HTC 18 plus
Chilling capacity	174 kW
Driving energy	CHP 2G 290 kW th. / 250 kW el.
Cooling application	Tool cooling system

Top 3 Industrie  
Handelsblatt  
**ENERGY  
AWARDS**  
2017



In operation since September 2016



# Metal processing

## Gebrüder Eberhard GmbH & Co.KG, Nordheim, Germany

Chillers	4 InvenSor LTC 30 plus
Chilling capacity	120 kW
Driving energy	Air compressor + CHP
Cooling application	Cold water pool



In operation since october 2017

# Machine cooling

## Miele & Cie. KG, Bünde, Germany

Chillers	11 InvenSor LTC 10 plus
Chilling capacity	110 kW
Driving energy	CHP Viessmann 370 kW th. / 240 kW el.
Cooling applications	Cooling of eroding maschinen



In operation since April 2015



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# Room cooling

## Marburg – Germany

Chillers	3x InvenSor LTC 09
Chilling capacity	27 kW
Driving energy	Solar thermal collectors
Cooling applications	Chilled air distribution



In operation since July 2011

# Office room cooling

## **Turin – Italy, Tekno Energy**

Chiller	InvenSor HTC 10
Chilling capacity	10 kW
Driving energy	flat plate collectors



In operation since April 2011



# Hotel room cooling

## Cuiabá – Brazil

Chiller	InvenSor HTC 10
Chilling capacity	10 kW
Driving energy	solar thermal collectors



In operation since February 2011

Photos: Pousada do Parque



# Thank you for your attention!

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