Company Presentation

GIG KARASEK – WHO WE ARE

Globally acting, Austrian supplier of thermal separation and environmental technology

Our offering

- Core competence: Design and manufacturing of falling-film, thin-film, short-path, distillation and drying technology
- Technology for CO_2 valorization and industrial heat pump solution
- Projects ranging from pilot plants and skid units to turnkey plants on EPC basis
- Own technical center for trials and R&D

"Our motto "Concentrating the Essentials" perfectly fits to our approach and way of working. We are focusing on utmost efficiency – both, in our core competences but also in new environmental technologies."

Andreas Schnitzhofer, General Manager

"We are proud on our extensive knowhow, top-quality technology and highly committed employees. We have everything in our hands for supporting our customers and being a valued industry partner."

Julia Aichhorn, General Manager

HISTORY AND MILESTONES

1933 — **Franz Karasek opens a metal workshop**

1996 — **Acquisition of Grill & Grossmann**

1998 — **Acquisition of Austrian Energy & Environment**, plate type evaporator production plant

1998 — Formation of **Karasek Group**

2004 — **Merger** of GIG and Karasek **to GIG Karasek** and rebranding

2008 — Opening of **Technical Center**

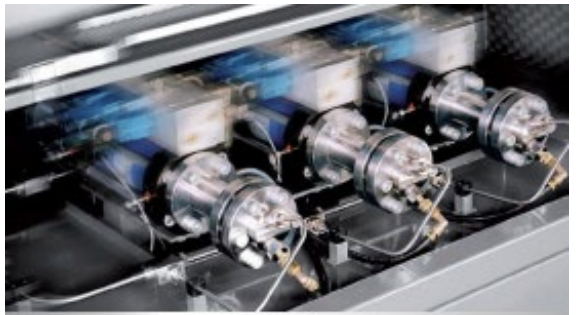
2016 — GIG Karasek becomes **part of Dr. Aichhorn Group**

2022 — New business unit **Environmental Technologies** with focus on CO_2 valorization

DR. AICHHORN GROUP

BHDT

Worldwide manufacturer and provider of high-pressure equipment and high-pressure components for the chemical and petrochemical industries



BFT

European producer of high-pressure pumps with operating pressures between 200 and 1,200 Mpa

GIG KARASEK

Globally acting, Austrian supplier of thermal separation and environmental technology

FORSTGUT DR.AICHHORN

The Dr. Aichhorn Forestry Estate is sustainably managed according to the latest forestry knowledge available

GIG KARASEK – OUR BUSINESS UNITS

Conventional Evaporation Technology

Different types of evaporators and tailor-made process solutions for high evaporation rates

Thin-film and Short-path Technology

Different types of evaporators for complex tasks and tailored process solutions

Environmental Technologies

CO_2 valorization and industrial heat pump technology for a sustainable economy

Technical Center

Laboratory tests, pilot test and scale up concepts for thermal separation and environmental technologies

KEY FACTS AND FIGURES

~ 30 € MIO. ORDER INCOME

Average during the past 10 years

125 EMPLOYEES

+ temporary workers depending on workload

NUMEROUS successfully completed **PROJECTS** on a global scale

GLOBALLY REPRESENTED by international partners and representatives

Own WORKSHOPS

in Austria, plus a global network of qualified sub suppliers

Own TECHNICAL CENTER

for testing, scale up and R&D

CERTIFICATES AND APPROVALS

ISO 9001, EN ISO 45001 PED, AD 2000, ASME, SQL (China)

Comprehensive **SERVICE CAPABILITIES**

Spare parts, IIoT solutions, financing

OUR LOCATIONS IN AUSTRIA

1

Gloggnitz-Stuppach
2640 Neusiedlerstraße 15-19

Headquarters, manufacturing for conventional evaporation technology, technical center

2

Attnang-Puchheim
4800, Industriestraße 21

Engineering and manufacturing for the areas thin-film, short-path and CO_2 valorization technology

3

Graz
8055, Brauquartier 21, 1 OG., Top 9

Process- & plant engineering for conventional evaporation and industrial heat pump technology

INTERNATIONAL REPRESENTATIONS

GLOBALLY REPRESENTED by international partners and representatives

CONVENTIONAL EVAPORATION TECHNOLOGY

Suitable for low-viscous and non-sensitive substances

- Conventional evaporator types:
  - Plate falling-film evaporator
  - Tube falling-film evaporator
- Rectification / distillation systems
- Energy optimized systems
  - Multiple Effect Evaporation
  - MVR (Mechanical Vapor Recompression)
  - TVR (Thermal Vapor Recompression)

TYPICAL KEY PARAMETERS	
Feed	approx. 1 t/h to > 1000 t/h
Viscosity	up to approx. 250 mPa·s

CONVENTIONAL EVAPORATION TECHNOLOGY

LACTIC ACID

STARCH PROCESSES

SOLVENT RECOVERY

LYOCELL

KRAFT PULP PROCESS

SULFITE PULP PROCESS

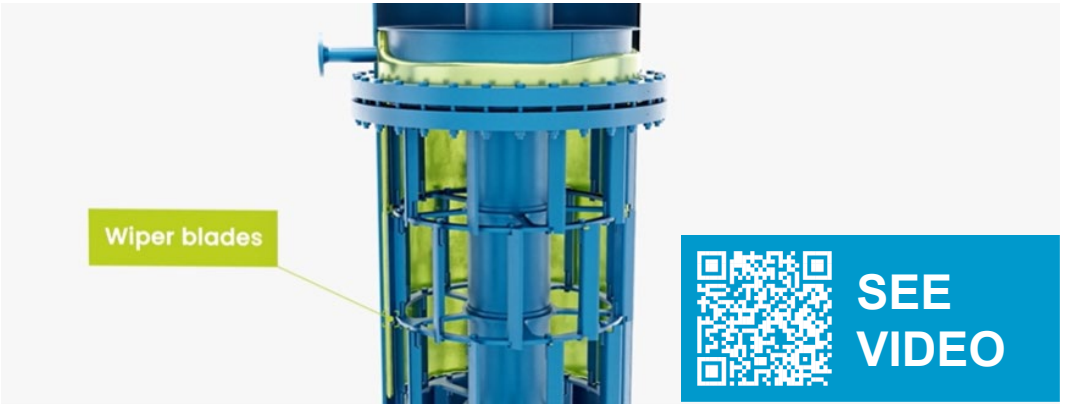
BIOREFINERY

(BIOLOGICAL) WASTEWATER

THIN-FILM AND SHORT-PATH TECHNOLOGY

For high-viscous and sensitive applications

- Thin-film evaporator
- Thin-film dryer
  - Horizontal
  - Vertical
- Viscofilm evaporator
- Short-path evaporator
- Miniplant



KEY PARAMETERS	
Feed	approx. 10 kg/h to 20.000 kg/h approx. 10 kg/h to 50 kg/h (Miniplant)
Temperature	up to approx. 390°C
Min. operating pressure	approx. 0,001 mbara
Viscosity	< 5.000 Pa·s (Viscofilm)

THIN-FILM AND SHORT-PATH TECHNOLOGY

GIG KARASEK
A Member of Dr. Aichhorn Group

USED OIL

LECITHIN

BASIC CHEMICALS

HIGH-VISCOUS MEDIAS

TALL OIL

SILICONE OIL

MUNICIPAL & INDUSTRIAL SLUDGE

ISOCYANATE

EPOXY

BIODIESEL

GLYCERINE

LACTIC ACID

CO_2 VALORIZATION – ECO2CELL

ECO2CELL

CO_2 emissions released by burning of fossil fuels contribute significantly to greenhouse effect and global climate change

We have set ourselves the task to contribute to the worldwide efforts of **Carbon Capture, Utilization and Storage (CCUS)**

- New business unit for **carbon utilization** formed in 2022
- Focus: **Electrochemical transformation of CO_2 in valuable chemicals and fuels**
- Perfectly suited for carbon-intensive industries

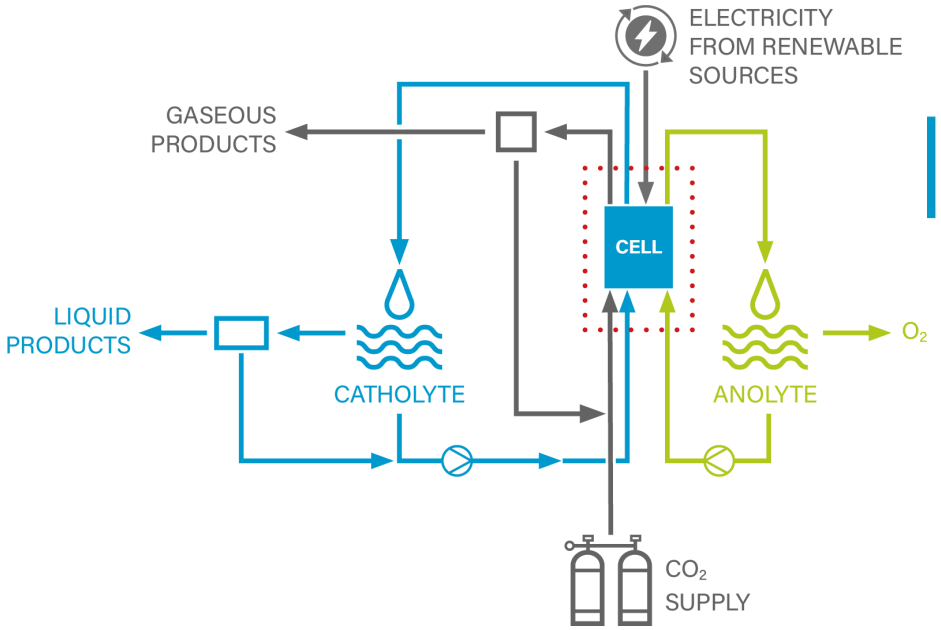
Our milestones

- Patented CO_2 electrolysis cell
- Demonstration of viability on a pilot scale
- Ongoing: development to industrial-scale

CO_2 VALORIZATION – ECO2CELL

FUNCTIONAL PRINCIPLE

System uses CO_2, water and electricity for production of different carbon compounds



ECO2CELL

ADVANTAGES

- **Product diversity**: production of a wide range of valuable products
- **Zero-emissions** thanks to combination of water and electricity from renewable sources
- **Scalable to customer demand**
- **Mild process conditions**
- **No hydrogen** for process needed

POSSIBLE END PRODUCTS

- Synthesis gas
- Ethylene
- Formic acid
- Methanol
- Further chemicals and fuels on request

INDUSTRIAL HEAT PUMP SOLUTION

CompriVAP

For sustainable industry processes:

Reduction of primary energy demand and operating costs by **waste heat utilization**

Our solution: **Industrial heat pump system for recovery and reuse of vapor**

FUNCTIONAL PRINCIPLE

Possible input: waste steam or liquid

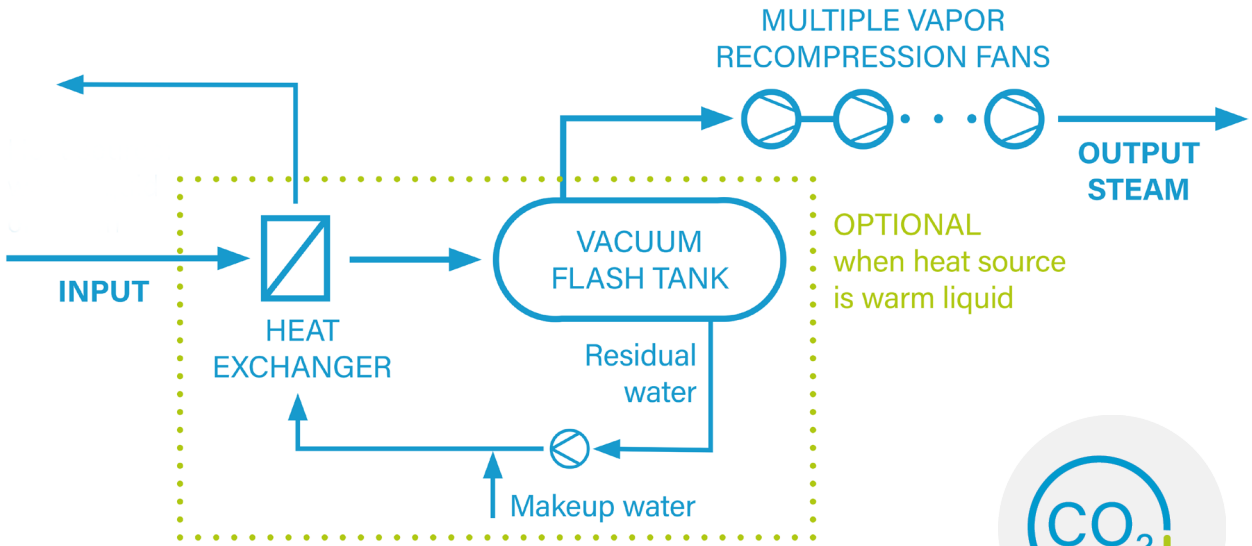
Energy level of steam is raised by means of MVR (Mechanical Vapor Recompression) fan(s)

© Piller

INDUSTRIAL HEAT PUMP SOLUTION

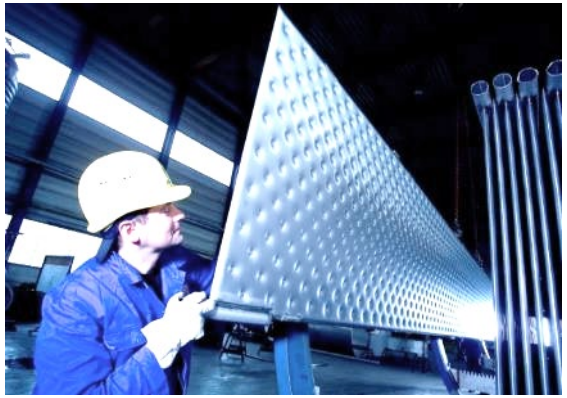
ADVANTAGES

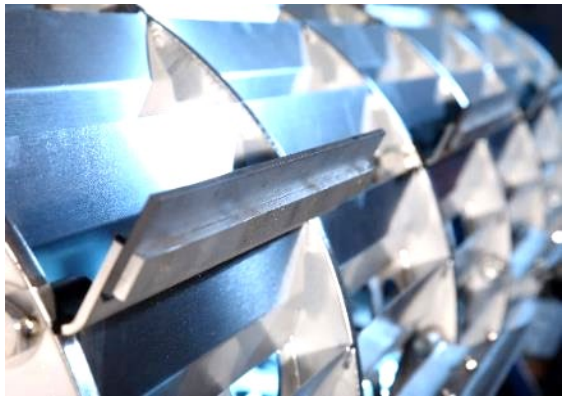
- **Reuse waste heat** → significant reduction of CO_2 emissions possible
- **Economic use of resources** → less fresh steam and cooling water demand
- High potential of **OPEX savings**
- Straightforward and **fast (retrofit) installation**



CompriVAP

SERVED INDUSTRIES


- Pulp industry (kraft, sulfite, dissolving)
- (Bio)refinery industry
- Fiber industry
- Alternative fuel industry
- Chemical industry
- (Bio)plastic industry
- Food and feed industry
- Processing of industrial wastewater
- Carbon-intensive industries

OUR SCOPE OF SERVICES

ENGINEERING

MANUFACTURING & PROCUREMENT

SUPERVISION & INSTALLATION

COMMISSIONING, START-UP & TRAINING

ALL PROJECT SIZES
(pilot plant, skid unit to turnkey projects)

AFTER SALES SERVICE

PROJECT MANAGEMENT & CONTROLLING

QUALITY, HEALTH & SAFETY

- **Consulting and studies**
  - Pre-engineering
  - Expansion concepts / energy optimization
  - Trouble shooting
- **Technical center and R&D**
  - Laboratory tests
  - Pilot tests
  - Scale up concepts
- **Greenfield and brownfield**
- **Optimization and modernization**
  - Revamping / Retrofitting
  - Debottlenecking

WORKSHOPS – EQUIPMENT MADE IN AUSTRIA

Own WORKSHOPS

in Austria, plus a global network of qualified sub suppliers

- High-quality key components and high-performance, high-pressure equipment
- In **Gloggnitz**
  Focus on plate and tube falling-film evaporators, lamella production
- In **Attnang-Puchheim**
  Focus on rotating evaporators: Thin-film and short-path technology
- Workshop capacity:
  80,000 man-hours per year

WORKSHOPS – EQUIPMENT MADE IN AUSTRIA

MATERIALS

- Rust/acid-resistant steel grades
- Duplex steel
- Fine-grained structural steel, low-carbon, high-temperature, and heat-resistant steels
- Plated steel grades
- All nickel-based alloys
- Titanium grades 1, 2, 7, 11

SURFACE TREATMENT

Pickled, passivated, sanded and electropolished Ra < 0,4 µm

STANDARDS

Certifications: DGRL 2014/68/EU, AD2000 HP0, EN ISO 3834-2, EN 1090-2, ASME VIII-1, CML

Test procedures:
VT, PT, MT, RT and UT

SINCE 2008 – TECHNICAL CENTER

Own TECHNICAL CENTER

for testing, scale up and R&D

High-quality test infrastructure for customized trials

- Laboratory evaporator
- Thin-film evaporator
- Short-path evaporator
- Horizontal thin-film dryer
- High-viscous evaporator
- Falling-film evaporator
- CO_2 valorization equipment

MINI-PLANT – COMPLETE PLANT IN SMALL SCALE

For trials and production of very small quantities

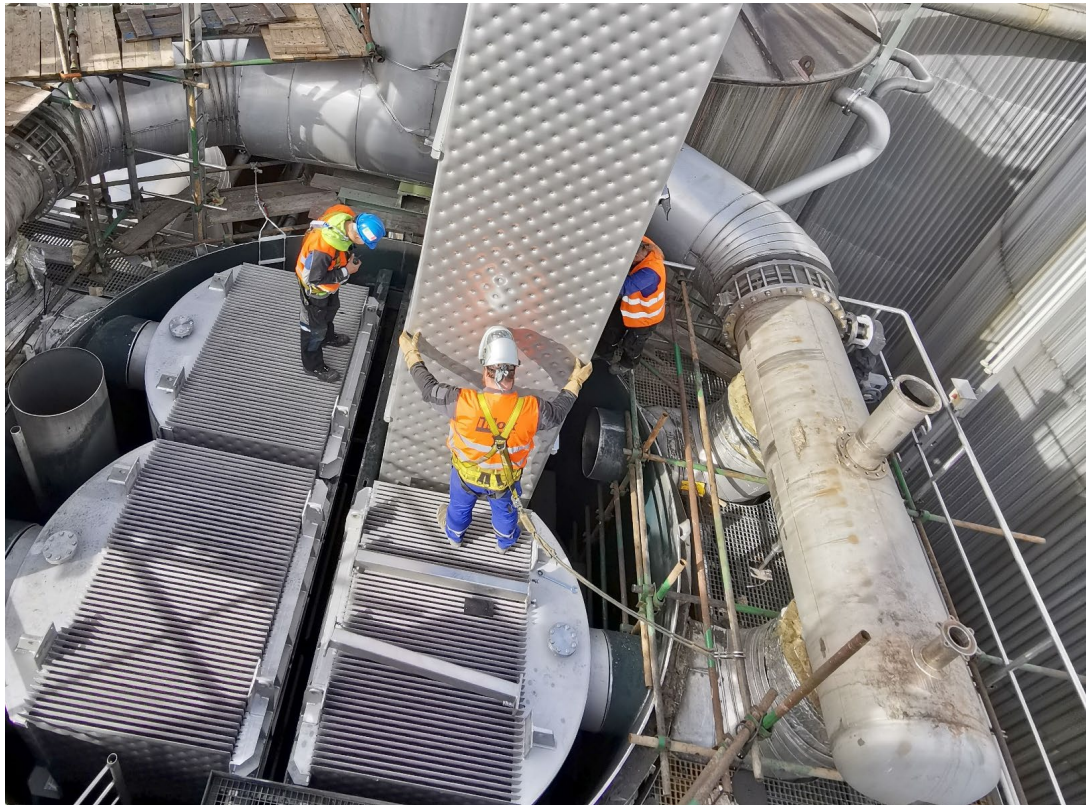
- On-site trials
- Production of very small quantities
- Versatile/multifunctional use
- Plug-and-play principle
- Can be used for temperature-sensitive, highly viscous and explosive media
- Compact size
- Continuous data recording
- IIoT features possible

TARGETED MODERNIZATION MEASURES

Keeping existing production systems competitive with **revamping**, **retrofitting**, and **debottlenecking**

Range of services

- On-site assessment and inventory
- Detailed examination and inspection
- Development of a strategy/concept
- Supply of replacement equipment, replacement of obsolete components
- Installation- and commissioning monitoring (warranty for new components supplied by GIG Karasek)



INDUSTRIAL INTERNET OF THINGS (IIoT)

Using the high potential of industry 4.0

Focus on the optimum point of plant operation with the **GIG Karasek Digitalization Platform**

Perfectly suited for optimization of single machines, stand-alone systems or complete plants

Our **Smart Services**:

- Digital Twin
- Conditioning Monitoring
- Predictive Maintenance
- Optimization as a Service

For more flexibility in financing:

- Pay per Use
- Equipment as a Service (EaaS)

INTERESTED TO LEARN MORE?

Read the GIG Karasek Insights!

We‘ve posted articles and whitepapers about following applications/topics:

- Sulfite liquor
- Biodiesel
- CO_2 utilization
- Lecithin
- Digitalization and IIoT
- Case studies… **More to come!**

TO THE BLOG

GIG Karasek GmbH
Neusiedlerstrasse 15-19
A-2640 Gloggnitz
+43 / 2662 / 42780
office.gigkarasek@gigkarasek.at
www.gigkarasek.com

GIG KARASEK
A Member of Dr. Aichhorn Group

Concentrating the Essentials