BRONSWERK HEAT TRANSFER
Dynamic Heat Exchange Solutions

Dynamic ACC Solutions

Debottlenecking ACC

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BRONSWERK
HEAT TRANSFER
Dynamic Heat Exchange Solutions

History:

1940

1988 – Privately owned

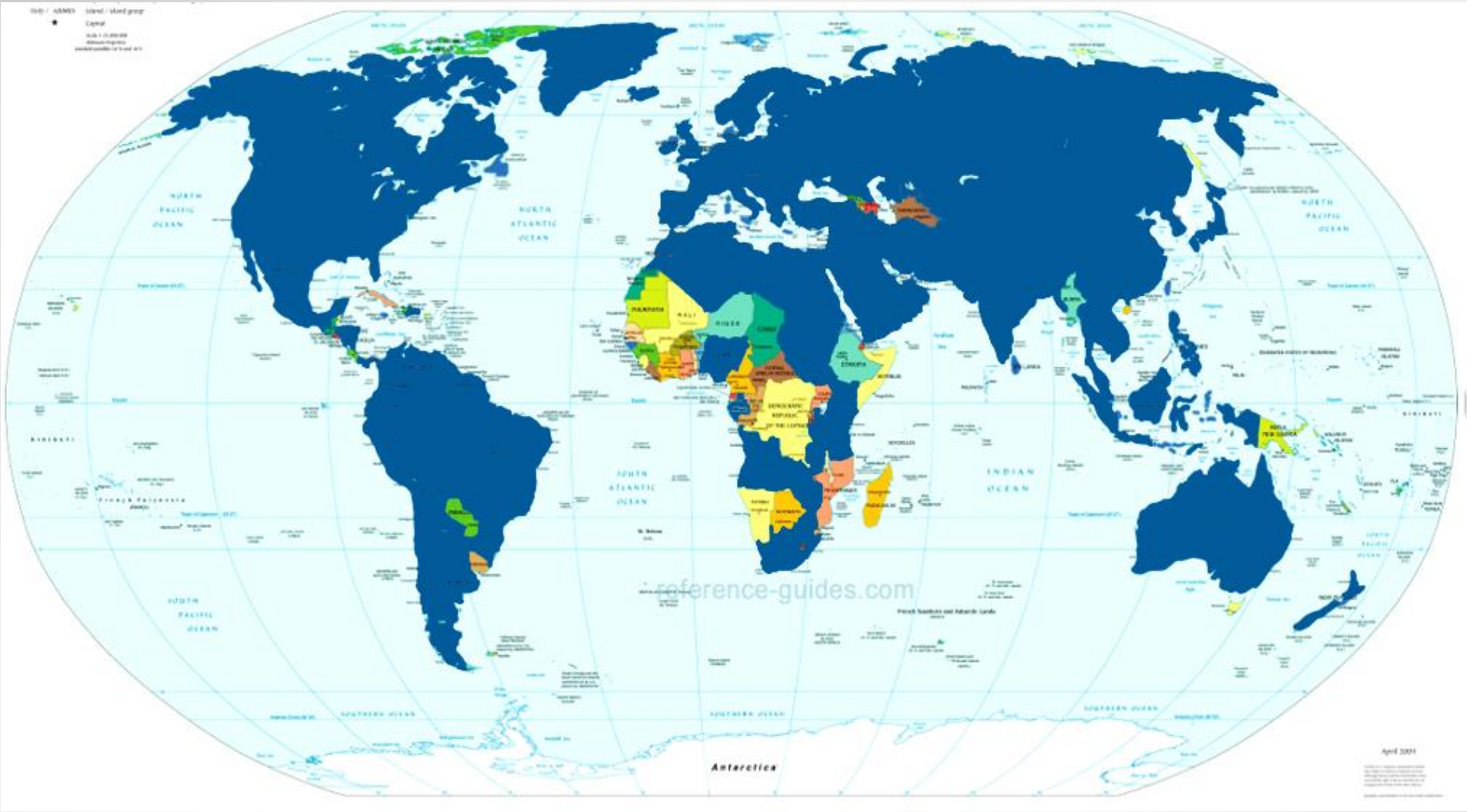
2014

Our markets:

- Power
- Oil
- Gas
- Chemical
- Air Handling
- Food Processing

Sustainability

Service & Maintenance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INDIAN OCEAN
SOUTH PACIFIC OCEAN
SOUTHERN OCEAN
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BRONSWERK
HEAT TRANSFER
Dynamic Heat Exchange Solutions

What we do:

- Process design
- Thermal design
- Mechanical design
- Manufacturing
- Supply
- Installation & Commissioning
- Maintenance

Condenser systems since 1980:

From 1980 Water Cooled Condenser

From 1995 ACC

JV between Bronswerk & Elflow

ELBRONS®

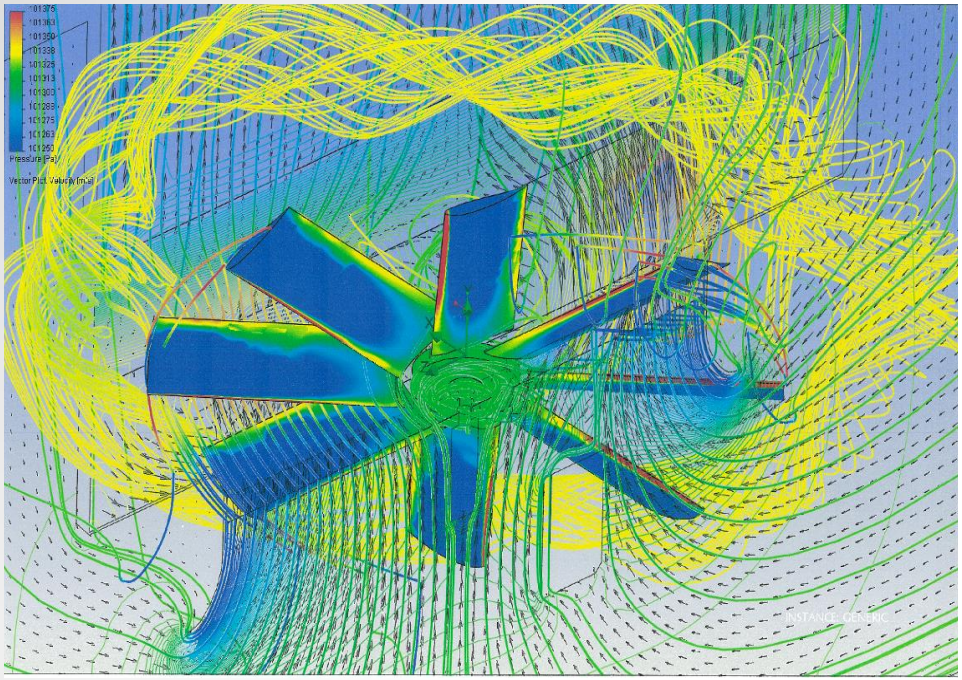
Fogging · Screens · Cleaning

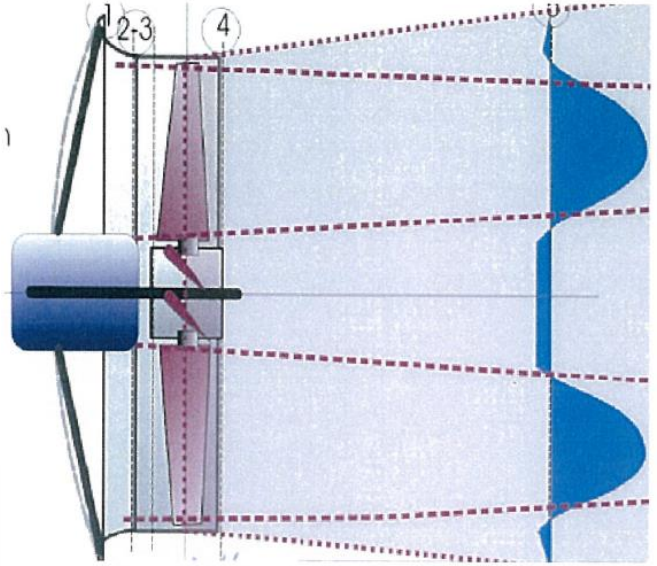
Whizz-wheel®:

Main purpose:

Develop ultra low noise fans to meet the stricter client requirements.

Conventional :



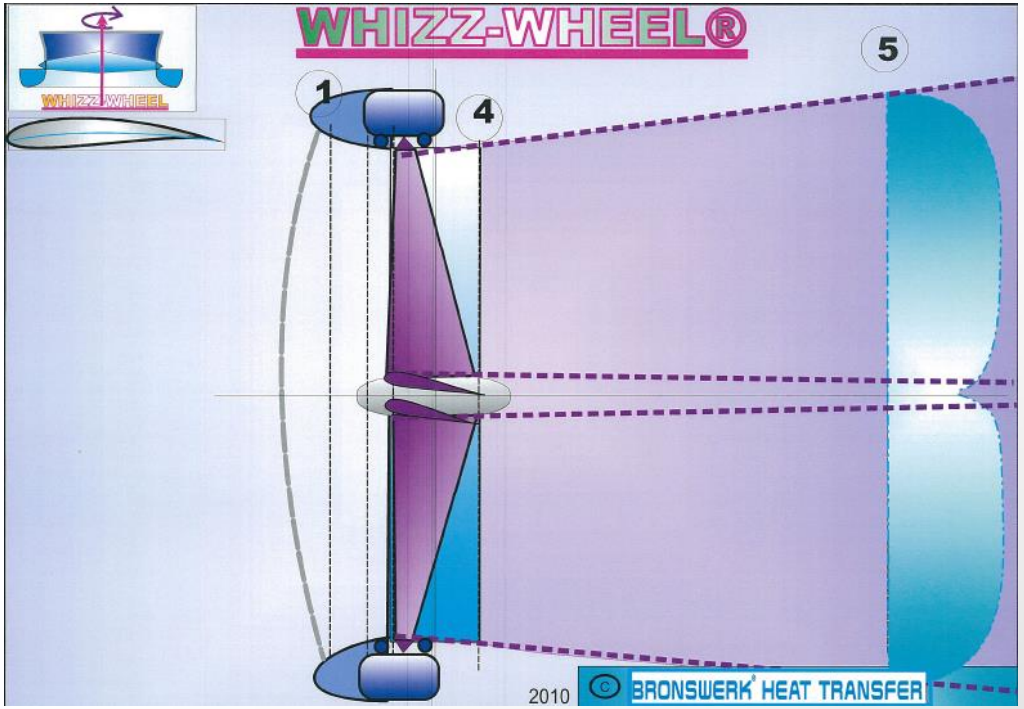


RS 725: “the pressure measurements taken show the static pressure in the chamber decreasing towards the centre of the swirling core and the average of the pressures measured in the chamber is lower than the pressure measured at the wall static tappings.”

Whizz-wheel®:

Main features

- Rim
- Small hub
- Blades are fully curved



Whizz-wheel® :

Developed for low noise: 6 – 20 dB lower noise

Benefits:

- 45 - 60% lower absorbed power
- Up to 40% more cooling air flow with same absorbed power
- Or a combination

- Minimal vibrations
- Rigid construction
- Less sensitive to wind

CASE 1: Debottlenecking

Waste to Energy plant – Germany
AVA - Velsen

Case description :

Plant

- 21MW waste to energy plant Germany
- 12 cell condenser
- 12 x 16ft low noise fans installed

Problem:

1. Unstable fans
2. Sound problems

Plant operating at 60% of it's capacity.

Three possible solutions :

Option 1: replace existing fans with same fans
- Lowest investment cost
- Not meeting future noise restrictions

Option 2: Replace existing fans with other low noise fans
- Lowest investment cost
- Not meeting future noise restrictions

Option 3: Replace existing fans with Whizz-wheel®
- Reduced vibrations
- 6 dB lower sound power level
- 45% lower absorbed power guaranteed
- Cost $323.000,- higher than Option 1 or 2, with a return on investment of 2,6 years.

Conclusion:

AVA Velsen was convinced of the advantages and therefore has chosen for new Whizz-wheel®

- Production back up to 100%
- Elimination of all noise issues
- Fan power reduced with 56%
- ROI: 2,6 years
- No vibration issues

CASE 2: Debottlenecking

Waste to Energy plant – Germany
EON - Neunkirchen

Case description:

Plant

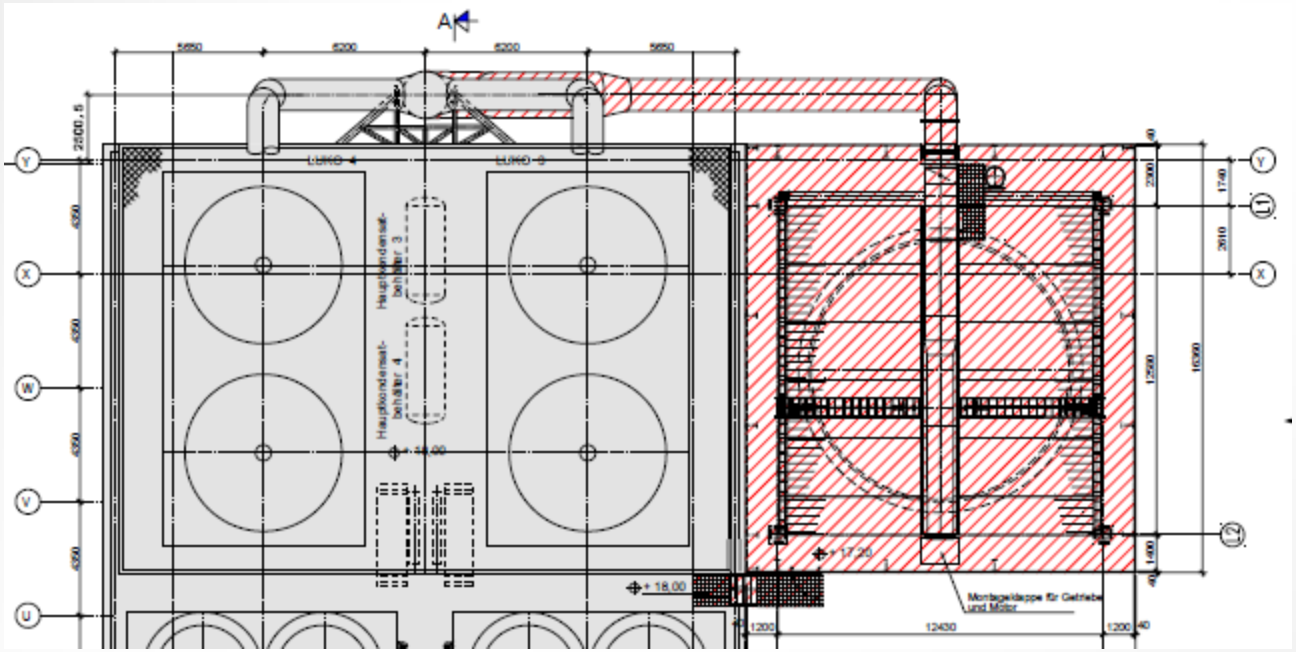
- 11,6MW Electric & 22 MW city heating
- Waste to energy plant Germany
- 4 cell condenser

Problem:

- Increased condenser pressure at high ambient temperatures
- High risk for turbine trips
- Increased steam flow

Solutions :

Solution was already selected by Client – 1 extra big cell



Conclusion:

Restrictions:
- minimized plot space due to permit limits 16 x 15m
- Sound power level of new bay should be lower than 85 dB(a)
- Tie inn with all existing equipment & piping

Bronswerk could only meet the first two demands by using the Whizz-wheel. The first time in a power plant.

E.ON Neunkirchen wins ERNIE price:

Quote: EON won the "ERNIE" energy efficiency award on Nov 15, 2012. The jury concluded that the overall plant efficiency was worth the ERNIE. This due to a combination of the increased steam flow and the Whizz-wheel® fan providing 20% more air with the same motor power.

Presented solutions:

- ✓ Additional bays
- ✓ Whizz-wheel®

Additional services:

- ✓ Site survey
  - Bronswerk provides a complete report with solutions
- ✓ Cleaning installations
  - reliable and faster cleaning / less down time
- ✓ Wind screens
  - Less fouling, less wind disturbance, less hot air recirculation and better mechanical performance of existing fans.

Thank you for your attention.

Questions?

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