



Galebreaker Industrial has grown from a niche operation to a multi-national success story. Located in a 40,000 square foot facility in the UK, the company has been designing and manufacturing Wind Shield solutions for over 30 years.

Galebreaker is involved in projects all over the world providing tailor-made solutions to the power industry, typically air cooled condensers, to combat the problems they encounter during windy conditions. Wind shear, jet stream, fan stalls and mechanical stress are all common symptoms that adversely affect ACC performance. Galebreaker has helped to significantly improve ACC vacuum, power output and reduce fan blade damage and other mechanical stresses.

Galebreaker Industrial Ltd
Galebreaker House
New Mills Industrial Estate
Ledbury
Herefordshire
HR8 2SS, UK.

Tel: +44 (0)1531 637900
Fax: +44 (0)1531 637901
Web: www.galebreaker.com



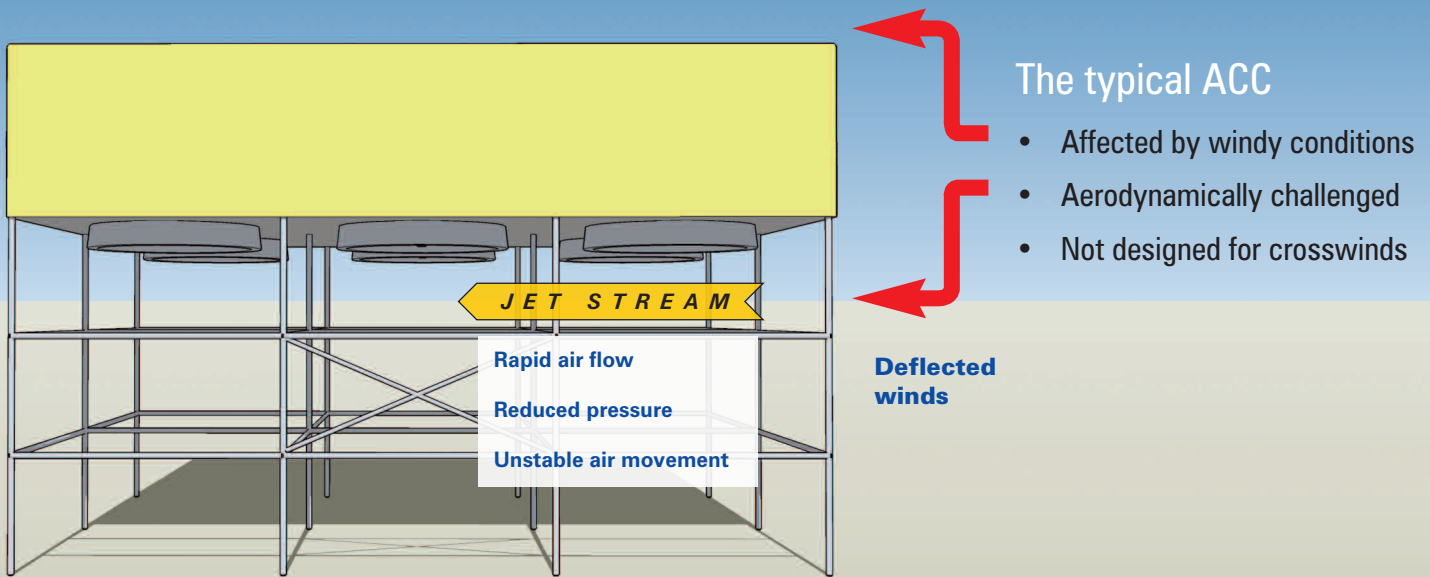
Tailor-Made Solutions for Air Cooled Condensers



*FLEXIBLE
WIND SHIELD
SOLUTIONS*



Windy Conditions and the Air Cooled Condenser



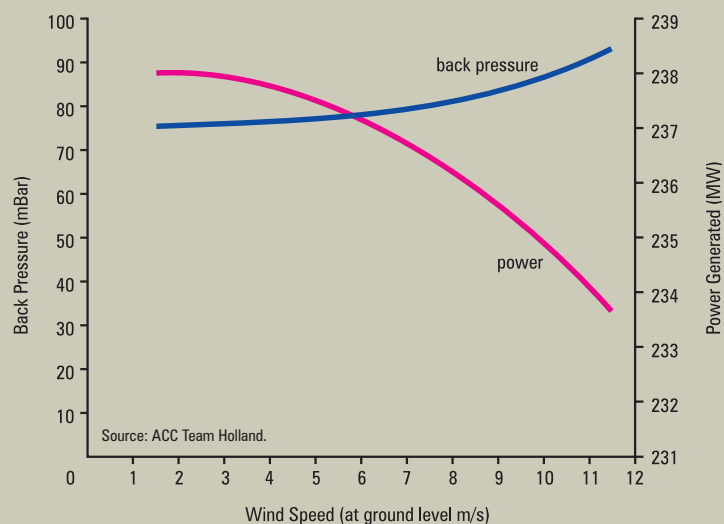
The impact on the fans

- High wind load on the fan blades
- Loss of pressure beneath the fans
- Less airflow through the fans
- Mechanical stresses
- Fan and motor damage

The impact on the ACC

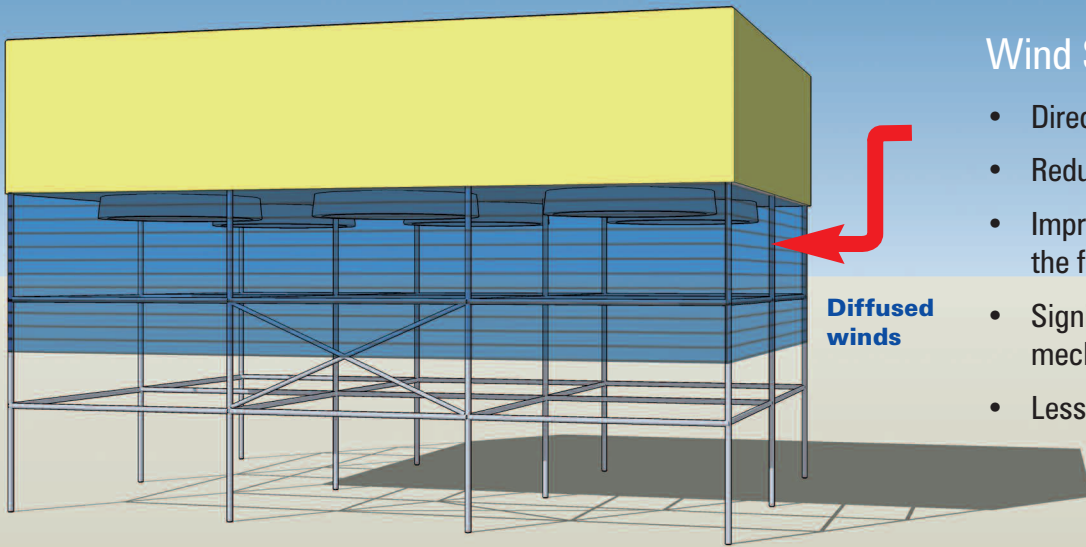
- Wind shear
- Increases in back pressure
- Increased fouling
- Drop in vacuum performance
- Decline in power output

The effect of crosswinds



The Galebreaker Fixed System Solution

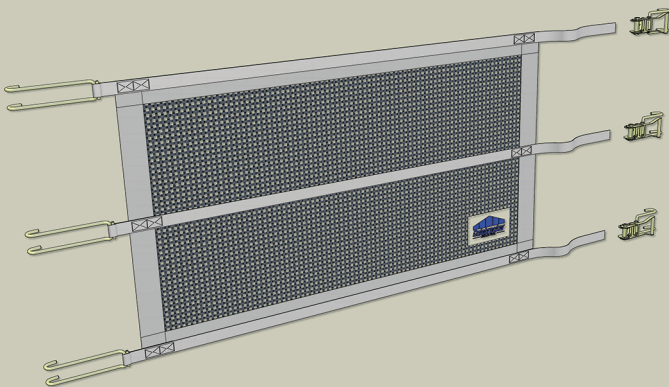
International patents



Wind Shield benefits

- Direct impact on the jetstream
- Reduces wind shear
- Improves pressure beneath the fans
- Significant reduction in mechanical stress
- Less opportunity for fouling

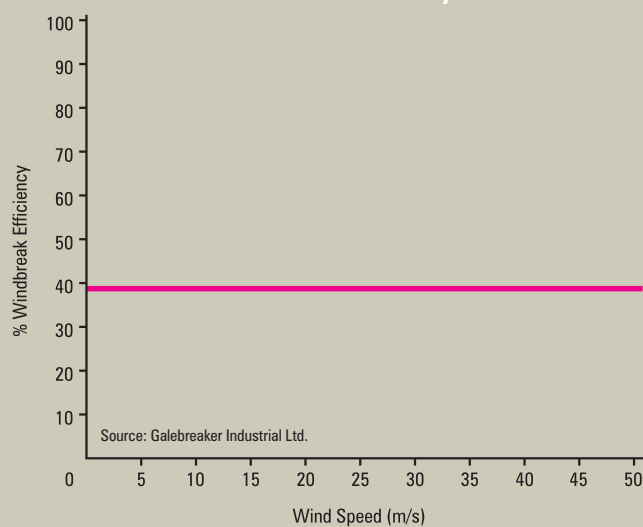
Wind Shield construction



Tailor made for each site

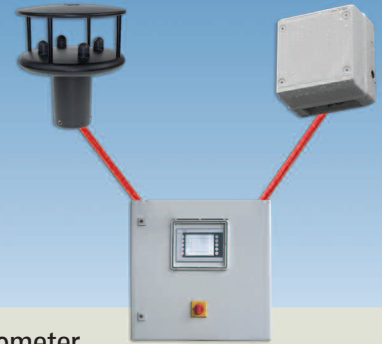
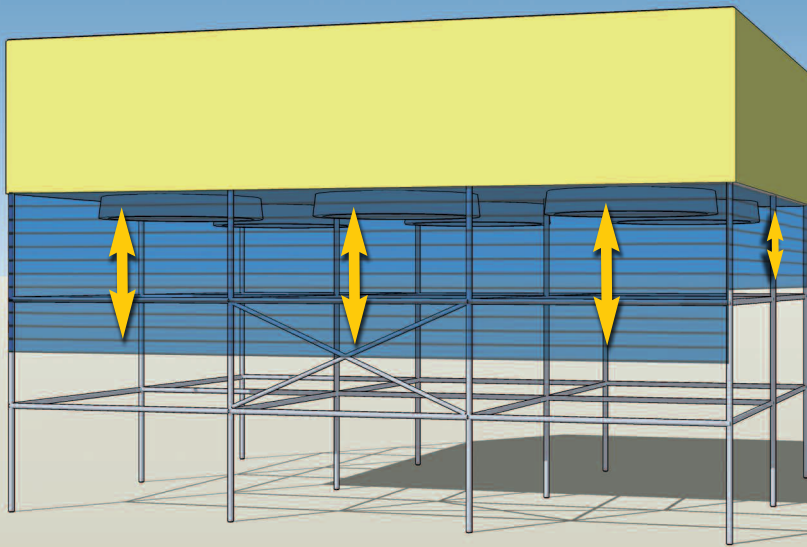
- Strong and lightweight
- Easy to install
- Up to 120 mph wind rating
- UV stabilized
- Maintenance free
- Rot proof
- Flame retardant

Windbreak efficiency



The Galebreaker Rolling System Solution

International patents



- Anemometer
- Temperature sensor
- Control box

Automatic Rolling System

- Same materials and benefits as the Fixed System
- Wind Shields linked to an automatic weather control system
- Wind Shields operated independently in response to weather conditions
- Optimized ACC conditions
- Improves ACC vacuum
- Structural wind loading reduced

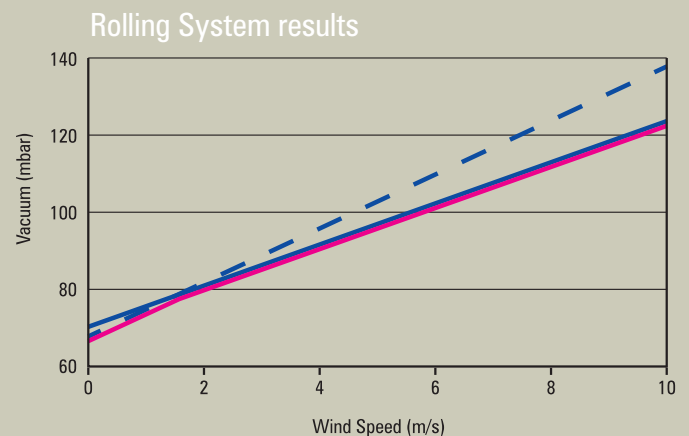
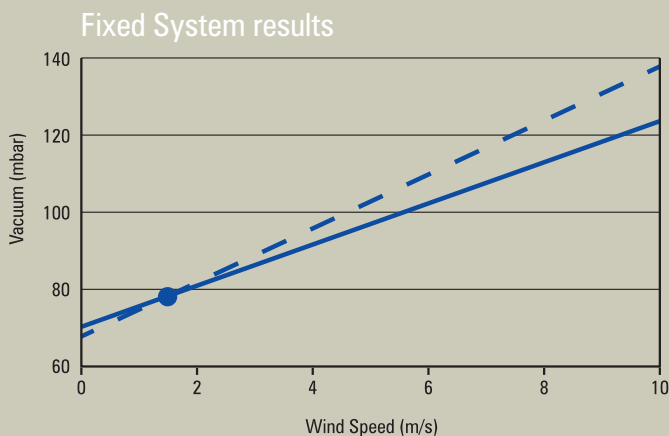
Vacuum v wind speed

Performance:

without Wind Shields

with fixed Wind Shields

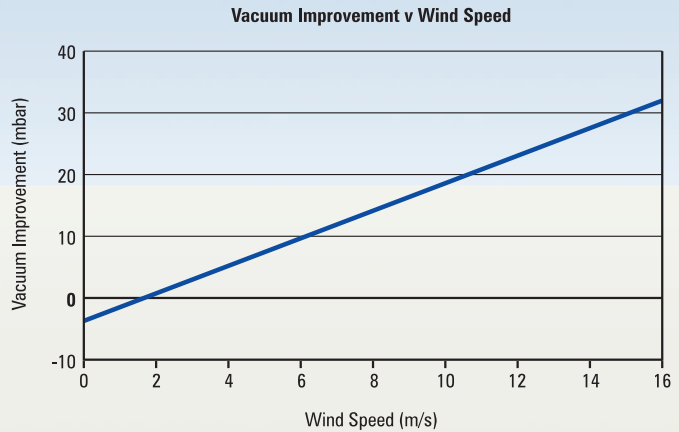
with Rolling System



Performance Case Studies

Coryton Power Station UK – 750 MW – 40 cell (8x5)

- 10 mbar vacuum improvement at 6 m/s wind speed
- ROI 15 months
- Noticeable reduction in fan maintenance



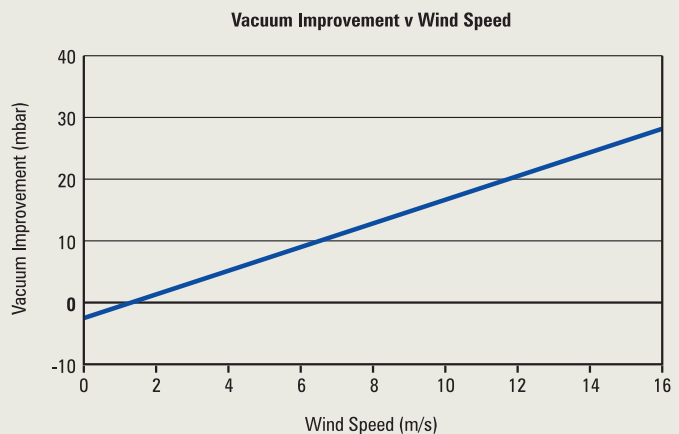
Source:

Rob Bailey – Coryton Power Station Operations Manager

Simon Melhuish (CEng, MIET, MIAgE) – Galebreaker Operations Director.

Kings Lynn Power Station UK – 340 MW – 16 cell (4x4)

- 9.5 mbar vacuum improvement at 6 m/s wind speed
- Noted additional benefits and savings due to less stress on fans, motors and gearboxes



Source:

Edmund Wiglusz – Kings Lynn Mechanical Performance Engineer

Simon Melhuish (CEng, MIET, MIAgE) – Galebreaker Operations Director.

Galebreaker Customers

Installation	Power Station	No. Wind Shields	Position	Shield Size	Manufacturer	Output
1998	Kings Lynn, UK	14	Cross	11 m x 6.5 m	SPX	360 MW
1999	Peterborough, UK	6	Outer	9 m x 6.5 m	GEA	380 MW
2001	Barry, UK	4	One bay in	12 m x 8 m	GEA	250 MW
2003	Big Horn, USA	30	Outer	14 m x 6 m	SPX	500 MW
2003	Hsin Tao, Taiwan	33	One bay in	13 m x 7.5 m	SPX	620 MW
2004	Coryton, UK	30	Outer	12 m x 5 m	GEA	753 MW
2005	Maalaea, Hawaii	6	One bay in	9 m x 2 m	SPX	215 MW
2006	Fengzhen, China	30	One bay in	12 m x 3.7 m	SPX	2x 600 MW
2006	Wijster, Netherlands	6	Outer	12 m x 6.3 m	SPX	110 MW
2007	Spalding, UK	24	Outer	12 m x 7 m	GEA	903 MW
2008	Sutton Bridge, UK	19	Outer	14 m x 8 m	SPX	2x 395 MW
2008	Gateway, USA	24	One bay in	13 m x 10 m	SPX	530 MW
2008	Thiva, Greece	10	One bay in	12.8 m x 5 m	SPX	430 MW
2009	Kuo Kuang, Taiwan	17	Outer	12 m x 8 m	GEA	480 MW
2010	Enfield, UK	20	Outer	10 m x 5 m	SPX	400 MW
2010	Langage, UK	22	One bay in	12 m x 5 m	SPX	850 MW
2011	Stevens Croft, UK	5	Outer	13 m x 4 m	GEA	50 MW
2011	Kings Lynn, UK	No. 1 Automatic Rolling System	Outer	36 m x 9 m	SPX	360 MW
2012	Star Buck, Taiwan	10	One bay in	13 m x 8 m	SPX	500 MW
2012	Ivanpah Solar, USA	48	One bay in	14.5 m x 5.5 m	SPX	400 MW
2012	Caithness Long Island, USA	No. 4 Rolling Systems	Outer	83 m x 5 m	GEA	350 MW
2012	Denizli, Turkey	6	One bay in	14 m x 5.4 m	SPX	775 MW
2012	Catalagzi, Turkey	9	Cross	12 m x 8 m	GEA	620 MW
2012	Dordecht, Netherlands	10	Outer	13.5 m x 6 m	SPX	75 MW
2013	Western Biomass Energy, UK	6	Outer	11.2 m x 2.5 m	GEA	48 MW
2013	Warren County (USA)	34	One bay in	14.5 m x 7.3 m	SPX	1300 MW

Testimonials:

“By 2006 we were experiencing significant performance issues with the ACC, and one of the main contributory factors were high wind speed conditions. Introducing Galebreaker Wind Shields as part of our ACC optimization programme has delivered excellent performance improvements throughout 2007 and 2008.” **Paul Hanson, Spalding P.S. Manager**

“It became clear that our southerly winds were causing pressure drops and maintenance problems on the ACC. We worked with Galebreaker who designed and installed Wind Shields to combat these issues, and now we have a low cost, maintenance free solution that works.” **David Snelson, Barry P.S. Plant Technician**

“During warm and windy conditions the ACC unit at Hsin Tao in Taiwan had performance problems, particularly poor vacuum measurements at the outlet of the steam turbine. After fitting the Galebreaker Wind Shields these specific issues were eliminated.” **Colin Pople, GE Facilities Manager.**

“Due to the severe storms we can experience at Long Island, the fan blades at Caithness have to cope with the stresses from high wind turbulence. After fitting Galebreaker Wind Shields it was immediately clear that more uniform airflow entered the windward side perimeter fans. Initial testing has shown significant stress reduction on the fan blades.” **Gary Mirsky, Caithness Long Island Energy Centre Consultant.**

Galebreaker Manufacture, Design & Installation



Galebreaker ACC Services

Option 1 – PI Data Analysis:

Review and graphical analysis of your current ACC PI Data. Will give you estimated performance improvement after the addition of Galebreaker Wind Shields. The following data is required over 12 months if possible, and at hourly intervals or better:

- Wind speed
- Wind direction
- Ambient temperature
- ACC vacuum
- Plant load

Option 2 – Standard Galebreaker Survey:

Includes PI data analysis, plus the following:

Site Survey – 1 day on site:

- Crosswind velocity measurements
- Smoke test

Site Survey Analysis:

- Smoke test video and conclusions
- Wind speed / direction conclusions
- Wind protection recommendations
- Quotation / Payback for your site

Option 3 – The ACC Doctor Survey

Includes the Standard Galebreaker Survey, plus the following:

The ACC Doctor – 2 days:

- Fan power – air flow and static pressure
- Back pressure – vacuum
- Actual performance versus data sheet performance
- Thermal imaging survey of heat transfer bundles
- Thermal modelling of condensation process

ACC Doctor Optimisation Report – 1 day:

- Fouling and cleaning survey
- Air ingress test
- Tube length restriction calculation
- Wind protection
- Fan performance
- Vacuum system
- Performance improvement report
- Performance guarantee

Galebreaker offer installation and site supervision to meet your requirements.



Products are protected by international patents and international patents pending. Copyright © Galebreaker Industrial Ltd 2013.

Made
Herefordshire 



Galebreaker Industrial Ltd
Galebreaker House
New Mills Industrial Estate
Ledbury
Herefordshire
HR8 2SS, UK.

Tel: +44 (0)1531 637900
Fax: +44 (0)1531 637901
Web: www.galebreaker.com

