HydroCel

AAF
Power & Industrial

CLEAN AIR FOR GAS TURBINES

REFINED FILTRATION AGAINST SALT AND SEAWATER

HydroCel Familiar with the problem

A Gas Turbine consumes vast amounts of atmospheric air heavily contaminated in offshore locations by natural pollutants such as salt and seawater spray, plus those self generated from drilling, shotblasting and engine exhausts. As an accumulated mass in fluctuating humidity, these pollutants can seriously effect the performance and operating efficiency of a precision gas turbine engine.

- Abrasive solids attack rotating parts.
- Dirt in the compressor stage is responsible for blade fouling which contributes to an alteration in profile and losses in efficiency.
- Fouling in the intercoolers reduces compression heat removal.
- Wet corrosion caused by salt can lead to damage particularly in the compressor stages.
- High temperature corrosion at the turbine stage is primarily a fuel problem but air pollution adds to any corrosion damage.
- Plugging of the Turbine Blade Cooling slits is caused by Sub-Micron particles which promotes fatigue from overheating.

The implication in terms of efficiency and operating cost are significant so they must be addressed.

- A loss in mass flow through the compressor stages increases heat rate.
- Continuous full load situations affected by out of limits fuel-air cleanliness may loose essential power output.
- Repair and maintenance costs including water wash frequency cycles are increased by poor quality air.
- Replacement parts especially turbine blades are a horrendous cost if the expected service life is not achieved.

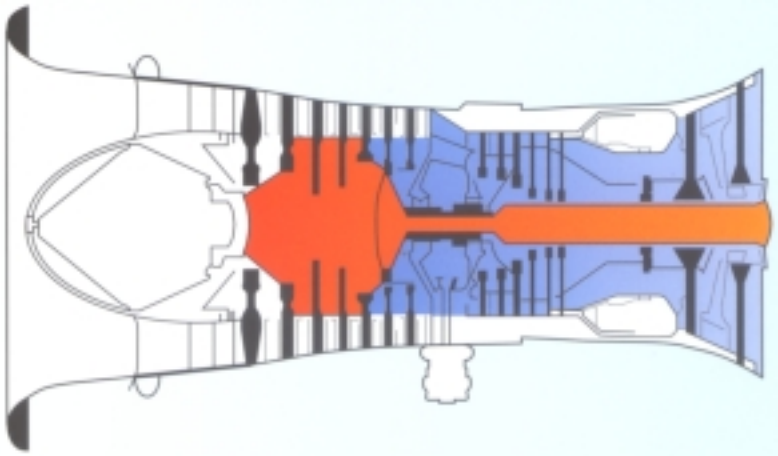
Key points for Turbine Efficiency.

Erosion **Fouling** **Corrosion**

- *Keep within concentration limits*
- *Reduce high cost of maintenance and repair*
- *Achieve constant full load capability*

Hydro Cel 95 & HI2

Filtration in Depth



HydroCel Providing the solution

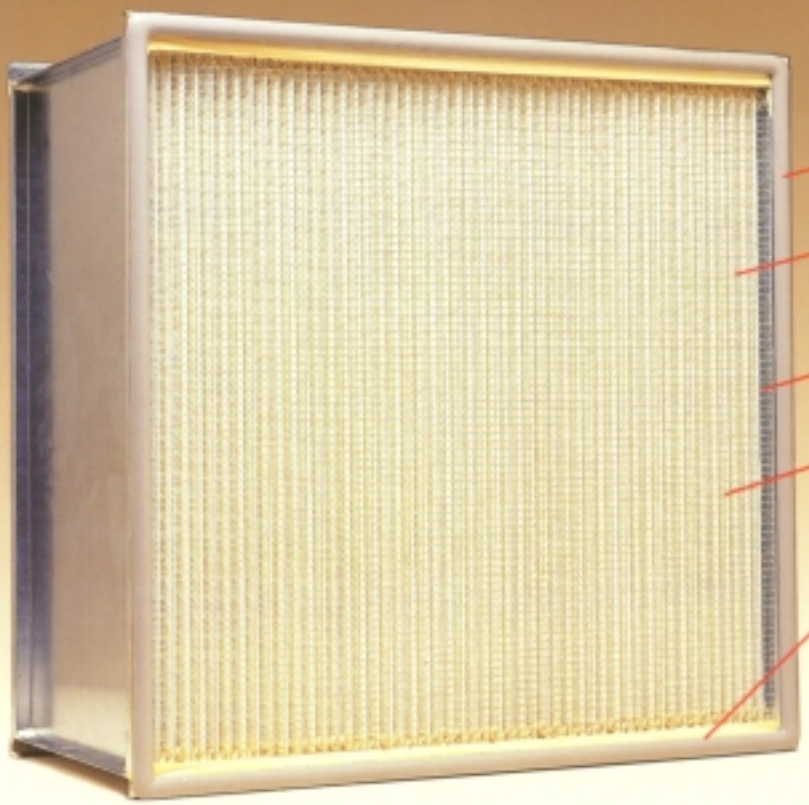
Hydrocel 95 has achieved a remarkable reputation for providing clean air to Gas Turbines operating in the hostile environment prevailing offshore and in coastal locations. Operators have achieved air cleanliness not previously found and have moved quickly to establish the HydroCel as their number one choice to remove sea-salt and water, in addition to the locally generated industrial pollution.

Hydrocel H12 is a complementary product which has been developed using the same special construction, but with a very high performance media. With this product, continuous turbine turbine operation with only one or two water wash cycles per year can be achieved.

The H12 significantly contributes towards less downtime and higher production with even longer turbine component life than that achieved by the HydroCel 95.

Hydro Cel 95
Proven Technology

Hydro Cel H12
Advanced Technology



Key Features

New ground breaking technology to keep supply air within salt solution limits.

- Outer casing 16 swg to increase body strength.
- Tapered plastic spacers which eliminate salt corrosion and improve flow characteristics.
- Free flow Polyurethane seal based on H13 standards.
- New Media is water repellent in clean and dirty condition.
- Continuous gasket to secure housing seal.

Hydrocel 95 & H12 solves the problem of excess salt solution which is essential for the protection against Turbine Blade Fouling and corrosion.

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Hydro Cel 95 & H12

Total Reassurance

Seawater Removal

In the absence of an independent water penetration test facility, AAF purpose built a special rig at Cramlington which simulated offshore marine conditions. The procedure was to measure sea water penetration through a filter in the clean condition. A dirty condition was then created by introducing sea salt, Hydrocarbons and Ashrae test dust up to the change pressure drop. Further sea water penetration tests were carried out to confirm removal efficiency is consistent over the filter life cycle.

Droplet Removal - Particulate Efficiency

Particle size Microns	Initial Efficiency %	
	95	H12
0.3 - 0.4	66.72	99.82
0.4 - 0.55	72.68	99.93
0.55 - 0.7	78.77	99.97
0.7 - 1.0	84.38	99.99
1.0 - 1.3	90.16	100.00
1.3 - 1.6	92.92	100.00
1.6 - 2.2	95.12	100.00
2.0 - 3.0	98.78	100.00
3.0 - 4.0	99.88	100.00
4.0 - 5.0	99.98	100.00
5.0 and above	99.99	100.00

Performance Data

Volumetric Air Flow				
Type - HydroCel		**95**		**H12**
m3/hr (cfm)	3400 (2000)	4250 (2500)	5100 (3000)	4250 (2500)
Initial Resistance Pa (inch wg)	110 (0.44)	155 (0.62)	210 (0.84)	500 (2.0)
Final Resistance Pa (inch wg)	635 (2.5)	635 (2.5)	635 (2.5)	635 (2.5)
Average Atmosphere Dust Spot Efficiency	97	93	91	99.97
Ac Fine D.H.C.	1400	1100	950	650
Filter Class	F9	F8	F8	H12
Humidity	100%	100%	100%	100%

Available in standard size 592x592x292mm (23⅜x23⅜x11½ inches)

Test results and performance data sourced from independent air filter testing authority

GLOBAL SALES & MARKETING websites www.aafintl.com & www.aafeurope.com

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