

# expel



## Case Studies

[www.originalavg.com](http://www.originalavg.com)



***“Moisture would cause the valves to stick.  
We have had no issues with this since  
installing Expel. Very impressed.”***

Oliver Loughram – Engineering Co-ordinator – Moy Park

## **Introduction**

Compressed air is an essential energy source; up to 70% of industries use it for some aspect of their operations. Businesses relying on compressed air for their operations must maintain a high standard of compressed air quality. For many companies, liquid water, oil emulsion fluids and solid particulates in compressed air lines lead to increased maintenance, downtime and costs.

For many years, problems caused by compressed air contaminants were considered unavoidable by industries worldwide as conventional filtration methods could not guarantee the removal of liquid water, oil emulsion fluids and solid particulates. Expel offers a revolutionary approach to compressed air filtration methods that guarantees the protection of pneumatic equipment to a consistently high standard.

We have gathered a range of real-life case studies where Expel has proven its effectiveness and has produced an array of benefits by improving the quality of compressed air preparation methods.

**Expel your inefficiencies!**



# TATA STEEL

## CASE STUDY

*“The compressed air has never been better since installing Expel.”*

Liam Bailey - Mechanical Engineer - Tata Steel

### Project background

At Tata Steel Hartlepool, the site was experiencing issues with liquid water and oil emulsion fluids despite having traditional compressed air filters installed. The furnace was a particular area of concern for the site. The furnace camera is essential because it eliminates the need to manually open hatches or shut down the furnace to perform visual inspections. The site also uses the camera to monitor the temperature of the furnace using optical pyrometry. The camera improves operational safety and significantly increases furnace availability. Therefore, the camera lens must always be clear. The lens is kept clear by a blast of compressed air that removes any settled debris. If the lens is unclear, the camera is useless, as you cannot see the view of the furnace and its functionality is compromised.

When the blast of compressed air is released, if the air contains contaminants, they can settle on the lens, which obstructs the display on the camera and defeats the point of using compressed air to clear the lens. If the camera lens is unclear, it results in downtime, increased maintenance and costs. Furthermore, if liquid water enters the furnace, the water quickly turns to steam, drastically increasing the risk of a blowout.

For these reasons, Mechanical Engineer Liam Bailey wanted a solution which **guaranteed complete protection** against liquid water and oil emulsion fluids in the compressed air supply.

### Why did Tata Steel choose Expel?

Before installing Expel, the site had traditional compressed air filters fitted, but they proved ineffective as problems with liquid water and oil emulsion fluids remained unsolved. Commonly, sites using conventional filters still experience issues with compressed air contamination because

they use sponges or mesh to trap substances like water or oil emulsion fluids. These filters can never guarantee the protection of pneumatic equipment, and their reliability diminishes over time. Once these materials become saturated, it becomes easier for substances like water to pass through and cause problems unless frequently replaced.

Expel represents a revolution in compressed air filtration because rather than using perishable internal elements to prevent issues, it uses physics to force contaminants out of the filter using a gravitational pull. Therefore, Expel can guarantee 1-micron removal of the three most common sources of compressed air contamination (liquid water, oil emulsion fluids and solid particulates).

Since installing Expel, the site has not experienced any further issues associated with liquid water, oil emulsion fluids, or solid particulates in the compressed air system. **To date, Original AVG has supplied 17 Expel units to the Hartlepool site because of these proven benefits.**

### Results



**Enhanced site safety** – Expel guarantees no liquid water, oil emulsion fluids, or solid particulates in the compressed air compromise the camera display by offering continual removal of these contaminants down to 1 micron. Therefore, the furnace camera lens remains clear, and there is a reduced risk of moisture entering the furnace.



**Reduced costs** – By eradicating water and oil emulsion fluids, nozzles are no longer getting blocked and need replacing. Furthermore, Expel stopped ongoing costs generated by disposable filter elements. Expel does not require ANY replacement internal components and is not associated with ongoing maintenance costs.



**Reduced maintenance** – The maintenance team no longer has to spend time replacing inadequate filter elements or replacing damaged pneumatic equipment caused by poor compressed air preparation.



**Reduced downtime** – The camera lens can always be clear of particulates because the Expel unit guarantees the protection of the air nozzles against liquid water and oil emulsion fluids. Therefore, there are no more unplanned furnace shutdowns, ensuring continual operation.



# HEINEKEN

## CASE STUDY

### Project background

The maintenance manager at the Hereford site was becoming increasingly concerned about the frequent damage caused by liquid water in compressed air lines. In particular, the air controllers in the boiler room frequently needed replacing. The air controller could be replaced up to **5 times every few weeks, costing the site £1,500 per replacement**. The Heineken site urgently needed a real solution to this expensive problem.

### Why did Heineken choose Expel?

Expel offers a revolutionary approach to compressed air filtration. Expel's internal element directs the air through an engineered tortuous route. The inner component manipulates the air to create multiple eddy currents. The eddy currents rotate at high speed, forcing contaminants to coalesce and fall out of the filter. The performance of Expel does not deteriorate with use, remains 99.999% efficient, and does not require any replacement filter elements or maintenance to operate. Therefore, Expel was the perfect solution to guarantee the protection of air controllers.

In contrast, conventional compressed air filters operate by retaining the substances they collect in sponge or mesh internal elements, so the performance of these filters deteriorates. Therefore, standard filters could never guarantee that harmful substances would not reach pneumatic equipment and cause expensive damage.

After hearing about Expel's exciting money-saving and equipment-protecting qualities, the site's maintenance manager made the well-informed decision to install Expel.

### Results



**Reduces wastage** - By removing the source of the problem at the point of use, Expel stopped several air controllers from ending up in landfill sites every month.



**Reduces costs** - Expel completely eradicated water damage to the air controllers, saving the site thousands of pounds each month.



**Reduces maintenance** - No more unnecessary time spent replacing damaged air controllers.



**Protects equipment** - The air controllers were no longer experiencing damage from liquid water in compressed air lines, proving that Expel is a superior solution to the problem of liquid water, oil emulsion fluids and solid particulates in compressed air lines.





HALLIBURTON

CASE STUDY

### Project background

At the Halliburton site in Houston, Texas, Principal R&D Engineer Prashant Shekhar reported frequent moisture issues at several points in the compressed air system. Whilst liquid water is a natural by-product of compressed air, it causes irrevocable damage to pneumatic equipment. Compressed air usage at the site is vast. Therefore, the compressed air lines are long and exposed to multiple ambient temperature changes, which causes moisture to occur at several points in the pneumatic system. Because of moisture damage, the engineering team frequently replaced the solenoid, actuated, and positioner valves. The site also wanted to make the protection of gas analysers a main priority, as they are critical to the site's functionality.

When protecting gas analysers, oil emulsion fluids must be removed because the oil contains hydrocarbons (HCs) and many gas analysers are used to detect HCs. Therefore, if oil emulsion fluids are present, this will add more HCs to the sample, invalidating the result. Liquid water is also an exceptionally destructive contaminant because it will corrode the gas analyser internally and cause damage to the capillary in the detector. The gas analyser will then need to be replaced, which increases costs, downtime and wastage.

### Why did Halliburton Choose Expel?

Compressed air needs treating through a molecular sieve before it enters a gas analyser. To extend the life of the molecular sieve, Halliburton wanted an ultimate pre-treatment system which would remove the main bulk of liquid water, oil emulsion fluids and solid particulates before the polishing stage of absorption, chemical removal and molecular sieve. Expel was the perfect tool for the job. Expel is a 3-in-1 solution capable of removing the three primary sources of contamination: liquid water, oil emulsion fluids and solid particulates. Unlike conventional compressed air filters, the performance of Expel does not drop with use. Rather than containing

mesh or sponge-like materials which trap the contaminants, Original AVG has designed Expel using computational fluid dynamics. The internal element circulates liquid water, oil emulsion fluids and solid particulates and deposits them through gravity and airspeed. Because Expel does not retain compressed air contaminants, it is guaranteed to maintain 99.999% efficiency.

### Results



**Reduced part replacement** – Expel stopped pneumatic valves failing caused by three primary sources of contamination.



**Reduced downtime** – If pneumatic equipment experiences malfunction due to poor air preparation, the site cannot function correctly until the engineering team has rectified the problem.



**Reduced costs** – The site made significant cost savings by reducing equipment turnover. For example, using Expel as a pre-treatment for gas analysers meant that the life of the molecular sieves increased drastically.



**Superior equipment protection** – Unlike traditional compressed air filters, which can never guarantee security for pneumatic equipment, Expel always operates at 99.999% efficiency.





# Wienerberger

## CASE STUDY

### Project background

The Bishop Auckland site was experiencing prominent issues with liquid water in the compressed air system. The transfer area was the most problematic part at the site as the solenoid valves and conveyors were experiencing faulty operation, production downtime and part replacement costs. Maintenance Manager Mick Abbott reported that the area is particularly prone to problems in the winter months. The liquid water in the lines would freeze, causing ice blockages, and all pneumatic equipment in the area would fail to function correctly.

### Why did Wienerberger choose Expel?

Previous attempts to help deal with the problems caused by moisture included purchasing a compressor with a built-in refrigerant dryer. The built-in dryer provided a pressure dew point of 3 degrees Celsius. However, when the ambient air temperature dropped below 3 degrees, it would allow significant volumes of water through to the airlines, which caused extensive damage to pneumatic equipment—leaving the problem unsolved.

The solution to this problem was to install a high-efficiency compressed air filter capable of continually removing 99.999% of all liquid water, oil emulsion fluids and solid particulates down to 1 micron. Expel was the perfect tool for the job because it ensures continually high protection against these compressed air contaminants. Therefore, Expel ensures there will never be enough liquid water in the airlines to freeze, stopping the damage to pneumatic equipment.

Expel immediately eliminated the problems the site was having. The maintenance manager reported:

***“This is the first year we haven’t had ANY problems with water and ice in the lines, and it is all thanks to the Expel unit you supplied us with.”***

Mick Abbott - Maintenance Manager - Wienerberger

### Results



**Reduced downtime** - Expel completely stopped the machines from freezing and being damaged by ice and liquid water. The conveyors now operate all year round, and the solenoid valves no longer fail, no matter how cold outside.



**Reduced costs** - No more money spent on replacing moisture-damaged pneumatic equipment. Expel does not require any replacement filter elements and saves the cost of internal components and maintenance expenses.



**Increased productivity** - Despite making previous attempts to solve the problem, Expel is the only solution that worked.



**Reduced wastage** - The performance of the Expel filter never drops below 99.999% efficiency, which meant no more damaged pneumatic equipment going to landfill because of liquid water, oil emulsion fluids and solid particulates in compressed air lines. Additionally, Expel does not require any replacement elements, meaning no ongoing wastage generation.





***“I would recommend it to any industry and operation that uses compressed air systems and anyone that suffers from moisture in the lines. We’ve not had a single issue since it was installed.”***

Emily Stevenson – District Operations Manager – Hanson.

## Project background

Hanson sites suffered from moisture in the compressed air system for many years. It had been the cause of excessive part replacement costs, higher energy bills, and increased maintenance costs. For example, solenoid valves would frequently fail. Once moisture has damaged a solenoid valve, you cannot simply repair it. You have no option but to replace it. Therefore, liquid water was causing ongoing part replacement and production downtime costs, as processes could not continue until the on-site maintenance teams found the time to replace them.

Hanson had long been searching for a solution to eliminate problems caused by compressed air contamination. For example, many Hanson sites had dryers. However, the dryers had severe limitations, and despite costing the plants money to purchase, run and maintain, moisture was still present in the lines. Pneumatic equipment continued to be damaged regularly.

## Why did Hanson choose Expel?

***“Since installing here at Nottingham, we haven’t had a single issue with a solenoid. If we think back maybe three months, we had 1 issue every week.”***

Emily Stevenson – District Operations Manager – Hanson.

**Unlike any other solution Hanson had explored, Expel worked!** Expel offers a bespoke approach to compressed air filtration by maintaining an unparalleled efficiency rate. The internal element manipulates the air through an engineered tortuous route that forces the compressed air

contaminants to deposit through the base of the filter. Therefore, Expel can guarantee the removal of all liquid water, oil emulsion fluids and solid particulates down to 1 micron. Refrigerant dryers contain traditional-style filters to remove liquid water. However, these filters have disposable internal elements made of sponge or mesh-like materials. As these elements retain moisture, their performance deteriorates, and pneumatic equipment is left vulnerable to damage from liquid water. Expel was the perfect failsafe for Hanson sites.

After installing Expel, Hanson quickly found they had a real solution to this costly problem. Solenoid valves were no longer failing, which resulted in **an annual saving of £775 per site**. Additionally, Hanson quickly realised (thanks to Expel) that they no longer needed the dryers and could disconnect them immediately. In turn, this eradicated all the costs associated with dryers, which, according to Hanson, **saved sites around £857 per year**.

Given these remarkable results, Hanson launched a national project to improve the compressed air quality at their concrete plants. **To date, Hanson has installed Expel on over 100 concrete plants.**

## Results



**Reduced costs** – By disconnecting their air dryers and having Expel guarantee the protection of solenoid valves, **each site saves over £1,600 per year**.



**Reduced maintenance** – Hanson’s concrete plants were no longer having to call in maintenance teams to maintain dryers. The on-site maintenance staff also no longer spend time replacing moisture-damaged solenoid valves.



**Increased productivity** – Since installing Expel, Hanson has reported significant performance and efficiency improvements, which are quantifiable and based on evidence. Thanks to these proven benefits, Hanson UK is installing Expel units across their ready-mix plants nationally.



**Reduced environmental impact** – By replacing dryers with Expel, Hanson has reduced energy consumption, reliance on fossil fuels and their global warming potential (GWP). Furthermore, Expel is far less wasteful and more energy efficient than a conventional filter.

*Expel has no ongoing consumable costs and has a 10-year manufacturers guarantee*

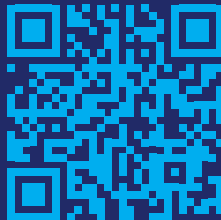
***“We finally have no water going to the guillotine. It is an excellent product.”***

Chris Kosolowski - Bar Line Production Manager - Nutrition Group Plc.



**expel®**





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