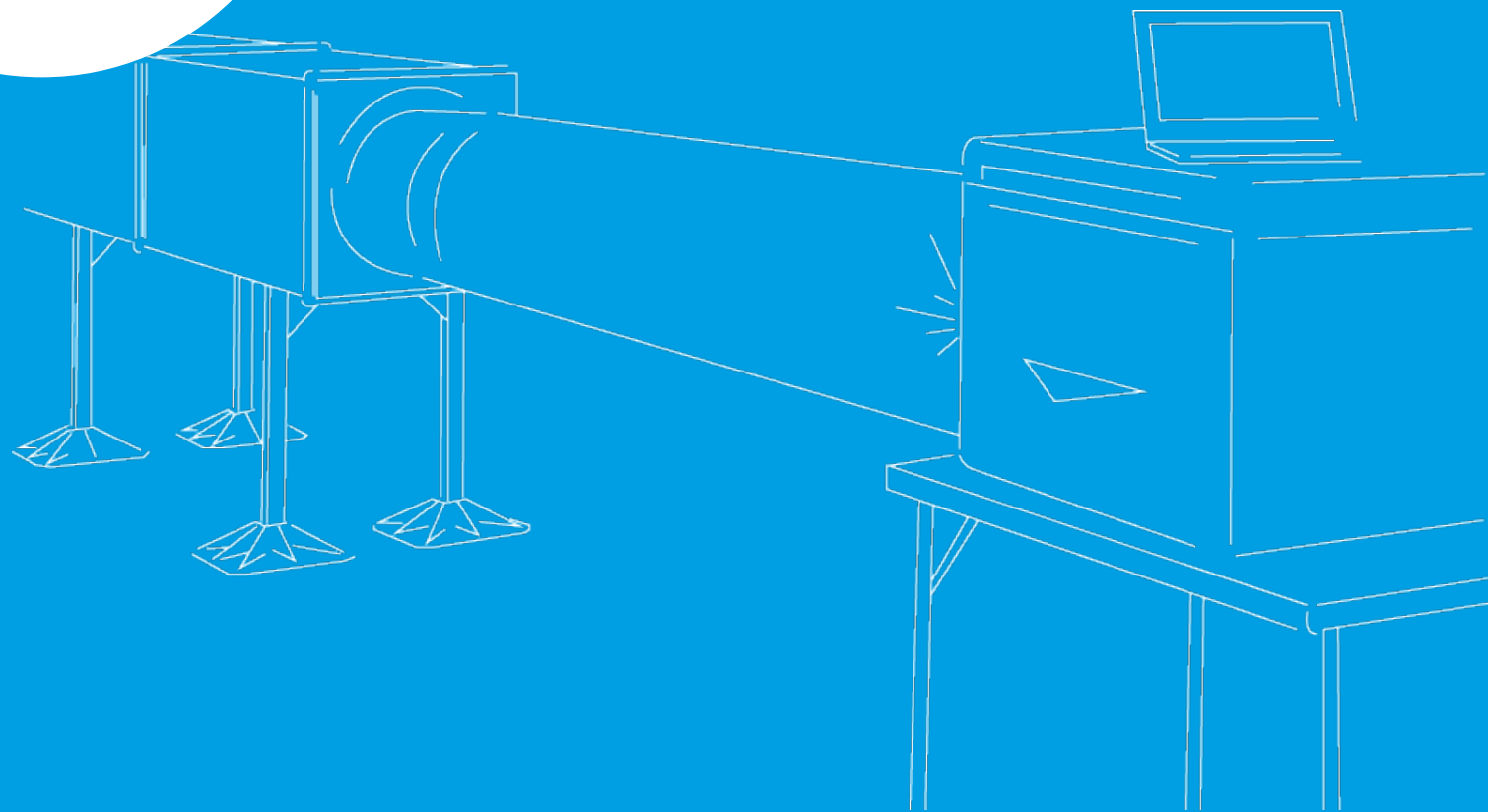




VSS AEROSEAL

DUCTWORK LEAKAGE SEALING SOLUTION



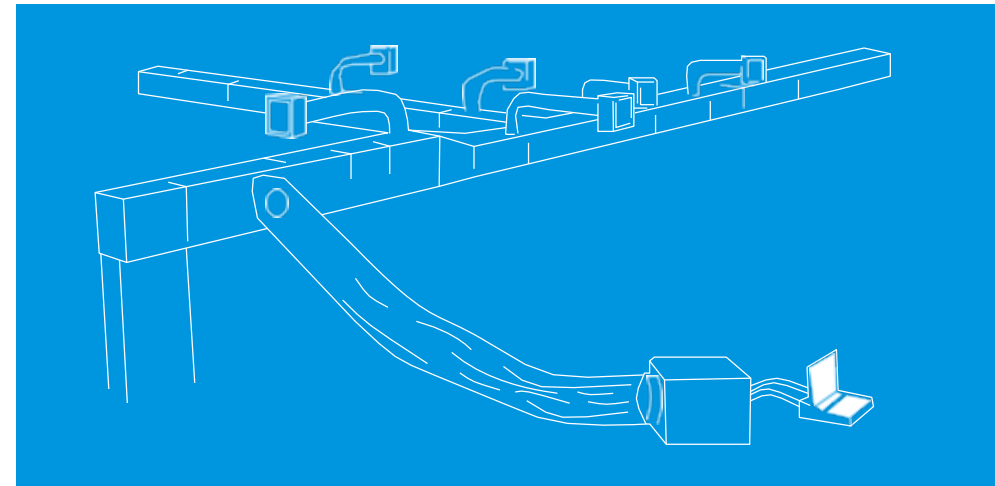
WHAT IS AEROSEAL?

AEROSEAL is a breakthrough technology for sealing air duct system leakage from the inside. The method is perfect for improving air tightness on new or existing ductwork systems.

The patented process was developed in the 1990s on behalf of the US government at the University of Berkeley in California. Ever since it has been used in both residential and commercial markets. Through an

international network the AeroSeal process is now available in the USA, the UK, and across Europe.

AeroSeal technology provides a much needed breakthrough to improve energy performance of inefficient HVAC systems, which make up a substantial part of a building's energy bill and carbon footprint.



HOW DOES AEROSEAL WORK?



The AeroSeal machine pressurises the ductwork system, then a sealant is transformed into a gaseous state using heated compressed air. The aerosolized sealant particles are blown through the ductwork system to seek out leakage. Adhesive particles attach directly onto the edges of any hole, quickly and effectively closing it from inside the ductwork. Gaps of all sizes up to a diameter of 1.5cm are sealed and will withstand a pressure of up to 2,000 Pa. In line components such as attenuators and fire dampers are unaffected by the process.



WHAT NEEDS TO BE CONSIDERED WHEN APPLYING AEROSEAL?



The process itself needs only a few steps of preparation. First all inlets and outlets of the air duct system are sealed shut with foam plugs or metal plates. The ductwork connections to air handling units, fans or heat exchangers are dis-connected and built-in sensors are taped over, so that no particles of the sealant can get into these

components. Silencers and dampers don't have to be protected as long as they are completely open. The AeroSeal machine is connected onto the ductwork system by a length of transparent plastic hose.

ADVANTAGE 1: SPEED

Finding ductwork leakage is very difficult, usually there is restricted access to the duct system due to the building's characteristics, other services and ductwork insulation.

Leakage is made up of many small leaks, and lots of other factors make locating and closing holes in the ductwork system extremely time consuming and expensive.

When AeroSeal is used none of this matters, the process is faster and less invasive whilst delivering superior results.

Aerosealed ducts can achieve higher efficiency than tightness

class D, as per DW144. AeroSeal has lowered the leakage of airduct systems by an average of 90%.





ADVANTAGE 2: COST

AeroSeal's speed reduces the cost of sealing leakage compared to manual sealing. No building work is necessary and the building can be used again within 2 hours of sealing. To perform the process, 2 or 3 service technicians are sufficient - this results in lower staff expenses and reduced risk to staff from working at height, confined space entry and manual labour.

Where ductwork has already been insulated there is further saving as this does not need to be removed or repaired.

ADVANTAGE 3: INCREASE OF COMFORT AND HYGIENE

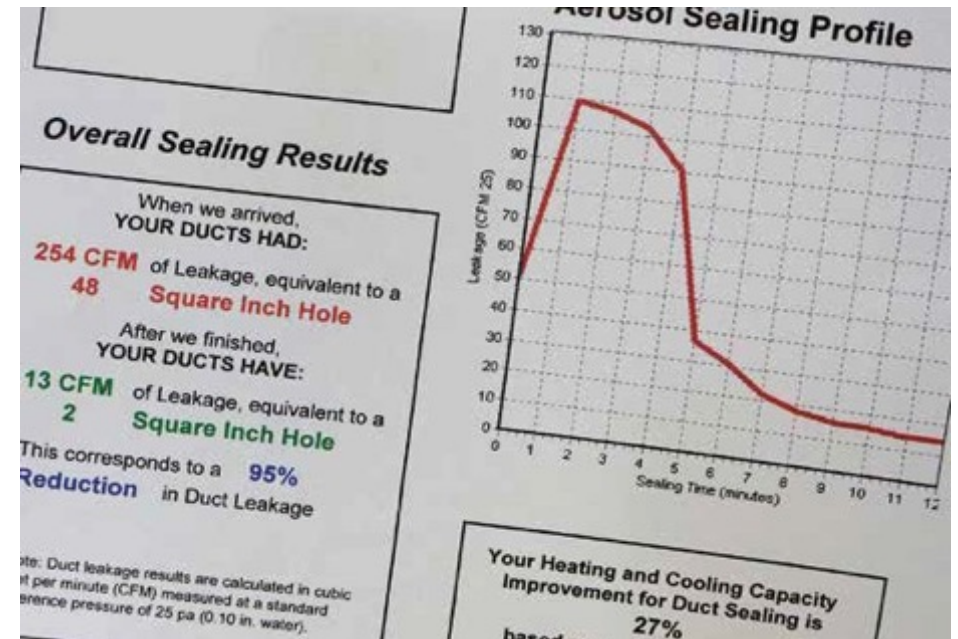
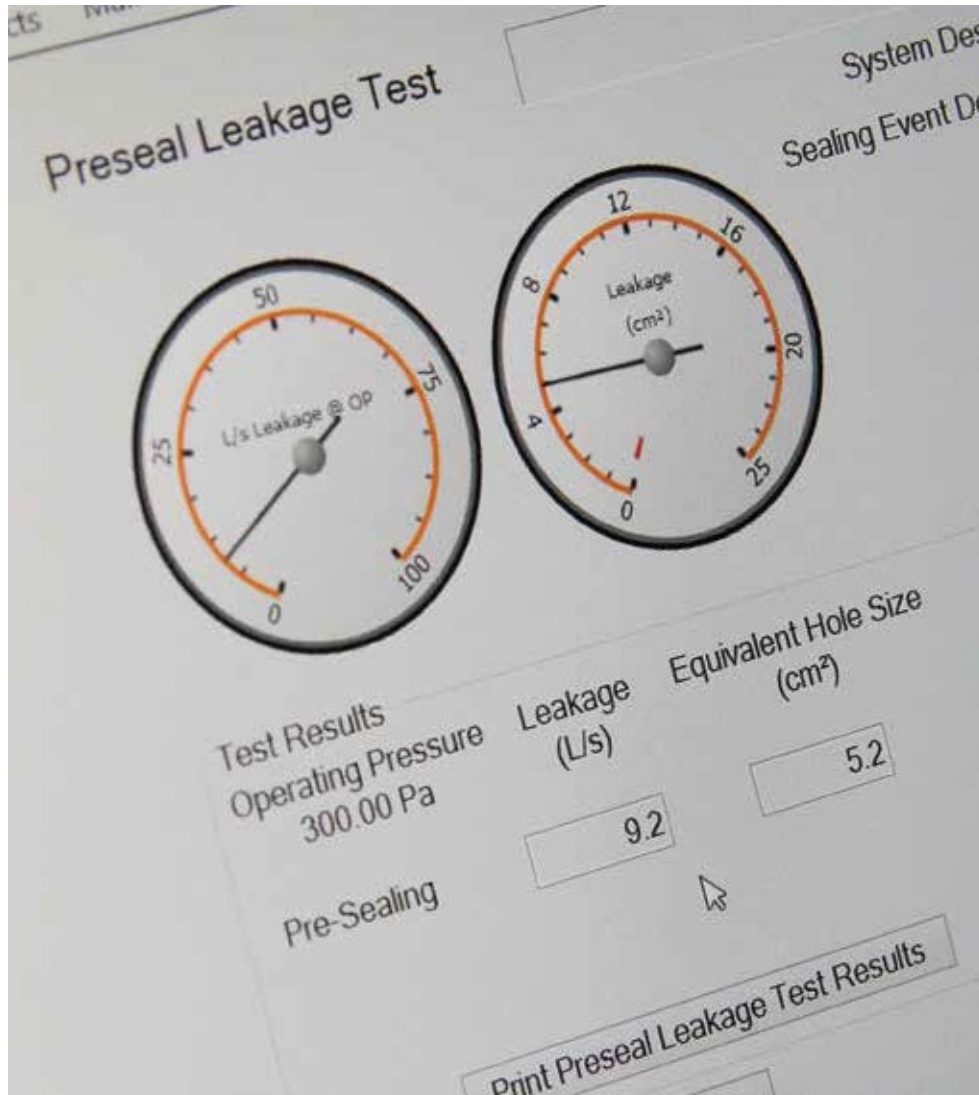
Besides achieving unprecedented air tightness, AeroSeal also leads to a substantial increase in the level of comfort within buildings, the thermal loss through leaks is greatly reduced and thus an even distribution of heating and cooling is supplied throughout the building.

Another advantage of the AeroSeal technology is the increase of hygiene. The sealant meets the requirements of the hygiene guideline VDI 6022 and has no negative health aspects. It may thus be used in all buildings such as schools, hospitals and other public facilities.



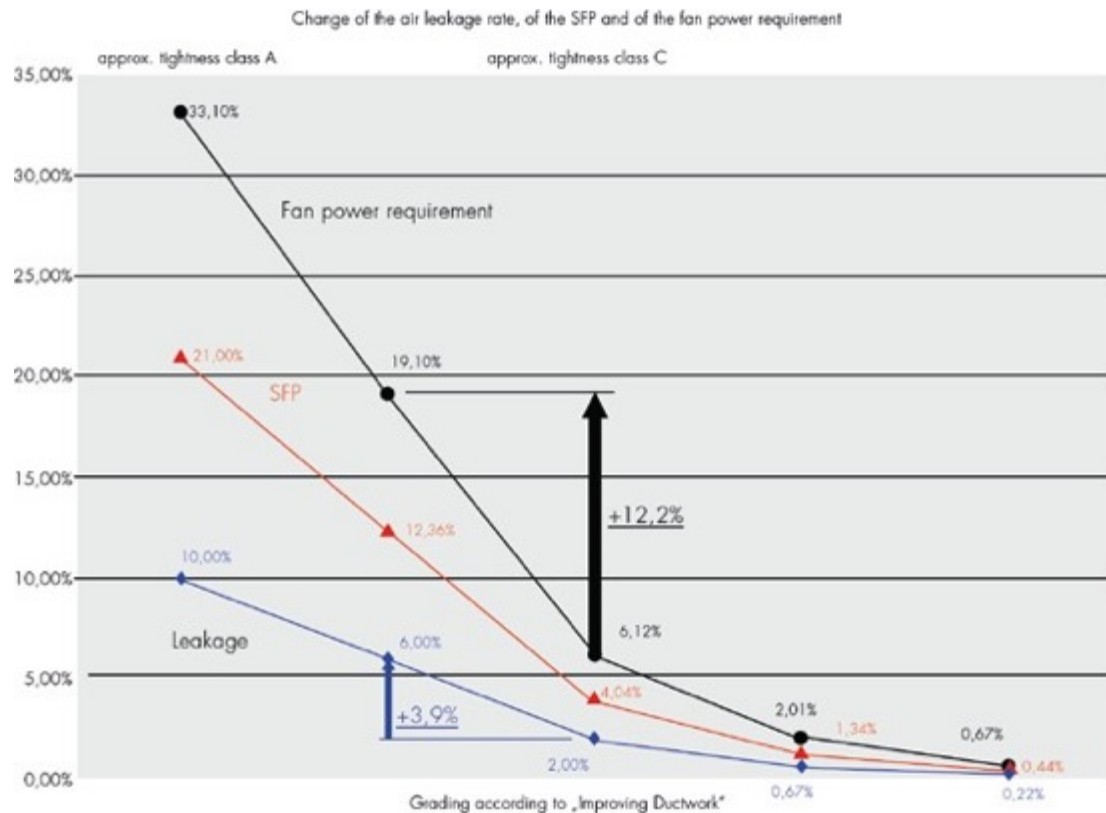
ADVANTAGE 4: DOCUMENTATION

Aeroseal provides real-time data during sealing which is then converted into a certificate at the end of the process. Total air loss and equivalent hole size in the ductwork are calculated, these are then presented clearly in graph-form and percentages. This makes it simpler to achieve required leakage rates as per DW144.



ADVANTAGE 5: ENERGY SAVINGS

Ductwork leakage testing is not mandatory on all new ductwork systems, therefore many systems are commissioned despite being highly inefficient. The lowest class of ductwork (class A) is generally expected to leak 6%, many untested systems will leak far more than this. This leads to large inefficiencies and increased demand on fan power. Improved air tightness achieved with AeroSeal can reduce fan power requirement and deliver considerable energy savings.



Fan power requirement increases by 3 times compared to the air leakage rate.

The SFP value (Specific Fan Power) according to EN 13779 can be reduced by the reduction of the air leakage rate. This allows a compliance with the guidelines of EnEV 2014

VSS - AEROSEAL PROJECTS

Recent Projects	Leakage (l/s)		Equivalent Leakage Class		Overall leakage reduction %
	Pre	Post	Pre	Post	
Whitfield Street Laboratories	477	42.1	>A	B	91%
Hospital Northern Ireland	526	47.1	>A	B	91%
Mickleton Hills Farm Wedding Venue	117	23.2	>A	A	80%
New Bond Street Luxury Offices	33.2	1.8	>A	D	95%
Francis Crick Institute Laboratory	60	9.0	B	D	84%
Whipps Cross Hospital Ward	583	51.4	>A	B	85%
Triumph Motorcycles Factory LEV	29	6.0	>A	C	80%

CASE STUDY: FRANCIS CRICK INSTITUTE

A state of the art research laboratory could not pass a vacuum hold test and it was suspected that ductwork leakage was the cause of failure. The laboratory could not be opened until a vacuum hold test was passed. The extract ductwork system serving the lab was sealed from the plantroom and the laboratory was then able to maintain a vacuum hold test for the required duration. This allowed the laboratory to be opened in early 2019 without any ductwork replacement or building alteration.

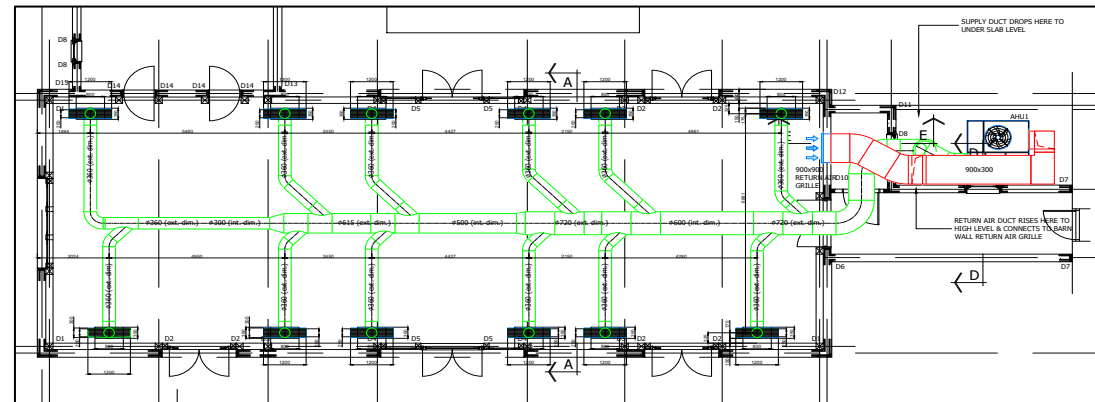
Date:	February 2019
Duct Material:	Steel
Objective:	Seal ductwork leakage to make laboratory airtight
Preseal leakage:	Class B
Postseal leakage:	Class D
Reduction of leakage:	84 %



CASE STUDY: MICKLETON HILLS WEDDING BARN

The supply ductwork system for the luxury wedding barn was laid underground within the concrete foundations of the building. The plastic ductwork could not be safely accessed and was leaking above the specified airtightness class A. The wedding barn was due to open for business in late 2018. Aero seal of the ductwork system meant that no structural works were required and no ductwork replacement needed to achieve the required airtightness class.

- Date: September 2018
- Duct Material: Plastic
- Objective: Compensate shortcomings of the ventilation system install and ensure the building's opening on time
- Preseal leakage: Not meeting tightness Class A
- Postseal leakage: Class A
- Reduction of leakage: 80 %





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