

case study

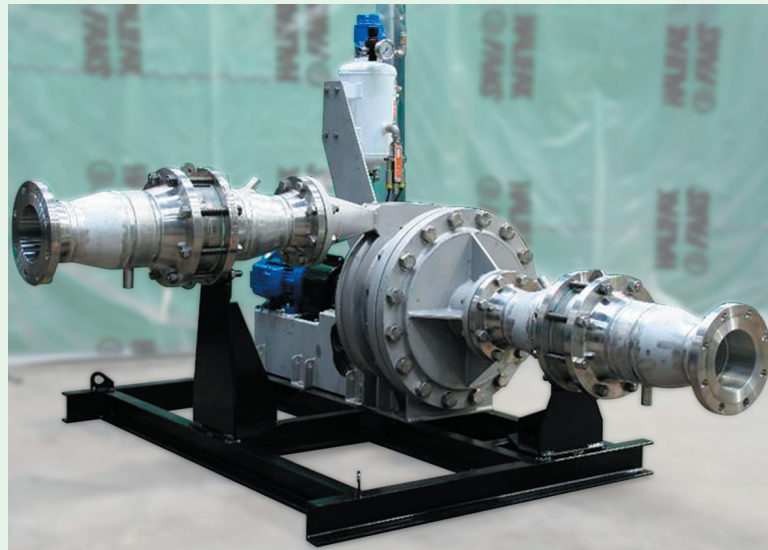


Halifax ATEX blowers kill all known germs

With MRSA and C. Diff. seemingly endemic in our hospitals, this might well be called the age of the superbug. For that reason sterilisation of everything used in a hospital is absolutely critical and most of us visualise sterilisation as a high temperature process. However, not everything medical can withstand the high temperatures necessary to bring about absolute sterility. Items such as soft rubber goods, surgical implants, intravenous kits and the like would all be damaged by high temperatures.

One option is gaseous sterilisation. Ethylene Oxide (EO) gas kills all known bacteria and their endospores, mould and fungi and is highly effective in sterilising materials that would be damaged by, for example, pasteurisation or Gamma radiation. Unfortunately, EO is carcinogenic, toxic, highly flammable, potentially explosive and gasifies at 10°C. It therefore requires great care in its utilisation and the design of EO sterilisation plant is a highly specialised one whereby all electrical and mechanical equipment must be fully compliant with hazardous area standards.

Getinge UK of Sutton-in-Ashfield are a centre of excellence in the design and construction of EO sterilisation systems and install bespoke sterilisation plants



Halifax Fan blower for hazardous gas application

worldwide for manufacturers of medical devices, sterilisation contractors and other healthcare product manufacturers.

In a typical system, pallets of the products to be sterilised are placed in a conditioning area where the temperature is raised to around 50°C and the humidity to around 70% RH. This 'activates' any microbes and renders them more susceptible to the EO gas. The pallets are then loaded into the hermetically sealed sterilisation chamber and the integrity of the chamber is confirmed with a vacuum test. The chamber is then flooded with EO gas at below atmospheric pressure and the temperature maintained at the conditioning level by circulating heated water round a water jacket surrounding the chamber. During the typically 12 hour period the goods are exposed, it is critical

that the EO gas is maintained as a homogenous environment throughout the chamber. To achieve this a specially designed explosion-proof Halifax Fan blower is used to continuously circulate the gas through manifolds on the sides and top of the chamber, changing the entire volume of the chamber typically 8 to 10 times per hour, eliminating gas stratification and ensuring that the gas penetrates every nook and cranny.

Once sterilisation is complete, the chamber must be progressively flushed with nitrogen while the EO gas mixture is bled off through a catalytic converter that converts the EO to CO₂ and water.



The Halifax blower continues to circulate the gas mixture in the chamber as the gases are of different densities and would stratify if not actively circulated. Once the concentration of EO is reduced to the point where it is safe to introduce air to the chamber, the pallets are moved to the post-condition area where the temperature is elevated to aid the degasification process.

The potentially explosive nature of Ethylene Oxide means that the circulating blower has to be designed to meet the exact needs of every installation, and to full explosion-proof standards. Halifax's design is based upon many years experience building fans and blowers to handle explosive gases and features spark-proof features such as brass rubbing strips and a coupling guard. The stainless steel 316 shaft is fitted with a dual cartridge mechanical shaft seal purged and cooled with water.

The fan is rated to work down to very low sub atmospheric pressures but the high integrity, gas tight, stainless-steel casing is designed to +10Bar and tested to +11Bar. ATEX certified stainless-steel inlet and outlet flame arrestors protect against potential flame propagation beyond the fan in the event of internal combustion. ATEX certified accelerometers and vibration monitors are included for early detection of any imbalance in the fan impeller that might lead to contact with the casing, potentially causing a spark.

Application benefits

- Bespoke ATEX design for handling ethylene oxide gas
- Flame Arresters on inlet and outlet
- Stainless steel 316 drive shaft fitted with a water purged and sealed dual cartridge mechanical shaft seal
- Stainless steel casing tested to +11 Bar
- Rated for ATEX category 1G, zone 0
- Tested to ATEX category 2G, zone 1

According to Shaun Riley, EO Product Specialist at Getinge, 'Although some of our competitors build their own blowers, we attach so much importance to this item that we wanted it designed, built and certified by specialists and supplied as a reliable fit-and-forget fully certified component. The hazardous nature of Ethylene Oxide meant that we wanted to deal with a manufacturer with a proven expertise in ATEX and hazardous gas applications. Halifax worked closely with us to develop a range of bespoke blower sizes that we can use for quotation purposes and then, once we have a contract settled, the blower design is fine tuned to the exact specification of that application.'

Although the blower comes to us fully certified to ATEX 94/9/EC for Category 2G, Zone 1, it is actually fully rated for duty at Category 1G, Zone 0, meeting the most demanding specifications of all our applications. We're happy with Halifax Fan's self certification for Zone 1 as this satisfies the environmental and gas groups with which we must comply but we also draw confidence from the increased safety margin of the Cat 1, Zone 0 rating to which Halifax builds the fans'.

Halifax Fan Limited

Mistral Works, Unit 11, Brookfoot Business Park, Elland Road, Brighouse, West Yorkshire, HD6 2SD, UK
T: +44 (0)1484 475123 F: +44 (0)1484 475122 E: sales@halifax-fan.co.uk

Halifax-Fan (Shenzhen) Co Ltd

1 & 2F, No. 4 Building, Creative Industrial Park, Shang Xia Wei, ShaJing, ShenZhen, GuangDong Province, China
Telephone No. 0086 755 8149 0059 Fax No. 0086 755 8149 0019

www.halifax-fan.co.uk