

# Comparative Analysis of Hydrogen Peroxide Systems Available

Feature	Deprox	BioQuell	Johnson & Johnson Glosair	Trust's Requirements
Process Time	Approximately 2 ½ hours	4-11 hours	4-8 hours	A rapid turnaround reduces downtime and optimizes patient flow; therefore, a faster process is beneficial to the Trust
Effectiveness	Independently validated to achieve a consistent log6 reduction of both vegetative organisms <i>Staphylococcus aureus</i> , MRSA and spores <i>Clostridium difficile</i> , <i>Bacillus subtilis</i> independent of operator inputs and ambient conditions	Ability to achieve a log6 reduction if the equipment is set up correctly and ambient conditions are favorable. Needs skilled external operatives to achieve these levels.	Very little evidence to support levels of efficacy. A log 3-4 reduction has been achieved when professionally set up in favorable conditions.	When decontaminating a room in preparation for the next patient, it is essential to deliver the highest log reduction available in order to thoroughly decontaminate the environment. This is fundamental in reducing hospital acquired infections.
Operator Input Required	From the push of one button the Deprox will calculate, programme and carry out the disinfection process with real-time monitoring technology. This eliminates the risk of operator error that would lead to an ineffective process, and removes the need to rely on the operator to calculate the room dimensions or understand the effect of absorbent materials on the process. This makes the Deprox suitable for staff of all skill levels and ensures an effective process every time the process is carried out.	The BioQuell system requires extensive complex operator input that means that only skilled, externally contracted personnel are able to use the system. This introduces a large opportunity for operator error, leading to an ineffective process, and makes no allowance for absorbent materials or ambient conditions.	Requires the operator to set all parameters making the operators very responsible for the efficacy of the process. The process is fully dependent on operator input and will only carry out the process as instructed. This requires skilled operators to carry out the process, and an incorrect input leads to an ineffective process. The system makes no allowance for absorbent materials or ambient conditions.	By de-skilling the process, savings can be made on carrying out the process, and means that there is a greater availability of competent operators throughout the different shifts. Removing dependence on accurate operator input also gives the Trust the assurance that every process will be effective, delivering the optimum benefit to us and our patients.
Maneuverability	With four swivel castors, the Deprox is easily maneuvered around the hospital site, making the turnaround of the process quicker. By design, all ancillary products for the Deprox process are stowed onto the unit, meaning a single operator can easily set up and run a process.	Consisting of two large and cumbersome pieces of equipment, the BioQuell system is difficult and slow to move around the hospital, increasing turnaround time and meaning more staff are required for the operation.	On two wheels, the Glosair system requires the operator to carry the weight of the equipment whilst maneuvering around the hospital, introducing a risk of strain injury.	A system that is quick and easy to maneuver will enhance the turnaround of decontamination processes, reduce the cost of labour and will reduce the risk of operator injury.
Concentration of chemical	The Deprox system uses a 4.9% hydrogen peroxide solution, meaning it is classed as "non-	The BioQuell system uses 35% hydrogen peroxide, meaning advanced health and safety	The Johnson & Johnson system uses a 15% concentration of hydrogen peroxide, introducing serious health	A lower concentration of hydrogen peroxide is very beneficial to the Trust, provided it is able to deliver a high

	<p>hazardous" and "below LQ". This means that the Deprox has no specialist storage or handling requirements, and is much safer to use than traditional systems.</p>	<p>precautions and measures have to be taken. Using this concentration also introduces issues with the compatibility of the healthcare building and life-cycles, as well as compatibility with sensitive medical equipment.</p>	<p>and safety considerations</p>	<p><b>level of efficacy, for its health and safety considerations. Also, as a PFI, the lower the concentration, the more favourable this is to the Trust in terms of life-cycle of the built environment, as high concentrations of hydrogen peroxide have been known to cause corrosion.</b></p>
<p><b>Method of vapour creation</b></p>	<p>The Deprox system uses ultrasonic technology to create the vapour. By introducing an ultra-fine vapour, the Deprox is able to achieve optimum levels of decontamination whilst using only very low concentrations of chemical.</p>	<p>BioQuell drop the hydrogen peroxide chemical onto a hot plate in order to create a steam. This creates a heavy droplet that often condenses on surfaces. This can have implications for other electrical equipment in the treatment area, and also means that surfaces must be wiped down prior to readmitting the next patient.</p>	<p>The Glosair system pressurizes the chemical through a nozzle, creating a fine spray of hydrogen peroxide. This has very heavy droplets which tend to gravitate and have an uneven diffusion, meaning that liquid can pool on upturned surfaces whilst concave and inverted surfaces are not decontaminated successfully.</p>	<p><b>The Trust requires a system that is able to deliver a high level of efficacy that is consistent throughout the treatment environment without creating any wetting of surfaces or condensation.</b></p>
<p><b>Remote Control of system</b></p>	<p>The Deprox system uses a remote Process Monitor from which the decontamination process is remotely activated. Throughout the process, the Monitor communicates what stage the process has reached, and when the process has completed with a simple colour-coded lighting display. In addition, an emergency stop button allows the operator to terminate the process in the event of an emergency without having to enter the treatment environment.</p>	<p>The BioQuell system is activated inside the treatment room with a time delay for the operator to evacuate the area. An emergency stop button is located on the vaporizing system itself, meaning that the operator will be exposed to high concentrations of chemical should the need arise to terminate the process in the event of an emergency.</p>	<p>The Glosair system has no remote devices, and is activated from inside the treatment space, potentially exposing the operator to hydrogen peroxide vapour. The emergency stop button is located on the reverse side of the machine, meaning the operator will be exposed to the full stream of hydrogen peroxide aerosolisation in an attempt to terminate the process should the need arise.</p>	<p><b>The Trust requires a system with remote operator controls and a remote communication system in order to prevent exposure to vapour whilst starting the process, during the process, and if the process needs to be terminated.</b></p>
<p><b>Leak Monitoring Function</b></p>	<p>The Deprox system has real-time monitoring technology built into the Process Analyser which is located in the treatment area. This is designed to detect any leaks of vapour, and subsequently "fail out" the process.</p>	<p>The BioQuell system has no leak detection function and will run its entire process regardless of leaks unless manually terminated.</p>	<p>The Johnson &amp; Johnson system has no leak detection function and will run its entire process regardless of leaks unless manually terminated.</p>	<p><b>A leak monitoring system is essential to ensure the safety of personnel, including patients, healthcare workers, visitors and operators are safe.</b></p>
<p><b>Set up and disassembly</b></p>	<p>The Deprox system is very quick</p>	<p>Requiring extensive operator</p>	<p>Similar to the BioQuell process the</p>	<p><b>In order to operate a consistent</b></p>

<b>time</b>	<p>to set up as a result of its on-board technology. Requiring only the press of a single start button, there are no time-consuming measurements or technical inputs to be made. Also, with the use of the Ventilation Restriction Kit and Fire Detector Cap Kit, the time of sealing ventilation and fire detector heads is reduced from at least 20 minutes to 3 minutes. Likewise, in the disassembly stage, these pieces of equipment greatly speed up the process of removing sealing from ventilation and fire detector heads. Another key time-saving feature is that on completion of the process, there is no need to wipe down surfaces prior to readmitting the next patient</p>	<p>inputs, the BioQuell system is slow to set up in order to run the process. Also, as there are no devices for sealing ventilation or fire detector heads, a time consuming method of sheeting has to be used, with the added delay of having to wait for Estates staff to carry out this stage. In the disassembly of the process, the room often has to be wiped down, and again, Estates staff have to be called to remove the seals on the ventilation and fire detector heads.</p>	<p>Glosair system requires technical inputs, including measuring the room, which is a time consuming process. With no accessories for sealing ventilation or fire detector heads, the Glosair also needs skilled Estates representatives to carry out the sealing stage, which makes this a lengthy process.</p>	<p><b>decontamination programme, the Trust will need a system that does not depend on the availability of other departments in order to make this sustainable. As bed turnover is key, it is vital to use a system that has a rapid set up and disassembly in order to optimize patient flow and availability of rooms.</b></p>
<b>Ancillary supporting products</b>	<p>As above, the Fire Detector Kit and the Ventilation Restriction Kit are telescopic systems designed to seal ventilation and fire detector heads quickly, safely and easily. In addition, the Deprox system comes with a "DorBar" access prevention device to prevent patients, staff or visitors accessing the treatment area during the process, as well as a warning sign that has an operator check sheet on the reverse side.</p>	<p>The BioQuell system focusses only on the decontamination technology itself, with no supporting systems or technology to enhance the process.</p>	<p>Unlike the Deprox system, the Glosair does not have any supporting devices, meaning that the Trust has to design and make its own method of sealing ventilation, fire detector heads, preventing access to the room and communicating the hazards to people in the area.</p>	<p><b>The best solution for the Trust is a system that has additional supporting equipment that makes the process safer, quicker, easier, more efficient and more sustainable.</b></p>
<b>Scalability for outbreak management</b>	<p>Hygiene Solutions provide an on-call Rapid Response Decontamination Service operated via a 24 hour Helpline, giving the Trust the ability to scale up the decontamination within 6 hours of logging a call.</p>	<p>BioQuell provide a managed service dependent on their availability, often with a lead time of up to four days.</p>	<p>Johnson &amp; Johnson provide an on-call decontamination service with a 48 hour callout and do not work all bank holidays.</p>	<p><b>In order to effectively deal with outbreaks, the Trust needs to be able to scale up its environmental decontamination. Response times are key in facilitating patient flow, and a 24 hour service is essential.</b></p>