Dortek Guide:
Specifying Doors for Healthcare Environments

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Dorteks Guide to Specifying Doors for Healthcare Environments

Doors in healthcare environments can sometimes be an afterthought within the design process, but are in fact an object which is touched most frequently and used by everyone throughout a hospital. Selecting the right hospital doors is essential for fire safety, acoustics, aesthetics, hygiene and air quality. Dortek examines the potential difficulties encountered when specifying doors in the healthcare environment and how to overcome

Hospitals provide a demanding and hostile environment within which a door is required to function. For the specifier, who will often require hundreds of different doors for many different purposes, selecting the correct product can seem a daunting task. The growing demands of hygiene legislation, increasing pressure on hospitals to ensure performance matches the demands of the environment, and a renewed focus on lifetime costs, mean there are now more elements to consider than ever before.

Mistakes: One of the most common mistakes made when selecting doors for installation in a hospital is specifying a particular system without thinking properly about its functionality.

For example, while two doors in the same hospital may both need to offer a one hour fire rating, their operational use could be totally different. A one hour fire-rated door specified for a corridor area will not necessarily be suitable for use within an intensive care unit. However, recently steps have been taken regarding the implementation of design and the service life of doors in hospitals, and companies like Dortek, who are specialists in the design, manufacture and fitting of door products in the healthcare sector, can advise on the correct door type to suit the application.

Materials: One of the most important aspects of a successful infection control policy, beyond general hygiene, is choosing the correct materials for both the construction of the room and the components within it. Traditionally, most hospital doors are painted wooden or wooden cored laminate. However, because of increasing standards of hygiene and infection control, glass reinforced polyester (GRP) is becoming the material of choice for the modern hospital designer, not only for high risk areas such as intensive care, pharmacy cleanrooms and operating theatres, but also for medium risk areas like recovery suites, laboratories and hydrotherapy pools.

GRP is a high technology engineering composite, manufactured from millions of strands of glass fibre and polyester resin. Doors are produced using a unique closed mould process, creating a strong, uniform product with no seams or joins on the door surface and no holes or crevices within. Unlike alternatives, colour is built into the door during the manufacturing process, and the outer skin has a gel coat finish that is chemically bonded to the glass fibre, ensuring that such doors will never require repainting or refinishing – avoiding costly shutdowns and maintenance throughout the door's lifetime.

Wall, floor and ceiling finishes are all upgraded, but all too often doors, **the one item that gets the most use and abuse, are overlooked.**

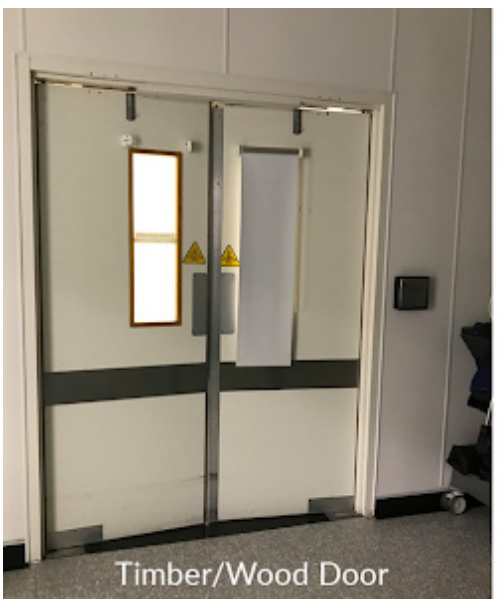
Organic doors not suitable for all areas
While wooden or laminate doors may be adequate for non-critical areas such as corridors, waiting areas and general office space, in areas where cleanliness is of the utmost importance organic materials are not suitable. No one would consider using organic materials to make trolleys, benches or operating tables, and yet we still see doors manufactured with timber

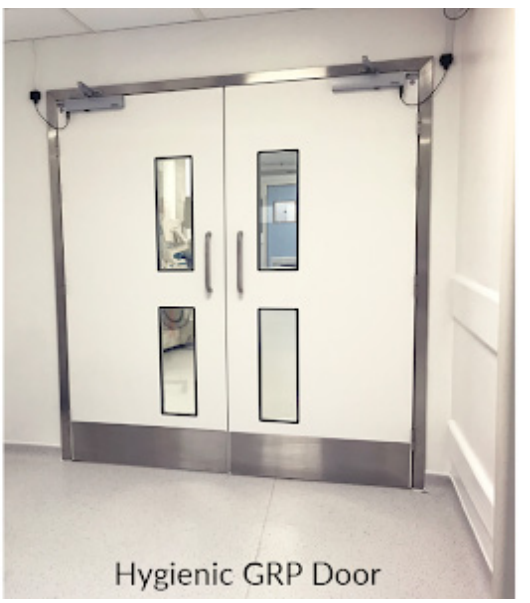
Fitting out: lippings, frames and vision panel surrounds in widespread use. In these areas there needs to be a step-up in specification. Wall, floor and ceiling finishes are all upgraded, but all too often doors, the one item that gets the most use and abuse, are overlooked. When in use in areas such as operating theatres, doors can be subject to damage on a regular basis, with trolleys manoeuvred in confined spaces inevitably hitting both the door and its frame. In the past concerns were purely aesthetic and repairs could be carried out when theatres were closed for major maintenance. However, when surfaces are damaged these days there is an immediate risk to infection control that must be dealt with urgently. Wooden and laminate doors are not only weaker than GRP doors, and thus more easily damaged, but can also pose a higher risk, as a knock or chip may reveal organic materials below where bacteria could reproduce, as well as being virtually impossible both to clean and to keep clean effectively.

Pharma sector 'turns its back' on timber/laminate: The international pharmaceutical manufacturing industry has now turned its back on timber and laminate doors, replacing them with GRP as standard across almost all manufacturing facilities. With the standards of cleanliness demanded by such industries specifiers are recognising that the downside of infection contamination in a cleanroom far outweighs any reason not to reconsider and challenge the decades-old thinking behind conventional hospital hygienic door specification. Table 1 provides a comparison of some of the mechanical properties of commonly used door materials.

Hygiene: Hygiene is now regarded as the most important performance criterion in healthcare applications in the fight against hospital-acquired infections. Infection control guidance note HFN 30, "Infection control in the Built Environment" 2003, addresses infection control issues in design and planning, and states that: "If the burden of healthcare-associated infection is to be reduced, it is imperative that architects, designers and builders be partners with healthcare staff and infection control teams when planning new facilities or renovating older buildings". The guidance note calls for smooth, hard impervious surfaces which are easy to clean and durable. Ledges, recesses and right angles where dust particles can be trapped should, it says, be avoided to allow ease of cleaning. Alongside the clinical environment, another potential area where cleanliness is of key importance in preventing HAIs is within a hospital's catering facility. Growing demands of hygiene legislation and increasing pressure on hospitals to provide better standards of catering are forcing many hospitals to reassess their kitchens and invest in new facilities.

Studies show doors can harbour bacteria: In recent studies of hospital cleanliness microbiologists have found that doors are a major area of bacteria collection and therefore need to be able to sustain regular cleaning.


Timber/Wood Door


Hygienic GRP Door

Doors should be able to tolerate constant cleaning with a number of different chemicals, including prolonged use of disinfectants, chlorine-releasing agents and alcohol wipes.

With the details of the new deep cleaning programme released at the end of 2007, it is more important than ever that doors are able to stand up to regular washdowns and chemical treatment.

Doors should be able to tolerate constant cleaning with a number of different chemicals, including prolonged use of disinfectants, chlorine-releasing agents and alcohol-impregnated wipes. Laminate and painted wooden doors can, on occasion, deteriorate and flake once exposed to common cleaning regimes. This can lead to costly maintenance and deterioration, meaning that the doors have to be replaced after a short space of time. Ease of cleaning should also be taken into consideration when fitting hardware or door furnishings. Hardware to be fixed to Dortek's GRP door sets is prepared using CNC controlled routering machines, ensuring the tightest possible fit of flush fitting door furniture.

Table 1: Comparison of mechanical properties of commonly used door materials

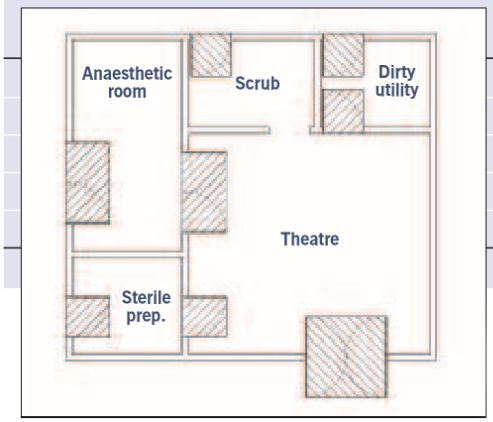
Material	Specific strength (Mpa)	Specific gravity	Tensile strength (Mpa)	Compressive strength (Mpa)
Mild Steel	31	7.8	240	240
Aluminium Aloy	154	2.7	417	417
Stainless Steel	30	7.92	241	241
GRP	417	2.16	900	450

Lifetime costs: One of the prime concerns when building a hospital is lifetime costs. It is essential that the chosen solution should be manufactured on time, on budget and using materials which will require minimum maintenance over the years. Projects undertaken under a Private Finance Initiative have embraced this idea, with the bidder being asked to provide a summary cashflow of projected lifecycle expenditure on a year-by-year basis.

The current HTM 69 covers the issue of long-term durability, stating that: "causes that lead to damage in healthcare buildings include... reduction in the quality of building materials and construction standards, often due to inadequately considered cost cutting." In PFI projects it is emphasised that the designs should have clinical functionality, maintaining elements such as fire ratings, whilst incorporating healthcare lifestyle elements such as smooth, easy to clean surfaces.

Hospital design and alternatives: Chosen door systems should work with the room design. Sliding doors are becoming increasingly popular, both in new buildings and as replacements for existing hinged single and double. action doors. Throughout Europe sliding doors are now standard in most hospitals, especially in the Netherlands and Switzerland, where use of hermetically sealing doors has helped dramatically reduce incidences of hospital-acquired infections.

Table 2: Dimensions lost due to operating swing doors



Room	Area	Area remaining after swing doors fitted	Area lost due to swing doors
Theatre	27.5 m²	23.5 m²	4 m²
Anaesthetic	12.0 m²	10.4 m²	1.6 m²
Sterile Prep.	5.5 m²	4.7 m²	0.8 m²
Scrub	5.7 m²	4.9 m²	0.8 m²
Dirty utility	5.0 m²	3.4 m²	1.6 m²
Totals	55.7 m²	46.9 m²	8.8 m²

A common misconception is that sliding doors are more expensive. They can, however, be more economical and, taking up less valuable floor space, they are ideal for small rooms and areas with narrow corridors. Overall construction costs are typically lower with sliding doors. Table 2 shows how much space can be saved if double action swing doors are replaced with sliding doors. With one of the UK's leading operating theatre and cleanroom builders estimating that theatres cost on average £1,500 per square metre to build, investing in sliding doors for this facility would save over £13,000, or 15% of the floor space.

Automation: In many areas of hospitals doors will be manually operated. However, there are cases where automation should be used to ensure operating efficiency as well as to protect the door itself and ensure it remains damage-free. Automated doors should be used in areas of high traffic flow and where individual members of staff may be passing through an area with equipment which must go through the door. They are also ideal for use in areas which require access control and where doors must not be held open. It is important to consider the positioning of the method of actuation, whether it be a push button, kick plate or touchless sensor, to maximise the benefits of automation.

Making the right choice: In conclusion, when specifying a door system, considering the following points will not only contribute to the cleanliness of the working environment, but will also ensure operating efficiency and a long, trouble-free lifespan for your door-sets:

- Hygienic performance
- Lifecycle costs
- Inorganic materials
- Benefits of sliding over hinged doors in certain environments
- Smoke and fire regulations
- Strength, durability and protection requirements
- Sound insulation
- Security
- Accessibility
- Colour and contrast.

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