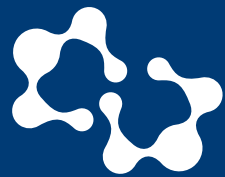




Durable antimicrobial
protection for
rail transport



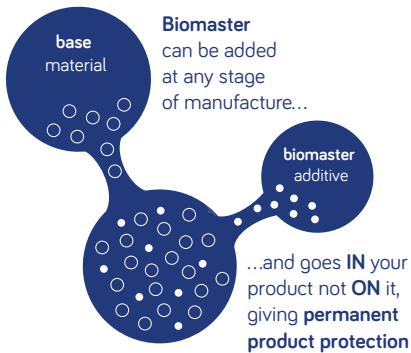
Biomaster[®]

Antimicrobial Technology

Study report on the cost effectiveness of incorporating antimicrobial technology into rail transport

How is it added?

Biomaster is easily incorporated into any polymer, textile, paint or coating. In most cases it is added during the manufacturing process to provide effective protection for the useful lifetime of the product.

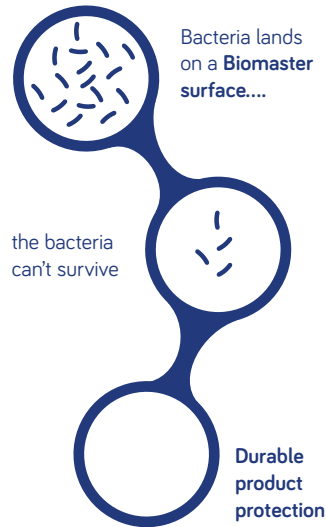


How does Biomaster work?

Biomaster is based on silver ion technology and has three modes of action.

When bacteria lands on a Biomaster protected surface, the silver ions prevent them from growing, producing energy or replicating, therefore they die.

When added, Biomaster becomes an integral part of the product. It is non-leaching so it stays permanently within the treated item.



Biomaster does not affect the basic colour or surface finish and can even be added to clear grades of plastic.

How effective is Biomaster?

Biomaster is incredibly durable and highly active.

Tested in thousands of applications, it is proven to reduce the overall level of most common types of harmful microbes on product surfaces.

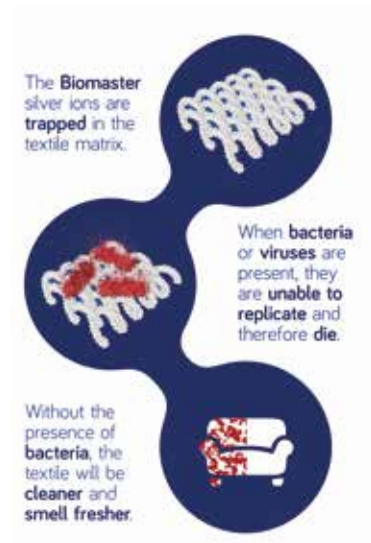
In typical tests to ISO 22196:2011 Biomaster reduced levels of E.coli, MRSA, Listeria, Legionella, Salmonella, Campylobacter and Staphylococcus aureus by over 99%

Can Biomaster be applied as a post-treatment?

Yes but only on fabrics. Biomaster fabric spray has been proven to reduce the microbial load in fabrics, both bacterial and viral (i.e. Norovirus) by up to 99.9%.

An additional benefit of the Biomaster technology is its ability to reduce odour-forming bacteria.

Laboratory tests show that fabric treated with silver-ion treated technology produce fewer malodours and therefore provide a fresher environment.



Tested and compliant

We know Biomaster is highly effective at reducing bacteria levels but it is essential our customers are just as confident that the finished product is effective.

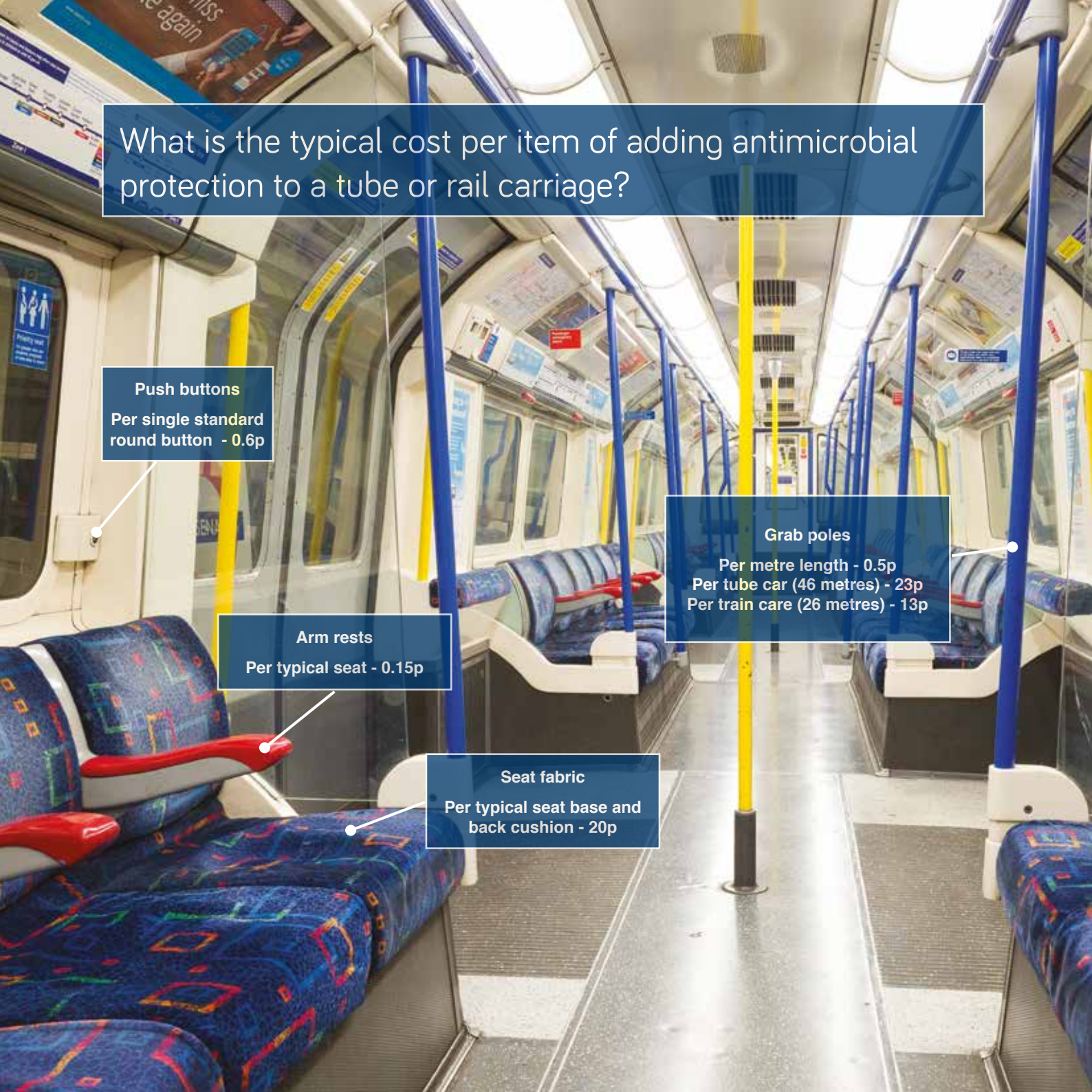
That's why our antimicrobial testing to the latest ISO standards is completely independent and conducted only at leading microbiology laboratories.

The Biomaster regulatory service will ensure your product complies with all the relevant legislation for biocidal products including:

- Biocidal Products Regulation (BPR)
- Environmental Protection Agency (EPA)
- Food and Drug Administration (FDA)

We also work closely with our customers to ensure they comply with the required regulations regarding the manufacture, importing and marketing of products incorporating Biomaster.





What is the typical cost per item of adding antimicrobial protection to a tube or rail carriage?

Push buttons
Per single standard round button - 0.6p

Arm rests
Per typical seat - 0.15p

Seat fabric
Per typical seat base and back cushion - 20p

Grab poles
Per metre length - 0.5p
Per tube car (46 metres) - 23p
Per train care (26 metres) - 13p



Seat back grab handles
Per pair of seats - 1p

Tables
Per standard table (laminated) - 2.8p
Per seat shell back table (gel coat) - 4p

Seat shells
Per single seat - 30p



Universal Access toilet cubicle
(Walls, grab handles, cabinets, sinks etc.)
per 20m² surface area - £1.20

Standard Module toilet cubicle
(Walls, grab handles, cabinets, sinks etc.)
per 12m² surface area - 72p



Biomaster® is a registered trademark of:

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