endurocide
INFECTION CONTROL

Endurocide® Antimicrobial PLUS Hospital Curtains

STANDARD COLOURS

Protecting your staff & patients all day, everyday

endurocide.com

The facts:

Hospital Acquired Infections (HAIs)

In 2016/17 NHS England hospitals had approximately 834,000 HAIs, accounting for an estimated 28,500 deaths[7]

Pathogens such as C.difficile spores, MRSA, COVID-19, Measles etc., can survive on surfaces anywhere from a few hours to up to five months[3,5,6]

Contamination of traditional Curtains can happen rapidly after installation, causing them to become potential sources of pathogenic transmission[1,4]

Traditional hospital laundering practices are not sufficient to remove all viable bacteria[2]

1. Ohl, Michael; Schweizer, Marin; Graham, Maggie; Heilmann, Kristopher; Boyken, Linda; Diejema, Daniel "Hospital privacy curtains are frequently and rapidly contaminated with potentially pathogenic bacteria" American Journal of Infection Control (2012)
2. Karen McIntyre "Hospital Laundering Practices linked to HAI's" www.nonwoven-industry.com (May 2013)
3. Kramer, Axel; Schwebke, Ingeborg and Kampf, Günter "How long do nosocomial pathogens persist on inanimate surfaces? A systematic review" BMC Infectious Diseases (2006), 6:130
4. Madeo, Maurice; Green, David; McGregor, Eileen "A study to compare the microbiological contamination of 3 types of hospital privacy curtains with a district general hospital" www.endurocide.com
5. Centers for Disease Control & Prevention "Science Brief: SARS-CoV-2 and Surface (Fomite) Transmission for Indoor Community Environments", April 2021 https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html
6. World Health Organisation "Measles Fact Sheet", December 2019
7. Guest JF, Keating T, Gould D, et al. Modelling the annual NHS costs and outcomes attributable to healthcare-associated infections in England. BMJ Open 2020;10:e033367. doi:10.1136bmjopen-2019-033367
8. Centers for Disease Control & Prevention "HAI and Antibiotic Use Prevalence Survey" https://www.cdc.gov/hai/eip/antibiotic-use.html
9. American Hospital Association "Fast Facts on U.S. Hospitals, 2022" https://www.aha.org/statistics/fast-facts-us-hospitals

The solution:

Endurocide® Antimicrobial **PLUS** Hospital Curtains

Why Antimicrobial Plus?

Unlike other available antimicrobial curtains, **Endurocide® Antimicrobial Plus Curtains** are:

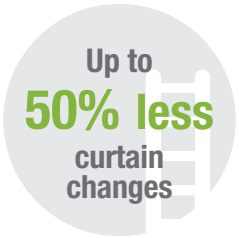
- Proven to remain active for up to two years*
- Silver additive free
- Tested and proven to be effective against the top five pathogen groups found in hospitals†

Tested against:†

- Bacteria
- Fungi
- Mycobacteria
- Spores
- Viruses

Other important benefits:

PATENTED COATING
for up to two year long life*



REDUCING RISK
and saving valuable time

OVERALL SAVINGS
over two years

PEER REVIEW TESTED
on five continents

* **Disclaimer:** Whilst Endurocide® Antimicrobial Plus Standard Curtains have been independently tested to remain antimicrobially and sporicidally effective for up to two years in-situ, the actual length of curtain use achieved will depend on a variety of factors, including, but not limited to: individual hospital practices; the natural longevity of polypropylene; the risk of the curtain being soiled from items such as blood, urine and general spills; etc. Curtains should always be replaced when visibly soiled. Any timescales provided/referenced are always offered as a guideline only and under no circumstances whatsoever constitute a guarantee. † See individual curtain testing pages for full details on pathogens tested against.

Our technology is different...

Whilst traditional polyester curtains, natural fibre or short-life disposable curtains can easily become **sources of pathogenic transmission within days of installation**, our curtains are different...

At the curtain manufacturing stage, the polypropylene curtain fabric is impregnated with our unique, patented **Endurocide® Curtain Liquid**.

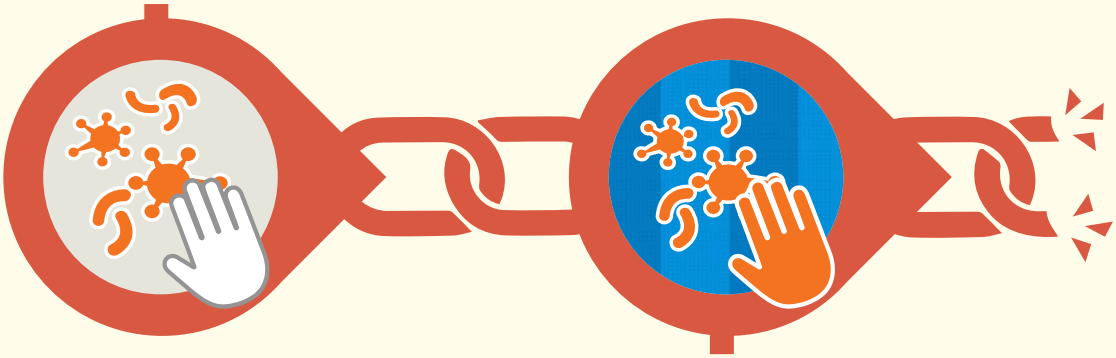
This impregnation coats the curtain fabric creating a polymer layer which has a **dual 'static' and 'cidal' action**.

The 'static' action allows the curtain fabric to **trap pathogens** on the surface of the fabric and prevent them from multiplying, whilst the 'cidal' action then **kills the pathogens** - **helping to break the chain of infection!**

The dual mechanism of trapping and killing the top healthcare pathogen groups on the curtain surface is key - and what makes Endurocide® Antimicrobial Plus Curtains so unique

Breaking the Chain of Infection...

Hand touches contaminated patient, item or surface and **picks up pathogens**.



Contaminated hand touches curtain - **pathogens may be transferred to curtain surface**.

Laboratory testing

To validate our claims, Endurocide® Antimicrobial Plus Curtains have been independently laboratory tested to a wide range of international standards:

Fabric Testing - Trapping pathogens

We use **qualitative** 'Zone of Inhibition' tests to prove that our Endurocide® Curtains both trap pathogens on the surface of our fabric and then prevent the pathogens from growing and reproducing further whilst they are trapped. These are known as 'static' tests.

International standards used:

- AATCC 147
- ISO 20645
- CG 147

Fabric Testing - Killing pathogens

We use **quantitative** fabric tests to prove that, once pathogens are trapped on the curtain surface, they are then killed – completing our unique dual-action patented protection technology. These are known as 'cidal' tests:

International standards used:

- ISO 20743
- ISO 18184
- AATCC 100
- JIS Z 2801

One Year & Two Year Testing*

Tests conducted on the Endurocide® Curtain fabric one year and two years after manufacture, both in use and in storage, to demonstrate that the treated fabric remains active and effective.

- CG 147
- AATCC 100

Five Year Testing*

Tests conducted on stored Endurocide® Curtain fabric five years after manufacture to demonstrate that the treated fabric remains active.

- CG 147
- AATCC 100

Liquid Testing

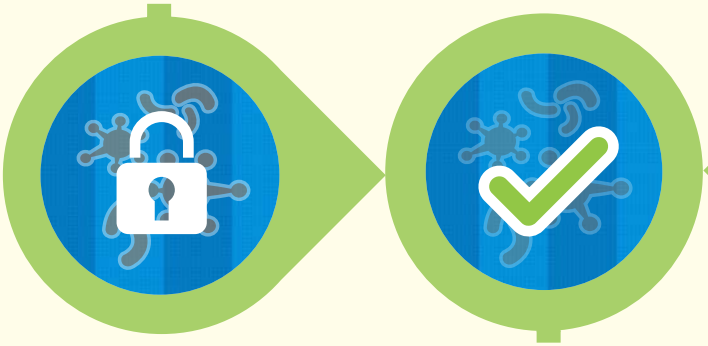
To show virucidal efficacy, quantitative suspension tests were carried out using the biocidal liquid which impregnates our Endurocide® Antimicrobial Plus Curtains.

International standard used:

- EN 14476

For information on pathogens tested against, please see the next page.

Endurocide® Antimicrobial Plus Curtains **trap pathogens on the fabric surface**, preventing their escape or multiplication.



Once trapped on the curtain surface, the unique impregnation action **kills the pathogens** – and continues to act for up to **two years**.*

Endurocide® Antimicrobial Plus Curtains prevent potential retransmission of pathogens to staff, patients, visitors, equipment, surfaces and any other items - **breaking the chain of infection!**

* See Disclaimer on page 12

Laboratory testing

To validate our claims against **spores, bacteria, enveloped viruses, mycobacteria** and **fungi**, Endurocide® Antimicrobial Plus Curtains have been independently laboratory against the following pathogens:

Spores	International Standards
Clostridium difficile	AATCC 147 CG 147 AATCC 100 JIS Z 2801
Bacillus cereus	AATCC 147

Bacteria	International Standards
Acinetobacter baumannii	CG 147
Acinetobacter baumannii (CRA)	CG 147
Acinetobacter baumannii (MDRA)	CG 147
Enterococcus hirae	CG 147
Escherichia coli	ISO 20645 CG 147 AATCC 100
Extended Spectrum Beta-lactamase (ESBL) *Escherichia coli*	CG 147 AATCC 100
Extended Spectrum Beta-lactamase (ESBL) *Klebsiella pneumoniae*	CG 147
Klebsiella pneumoniae	ISO 20645 CG 147 ISO 20743
Methicillin-resistant *Staphylococcus aureus* (MRSA)	AATCC 147 CG 147 AATCC 100 JIS Z 2801
Pseudomonas aeruginosa	CG 147 AATCC 100
Salmonella typhimurium	CG 147 AATCC 100
Serratia marcescens	AATCC 147 AATCC 100
Staphylococcus aureus	ISO 20645 ISO 20743
Vancomycin resistant *Enterococcus faecalis* (VRE)	AATCC 147 CG 147 AATCC 100

Tested against:

- Bacteria
- Fungi
- Mycobacteria
- Spores
- Viruses

Enveloped viruses	International Standard
Vaccinia virus, strain Ankara (MVA)	ISO 18184

Mycobacteria	International Standard
Mycobacterium tuberculosis	CG 147

Fungi	International Standards
Aspergillus brasiliensis	CG 147 AATCC 147 AATCC 100
Candida albicans	CG 147 AATCC 147 AATCC 100 JIS Z 2801
Candida auris	CG 147 AATCC 147 AATCC 100

Liquid treatment testing

Enveloped viruses	International Standard
Human Coronavirus	EN 14476
H1N1 Influenza A virus	EN 14476
Measles virus	EN 14476

Our curtains have been tested to the following International fire retardant standards:

Country/Region	International Standards
UK	BS 5867 Part 2 Types B & C: 2008
Europe	EN 13773: 2003+A1: 2007
USA	NFPA 701: 2010
Canada	CAN/ULC-S109
Australia & New Zealand	AS 2755.2-1985 AS 1530.2-1993 Part 2

Independent Peer Review Trials

Endurocide® Antimicrobial Plus Standard Curtains have been extensively tested in independent international trials and peer reviews:

Scan here to find out more about our international trials:

American Journal of Infection Control 24 month trial[1]

In 2016, a report was published in the American Journal of Infection Control testing the antibacterial efficacy of Endurocide® Antimicrobial Plus Standard Curtains 24 months after installation.

Organised by one of Australia's largest public health services, every six months over a period of **24 months** Zone of Inhibition and Contact Inhibition testing was carried out against a range of multi-resistant microorganisms, including:

- Gram positive bacteria (MRSA, VRE *E.faecium*)
- Gram negative bacteria (*Pseudomonas aeruginosa*, ESBL *E.coli*)
- Fungi (*Candida albicans*)
- Spores (*Clostridium difficile*)

COST REDUCTION 50%

Excellent results were achieved... when tested at baseline, **6, 12, 18 and 24 months.**

There were cost benefits for replacing standard fabric curtains with Endurocide Curtains... cutting the overall cost by more than 50%.*

* The cost savings were based on comparing the use of Endurocide® Antimicrobial Plus Standard Curtains with traditional cotton cubicle curtains, not only in regards to the initial purchasing costs but to the saving of labour and laundering over two years.

1. Kotsanas, Despina; Gillespie, Elizabeth "Disposable antimicrobial and sporicidal privacy curtains: Cost benefit of hanging longer" American Journal of Infection Control, February 25, 2016; DOI:https://doi.org/10.1016/j.ajic.2016.01.009

Independent US Military Hospital evaluation on curtains 20 weeks after hospital use[2]

An independent study carried out by a US military hospital evaluated whether Endurocide® Antimicrobial Plus Curtains can reduce pathogen contamination on curtains and so reduce the potential for HAI transmission. It also compared the annual cost difference between using Endurocide® Antimicrobial Plus Curtains and traditional cotton curtains.

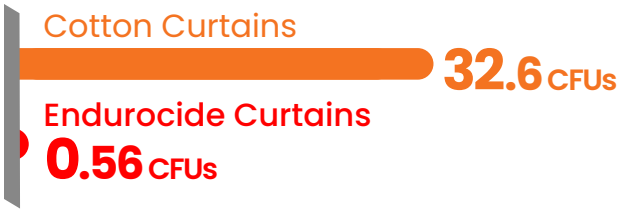
Published in the journal Infection Prevention in Practice, this study compared curtains by hanging new or laundered curtains in acute care and maternity wards in the hospital for 20 weeks. The curtains used were:

- Endurocide® Antimicrobial Plus Curtains (hung in 13 rooms).
- Traditional cotton curtains (hung in 2 rooms).

Bacterial swabs were taken at the start of the trial and 20 weeks after installation; swabs were taken from both sides of the curtain from the area of the curtains at waist height, ie the part most frequently touched by staff and patients. To robustly evaluate the antimicrobial efficacy of the Endurocide® Curtains, they remained in the rooms when inhabited by patients on "contact or droplet precautions," whereas cotton curtains were removed and laundered between patients.

Results: bacterial reduction

No. CFUs after 20 weeks (mean)



98.3% reduction

Results: cost reduction

	Endurocide Curtains	Cotton Curtains	Total savings
Initial Purchase Cost	$1,564.70	$8,432.14	**$6,867.44**
Staff cost (changing curtains)	$9.25	$485.63	**$476.40**
Laundry cost	$0.00	$379.05	**$379.05**
		Total savings over 20 weeks:	**$7,722.89**

Conclusions

- "The data demonstrates that **antimicrobial and sporicidal curtains decrease bacterial count after installation**."
- Endurocide® Antimicrobial Plus Curtains "provide a **passive infection prevention method to mitigate the transmission of hospital associated pathogens** during hospitalisation."
- Potential **savings of over $20,000 annually** and approximately **70 hours of staff time** in curtain changes.
- "These findings suggest **similar facilities should consider implementing these curtains** as our results suggest the possibility to **improve patient outcomes and decrease costs**."

2. Nicole M Nelson, Anna Aceto, Gordon F West, "New patient privacy curtains to provide passive infection prevention," Infection Prevention in Practice, 2023 Jun 13;5(3):100291. doi: 10-.1016/j.infpip.2023.100291

Hong Kong joint Universities & Government study on bacterial contamination of hospital curtains[3]

This study, published in the Journal of Infection Control & Epidemiology, evaluated both bioburden and hanging times of three types of curtain Endurocide® Antimicrobial Plus Standard Curtains, curtains with built-in silver additives and traditional fabric curtains.

Organised jointly between eight hospitals and three government departments in Hong Kong, the study collected culture samples weekly from 12 rooms across 10 hospitals over 12 months to amass significant data before publishing their findings.

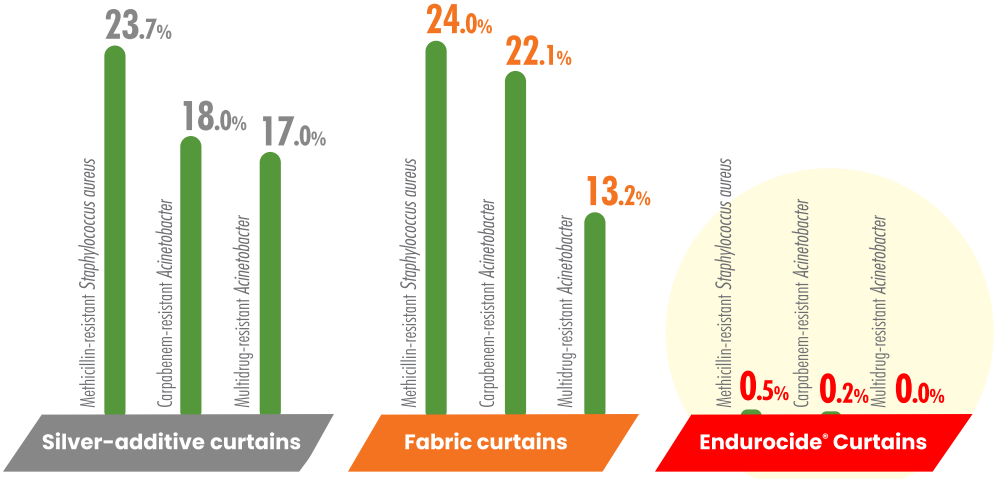
The results overwhelmingly supported the continued use of Endurocide® Curtains to improve patient safety by eliminating sources of Multi-drug Resistant Organism (MDRO) transmission.

Results:

Number of days before contamination first detected on curtains (median)

Scan here to find out more about our international trials:

Percentage of contamination detected in this period:



Conclusions.

- Endurocide® Antimicrobial Plus Curtains were "**highly effective in reducing the bioburden**" and "**percentages of MDRO [multidrug-resistant organisms] contamination were also significantly lower**" (98-100% reductions) – "**even after prolonged use.**"
- Using Endurocide® Curtains in place of standard curtains "**could avert the costs related to curtain changing, laundering, and revenue loss**, in addition to **improving patient care by removing an environmental source of MDROs.**"

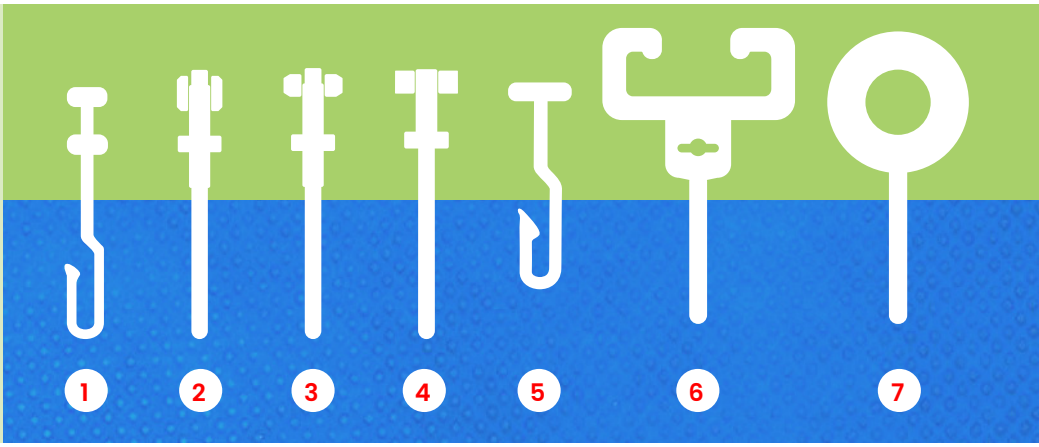
> "Curtains that resist MDRO contamination for >19 weeks [...] could potentially improve patient safety by eliminating a source of healthcare-associated pathogens."

3. Shik Luk MBBS, MRCP, FRCPath, FHKCPath, FHKAM1 et al, "Effectiveness of antimicrobial hospital curtains on reducing bacterial contamination - A multicenter study," Infection Control & Hospital Epidemiology (2019), 40, 164–170; DOI:10.1017/ice.2018.315

Options & specifications

Hanging systems

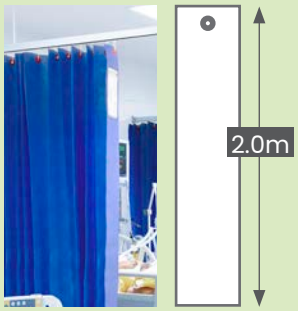
1. Quick-fit
2. Wheeled
3. Wide-wheeled
4. Metal bar wide-wheeled
5. Large-top
6. U-type
7. Eyelet extension hook



Curtain types

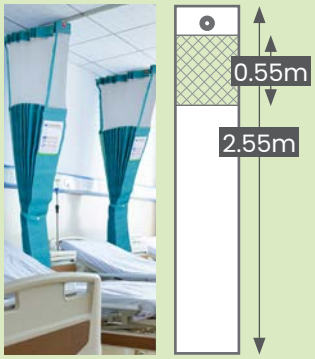
Standard

100% polypropylene, designed for use with suspended rails



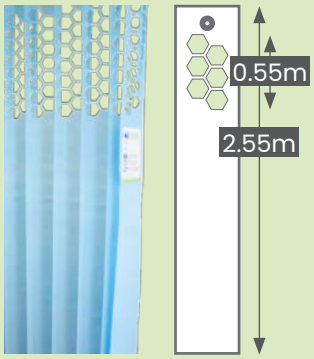
Mesh Top

With NFPA 13 compliant mesh, designed for use with ceiling-fixed rails



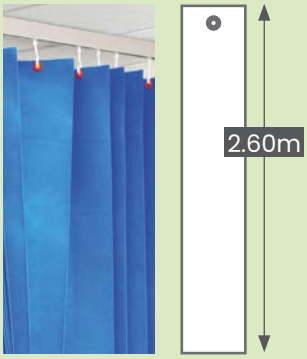
Mesh Cut*

An economical alternative to traditional mesh top curtains



Long Drop

100% polypropylene, designed for use with ceiling-fixed rails



* Mesh Cut curtains do not meet US NFPA 13 specifications and are not suitable in areas that require mesh for sprinkler access.

Curtain dimensions

	Standard	Mesh top	Mesh cut	Long drop
Height	**2.0m**	**2.55m** (includes 0.55m mesh)	**2.55m**	**2.6m**
Full width	**7.5m**	**7.5m**	**7.5m**	**7.5m**
Medium width	**5.55m**	**5.55m**	**5.55m**	**5.55m**
Half width	**3.75m**	**3.75m**	**3.75m**	**3.75m**
Pleat width	**0.15m**	**0.15m**	**0.15m**	**0.15m**

As a general rule, total curtain width needs to be twice the length of the curtain rail.

Please note: curtain width refers to the total fabric used; visible width may be reduced due to double-pleating. There is a +/-9% tolerance on all aspects of the curtains.

Standard colours

Order codes

Please use these codes when placing orders for our Antimicrobial Plus Curtains:

Section	Option	Order code
1 CURTAIN TYPE	Standard	SC
	Mesh top	SMTC
	Mesh cut	SMC
	Long drop	SLD
2 WIDTH	Full width (7.5m)	FW
	Medium width (5.55m)	MW
	Half width (3.75m)	HW
3 HANGING SYSTEM	Eyelets only (no hooks)	E
	Quick-fit hooks	QF
	Large-top hooks	LT
	Wheeled hooks	WH
	Wide-wheeled hooks	WWH
	Metal-bar wide-wheeled	MWW
	U-type	U
	Eyelet extension hooks	EEH
4 COLOUR	Medical blue	MB
	Pastel blue	PB
	Pastel green	PG
	Pastel yellow	PY
	Lilac	LI
	Grey	GY
	Teal	TE
	Latte	LA

Order code example:

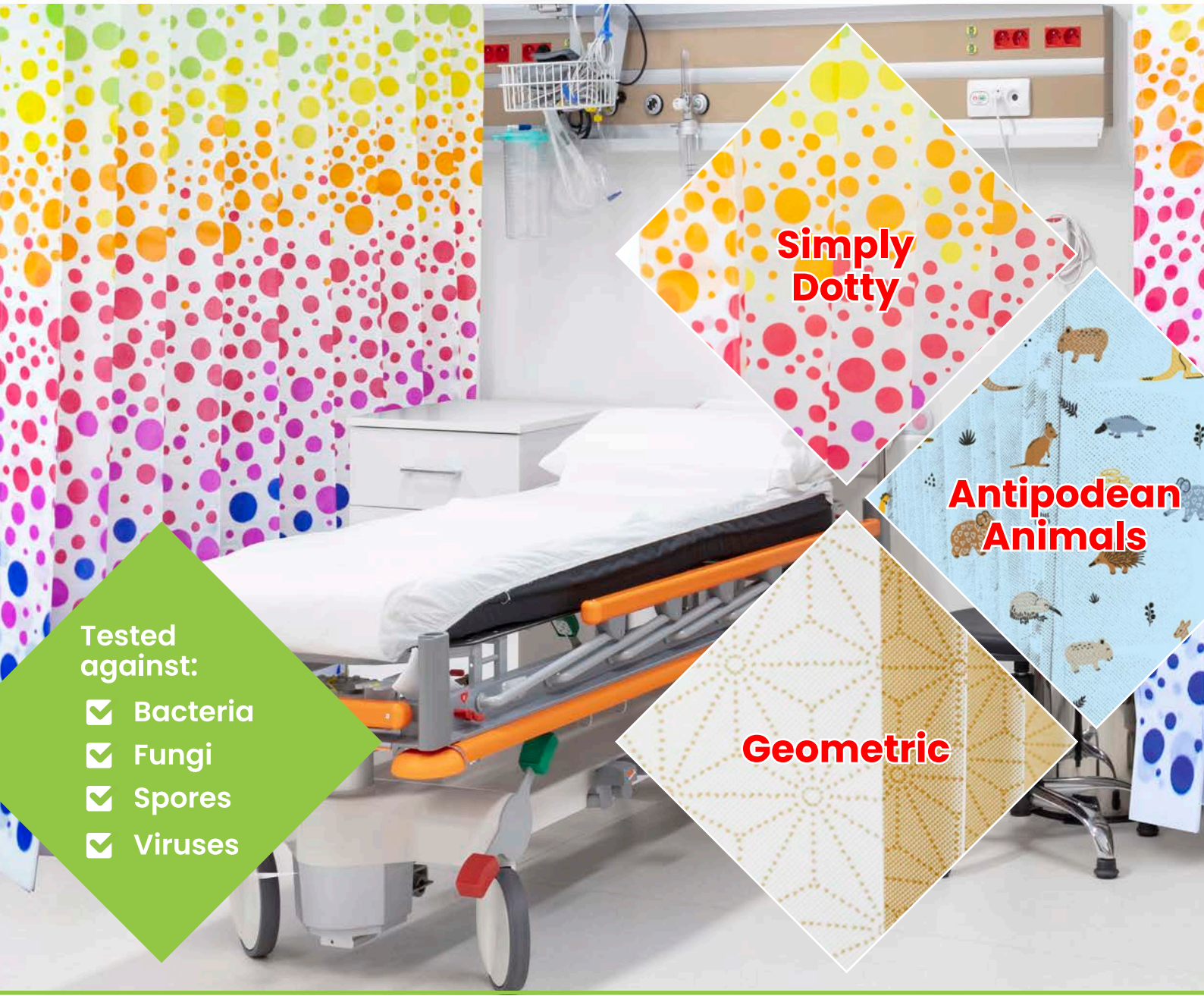
1 CURTAIN TYPE		2 WIDTH		3 HANGING SYSTEM		4 COLOUR / DESIGN
Standard		Full Width		Quick-fit hooks		Pastel Green
SC	**-**	**FW**	**-**	**QF**	**-**	**PG**

Scan here to access our handy Order Code Generator:

Also available:

Endurocide® Antimicrobial PLUS Printed Hospital Curtains

Find out more:



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