endurocide
INFECTION CONTROL

Endurocide® Antimicrobial PLUS Hospital Curtains

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]

93% of tested laundered fabrics contained bacteria that could result in HAIs[2], with up to 92% of traditional (fabric) curtains becoming re-contaminated within one week[1]

21% of all bed days across NHS England hospitals in 2016/2017 were due to HAIs, costing some £2.7 billion per year[7]

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:

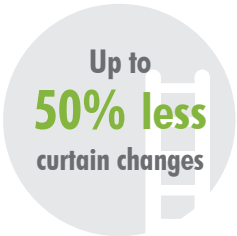
- Proven to remain active for up to two years*
- Silver additive free
- Tested and proven to be effective against the top five pathogen groups found in hospitals†

Tested against:†

- Bacteria
- Fungi
- Mycobacteria
- Spores
- Viruses

Other important benefits:

PATENTED COATING
for up to two year long life*



REDUCING RISK
& saving valuable time

OVERALL SAVINGS
over two years

PEER REVIEW TESTED
in over eight countries

* **Disclaimer:** Two year long life applies to Endurocide® Antimicrobial Plus Standard Curtains only and 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**.

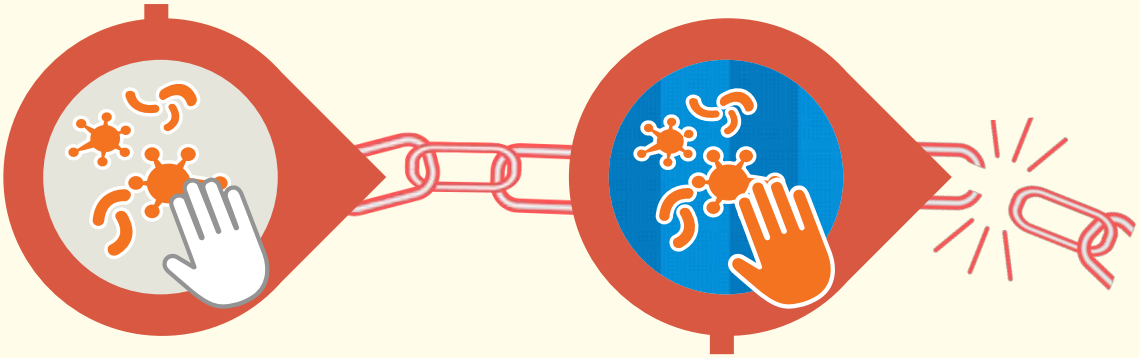
This impregnation coats the curtain fabric creating a polymer layer which has a **dual 'static' and 'cidal' action**.

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**

Our technology in action...

Endurocide® Antimicrobial Plus Curtains kill the top 5 pathogen groups:*

Bacteria & fungi

are killed by both preventing their respiration and rupturing their cell membrane, then disrupting their cell metabolism and finally inhibiting the cell from reproducing

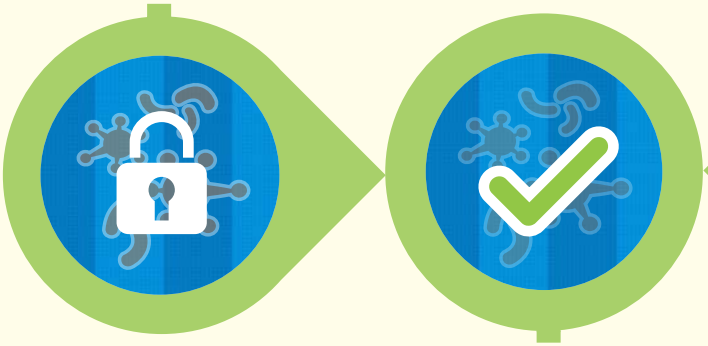
Spores

are killed by piercing through the spore coats and cortex, so causing lethal DNA damage

Enveloped viruses

are inactivated by attacking and damaging the virus's protein and lipid structures, so stopping their ability to cause infections

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 3

Antimicrobial **PLUS**
Hospital Curtains – Standard Colours

Laboratory testing

1. 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:

- AATCC 147
- CG 147

2. 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 know as 'cidal' tests:

- AATCC 100
- ISO 20743
- JIS Z 2801

3. One Year & Two Year Testing*

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

- CG 147
- AATCC 100

4. Liquid Testing

Fabric tests against certain viruses, such as Measles and Coronavirus, do not yet exist.

In this situation, to demonstrate our virucidal effectiveness, we instead use quantitative suspension tests against the liquid used to impregnate our Endurocide® Curtains:

- EN 14476

* See website for further details on our one and two year testing

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

Mycobacteria	International Standards
Mycobacterium tuberculosis	CG 147

Bacteria	International Standards	
Acinetobacter baumannii	CG 147	
Acinetobacter baumannii (CRA)	CG 147	
Acinetobacter baumannii (MDRA)	CG 147	
Enterococcus hirae	CG 147	
Escherichia coli	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	CG 147	ISO 20743
Methicillin-resistant *Staphylococcus aureus* (MRSA)	CG 147 AATCC 100	AATCC 147 JIS Z 2801
Pseudomonas aeruginosa	CG 147	
Salmonella choleraesuis	JIS Z 2801	
Salmonella typhimurium	CG 147	AATCC 100
Staphylococcus aureus	ISO 20743	JIS Z 2801
Vancomycin resistant *Enterococcus* faecalis (VRE)	CG 147	

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

Liquid treatment testing

Enveloped viruses	International Standards
Human Coronavirus	EN 14476
H1N1 Influenza A virus (Swine Flu)	EN 14476
Measles virus	EN 14476

Fire retardant standards

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

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

TESTED AGAINST CORONAVIRUS

Standard colours

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

Hong Kong joint Universities & Government study on bacterial contamination of hospital curtains[2]

This study, published in the Journal of Infection Control & Hospital 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.

Using Endurocide® Curtains in place of standard curtain:

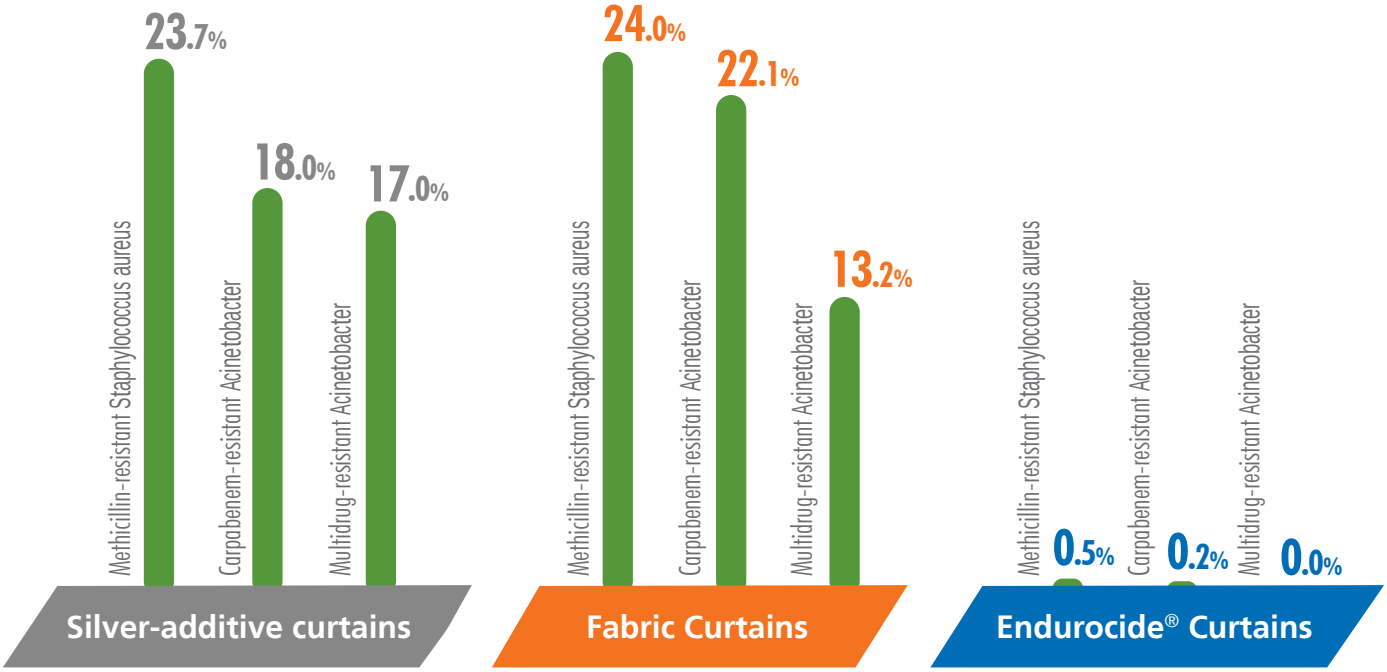
"could avert the costs related to curtain changing, laundering, and revenue loss, in addition to improving patient care by removing an environmental source of MDROs."

Results:

Contamination detected on curtains after:*

Silver-additive curtains	Fabric curtains	Endurocide® Curtains
4 DAYS	5 DAYS	138 DAYS

Percentage of contamination detected in this period:



*Median

2. 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

Antimicrobial PLUS
Hospital Curtains – Printed Colours

Laboratory testing

1. Fabric Testing - Trapping pathogens

We use a **qualitative** 'Zone of Inhibition' test 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.

This type of test is known as a 'static' test (*see image 1*):

- **CG 147**

2. Fabric Testing - Killing pathogens

We use a **quantitative** fabric test to prove that, once pathogens are trapped on the curtain surface, they are then killed – completing our unique dual-action patented protection technology.

This type of test is known as a 'cidal' test (*see image 2*):

- **ISO 20743**

3. Liquid Testing

Fabric tests against certain viruses, such as Measles and Coronavirus, do not yet exist.

In this situation, to demonstrate our virucidal effectiveness, we instead use quantitative suspension tests against the liquid used to impregnate our Endurocide® Curtains:

- **EN 14476**

Spores	International Standards
Clostridium difficile	**CG 147**

Bacteria	International Standards
Enterococcus hirae	**CG 147**
Escherichia coli	**CG 147**
Klebsiella pneumoniae	**CG 147** **ISO 20743**
Methicillin resistant *Staphylococcus aureus* (MRSA)	**CG 147**
Salmonella typhimurium	**CG 147**
Staphylococcus aureus	**ISO 20743**
Vancomycin resistant *Enterococcus* faecalis (VRE)	**CG 147**

Fungi	International Standards
Candida albicans	**CG 147**

Liquid treatment testing

Enveloped viruses	International Standards
Human Coronavirus	**EN 14476**
H1N1 Influenza A virus (Swine Flu)	**EN 14476**
Measles virus	**EN 14476**

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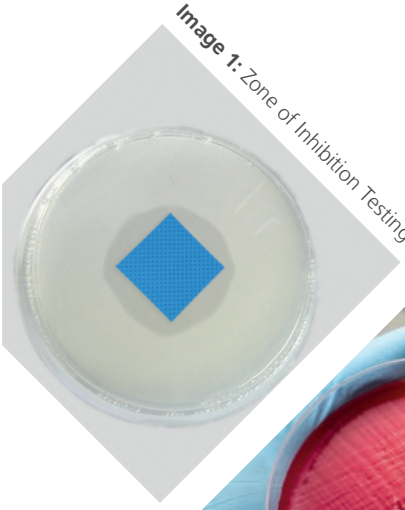


Image 1: Zone of Inhibition Testing

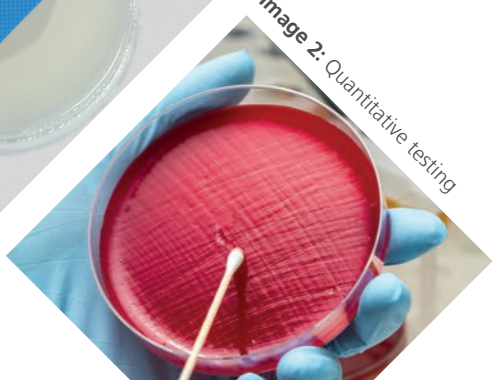


Image 2: Quantitative testing

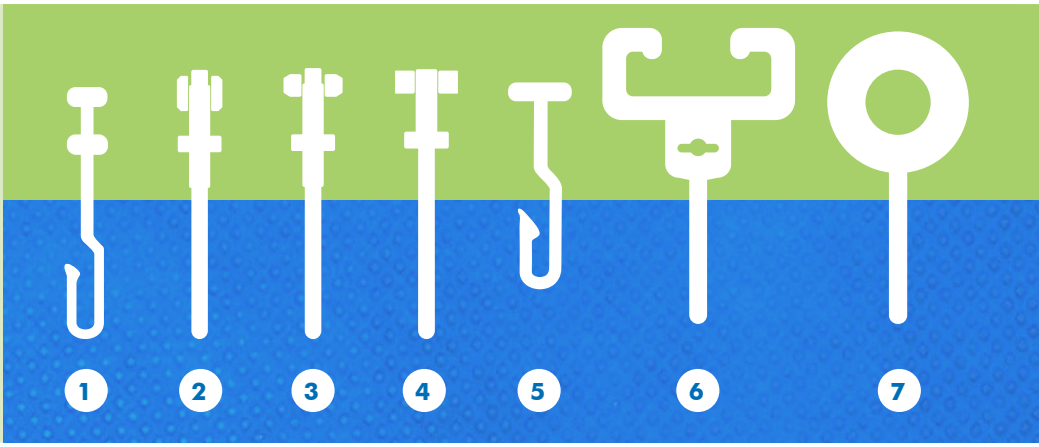
TESTED AGAINST CORONAVIRUS

Printed Colours

Options & specifications

Hanging systems

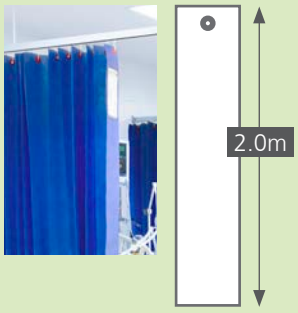
1. Quick-fit
2. Wheeled
3. Wide-wheeled
4. Metal bar wide-wheeled
5. Large-top
6. U-type
7. Eyelet extension hook



Curtain types

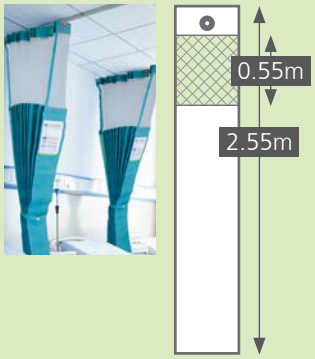
Standard

100% polypropylene, designed for use with suspended ceiling rails



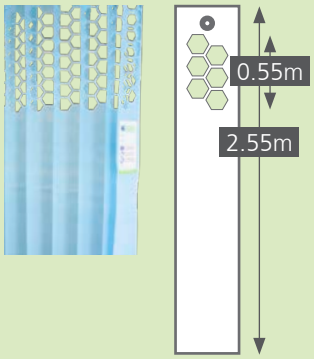
Mesh Top

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



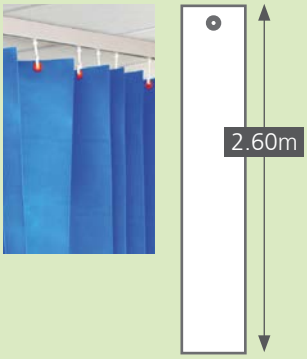
Mesh Cut*

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 will be reduced due to double-pleating. Please note there is a +/-9% tolerance on all aspects of the curtains.

Where to use

Designed for critical hospital and healthcare environments where patient care cannot be compromised. Suitable for use in hospital departments such as:

- Burns units
- Intensive care units
- Accident & Emergency
- General surgery wards
- Maternity & Neonatal
- High dependency units
- Operation Suites
- Gynaecology
- Renal Units
- Cardiology wards
- Infectious disease units
- Oncology Wards
- Isolation wards
- Rheumatology
- Obstetrics

Features & Benefits

- **Kills top five pathogen groups found in hospitals***
- **Breaks the chain of infection**
- **Long lasting (up to two years*) - significant cost savings**
- **Up to 50% less curtain changes required - saves time & reduces potential for injury**
- **Light-weight, flexible & easy to use**
- **Self-auditing & privacy labels**
- **Silver-additive free**
- **No laundry required**
- **Works with existing tracking**
- **100% recyclable**

If your hospital would like to conduct a trial, please get in touch:

info@endurocide.com

+44 (0) 1561 361515

endurocide.com

* See Disclaimer on page 3

Photograph courtesy of Rotorua Hospital Children's Ward, New Zealand

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 / DESIGN	Medical blue	MB
	Pastel blue	PB
	Pastel green	PG
	Pastel yellow	PY
	Lilac	LI
	Grey	GY
	Teal	TE
	Latte	LA
	Simply Dotty on White	SDWH
	Simply Dotty on Pastel Blue	SDPB
	Simply Dotty on Pastel Yellow	SDPY
	Geometric - Black on White	GBKWH
	Geometric - Gold on White	GGOWH
	Geometric - Blue on Pastel Blue	GMBPB
	Geometric - Brown on Latte	GBRLA

Scan here to access our handy Order Code Generator:

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**

About us

Our company values are simple:

- 100% product satisfaction - guaranteed
- Market-leading products - which are environmentally friendly
- Products tested and accredited to the highest possible standards
- World class customer service and distribution

Our green credentials

Caring for the environment is tightly woven into our DNA.

Not only are our products carefully engineered to be highly effective with minimal impact on the environment, but our operations are monitored to ensure that as a company we are as environmentally friendly as possible.

- In 2021 we recycled >95% of our waste. The UK national average was 44%
- The company's premises is heated using a biomass boiler and lit by energy efficient LED lighting
- We're on track for 80% of all our vehicles to be fully electric by 2023
- We are in Year One of our Carbon Reduction plan involving assessment & information gathering to enable formal carbon reduction goals to be set

35+ YEARS IN MANUFACTURING

Scan here to to view our full range of Infection Control brochures:

Manufactured by:

Bio Technics Ltd.
Linton Business Park,
Aberdeenshire,
Scotland, UK DD10 0NH

Tel: +44 (0) 1561 361515
info@endurocide.com
endurocide.com

Your local distributor:

35 YEARS IN MANUFACTURING

Fabric treatment manufactured in UK

bsi. ISO 14001:2015 Environmental Management
EMS 696323

bsi. ISO 9001:2015 Quality Management
FM 696382

REV. 140922