Bioseal: ‘Safe to touch print’ Presentation

anti-microbial print coating system

bioseal®

Safe to touch print ™

Who are we?

CHEMICAL INTELLIGENCE

Chemical Intelligence is a research and development company where scientists with decades of experience work on new ways to combat infection.

Every step of the way we aim to harmonise our expertise in the fields of Chemistry, Microbiology, Chemical Engineering and Biochemistry with our commercial acumen.

Our mission is to advance science in practical applications and market these **Positive Impact Technologies** to allow them to realise their potential both scientifically and commercially.

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What is the current situation?

In recent years there has been heightened awareness within the medical industry, food industry, print industry and the media about the harmful infections contaminating paper based products such as food packaging, pharma packaging, magazines and bank notes etc

Although millions of tonnes of printed matter is produced every year virtually none of it is protected with an **antimicrobial print coating.** This been largely due to the previously available products on the market being expensive, having low safety profiles and poor efficacy.

A pioneering survey showed that over 40 percent of packaging analysed from a range of supermarkets, convenience stores and butchers were covered in harmful bacteria on the outside.[1]

Chemical Intelligence has now developed a commercially viable, safe and highly effective solution – **Bioseal®**.

1. Ward Victoria Outer Packaging of Chicken 'covered in bacteria' study. London: The Telegraph

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Introducing Bioseal

Bioseal is a cutting edge technology additive, that is blended in to any print coating (water based, oil based or UV based), at the manufacturing stage. Therefore, it is supplied as a finished product and requires no user/ printer intervention.

It is commercially viable, safe even for direct food contact and provides the highest level of antimicrobial protection for paper based products on the market.

Officially launched in February 2014 Bioseal is the only patented formulation for use in print based sealants, varnishes and coatings offering up to a Log 5 reduction against harmful pathogens.

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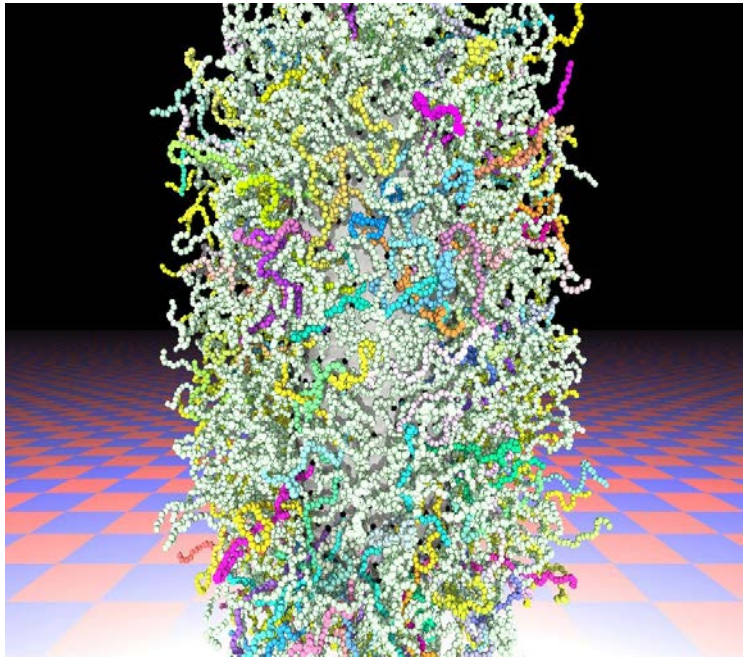
Bioseal: How does it work?

✓No resistance
✓No recover
✓No residue
✓No contamination
✓No re growth
✓No risk

Bioseal was originally developed to coat medical packaging for products supplied to the NHS to reduce the risk of colonisation of harmful pathogens and therefore reducing the potential of contracting an infection. It was quickly acknowledged that its application had a wider responsibility to be extended in to everyday life.

Bioseal operates a multi-stage approach by destroying micro organisms on the surface, active ingredients prevent this by deactivating them on contact and not allowing the organisms to build up any resistance.



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What does it kill?

Bioseal kills many organism including both gram+ and gram – bacteria, viruses and fungi. We have listed some of the more common bacteria below, however there are many more:

- ✓Campylobacter coli
- ✓Campylobacter
- ✓MRSA
- ✓Ecoli
- ✓Enterobacter cloacae
- ✓Escherichia coli
- ✓Klebsiella pneumoniae
- ✓Lactobacillus casei
- ✓Listeria monocytogenes
- ✓Pseudomonas aeruginosa
- ✓Salmonella
- ✓Salmonella enteritidis
- ✓Staphylococcus
- ✓Staphylococcus aureus
- ✓Staphylococcus epidermidis
- ✓Stenotrophomonas maltophilia
- ✓Streptococcus
- ✓Streptococcus pneumoniae
- ✓Streptococcus pyogenes
- ✓Streptococcus salivarius
- ✓Streptococcus sanguis
- ✓Streptococcus sobrinus

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What the experts say

"The results of independent testing confirm that Bioseal has impressive killing activity against bacteria. This indicates its potential as a means of reducing the transmission of infections via printed materials such as food packaging”

Professor Richard James,
Professor of Microbiology & Director of the Centre for Healthcare Associated Infections, University of Nottingham

“Due to its severe consequences, Listeriosis is a major public health concern. L. monocytogenes is also commonly found in nature and in food processing environments and has the ability to survive for extended time periods outside animal hosts.Thus, control of this organism represents a serious challenge for the food industry”

Professor Martin Wiedmann,
Department of Food Science, Cornell University

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Where do we see Bioseal?

Bioseal is suitable for all paper, board and pulp based products. The applications are endless. Some of them include:

Food Packaging

Pharmaceutical Packaging

Schools

Magazines

Confectionary

Banknotes

Labelling

Paper Cups

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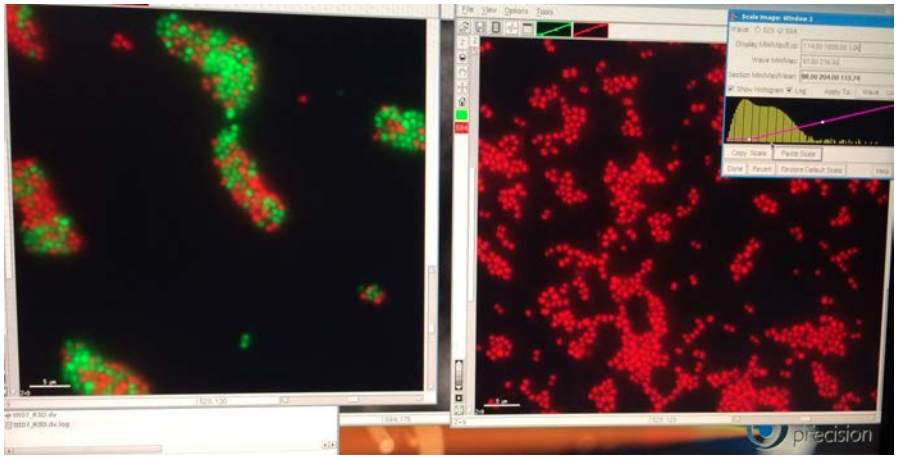
Does paper and packaging carry harmful bacteria?

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Consumer packaging is a high contact item and a haven for dangerous pathogens.

Dr Emma King, Research Technician, Faculty of Medicine & Health Sciences, University of Nottingham, conducted a **Live Dead Staining** study (see pic) imaging bacteria under a microscope on both a piece of paper treated with Bioseal and one treated without. The bacteria was stained so it would be green when alive and red when dead. Within four minutes the Bioseal coated piece had a 100% kill and after 20 hours the untreated piece still had live bacteria.

Most consumer goods today are supplied in a box or outer packaging. During transportation these products pass through a myriad of destinations: warehouses, shipping containers and distributor sites, before finding their way to your supermarket shelf and eventually your home.



No Bioseal: bacteria still living after 20 hours

Bioseal: 100% kill within 4 minutes

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Who are we regulated by?

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How safe is Bioseal?

Bioseal was originally designed for use in clinical environments, food & pharma packaging and banknotes, using the expertise of our Microbiologists, Chemists and Engineers. In order to extend the initial finding we have validated the product to the following food standards.

- ✓ Complies with European Food Safety Standards
- ✓ Complies with Food Regulation EC 1935/2004
- ✓ Complies with Swiss Ordinance SR817.023.21
- ✓ Complies with ISEGA registration protocol
- ✓ Complies with EC No. 1272/2008
- ✓ Complies with the foods standards act 1990
- ✓ Complies with EuPIA exclusion requirements
- ✓ Contains no heavy metals

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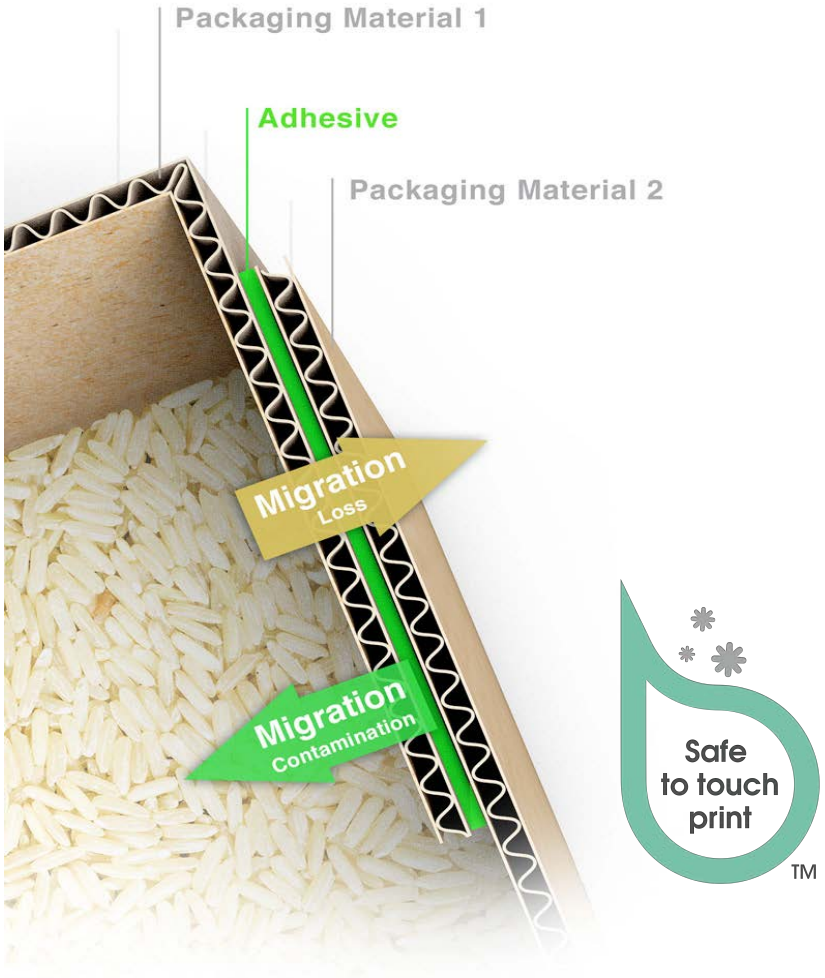
Will it comply with Low Migration requirements?

Our claim that Bioseal is suitable for Low Migration packaging has been validated using a number of UKAS affiliated institutions. Utilising GCMS and LCMS mass spectrometry at CampdenBRI we have determined we are compliant with the following requirements

- ✓ Complies with Swiss Ordinance SR817.023.21
- ✓ Complies with ISEGA registration protocol
- ✓ Complies with EC No. 1272/2008
- ✓ Complies with the foods standards act 1990
- ✓ Direct or indirect food contact
- ✓ Contains no heavy metals



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Will it comply with taint and odour requirements?

Following studies conducted at a number of food accreditation services we can confirm Bioseal can be used on both direct and indirect contact. We have undertaken the following studies:

- ✓ Campden BRI Low migration assessment
- ✓ Campden BRI Indirect food contact assessment
- ✓ Campden BRI direct food contact Assessment
- ✓ Complies with EC No. 2023/2006
- ✓ Contains no toxic heavy metal components EN 71:

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To what manufacturing standards is it produced?

- ✓ Manufactured to GMP ISO 22716
- ✓ Commission regulation EC 1935/2004
- ✓ Commission regulation EC 2023/2006
- ✓ EU Directive 94/62/EEC
- ✓ EU Directive 76/769/EEC
- ✓ EU Directive 2002/72/EC
- ✓ Council of Europe AP (2005) 2
- ✓ EN71/3 1994
- ✓ Swiss Ordinance 817.023.21
- ✓ CEPE Exclusion List
- ✓ Nestec Guidance note on packaging ink

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What effect do we have on the environment?

✓ Bioseal is a biodegradable product

✓ Analysis of the materials contained in our patented formulation has been extensively reviewed by current BPR and Reach regulations the formulation only contains material currently listed within the ECHA directives.

✓ The potential for the Bioseal additive to leach and make any considerable contribution is far less significant to that of the coating. It only represents 5% of the total weight of coating and less than 0.005% the weight for the carton or pack, the environmental impact is less that 0.005% per 'tonne' of any individual ingredient.

✓ The land fill requirement for ecological exo thermophilic degradation would oxidise all material to salt, carbon, hydrogen and water within the required time lines.

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Does Bioseal contain substances that appear on restricted lists?

No – Bioseal has no products listed on any restricted list published by the European Food Standards Agency

- ✓ Bioseal is manufactured from products confirmed as being safe to touch
- ✓ Bioseal contains non of the following raw materials, carcinogens, mutagens and reprotoxic substances category 1A or 1B according to the CLP Regulation
- ✓ We do not use material identified as endocrine disruptors
- ✓ We uphold Directive 98/8/EC. Comply with Regulation EU 528/2012
- ✓ We can also confirm that Bioseal is not persistent in the environment
- ✓ Bioseal is not bio accumulative and has not been classified as a toxic (PBT) substances it is not identified very persistent and very bio accumulative (vPvB) substances

REACH COMPLIANCE

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Credibility and Testing

- ✓ Patented formula
- ✓ Independently tested*
- ✓ ISO 20743:2007
- ✓ ISO 22196**
- ✓ EN 13697**
- ✓ EN 1275
- ✓ EN 1276
- ✓ AATCC 147-1998
- ✓ BS EN ISO 1186 parts 2,3,4,5,6,7,8,9 and 14

* Results available on request
** Modified version of standard test.

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What have we done to protect our Intellectual Property?

Bioseal is the only patent applied for formulation available on the market.

✓ We applied for a patent In the UK on 23rd November 2012

✓ We have submitted an international application in November 2013 and will have submitted national and regional applications by 21st November 2014

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What are the key benefits to Brand Owners?

✓ Upholding Social responsibility

✓Commercial Advantage: First in category to launch 'safe to touch' product packaging.

✓ Can Promote 'safe to touch' by using the identifier on packaging and claim that all items produced with Bioseal have 'antimicrobial' protection

✓No additional cost as Bioseal is already built in to the whole range of finished products currently being used in the market

✓Contribute towards governments ever increasing initiatives to reduce harmful infections on packaging and paper based products.

✓Address public health concerns: The issue of contaminated products and packaging is becoming a public health concern worldwide as more and more studies are being carried out

✓Potential to create a new income stream

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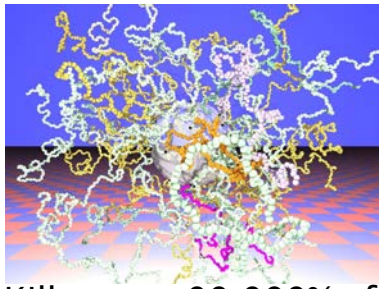
Bioseal: The Key Points



Kills up to 99.999% of harmful organisms

Patented Formulation

Reduces the risk of infection

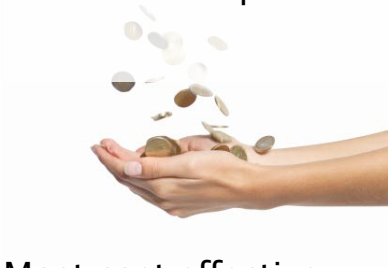
Protection will last the lifetime of the product

efsa
European Food Safety Authority

Food Safety Accreditation

Excellent Environmental profile

Effective within 30 seconds



Most cost effective solution on the market

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Some of the brands we are currently working with….

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Current European Distribution

United Kingdom

Druckfarben
THINKING TECHNOLOGY

SHACKELL EDWARDS

Netherlands, Belgium, Luxembourg

AtéCé
GRAPHIC PRODUCTS

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Testimonials

"By using innovative science and technology, Chemical Intelligence have incorporated the latest antimicrobial technology in to print sealants. This will add immense value to the print industry by introducing a unique selling point that can be added to every single print product."
Dr. Peter Smallwood CChem FRSC, Chemist

"Chemical Intelligence have achieved something with Bioseal that no other company has come close to: a way of adding incredibly powerful protection to every printed product without increasing the price. There is no doubt that this technology is going to improve infection control across dozens of industry sectors. "
Jonathan Hibbard, Chemist

"We believe the best way to prevent the contraction of avoidable infections is to use antimicrobial products, such as those created by Chemical Intelligence."
Derek Butler, Chairman of MRSA Action UK

"Bioseal has enormous potential to reduce the transmission of infections from contact with printed materials"
Professor Richard James Professor of Microbiology & Director of the Centre for Healthcare Associated Infections, University of Nottingham

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Contact us now for a free trial
and make your products:

‘Safe to touch’

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Safe
to touch
print
™

Thank You

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