



Life Cycle Analysis of BioCote® Treated Products

BACKGROUND

To back-up theoretical data, BioCote® was required to produce practical data that demonstrated the continued antimicrobial efficacy of BioCote® Technology over a period of time.

Initial studies carried out on BioCote® treated products showed no migration of the additives from the surfaces of polymers. BioCote® also worked with an independent laboratory to create a protocol that mirrored the typical lifecycle of these products.

BioCote® opted to investigate a hospital bed that has an average 25-year lifespan before being replaced. According to the hospital facilities manual, the bed should be cleaned by hand with a wipe. Following discussions with a range of hospitals and a bed manufacturer this was done approximately every 2 weeks.

PROTOCOL

Based on the information obtained, BioCote® created a protocol of washing. Twelve referenced panels were allowed to stabilise in a chamber for 16 hours at a temperature of 23°C +/- 2°C.

The conditioning sample comprised of the following:

Spraying the plates with water at 65°C for a period of 5 minutes, rest for 5 minutes. Care was taken to ensure that an even spray was applied to the test panels.

After each 72 cycles (12 hours) the samples were rested for 12 hours. Each cycle is the equivalent of 5 domestic washes.

This was repeated for 300 cycles (1500 washes) and the samples were then returned to BioCote®.

Assuming a 25-year lifespan this equates to washing the product every 6 days. BioCote's cleaning protocol was much harsher than real-life conditions so as to present a worst case scenario.

CONCLUSIONS

Based on the results from the laboratory, no reduction in antimicrobial performance was evident from the BioCote® treated products following exposure to the durability cycle. This serves to back-up the theoretical evidence obtained from the initial migration studies.

TABLE OF RESULTS

TABLE 1. % KILL OF ESCHERICHIA COLI 0157 NCTC 12900

Sample Ref	Inoculum Level C fu/ml	Recovery after 24 hours C fu/ml	% Kill
533	820000000	13000	99.998
534	820000000	15000	99.998
535	820000000	45000	99.995
536	820000000	12000	99.999
537	820000000	15000	99.998
538	820000000	12000	99.999
557/1	820000000	10000	99.999
557/2	820000000	12000	99.999
557/3	820000000	30000	99.996
561/1	820000000	12000	99.999
561/2	820000000	8000	99.999
561/3	820000000	12000	99.999
558/1	820000000	10000	99.999
558/2	820000000	20000	99.998
558/3	820000000	5000	99.999
562/1	820000000	45000	99.995
562/2	820000000	8000	99.999
562/3	820000000	16000	99.998
505/1	820000000	10000	99.999
505/2	820000000	22000	99.997
505/3	820000000	13300	99.998
507/1	820000000	9000	99.999
507/2	820000000	17000	99.998
507/3	820000000	18000	99.998
559/1	820000000	30000	99.996
559/2	820000000	14000	99.998
559/3	820000000	40000	99.995
563/1	820000000	18000	99.998
563/2	820000000	19000	99.998
563/3	820000000	22000	99.997



TABLE OF RESULTS

TABLE 1. % KILL OF STAPHYLOCOCCUS AUREUS. NCTC 10788

Sample Ref	Inoculum Level C fu/ml	Recovery after 24 hours C fu/ml	% Kill
533	180000000	15000	99.992
534	180000000	12000	99.993
535	180000000	5000	99.997
536	180000000	1020000	99.433
537	180000000	2390000	98.672
538	180000000	12000	99.993
557/1	180000000	14000	99.992
557/2	180000000	13000	99.993
557/3	180000000	30000	99.983
561/1	180000000	340000	99.811
561/2	180000000	8000	99.996
561/3	180000000	420000	99.767
558/1	180000000	10000	99.994
558/2	180000000	400000	99.778
558/3	180000000	204000	99.887
562/1	180000000	145000	99.919
562/2	180000000	154000	99.914
562/3	180000000	19000	99.989
505/1	180000000	980000	99.456
505/2	180000000	12000	99.993
505/3	180000000	17800	99.990
507/1	180000000	2900000	98.389
507/2	180000000	700000	99.611
507/3	180000000	22000	99.988
559/1	180000000	14000	99.992
559/2	180000000	22000	99.988
559/3	180000000	2890000	98.394
563/1	180000000	2300000	98.722
563/2	180000000	14000	99.992
563/3	180000000	22000	99.988

CONCLUSION

All active samples showed good inhibition levels when challenged to high levels of selected Gram positive and Gram negative bacteria



Client: **Biocote Limited**
Wolverhampton Science Pk
Technology Centre
Stafford Road
Wolverhampton
WV10 9RU

Sample Ref No. **LSN 6/987**
 Date Received: **27/06/02**
 Date reported: **28/06/02**

CERTIFICATE OF ANALYSIS

0.3% Washed By BCL 559 Rep3

Reference: **BIO/038**

Supplier:

Run:

Method Description: **Film Test**

Staphylococcus aureus

>99.9

% Reduction After 24Hrs

Eschericia coli 0157

>99.9

% Reduction After 24Hrs

Comment: **Microbiological Results Satisfactory.**

1 of 1

R.P.Elliott
 CChem., MRSC,
 MIFST
 Deputy Managing
 Director

D.J.Petford
 MChemA., CChem.,
 FRSC., FIFST
 Analytical Services
 Director

C.O. Fuller
 BSc.Hons., CBiol., MIFST
 Company Microbiologist

P.M.Sutton
 CChem., MRSC
 Nutritional
 Services Manager

J.M. Bayles
 Principal Microbiologist

J.Francis
 BSc., Hons
 Senior Microbiologist

P. Downes
 Senior Microbiologist

Law Laboratories Ltd Shady Lane, Great Barr, Birmingham B44 9ET England



Client: **Biocote Limited**
Wolverhampton Science Pk
Technology Centre
Stafford Road
Wolverhampton
WV10 9RU

Sample Ref No. **LSN 6/993**
 Date Received: **27/06/02**
 Date reported: **28/06/02**

CERTIFICATE OF ANALYSIS

Washed By BCL 563 Rep3

Reference: **BIO/038**

Supplier:

Run:

Method Description: **Film Test**

Staphylococcus aureus
Eschericia coli 0157

>99.9
>99.9

% Reduction After 24Hrs
% Reduction After 24Hrs

Comment: **Microbiological Results Satisfactory.**

1 of 1

R.P. Elliott
 CChem., MRSC,
 MFST
 Deputy Managing
 Director

D.J. Petford
 NChemA, CCHEM,
 FRSC, PFST
 Analytical Services
 Director


C.Q. Fuller
 BSc(Hons), CBiol., MFST
 Company Microbiologist

P.M. Sutton
 CChem., MRSC,
 Nutritional
 Services Manager

J.M. Bayles
 Principal Microbiologist

J. Francis
 BSc(Hons)
 Senior Microbiologist


P. Downes
 BSc(Hons)
 Senior Microbiologist

Law Laboratories Ltd Shady Lane, Great Barr, Birmingham B44 9ET England