

Dryflex[®]

Antimicrobial TPEs



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INTRODUCTION

Hygiene is a growing concern in today's society. Preventing the spread of harmful bacteria and the safe protection of everyday products, in hospitals, public places or at home is highly valued by customers.

Dryflex antimicrobial TPEs attack micro-organisms at source, helping prevent problems before they occur. Samples made from Dryflex antimicrobial TPEs have been independently tested and proven to kill >99.9% of gram positive and negative bacteria when tested by the recognised ISO 22196 test method. Dryflex antimicrobial TPEs are effective against MRSA, E-Coli, Pseudomonas Aeroginosa and Salmonella and many other harmful bacteria.

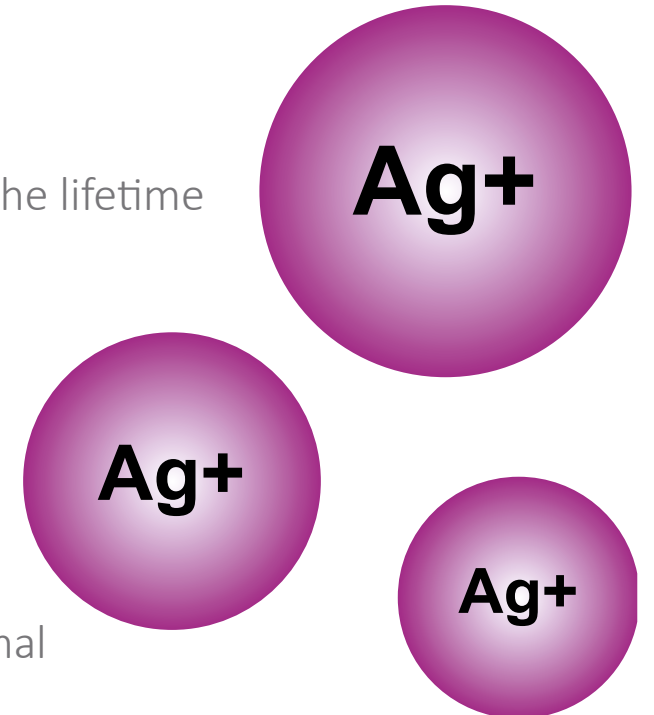
Some bacteria can also adversely affect everyday products causing stains, embrittlement, odours and product deterioration. Using Dryflex Antimicrobial TPE can help to prevent these issues and extend the service life of the finished product. They can add value to your product by addressing the health image desired by end-users.

HOW DOES IT WORK?

Atmospheric moisture triggers the gradual release of silver ions in the compound.

These ions interact with the micro-organisms to prevent a wide spectrum of bacteria from reproducing. Silver does not deteriorate and this controlled release of silver ions lasts for the lifetime of the product. Silver is non toxic and safe for humans.

As the antimicrobial treatment is formulated into the compound at the time of manufacture; the antimicrobial activity is consistent throughout the TPE and not solely on the surface. Performance is not affected by external stresses, scratches, and wear and tear. The additive system is suitable for transparent articles and has a high degree of thermal stability to withstand industrial processing.

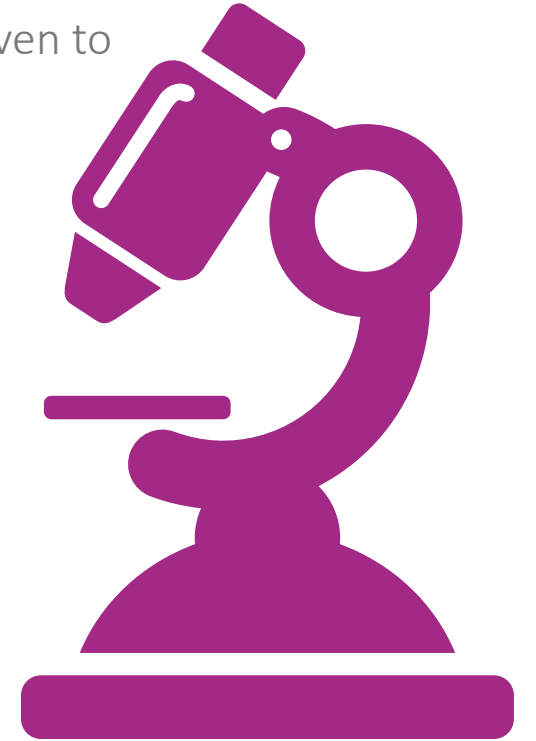


PERFORMANCE

Articles manufactured using Dryflex Antimicrobial TPEs have been independently tested and proven to exhibit reductions in bacterial viable counts by more than 99.9%.

We will submit customer finished articles made from Dryflex for free external micro-biological testing and report on the findings. Samples are tested according to international recognised test protocols such as JIS Z 2801 and ISO 22196:2007, a quantitative antibacterial test, and other variants applicable to the end use requirement.

The active ingredient is included in the EFSA guidelines and FDA approved as suitable for food contact, it is EPA registered and complies with the European Biocidal Products Directive (BPD).



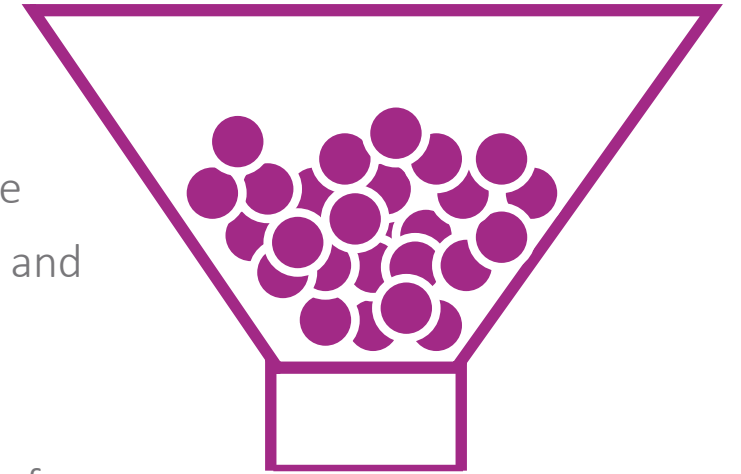
TYPICAL APPLICATIONS

Cross-contamination is of concern for multi-use articles, and especially those frequently used by different people. Dryflex Antimicrobial TPEs can add value to applications found in public and domestic environments, including:

- Consumer goods
- Sports equipment
- Furniture trimming, flooring and wall protection
- Hand held devices
- Healthcare and clinical environments
- Areas with a heavy footfall such as schools, shopping centres and gyms
- Packaging
- Public transport

COMPOUND OR MASTERBATCH?

There are many benefits to using a compound over a masterbatch in antimicrobial applications. The accuracy of the dosing equipment is vital to the performance of the material. Addition rates are typically in the 1 to 2% range and the antimicrobial active ingredient must be dispersed perfectly to ensure the properties are not compromised and the efficacy of each part.



If your product requires third party certifications, such as UL listing, then the addition of a masterbatch can make the material certifications invalid. If you need to add more than one masterbatch to include other properties such as colour or UV, the costs can quickly rise. A fully compounded Dryflex TPE gives a perfectly dispersed, consistent antimicrobial activity with a correct and reproducible addition level. Dryflex Antimicrobial TPEs are custom formulated for your application, they are ready for use, with no additional steps.

ANTIMICROBIAL TESTING

Five Dryflex samples, three of which had been compounded with antimicrobial additive, were independently tested. The samples were leached and tested for activity using a quantitative test method.

PROCEDURE- QUANTITATIVE ANTIBACTERIAL ASSESSMENT:

ISO 22196:2007 was used to quantitatively test the specimen for antibacterial activity. In brief:

1. The sample was placed into a container with a lid.
2. A 0.1mL inoculum of Escherichia coli (ATCC #8739) or Methicillin resistant Staphylococcus aureus (ATCC #33591) was placed, in microdroplets, on the surface of the samples. Sterile films were placed over the inoculum to encourage good contact.
3. The specimen was incubated 24 hours at 37°C.
4. 20mL of Letheen broth was added to the container and shook. The liquid was plated using dilution techniques.
5. The “Value of Antimicrobial Activity” was carried out using the formula

$R = [\log (B/C)]$ (where R: value of antimicrobial activity)

B = Average of the number of viable cells of bacteria on the untreated test piece / inoculum control after 24 hours

C = Average of the number of viable cells of bacteria on the antimicrobial piece after 24 hours.

RESULTS

E.coli after 1hr leach

Concentration of starting inoculum 3.88×10^5 CFU/mL

Sample Description	No. Bacteria Recovered	Log Value	R = [log (B/C)]	% Reduction
1. Dryflex 500000 TPE	8.26×10^2	2.9	-	-
2. Dryflex 500000 + 0.6% Antimicrobial Additive TPE	$<2.00 \times 10^1$	<1.3	>1.7	>98.0
3. Dryflex 500400 TPE	8.52×10^4	4.9	-	-
4. Dryflex 500400 + 0.5% Antimicrobial Additive TPE	$<2.00 \times 10^1$	<1.3	>3.6	99.9
5. Dryflex 600400 + 0.5% Antimicrobial Additive TPE	$<2.00 \times 10^1$	<1.3	>3.6	99.9
Inoculum Control	1.70×10^7	7.2	-	-

RESULTS

MRSA after 1hr leach

Concentration of starting inoculum 1.67×10^5 CFU/mL

Sample Description	No. Bacteria Recovered	Log Value	R = [log (B/C)]	% Reduction
1. Dryflex 500000 TPE	1.52×10^5	5.2	-	-
2. Dryflex 500000 +0.6% Antimicrobial Additive TPE	8.13×10^2	2.9	2.3	99.5%
3. Dryflex 500400 TPE	2.75×10^2	2.4	-	-
4. Dryflex 500400 + 0.5% Antimicrobial Additive TPE	2.27×10^2	2.4	0.1	17.5%
5. Dryflex 600400 + 0.5% Antimicrobial Additive TPE	1.24×10^3	3.1	-0.7	0.0%
Inoculum Control	1.14×10^5	5.1	-	-

The level of treatment stated in the results tables indicate theoretical levels only. For further information please contact us.

CONTACT US

If you can't see what you're looking for or have any questions, please get in touch. Click the button to find your local contact from our global network of plants, offices and distribution partners.

Or, simply send us an email to info@hexpolTPE.com

ABOUT HEXPOL TPE

HEXPOL TPE is a global compounding group specialising in Thermoplastic Elastomers (TPE) for key industries such as consumer, medical, packaging, automotive and construction. We have a core belief in being the easiest company to do business with. That's why we invest in our operations, teams and technologies to offer our customers the most reliable, relevant and cost-effective TPE compounds, backed by highly responsive support, technical know-how and application expertise. Our teams work together, across boundaries, applying the knowledge, experience and talents we have all around the world to meet the needs of our customers.

All the information about chemical and physical properties consists of values measured in tests on injection moulded test specimens. We provide written and illustrated advice in good faith. This should only be regarded as being advisory and does not absolve the customers from doing their own full-scale tests to determine the suitability of the material for the intended applications. You assume all risk and liability arising from your use of the information and/or use or handling of any product. Figures are indicative and can vary depending on the specific grade selected and the production site. HEXPOL TPE makes no representations, guarantees, or warranties of any kind with respect to the information contained in this document about its accuracy, suitability for particular applications, or the results obtained or obtainable using the information. Some of the information arises from laboratory work with small-scale equipment which may not provide a reliable indication of performance or properties obtained or obtainable on larger-scale equipment. We retain the right to make changes without prior notice. HEXPOL TPE makes no warranties or guarantees, express or implied, respecting suitability of HEXPOL TPE's products for your process or end-use application. Dryflex® is a registered trademark, property of the HEXPOL TPE group of companies.

