

Optiguard Hygiene™

CORONAVIRUS 2019 (COVID-19)

As Covid-19 is a newly discovered disease which has only been known on a worldwide scale since the beginning of 2020 (with the first cases being traced back to mid November 2019), testing houses worldwide are still in the process of conducting thorough testing and monitoring of all anti-microbial coatings. At the time of publishing this data sheet, results of Covid-19 testing are unknown. Please contact our sales team to obtain the latest information.

Optiguard Hygiene™ Testing and Development

Panel Graphic has been working alongside industry leading specialists **Addmaster** to develop an anti-microbial coating to compliment our already impressive group of Optiguard™ Coating products. Following a full research and development program, **Panel Graphic** and **Addmaster** have gained the required >99% efficacy during stringent ISO 22196 testing to enable certification and approvals for manufacture by introducing the Biomaster TD100 additive to our existing Optiguard™ hard coat UV curable spray coating products. By combining both products, we are now able to offer the additional benefit of anti-microbial properties to the existing abrasion and chemical resistance properties found in our Optiguard™ hard coating product range.

We have branded this new product as **Optiguard Hygiene™** and are in a position to offer this product for application to a wide range of plastic products. These include PMMA, Polycarbonate, PETG and many other polymers in either flat sheet or developed polymers ie. Injection moulded or formed products. The addition of the Biomaster TD100 additive does not have any negative effects to the existing Optiguard™ hard coatings and has been proven to remain 100% efficient for the entire product lifetime.



Optiguard Coatings™ Abrasion Resistant Coatings

Optiguard Coatings dramatically reduce scratching when applied to acrylic or polycarbonate sheet or mouldings giving a surface hardness approaching that of glass together with superior resistance to chemical attack. All Optiguard Coatings are suitable for Internal and external use but it is recommended that UV stable substrates are used when exposed in direct sunlight.

Optiguard Coatings are UV curing solvent-based Polyacrylate (a blend of bi and tri-functional Acrylates) with a cured film thickness of 2 - 10 microns (dependant on format required). Using very specific photo-initiators Optiguard uses the high-energy UV output to trigger the cross-linking process. It is with this high efficiency of cross-linking which imparts such high qualities of abrasion and chemical resistance and adhesion to many different substrates. **The Optiguard Coating family consists of the following:**

- | | | |
|-------------------------------|----------------------|----------------------|
| Optiguard Clear™ | Optiguard 75™ | Optiguard 40™ |
| Optiguard Anti-Newton™ | Optiguard 65™ | Optiguard 30™ |
| Optiguard Diffuser™ | Optiguard 55™ | Optiguard 20™ |
| Optiguard Automotive™ | | |

*varying formulations can be manufactured to meet customer requirements

Optiguard Coatings™ Coating Capabilities

Absolute Maximum Coating Dimensions	2000mm(L)	610mm(W)	130mm(H)
Acrylic Sheet recommended dimensions	1000mm	500mm	130mm
Polycarbonate Sheet recommended dimensions	1250mm	510mm	130mm

Polycarbonate Test Data

Environmental Exposure

	Unexposed	Humidity (1)
Light Transmittance % (2)	91	91
	0.4	0.5
Adhesion % (4)	100	100
Yellowness Index Change (5)	0	0

Scratch / Abrasion Tests

	Haze Change (3)	
	Uncoated	Coated
Steel-wool Scratch (6)	28.1	0.4
Taber Abrasion (7) 100 Cycle	32.0	3-4

Chemical Resistance (8)

	Uncoated	Coated
Trichloroethylene	X	L
	S	S
50% Caustic Soda	X	S
10% Sulphuric Acid	L	L

Acrylic Test Data

Environmental Exposure

	Unexposed	Humidity (1)
Light Transmittance % (2)	91	91
Haze % (3)	0.2	0.4
Adhesion % (4)	100	100
Yellowness Index Change (5)	0	0

Scratch / Abrasion Tests

	Haze Change (3)	
	Uncoated	Coated
Steel-wool Scratch (6)	31.1	0.4
Taber Abrasion (7) 100 Cycle	26.2	3-4

Chemical Resistance (8)

	Uncoated	Coated
Ethanol	L	L
Trichloroethylene	X	S-M
5% Ammonia	L	L
50% Caustic Soda	L	L
10% Sulphuric Acid	L	L

- Humidity: 120 hrs @ 52°C & 100% RH
- Light Transmittance: ASTM D-1003
- Haze: ASTM D-1003
- Adhesion: ASTM D-3359
- Yellowness Index: ASTM D-1925

- Steel-wool Scratch: Steel-wool rotary test representing severe scratching using a 1.25sq.inch #0000 steel-wool pad at 24psi for 100 rotations.
- Taber Abrasion: ASTM D-1044

- L = greater than 24 hours
- M = up to 8 hours
- S = up to 1 hour

X = do not use

Optiguard Hygiene™

Optiguard Hygiene™ antimicrobial technology is an incredibly effective way to stop the growth of harmful bacteria in places where good hygiene is critical. It's effective against a wide range of germs from food poisoning causing E.coli and Salmonella to antibiotic resistant bacteria like MRSA and VRE.

Optiguard Hygiene™ is ideal for use in situations where good hygiene is critical, like hospitals, schools, public transport and kitchens. Potentially deadly bacteria can multiply quickly in these types of places and as such, there is a risk of contamination being spread from surfaces and equipment to humans. Whilst disinfectants can be instantly effective in removing bacteria, after a few hours the effect wears off and contamination can occur again. Optiguard Hygiene™ helps to reduce bacteria growing between cleans and reduce the risk of infectious bugs being spread.

Optiguard Hygiene™ will remain effective for many years due to its inherently low water solubility. The inherent biocidal properties means the coated surface can be cleaned effectively and is completely UV stable. It utilises silver-ion technology, which is a natural antibacterial which does not leach out, therefore, it's completely safe to use even with food and water.

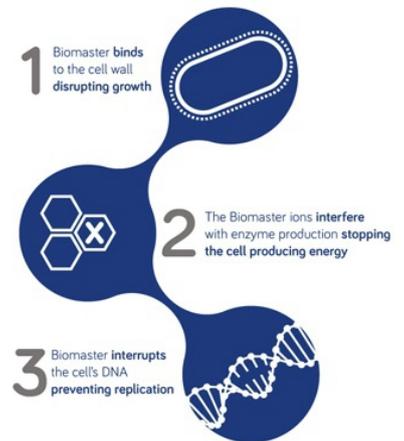
How does Optiguard Hygiene™ work?



Optiguard Hygiene™ uses **Biomaster TD100** and has passed British Standard ISO 22196 tests for severe usage.

Biomaster TD100 is an inorganic antimicrobial concentrate designed for controlling the growth of bacteria on solid surfaces.

As Biomaster uses 3 ways of stopping bacteria from growing it is far more powerful and effective than regular disinfectants and other antimicrobial agents.



TECHNICAL DATA

Biomaster utilises silver ion technology with a range of carriers. This provides a release of silver ions on demand, safely inhibiting bacterial growth. The slow release of the active silver ingredient give the products maximum long term activity. Biomaster antimicrobial additives can be processed at temperatures up to 600 degrees Celsius without losing their antimicrobial properties.

Testing procedure

All testing is undertaken independently by Industrial Microbiological Services Limited. The procedure is a quantitative test designed to assess the performance of antimicrobial properties. Submitted samples are challenged against stock cultures and incubated for 24 hours at 37°C according to ISO standards. TVC (Total Viable Count) of bacteria are then recorded and the percentage of reduction is calculated. Optiguard Hygiene™ has received a point 3 award from the NHS Infection Control Rapid Review Panel (Surface Coating Category).

Biomaster efficacy

Biomaster has been tested to ISO 22196:2011 and is proven to reduce the growth of bacteria by up to 99.99%. Effective against common organisms such as:

- Campylobacter
- E.coli
- Listeria
- MRSA
- Pseudomonas
- Salmonella

Regulatory

The active ingredient complies with the required legislation for biocides.

This can include:

- Biocidal Products Regulation (BPR)
- Food and Drug Administration (FDA)
- Environmental Protection Agency (EPA)