ECO CONCEPTS
ECO attitude
EQUAL responsibilities

Germoguard

Germ-Repellent
Life-Long Protection

*New &
Patented*

A regular plastic coffee mug

Unconventional patented technology.
An antimicrobial plastic coffee mug

Germ-repellent

NO biocides

NO nano particles

Life-long protection

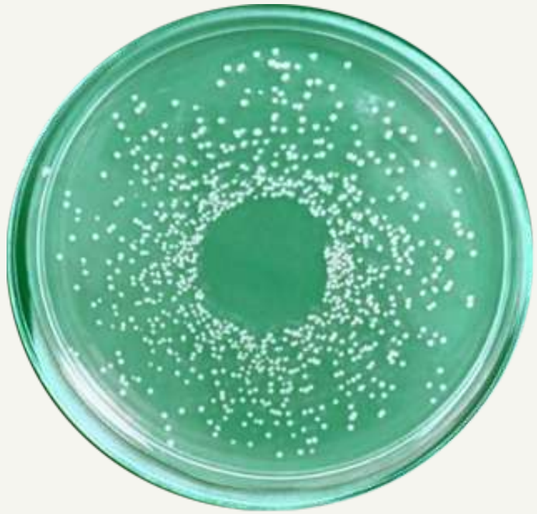
Food safe (EU / FDA)

Same mould.
Same production method

GermoGuard - Biocide-free Germ-repellent Effect

It is a technology that repels bacteria from plastic surface without killing them

Normal Plastic



Regular plastic is adhesive to bacteria & form bio-film

VS

GermoGuard

GermoGuard significantly reduce bacterial attachment & bio-film formation

GermoGuard

Life-long Antimicrobial Protection without Harmful Biocides

- With NO Biocides
- 99.8% Germ Repellency efficiency
- Nanoparticles-free
- Food grade (EU & US FDA compliant) & BPA-free
- Durable & Recyclable
- Negligible effects on plastic physical properties

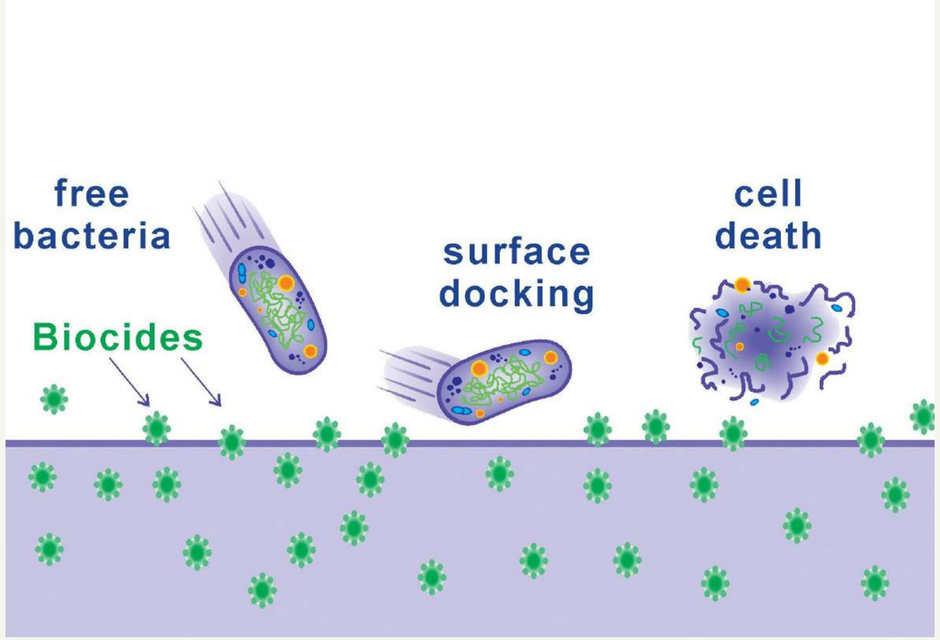
Why Germ-Repellent technology

A moment of truth.....

The markets for antimicrobial products have so far been dominated by products incorporated with biocides, for example triclosan, silver-based materials... as the means to inhibit germ growth on surfaces by "leach-and-kill" actions.

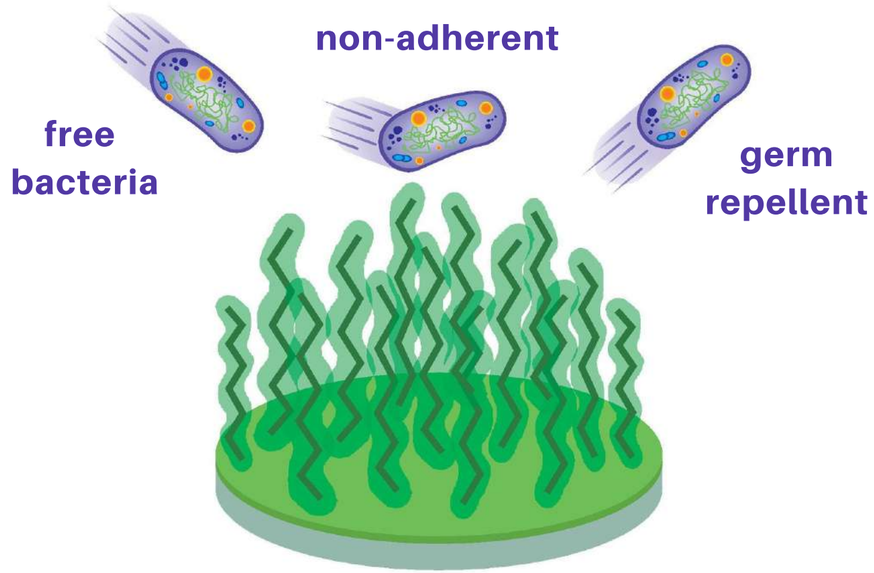
However, this has largely raised public awareness on safety issue of biocides since they may end up in our body after leaching out to food. On top of that abuse and misuse may lead to "Super-bacteria" threatening human health and ecological environment.

Conventional Anti-bacteria Technologies



VS

Biocide-free Germ-repellent Effect



- Damage bacterial membrane
- Bacterial dysfunction by interacting with cellular structures
- Induce oxidative stress

Germ repellent material is based on surface steric hinderance to prevent bacterial adhesion.

GermoGuard - Biocide-free Germ-repellent Effect

It is a technology that repels bacteria from plastic surface without killing them

GermoGuard Plastics makes use of safe ingredients in food additives or pharmaceutical products.
It complies with EU & FDA standards for food contact, and ISO-10933-5 for biocompatibility.

GermoGuard Plastics reduce the attachment of bacteria without killing them, thus trigger NO mutation to bacteria.

GermoGuard Plastics has as high as 99.8% of Germ-Repellent Efficacy is proven towards *Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa,* etc...

GermoGuard Plastics uses the technology that realises an intrinsic, insert property change in and on the surace of the material. There is no substance leaching to act against bacteria. We built-in the germ-repelling agent to ensure performance & durability.

	Conventional Anti-bacteria Technologies	Biocide-free Germ-repellent Effect
1. **MECHANISM**	Damage bacterial membrane Bacterial dysfunction by interacting with cellular structures Induce oxidative stress	**Surface steric hinderance to prevent bacterial adhesion**
2. TOXICITY	ZnNPs: Induce oxidative stress lead to DNA damage & apoptosis AgNPs: Cause DNA damage CuNPs: Cause systemic toxic effects with functional & morphological changes in liver, kidneys, and spleen	**Can be used safely as both a direct & indirect food additive, also consider safe in medical & cosmetic use**
3. DRUG RESISTANCE	AgNPs: enhance bacterial resistance to antibiotics Cu2+ CuNPs: Both CuO NPs ⁎& Cu2+ facilitated conjugative transfer of antibiotic resistance	**Since germ repellent material does not inhibit or suppress bacterial growth, they will not induce antibiotic resistance**

Certifications

EU Food Contact Certificate - EU10/2011

Germ-Repellent Efficacy - Modified ISO22196, ASTM WK66122

Biocompatible - ISO 10993-5

US Food contact Certificate - FDA 21 CFR 177

Reistance to Fungi / Bacteria - ASTM G21 / G22

Toy Grade - ASTM F963, EN71

GermoGuard

Wide applications.
Compatible to most plastic materials.

GermoGuard is a master batch with low let-down ratio. The technology repels bacteria from plastic surface without killing them.

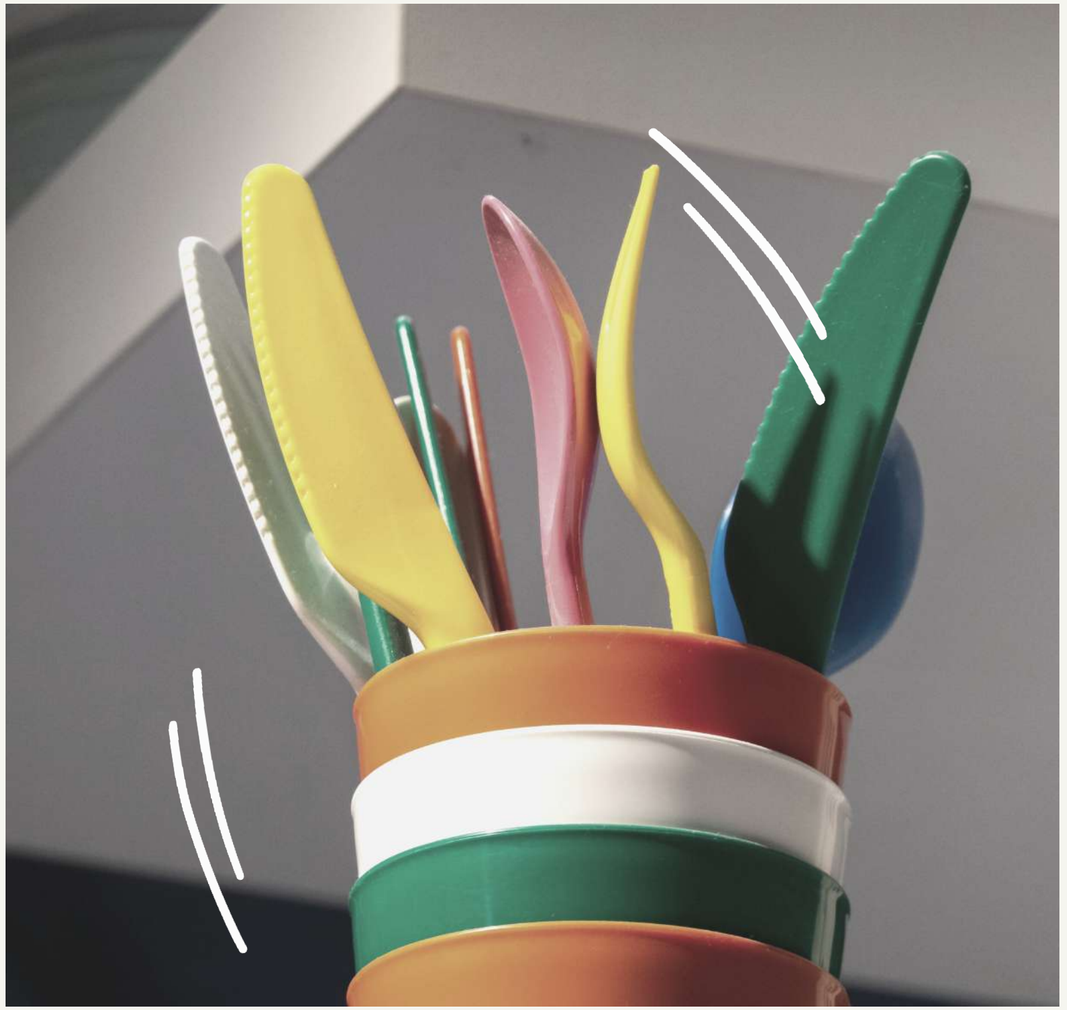
It is compatible to a vast variety of plastic materials, including PE, PP, PVC, ABS, PC, PS, PET... as well as the manufacturing process.

GermoGuard

Give your plastic products Life-Long protection

- ✓ Cups, mugs, tumblers
- ✓ Cutlery, plates, bowls...
- ✓ Lunch boxes, containers...
- ✓ Mask holder, toys

and many more.....



Product ideas

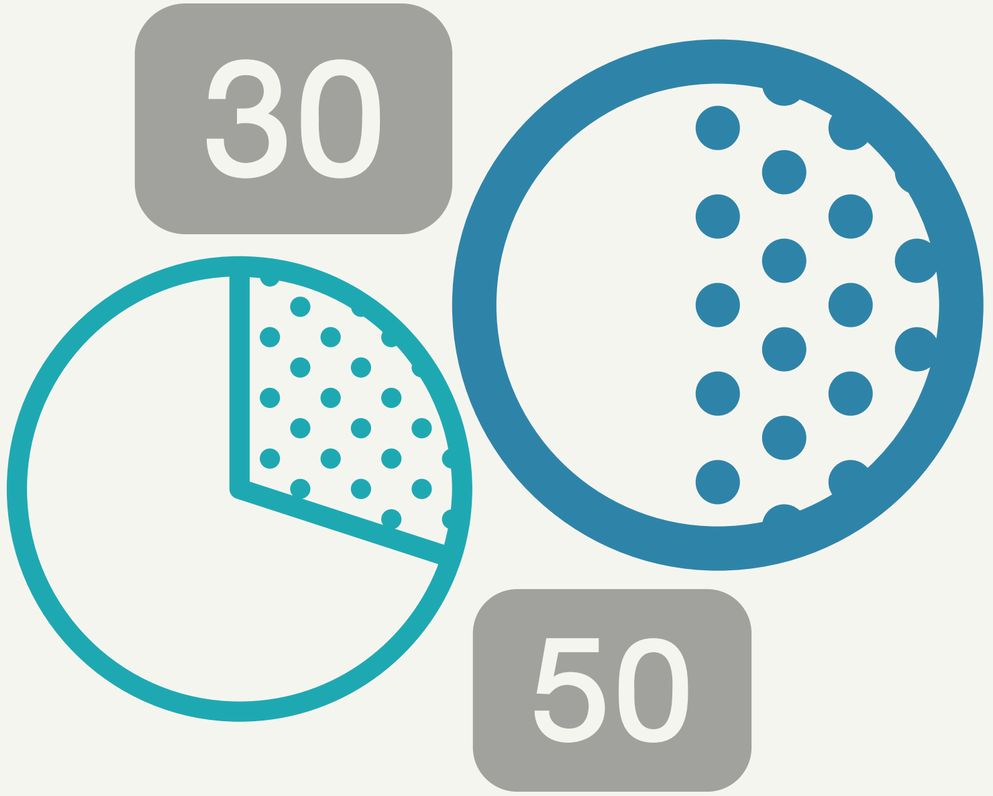
GermoGuard

Transform regular plastic products into antimicrobial products. The way for 2021 and beyond.

Cost is just around 30-50% more, depends on the plastic types & products.

We can provide you the blended polymer if you have the moulds & factory ready.

OR check with us if our product moulds suit you.
OR we can do OEM products starting from mould-building.



ECO CONCEPTS
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EQUAL responsibilities

Germoguard

Masterbatch using
germ-repellent technology

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