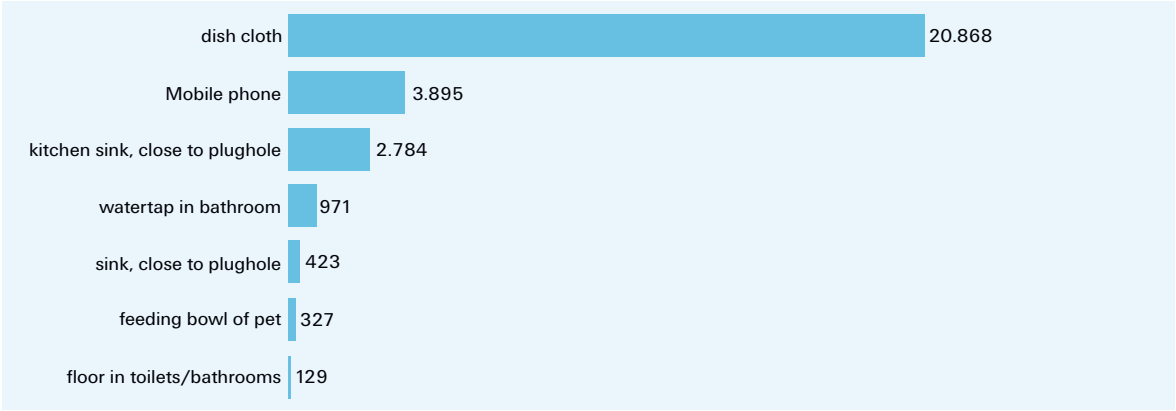
CENTROGUARD

Antimicrobial effectiveness

Centroplast
Engineering Plastics GmbH

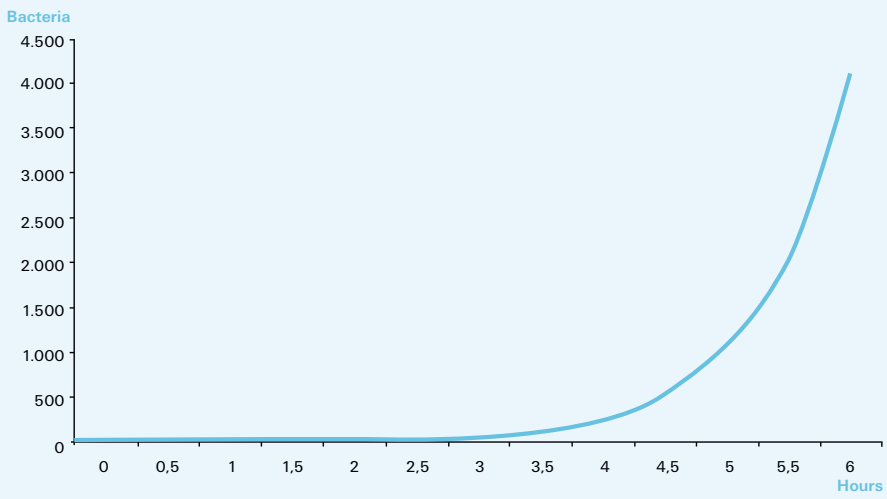
Problem: Bacterial spread and possible consequences of disease

The growth of pathogenic microorganisms (germs) such as algae, bacteria and moulds on surfaces is an undesirable effect. Germs lead to signs of decay, present a risk to hygiene and reduce the utility value of objects. Many pathogens are transferred via the hands (cross-infection) and are quickly spread via communal use of contact surfaces. Germs spread quickly in places where they have optimal conditions for survival: at body temperature, high humidity and in the presence of organic sources of nutrients.



Number of bacteria on everyday objects in Germany (per cm^2)
Source: www.statista.com

Hours	Bacteria
0	1
0,5	2
1	4
1,5	8
2	16
2,5	32
3	64
3,5	128
4	256
4,5	512
5	1.024
5,5	2.048
6	4.096



Spread of bacteria within six hours under normal conditions
Source: www.statista.com

Plastic surface as nutrient substrate

Plastics are used in many areas and are often in direct contact with humans. Their polymers, whose surfaces are far from smooth, directly or indirectly form a nutrient substrate and provide good breeding grounds for bacteria and viruses. Although in many cases plastics have a high degree of chemical stability, disinfectants that contain, for example, chlorine, have a severely corrosive influence on plastics. The material's surface corrodes, roughens, is less able to repel dirt and bacteria are easily able to colonise such substrates, for example, on cutting boards. That is why stainless steel is preferred in, for example, hospitals. So alternative procedures are frequently required to ensure a germ-free environment, instead of the usual all-rounder plastic, which, due to its versatility and economy, can only be replaced by a limited range of other materials.

Which bacteria are a concern?

Bacteria and other microorganisms are part of life. Some are beneficial, many neutral and others are dangerous and must be fought. The often widespread gram-negative E.coli bacteria and gram-positive S.aureus bacteria provide a yardstick.

Escherichia coli (E.coli)

OCCURRENCE:
In the intestinal tract of humans and animals

PROPERTIES:
Indicator bacteria (faecal indicator)
Vitamin K producer

PROBLEM:
Pathogens can lead to urinary tract infections and diarrhoea

TRANSFER PATHS:
- Smear infections
- Faecal contamination on food (raw meat: EHEC) is safe for cattle; transferred to humans it leads to food poisoning.
- Faecal contamination in drinking water or surface water sources
- Infection between humans as well as transfer from animal-human contact

Staphylococcus aureus (S.aureus)

OCCURRENCE:
- Part of the normal flora on the skin and mucous membranes
- Around 20 to 50 percent of all healthy adults carry Staphylococcus around with them either permanently or temporarily

PROPERTIES:
Resistant to antibiotics in the group beta-lactam antibiotics (penicillin)

PROBLEM:
S.Aureus can trigger skin, muscle and lung infections

TRANSFER PATHS:
- Smear infections, skin contact via hands
- In hospital, because Staphylococcus aureus is transferred unnoticed by doctors and nursing staff to (usually immunodeficient or injured) patients.
- Adheres well to all plastic materials and stainless steel alloys

Our solution: CENTROGUARD / POM CG

The plastic for antibacterial purity

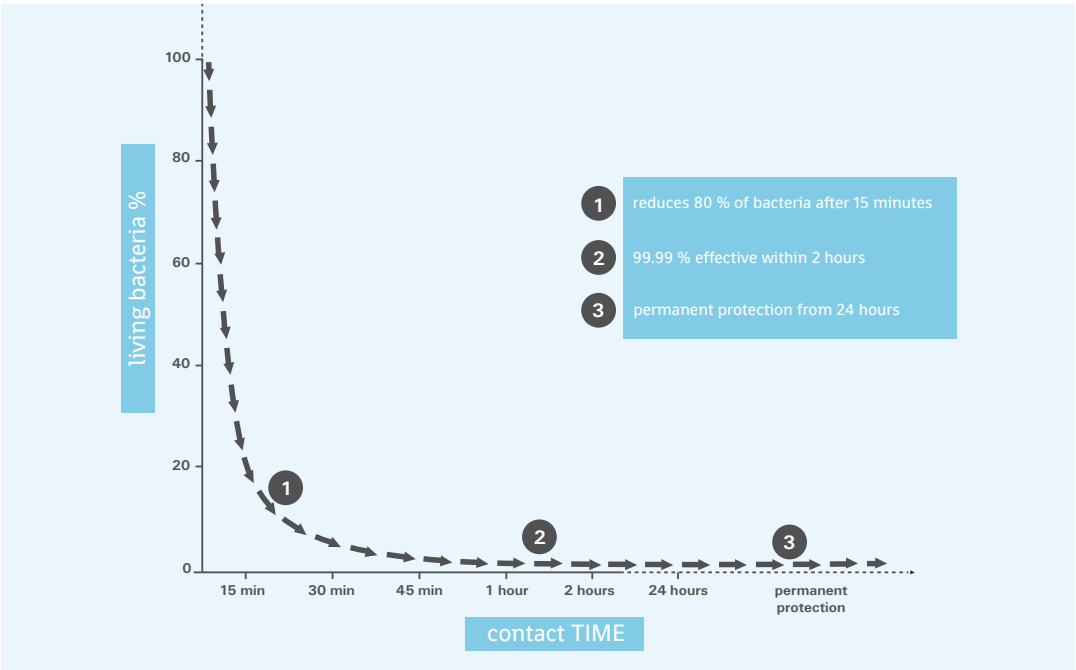
We have tackled the problem and developed the technical plastic CENTROGUARD / POM CG. Our CENTROGUARD / POM CG products are imbued with antibacterial substances that are an effective and lasting solution for undesirable growth of microorganisms. The substances ensure the killing of germs and provide additional protection between cleaning processes.

For this reason CENTROGUARD / POM CG is frequently used in the packaging and foods industry, medical technology and even in public buildings and spaces where regular cleaning is not possible. The antibacterial efficacy remains constant throughout the entire product life and there is long-lasting prevention of bacterial reproduction.

Antibacterial effectiveness - JIS Z 2801 / ISO 22196

The mortification rate of germs within 24 hours is determined by means of the test JIS Z 2801 / ISO 22196. Here, a germ solution of E.coli and S.aureus bacteria is pipetted onto a CENTROGUARD / POM CG-carrier plate. For comparison, the same germ solution is applied to another plastic carrier plate (control sample). The germ concentration is determined on both carrier plates at the time t-zero. After 24 hours under ideal, moist conditions, the germ concentration is measured a second time on both carrier plates.

The following result is given for the CENTROGUARD carrier plate:



Antibacterial effect

After the test period had ended, 99.47 % of S.aureus bacteria and 99.97 % of E.coli bacteria had been killed.

Beschreibung	Bakterien nach 0 h		Bakterien nach 24 h		% Reduktion	
	S.aureus	E.coli	S.aureus	E.coli	S.aureus	E.coli
CENTROGUARD / POM CG	11000	12000	36	54	99,47 %	99,97 %

CENTROGUARD / POM CG plastic ensures almost complete reduction of S.aureus and E.coli bacteria.

Product range

The CENTROGUARD / POM CG plastics are used, e. g., as medical and food-technical devices, trays and cutting boards, underlays in the kitchen area or closures.

Rods 6 – 300 mm

Tubes available on request

Plates 10 – 100 mm

Precise measurements can be found in our delivery programme or www.centroplast.de.
Details on our CENTROGUARD / POM CG products can be found at www.centroplast.de/CENTROGUARD.

Centroplast
Engineering Plastics GmbH

Our competence is yours!

Centroplast
Engineering Plastics GmbH

Unterm Ohmberg 1
D-34431 Marsberg

Tel. +49 (0) 2992 9704-700
Fax +49 (0) 2992 9704-30

www.centroplast.de
info@centroplast.de