Introduction

Handles and operating elements can act as carriers for many pathogens. With every hand contact, bacteria and germs take hold on the surface where they can proliferate unchecked over time, such as between two cleaning cycles. If one or more people later touch the same part, the expanded growth of pathogens has the opportunity to spread even further.

The antibacterial standard parts of the **Sanline** product family can prevent bacteria and germs from propagating on an operating element, actively reducing their spread and preventing bacterial illnesses that could otherwise result.

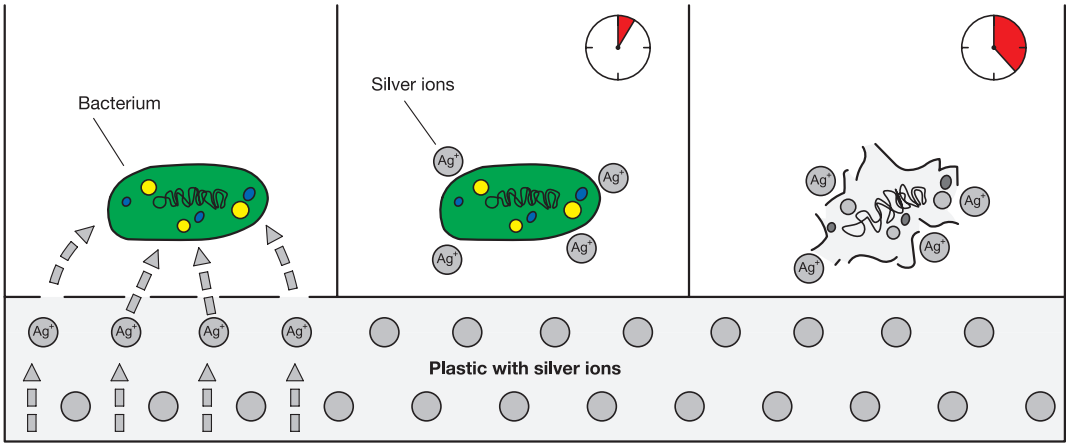
Two different active principles can be found in the **Sanline** product family: Plastic standard parts with additives based on silver ions and metal standard parts with a powder coating based on zinc molybdate. Both principles destroy the cell walls of the microorganisms, causing them to die. The antibacterial effectiveness is retained for a long time, even after frequent cleaning cycles, and is absolutely safe for the user.

With their antibacterial properties, the **Sanline** operating elements are predestined for areas with elevated hygiene requirements. These include doctors' offices, hospitals, rehabilitation and care facilities as well as cafeterias, food-processing plants, and agricultural operations with livestock. **Sanline** products also reduce the risk of infection in locations where many different people come into contact with handles and operating elements, such as in stadiums and concert halls, amusement parks and wellness facilities as well as on public transport.

Functioning differences - Plastic with silver ions

Plastics manufactured with silver ions inhibit the establishment and proliferation of bacteria and germs on the surface. The effect is based on a natural principle and remains continuously effective for a long time.

Silver ions (Ag^+) diffuse from the plastic surface and attach to the cell walls of the microbe. After a short time, the silver ions break through the cell wall of the microbe and destroy the enzyme activity within the cell. The genetic material of the microbe is attacked, preventing further cell division and eventually killing off the germ.



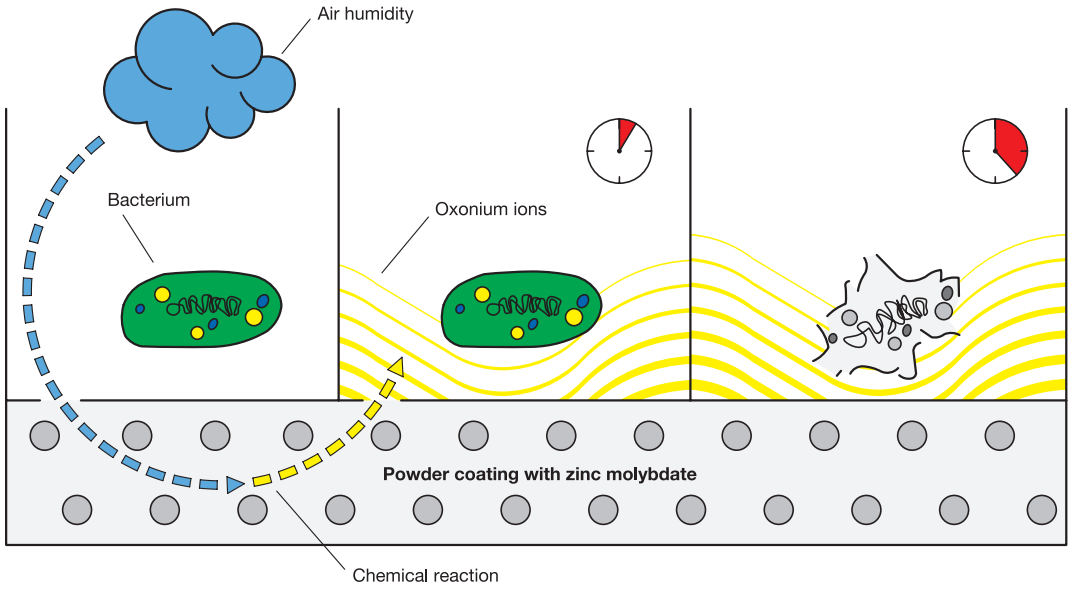
The antibacterial effect of the additive is not reduced by repeated cleaning with soap or solvent. Even at sterilization temperatures of up to 266 °F (130 °C), the effect is not lost.

Functioning differences - Powder coating with zinc molybdate

Powder coatings with an additive based on zinc molybdate have a powerful antibacterial effect. The coating mimics the natural acidic protective sheath of human skin. Glands in the skin produce acids that lower the pH and form an acidic protective sheath for the body, rendering pathogens on the skin harmless.

With zinc molybdate, this principle can be recreated by technical means: On the surface of the coating, oxide particles chemically react with moisture in the air to form an acid group, lowering the pH. The resulting oxonium ions (H_3O^+) destroy the cell walls of the bacteria via protolysis.

This process ensures a constant reduction in microorganisms, preventing their growth and disrupting their ability to establish themselves on the surfaces.



Laboratory tests

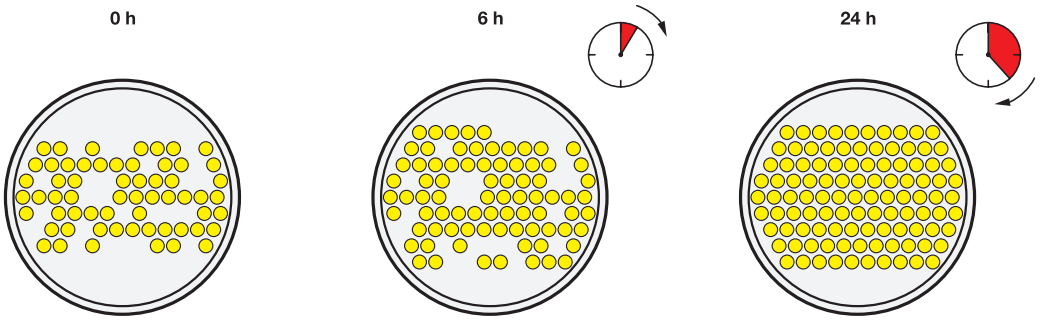
Sanline standard parts have been tested successfully according to ISO 22196:2011-08 “Plastics – Measurement of antibacterial activity on plastics and other non-porous surfaces.”

The antibacterial effect was demonstrated on the following test microbes:

Silver ions	Zinc molybdate
Bacteria: - Staphylococcus aureus ATCC® 25923™ - Escherichia coli ATCC® 25922™ - Klebsiella pneumoniae ATCC® 13883™ - Pseudomonas aeruginosa ATCC® 27853™ Fungus: - Candida albicans ATCC® 10231™	Bacteria: - Staphylococcus aureus ATCC 6538P - Escherichia coli ATCC 8739
The testing and confirmation was performed by the accredited testing laboratory CSI S.p.A.	The testing and confirmation was performed by the accredited testing laboratory Institut Hohenstein.

The active principle demonstrably reduces the growth of bacteria within 24 hours so that contaminated surfaces ultimately have less than 0.2 % of the original number of microbes.

Typical standard part
Microorganism proliferation in a period of 24 h



Sanline standard part
Microorganism reduction in a period of 24 h