



SiShield

Peace-of-mind protection



Si-QAC Chemical Compound

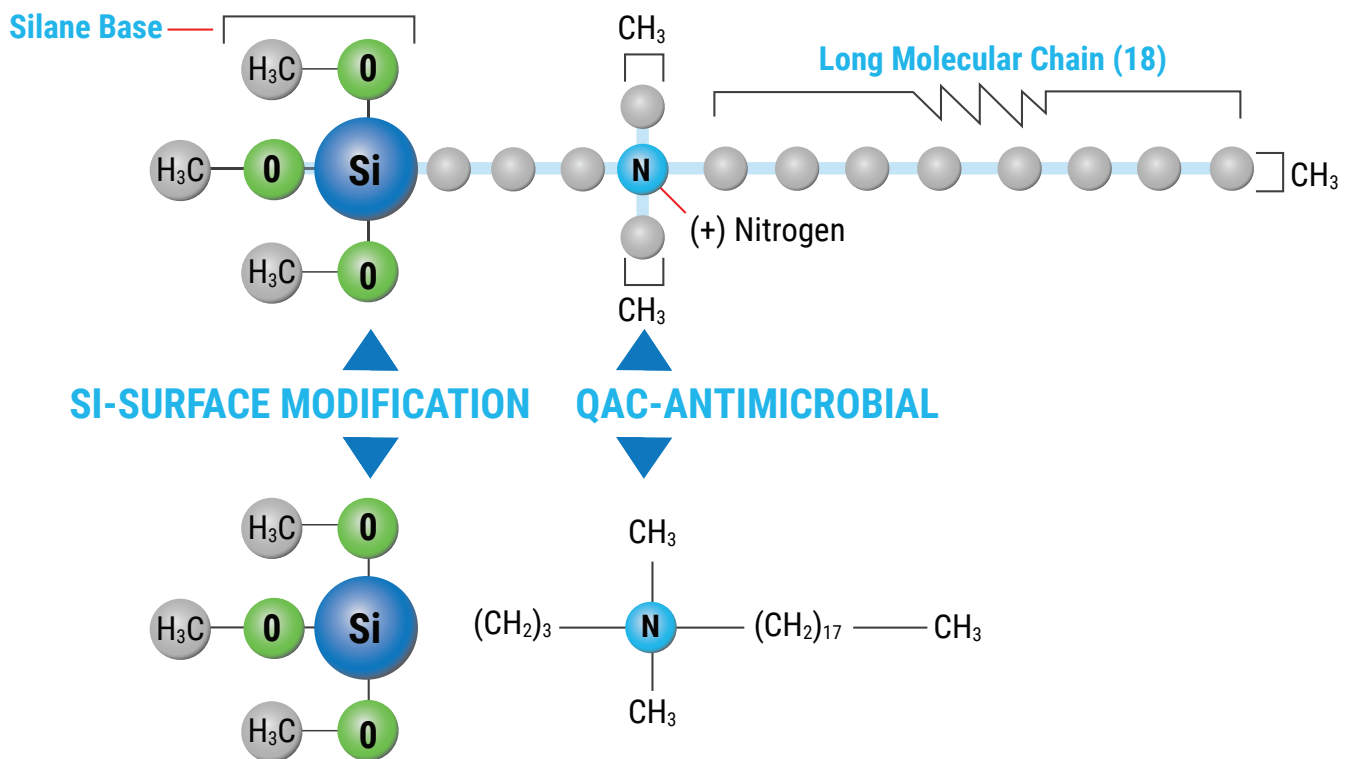
The basis for SiShield
antimicrobial solutions

**Molecular details,
chemistry and mode of action**

SI-QAC

Powerful Combination

POWERFUL COMBINATION (Si-QAC)

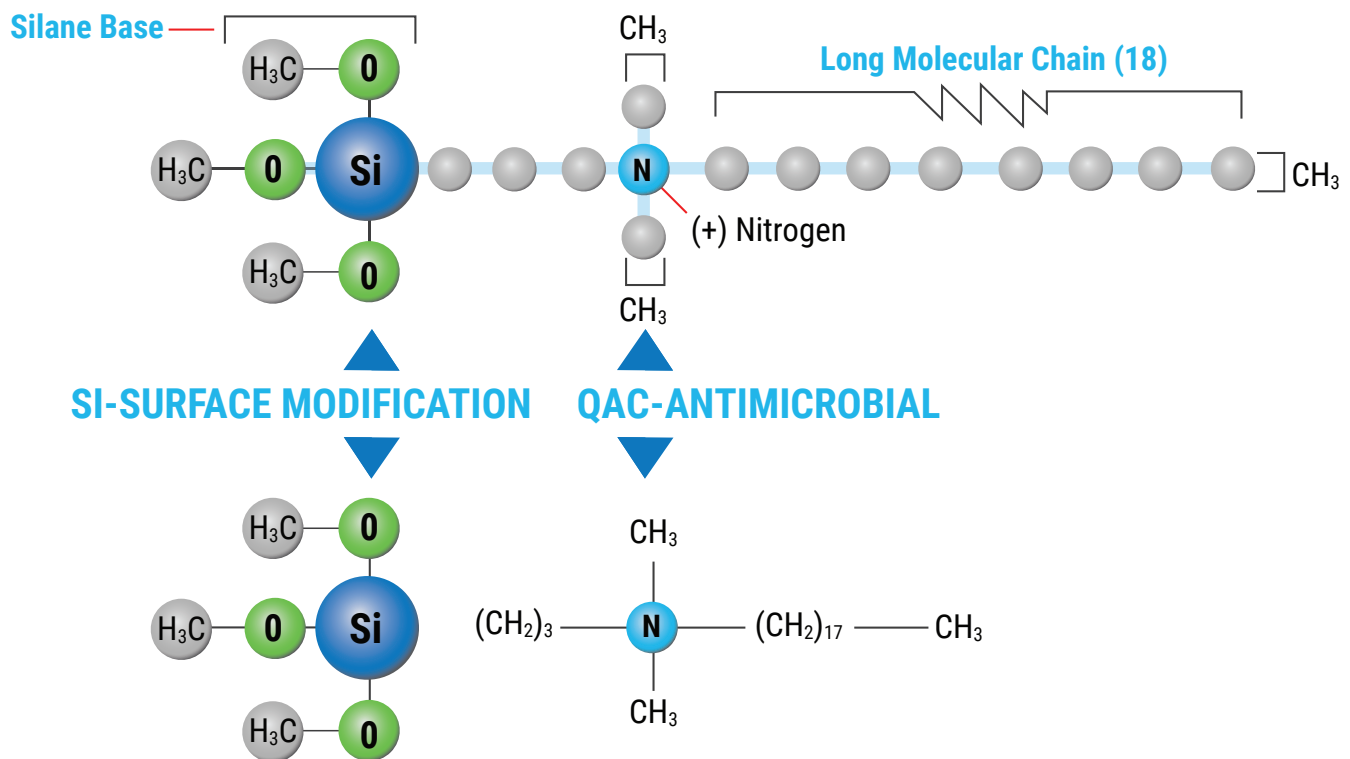


- Non-migrating & non-leaching antimicrobials
- Bounded to the substrate and require a contact by the microbe
- Bonded to the product surface for long lasting protection
- Not consumed by micro-organisms
- Mechanically and/or electrostatically interrupts the cell wall

SI-QAC

Mode of Action

Organosilane quaternary amine
CAS: 27688-52-6



Section 1 Silane base

The central section of the long chain molecule is a silane base, which enables the antimicrobial to anchor securely onto the substrate. A covalent bond is formed, providing long-lasting antimicrobial protection against a broad spectrum of single cell microorganisms.

Section 2 Long Molecular Carbon Chain

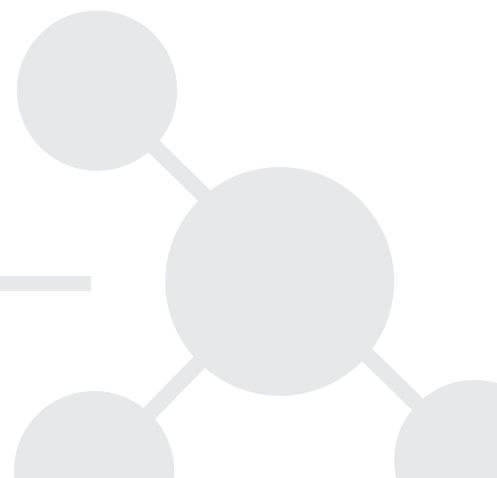
The long chain molecule is the blade that initially comes into contact with the offending microbes. This acts like a sword that punctures the cell membranes of all microbes coming in contact with it.

Section 3 Positively Charged Nitrogen

Positively charged nitrogen is a bolt of electricity that finishes off any speared microbe that survives the sword. The mechanical decontamination negates the need for harsh chemicals.

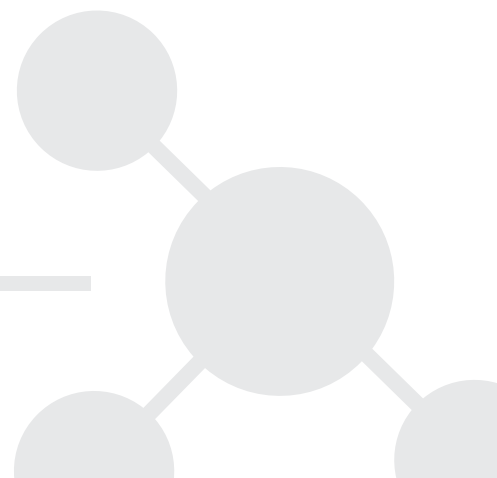
The attachment of Si-QAC chemical compounds to surfaces involves two processes:

1. **Bonding.** An instant process by which the Si-QAC forms a strong covalent bond with the surface. This association confers a positive electronic charge to the surface.
2. **Polymerization:** Unlike other antimicrobials, our Si-QAC antimicrobial compounds can polymerize after they have been applied to the surface. Polymerizeable compounds, meaning the liquid Si-QAC monomer can turn into a long-lasting solid coating. Once this molecule is hydrolyzed, it forms a dense polysiloxane network on the treated surface and with itself. The network creates an extremely high cationic charge density capable of destroying microbes when they come in contact with the surface. This long carbon chain can puncture the host cell membrane and deprive it from functioning as a living organism.



Other Chemical Mode of Action

Number	Chemical Category	Mode of Action
1	Quaternary ammonium compounds alcohol	Disrupts cell membrane but no residual activity
2	Formaldehyde	Denature proteins and solubilizes lipids; Reacts with NH ₂ , SH and COOH groups of cell wall
3	Iodine	Inactive proteins
4	Chlorine gas	Forms hypochloric acid, a strong oxidizing agent
5	Heavy metal (Silver salts)	Precipitates proteins, inactive proteins
6	Phenolic Compounds (Triclosan)	Denatures proteins and disrupts cell membranes



Contact us for a
consultation with
our chemists and learn
more about a customized
antimicrobial solution that
works for you.

Thank you



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