CATIONIC COATING TECHNOLOGY

An Organofunctional Silane Technology

- Silane-quat (Si-Quat) based is a molecularly-bonded unconventional technology.
- The bound unconventional technology, an organofunctional silane, has a mode of action that results from the coating technology inhibiting microorganisms as they contact the surface.
- Effective levels of this technology do not leach or diminish over time. The technology actually polymerizes with the substrate making the surface antimicrobial.
- Durability to wear and laundering with broad-spectrum antimicrobial activity have been demonstrated.

Safety Profile

The ability of the Si-Quat, when properly applied, to chemically bond to the textile substrate and still provide for the broad-spectrum inhibiting of microorganisms, makes it well suited to the safety challenges encountered in the full range of applications used in a variety of industries and applications.

The following studies have been conducted on Si-Quat cationic coatings: (a) acute oral, (b) acute ocular, (c) acute and subacute dermal, (d) acute vapor inhalation, (e) primary skin sensitization and irritation, (f) sub-acute vaginal irritation, (g) fourday static fish toxicity, (h) teratogenic evaluation, (i) sub-acute human wear test (socks), (j) human repeated insult patch test, (k) invitro Ames Microbial Assay with and without metabolic activation, (l) in-vitro mammalian cell transformation in the presence and absence of exogenous metabolic activation, (m) in-vitro Host- Mediated Assay and (n) a percutaneous absorption study.

No untoward effects are notable regarding treated substrates. Years of clinical use with no untoward effects also support the suitability of the treated fabric for its intended use.

Case Study - The Arthur G. James Cancer Center Hospital and Research Institute

The study building is a 12-story comprehensive cancer center and research institute located in Columbus, Ohio. Just prior to its opening in January, 1990, a ruptured water pipe on the 12th floor flooded the building with an estimated 500,000 gallons of water.Large numbers of fungi and bacteria were retrieved from the air in all areas of the hospital. Large numbers of water-associated bacteria, such as Acinetobacter sp., as well as fungi were retrieved from carpeting.

All accessible interior surfaces (including carpeting, ceilings, walls, above ceiling space, furnishings, elevator shafts, mechanical and electrical chases) were treated with the Si-Quat antimicrobial in accordance with the manufacturer’s application specifications.

Each of the 24 Bone Marrow Transplant patient rooms was negative for microorganisms during all of the post-treatment samplings. The facility is presently free of odor and has a new appearance unaffected by the extensive application of a surface antimicrobial.

No fungal nosocomial infections were recorded in this facility during the 30-month study and a post study check after five years.

All renovations or reconstruction in the facility were strictly controlled and all newly added or modified surfaces were treated with Si-Quat antimicrobial for five years after the initial treatment.

Study - Nonwoven Surgical Drapes

A considerable body of microbiological efficacy data was generated to support the effectiveness of the nonwoven surgical drape through a variety of microbiological tools.

These included: in-vitro tests, Scanning Electron Microscopy (SEM) work, and clinical evaluations. The purpose of these tests was to support claims relating to the reduction of microbial dose on the drape in the vicinity of the wound.

The surgical drape fabric was found to kill the bacteria commonly associated with surgical wound infections and takes an active role in maintaining an aseptic field at the wound site. The antimicrobial coating serves to isolate the wound from bacterial transfer from the drape surface.

The antimicrobial component of this fabric was chemically bonded, safe for use in surgery, and did not lose its effectiveness when sterilized, stored, or handled during the manufacturing procedure or in surgery

Wound Care Silk Dressings

The Department of Pediatrics at the University of Bologna evaluated the effectiveness of a special silk fabric (MICROAIR DermaSilk treated with Si-Quat technolgy) in the treatment of young children affected by AD with acute lesions at the time of examination.

Using the SCORAD index, a significant decrease in AD severity was noted with the treated dressings (mean SCORAD decrease from 43 to 30: P= 0,003).

This allowed for the conclusion that such treated clothes (dressings) should be useful in the management of AD in children.

Hospital Blankets

Participation with Spartan Mills and the Virkler Company in studying blankets that were treated with the technology and blankets that were untreated. In any environment, blankets can become a haven for bacteria.

Studies clearly show that blankets protected by the Si-Quat technology have a significantly lower bioburden and will present less of a risk in the patient environment.

These data generated by university, medical and industrial laboratories represent some of the most extensive microbiological work ever performed on antimicrobial treated substrates for use in the medical community. The control of the microorganisms is impressive and provides numerous benefits.

- Prevents blanket staining due to mold and mildew growth that occurs on damp blankets prior to laundering.
- Controls blanket deterioration due to microbial growth that occurs on blankets during storage.
- Controls odors caused by bacteria and fungus normally found in blankets.
- Provides 3 times more protection from bacteria and fungus than an untreated blanket.

Summary

The health care industry is challenged with providing the best possible care for their patients and a safe environment for health care workers. Microorganisms are the most prevalent and potent pollutants in the indoor environment and their role as causers and aggravators of disease conditions are well documented. The proven technology with the properties appropriate for use at all stages of a facilities “life” is; Si-Quat based, Cationic Surface Coatings.

References

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