

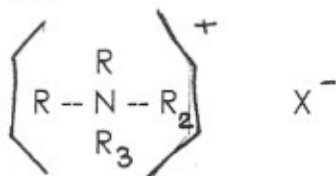
TECHNICAL UPDATE

TECHNICAL INFORMATION PHYSAN 20™

PH-TB-003

PHYSAN 20, E.P.A. No. 55364-5 is a highly refined mixture of n-alkyl dimethyl benzyl ammonium chlorides and n-alkyl dimethyl ethyl benzyl ammonium chlorides.

The quaternary ammonium salts of long chain alkyl, or heterocyclic groups (obtained from fatty acids) make up the group of chemicals known as cationic surface-active quaternary ammonium disinfectants, and have the following basic form.



When R represents the lipophilic group (long chain alkyl or polycyclic groups), R_{1,3} represents "H", alkyl, azyl, or heterocyclic groups or residues. "X" represents a negative ion with a negative one valence, and "N" represents the nitrogen.

CHEMICAL AND PHYSICAL PROPERTIES

Active Ingredients:

N-alkyl (60% C ₁₄ , 30% C ₁₆ , 5% C ₁₂ , 5% C ₁₈) dimethyl benzyl ammonium chlorides	10%
N-alkyl (68% C ₁₂ , 32% C ₁₄) dimethyl ethyl benzyl ammonium chlorides	10%
Inert ingredients:	<u>80%</u> 100%



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GENERAL DESCRIPTION: PHYSAN is an almost clear liquid having a slight, but pleasant odor. It mixes easily in water and does not separate.

SURFACE ACTIVITY: PHYSAN has an inherently high wetting and penetrating action that provides a deep and intimate contact between the antiseptic-germicide and any microorganisms, dirt, etc.

MOLECULAR WEIGHT: Average molecular weight of PHYSAN is 384.

SOLUBILITY: PHYSAN is soluble in water, alcohol and acetone. It is partially soluble in benzene and insoluble in ether.

SUBSTANTIVITY: PHYSAN aqueous solutions are readily absorbed by such textiles as cotton, wool, viscose and acetate rayon. It is so strongly retained by these fibers that bacteriostatic activity is evident even after washing or cleanings.

STABILITY AND SHELF LIFE: PHYSAN is a highly stable product that retains its antiseptic and germicidal properties for long periods - even years, when it is stored under normal conditions.

ACTIVITY: 20%

SPECIFIC GRAVITY: PHYSAN at 20° (pycnometer) is rated at a specific gravity of 0.997.

pH: The pH ratings of PHYSAN aqueous solutions fall within the range of 6.5 to 7.5. PHYSAN is cationic in its reaction to surfaces throughout the entire pH range. It maintains its bactericidal effect throughout the pH range.

HARDNESS TOLERANCE: PHYSAN is stable and effective in waters containing up to 750 ppm hardness calculated as CaCO_3 as determined by the Chambers Method Hardness Test. This fulfills the requirements of appendix F, as revised March 12, 1956, of the Milk Ordinance and Code 1953 -- Recommendations of the U.S. Public Health Service.

COMPATIBILITIES AND INCOMPATIBILITIES: PHYSAN is compatible with the non-ionic surface-active agents, i.e. ethylene oxide, condensates of alkylphenols and high activity fatty acid alkonolomides. It is also compatible with other cationic materials and with certain dye stuffs, essential oils, inorganic and organic salts, alcohol acids and alkalis.

PHYSAN is incompatible with soaps, sulfated or sulfonated fatty alcohols and oils and certain other anionic or surface-active agents. It should never be mixed with these materials. Care should also be taken to fully rinse and remove any soap trace from any surface before applying PHYSAN.

COMPATIBILITIES WITH PESTICIDES: PHYSAN has not been tested for compatibility with other pesticides or fertilizers. We do not recommend the mixing of PHYSAN with other chemicals.

CORROSION AND DAMAGE TO MATERIALS: PHYSAN in use dilutions, will not damage or mar natural rubber, glass, painted or plastic surfaces. It is non-corrosive to all metals in normally used applications for swabbing, mopping and rinsing. PHYSAN is non-flammable and non-explosive.

BACTERICIDAL ACTIVITY: PHYSAN has demonstrated bactericidal or bacteristatic activity against a wide specturm of bacterial organisms such as:

Agrobacterium tumefaciens	Pseudomonas sp.
Enterobacter Agglomerans	Erwinia cyripedii
Erwinia carotovora	Xanthomonas campestris

FUNGICIDAL ACTIVITY: PHYSAN is effective against a wide variety of fungi that may cause rots, rusts, blights, and mildew.

Botrytis cinerea	Gnomonia veneta
Fusarium spp.	Rhizoctonia solani
Penicillium digitatum	Curvularia sp.
Gliocladium roseum	Phythium aphanidermatum
Rhodoturula glutinis	Helminthosporium sativum
Ophiobolus graminis	Puccinia antirrhini
Ceratocystis ulmi	Sclerotinia homeocarpa

VIRUCIDAL ACTIVITY: PHYSAN has been tested and proven to be effective in controlling Tobacco Mosaic Virus (TMV) on hard surfaces and tobacco leaves. TMV is the most stable of the viruses which are pathogenic to plants. PHYSAN's ability to control TMV may indicate that it would be a good product to control other viruses.

PHYTOTOXICITY: PHYSAN generally is not phytotoxic to plants at concentrations below 400 ppm (1/4 ounce per gallon of water). However, this can vary depending on the type of plant and its stage of growth.

ALWAYS TEST A SMALL NUMBER OF PLANTS FOR PHYTOTOXICITY BEFORE PHYSAN IS USED IN A GENERAL APPLICATION.

RESIDUAL BACTERIOSTASIS: PHYSAN has an affinity for most materials and hard surfaces and also possesses great lasting properties. When PHYSAN is used, an almost imperceptible residual anti-bacterial film is left on the surface. This film prevents and inhibits the growth of microorganisms over a period of several days.

TEMPERATURE AND BACTERICIDAL ACTIVITY: PHYSAN is effective in either hot or cold water. Its effectiveness however, increases with a higher water temperature.

TOXICOLOGICAL PROPERTIES

ACUTE ORAL TOXICITY: LD₅₀ OF PHYSAN 20 on white rats is 1,000 MG/KG (RATS)

IRRITATION AND SENSITIZATION: PHYSAN at recommended use concentrations, up to 1,000 ppm is neither a primary irritant nor a sensitizing agent.

FIRST AID: In case of contact with PHYSAN 20 concentrate on skin, wash with water; flush eyes with plenty of water, and for eyes call a physician. If swallowed, drink a large quantity of milk, buttermilk, egg whites, or if these are not available, drink large quantities of water. Avoid alcohol. The concentrate is very bitter to the taste. See physician to re-innoculate the intestines.