PRODUCT DATA SHEET

# AEROSOL® 22 Surfactant

**Type:** Anionic

**Chemical:** Tetrasodium N-(1,2-dicarboxyethyl)-N octadecyl sulfosuccinamate

AEROSOL 22 surfactant is a highly hydrophilic surface active agent and has excellent electrolyte compatability. It is a good dispersant for inorganic materials and an excellent solubilizing agent. AEROSOL 22 surfactant is non-dermatitic.

## SOLUBILITY IN WATER

AEROSOL 22 surfactant is not phytotoxic if used in spray solutions at a concentration below 0.5%.

## SOLUBILITY IN SOLVENTS

AEROSOL 22 is insoluble in organic solvents such as the following:

| | |
|---|---|
| Aromatic petroleum solvent | Kerosene |
| Benzene | Mineral oils |
| Butanol | Oleic acid |
| Butyl acetate | Olive oil |
| Carbon tetrachloride | Pine oil |
| Dibutyl phthalate | Teaseed oil |
| Ethanol | Turpentine |
| Glycerine | Xylene |

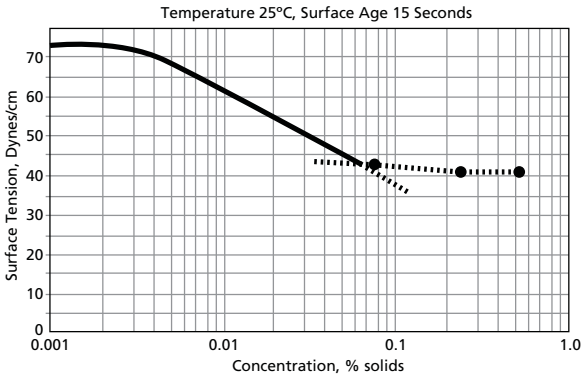
However, water-soluble solvents, such as ethanol (SDA 2-B), may be added at approximately 5-10% concentrations to AEROSOL 22 surfactant, as sold, without precipitating the active ingredient. Small amounts of water-insoluble solvents can be dissolved in AEROSOL 22 surfactant.

## PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Appearance at 25°C (77°F) | Clear, slightly cloudy solution |
| Solids, % by weight | 34-36 |
| Solvent | Water + residual ethanol |
| Color, as is, maximum (Gardner Scale) | 8 |
| Specific gravity, 25°C | ~1.12 |
| Density, lb/gal, 25°C | ~9.4 |
| Viscosity, cps, 25°C Brookfield RVF, No. 1 spindle, 20 rpm | ~53 |
| Freezing point, °C | Separates below 10 (50°F) |
| Melting point, °C (of solids) | >200 (392°F) |
| pH, as is | 7-8 |
| Acid number, as is, maximum | 2.0 |
| Iodine value, as is, maximum | 0.5 |

## SURFACE TENSION

**Figure 1 – Surface Tension of Aerosol 22**




## WETTING (DRAVES TEST)

Although AEROSOL 22 surfactant is primarily a detergent, dispersant and solubilizer, its wetting power is sufficiently good to be of interest. This is especially true at 40°C and above, where the wetting power is excellent.

## SOLUBILIZING ACTION

AEROSOL 22 surfactant is an excellent solubilizing agent. It increases the tolerance of soaps, sulfonated oils and other surface active agents to inorganic salts, acids and bases and reduces scumming. It also renders emulsions stable to high concentrations of inorganic salts.

## SURFACE ACTIVE PROPERTIES

| | |
|---|---|
| Critical Micelle Concentration (CMC), % by weight | 0.04 |
| Surface Tension | See Figure 1 |
| Interfacial tension<br>Ross Miles Foam Test, | See Interfacial Tension table below |
| ASTM D-1173,<br>1.0% solution, 25°C<br>Initial foam volume, mL Foam<br>Volume after 15 min. Foam<br>Volume after 105 min. | <br><br>280<br>200<br>0 |

**Interfacial Tension of Solutions**
**AEROSOL 22 Surfactant vs Methyl Acrylate**
**(Pendant Drop Method)**

| AEROSOL 22 surfactant Concentration, % solids | Interfacial tension, dynes/cm at 25°C |
|---|---|
| 10 | 4.9 |
| 5 | 5.4 |
| 2.5 | 5.6 |
| 1.0 | 6.0 |
| 0.5 | 6.0 |
| 0.0 | 15.0 |

**Wetting Time vs AEROSOL 22 Surfactant Concentration**
**(1.5 g hook)**

| Sinking time, seconds | | | |
|---|---|---|---|
| % solids | 30°C | 50°C | 70°C |
| 2.5 | 148 | 35 | 10 |
| 1.25 | 123 | 47 | 13 |
| 0.6 | 148 | 47 | 22 |
| 0.25 | 232 | 57 | 30 |
| 0.1 | - | 98 | 44 |
| 0.0625 | - | - | 76 |

## ELECTROLYTE TOLERANCE

AEROSOL 22 surfactant is soluble in saturated salt solutions. When AEROSOL 22 surfactant is used in the proper proportions it will help agents with poor salt tolerance to mix into salt solutions of high concentrations. The maximum concentrations of electrolyte solution in which 1% AEROSOL 22 surfactant is soluble at 30°C are shown in the Solubility table on right.

## STABILITY IN ACIDS AND ALKALIES

The acid and alkaline stabilities of AEROSOL 22 surfactant were determined by keeping 1% solutions containing various concentrations of hydrochloric acid, sulfuric acid and sodium hydroxide for varying lengths of time at temperatures ranging from 86 to 180°F. As shown in the Effects of Acid and Alkali table below, AEROSOL 22 surfactant is fairly stable in acids and extremely stable in sodium hydroxide.

**Solubility of 1% AEROSOL 22 Surfactant in Electrolyte Solutions**

| Salt | Maximum concentration of electrolyte solution tolerated, %4.9 |
|---|---|
| Sodium chloride | 26 |
| Sodium nitrate | 50 |
| Sodium sulfate | 30 |
| Sodium phosphate | 30 |
| Sodium hydroxide | 40 |

**Effect of Acid and Alkali on AEROSOL 22 Surfactant, 1% Solids**

| Acid or Alkali | Concentration % | Appearance of Solution | | |
|---|---|---|---|---|
| | | After 3 days at 86°F (30°C) | After 5 days at 86°F (30°C) | After 1/2 hour at 180°F (82°C) |
| HCl | 1.0 | Clear | Clear | Turbid precipitate |
| | 2.5 | Clear | Clear | Turbid precipitate |
| | 5.0 | Clear | Clear | Turbid precipitate |
| | 10.0 | Clear | Precipitate | Turbid precipitate |
| $H_2SO_4$ | 1.0 | Clear | Clear | Turbid precipitate |
| | 2.8 | Clear | Clear | Turbid precipitate |
| | 6.0 | Clear | Precipitate | Turbid precipitate |
| NaOH | 1.0 | Clear | Clear | Clear |
| | 2.5 | Clear | Clear | Clear |
| | 5.0 | Clear | Clear | Clear |
| | 10.0 | Clear | Clear | Clear |

## CALCIUM TOLERANCE

AEROSOL 22 surfactant exhibits sufficient calcium tolerance to recommend its use in hard water areas. Furthermore, because of its tolerance to calcium, it is also a good water softener.

## STORAGE AND HANDLING

AEROSOL 22 should not be exposed to extremes of cold or heat. It should be stored above 10°C (50°F) in order to prevent separation (gel layer on bottom of drum).

The efficacy of AEROSOL 22 surfactant is not impaired by freezing or thawing. However, if a freeze thaw cycle occurs, it is recommended to warm the entire contents of the container and thoroughly agitate it to assure homogenicity prior to use. Prolonged storage (more than one month) at temperatures exceeding 40°C may result in separation (a creamy layer results) as well as an increase in pH.

Handling and storage information on this product can be found in the corresponding Cytec Industries Inc. Material Safety Data Sheet.

## HEALTH AND SAFETY INFORMATION

Before handling this material, read the corresponding Material Safety Data Sheet for safety, health and environmental data.

**Tolerance to Calcium, Hart Method**

| AEROSOL 22 surfactant Concentration, % solids | Calcium tolerance, ppm | |
|---|---|---|
| | pH 8.6 | pH 7.5 |
| 2.50 | 1125 | 960 |
| 1.25 | 405 | 314 |
| 0.625 | 262 | 163 |
| 0.375 | 218 | 194 |
| 0.250 | 216 | 160 |
| 0.125 | 196 | 142 |
| 0.0625 | 191 | 131 |

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