



**SOLVAY**

asking more from chemistry®

# Surfactants and Specialty Monomers





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# Solvay Novecare Emulsion Polymerization

**Solvay Novecare** is the leading global supplier of emulsifiers, specialty monomers and specialty additives to the Emulsion Polymerization Industry.

For more than 40 years, we have been committed to providing leading edge solutions to this industry. Our portfolio has evolved into the most comprehensive range of products addressing formulation challenges and more importantly enabling customers to create tomorrow's performance requirements today.

**Solvay Novecare** supports customers with a broad range of sustainable solutions and services including products optimized around criteria such as biodegradability, eco-toxicity, VOC content, and percentage of renewable materials.

Our APE-free surfactant portfolio covers all chemistries from nonionics (RHODASURF<sup>®</sup>), to anionics like alkyl sulfonates (RHODACAL<sup>®</sup>), alkyl ether sulfates (RHODAPEX<sup>®</sup>), sulfosuccinates (GEROPON<sup>®</sup>), phosphate esters (RHODAFAC<sup>®</sup>) and formulated blends (ABEX<sup>®</sup>).

**Solvay Novecare's** dedicated specialty monomer portfolio (SIPOMER<sup>®</sup>) brings functionality and boosts binder performance to higher levels. Whether seeking to improve substrate wetting, adhesion to different substrates, emulsion stability or simply demand higher film performance, such as high scrub, stain or water resistance, Solvay has the solution.

## Working with Solvay

- ▶ Extensive portfolio of products
- ▶ Surfactants & Specialty monomers dedicated to Emulsion Polymers manufacturing
- ▶ Over 40 years as major supplier to the Emulsion Polymer industry
- ▶ Global player with local technical teams to support your developments

*Note: These products are produced at worldwide locations through the Novecare division of Solvay.*

# Formulated Emulsifiers

| Product | Description | APE/<br>APE-Free | Physical<br>Form | Solids<br>Content (%) | Critical<br>Micelle<br>Concentration<br>(%) | Surface<br>Tension<br>at CMC<br>(dynes/CM) |
|---------|-------------|------------------|------------------|-----------------------|---|--|
|---------|-------------|------------------|------------------|-----------------------|---|--|

## Formulated Anionics

|              |             |          |        |    |      |    |
|--------------|-------------|----------|--------|----|------|----|
| ABEX® 18-S   | Proprietary | APE-Free | Liquid | 35 | 0.03 | 48 |
| ABEX® 23-S   | Proprietary | APE-Free | Liquid | 60 | 0.10 | 40 |
| ABEX® 26-S   | Proprietary | APE      | Liquid | 33 | 0.02 | 55 |
| ABEX® 33-S   | Proprietary | APE      | Liquid | 30 | 0.12 | 37 |
| ABEX® JKB    | Proprietary | APE-Free | Liquid | 30 | 0.13 | 40 |
| ABEX® VA-50  | Proprietary | APE      | Liquid | 46 | 0.17 | 44 |
| ABEX® 2005   | Proprietary | APE-Free | Liquid | 30 | —    | —  |
| ABEX® 2020   | Proprietary | APE-Free | Liquid | 30 | 0.01 | 41 |
| ABEX® 2115-A | Proprietary | APE-Free | Liquid | 33 | —    | —  |
| ABEX® 8018   | Proprietary | APE-Free | Liquid | 31 | 0.05 | 37 |

## Formulated Anionics

|                 |   |     |        |    |      |    |
|-----------------|---|-----|--------|----|------|----|
| ABEX® EP-100    | Ammonium salt of Sulfated Nonylphenol Ethoxylate; 4 Moles EO  | APE | Liquid | 30 | 0.03 | 33 |
| ABEX® EP-110    | Ammonium salt of Sulfated Nonylphenol Ethoxylate; 9 Moles EO  | APE | Liquid | 30 | 0.01 | 37 |
| ABEX® EP-120    | Ammonium salt of Sulfated Nonylphenol Ethoxylate; 30 Moles EO | APE | Liquid | 30 | 0.05 | 42 |
| ABEX® EP-120 NA | Sodium Salt of Sulfated Nonylphenol ethoxylate                | APE | Liquid | 35 | ND   | ND |



| FDA Status |         |         |         |         |         |         |          |        |
|------------|---------|---------|---------|---------|---------|---------|----------|--------|
| 175.105    | 175.300 | 175.320 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 | 181.30 |

| International Inventory Status |              |                 |                  |                    |             |
|--------------------------------|--------------|-----------------|------------------|--------------------|-------------|
| US (TSCA)                      | Canada (DSL) | Europe (EINECS) | Australia (AICS) | South Korea (KECL) | Japan (MIT) |

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**FDA Listing Status Codes**

- Listed with no specific limits
- E Extraction limitation
- L Listed with limitations
- R Referenced with no limitations
- RL Referenced with limitations

**International Inventory Status Codes**

- Listed
- Not Listed

# Formulated Emulsifiers

| Product          | Description | APE/<br>APE-Free | HLB  | Physical<br>Form | Solids<br>Content<br>(%) | Critical<br>Micelle<br>Concentration<br>(%) | Surface<br>Tension<br>at CMC<br>(dynes/CM) |
|------------------|-------------|------------------|------|------------------|--------------------------|---|--|
| <b>Nonionics</b> |             |                  |      |                  |                          |   |  |
| ABEX® 2515       | Proprietary | APE-Free         | 16.3 | Liquid           | 50                       | 0.03  | 38   |
| ABEX® 2525/40    | Proprietary | APE-Free         | 17.4 | Liquid           | 40                       | 0.08  | 44   |
| ABEX® 2535       | Proprietary | APE-Free         | 18.0 | Liquid           | 50                       | 0.09  | 45   |
| ABEX® 2545       | Proprietary | APE-Free         | 18.3 | Liquid           | 50                       | 0.12  | 46   |







| FDA Status |         |         |         |         |         |         |          |        |
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| 175.105    | 175.300 | 175.320 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 | 181.30 |

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|--------------------------------|--------------|-----------------|------------------|--------------------|-------------|
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# Sulfates

| Product               | Description  | Ionic Charge | Physical Form | Solids Content (%) | Critical Micelle Concentration (%) | Surface Tension at CMC (dynes/CM) |
|-----------------------|--|--------------|---------------|--------------------|------------------------------------|-----------------------------------|
| <b>ALKYL SULFATES</b> |  |              |               |                    |                                    |                                   |
| RHODAPON® UB STD      | Sodium Lauryl Sulfate  | Anionic      | Liquid        | 30                 | 0.06                               | 29                                |
| RHODAPON® L-22EP      | Ammonium Lauryl Sulfate  | Anionic      | Liquid        | 28                 | 0.06                               | 33                                |
| RHODAPON® LX-28 AEP   | Sodium Lauryl Sulfate  | Anionic      | Liquid        | 30                 | 0.06                               | 29                                |
| <b>ETHER SULFATES</b> |  |              |               |                    |                                    |                                   |
| RHODAPEX EST-30*      | Sodium Tridecyl Ether Sulfate;<br>3 Moles EO                   | Anionic      | Liquid        | 30                 | 0.08                               | 33                                |
| RHODAPEX® LA-40S      | Sodium Salt of Sulfated Linear Alcohol Ethoxylate; 4 Moles EO  | Anionic      | Liquid        | 31                 | 0.02                               | 32                                |
| RHODAPEX® LA-120S     | Sodium Salt of sulfated linear Alcohol Ethoxylate, 12 Moles EO | Anionic      | Liquid        | 30                 | 0.02                               | 34                                |
| RHODAPEX® LA-300S     | Sodium Salt of sulfated linear alcohol ethoxylate, 30 Moles EO | Anionic      | Liquid        | 30                 | 0.03                               | 44                                |
| RHODAPEX® AB-20**     | Ammonium Salt of Sulfated Alcohol Ethoxylate; 9 Moles EO       | Anionic      | Liquid        | 29                 | 0.03                               | 33                                |
| RHODAPEX® OPS-253     | Sulfate of Alkyl Phenol Ethoxylate Sodium Salt                 | Anionic      | Liquid        | 36                 | 0.09                               | 36                                |
| RHODAPEX® CO-436      | Ammonium Salt of Sulfated Alkylphenol Ethoxylate; 4 Moles EO   | Anionic      | Liquid        | 58                 | 0.03                               | 33                                |

\* North America Only, \*\*Europe- Asia





**FDA Status**

| 175.105 | 175.300 | 175.320 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 |
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**International Inventory Status Codes**

- Listed
- Not Listed

# Phosphate Esters

| Product              | Description   | Ionic Charge | Physical Form | Solids Content (%) | Critical Micelle Concentration (%) | Surface Tension at CMC (dynes/CM) |
|----------------------|---|--------------|---------------|--------------------|------------------------------------|-----------------------------------|
| PHOSPHATE ESTERS     |   |              |               |                    |                                    |                                   |
| RHODAFAC® RS-410     | Aliphatic Phosphate Ester; 3 Moles EO                         | Anionic      | Liquid        | 100                | 0.002                              | —                                 |
| RHODAFAC® RS-610     | Aliphatic Phosphate Ester; 6 Moles EO                         | Anionic      | Liquid        | 100                | 0.002                              | —                                 |
| RHODAFAC® RS-610A-25 | Aliphatic Phosphate Ester; 6 Moles EO; Ammonium Salt Solution | Anionic      | Liquid        | 25                 | 0.01                               | 30                                |
| RHODAFAC® RS-710     | Aliphatic Phosphate Ester; 10 Moles EO                        | Anionic      | Liquid        | 100                | 0.002                              | 36                                |
| RHODAFAC® RS-710 D   | Aliphatic Phosphate Ester; 10 Moles EO                        | Anionic      | Liquid        | 30                 | 0.002                              | 36                                |
| RHODAFAC® RS-960     | Aliphatic Phosphate Ester; 50 Moles EO                        | Anionic      | Liquid        | 80                 | —                                  | —                                 |
| RHODAFAC® RE-410     | Aromatic Phosphate Ester; 3 EO                                | Anionic      | Liquid        | 100                | —                                  | —                                 |
| RHODAFAC® RE-610     | Aromatic Phosphate Ester; 9 Moles EO                          | Anionic      | Liquid        | 100                | 0.01                               | 37                                |
| RHODAFAC® RK-500 A   | Aliphatic Phosphate Ester; 3.5 Moles EO                       | Anionic      | Liquid        | 74                 | —                                  | —                                 |





| FDA Status |         |         |         |         |         |         |          |
|------------|---------|---------|---------|---------|---------|---------|----------|
| 175.105    | 175.300 | 175.320 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 |

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# Sulfonates

| Product | Description | Ionic Charge | Physical Form | Solids Content (%) | Critical Micelle Concentration (%) | Surface Tension at CMC (dynes/CM) |
|---------|-------------|--------------|---------------|--------------------|------------------------------------|-----------------------------------|
|---------|-------------|--------------|---------------|--------------------|------------------------------------|-----------------------------------|

## SULFONATES

|                   |   |         |        |    |      |    |
|-------------------|---|---------|--------|----|------|----|
| RHODACAL® A-246/L | Sodium Alpha Olefin Sulfonate             | Anionic | Liquid | 40 | 0.07 | 29 |
| RHODACAL® 330     | Isopropyl Amine Dodecyl Benzene Sulfonate | Anionic | Liquid | 90 | 0.1  | 32 |
| RHODACAL® DS-10   | Sodium Dodecyl Benzene Sulfonate          | Anionic | Flake  | 98 | 0.1  | 32 |
| RHODACAL® DS-4    | Sodium Dodecyl Benzene Sulfonate          | Anionic | Liquid | 23 | 0.1  | 32 |
| RHODACAL® DSB     | Disodium Alkyl Diphenyloxide Sulfonate    | Anionic | Liquid | 45 | 0.08 | 32 |
| RHODACAL® LDS-22  | Sodium Dodecyl (linear) Benzene Sulfonate | Anionic | Liquid | 23 | 0.1  | 32 |

## SULFOSUCCINATES

|                 |   |         |        |    |      |    |
|-----------------|---|---------|--------|----|------|----|
| GEROPON® SS-OIP | Disodium Salt of Monoalkyl Ether Sulfosuccinate | Anionic | Liquid | 40 | 0.1  | 30 |
| GEROPON® ACR-4  | Disodium Sort 4 Monoalkyl ether Sulfosuccinate  | Anionic | Liquid | 31 | 0.01 | 29 |
| Geropon® 99     | Aqueous Dioctyl Sodium sulfosuccinate           | Anionic | Liquid | 75 | 0.35 | 27 |





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|------------|---------|---------|---------|---------|---------|---------|----------|
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# Nonionics (APE Free)

| Product                              | Description    | Moles of Ethylene Oxide | Physical Form | Solids Content (%) | Critical Micelle Concentration (%) | Surface Tension at CMC (dynes/CM) | HLB  |
|--------------------------------------|----------------|-------------------------|---------------|--------------------|------------------------------------|-----------------------------------|------|
| <b>ALIPHATIC ALCOHOL ETHOXYLATES</b> |                |                         |               |                    |                                    |                                   |      |
| RHODASURF® BC-420                    | TDA Ethoxylate | 3                       | Liquid        | 100                | —                                  | —                                 | 8    |
| RHODASURF® BC-610                    | TDA Ethoxylate | 6                       | Liquid        | 100                | —                                  | —                                 | 11.4 |
| RHODASURF® BC-720                    | TDA Ethoxylate | 9-10                    | Paste         | 100                | —                                  | —                                 | 13.8 |
| RHODASURF® BC-729                    | TDA Ethoxylate | 9-10                    | Liquid        | 90                 | —                                  | —                                 | 13.8 |
| RHODASURF® BC-840                    | TDA Ethoxylate | 15                      | Paste         | 100                | —                                  | —                                 | 15.4 |
| RHODASURF® TLA 3040                  | TDA Ethoxylate | 30                      | Liquid        | 40                 | 0.08                               | 44                                | 17.4 |
| RHODASURF® TLA 4050                  | TDA Ethoxylate | 40                      | Liquid        | 50                 | 0.09                               | 45                                | 18   |
| RHODASURF® TLA 5050                  | TDA Ethoxylate | 50                      | Liquid        | 50                 | 0.12                               | 46                                | 18.3 |
| RHODASURF® TR 4070*                  | TDA Ethoxylate | 40                      | Liquid        | 70                 | —                                  | —                                 | —    |
| RHODASURF® L-4                       | LA Ethoxylate  | 4                       | Liquid        | 100                | —                                  | —                                 | 9.7  |
| RHODASURF® LA-9/85                   | LA Ethoxylate  | 9                       | Liquid        | 85                 | —                                  | —                                 | 13.1 |
| RHODASURF® LA-12/80                  | LA Ethoxylate  | 12                      | Liquid        | 80                 | —                                  | —                                 | 14.4 |
| RHODASURF® ON-870                    | OA Ethoxylate  | 20                      | Solid         | 100                | 0.015                              | 37                                | 15.4 |
| RHODASURF® ON-877                    | OA Ethoxylate  | 20                      | Liquid        | 70                 | —                                  | —                                 | —    |
| RHODASURF® 6530                      | Proprietary    | —                       | Liquid        | 65                 | 0.08                               | 41                                | 17   |
| RHODASURF® L-7/90                    | LA Ethoxylate  | 7                       | Liquid        | 90                 | —                                  | 30                                | 12.5 |
| RHODASURF® S25 28                    | TSP Ethoxylate | 25                      | Liquid        | 28                 | —                                  | —                                 | 14.5 |
| <b>BLOCK CO-POLYMERS</b>             |                |                         |               |                    |                                    |                                   |      |
| ANTAROX® L-61                        | EO/PO          | —                       | Flakes        | 100                | —                                  | Insoluble                         | 3.0  |
| ANTAROX® L-62                        | EO/PO          | —                       | Liquid        | 100                | —                                  | Soluble                           | 7.0  |
| ANTAROX® L-64                        | EO/PO          | —                       | Liquid        | 100                | —                                  | 43.2                              | 15.0 |

\*Europe- Asia



**FDA Status**

| 175.105 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 | 181.30 |
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**FDA Listing Status Codes**

- Listed with no specific limits
- E Extraction limitation
- L Listed with limitations
- R Referenced with no limitations
- RL Referenced with limitations

**International Inventory Status**

| US (TSCA) | Canada (DSL) | Europe (EINECS) | Australia (AICS) | South Korea (KECL) | Japan (MIT) |
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**International Inventory Status Codes**

- Listed
- Not Listed



# Nonionics

| Product                        | Description              | Moles of Ethylene Oxide | Ionic Charge | Physical Form | Solids Content (%) | Critical Micelle Concentration (%) | Surface Tension at CMC (dynes/CM) | HLB  |
|--------------------------------|--------------------------|-------------------------|--------------|---------------|--------------------|------------------------------------|-----------------------------------|------|
| <b>ALKYLPHENOL ETHOXYLATES</b> |                          |                         |              |               |                    |                                    |                                   |      |
| IGEPAL® CA-210                 | Octylphenol Ethoxylate   | 1.5                     | Nonionic     | Liquid        | 100                | —                                  | Insoluble                         | 4.8  |
| IGEPAL® CA-630                 | Octylphenol Ethoxylate   | 9                       | Nonionic     | Liquid        | 100                | 0.005                              | 31                                | 13   |
| IGEPAL® CA-877                 | Octylphenol Ethoxylate   | 23                      | Nonionic     | Liquid        | 70                 | —                                  | —                                 | 16.6 |
| IGEPAL® CA-887                 | Octylphenol Ethoxylate   | 30                      | Nonionic     | Liquid        | 70                 | 0.03                               | 38                                | 17.4 |
| IGEPAL® CA-897                 | Octylphenol Ethoxylate   | 40                      | Nonionic     | Liquid        | 70                 | 0.04                               | 44                                | 18   |
| IGEPAL® CA-407                 | Octylphenol Ethoxylate   | 40                      | Nonionic     | Liquid        | 70                 | 0.04                               | 44                                | 18   |
| IGEPAL® CO-210                 | Nonylphenol Ethoxylate   | 1.5                     | Nonionic     | Liquid        | 100                |                                    |                                   | -    |
| IGEPAL® CO-430                 | Nonylphenol Ethoxylate   | 4                       | Nonionic     | Liquid        | 100                |                                    |                                   | -    |
| IGEPAL® CO-530                 | Nonylphenol Ethoxylate   | 6                       | Nonionic     | Liquid        | 100                | 0.03                               | 32                                | 10.8 |
| IGEPAL® CO-630                 | Nonylphenol Ethoxylate   | 9                       | Nonionic     | Liquid        | 100                | 0.005                              | 32                                | 13   |
| IGEPAL® CO-720                 | Nonylphenol Ethoxylate   | 12                      | Nonionic     | Liquid        | 100                | 0.007                              | 36                                | 14.2 |
| IGEPAL® CO-730                 | Nonylphenol Ethoxylate   | 15                      | Nonionic     | Liquid        | 100                | 0.008                              | 39                                | 15.0 |
| IGEPAL® CO-858                 | Nonylphenol Ethoxylate   | 20                      | Nonionic     | Liquid        | 80                 | 0.01                               | 41                                | 16.0 |
| IGEPAL® CO-887                 | Nonylphenol Ethoxylate   | 30                      | Nonionic     | Liquid        | 70                 | 0.02                               | 45                                | 17.2 |
| IGEPAL® CO-897                 | Nonylphenol Ethoxylate   | 40                      | Nonionic     | Liquid        | 70                 | 0.04                               | 44                                | 17.8 |
| IGEPAL® CO-977                 | Nonylphenol Ethoxylate   | 50                      | Nonionic     | Paste         | 70                 | 0.05                               | 44                                | 18.2 |
| IGEPAL® CO-987                 | Nonylphenol Ethoxylate   | 70                      | Nonionic     | Paste         | 70                 | 0.05                               | 48                                | 18.6 |
| IGEPAL® DM-430                 | Dinonylphenol Ethoxylate | 7                       | Nonionic     | Liquid        | 100                | —                                  | —                                 | 9.5  |



| FDA Status |         |         |         |         |         |         |          |
|------------|---------|---------|---------|---------|---------|---------|----------|
| 175.105    | 175.300 | 175.320 | 176.170 | 176.180 | 176.200 | 176.210 | 178.3400 |

| International Inventory Status |              |                 |                  |                    |             |
|--------------------------------|--------------|-----------------|------------------|--------------------|-------------|
| US (TSCA)                      | Canada (DSL) | Europe (EINECS) | Australia (AICS) | South Korea (KECL) | Japan (MIT) |

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**FDA Listing Status Codes**

- Listed with no specific limits
- E Extraction limitation
- L Listed with limitations
- R Referenced with no limitations
- RL Referenced with limitations

**International Inventory Status Codes**

- Listed
- Not Listed

# Specialty Monomers

| Trade Name                                      | % of Solid | Tg (°C) | % Water | Inhibitor ppm | Specific gravity |
|---|------------|---------|---------|---------------|------------------|
| <b>PAM Technology</b><br>Adhesion and Much More |            |         |         |               |                  |
| SIPOMER® PAM-100                                | 100        | -18     | <1      | MEHQ/~5000    | 1.2              |
| SIPOMER® PAM-200                                | 100        | 0       | <1      | MEHQ/~5000    | 1.1              |
| SIPOMER® PAM-300                                | 100        | -40     | <1      | MEHQ/~5000    | 1.1              |
| SIPOMER® PAM-4000                               | 100        | ND      | <0.25   | MEHQ/~400     | 1.2              |
| SIPOMER® PAM 5000                               | 100        | NA      | 1.0 max | none          | 1.25             |
| <b>Polymerizable Stabilizers</b>                |            |         |         |               |                  |
| SIPOMER® COPS-1                                 | 40         | NA      | 60      | none          | 1.17             |
| SIPOMER® COPS-3*                                | 25         | NA      | 75      | none          | —                |
| SIPOMER® AES-100                                | 97         | NA      | <2.0    | none          | 1.0              |
| SIPOMER® AAE-10                                 | 99         | NA      | <0.3    | none          | —                |

\* Asia - Latin America - MEA

\* Remainder consists of acrylic acid (~20%) and higher adducts (~50%)

\*\* Sipomer® BEM contains ~25% methacrylic acid

\*\*\* Sipomer® SEM-25 contains ~20% methacrylic acid

\*\*\*\* Sipomer® WAM II-25 contains ~25% methacrylic acid

### International Inventory Status

| US (TSCA) | Canada (DSL) | Europe (EINECS) | Australia (AICS) | South Korea (KECL) | Japan (MIT) | China (JECSC) | Philippines (PICCS) | New Zealand (NZIoC) |
|-----------|--------------|-----------------|------------------|--------------------|-------------|---------------|---------------------|---------------------|
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### Performance Features and Application

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- ▶ Improved adhesion on metal, glass, and other inorganic substrates
- ▶ High mono/di alkyl phosphate ratio and low residual acid
- ▶ Improved latex stability

- ▶ Improved adhesion on metal, glass, and other inorganic substrates
- ▶ Excellent compatibility with most common organic systems
- ▶ High mono/di alkyl phosphate ratio and low residual acid
- ▶ Improved anti-corrosion properties
- ▶ Polymerizable surfactant

- ▶ Improved adhesion on metal, glass, and other inorganic substrates
- ▶ Excellent compatibility with most common organic systems
- ▶ High mono/di alkyl phosphate ratio and low residual acid
- ▶ Improved anti-corrosion properties
- ▶ Polymerizable surfactant

- ▶ Improved adhesion on metal substrate
- ▶ Improved latex stability
- ▶ Improved gloss

Improved scrub resistance when formulated into vinyl binders for high PVC paints

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Reactive co-stabilizer providing:

- ▶ Low foaming latexes
- ▶ Better latex stability at low surfactant dosage
- ▶ Coatings with improved water and bleach resistance

Reactive co-stabilizer providing scrub/washability for high PVC coating formulation

Reactive co-stabilizer providing:

- ▶ Low foaming latexes
- ▶ Better latex stability at low surfactant dosage
- ▶ Coatings with improved water and bleach resistance

Nonionic reactive co-stabilizer:

- ▶ Low foaming latexes
- ▶ Better latex stability at low surfactant dosage
- ▶ Coatings with improved water and bleach resistance

#### International Inventory Status Codes

● Listed | — Not Listed