Dow Surfactants
Reference Chart
A Broad Range of Anionic and Nonionic Products

Including...

DOWFAX® Anionic and Nonionic Surfactants

ECOSURF™ Nonionic Surfactants

TERGITOL™ Nonionic Surfactants

TRITON™ Anionic and Nonionic Surfactants

Dow surfactants include some of the most familiar anionic and nonionic surfactants in the industry, known worldwide for excellent emulsification and dispersion. They increase the cleaning and wetting properties of household cleaners as well as industrial and institutional cleaning product formulations. Dow surfactants are also used by formulators of paints, coatings, and inks for pigment wetting, film leveling, and pigment and dye stabilization.

Dow surfactants contribute desired mechanical properties and storage stability to emulsion polymerization systems, including styrene-butadiene, vinyl, acrylic, and other copolymer latex resin systems. They are also broadly used in agricultural formulations, textile processing, paper manufacturing, and oilfield operations.

An Overview of Dow Surfactants

This brochure provides an overview for Dow nonionic, anionic, and low foam surfactant products. Included are readily biodegradable* products which are labeled with our "leaf" symbol as well as non-APE based products. We invite you to review the product features, physical and performance properties, and application information detailed in the following pages.

Total Support Capabilities

The total package of value you get with Dow surfactants goes beyond our brand names. Our investments in surfactant products and technology have created one of the strongest capability platforms in the industry.

Dow is a collaborative source of solutions, willing to work closely with you to find innovative answers to your performance and other surfactant requirements.

For your convenience, we offer a comprehensive library of starting formulations and other technical information on our website at www.dow.com/surfactants. This information is frequently updated to meet the latest requirements for formulation performance and sustainability.

With Dow surfactants, you also receive...

• A wide range of available chemistries
• Extensive applications expertise
• The knowledge and resources to innovate
• Active participation in and awareness of current regulations and legislation
• A global sales, distribution and technical support network
• Global supply from world-class manufacturing facilities
• The strength and stability of Dow for confidence and peace of mind

*Dow surfactants include some of the most familiar anionic and nonionic surfactants in the industry, known worldwide for excellent emulsification and dispersion. They increase the cleaning and wetting properties of household cleaners as well as industrial and institutional cleaning product formulations. Dow surfactants are also used by formulators of paints, coatings, and inks for pigment wetting, film leveling, and pigment and dye stabilization.

Dow Biodegradable Nonionic Surfactants

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point</th>
<th>HLB</th>
<th>Mol% EO</th>
<th>CMC/θ Surface Tension</th>
<th>Foam Height</th>
<th>Pore Point</th>
<th>Form</th>
<th>APE Based</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOSURF EH-3</td>
<td>7</td>
<td>9</td>
<td>498/30</td>
<td>0/0</td>
<td>-21</td>
<td>L</td>
<td>No</td>
<td>Excellent oil-soluble emulsifier, low foam, low odor, good handling, very low aquatic toxicity, listed on CleanGredients® and approved for DRI Formulations</td>
<td>Cleaners and degreasers, textiles, agrochemicals</td>
<td></td>
</tr>
<tr>
<td>ECOSURF EH-6</td>
<td>40</td>
<td>10.8</td>
<td>914/30</td>
<td>20/0</td>
<td>5</td>
<td>L</td>
<td>No</td>
<td>Exceptional wetting and hard surface cleaning, low odor, excellent handling and formulation properties, very low aquatic toxicity, listed on CleanGredients® and approved for DRI Formulations</td>
<td>Concentrations, cleaners and detergents, paints &amp; coatings, textile processing, agrochemicals</td>
<td></td>
</tr>
<tr>
<td>ECOSURF EH-9</td>
<td>61</td>
<td>12.5</td>
<td>1086/31</td>
<td>60/0</td>
<td>18</td>
<td>L</td>
<td>No</td>
<td>Exceptional wetting and hard surface cleaning, low odor, excellent formulation properties, very low aquatic toxicity, listed on CleanGredients® and approved for DRI Formulations</td>
<td>Concentrations, cleaners and detergents, paints &amp; coatings, textile processing, agrochemicals</td>
<td></td>
</tr>
<tr>
<td>ECOSURF EH-9 (90%)</td>
<td>61</td>
<td>12.5</td>
<td>1086/31</td>
<td>60/0</td>
<td>-5</td>
<td>L</td>
<td>No</td>
<td>Exceptional wetting and hard surface cleaning, low odor, improved handling and formulation properties, very low aquatic toxicity, listed on CleanGredients® and approved for DRI Formulations</td>
<td>Concentrations, cleaners and detergents, preswep spotters, paints &amp; coatings, textile processing, agrochemicals</td>
<td></td>
</tr>
<tr>
<td>ECOSURF EH-14 (80%)</td>
<td>86</td>
<td>14</td>
<td>4018/32</td>
<td>70/10</td>
<td>6</td>
<td>L</td>
<td>No</td>
<td>Exceptional wetting and hard surface cleaning, low odor, improved handling and formulation properties, very low aquatic toxicity, listed on CleanGredients® and approved for DRI Formulations</td>
<td>Concentrations, cleaners and detergents, preswep spotters, paints &amp; coatings, textile processing, agrochemicals</td>
<td></td>
</tr>
<tr>
<td>ECOSURF EH-4D (75%)</td>
<td>&gt;100</td>
<td>18</td>
<td>845/46</td>
<td>N/A</td>
<td>3</td>
<td>L</td>
<td>No</td>
<td>Emulsion stabilizer, Electrolyte solubility, Provides Freeze/ thaw &amp; ionic stability, Good handling properties, Low odor, Readily biodegradable, Aquatic toxicity &gt; 100 mg/L</td>
<td>Emulsion polymerization, paints &amp; coatings, floor polish &amp; wax emulsions</td>
<td></td>
</tr>
</tbody>
</table>

Footnotes:

(1) Cloud point: °C, 5% active aqueous solution
(2) HLB Range: 10-15 = emulsifier, > 15 = ionic
(3) Critical micelle concentration: ppm at 25°C
(4) Surface tension: dynes/cm at 1% actives, 25°C
(5) Basis Miles foam height: min at 0.1% w/w actives, 25°C, initial 5 residence
(6) Pour point: °C
(7) Form at 25°C: L = Liquid, S = Solid
(8) APE = Alkyl phenol ethoxylate

*Readily biodegradable as defined in OECD Guidelines for the Testing of Chemicals, Section 3 (Rev. 23 March 2006)
**Dow Biodegradable Nonionic Surfactants, continued**

**TERGITOL™ 15-5 Secondary Alcohol Ethoxylates**

TERGITOL™ 15-5 nonionic surfactants are versatile, high performance Secondary Alcohol Ethoxylates (SAEs) that provide an unbeatable combination of performance and cost when used in place of Primary Alcohol Ethoxylates (PAlEs), Nonylphenol Ethoxylates (NPEs), Octylphenol Ethoxylates (OPEs), and other general purpose surfactants in a wide range of formulating applications.

- **ECOSURF™ LF Low Foam Surfactants**
- **ECOSURF™ SA Seed Oil Surfactants**
- **TERGITOL™ L-81 20 2 PRT -/36 Disp -20 L No Low temperature foam control, Fermentation, MWF, chemical intermediates**
- **TERGITOL™ L-64 62 15 PRT -/44 48/18 7 L No Higher temperature foam control,**
- **TERGITOL™ L-62 32 7 PRT -/41 45/30 -2 L No Efficient foam control agent, wetting agent**
- **TERGITOL™ L-62 38 PRT -/44 45/30 -2 L No Efficient foam control agent, wetting agent**
- **TERGITOL™ L-81 20 2 PRT -/36 48/18 7 L No Higher temperature foam control,**
- **TERGITOL™ L-101 18 1 PRT -/33 30/25 -24 L No Low temperature foam control**

**ECOSURF™ LF Surfactants** are non-APE based, low foaming readily biodegradable nonionic surfactants that provide excellent pigment wetting, improved color acceptance and outstanding formulation and handling properties.

**ECOSURF™ SA Surfactants** are based on seed oil, low odor, rapid dissolution, excellent wetting & detergency, effective emulsifier.

**TERGITOL™ L Series Surfactants** are high performance, nonionic surfactants for defoaming, wetting and emulsifying. Readily biodegradable, TERGITOL™ L Series Surfactants deliver low foam, excellent solvency, chemical stability and reliable formulation performance in a number of fermentation, food processing, metalworking and other applications.

**TERGITOL™ L Ozone/Oxide/Propylene Oxide (EO/PO) Copolymers**

**ECOSURF™ LF Low Foam Surfactants**

**TERGITOL™ L Ozone/Oxide/Propylene Oxide (EO/PO) Copolymers**

**ECOSURF™ SA Seed Oil Surfactants**

**TERGITOL™ L Series Surfactants** are high performance, nonionic surfactants for defoaming, wetting and emulsifying. Readily biodegradable, TERGITOL™ L Series Surfactants deliver low foam, excellent solvency, chemical stability and reliable formulation performance in a number of fermentation, food processing, metalworking and other applications.

**TERGITOL™ L Series Surfactants** are high performance, nonionic surfactants for defoaming, wetting and emulsifying. Readily biodegradable, TERGITOL™ L Series Surfactants deliver low foam, excellent solvency, chemical stability and reliable formulation performance in a number of fermentation, food processing, metalworking and other applications.
### DOWFAX™ Nonionic Surfactants

DOWFAX™ Nonionic Surfactants are high-performance products that feature excellent solvency, low foam characteristics, chemical stability, and a long list of other valuable performance properties. They serve as foam control agents, emulsifiers, wetting agents, and coupling agents in a wide range of applications. Cleaning products, industrial foam control agents, oil and gas production fluids, and industrial surfactants are just a few of the many uses for these versatile polyglycols.

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point°C</th>
<th>HLB®</th>
<th>Moles ED</th>
<th>CMC/ Surface Tension®</th>
<th>Foam Height®</th>
<th>Pour Point°C</th>
<th>APE Based®</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON® Alkyl Polyglycolides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRITON® BS-10</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>159/126</td>
<td>112/115</td>
<td>-5</td>
<td>L</td>
<td>No, Soluble in high alkyl solutions, good detergency and wetting properties</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-50</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>870/97</td>
<td>112/112</td>
<td>0</td>
<td>L</td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-110</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>1748/27</td>
<td>105/100</td>
<td>-15</td>
<td>L</td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-425</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>81/29</td>
<td>140/140</td>
<td>-18</td>
<td>L</td>
<td>No, Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
<tr>
<td>TRITON® CG-650</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>74/29</td>
<td>80/80</td>
<td>6</td>
<td>L</td>
<td>Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
</tbody>
</table>

### Dow Biodegradable Nonionic Surfactants, continued

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point°C</th>
<th>HLB®</th>
<th>Moles ED</th>
<th>Foam Height®</th>
<th>Pour Point°C</th>
<th>APE Based®</th>
<th>Features</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON® Alkyl Polyglycolides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRITON® BS-10</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, good detergency and wetting properties</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-50</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-110</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-425</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
<tr>
<td>TRITON® CG-650</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
</tbody>
</table>

### TRITON® Alkyl Polyglycolides

TRITON® BS and TRITON® CG specialty surfactants are non-ionic products used in household and industrial & institutional detergent formulations where high, stable foam is required or where high caustic concentrations are necessary.

### Dow Biodegradable Nonionic Surfactants

DOWFAX™ Nonionic Surfactants are biodegradable and list on CleanGredients® and approved for DfE formulations. For more information, visit the Dow Biodegradable Surfactants page on the Dow website.

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point°C</th>
<th>HLB®</th>
<th>Moles ED</th>
<th>Foam Height®</th>
<th>Pour Point°C</th>
<th>APE Based®</th>
<th>Features</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON® Alkyl Polyglycolides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRITON® BS-10</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, good detergency and wetting properties</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-50</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-110</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, low foam characteristics, good detergent and wetter, high stable foam, listed on CleanGredients® and approved for DFE formulations</td>
<td>Bottle washing, metal cleaners, highly alkaline detergents, paint strippers, aluminum brighteners, agrochemicals</td>
</tr>
<tr>
<td>TRITON® CG-425</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>No, Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
<tr>
<td>TRITON® CG-650</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>Soluble in high alkyl solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
</tbody>
</table>

### Dow Biodegradable Nonionic Surfactants

DOWFAX™ Nonionic Surfactants are high-performance products that feature excellent solvency, low foam characteristics, chemical stability, and a long list of other valuable performance properties. They serve as foam control agents, emulsifiers, wetting agents, and coupling agents in a wide range of applications. Cleaning products, industrial foam control agents, oils, and gas production fluids, and industrial surfactants are just a few of the many uses for these versatile polyglycols.
### Dow Nonionic Surfactants

#### TERTIOL™ X Ethylene Oxide/Propylene Oxide (EO/PO) Copolymers

TERTIOL™ X surfactants are versatile nonionic specialty surfactants that provide excellent stabilizer and dispersant performance for aqueous systems. They are used in conjunction with other surfactants to provide stability and freeze-thaw resistance to emulsions, dispersions, and emulsion polymer systems. They can also provide lubricity for fibers and solidification of silicone for germicidal cleaners.

**Properties**
- **Surface Tension**: 1% actives, 25°C
- **Critical Micelle Concentration (CMC)**: ppm at 25°C
- **Cloud Point**: °C, 1 wt% actives aqueous solution

**Features**
- Excellent anionic and cationic surfactants
- Low FBIL to be used with polar solvents
- Effective at high temperatures

**Applications**
- Agricultural products
- Emulsification
- Industrial cleaning and oilfield chemicals

**Surfactants**
- **TERGITOL™ NP Series**
- **TERGITOL™ X Series**

#### TERTIOL™ TMN Branched Secondary Alcohol Ether Alcohol Ether Alcohols

TERTIOL™ TMN Series surfactants are highly effective nonionic wetting agents having low aqueous dynamic and equilibrium surface profiles. They offer excellent performance in cleaners, emulsion polymerization, and paints and coatings applications.

**Features**
- Excellent oil soluble emulsifier, hydration compatibility
- Improves color appearance and prevents agglomeration of pigments
- Non-APE alternative for TRITON™ X-100
- Non-silicone based, superior wetting & leveling

**Applications**
- Paints & coatings, textile printing & fiber control
- Personal care
- Textile finishing
- Paper & textile processing, pigment & wax/resin finishes

**Surfactants**
- **TRITON™ CA**
- **TRITON™ N-57**
- **TRITON™ X-207**
- **TRITON™ NW-1000**

#### TERTIOL™ NP Nonphenol Ether Alcohols

TERTIOL™ NP surfactants cover a wide range of ethoxylate and HLB values. They are used as emulsifiers, wetting agents and dispersants in a variety of applications, including emulsion polymerization, cleaning applications, and paints and coatings.

**Features**
- Excellent oil soluble surfactant, low HLB emulsifier
- Excellent emulsifier, wetting agent, stabilizer, complexes detergent range nonionics into hydrocarbon systems
- Excellent detergent, outstanding wetting, high HLB emulsifier

**Applications**
- Cleaners & detergents
- Textile finishing
- Paints & coatings, agricultural products

**Surfactants**
- **TERGITOL™ NP Series**
- **TERGITOL™ XD Series**
- **TERGITOL™ XDLW Series**
- **TERGITOL™ XH Series**

---

**Footnotes**
1. HLB: Hydrophilic-Lipophilic Balance
2. EO: Ethylene Oxide
3. CMC: Critical Micelle Concentration
4. S: Stabilizer
5. EO: Ethylene Oxide
6. APE: Animal, Plant, or Mineral
7. PRT: Proprietary
8. MWF: Metalworking Fluids

### Dow Nonionic Surfactants, continued
Polypropylene Glycols and Random Copolymers

Polypropylene Glycols

<table>
<thead>
<tr>
<th>Product</th>
<th>Molecular Weight</th>
<th>Specific Gravity (at 25°C)</th>
<th>Average Viscosity (at 100°C)</th>
<th>Pour Point, °C</th>
<th>Refractive Index (at 25°C)</th>
<th>Density (at 25°C)</th>
<th>APE Based®</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT250</td>
<td>250</td>
<td>1.011</td>
<td>285</td>
<td>-18</td>
<td>1.459</td>
<td>9.07</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>PT700</td>
<td>700</td>
<td>1.033</td>
<td>108</td>
<td>-32</td>
<td>1.453</td>
<td>8.59</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>PT3000</td>
<td>3000</td>
<td>1.011</td>
<td>235</td>
<td>-27</td>
<td>1.451</td>
<td>8.40</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P425</td>
<td>425</td>
<td>1.007</td>
<td>33</td>
<td>-45</td>
<td>1.447</td>
<td>8.32</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P1000TB</td>
<td>1000</td>
<td>1.005</td>
<td>76</td>
<td>-25</td>
<td>1.448</td>
<td>8.38</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P1200</td>
<td>1200</td>
<td>1.003</td>
<td>91</td>
<td>-40</td>
<td>1.448</td>
<td>8.38</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P2000</td>
<td>2000</td>
<td>1.002</td>
<td>160</td>
<td>-30</td>
<td>1.449</td>
<td>8.34</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P4000</td>
<td>4000</td>
<td>1.004</td>
<td>485</td>
<td>-26</td>
<td>1.45</td>
<td>8.36</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
</tbody>
</table>

Random Copolymers

Polyglycol Copolymers are polymers of ethylene oxide and propylene oxide. Polyglycol 15-200 finds utility where a water soluble liquid with a low pour point is desired.

<table>
<thead>
<tr>
<th>Product</th>
<th>Molecular Weight</th>
<th>Specific Gravity (at 25°C)</th>
<th>Average Viscosity (at 100°C)</th>
<th>Pour Point, °C</th>
<th>Refractive Index (at 25°C)</th>
<th>Density (at 25°C)</th>
<th>APE Based®</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT250</td>
<td>250</td>
<td>1.011</td>
<td>285</td>
<td>-18</td>
<td>1.459</td>
<td>9.07</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>PT700</td>
<td>700</td>
<td>1.033</td>
<td>108</td>
<td>-32</td>
<td>1.453</td>
<td>8.59</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>PT3000</td>
<td>3000</td>
<td>1.011</td>
<td>235</td>
<td>-27</td>
<td>1.451</td>
<td>8.40</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P425</td>
<td>425</td>
<td>1.007</td>
<td>33</td>
<td>-45</td>
<td>1.447</td>
<td>8.32</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P1000TB</td>
<td>1000</td>
<td>1.005</td>
<td>76</td>
<td>-25</td>
<td>1.448</td>
<td>8.38</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P1200</td>
<td>1200</td>
<td>1.003</td>
<td>91</td>
<td>-40</td>
<td>1.448</td>
<td>8.38</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P2000</td>
<td>2000</td>
<td>1.002</td>
<td>160</td>
<td>-30</td>
<td>1.449</td>
<td>8.34</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
<tr>
<td>P4000</td>
<td>4000</td>
<td>1.004</td>
<td>485</td>
<td>-26</td>
<td>1.45</td>
<td>8.36</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low salt, non-varnishing, chemically stable</td>
<td>Foam control, chemical intermediaries, viscosity modifiers</td>
</tr>
</tbody>
</table>
## Dow Anionic Surfactants

**DOWFAK™ Alkylphenylpolyethoxylate Sulfate**
- *DOWFAK™* surfactants are an excellent choice for formulas containing acids, bleach, or caustic. They provide excellent solubility and stability in concentrated electrolytes, and they’re remarkably resistant to oxidation and thermal degradation.
- **DOWFAK 25A**
  - 45 % water
  - L amber
  - 34 35 140/130 145/145
  - Excellent stability & solubility in acidic, alkaline, bleach and other oxidizing systems. Insoluble, emulsion stabilizer, resists easy from surfaces.
- **DOWFAK 35Q**
  - 45 % water
  - L yellow/ light brown
  - 37 38 135/135 140/130
  - Excellent stability in alkaline, acid, bleach and oxidizing systems, hard water tolerant, resists wash from surfaces.
- **DOWFAK 6380**
  - 35 % water
  - L light brown
  - 44 46 120/25 140/25
  - Excellent stability, excellent solubility, stable in oxidizing systems, high level of particulate soil detergency, excellent emulsivity.
- **DOWFAK C61L**
  - 45 % water
  - L light brown
  - 94 34 145/145 145/130
  - Reduces gelation, provides coupling, excellent solubility and stability. Insoluble, hypochlorite stable, resists easy from surfaces, hydrolysis.
- **DOWFAK C10L**
  - 45 % water
  - L yellow/brown
  - 35 37 135/125 130/115
  - Low streaking and low visible residue, rapid dissolution, excellent stability.
- **DOWFAK 305/09**
  - 45 % water
  - L yellow/brown
  - 33 34 154/145 130/125
  - Emulsion stabilizer with low reactor waste, stable in acidic, alkaline and oxidizing systems.

**TRITON® GF Dictyl Dithanol Catenates**
- **TRITON®** GR Series surfactants feature excellent wetting and rewetting properties as well as excellent emulsifying and dispersing ability. These versatile surfactants are available in a range of solvent compatibilities for use in cleaning, paint and coatings, emulsion polymerization and other applications.
- **TRITON®** GR-5M
  - 60 % IPA/ water
  - L colorless
  - 26
  - NR 150/180 NR
  - Excellent wetting, emulsifying & dispersing ability.
- **TRITON®** GR-7M
  - 64 % petroleum distillate
  - L amber
  - Ins Ins Ins Ins
  - Excellent emulsifying & dispersing ability, oil soluble.

**TRITON® Phosphate Esters**
- **TRITON®** QS-55, TRITON® H-66, and TRITON® QS-44 are anionic hydrocarbons that provide solubilization for nonionic surfactants in low to highly built cleaner systems.
- **TRITON® QS-44** surfactants are also used in emulsification polymerization.
- **TRITON®** QS-44
  - 50 % water
  - L amber
  - 45 53 8/0 25/0
  - No Hydrolysis, stable in acidic and alkaline conditions. Solubilizer for surfactants into highly built systems.
- **TRITON®** QS-55
  - 50 % water
  - L yellow
  - 45 41 50/8 105/26
  - No Hydrolysis, stable in acidic and alkaline conditions, uniquely effective with low surfactants.

**TRITON® Surfactants**
- **TRITON®** sulfates and sulfonate anionic surfactants offer excellent wetting, emulsifying, dispersing and stabilizing ability. Applications include emulsion polymerization, wax emulsification, personal care and cleaners.
- **TRITON®** GS-15
  - 100 % water
  - L yellow/brown
  - 33 32 95/70 150/15
  - Excellent detergent, soluble & stable in hot alkaline solutions, uniquely effective in high soil loads.
- **TRITON®** GN-455
  - 60 % water
  - L colorless
  - 33 32 170/165 170/170
  - Excellent wetting, emulsifying and dispersing ability, hypochlorite stable.

**Dow Low Foam Surfactants**

### Dow Low Foam surfactants

**TRITON®** Low Foam surfactants include specialty products used in applications where low-to-no foam performance is required. These high performance solutions provide excellent detergentry and wetting properties, as well as caustic and acid stability.

#### Typical Physical Properties

<table>
<thead>
<tr>
<th>Active Ingredient, wt %</th>
<th>100</th>
<th>100</th>
<th>95</th>
<th>100</th>
<th>90</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cloud Point, % ethanol, °C (°F)</strong></td>
<td>28 (82)</td>
<td>25 (77)</td>
<td>31 (88)</td>
<td>32 (88)</td>
<td>17 (63)</td>
<td>30 (87)</td>
<td>--</td>
<td>21</td>
<td>40</td>
</tr>
<tr>
<td><strong>HLB (calculated)</strong></td>
<td>12.6</td>
<td>12.9</td>
<td>11.0</td>
<td>12.6</td>
<td>12.7</td>
<td>10.6</td>
<td>11.6</td>
<td>--</td>
<td>12.1</td>
</tr>
<tr>
<td><strong>Critical Micelle Concentration (CMC), ppm</strong></td>
<td>75</td>
<td>130</td>
<td>--</td>
<td>25</td>
<td>80</td>
<td>290</td>
<td>530</td>
<td>180</td>
<td>24</td>
</tr>
<tr>
<td><strong>Surface Tension (1)</strong></td>
<td>36</td>
<td>32</td>
<td>37</td>
<td>33</td>
<td>34</td>
<td>30</td>
<td>31</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td><strong>Cloud Point, 1% aqueous soln, °C (°F)</strong></td>
<td>28 (82)</td>
<td>40 (104)</td>
<td>25 (77)</td>
<td>31 (88)</td>
<td>32 (88)</td>
<td>17 (63)</td>
<td>30 (87)</td>
<td>--</td>
<td>21</td>
</tr>
<tr>
<td><strong>Surface Tension(2)</strong></td>
<td>37</td>
<td>--</td>
<td>30</td>
<td>30</td>
<td>31</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface Tension(3)</strong></td>
<td>36</td>
<td>32</td>
<td>37</td>
<td>33</td>
<td>34</td>
<td>30</td>
<td>31</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>

#### Stability on Solid Caustic

- **Fair**
- **Poor**
- **Excellent**
- **Good**
- **Poor**
- **NR**
- **Poor**
- **Poor**
- **Poor**

#### Stability in Nonoxidizing Acids

- **Good**
- **Excellent**
- **NR**
- **Poor**
- **Good**
- **NR**
- **NR**
- **Good**
- **Excellent**

#### Chlorine Stability in Dry Blended Powders

- **Good**
- **NR**
- **Fair**
- **Good**
- **NR**
- **NR**
- **NR**
- **NR**
- **NR**

#### Food Soil Defoaming

- **Poor**
- **Excellent**
- **Good**
- **Fair**
- **Good**
- **Poor**
- **Poor**
- **Poor**
- **Poor**

#### Food Oil Defoaming

- **Poor**
- **Excellent**
- **Good**
- **Fair**
- **Poor**
- **Poor**
- **Poor**
- **Poor**
- **Poor**

#### Foam Performance Minimum Water Temp for Low Foam, °C (°F)

- 38 (100)
- 43 (110)
- 29 (85)
- 35 (95)
- 38 (100)
- 16 (60)
- 38 (100)
- 43 (110)
- 27 (80)
- 43 (110)

#### Applications

- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Detergents, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Detergents, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**
- **Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield**

---

(1) Active Ingredient = 10% actives, dynes/cm
(2) Surface Tension: 1 wt% actives, 25 °C
(3) Ross-Miles foam height: 1 wt% actives, 25 °C, initial / 5 minute
(4) Actual pH = 12.5 (sodium hydroxide solution)
(5) Dow Anionic Surfactants
(6) TRITON™ Phosphate Esters
(7) TRITON™ Sulfates
(8) TRITON™ Surfactants
(9) APE = Alkyl phenol ethoxylate

---

**Notes:**
- (1) 1 wt% actives, dynes/cm
- (5) Actual pH = 12.5 (sodium hydroxide solution)
- (3) Ross-Miles foam height: 1 wt% actives, 25 °C, initial / 5 minute
- (2) Surface Tension: 1 wt% actives, 25 °C
- (4) TRITON™ Surfactants

---

**Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow**
Reference Chart

Dow Surfactants

Published June 2013

www.dowsurfactants.com

®Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow

ECOSURF™ Surfactants are marketed under the TERGITOL ™ brand in Canada and Japan.