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

Including…
DOWFAX™ Anionic Surfactants
ECOSURF™ Nonionic Surfactants
TERGITOL™ Nonionic Surfactants
TRITON™ Anionic and Nonionic Surfactants

Dow surfactants include some of the most familiar anionic and nonionic products 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

*Readily biodegradable as defined in OECD Guidelines for the Testing of Chemicals, Section 3 (Rev. 23 March 2006)
ECOSURF™ EH Specialty Ethoxylates

ECOSURF™ EH series nonionic surfactants are a new generation of high-performance, readily biodegradable specialty surfactants that provide performance comparable to alkylphenol ethoxylate (APE) surfactants, and better than primary alcohol ethoxylate (PAE) surfactants in many applications, including hard surface cleaning, textile processing, and any application in which excellent wetting performance is required.

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point(1)</th>
<th>HLB(2)</th>
<th>Moles EO</th>
<th>CMC(3)/ Surface Tension(3)</th>
<th>Foam Height(3)</th>
<th>Pour Point(3)</th>
<th>Form(3)</th>
<th>APE Based(3)</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOSURF EH-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Excellent oil-soluble emulsifier, low foam, low odor, good handling, very low aquatic toxicity, listed on CleanGredients® and approved for DfE Formulations</td>
<td>Cleaners and degreasers, textiles, agrochemicals</td>
</tr>
<tr>
<td>ECOSURF EH-6</td>
<td>40</td>
<td>10.8</td>
<td>PRT</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 DfE Formulations</td>
<td>Concentrates, cleaners and detergents, paints &amp; coatings, textile processing, agrochemicals</td>
</tr>
<tr>
<td>ECOSURF EH-9</td>
<td>61</td>
<td>12.5</td>
<td>PRT</td>
<td>1066/31</td>
<td>60/0</td>
<td>16</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 DfE Formulations</td>
<td>Concentrates, cleaners and detergents, paints coatings, textile processing, agrochemicals</td>
</tr>
<tr>
<td>ECOSURF EH-9 (90%)</td>
<td>61</td>
<td>12.5</td>
<td>PRT</td>
<td>1066/31</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 DfE Formulations</td>
<td>Concentrates, cleaners and detergents, prewash spotters, paints &amp; coatings, textile processing, agrochemicals</td>
</tr>
<tr>
<td>ECOSURF EH-14 (90%)</td>
<td>86</td>
<td>14</td>
<td>PRT</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 DfE Formulations</td>
<td>Concentrates, cleaners and detergents, prewash spotters, paints &amp; coatings, textile processing, agrochemicals</td>
</tr>
</tbody>
</table>

Footnotes:
(1) Cloud point: °C, 1 wt% actives aqueous solution
(2) HLB Range: <10 w/o emulsifier, >10 o/w emulsifier 10-15 good wetting, 12-15 detergents
(3) Critical micelle concentration: ppm at 25°C
(4) Surface tension: dynes/cm at 1% actives, 25°C
(5) Ross-Miles foam height: mm at 0.1 wt% actives, 25°C, initial / 5 minute
(6) Pour point: °C
(7) Form at 25°C: L = Liquid, S = Solid
(8) APE = Alkyl phenol ethoxylate

Ins = Insoluble
Disp = Dispersible
PRT = Proprietary
Readily biodegradable as defined in OECD Guidelines for the Testing of Chemicals, Section 3 (Rev. 23 March 2006)

Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
### TERGITOL™ 15-S Secondary Alcohol Ethoxylates

TERGITOL™ 15-S 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 (PAEs), Nonylphenol Ethoxylates (NPEs), Octylphenol Ethoxylates (OPEs), and other general purpose surfactants in a wide range of formulating applications.

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point</th>
<th>HLB</th>
<th>Moles EO</th>
<th>CMC*/Surface Tension</th>
<th>Foam Height</th>
<th>Pour Point</th>
<th>Form</th>
<th>APE-based</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TERGITOL 15-S-3</td>
<td>Insoluble</td>
<td>8.0</td>
<td>3</td>
<td>Ins</td>
<td>Ins</td>
<td>-46</td>
<td>L</td>
<td>No</td>
<td>Excellent hydrocarbon compatibility and detergency</td>
<td>Defoamers, textile, pulp/paper, prewash spot removers, agrochemicals, dry cleaners</td>
</tr>
<tr>
<td>TERGITOL 15-S-5</td>
<td>Dispersible</td>
<td>10.5</td>
<td>5</td>
<td>Disp</td>
<td>Disp</td>
<td>-25</td>
<td>L</td>
<td>No</td>
<td>Excellent emulsifier and detergent, enhances paint associative thickener efficiency, aids in rinseability of solvent-based systems</td>
<td>Paints and coatings, cleaners, prewash spot removers, agrochemicals, dry cleaners, textile, oilfield</td>
</tr>
<tr>
<td>TERGITOL 15-S-7</td>
<td>37</td>
<td>12.1</td>
<td>7</td>
<td>38/30</td>
<td>117/28</td>
<td>1</td>
<td>L</td>
<td>No</td>
<td>Excellent wetting and rinseability, excellent formulation and handling properties</td>
<td>Paints and coatings, cleaners, prewash spot removers, agrochemicals, textile, pulp/paper, oilfield</td>
</tr>
<tr>
<td>TERGITOL 15-S-9</td>
<td>60</td>
<td>13.3</td>
<td>9</td>
<td>52/30</td>
<td>124/43</td>
<td>9</td>
<td>L</td>
<td>No</td>
<td>Excellent detergent, rapid dissolution and good rinseability, low odor, excellent formulation and handling properties</td>
<td>High performance cleaners, paints and coatings, agrochemicals, textile, pulp/paper, oilfield</td>
</tr>
<tr>
<td>TERGITOL 15-S-12</td>
<td>89</td>
<td>14.5</td>
<td>12</td>
<td>104/33</td>
<td>124/43</td>
<td>22</td>
<td>S</td>
<td>No</td>
<td>Excellent detergent and dispersant, good handling properties, higher temperature wetting, listed on CleanGredients® and approved for DfE formulations</td>
<td>Agrochemicals, dispersions, high temperature systems</td>
</tr>
<tr>
<td>TERGITOL 15-S-12 (90%)</td>
<td>89</td>
<td>14.5</td>
<td>12</td>
<td>107/34</td>
<td>130/28</td>
<td>-8</td>
<td>L</td>
<td>No</td>
<td>Excellent detergent and dispersant, good handling properties, higher temperature wetting, listed on CleanGredients® and approved for DfE formulations</td>
<td>Agrochemicals, dispersions, high temperature systems</td>
</tr>
<tr>
<td>TERGITOL 15-S-15</td>
<td>&gt;100</td>
<td>15.4</td>
<td>15</td>
<td>162/36</td>
<td>126/24</td>
<td>29</td>
<td>S</td>
<td>No</td>
<td>High HLB emulsifier and dispersant, provides freeze thaw and ionic stability, listed on CleanGredients® and approved for DfE formulations</td>
<td>Emulsion polymerization, paper and textile processing, solid cleaners</td>
</tr>
<tr>
<td>TERGITOL 15-S-20</td>
<td>&gt;100</td>
<td>16.3</td>
<td>20</td>
<td>315/38</td>
<td>112/42</td>
<td>35</td>
<td>S</td>
<td>No</td>
<td>Excellent emulsion stabilizer with low reactor residue, provides freeze thaw and ionic stability, good handling properties</td>
<td>Emulsion polymerization, paper and textile processing, solid cleaners</td>
</tr>
<tr>
<td>TERGITOL 15-S-20 (80%)</td>
<td>&gt;100</td>
<td>16.3</td>
<td>20</td>
<td>315/38</td>
<td>112/42</td>
<td>6</td>
<td>L</td>
<td>No</td>
<td>Excellent emulsion stabilizer with low reactor residue, provides freeze thaw and ionic stability, good handling properties</td>
<td>Emulsion polymerization, paints and coatings, floor polish and wax emulsions</td>
</tr>
<tr>
<td>TERGITOL 15-S-30</td>
<td>&gt;100</td>
<td>17.4</td>
<td>31</td>
<td>558/43</td>
<td>115/30</td>
<td>39</td>
<td>S</td>
<td>No</td>
<td>Excellent emulsion stabilizer with low reactor residue, provides freeze thaw and ionic stability</td>
<td>Emulsion polymerization, paints and coatings, floor polish and wax emulsions</td>
</tr>
<tr>
<td>TERGITOL 15-S-40</td>
<td>&gt;100</td>
<td>18.0</td>
<td>41</td>
<td>783/44</td>
<td>110/24</td>
<td>43</td>
<td>S</td>
<td>No</td>
<td>Emulsion stabilizer, provides freeze thaw and ionic stability, good handling properties</td>
<td>Emulsion polymerization, paint and coatings, floor polish and wax emulsions</td>
</tr>
<tr>
<td>TERGITOL 15-S-40 (70%)</td>
<td>&gt;100</td>
<td>18.0</td>
<td>41</td>
<td>1314/45</td>
<td>103/28</td>
<td>5</td>
<td>L</td>
<td>No</td>
<td>Emulsion stabilizer, provides freeze thaw and ionic stability, good handling properties</td>
<td>Emulsion polymerization, paint and coatings, floor polish and wax emulsions</td>
</tr>
</tbody>
</table>
ECOSURF™ SA Seed Oil Surfactants

ECOSURF™ SA series nonionic surfactants are a new generation of patent pending, biodegradable nonionic surfactants based on seed oil based materials. These surfactants offer outstanding performance across a wide range of parameters including wetting and detergency, as well as excellent formulation and handling properties. They are ideal candidates for paints & coatings, household and industrial & institutional cleaners, and textiles.

| ECOSURF SA-4 | Disp | 7.5 | PRT | Disp | -8 | L | No | Based on seed oil, low odor, no gel range, excellent wetting, oil soluble emulsifier | Concentrates, cleaners and detergents, prewash spotters, dry cleaning, paints & coatings, textile processing |
| ECOSURF SA-7 | 37 | 9.7 | PRT | 17/29 | 100/20 | 3 | L | No | Based on seed oil, low odor, no gel range, rapid dissolution, excellent wetting & detergency, effective emulsifier | Concentrates, cleaners and detergents, prewash spotters, paints & coatings, textile processing, agrochemicals |
| ECOSURF SA-9 | 57 | 11.1 | PRT | 22/29 | 100/20 | 4 | L | No | Based on seed oil, low odor, no gel range, rapid dissolution, excellent wetting & detergency, effective emulsifier | Concentrates, cleaners and detergents, prewash spotters, paints & coatings, textile processing |
| ECOSURF SA-15 | >100 | 13.5 | PRT | 153/34 | 130/25 | 27 | S | No | Based on seed oil, low odor, rapid dissolution, excellent wetting & detergency especially at higher temperatures, effective emulsifier. | Concentrates, higher temperature cleaners and detergents, paints & coatings, textile processing |

TERGITOL™ L Ethylene Oxide/Propylene Oxide (EO/PO) Copolymers

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-61 | 24 | 3 | PRT | -/40 | 0/0 | -32 | L | No | Efficient foam control agent, wetting agent | Foam control for fermentation, food washing, water treatment, MWF, machine dishwash, food & dairy process cleaning, agrochemicals |
| TERGITOL L-62 | 32 | 7 | PRT | -/41 | 45/30 | -2 | L | No | Efficient foam control agent, wetting agent | Foam control for fermentation, MWF, machine dishwash, food & dairy process cleaning, paints & coatings, agrochemicals |
| TERGITOL L-64 | 62 | 15 | PRT | -/44 | 48/18 | 7 | L | No | Higher temperature foam control, good detergency | Fermentation, food processing, adhesives, paper processing, MWF, sanitizing solutions |
| TERGITOL L-81 | 20 | 2 | PRT | -/36 | Disp | -20 | L | No | Low temperature foam control | Fermentation, MWF, chemical intermediates |
| TERGITOL L-101 | 18 | 1 | PRT | -/33 | 30/25 | -24 | L | No | Low temperature foam control | Fermentation processes, MWF |

Footnotes:
(1) Cloud point: °C, 1 wt% actives aqueous solution
(2) HLB Range: <10 w/o emulsifier, >10 o/w emulsifier 10-15 good wetting, 12-15 detergents
(3) Critical micelle concentration: ppm at 25°C
(4) Surface tension: dynes/cm at 1% actives, 25°C
(5) Ross-Miles foam height: mm at 0.1 wt% actives, 25°C, initial / 5 minute
(6) Pour point: °C
(7) Form at 25°C: L = Liquid, S = Solid
(8) APE = Alkyl phenol ethoxylate

MWF = Metalworking fluids
Ins = Insoluble
Disp = Dispersible
PRT = Proprietary
R = Readily Biodegradable
### Dow Biodegradable Nonionic Surfactants, continued

<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point(1)</th>
<th>HLB(2)</th>
<th>Moles EO</th>
<th>CMC(3)/Surface Tension(4)</th>
<th>Foam Height(5)</th>
<th>Pour Point(6)</th>
<th>Form(7)</th>
<th>APE Based(8)</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON™ Alkyl Polyglucosides</td>
<td></td>
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<tr>
<td>TRITON™ BG-10</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>1591/28</td>
<td>112/115</td>
<td>-5</td>
<td>L</td>
<td>No</td>
<td>Soluble in highly alkaline solutions, good detergency and wetting properties, mild, 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-50</td>
<td>&gt;100</td>
<td>-</td>
<td>0</td>
<td>870/27</td>
<td>112/112</td>
<td>0</td>
<td>L</td>
<td>No</td>
<td>Soluble in highly alkaline solutions, mild, 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</td>
<td>Soluble in highly alkaline solutions, mild, low skin drying effects, 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>61/29</td>
<td>140/140</td>
<td>-18</td>
<td>L</td>
<td>No</td>
<td>Soluble in highly alkaline solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
<tr>
<td>TRITON™ CG-600</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>No</td>
<td>Soluble in highly alkaline 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>67/29</td>
<td>110/110</td>
<td>-18</td>
<td>L</td>
<td>No</td>
<td>Soluble in highly alkaline solutions, mild, good detergent and wetter, high stable foam</td>
<td>Glass cleaners, highly alkaline detergents</td>
</tr>
</tbody>
</table>

**Footnotes:**

1. Cloud point: °C, 1 wt% actives aqueous solution
2. HLB Range: <10 w/o emulsifier, >10 o/w emulsifier 10-15 good wetting, 12-15 detergents
3. Critical micelle concentration: ppm at 25°C
4. Surface tension: dynes/cm at 1% actives, 25°C
5. Ross-Miles foam height: mm at 0.1 wt% actives, 25°C, initial / 5 minute
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 Nonionic Surfactants

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

TERGITOL™ 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 solubilization of iodine for germicidal cleaners.

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</tr>
</thead>
<tbody>
<tr>
<td>TERGITOL XD</td>
<td>74</td>
<td>-</td>
<td>PRT</td>
<td>-/38</td>
<td>60/25</td>
<td>34</td>
<td>S</td>
<td>No</td>
<td>Excellent steric and freeze thaw stabilizer, effective pigment and carbon black dispersant</td>
<td>Agrochemicals, paints and coatings dispersions, iodophors, emulsion polymerization</td>
</tr>
<tr>
<td>TERGITOL XDLW</td>
<td>74</td>
<td>-</td>
<td>PRT</td>
<td>-/32</td>
<td>100/45</td>
<td>15</td>
<td>L</td>
<td>No</td>
<td>Excellent steric and freeze thaw stabilizer, effective pigment and carbon black dispersant</td>
<td>Agrochemicals, paints and coatings dispersions, iodophors, emulsion polymerization</td>
</tr>
<tr>
<td>TERGITOL XH</td>
<td>95</td>
<td>-</td>
<td>PRT</td>
<td>-/41</td>
<td>80/40</td>
<td>40</td>
<td>S</td>
<td>No</td>
<td>Provides lubricity, effective steric and freeze thaw stabilizer, solubilizes iodine</td>
<td>Fiber lubricants, emulsion polymerization, iodophors. agrochemicals</td>
</tr>
<tr>
<td>TERGITOL XJ</td>
<td>49</td>
<td>-</td>
<td>PRT</td>
<td>-/36</td>
<td>53/13</td>
<td>27</td>
<td>S</td>
<td>No</td>
<td>Excellent emulsifier for aromatic and chlorinated solvents, steric and freeze thaw stabilizer</td>
<td>Emulsion and dispersion systems, emulsion polymerization, agrochemicals</td>
</tr>
</tbody>
</table>

### TERGITOL™ TMN Branched Secondary Alcohol Ethoxylates

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

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>TERGITOL TMN-3</td>
<td>Ins</td>
<td>8.1</td>
<td>3</td>
<td>Ins</td>
<td>Ins</td>
<td>-49</td>
<td>L</td>
<td>No</td>
<td>Excellent oil soluble emulsifier, hydrocarbon compatibility</td>
</tr>
<tr>
<td>TERGITOL TMN-6 (90%)</td>
<td>36</td>
<td>13.1</td>
<td>8</td>
<td>800/27</td>
<td>130/22</td>
<td>ε-40</td>
<td>L</td>
<td>No</td>
<td>Excellent wetting agent, penetrant &amp; dispersant, silicone emulsifier, narrow gel range</td>
</tr>
<tr>
<td>TERGITOL TMN-100X (90%)</td>
<td>65</td>
<td>14.0</td>
<td>9</td>
<td>830/27</td>
<td>150/24</td>
<td>-6</td>
<td>L</td>
<td>Non-APE alternative for TRITON X-100, excellent wetting, penetrant &amp; dispersant, superior emulsification</td>
<td>Paints &amp; coatings, paper &amp; textile processing pigment &amp; wax / resin dispersants, cleaners</td>
</tr>
<tr>
<td>TERGITOL TMN-10 (90%)</td>
<td>76</td>
<td>14.4</td>
<td>11</td>
<td>1313/30</td>
<td>118/28</td>
<td>-19</td>
<td>L</td>
<td>No</td>
<td>High temperature penetrant &amp; dispersant, high HLB emulsifier, narrow gel range</td>
</tr>
</tbody>
</table>

### TRITON™ Specialty Alkoxylates

These TRITON™ surfactants are used as emulsifiers, wetting agents or detergents in applications including paints and coatings, agrochemicals, and paper and textile processing, emulsification systems, household and industrial cleaning and oilfield chemicals.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON CA</td>
<td>Disp</td>
<td>10-12</td>
<td>PRT</td>
<td>-/32</td>
<td>10/0</td>
<td>-20</td>
<td>L</td>
<td>Yes</td>
<td>Improves color acceptance and prevents agglomeration of pigments, oil-in-water emulsifier</td>
</tr>
<tr>
<td>TRITON N-57</td>
<td>Disp</td>
<td>10.0</td>
<td>5</td>
<td>-/31</td>
<td>18/12</td>
<td>-28</td>
<td>L</td>
<td>Yes</td>
<td>Emulsifier, enhance associative thickener efficiency, improves colorant acceptance</td>
</tr>
<tr>
<td>TRITON X-207</td>
<td>Disp</td>
<td>10.7</td>
<td>PRT</td>
<td>-/32</td>
<td>20/16</td>
<td>-14</td>
<td>L</td>
<td>Yes</td>
<td>Emulsifier for refined paraffinic and white oils, forms stable brine-in-oil emulsions</td>
</tr>
<tr>
<td>TRITON HW 1000</td>
<td>Ins</td>
<td>10.8</td>
<td>PRT</td>
<td>Ins</td>
<td>Ins</td>
<td>-18</td>
<td>L</td>
<td>No</td>
<td>Non-silicone-based, superior wetting &amp; leveling agent, low foaming, wets various substrates, improves gloss and smoothness of coating films, penetrant &amp; rapid pigment dispersant, narrow gel range</td>
</tr>
</tbody>
</table>

### Footnotes

1. Cloud point: °C. 1 wt% actives aqueous solution
2. HLB Range: <10 w/o emulsifier, >10 o/w
3. Critical micelle concentration: ppm at 25°C
4. Surface tension: dynes/cm at 1% actives, 25°C
5. Ross-Miles foam height: mm at 0.1 wt% actives, 25°C, initial / 5 minute
6. Pour point: °C
7. Form at 25°C: L = Liquid, S = Solid
8. APE = Alkyl phenol ethoxylate

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<table>
<thead>
<tr>
<th>Product</th>
<th>Cloud Point</th>
<th>HLB</th>
<th>Moles</th>
<th>CMC/ Surface Tension</th>
<th>Foam Height</th>
<th>Pour Point</th>
<th>Form</th>
<th>APE Based</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEGITOL NP-4</td>
<td>Ins</td>
<td>8.9</td>
<td>4</td>
<td>Ins</td>
<td>Ins</td>
<td>-28</td>
<td>L</td>
<td>Yes</td>
<td>Excellent oil-soluble surfactant, low HLB emulsifier</td>
<td>Cleaners &amp; degreasers, dry cleaning, dispersant for petroleum oil</td>
</tr>
<tr>
<td>TEGITOL NP-6</td>
<td>Ins</td>
<td>10.9</td>
<td>6</td>
<td>Ins</td>
<td>Ins</td>
<td>-26</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsifier, wetting agent, stabilizer, couples detergent range nonionics into hydrocarbon systems</td>
<td>Cleaners &amp; degreasers, dry cleaning, adhesives, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-7</td>
<td>20</td>
<td>12.0</td>
<td>7</td>
<td>39/32</td>
<td>20/19</td>
<td>-19</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; degreasers, paper &amp; textile processing, prewash spotters, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-8</td>
<td>43</td>
<td>12.6</td>
<td>8</td>
<td>61/32</td>
<td>103/95</td>
<td>-6</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting, good rinseability</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-9</td>
<td>54</td>
<td>12.9</td>
<td>9</td>
<td>60/32</td>
<td>105/90</td>
<td>-1</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting, good rinseability</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, laundry, paints &amp; coatings, dust control, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-9.5</td>
<td>59</td>
<td>13.1</td>
<td>9.5</td>
<td>62/32</td>
<td>115/102</td>
<td>7</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-10</td>
<td>63</td>
<td>13.2</td>
<td>10</td>
<td>55/33</td>
<td>115/110</td>
<td>6</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-11</td>
<td>72</td>
<td>13.5</td>
<td>11</td>
<td>71/34</td>
<td>112/92</td>
<td>11</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-12</td>
<td>78</td>
<td>13.8</td>
<td>12</td>
<td>85/35</td>
<td>117/115</td>
<td>13</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-13</td>
<td>82</td>
<td>13.9</td>
<td>13</td>
<td>66/35</td>
<td>118/97</td>
<td>14</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-15</td>
<td>&gt;100</td>
<td>15.0</td>
<td>15</td>
<td>90/41</td>
<td>128/95</td>
<td>25</td>
<td>S</td>
<td>Yes</td>
<td>Excellent detergency, outstanding wetting, suitable for higher temperatures</td>
<td>Cleaners &amp; detergents, paper &amp; textile processing, paints &amp; coatings, agrochemicals, MWF</td>
</tr>
<tr>
<td>TEGITOL NP-30</td>
<td>&gt;100</td>
<td>17.1</td>
<td>30</td>
<td>157/46</td>
<td>125/77</td>
<td>37</td>
<td>S</td>
<td>Yes</td>
<td>Highly water soluble emulsifier &amp; stabilizer, effective at high temperatures</td>
<td>Wetting agents &amp; stabilizers, emulsifiers &amp; dispersants, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-30 (70%)</td>
<td>&gt;100</td>
<td>17.1</td>
<td>30</td>
<td>160/42</td>
<td>125/77</td>
<td>-8</td>
<td>L</td>
<td>Yes</td>
<td>Highly water soluble emulsifier &amp; stabilizer, effective at high temperatures</td>
<td>Wetting agents &amp; stabilizers, emulsifiers &amp; dispersants, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-40</td>
<td>&gt;100</td>
<td>17.8</td>
<td>40</td>
<td>230/50</td>
<td>123/115</td>
<td>48</td>
<td>S</td>
<td>Yes</td>
<td>Effective at high temperatures, highly water-soluble emulsifier &amp; stabilizer, wetting</td>
<td>Paper &amp; textile processing, paints &amp; coatings, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-40 (70%)</td>
<td>&gt;100</td>
<td>17.8</td>
<td>40</td>
<td>232/50</td>
<td>123/115</td>
<td>2</td>
<td>L</td>
<td>Yes</td>
<td>Effective at high temperatures, highly water-soluble emulsifier &amp; stabilizer</td>
<td>Paper &amp; textile processing, paints &amp; coatings, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-50</td>
<td>&gt;100</td>
<td>18.2</td>
<td>50</td>
<td>256/53</td>
<td>115/110</td>
<td>2</td>
<td>S/L</td>
<td>Yes</td>
<td>Effective at high temperatures, highly water-soluble emulsifier &amp; stabilizer</td>
<td>Paper &amp; textile processing, paints &amp; coatings, agrochemicals</td>
</tr>
<tr>
<td>TEGITOL NP-70</td>
<td>&gt;100</td>
<td>18.7</td>
<td>70</td>
<td>287/51</td>
<td>105/100</td>
<td>15</td>
<td>S</td>
<td>Yes</td>
<td>Effective at high temperatures, highly water-soluble emulsifier &amp; stabilizer</td>
<td>Paper &amp; textile processing, paints &amp; coatings, agrochemicals</td>
</tr>
</tbody>
</table>
### TRITON™ RW Amine Ethoxylates

TRITON™ RW Series surfactants offer unique reversible surfactancy, allowing for easier separation of emulsified oils from aqueous waste streams. They are especially well-suited for industrial laundry applications and deliver exceptional metal cleaning performance.

<table>
<thead>
<tr>
<th>TRITON RW-20</th>
<th>Ins</th>
<th>6-8</th>
<th>2</th>
<th>Ins</th>
<th>Ins</th>
<th>&lt; -6</th>
<th>L</th>
<th>No</th>
<th>Oil soluble emulsifier, pH reversible</th>
<th>Degreasers, MWF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON RW-50</td>
<td>Disp</td>
<td>12-14</td>
<td>5</td>
<td>260/29</td>
<td>pH=12</td>
<td>&gt;/51 pH=2</td>
<td>28/2</td>
<td>pH=12</td>
<td>&lt; -6</td>
<td>L</td>
</tr>
<tr>
<td>TRITON RW-150</td>
<td>&gt;100</td>
<td>&gt;16</td>
<td>15</td>
<td>860/30</td>
<td>pH=12</td>
<td>&gt;/54 pH=2</td>
<td>135/15</td>
<td>pH=12</td>
<td>11</td>
<td>L</td>
</tr>
</tbody>
</table>

### TRITON™ X Octylphenol Ethoxylates

TRITON™ X Series surfactants are versatile nonionic specialty surfactants that cover a wide range of ethoxylation 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.

<table>
<thead>
<tr>
<th>TRITON X-15</th>
<th>Ins</th>
<th>4.9</th>
<th>1.5</th>
<th>Ins</th>
<th>Ins</th>
<th>3</th>
<th>L</th>
<th>Yes</th>
<th>Oil soluble emulsifier, solubilizer</th>
<th>Defoamers, dye solubilizer, chemical intermediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRITON X-35</td>
<td>Ins</td>
<td>7.8</td>
<td>3</td>
<td>Ins</td>
<td>Ins</td>
<td>-9</td>
<td>L</td>
<td>Yes</td>
<td>Excellent compatibility with aliphatic or aromatic hydrocarbons and polar organic solvents</td>
<td>Defoamers, pulp/paper, textile, dry cleaning, MWF, chemical intermediate</td>
</tr>
<tr>
<td>TRITON X-45</td>
<td>Disp</td>
<td>9.8</td>
<td>4.5</td>
<td>136/29</td>
<td>23/9</td>
<td>-24</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsifier with good wetting, aids in rinseability of solvent-based systems</td>
<td>Defoamers, cleaners, MWF, agrochemicals, paints and coatings, textile, pulp/paper, oilfield</td>
</tr>
<tr>
<td>TRITON X-114</td>
<td>25</td>
<td>12.3</td>
<td>7.5</td>
<td>120/31</td>
<td>55/40</td>
<td>-24</td>
<td>L</td>
<td>Yes</td>
<td>Excellent wetting and detergency</td>
<td>Cleaners, paints and coatings, pulp/paper, textile, agrochemicals, MWF, oilfield</td>
</tr>
<tr>
<td>TRITON X-100</td>
<td>66</td>
<td>13.4</td>
<td>9.5</td>
<td>189/33</td>
<td>128/107</td>
<td>1</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergent, dispersant, and emulsifier for oil-in-water systems</td>
<td>Household and industrial cleaners, paints and coatings pulp/paper, textile, agrochemicals, MWF, oilfield</td>
</tr>
<tr>
<td>TRITON X-102</td>
<td>88</td>
<td>14.4</td>
<td>12</td>
<td>267/36</td>
<td>124/75</td>
<td>13</td>
<td>L</td>
<td>Yes</td>
<td>Excellent detergent and dispersant</td>
<td>Dispersions, high temperature systems</td>
</tr>
<tr>
<td>TRITON X-165 (50%)</td>
<td>&gt;100</td>
<td>15.5</td>
<td>16</td>
<td>not run/40</td>
<td>115/45</td>
<td>2</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsion stabilizer and dispersant</td>
<td>Paints and coatings, dispersions</td>
</tr>
<tr>
<td>TRITON X-165 (70%)</td>
<td>&gt;100</td>
<td>15.5</td>
<td>16</td>
<td>570/39</td>
<td>124/68</td>
<td>22</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsion stabilizer and dispersant</td>
<td>Paints and coatings, dispersions</td>
</tr>
<tr>
<td>TRITON X-305 (70%)</td>
<td>&gt;100</td>
<td>17.3</td>
<td>30</td>
<td>1916/49</td>
<td>103/25</td>
<td>-7</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsion stabilizer, provides freeze thaw and ionic stability</td>
<td>Emulsion polymerization, paints and coatings, floor polish, wax emulsions</td>
</tr>
<tr>
<td>TRITON X-405 (70%)</td>
<td>&gt;100</td>
<td>17.6</td>
<td>35</td>
<td>2442/52</td>
<td>93/22</td>
<td>-6</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsion stabilizer, provides freeze thaw and ionic stability</td>
<td>Emulsion polymerization, paints and coatings, floor polish, and wax emulsions</td>
</tr>
<tr>
<td>TRITON X-705 (70%)</td>
<td>&gt;100</td>
<td>18.4</td>
<td>55</td>
<td>3585/44</td>
<td>80/55</td>
<td>2</td>
<td>L</td>
<td>Yes</td>
<td>Excellent emulsion stabilizer</td>
<td>Emulsion polymerization</td>
</tr>
</tbody>
</table>

**Footnotes:**

1. Cloud point: °C, 1 wt% actives aqueous solution
2. HLB Range: <10 w/o emulsifier, >10 o/w emulsifier 10-15 good wetting, 12-15 detergents
3. Critical micelle concentration: ppm at 25°C
4. Surface tension: dynes/cm at 1% actives, 25°C
5. Ross-Miles foam height: mm at 0.1 wt% actives, 25°C, initial / 5 minutes
6. Pour point: °C
7. Form at 25°C: L = Liquid, S = Solid
8. APE = Alkyl phenol ethoxylate

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## Polypropylene Glycols and Random Copolymers

<table>
<thead>
<tr>
<th>Product</th>
<th>Molecular Weight</th>
<th>Specific Gravity&lt;sup&gt;(1)&lt;/sup&gt; @25/25°C</th>
<th>Average Viscosity&lt;sup&gt;(2)&lt;/sup&gt;, cSt @40°C</th>
<th>Pour Point, °C</th>
<th>Refractive Index&lt;sup&gt;(3)&lt;/sup&gt; @25°C</th>
<th>Density lb/gal @25°C</th>
<th>APE Based&lt;sup&gt;(4)&lt;/sup&gt;</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT250</td>
<td>250</td>
<td>1.091</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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, 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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, viscosity modifiers</td>
</tr>
<tr>
<td>PT3000</td>
<td>3000</td>
<td>1.01</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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, 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>8.39</td>
<td>No</td>
<td>Compatibility, solvency, low toxicity, low odor, natural lubricity, low ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, viscosity modifiers</td>
</tr>
<tr>
<td>P1000TB</td>
<td>1000</td>
<td>1.005</td>
<td>78</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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, 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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, 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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, viscosity modifiers</td>
</tr>
<tr>
<td>P4000</td>
<td>4000</td>
<td>1.004</td>
<td>455</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 ash, non-varnishing, chemically stable</td>
<td>Synthetic lubricants, foam control, chemical intermediates, 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.

| 15-200 | 2400           | 1.069                                    | 180                                        | 51             | 1.460                           | 8.90                 | No            | Compatibility, solvency, low toxicity, low odor, natural lubricity, low ash, non-varnishing, chemically stable | Foam control, chemical intermediates, viscosity modifiers |

---

**Footnotes:**

1. ASTM D 892
2. ASTM D 445/446
3. ASTM D 1218
4. APE = Alkyl phenol ethoxylate

Polypropylene Glycols are polymers of propylene oxide. They are clear, viscous liquids with low pour points. Viscosity increases and water solubility decreases with increasing molecular weight. DOW P-series polyglycols are linear polymers containing two terminal hydroxyl groups. DOW PT-series polyglycols are glyceryl ether polymers containing three terminal hydroxyl groups.

**Features:**
- Compatibility
- Solvency
- Low toxicity
- Low odor
- Natural lubricity
- Low ash
- Non-varnishing
- Chemically stable

**Applications:**
- Synthetic lubricants
- Foam control
- Chemical intermediates
- Viscosity modifiers
Dow Anionic Surfactants

<table>
<thead>
<tr>
<th>Product</th>
<th>Actives</th>
<th>Diluent</th>
<th>Form(1)</th>
<th>Surface Tension(2)</th>
<th>Foam(3)</th>
<th>APE Based(5)</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWFAX™ Alkylphenoxypolyethoxyethers Disulfonate Salts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOWFAX 2A1</td>
<td>45</td>
<td>water</td>
<td>L amber</td>
<td>34 35</td>
<td>140/130 145/145</td>
<td>No</td>
<td>Excellent solubility &amp; stability in acidic, alkaline, bleach and other oxidizing systems, dispersant, emulsion stabilizer, rinses easily from surfaces</td>
<td>Cleaners, textile, pulp/paper, agrochemicals, oilfield, emulsion polymerization, fragrance solubilization</td>
</tr>
<tr>
<td>DOWFAX 3B2</td>
<td>45</td>
<td>water</td>
<td>L yellow/lt brown</td>
<td>37 38</td>
<td>135/135 140/120</td>
<td>No</td>
<td>Excellent stability in alkaline, acid, bleach and oxidizing systems, hard water tolerant, rinses easily from surfaces</td>
<td>Textile and pulp/paper processing, agrochemicals, oilfield, cleaners</td>
</tr>
<tr>
<td>DOWFAX B390</td>
<td>35</td>
<td>water</td>
<td>L light brown</td>
<td>44 46</td>
<td>120/25 140/25</td>
<td>No</td>
<td>Emulsion stabilizer, excellent solubility, stable in oxidizing systems, high level of particulate soil detergency, excellent rinseability</td>
<td>Emulsion polymerization, cleaners &amp; detergents, oil field chemicals, textile, pulp &amp; paper</td>
</tr>
<tr>
<td>DOWFAX C6L</td>
<td>45</td>
<td>water</td>
<td>L light brown</td>
<td>34 34</td>
<td>145/140 145/130</td>
<td>No</td>
<td>Reduces gelation, provides coupling, excellent solubility and stability, hypochlorite stable, low visible residue, rinses easily from surfaces, hydrotrope</td>
<td>Cleaners and detergents, oilfield chemicals</td>
</tr>
<tr>
<td>DOWFAX C10L</td>
<td>45</td>
<td>water</td>
<td>L yellow/brown</td>
<td>35 37</td>
<td>135/125 130/115</td>
<td>No</td>
<td>Low streaking and low visible residue, rapid dissolution, excellent stability</td>
<td>Glass &amp; all-purpose cleaners and other detergents, agrochemicals</td>
</tr>
<tr>
<td>DOWFAX 30599</td>
<td>45</td>
<td>water</td>
<td>L yellow/brown</td>
<td>33 34</td>
<td>154/145 130/125</td>
<td>No</td>
<td>Emulsion stabilizer with low reactor waste, stable in acidic, alkaline and oxidizing systems</td>
<td>Emulsion polymerization</td>
</tr>
</tbody>
</table>

TRITON™ GR Diocyl Sulfosuccinates

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(6)/ water | L colorless | 26 | NR(7) | 190/180 | NR | No | Excellent wetting, emulsifying & dispersing ability | Paints & coatings, paper & textile, agrochemicals, cleaners, oilfield |
| TRITON® GR-7M | 64 | petroleum distillate(8) | L amber | Ins | Ins | Ins | Ins | No | Excellent emulsifying & dispersing ability, oil soluble | Dry cleaning, paints & coatings, agrochemicals, oilfield chemicals |

TRITON™ Phosphate Esters

TRITON™-H-55, TRITON™-H-66, and TRITON™ QS-44 are anionic hydrotropes that provide solubilization for nonionic surfactants in low to highly built cleaner systems. TRITON™ QS-44 and TRITON™ XOS-20 surfactants are also used in emulsification polymerization.

| TRITON™ H-55 | 50 | water | L amber | 45 | 53 | 8/0 | 25/0 | No | Hydro trope, stable in acidic and alkaline conditions | Solubilizer for surfactants into highly built detergents |
| TRITON™ H-66 | 50 | water | L yellow | 45 | 41 | 50/8 | 105/25 | No | Hydro trope, stable in acidic and alkaline conditions, uniquely effective with low foam surfactants | Solubilizer for surfactants into built detergents and other formulated systems |
| TRITON™ QS-44 | 80 | water | L amber | 38 | 39 | 130/65 | 150/140 | Yes | Hydro trope with surface activity, good solubility in alkali, stable on solid caustic, hypochlorite stable | Cleaners, emulsion polymerization, agrochemicals, solubilizer for low built detergents |
| TRITON™ XOS-20 | 70 | water | L amber | 46 | 46 | 145/130 | 130/120 | Yes | High HLB emulsifier and stabilizer | Emulsion polymerization |

TRITON™ Sulfates

TRITON™ sulfate and sulfonate anionic surfactants offer excellent wetting, emulsifying, dispersing and stabilizing ability. Applications include emulsion polymerization, wax emulsification, textile processing, personal care and cleaners.

| TRITON™ QS-15 | 100 | none | L amber | 33 | 36 | 95/70 | 150/15 | No | Excellent detergent, soluble & stable in hot alkaline solutions, uniquely effective in high soil loads | Highly alkaline metal cleaners, bottle washing, zinc plating brightener, gas well cleaning |
| TRITON™ XN-45S | 60 | ethanol/ water | L amber | 33 | 32 | 170/165 | 170/170 | Yes | Excellent wetting, emulsifying & dispersing ability, hypochlorite stable | Emulsion polymerization, wax emulsification, cleaners |

Footnotes:
(1) Form at 25°C: L = Liquid, S = Solid
(2) Surface Tension: dynes/cm at 1 wt% actives, 25 °C
(3) Ross-Miles foam height: mm at 1 wt% actives, 25 °C, initial / 5 minute
(4) Actual pH = 7 (distilled water)
(5) Actual pH = 12.5 (sodium hydroxide solution)
(6) IPA = Isopropanol
(7) NR = Not recommended; can hydrolyze under some alkaline conditions
(8) Blend of ethanol, naphtha, propylene glycol and naphthalene
(9) APE = Alkyl phenol ethoxylate

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

### Typical Physical Properties

<table>
<thead>
<tr>
<th></th>
<th>TRITON™ CF-10/CF-10 (90%)</th>
<th>TRITON™ CF-21</th>
<th>TRITON™ CF-32</th>
<th>TRITON™ CF-76</th>
<th>TRITON™ CF-87</th>
<th>TRITON™ DF-12</th>
<th>TRITON™ DF-16</th>
<th>TRITON™ DF-20</th>
<th>TERGITOL™ MinFoam 2X</th>
<th>TERGITOL™ MinFoam 1X</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active Ingredient, wt %</strong></td>
<td>100</td>
<td>100</td>
<td>95</td>
<td>100</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</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 (90)</td>
<td>17 (63)</td>
<td>16 (63)</td>
<td>11,6</td>
<td>--</td>
<td>21</td>
</tr>
<tr>
<td><strong>HLB (calculated)</strong></td>
<td>12.6</td>
<td>12.9</td>
<td>11</td>
<td>12.6</td>
<td>12.7</td>
<td>10.6</td>
<td>11.6</td>
<td>--</td>
<td>12.1</td>
<td>12.6</td>
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<tr>
<td><strong>Surface Tension</strong></td>
<td>36</td>
<td>32</td>
<td>37</td>
<td>33</td>
<td>34</td>
<td>34</td>
<td>30</td>
<td>30</td>
<td>31</td>
<td>30</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>
<td>34</td>
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<tr>
<td><strong>– Viscosity at 25 °C (77 °F), cp</strong></td>
<td>250</td>
<td>250</td>
<td>550</td>
<td>295</td>
<td>240</td>
<td>60</td>
<td>35</td>
<td>630</td>
<td>56</td>
<td>61</td>
</tr>
<tr>
<td><strong>– Pour Point, ASTM D 97, °C (°F)</strong></td>
<td>15 (59) / -1 (30)</td>
<td>27 (-16)</td>
<td>2 (35)</td>
<td>7 (45)</td>
<td>0 (32)</td>
<td>16 (61)</td>
<td>-6 (22)</td>
<td>-25 (-13)</td>
<td>&lt; -40 (&lt; -40)</td>
<td>-34 (-20)</td>
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<tr>
<td><strong>APE-Based</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</table>

### Performance Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Fair</th>
<th>Poor</th>
<th>Poor</th>
<th>Excellent</th>
<th>Good</th>
<th>Good</th>
<th>Poor</th>
<th>NR(2)</th>
<th>Poor</th>
<th>Poor</th>
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</thead>
<tbody>
<tr>
<td><strong>Stability on Solid Caustic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stability in Nonoxidizing Acids</strong></td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>NR</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>NR</td>
<td>Excellent</td>
<td>Excellent</td>
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<tr>
<td><strong>Chlorine Stability in Dry-Blended Powders</strong>(4)</td>
<td>Good</td>
<td>NR</td>
<td>Fair</td>
<td>Good</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td><strong>Food Soil Defoaming</strong></td>
<td>Fair</td>
<td>Poor</td>
<td>Excellent</td>
<td>Good</td>
<td>Fair</td>
<td>Good</td>
<td>Poor</td>
<td>--</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>Soap Soil Defoaming</strong></td>
<td>Fair</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
<td>Fair</td>
<td>Poor</td>
<td>Fair</td>
<td>--</td>
<td>Fair</td>
<td>Poor</td>
</tr>
<tr>
<td><strong>Foaming Performance Minimum Water Temperature for Low Foam, °C (°F)</strong></td>
<td>38 (100)</td>
<td>43 (110)</td>
<td>29 (85)</td>
<td>35 (95)</td>
<td>38 (100)</td>
<td>16 (60)</td>
<td>38 (100)</td>
<td>43 (110)</td>
<td>27 (80)</td>
<td>43 (110)</td>
</tr>
</tbody>
</table>

### Applications

<table>
<thead>
<tr>
<th></th>
<th>Food &amp; Dairy Cleaners</th>
<th>Ion Exchange Resin Cleaners</th>
<th>Machine Dishwash</th>
<th>Metal Cleaners</th>
<th>Pigment Dispersions</th>
<th>Pulp &amp; Paper</th>
<th>Rinse Aids</th>
<th>Textile Processing</th>
<th>Wetting Agent</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

### Footnotes:

1. 1 wt% actives, dynes/cm
2. NR - Not Recommended
3. Excellent stability; however, moderate foaming in acid systems. Use in combination with TRITON CF-10 or another low foam surfactant for improved low foaming performance in acid systems.
4. With organic chlorine release agent

### U.S., Canada, Mexico:
Call: 1-800-447-4369

### Latin America:
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### Europe:
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Call: +31-11567-2626

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Call toll-free: +800 7776-7776*
Call: (+60) 3-7965-5392

* Toll free service not available in all countries

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