1. Multifunctional Surfactants : Wettng & Defoaming agents

2. High Performance Wetting Agents (Dynol series)

3. Defoamers & Deaerators (수계 소포제)

4. Grinding Aids for Stabilizing (수/유계 분산조제)

5. Dispersants (수/유계 안료분산제)

1. Multifunctional Surfactants : Wettng & Defoaming agents

**1) Surfynol 104 grade**

**▶구조 :**



* 상온에서는 백색 왁스성상을 지니고, 용제로 희석하여 사용가능.

**▶특징 :**

① Acetylene 삼중결합과 중앙에 위치한 친수기(OH기)에 의한 표면장력 저하에 따른 Wetting성 부여

② 삼중결합을 중심으로 양쪽에 Branch화된 methyl그룹(소수성)에 의한 기포억제 효과

③ Cloud Point가 없으며, 넓은 범위의 PH(PH 3~12)에서 안정함.

④ Aliphatic solvent를 제외한 대부분의 solvent에 soluble함.

 **▶용제에 따른 제품 분류**



**▶적용분야 :**

① 수계도료(자동차, DIY목공, 건축용, 플라스틱용)및 코팅(종이, 나무, 금속 등)

② 수계인쇄잉크(Flexo, Gravure, inkjet ink, OPV, Fountain Solution)

③ 감압접착제(Pressure Sensitive Adhesive)

④ 농약약재

⑤ 염료(분산염료, Azo Dye)

⑥ 금속가공유, 금속세정제, 가정용세정제, 반도체 세정제

⑦ Concrete admixture, 시멘트 Mortar

**2) Surfynol 400 grade**

**▶구조 :** Surfynol 104에 ethylene oxide 가 결합된 구조

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**▶특징**

 ①첨가된 ethylene oxide 는 hydrophilic 성질을 증가시킴. 즉, 소포성을 향상시킴.

②EO mole수에 따라서 low-foaming, nonfoaming 또는 defoaming wetting agent로 다양하게 작용한다.

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**3) Surfynol 2502 surfactant**

: Surfynol 104에 EO(Ethylene Oxide)와 PO(Propylene Oxide)를 부가한 제품으로서, Surfynol 440과 465 중간 물성을 띈다.



**3) Surfynol AD-01 surfactant**

**:** Surfynol 104의 액체성상으로, Zero VOC, APE-Free타입의 친환경형 수계 계면활성제

Surfynol 104과 유사한 물성을 보이며, low DST와 빠른 소포력을 갖는다.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **EST (0.1 wt%)** | **DST (0.1 wt%)** | **VOC (%)** | **HLB** | **ACITIVITY (%)** |
| **EnviroGem® AD-01** | 35.2 | 36.4 | 0 | 4 | 100 |

2. High Performance Wetting Agents (Dynol series)

**1) Super wetting agent & Coalescing surfactant : Dynol 360**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **EST****(정적표면장력)** | **DST****(동적표면장력)** | **VOC\*** | **HLB** | **Activity %** |
| **Dynol 360** | 28.0 | 35.0 | 2.7/0 | 3~4 | 100 |

\* Wt % VOC (U.S. EPA Method 24) : 0
VOC (European Solvent and Paint Directives) : 0 ▶ 특징 :

1) 실리콘계/ 불소계 계면활성제를 능가하는 낮은 정적/동적 표면장력 형성

2) 뛰어난 기포제어 능력

3) Plastic과 같이 낮은 에너지 표면을 갖는 기재에서 우수한 습윤효과

4) Fountain Solution에서 소포제 역할

5) Coalescing surfactant로서, MFFT(최소도막형성온도)를 낮추는 효과를 가짐.

=> 소량 첨가하여 coalescing solvent의 사용량을 50% 이상 감소

6) 수계에서 우수한 상용성

**2) Non Siloxane Super wetting agent : Dynol 604/607/800/810**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **EST\*(정적표면장력)** | **DST\*(동적표면장력)** | **VOC(%)** | **IONIC NATURE** |
| **Dynol 604**  | 25.8 | 28.4 | < 1.5 | NONIONIC |
| **Dynol 607** | 26.0 | 27.0 | < 1.45 | NONIONIC |
| **★Dynol 800** | 26 | 32 | 0 | NONIONIC |
| **★Dynol 810** | 26 | 32 | 0 | NONIONIC |

\* at 0.1wt % in water(mN/m)

★: 신제품

▶ 특징:

1) 비 실리콘계. 비 불소계

2) EST 와 DST 를 현저하게 낮춤.

3) 뛰어난 flowing성과 wetting성.

4) 저기포성 / 뛰어난 소포력

5) 환경친화적 – VOCs, APEs, HAPs FREE

6) 100% active

7) 혼합하기 쉽고, 상용성 좋음

▶ 적용분야 **:** 다양한 범위의 수계 시스템에 권장됨.

• Graphic Arts

– Printing Inks, Overprint varnishes, Fountain solution

• Coatings

– Automotive OEM and refinish, OEM and DIY wood coatings, Metal coatings,

Leather coating, Plastic coatings.

• Adhesives

**3) Siloxane Super wetting agent : Dynol 960/980**

3. Defoamers & Deaerators (수계 소포제)

**1) Molecular Defoamers**

: wetting defoamer라고도 불리며, wetting성과 defoaming성을 동시에 갖는다.

수계 시스템에 상용성이 좋아, 기포를 안정화하는 surfactant 사이에 위치하여 표면장력 차이를 발생시키고, foam lamella

층을 약화시켜 기포를 제거한다.

|  |  |
| --- | --- |
| **Grade** | **Application** |
| SURFYNOL® 104 grades SURFYNOL® AD01  | 비이온성 wetting agent and molecular defoamer. | Waterborne Inks, Coatings. Adhesive |
| SURFYNOL® DF-110C/D/L | 비이온성 organic molecular defoamer ▶ 주요기능 : microfoam 제거, long-lasting foam control, defect-free foam control, and good dynamic wetting | Printing ink, Concrete system, Fountain Solution, Ceramics, Paper coating, Grouts and mortars |
| SURFYNOL® MD-20 | 비이온성 organic defoaming and wetting agent. |

|  |
| --- |
| Coatings - Automotive, Wood, Metal, Architectural Graphic Arts - Printing inks, Fountain solutionsAdhesives, Oil&gas processing, 반도체 세정제 등.  |

 |

**2) Organic Oil Defoamers**

|  |  |
| --- | --- |
| **Grade** | **Application** |
| SURFYNOL® DF-70  | Waterborne Inks, Coatings. Adhesive |
| SURFYNOL® DF-75 | Printing ink, Concrete system, Fountain Solution, Ceramics, Paper coating, Grouts and mortars |
| SURFYNOL® DF-220  | Coatings - Automotive, Wood, Metal, Architectural Graphic Arts - Printing inks, Fountain solutionsAdhesives, Semi-conductor cleaner |
| AIRASE 4500  | Waterborne Inks, Overprint varnishes, Adhesives, Coatings, Architectural paints. |

**3) Siloxane Defoamers**

|  |
| --- |
| **Grade Application**  |
| SURFYNOL® DF-58 | Coating (Pigment Grinding and Dispersion) |
| SURFYNOL® DF-62 | Printing inks, Industrial Maintenance Coating, Wood coating, Adhesive, Paper coating, Latex dipping |
| SURFYNOL® DF-66 | Inks, Coating, Light duty industrial maintenance, Pigment dispersions |
| SURFYNOL® DF-695SURFYNOL® DF-178 | Graphic arts (Pigment Grinding and Dispersion, Let down)Polyurethane dispersion, Polyurethane/acrylic hybrid, Two –component epoxy Formulations, Pigmented coatings, Flexographic new ink |

**★New Siloxane Defoamer Line : Airase Defoamers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A5100, A5200 | A5300, A5400 | A5500, A5600  | A5700  |
| Performance with Increasing PVC | Excellent | Very good | Good  | Poor  |
| High Shear stability  | Excellent | Very good | Good  | Poor  |
| End uses(적용분야) | Colorants, High concentratedPigment millbases | Primers, Inks, Semi-gloss paints  | Gloss paints,Wood clear coats | High gloss paintAuto OEM,Plastic coating  |

**★ New Siloxane Deaerators : Airase 8070**

**▶특징**

① 계 안에 존재하는 작은 사이즈의 기포(microfoam)을 제거하는 소포제

② 점도가 크거나, airless spray와 같이 약한 shear가 가해지는 조건에서 microfoam 제거에 용이

③ 수계 coating에서 발생하는 핀홀, solvent popping 문제해결

④ 수계 및 무용제계에서 사용가능하며, wood coating, metal,plastic, concrete coating에 추천.

4. Grinding Aids for Stabilizing (수/유계 분산조제)

|  |  |  |  |
| --- | --- | --- | --- |
| Grade | HLB | Activity(in water) | Description |
| CARBOWET® GA211 | 8 - 11 | 83% | 1. A nonionic pigment grind aid and wetting2. Provides low-foam pigment and substrate wetting 3. Improve the milling process and pigment color |
| SURFYNOL® TG | 83% | 1. A nonionic pigment grind aid and wetting agent2. Improved pigment wetting 3. Greater color development4. Reduced pigment “cut-in” time5. Low foam6. Reduced water sensitivity  |
| CARBOWET® GA100 |  10~11 |  | 1. Milling efficiency improvement for faster and greater color development. 2. Low foam with dynamic pigment wetting 3. 계의 점도, 내수성, 광택, 건조시간 등에 영향을 주지 않음4. solvent free, APEs free.  |
| CARBOWET® GA210 | ~13 | 88% | 1. 적용분야: 유/무기 안료분산, 인쇄용잉크, 건축용 코팅, 점,접착제, 농약 등.  |
| CARBOWET® GA221 | 11 - 15 | 70% | 1. Nonionic grind aid for pigment wetting2. Improved color development 3. Control the mill base foam 4. Low viscosity  |
| SURFYNOL® GA | 70% | 1. Nonionic pigment grind aids2. Low foam |
| SURFYNOL® CT121 | 70% | 1. Nonionic pigment grind aids |
| SURFYNOL® CT136 | 11 - 20 | 52% | 1. Anionic/nonionic pigment dispersant and wetting2. Grind aid for High HLB organic & inorganic pigment 3. 형광 Pigment 분산에 유용 |
| SURFYNOL® CT131 | 52% | 1. Anionic / nonionic pigment wetting & dispersing |
| SURFYNOL® CT231 | 52% | 1. Nonionic pigment grind aids 2. Control mill base foam3. Low viscosity at high pigment loadings |
| SURFYNOL® CT324 | 13 - 20 | 46% | 1. Anionic / nonionic grind aids for organic/ inorganic pigments2. Pigment wetting and dispersing3. Low foam4. High pigment solids at optimal working viscosities |
| SURFYNOL® CT171 | 38% | 1. Anionic / nonionic pigment grind aid2. Long-term dispersion and finished ink viscosity stability 3. Viscosity reduction for higher pigment loadings4. Good foam control 5. Both resin and resin-free dispersions |
| SURFYNOL® CT141 |  | 1. Anionic / nonionic pigment dispersant 2. Useful with high HLB pigments such as carbon black 3. Compatible with acrylic resins and polymers used in printing inks and coatings. 4. Viscosity control in a finished ink |

5. Dispersants (수/유계 안료분산제) – ZETASPERSE

**1) Resin-free system Dispersant**

|  |  |  |
| --- | --- | --- |
|  | Activity | Reference (Usage) |
| Zetasperse 1200 | 45% active in water | Iron oxide (PY42,PR101,PBK11), Titanium oxide (PW6), 기타 무기안료용 분산제High pigment loading시 양호한 분산안정성을 보임 |
| Zetasperse 2300 | 95% active in water | Cost-effective for Organics / Inorganics pigments |
| Zetasperse 2500 | 40% active in water | Metal salt red (lithol rubine - PR57:1)Red lakes (PR57:x, PR48:x, PR49:x, others) |
| Zetasperse 3100 | 40% active in water | Carbon black(all types)Inorganics(PW6, PY42, PR101, and others) |
| Zetasperse 3400 | 29% active in water | Quinacridones(PV19, PR122, and others),Perylenes(PR179, PR123, and others)Dioxazine(PV23, PV37, and others)Metal-azo complex(PR257, PY150, others) |
| ★Zetasperse 3600 | 52% active in water | Surfynol CT-131 CT-136, CT-231 대응 수계안료분산제.Resin-free. All organic and carbon black pigments |
| Zetasperse 3700 | 40% active in water | DPP(PR254, PR264, PO73, and others)Azo(PY74, PR170, PR120, PO5 and others)Dioxazine(PV23, PV37, and others)Phthalocyanine(PG7, PG36, PB15:x, others) |

**2) Resin-containing system Dispersant**

|  |  |  |
| --- | --- | --- |
| Zetasperse 170 |  | Nonionic wetting agent & dispersing stabilizing surfactantCarbon black, Titanium oxide pigment dispersion에 분산안정성을 향상.  |
| Zetasperse 179 |  | Nonionic, High HLB surfactant. Organic/Inorganic , carbon black dispersion에 분산안정제로 사용 |
| Zetasperse 182 |  |
| Zetasperse 2500 | 40% active in water | Metal salt red (lithol rubine - PR57:1)Red lakes (PR57:x, PR48:x, PR49:x, others) |
| ★Zetasperse 3600 | 52% active in water | Surfynol CT-131 CT-136, CT-231 대응 수계안료분산제.Resin-free. All organic and carbon black pigments |