The Disparlon trade name is applied to a series of functional additives used in paint, ink, adhesive and sealant markets worldwide. Major product types include, thixotropes, dispersants and surface control agents. Originally designed for solvent systems, the Disparlon line has expanded in recent years to include high performance additives used in aqueous, powder and UV systems.

Disparlon additives are manufactured by Kusumoto Chemicals Ltd. of Tokyo, Japan. Through a technology partnership spanning over three decades, King Industries, Inc. serves as exclusive sales, technical service and marketing arm in North and South America.

**DISPARLON® Thixotropes**

**Introduction**

Disparlon thixotropes offer today’s formulators a wide choice of unique products for conventional, high solids and aqueous coatings, as well as specialty additives for inks, adhesives, gel-coats, sealants and caulks. Their primary advantages over other types of thixotropes (organo-clay, castor wax or fumed silica) are:

- Superior shear thinning
- Non-seeding
- Maximum anti-sagging/anti-settling
- Excellent stability on aging
- Superior performance in high gloss systems

Disparlon anti-sag and anti-settling agents can be characterized into two functional types:

**NON-PIGMENT DEPENDENT** - These types of thixotropes, which include polyamide powders and pastes function by forming a three dimensional network. Since these thixotropes are non-associative by nature, they do not require the presence of pigments or fillers to function. These thixotropes can be used in pigmented or clear systems.

**PIGMENT DEPENDENT** - These products are dependent on the type and level of pigment in the formulation, since they adsorb onto pigment surfaces to provide thickening efficiency.

Also included in the pigment dependent type are “Hybrids”, polyamide waxes that are coated with pigment dependent polyethylene waxes. These “Hybrids” offer excellent pigment suspension plus sag control.

**Types Of Thixotropes**

**NON-PIGMENT DEPENDENT TYPE**
Magnification of Disparlon 6900-20X under an electron microscope, illustrative of polyamide based thixotropes.

**PIGMENT DEPENDENT TYPE**
Magnification of Disparlon 4200-10 under an electron microscope showing oxidized polyolefin particles that will absorb on the surface of pigments and other thixotropes.

**“HYBRID” PIGMENT DEPENDENT**
Magnification of Disparlon NS-30 under an electron microscope showing polyamide coated with oxidized polyolefin.

DISPARLON® is a registered trademark of Kusumoto Chemicals Ltd., Tokyo, Japan.
Disparlon Powder Polyamide Thixotropes

Powder thixotropes (100% active) require heat and/or hydrogen bonding to activate. By heating these thixotropes to the appropriate temperature in the formulation using good agitation, the polyamide will swell and disperse (activate), and provide very efficient thickening.

Disparlon Powder Polyamide Thixotropes

After activating the polyamide, it is generally best to mix slowly during the first 20°C of cool down. The slow mixing during cool down will give the system the most uniform and reproducible rheology.

Please note, these materials will activate at lower temperatures than shown in the chart when in the presence of alcohols or amines, due to increased hydrogen bonding.

Powder Thixotropes Selection Chart

The polyamide powder thixotropes need to be activated (swelled and dispersed) in the system. Add the powder to the pigment grind portion of the formulation. While grinding the pigments, allow the temperature of the grind to rise to the temperatures shown in the selection chart above. Once at the “activation temperature” continue to grind for 15 minutes to get full activation of the polyamide.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>Composition</th>
<th>Volatile</th>
<th>Solids % Form</th>
<th>Additive Level By Total Weight</th>
<th>Attributes/Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPARLON 6100*</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 3.0%</td>
<td>Sag/Slump control. Lowest activation temperature. Designed specifically for MMA, adhesives and sealants.</td>
</tr>
<tr>
<td>DISPARLON 6200*</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 3.0%</td>
<td>Sag/Slump control. Low activation temperature. Designed specifically for adhesives and sealants.</td>
</tr>
<tr>
<td>DISPARLON 6300</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 2.0%</td>
<td>Ideal for use in formulations where a low activation temperature is needed such as 100% solids epoxy coatings and adhesives.</td>
</tr>
<tr>
<td>DISPARLON 6500</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 2.0%</td>
<td>Sag control. Most versatile. General purpose coatings and sealants.</td>
</tr>
<tr>
<td>DISPARLON 6600</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 2.0%</td>
<td>Sag control with improved recoatability for coatings, such as epoxy primers.</td>
</tr>
<tr>
<td>DISPARLON 6650</td>
<td>Polyamide</td>
<td>–</td>
<td>100% Powder</td>
<td>0.5 - 2.0%</td>
<td>Cost effective sag control with improved recoatability for coatings, such as epoxy primers.</td>
</tr>
<tr>
<td>DISPARLON 6700</td>
<td>Polyamide</td>
<td>-</td>
<td>100% Powder</td>
<td>0.5 - 2.0%</td>
<td>Sag control in heavy-duty paints. Particularly effective in 100% solids epoxies and epoxy coatings containing polar solvents.</td>
</tr>
</tbody>
</table>

* DISPARLON 6100 and 6200 are not available in the EU.
Disparlon Preactivated Polyamide Thixotropes

The preactivated polyamide thixotropes are ready to use. They do not require heat for activation, and can be added directly to the formulation. These materials can be used in clear as well as pigmented systems, and offer good anti-sag and anti-settling properties. The preactivated polyamides are commonly used in coatings such as aerosol paints, clear coats, architectural stains, auto refinish, industrial and maintenance coatings. They can also be used to orient metallic pigments and flattening pigments in oil modified urethanes.

### Disparlon Pre-activated Polyamide Thixotropes Selection Chart

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>Composition</th>
<th>Volatile</th>
<th>Solids % Form</th>
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</tr>
</thead>
<tbody>
<tr>
<td>DISPARLON A603-20X</td>
<td>Pre-activated Polyamide Wax</td>
<td>Xylene</td>
<td>20% Paste</td>
<td>0.5 - 5.0%</td>
<td>Moisture cure urethane systems</td>
</tr>
<tr>
<td>DISPARLON A650-20X</td>
<td>Pre-activated Polyamide Wax</td>
<td>Xylene Alcohol</td>
<td>20% Paste</td>
<td>0.5 - 5.0%</td>
<td>Primers and industrial maintenance coatings. Best efficiency in thick films.</td>
</tr>
<tr>
<td>DISPARLON A670-20M</td>
<td>Pre-activated Polyamide Wax</td>
<td>Mineral Spirits Alcohol</td>
<td>20% Paste</td>
<td>0.5 - 5.0%</td>
<td>DIY and industrial stains for good anti-settling of pigments. DIY varnishes for suspension/spacing of flattening pigments.</td>
</tr>
<tr>
<td>DISPARLON A671-EZ</td>
<td>Pre-activated Polyamide Wax</td>
<td>Mineral Spirits Alcohol</td>
<td>10% Paste</td>
<td>0.5 - 5.0%</td>
<td>Easier to use version of A670-20M</td>
</tr>
<tr>
<td>DISPARLON 6900-20X</td>
<td>Pre-activated Polyamide Wax</td>
<td>Xylene Alcohol</td>
<td>20% Paste</td>
<td>0.5 - 1.5% anti-settling 1.0 - 5.0% anti-sagging</td>
<td>General purpose. Best gloss in thin films &amp; clears or with metallic and pearlescent pigments.</td>
</tr>
<tr>
<td>DISPARLON F-9030</td>
<td>Pre-activated Polyamide Wax</td>
<td>Benzyl Alcohol</td>
<td>30% Paste</td>
<td>0.4-4.0%</td>
<td>100% solids epoxy systems and epoxy floor paints.</td>
</tr>
<tr>
<td>DISPARLON BB-102</td>
<td>Pre-activated Polyamide Wax</td>
<td>Butyl Acetate Alcohol</td>
<td>10% Paste</td>
<td>0.5 - 5.0%</td>
<td>Pourable paste. Post addable, HAPS free for best overall appearance and easiest incorporation.</td>
</tr>
<tr>
<td>DISPARLON PFA-231</td>
<td>Pre-activated Polyamide Paste</td>
<td>Hydrocarbons, Ethanol/IPA</td>
<td>20% Paste</td>
<td>0.5 - 5.0%</td>
<td>Haps-free version of 6900-20X.</td>
</tr>
<tr>
<td>DISPARLON PFA-240</td>
<td>Pre-activated Polyamide Wax</td>
<td>PCBTF</td>
<td>20% Paste</td>
<td>0.5 - 5.0%</td>
<td>0 VOC version of 6900-20X.</td>
</tr>
</tbody>
</table>

**Preactivated Thixotropes Incorporation**

The preactivated pastes are best added to the end of the grind and dispersed with good agitation before the letdown step. It is also recommended to incorporate the pastes by making a master batch. This method involves pre-dispersing the paste in a resin/solvent medium (4 parts resin/1 part solvent/1 part Disparlon). It is important to avoid air entrapment. Please mix with a vortex only to the shaft. Please refer to individual technical data sheets for more information. Disparlon A671-EZ and BB-102 can be post added.
**Disparlon Pigment Dependent Thixotropes**

This type of thixotrope imparts rheology by setting up a network structure with pigments, fillers, and even particle swelling thixotropes. These thixotropes are designed for pigmented systems only and help control flood/float, prevent settling and provide good sag resistance properties.

### Pigment Dependent Thixotropes Selection

**Oxidized Polyolefin**<br>**Anti-settling Agent**

- **DISPARLON 4200-20**<br>Use in epoxies, acrylics and urethanes

- **DISPARLON 4200-10**<br>Use in epoxies, acrylics and urethanes<br>Liquid: can be post-added

### Performance Comparison

**Additive Type:**
- A: Blank
- B: EVA Copolymer Wax (10% Xylene)
- C: DISPARLON 4200-10
- D: DISPARLON 6900-20X
- E: DISPARLON 6900-20X/4200-10 (NS-5500)
- F: Organo Clay (1)
- G: Organo Clay (2)
- H: Organo Clay (3)
- I: Fumed Silica

**Formulation:**
Acrylic melamine metallic base coat. 2 weeks after adjusting viscosity to 15 sec., #4 FORD Cup

### Hybrid Thixotropes Polyamide/Polyolefin**<br>Anti-settling and Anti-sagging

- **DISPARLON NS-30**<br>Maintenance coatings, zinc rich primers, and 2K epoxies (amide side)

- **DISPARLON NS-5500**<br>Metallic flip/flop improvement<br>Excellent pigment suspension

- **DISPARLON F-9050**<br>Solvent free<br>Excellent pigment suspension

### Pigment Dependent Thixotropes Incorporation

For best results these thixotropes should be added to the grind portion of the formulation and attain a temperature of 50°C.

<table>
<thead>
<tr>
<th>PRODUCT</th>
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<th>Solids % Form</th>
<th>Additive Level By Total Weight</th>
<th>Attributes/Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPARLON 4200-10</td>
<td>Oxidized Polyethylene</td>
<td>Xylene</td>
<td>10% Liquid</td>
<td>1.0 - 5.0%</td>
<td>All non-aqueous pigmented systems, Anti-Settling Agent. Complies with FDA 21CFR Section 175.300 (b) (3) xii &amp; xiii (a) &amp; (b)</td>
</tr>
<tr>
<td>DISPARLON 4200-20</td>
<td>Oxidized Polyethylene</td>
<td>Xylene</td>
<td>20% Paste</td>
<td>0.3 - 1.0%</td>
<td>All non-aqueous pigmented systems Anti-Settling Agent. Complies with FDA 21CFR Section 175.300 (b) (3) xii &amp; xiii (a) &amp; (b)</td>
</tr>
<tr>
<td>DISPARLON NS-30</td>
<td>Hybrid of Oxidized Polyethylene with Polyamide</td>
<td>Xylene</td>
<td>15% Paste</td>
<td>1.0 - 5.0%</td>
<td>For polyamide side of 2K epoxy maintenance coatings. Not recommended for high gloss coatings. Anti-sag &amp; settle.</td>
</tr>
<tr>
<td>DISPARLON NS-5500</td>
<td>Hybrid of Oxidized Polyethylene with Polyamide</td>
<td>Aromatic 100 Alcohols</td>
<td>7.5% Liquid</td>
<td>2.0 - 5.0%</td>
<td>Easy to use fluid paste for improved flip/flop with metallics and orientation and anti-setting of flattening silica and inorganic pigments. Post-add.</td>
</tr>
<tr>
<td>DISPARLON F-9050</td>
<td>Hybrid of Oxidized Polyethylene with Polyamide</td>
<td>Low Volatility Diluent</td>
<td>20% Paste</td>
<td>1.0 - 5.0%</td>
<td>Solvent free anti-sag and anti-settling agent.</td>
</tr>
</tbody>
</table>

**DISPARLON 4200-10 and NS-5500 can be added to the letdown or post added.**
The DISPARLON AQ Series of anti-settling and pigment orientation agents are recommended for use in waterborne coatings, inks, varnishes and stains. They are extremely shear thinning which allows for easy application by spray, dip, brush or roller, while maintaining excellent anti-settling in the container. The AQ Series is designed to suspend dense materials such as metallic, pearlescent and iron oxide pigments, while maintaining low "in can" viscosity and good sag resistance.

**Disparlon Thixotropes for Aqueous Systems**

**Water Reducible Systems**

DISPARLON AQ-600  
Water reducible systems

DISPARLON AQ-607  
Liquid version of AQ-600

**Emulsions and Dispersions**

DISPARLON AQ-607/AQX-60  
Dispersions and emulsions  Very Efficient

DISPARLON AQ-610/AQX-61  
Emulsions and dispersions

**Disparlon AQH-800**

General purpose - Very shear thinning  Easy to use as post add

**AQ Series Performance**

Excellent Anti-Settling**

Excellent Sag Control**

Excellent Pigment Orientation

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**PRODUCT** | **Composition** | **Volatile** | **Solids %** | **Additive Level** | **Attributes/Uses**
--- | --- | --- | --- | --- | ---
DISPARLON AQ-600 | Polyamide | Water 7% Propylene Glycol  Mono Methyl Ether | 20% | Gel 1.0 - 3.0% | Water reducible systems.
DISPARLON AQ-607 | Polyamide | Water 5% Propylene Glycol | 17% | Gel 1.0 - 3.0% | Dispersions and emulsions.  Best compatibility.  Excellent efficiency.
DISPARLON AQ-610 | Polyamide | Water 4% Propylene Glycol  Mono Butyl Ether | 17% | Gel 1.0 - 3.0% | Dispersions and emulsions.
DISPARLON AQ-870 | Polyamide | Water 8% 2-ethylhexanol  N, N, trimethylthanolamine | 15% | Liquid 1.0 - 3.0% | Water reducible systems. Liquid version of AQ-600.
DISPARLON AQH-800 | Polyamide Hybrid | Water 8% Propylene Glycol  Mono Methyl Ether | 10% | Liquid 1.0 - 3.0% | General purpose anti-settle and anti-sag.  Post addable. Easiest to use. Recommended for all waterborne
DISPARLON AQX-60 | Polyamide | Water 15% | Gel 1.0 - 3.0% | Co-solvent free version of AQ-607
DISPARLON AQX-61 | Polyamide | Water 15% | Gel 1.0 - 3.0% | Co-solvent free version of AQ-610.

**AQ Series Thixotropes Incorporation**

Disparlon AQ-600, 607, 610, AQX-60, AQX-61 should be prediluted before addition:
- Mix AQ with water (4 parts water/1 part AQ), at low to medium shear for 20 minutes, and add to the batch with good mixing. Water should be preneutralized and mix without vortexing to the blade.
- Disparlon AQH-800 & AQ-870 should be post added.