Fixate™ PLUS Polymer
Novel, Acrylates Copolymer for Film-Forming, Fixative PLUS Rheology Modifying Properties
INCI Name: Polyacrylate-14

Quick Start Guide

Fixate™ PLUS polymer was designed to improve style longevity while enhancing aesthetics and sensory properties. Fixate PLUS polymer enables the creation of cost-effective, medium-to-high viscosity styling products with exceptional humidity resistance and weightless, touchable hold. For comprehensive information including starting formulation concepts with processing instructions and supplier references, visit www.lubrizol.com/personalcare.

Introduction:
Fixate PLUS polymer is a patent-pending, anionic acrylate copolymer.

This Alkali-Swelling Associative Polymer (ASAP) combines hydrophilic, semi-hydrophobic (capable of controlling associative structure) and hydrophobic components. It delivers an optimized balance of properties, such as excellent hold and solubility; clear, uniform films with good adhesion; enhanced humidity resistance; and a smooth, natural feel on hair.

The controlled association of this ASAP provides thickening efficiency, while maintaining smooth, aesthetically-pleasing gels having shear-thinning rheology.

Chemistry:
Fixate PLUS polymer is a slightly crosslinked acrylate copolymer of C1-4 alkyl(meth)acrylate, (meth)acrylic acid and a proprietary mixed hydrophobe package.

Form:
Fixate PLUS polymer is supplied as a low viscosity, milky white emulsion which contains approximately 30% total polymer solids.

Typical Properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity (mPa·s), as supplied</td>
<td>15</td>
</tr>
<tr>
<td>Total Solids (%)</td>
<td>~30</td>
</tr>
<tr>
<td>pH, as supplied</td>
<td>2.5 - 3.5</td>
</tr>
<tr>
<td>1.0% Gel** Viscosity (mPa·s)</td>
<td>7,000</td>
</tr>
<tr>
<td>1.0% Gel** Clarity (%)</td>
<td>≥89</td>
</tr>
</tbody>
</table>

1 Brookfield LV @ 60 rpm
2 Brookfield RVT @ 20 rpm
3 Brinkman 920 Colorimeter, % transmittance
** 1.0% polymer solids in water, neutralized with AMP-95® to pH 6.8 - 7.2

For further information, please visit: www.lubrizol.com/personalcare
Benefits:
- Exceptional humidity resistance
- Style support with weightless, touchable hold
- No tack or stickiness
- Easily removed, with no residue or buildup on hair
- Superior clarity and viscosity in gels
- Non-yellowing
- Excellent compatibility with Carbopol® polymers, other natural or synthetic thickeners and many commonly used styling product additives
- Efficient thickening with Carbopol copolymers
- Efficient, cost effective and easy-to-use

Applications:
- Tube Styling Gels
- High Viscosity Molding Gels
- Conditioning Styling Gels
- Smoothing and Straightening Crèmes
- Styling Putties and Pastes
- Waxes and Pomades
- Mousses and Styling Foams

Formulating Guidelines:
Recommended Use Level: 0.5 - 1.0% solids (1.7 - 3.3 wt% as supplied). Fixate PLUS polymer can provide “2-in-1” (fixative PLUS rheology modifier) performance when used at concentrations above 1.0% solids.

Recommended pH: >6.5; optimal viscosity and clarity achieved at pH 6.5 - 7.5

Neutralization: Inorganic bases and water/alcohol-soluble amines (NaOH, TEA, AMP-95®, etc.)

Rheology Modifier Compatibility: Carbopol polymers (940, 980, ETD 2020, Ultrez 21) or other natural or synthetic thickeners

Recommended Carbopol Polymer Use Level: 0.2 - 0.8 wt%, or as needed for desired viscosity.

Recommended Order of Addition:
- Add desired Carbopol polymer or thickener to the deionized water of the formulation, following recommended processing instructions.
- After hydration, and using gentle agitation, add Fixate PLUS polymer and mix well.
- Add conditioning and ancillary ingredients (such as silicones, cationics, EDTA), mixing after the addition of each.
- If desired, add appearance modifying ingredients (such as pearlizing agents), mixing after addition of each.
- Add UV stabilizer, fragrance, dyes and preservatives, mixing after each addition.
- Neutralize to desired pH. For best clarity, neutralize to pH 6.5 - 7.5.

Note: For best results, add ingredients which are sensitive to acid pH and ingredients which contain electrolytes (such as botanicals, water soluble actives, etc.) after the polymer dispersion has been neutralized.

Formulations Available:

<table>
<thead>
<tr>
<th>Formulaation Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>S-G0015</td>
<td>Long-Lasting, Weightless Hold Styling Gel</td>
</tr>
<tr>
<td>S-G0016</td>
<td>High Viscosity Molding Gel</td>
</tr>
<tr>
<td>S-G0017</td>
<td>Conditioned Control Styling Gel</td>
</tr>
<tr>
<td>S-G0027</td>
<td>Firm Control Styling Gel</td>
</tr>
<tr>
<td>S-G0028</td>
<td>High Viscosity Grooming Gel</td>
</tr>
<tr>
<td>S-G0031</td>
<td>Long-Lasting Styling Gel</td>
</tr>
<tr>
<td>S-G0033</td>
<td>Hard-Hold and Long-Lasting Styling Gel</td>
</tr>
<tr>
<td>S-G0038(EU)</td>
<td>Melting Hair Gel</td>
</tr>
<tr>
<td>S-G0039(EU)</td>
<td>Hocus Pocus Hair Gel</td>
</tr>
<tr>
<td>S-G0040(EU)</td>
<td>Marmalade Savourous Hair Gel</td>
</tr>
<tr>
<td>S-X0008</td>
<td>Fiber Putty for Pliable Styling</td>
</tr>
<tr>
<td>S-X0009</td>
<td>Humidity Resistant Smoothing and Straightening Cream</td>
</tr>
<tr>
<td>S-X0016</td>
<td>Volumizing Root Lifter</td>
</tr>
<tr>
<td>S-X0017</td>
<td>Scrunching Balm</td>
</tr>
<tr>
<td>S-X0019</td>
<td>Curling Spray Potion</td>
</tr>
</tbody>
</table>
Storage & Handling:
- Packaging: 55 gallon, 480 pound (217 kilogram) net weight plastic drums
- For best results, Fixate PLUS polymer should be filtered prior to use and transferred with low shear pumps
- To prevent "skinning" on surface of the liquid, drums should not be opened until used
- For storage tanks, agitated stainless steel storage and mixing tanks are recommended
- Shelf life: twelve (12) months
- Storage temperature: Ambient room temperature conditions, 15-30°C (60-86°F); away from direct heat and light
- DO NOT FREEZE*

*Fixate PLUS polymer is not freeze thaw stable as supplied. The polymer in finished applications, however, is freeze-thaw stable.

Toxicology:
The toxicity profile of Fixate PLUS polymer, as supplied, indicates that it has a low potential for causing irritation or sensitization. These data indicate that it is suited for personal care applications where there is contact with skin or where there is a potential for contact with the eyes. A complete summary of toxicological effects is available upon request.

Microbiology:
Fixate PLUS polymer, as supplied, contains no preservative. The as-supplied polymer has passed a Mixed Inoculum Preservative Efficacy Test (Challenge Test). Formulators are advised to conduct normal microbial testing of formulated products.

Regulatory Status:
Fixate PLUS polymer is exempt from TSCA when used in cosmetic applications.

Fixate PLUS polymer qualifies as a polymer exempt from EINECS or ELINCS registration; all monomers used in Fixate PLUS polymer are listed on EINECS. Fixate PLUS polymer complies with the European Union Cosmetics Directive 76/768/EEC, 7th Amendment.

Registration is pending in Canada and Australia, and a Japanese INCI name will be provided once proposed INCI name has been finalized.

Genetically Modified Organisms (GMO):
Fixate PLUS polymer is prepared solely from synthetic material and does not contain, and is not derived from, any material of plant or animal origin.

Other General Information:
- Fixate PLUS polymer technology is patent-pending.
- The Harmonized Tariff System (Schedule B) number for Fixate PLUS polymer is 3906.90.6000.

Other Literature Available:
- Product Summary Brochure (TDS-317)
- Temporary Product Specifications
- Test Procedures
- Material Safety Data Sheet (MSDS)
- Toxicological Summary (TOX-076)
- Microbial Summary (TOX-079)
- Formulations FP-0001 through FP-0004