

CARBOPOL® AQUA SF-1 POLYMER — The Premier Rheology M

INTRODUCTION

Turn concept into reality with a contemporary liquid rheology modifier and open the door to a new level of freedom in surfactant-based formulating. Carbopol® Aqua SF-1 polymer is an alkali swellable, lightly crosslinked acrylic emulsion polymer. It is supplied as a 30% active polymer in water.

INCI Designation: Acrylates Copolymer

PROPERTIES	
Appearance	Milky White Liquid
Viscosity (as supplied)	10
Viscosity (1% by weight)	30
Viscosity (5% by weight)	1.05
Viscosity (10% by weight)	3.0
Viscosity (20% by weight)	95
Swelling (EA, ppm)	<1.0
Swelling (EA, %)	3,800
Swelling (2% NaCl, mPa·s)	700
Swelling (2% NaCl, %)	30
Swelling (Water @ pH 7.5)	

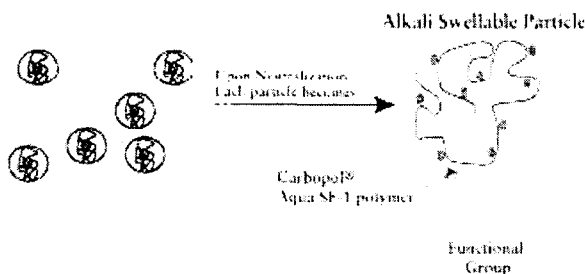
Key Benefits of Carbopol® Aqua SF-1 Polymer Include:

- Surfactant Compatibility
- Excellent Clarity in Surfactant Systems
- High Suspending and Stabilizing Ability
- Silicone Stabilization
- Enhanced Pearlescent Appearance
- Low pH Applications — "Back Acid" Thickening
- Synergistic Thickening with Salt
- Compatibility with Cationic Hair Dyes and Polymers
- Stable Viscosity Profile

THICKENING MECHANISM

Carbopol® Aqua SF-1 polymer functions through a hydrodynamic thickening mechanism — thickening occurs at pH 6.2 with addition of a base. It is distinguished from many other products by its synergistic thickening behavior in the presence of surfactants and salt.

Space Filling* Mechanism Forms Microgel Network.

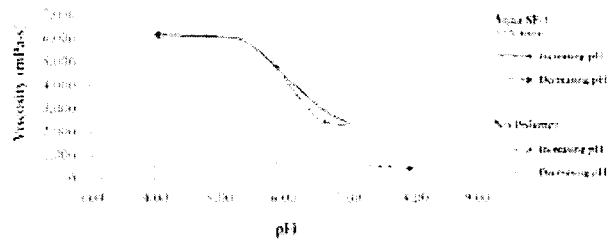


CARBOPOL®
AQUA SF-1 Polymer

BACK ACID THICKENING

The thickening and stabilizing power of Carbopol® Aqua SF-1 polymer can be maximized by adding citric (or other acids) to a neutralized system, a phenomenon called "Back Acid" thickening. Final product pH can be adjusted to as low as 3.0. Lower pH can be obtained when using inorganic acids.

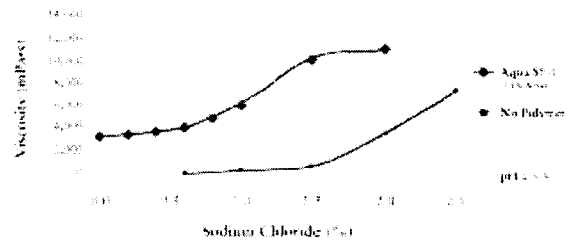
Formula CASE1-001: Brilliant Gold 2-in-1 Shampoo



SUPERIOR SALT TOLERANCE

Carbopol® Aqua SF-1 polymer exhibits synergistic thickening with salt. Low levels of sodium chloride serve to increase formulation viscosity when the polymer is formulated with surfactants.

Formula CASE1-007: Amdanduff Shampoo



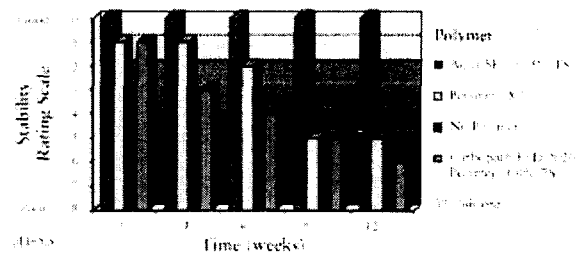
©2005 Dow Corning. All rights reserved. See www.dowcorning.com

FUNCTIONAL ATTRIBUTES OF CARBOPOL® AQUA SF-1 POLYMER

High Temperature Stability

Improved high temperature stability is one of the many functional attributes that Carbopol® Aqua SF-1 polymer provides. Carbopol® Aqua SF-1 polymer allows you to significantly improve the stability of a broad range of cleansing formulations.

Formula CASE1-002B: Pearlized 2-in-1 Shampoo — 12 weeks @ 45°C



©2005 Dow Corning. All rights reserved. See www.dowcorning.com

Modifier for Surfactant Based Cleansing Formulations

BROAD RANGE OF APPLICATIONS

Carbopol® Aqua SF-1 polymer builds high clarity products with yield value. It suspends hydrating capsules and exfoliants in pourable clear gel products and can be used to create:

- Clear shampoos, bath gels and cleansers
- Pearlescent shampoos and washes
- Conditioning products with high molecular weight silicones
- Low pH facial and body scrubs
- Economy personal washes and gels

PROCESSING GUIDELINES FOR CARBOPOL® AQUA SF-1 POLYMER

1. Add Carbopol® Aqua SF-1 polymer to deionized water.
2. Add primary surfactants with gentle mixing.
3. Neutralize to pH 6.2 - 6.8.
4. Add specialty carboxylates, amphoterics, etc.
5. Add UV absorber, EDTA, silicone, cationics, salts, etc.
6. Add pearling ingredients such as mica, EGDs or EGMS.
7. Add fragrance, dye and preservative.
8. Adjust final pH with citric acid solution ("Back-Acid" process).
9. Add sodium chloride to adjust viscosity (if necessary).

Order of addition is very important

EXCELLENT SUSPENSION PROPERTIES

This novel rheology modifier can be used to create products with a wide range of flow properties. It forms high clarity formulations in gel and surfactant systems. Carbopol® Aqua SF-1 polymer has broad compatibility with other raw materials and will help the formulator to create smooth, optimal flow properties in shampoos and body washes.

Clear Shampoo with Microcapsules Formulation

Carbopol® Aqua SF-1 polymer helps build clear products with good yield value. You can easily suspend capsules in transparent, pourable products.

INCI NAME	WEIGHT %
PART A	
Deionized Water	39.80
Acrylates Copolymer (30%)	8.00
Carbopol® Aqua SF-1 Polymer	
Sodium Laureth Sulfate (2 mole, 26%)	24.00
Ammonium Lauryl Sulfate (25%)	10.00
Sodium Hydroxide (18%)	1.80
PART B	
Deionized Water	9.00
Cocamidopropyl Betaine (and)	3.00
Cocamide MEA (34%)	
Carboxymethylmorpholine Lactate	2.00
PART C	
Deionized Water	1.00
Ethidium EDTA	0.10
PART D	
D&D(M) Hydantoin / Methylparaben / Propylparaben	1.00
Chelaphores® DEA-509	0.10
Disphores AGE-527	0.10
Disphores YE-501	0.10

Formulation CAS# 1-026

Salicylic Acid Facial Scrub Formulation

Surfactant compatible formulations that are bright and dazzling, not dull and flat, are easy to create with Carbopol® Aqua SF-1 polymer.

INCI NAME	WEIGHT %
PART A	
Deionized Water	35.35
Acrylates Copolymer (30%)	5.00
Carbopol® Aqua SF-1 Polymer	
Sodium C14-16 Olefin Sulfonate (40%)	15.00
Sodium Hydroxide (18%)	0.75
Citric Acid (50%)	0.80
PART B	
Deionized Water	15.00
Sodium C14-16 Olefin Sulfonate (40%)	10.00
Glycerin	2.00
Salicylic Acid (USP)	2.00
PART C	
Cocamidopropyl betaine (35%)	10.00
Potassium C12-13 Phosphite (40%)	2.00
D&C Red No. 33 (0.1%)	0.10
FD&C Yellow No. 6 (0.1%)	0.20
Jojoba Beads	1.00
Jojoba Beads	1.00

Formulation CAS# 1-010

For specific information on preparation and properties of example formulations, go to www.carbopol.com.

noveon

The Specialty Chemicals Innovator™