AMPHOMER®

Excellent curl retention with flexible hold when formulated with a variety of silicones.

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Section 1

Sales Specifications for AMPHOMER®

AkzoNobel
Tomorrow's Answers Today

AMPHOMER® polymer

INCI Name: Octylacrylamide / Acrylates / Butylaminoethyl Methacrylate Copolymer

Specification

Appearance: Fine, white, free flowing powder

Parameter	Limits
% Volatiles	3.0 maximum
Acidity (meq/g)	1.88 - 2.22

Measurements
Volatiles are determined on a 2 gram sample heated at 130°C for 45 minutes.

Acidity is determined by colorimetric titration.

Issued: 2000.03

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Section 2

Technical Sales Bulletin for AMPHOMER®

AMPHOMER® Polymer

AMPHOMER® Polymer
INCI: Octylacrylamide/Acrylates/Butylaminoethyl Methacrylate Copolymer

Hard Holding Hair Fixative

INTRODUCTION

AMPHOMER® polymer is an exceptionally hard holding acrylic polymer that is widely used in a variety of hair styling aids. When used in hair sprays at "typical" solids levels, AMPHOMER polymer produces a very hard hold and unsurpassed style retention. Alternatively, AMPHOMER polymer can be used at reduced solids to give a soft, natural hold while maintaining good setting properties. AMPHOMER polymer has both carboxylate and amine functionality along the polymer backbone. After neutralization, the carboxylate groups become highly anionic. During dry down, these anionic groups may associate with the amine groups in AMPHOMER polymer through ionic association and hydrogen bonding mechanisms to give a three-dimensional resin matrix. This polymer matrix performs like a polymer of much greater molecular weight than AMPHOMER polymer and contributes to its excellent humidity resistance, solubility, and adhesion. However, AMPHOMER polymer still retains the desired properties of a low molecular weight polymer: fine spray pattern, easy dry comb, good solubility, and shampoo removability.

APPLICATION AREAS

Traditional and low VOC aerosol and pump hair sprays, and styling aids such as mousses, gels, creams, pomades, and glues

FEATURES / BENEFITS

- High hydrocarbon propellant tolerance
- Holds styles under humid conditions
- Gives very firm hold sprays
- High performance acrylate polymer
- Very resistant to humidity
- Forms strong films
- Provides additional hold and humidity resistance in styling aids

SUGGESTED USE LEVELS, AS SUPPLIED

Hair sprays:	2.0% to 7.0%, may be used in higher concentrations in non-aerosol hair spray formulations

AMPHOMER polymer is a humidity resistant, extra hard holding hair spray resin. The exact amount to use depends on the hold level desired, amount of propellant in the system, and the types and levels of other additives that may affect the hold properties of the final formulation.

Suggested pH range of final formulation: 8.0 – 9.0

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AMPHOMER® Polymer

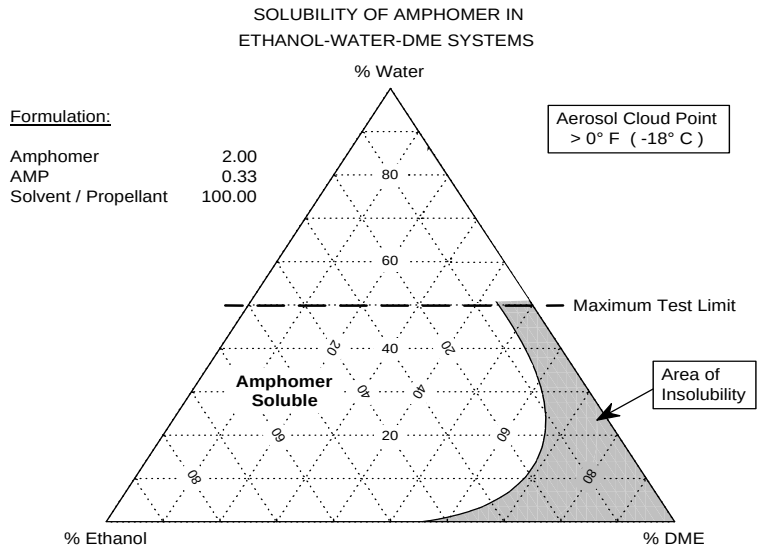
PROPELLANT SYSTEMS

AMPHOMER polymer is highly compatible with hydrocarbon, dimethylether, and hydrofluorocarbon propellants. In fact, AMPHOMER polymer is widely used throughout the world in aerosol hair sprays using combinations of these types of propellants. AMPHOMER polymer and other carboxylated polymers can be made more compatible with hydrocarbon propellants by adding small quantities (1-5%) of water. For optimum hydrocarbon tolerance and resin stiffness, it is recommended that the formulator evaluate partial neutralization with a long chain amine. The balance should then be made up of a primary neutralizer such as AMP (aminomethyl propanol). This may eliminate the need for additional plasticizers in the formulation.

For VOC compliant hair spray formulas, AMPHOMER polymer may also be used with Hydrofluorocarbon 152A (1,1 difluoroethane) propellant.

Alcoholic solutions of AMPHOMER polymer are compatible with carbon dioxide. This solubilized, compressed gas has been used as a propellant with AMPHOMER-based concentrates.

DIMETHYL ETHER AEROSOL HAIRSPRAYS



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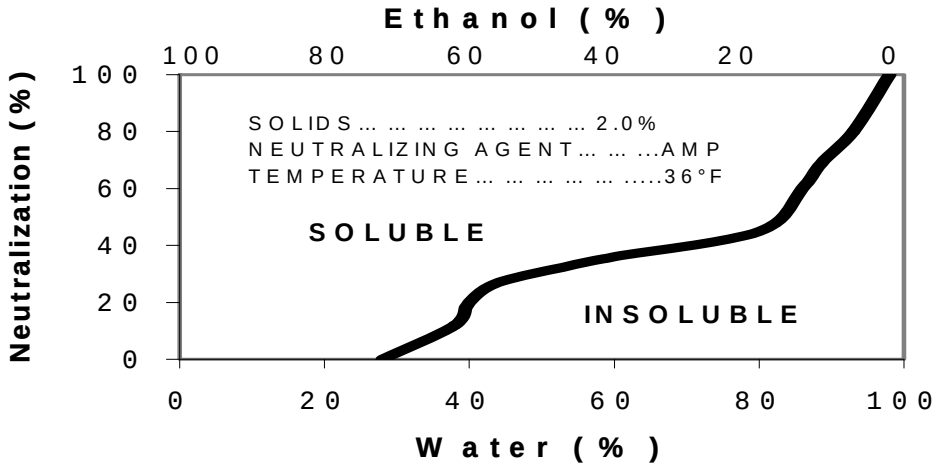
AMPHOMER® Polymer

FORMULATION GUIDELINES

Solubility

AMPHOMER polymer is soluble in ethanol and isopropanol. As supplied, it is insoluble in water, but can be made water soluble by complete neutralization of the carboxyl groups with a strong base. Suggested neutralizers include AMP (2-amino-2-methyl-1-propanol), ammonium hydroxide, sodium hydroxide, and potassium hydroxide. When partially neutralized, AMPHOMER polymer is soluble in a wide range of water-alcohol blends. Depending on the type of neutralizer used, propellant tolerance needs to be re-checked.



Plasticization

AMPHOMER polymer is an exceptionally hard resin which offers the formulator a great deal of freedom in developing hair sprays over a range of tactile properties. In most cases, plasticizers are used in combination with AMPHOMER polymer to improve feel and to enhance gloss and combing properties.

Polymeric “plasticizers” such as RESYN® 28-2930 polymer can also be used to achieve some very interesting results. These can plasticize AMPHOMER polymer without producing undesirable softening. Propellant compatibility and low temperature stability of any blend should be thoroughly evaluated.

Neutralization

AMPHOMER polymer is carboxylated and must be completely or almost completely neutralized for water solubility and shampoo removability. A neutralization range of 80-100% with AMP is recommended. The final formulation pH of an AMPHOMER-containing hair spray should fall within a pH range of 8.0-9.0.

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The level of neutralization can also alter the film properties, where higher neutralization provides a softer, more flexible feel, while lower neutralization imparts a harder, stiffer feel.

While AMP is the neutralizing agent of choice, other agents may be used effectively including AMPD (2-amino-2-methyl-1,3-propanediol), monoisopropanolamine, triisopropanolamine, and dimethyl stearamine.

The amount of base needed to neutralize the carboxyl groups in AMPHOMER polymer can be determined by the following relationships:

$$B = \frac{W * A * N * E}{1000}$$

Where:

B = weight of base needed (grams)
W = weight of AMPHOMER used
A = acidity in meq/g of AMPHOMER
N = % neutralization required (decimal)
E = equivalent weight of base

Example:
To neutralize 100 grams of AMPHOMER polymer 90% with AMP

W = 100 grams
A = 2.05 (average acidity)
N = 0.90
E = 89

$$16.4 = \frac{100 * 2.05 * 0.90 * 89}{1000}$$

Organic amines and amino alcohols, when used as neutralizers for carboxylated polymers, will produce a plasticizing effect on the polymer. The degree of softening will be a function of molecular weight and structure of the neutralizer, as well as degree of neutralization required. Neutralization with inorganics provides an excellent way to bring out the inherent stiffness of AMPHOMER polymer.

It has been found that certain inorganic neutralizers, such as potassium hydroxide, impart minimal softening while speeding alcohol release from the polymer film. Since inorganic neutralizers are relatively strong bases, the formulator should consider lower percent neutralization of the polymer than would be used with amino alcohol neutralization.

Note:
Depending upon the polymer used, it may be necessary in quality control to consider the alkalinity of the polymer in titrations to determine percent neutralization. Call AkzoNobel Personal Care for further information and procedures.

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Preparation of Hair Spray Concentrates

The preparation of the aerosol concentrates should be carried out according to the procedure outlined in the following example:

Procedure:

1. Charge the mixing vessel with the required amount of alcohol
2. Start agitation
3. Add resin slowly – so that no accumulation of resin occurs on the surface
4. After all the resin is added, slowly add the neutralizing agent (If KOH, add as 10% solution in alcohol)*
5. Continue mixing until all the resin is in solution
6. Add the rest of the ingredients in the formulation
7. Filter the concentrate down through 5-10 micron cartridge filters before filling the containers.

***Note:**

Alcohol temperature dramatically affects dissolution rate. It is generally suggested that the alcohol temperature be 15-20 degrees Centigrade. Concentrates of up to 20% neutralized resin in alcohol may be prepared. Care should be taken that the viscosity of the concentrate is suited to the production equipment involved.

COMPATIBILITY

Additives

AMPHOMER polymer is compatible with a wide variety of additives such as ester type plasticizers, ethoxylates, silicones and a variety of protein derivatives. When formulating AMPHOMER polymer with high proportions of hydrocarbon or hydrofluorocarbon propellant, it is essential that the hydrocarbon compatibility of the additives themselves be confirmed.

STORAGE AND HANDLING

AMPHOMER polymer can be stored under ambient conditions without undergoing decomposition or degradation. This product is supplied in fiber containers. When not in use, the container should be kept covered to prevent dirt, dust, and moisture pick-up. Store in a cool, dry area.

HEALTH AND SAFETY

Information on AMPHOMER polymer relating to the EU Cosmetics Directive 76/768/EEC is available on request.

12.2006, REV. 09.08.2008

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Section 3

Regulatory Information for AMPHOMER®

AkzoNobel
Tomorrow's Answers Today

AMPHOMER® polymer

Regulatory Information

Parameter	
CAS Number	70801-07-9
USA (TSCA)	Yes
Europe	Polymers of EINECS listed monomers
Canada	Yes
Australia	Yes

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AkzoNobel
Tomorrow's Answers Today

Friday, June 19, 2009

Re: AMPHOMER® Material Origin BSE

To: Whom it may concern,

AkzoNobel Surface Chemistry Personal Care has completed a review of the ingredients used in the manufacture of our personal care products. As a result of this exercise, we are able to certify that the below product is free of any animal derived ingredients.

AMPHOMER polymer

Specifically, this product is derived from synthetic sources.

Sincerely,

David Bower
Regulatory, U.S.
908 707-3756

Section 4

MSDS for AMPHOMER®

*** MATERIAL SAFETY DATA SHEET ***

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER	15-05077
PRODUCT NAME	AMPHOMER® 4910 Hair fixative
Manufacturer	Akzo Nobel Surface Chemistry LLC 525 West Van Buren Street Chicago, IL 60607-3823 USA www.surfactants.akzonobel.com EMERGENCY PHONES: MEDICAL: 914-693-6946 (Health & Safety Call Center-24 hours) TRANSPORT: CHEMTREC: 800-424-9300 (24 hours) CHEMTREC International: 703-527-3887 (call collect) CANUTEC: 613-996-6666 (24 hours) MSDS Requests/Customer Service: See phone numbers in Section 16
SYNONYMS	INCI Name: Octylacrylamide/Acrylates/Butylaminoethyl methacrylate Copolymer

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY Octylacrylamide/Acrylate Copolymer

COMPONENT	CAS NUMBER	CONCENTRATION (% by weight)

None classified as hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Possible physical irritant from dust particles. Potential for dust explosion.
White Powder. Slight odor

EYE	Particulates may scratch eye surfaces and cause mechanical irritation.
SKIN CONTACT	Repeated or prolonged skin contact may result in mild irritation.
INHALATION	This product can produce a nuisance dust which should be maintained below a time weighted average of 10 mg/m3. Dust is irritant to the respiratory tract.

INGESTION	Ingestion may cause irritation of the gastrointestinal tract.

4. FIRST-AID MEASURES

EYE	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain medical attention.
SKIN CONTACT	Wash skin with soap and water. If symptoms develop, obtain medical attention.
INHALATION	Remove to fresh air. Get medical attention if irritation persists.
INGESTION	Treat symptomatically and supportively. Get medical attention. DO NOT attempt to give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

AUTOIGNITION	Not available
FLASH POINT	Not applicable
EXTINGUISHING MEDIA	CO2; Dry Chemical; Foam; Water Fog
SPECIAL FIREFIGHTING PROCEDURES	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.
FIRE & EXPLOSION HAZARDS	Product is a finely divided combustible powder and as such constitutes a potential fire hazard. Keep workplace dust levels below the stipulated exposure limits. Prohibit smoking and open flames. Avoid sparks or other sources of static electricity. Product contains low level of organic volatiles which may be emitted at elevated temperatures.
HAZARDOUS COMBUSTION PRODUCTS	Carbon monoxide, carbon dioxide, unknown hydrocarbons.
LOWER EXPLOSION LIMIT (%)	< 30.0 g/m3
UPPER EXPLOSION LIMIT (%)	Unknown
MINIMUM IGNITION ENERGY	Not determined.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES	Normal precautions for "nuisance dust" should be observed. Avoid prolonged inhalation of dust. Sweep up or vacuum up and place in suitable container for disposal.

For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	Ambient.

HANDLING/STORAGE	Store in a cool, dry area away from heat, sparks or fire. Mechanical handling of the powder on inadequately grounded equipment can result in static electrical discharges. All handling equipment must be properly grounded. Product contains low level of organic volatiles which could accumulate in the unvented headspace of drums or bulk storage vessels. Open drums in well ventilated area. Avoid breathing vapors.
SENSITIVITY TO STATIC ELECTRICITY	Yes
SENSITIVITY TO MECHANICAL IMPACT	No

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

	ACGIH	OSHA	Mfg Working Standard

VENTILATION REQUIREMENTS	Local.
EYE PROTECTION REQUIREMENTS	Wear safety glasses with side shields. Protect against dust and particulates.
GLOVE REQUIREMENTS	The use of chemically resistant gloves is recommended.
CLOTHING REQUIREMENTS	Uniforms, coveralls, or a lab coat should be worn.
CHANGE/REMOVAL OF CLOTHING	Remove contaminated clothing and launder before reuse.
WASH REQUIREMENTS	Wash exposed areas with soap and water.
RESPIRATOR REQUIREMENTS	None required under normal handling conditions. Use NIOSH approved dust mask if dust levels are irritating.

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Powder.
COLOR	White
ODOR	Slight
ODOR THRESHOLD	Not available
PH AS IS	Not applicable
pH IN (1%) SOLUTION	Not applicable
OXIDIZING PROPERTIES	Not applicable
BOILING POINT	Not applicable
MELTING/FREEZING POINT	Not applicable
SOLUBILITY IN WATER	Insoluble
PARTITION COEFFICIENT (n-octanol/water)	Not applicable
BULK DENSITY	3 lb/gal
EVAPORATION RATE	Not applicable
VAPOR PRESSURE (mmHg)	Not applicable
VAPOR DENSITY (air = 1)	Not applicable
VOLATILES	< 3 %
VOLATILE ORGANIC COMPOUNDS	Not available
AUTOIGNITION	Not available

FLASH POINT	Not applicable

10. STABILITY AND REACTIVITY

STABILITY	Stable
STABILITY DETAIL	Stable under normal temperature and pressure. Product contains low level of organic volatiles which may be emitted or released in application processes involving the use of heat. Vent all ovens and process vessels to the outside atmosphere.

11. TOXICOLOGICAL INFORMATION

ROUTE OF ENTRY	Eye Contact; Skin Contact; Inhalation; Ingestion

CARCINOGEN	IARC (group)	NTP	OSHA Substance Specific Regulation
COMPONENT			
There is no evidence that this product poses a carcinogenic risk under normal conditions of handling and use.			

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

EFFECTS OF CHRONIC EXPOSURE	Prolonged or frequent breathing of excess dust may cause an adverse respiratory effect.
TARGET ORGANS	Lungs

PRODUCT TOXICOLOGY

PRODUCT INFORMATION	Unlikely to cause harmful effects under normal conditions of handling and use.

12. ECOLOGICAL INFORMATION

POTENTIAL TO BIOACCUMULATE	Unknown.
AQUATIC TOXICITY	None Established

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Disposal should be in accordance with local, state or national legislation.

EMPTY CONTAINER WARNINGS Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

This section provided for general information only.
FOR NON-BULK SHIPMENTS.
FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

DOT CLASSIFICATION
PROPER SHIPPING NAME NOT APPLICABLE

The information provided herein may not include the impact of additional regulatory requirements (eg, for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/of marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

15. REGULATORY INFORMATION

USA

TSCA This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C. 2601 et. seq.

SARA/TITLE III	CAS NUMBER	CONCENTRATION (% by weight)
Contains no substances at or above the reporting threshold under Section 313.		

16. OTHER INFORMATION

HMIS® Hazard Ratings
HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs by OSHA's 29 CFR 1910.1200, we choose to provide them as a service to our customers using HMIS®. These ratings are to be used only with a fully implemented HMIS® program. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

NPCA recommends that employers must determine appropriate PPE for the actual conditions under which this product is used in their workplace. For information on PPE codes, consult the HMIS® Implementation Manual.

HMIS® is a registered trademark of the National Paint and Coatings Association (NPCA).

Health	Flammability	Reactivity
1	1	0

MSDS DATE 26-January-2005

FOR INFORMATION CONTACT: Akzo Nobel Surface Chemistry LLC
Phone: 1-888-331-6212

ADDITIONAL INFORMATION: The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.

Links

Overview

Paper and Articles

Formulations

Presentations

Sample Order Page