ANGUS CHEMICAL COMPANY

Key Performance Advantages

- Enhances the performance of multiple products
- High base strength and low molecular weight
- Proven safe in a variety of indirect food contact uses

Paints and Coatings

AMP-95®

2-AMINO-2-METHYL-1-PROPANOL SOLUTION
CAS Registry No. 124-68-5
EINECS No. 204-709-8

AMP-95® is the product name under which ANGUS markets 2-amino-2-methyl-1-propanol containing 5% added water. This colorless, mobile liquid with a relatively low viscosity remains liquid at temperatures as low as 4°C for easy, convenient handling.

The many benefits of AMP-95 include:

- Efficient amine for resin neutralization
  - High base strength
  - Relatively low molecular weight
- Multiple food contact approvals
- Acts as a co-dispersant for particulate systems
- Corrosion inhibitor for steam-condensate lines
- Key component of low cobalt-leaching metalworking fluids
- Acts as a formaldehyde scavenger
- Useful raw material for synthesis applications
- Component of powerful anionic emulsifier systems

Typical Properties

Neutral equivalent	93–97
Water (max.)	5.8% by wt.
Color (max.)	20APHA
Molecular weight (calc.)	89.1
Specific gravity at 25/25°C	0.942
Viscosity at 25°C	147mPa·s
Viscosity at 10°C	561mPa·s
Coefficient of Expansion, 20 to 90°C	0.00096/°C
Flash Point, Tag Closed Cup	83°C
Flash Point, Pensky-Martens Closed Cup	87°C
Vapor Pressure at 20°C	10.6Pa
Freezing Point	-2°C
Surface Tension, neat	36-38mN/m
Surface Tension in 10% Aqueous Solution	~58 mN/m
pH of 0.1M Aqueous Solution at 20°C	11.3
pKa at 25°C	9.72
Refractive Index, nD, at 20°C	1.4568

Uses

In latex emulsion paints, AMP-95 is a very efficient co-dispersant for pigments. In addition, AMP-95 contributes pH stability, low odor, and anticorrosive properties; furthermore, it promotes acceptance of colorants.

AMP-95 is an effective emulsifier for polyethylene and wax by either the normal emulsification techniques or those requiring pressure.

AMP-95 is a very efficient amine for neutralizing the carboxylic acid moieties in acid-functional resins to make them suitable for use in water-borne coatings and other aqueous applications. Such coatings formulations exhibit higher gloss and greater water resistance than do formulations based on other neutralizing amines.

Corrosion in boiler-water systems can be controlled successfully by use of AMP-95 as the amine additive to remove CO_2.

AMP-95 is a high performance alkanolamine, proven as a multifunctional additive for metalworking fluids. It is a highly efficient alkalinity enhancer which also provides corrosion inhibition properties. The use of AMP-95 will often improve the biostability of these fluids, which can result in longer fluid life. AMP-95 is the least aggressive amine toward the cobalt binder in carbide tooling. As an added feature, AMP-95 enhances the performance of triazine biocides, while reducing levels of airborne formaldehyde. AMP-95 does not contribute to ammonia release as do other amines.

AMP-95 also functions in dilute aqueous solutions containing small amounts of formaldehyde to scavenge that which otherwise might be released to the atmosphere.

Food Contact Approvals

AMP-95 possesses the following FDA clearances:

- Section 175.105 lists AMP among substances cleared for use as components of food packaging adhesives (AMP is designated as aminomethylpropanol in the regulations).
- Sections 176.170 and 176.180 – AMP is cleared for use as an indirect food additive for use as a pigment dispersant at levels up to 0.25% by weight of pigment. The resulting dispersion may be used to coat paper which will contact fatty, dry, or aqueous foods in room temperature, refrigerated, or frozen storage.
- Section 175.300 lists substances cleared for use as components in resinous and polymeric coatings intended for use in contact with food.
- AMP is listed as a permissible catalyst for modification of triazine-formaldehyde resins in paragraph (b)(3)(xiii)(a) of this section. The FDA has identified AMP by the ambiguous name "methylpropanolamine".
- The resins and coatings cleared under Section 175.300 have been cleared by cross reference for use as provided in the following sections:
  - Section 175.380 Xylene-formaldehyde resins condensed with 4,4'- isopropylidenediphenol- epichlorohydrin epoxy resins
  - Section 175.390 Zinc-silicon dioxide matrix coatings
  - Section 177.1210 Closures with sealing gaskets for food containers
  - Section 177.2260 Filter, resin-bonded
- AMP-95 has also received BgVV approval under Recommendation XXXVI "Production aid as dispersant and flotation agent in the manufacture of paper and board for food contact use."

Toxicity

AMP-95 causes eye burns. Wear protective goggles for any operation in which splashing is likely to occur. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes; see a physician.

Prolonged or frequently repeated exposure of the skin to AMP-95 may result in skin irritation. When such exposure is unavoidable, use of protective clothing is advised. In case of skin contact, wash the exposed area thoroughly with water. Remove contaminated clothing and wash before reuse. Discard contaminated shoes.

The vapor pressure of AMP-95 is quite low. Hence there will be only a small concentration of vapors at ordinary temperatures of use. Avoid repeated inhalation exposure to vapors or mists from heated material as the effects of inhalation have not been fully evaluated.

The acute oral LD50 for AMP is 2.9 g/kg when tested in rats. Intraperitoneal administration to mice gave an LD50 of 0.32 g/kg. Thus, AMP-95 would be considered as only slightly toxic by either route of administration.

AMP-95 when neutralized with fatty acids, as in the use for emulsification, has much less potential for irritation of skin or eyes. In several decades of use, there have been no reports of dermatitis resulting from exposure to its fatty acid soaps. Oral ingestion by rats of solutions containing 3 g/kg of the stearate soap of AMP produced no acute toxic symptoms or death.

Handling and Storage

AMP-95 is corrosive to copper, brass, and aluminum. Contact with these metals should be avoided. Ordinary iron and steel generally are unaffected by this product and are the recommended materials of construction.

AMP-95 is a combustible liquid with a relatively high flash point and a low vapor pressure at ordinary temperatures. These properties cause no problems with respect to storage and handling. Do not store near heat or flame.

AMP-95 should not be exposed unnecessarily to the atmosphere, since it can pick up moisture and carbon dioxide due to its amine functionality. Evidence of this may be detected by a weight gain, a lower alkalinity equivalency than when first received, or the formation of cloudy solutions when dissolved in alcohol.

Product Stewardship

ANGUS encourages its customers to review their applications of ANGUS products from the standpoint of human health and environmental quality. To help ensure that ANGUS products are not used in ways for which they are not intended, ANGUS personnel will assist customers in dealing with environmental and product safety considerations. For assistance, product Safety Data Sheets, or other information, please contact your ANGUS representative at the numbers provided in this document. When considering the use of any ANGUS product in a particular application, review the latest Safety Data Sheet to ensure that the intended use is within the scope of approved uses and can be accomplished safely. Before handling any of the products, obtain available product safety information including the Safety Data Sheet(s) and take the necessary steps to ensure safety of use.

Contact Information

angus.com

North America
+1 (847) 808-3887

Latin America
+55 (11) 94245-5307

Western Europe
+33 670654658

Central and Eastern Europe
+33 670654658

Middle East and Africa
+33 670654658

Indian Subcontinent
+33 670654658

Greater China
+65 8686 5712

Japan and Korea
+65 8686 5712

Southeast Asia and New Zealand
+65 8686 5712

ANGUS® CHEMICAL COMPANY

®™Trademark of ANGUS Chemical Company
Notice: No freedom from infringement of any patent owned by ANGUS or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where ANGUS is represented. The claims made may not have been approved for use in all countries. ANGUS assumes no obligation or liability for the information in the document. References to "ANGUS" or the "Company" mean the ANGUS Chemical Company legal entity selling the products to Customer unless expressly noted. NO WARRANTIES ARE GIVEN: ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

Published May 2015 Form number: AMP-1295-0415-TCG