DTEA II™ Basics



An overview of DTEA II[™] and its applications

Take Control of your industrial water treatment programs with DTEA II^{TM} chemistry. DTEA II^{TM} is the ideal treatment to enhance inhibitor programs, control organic deposits and fouling in cooling towers, closed loop systems, spray nozzles, filter cleaning, sand filters and other industrial applications. When you need results fast, turn to DTEA II^{TM}



Organic Deposit & Corrosion Control

- New One Drum Formulas
- Used With Oxidizers/Bleach
- Deposit Removal Starts in Minutes
- Longer Lasting Halogen Residuals
- Cuts Biocide Use & Costs
- Stable to Ammonia & Sour Gas
- Stable to High Temperature
- Stable to High pH
- Corrosion Inhibitor
- Low Fish Toxicity
- Biodegradable



- Cost Effective
- Treatment Frequency: 1-3 Times/Week
- 50-100 ppm Product (6-12 fl oz/1000 gal)
- Shipping Class: Non-Hazardous
- DTEA IITM + Minimal Bleach = Great Program
- DTEA IITM + Minimal Biocide = Great Program

Note: As of 1999, this technology no longer is sold in the USA as a biocide. The original chemistry was EPA registered (1993) as biocide and also sold as a biofilm removal agent (1994) by The Dow Chemical Company.







Table of Contents

Contents	Page(s)
DTEA II [™] Technology History	3
Product Data Sheet	4 - 6
Applications Overview	7
DTEA II^{TM} as a Corrosion Inhibitor	8 - 9
DTEA II [™] Products	10
All-In-One Formulations	11
Before and After Case Studies	12 - 13





DTEA IITM Technology History

1993	Dow biocide label sales (EPA registration)		
1994	Dow biofilm removal label		
1996	AMSA, Inc. as distributor of Dow technology		
1998	AMSA, Inc. introduces & manufactures DTEA II ^{™,}		
1999	Dow quits DTEA (purchase of Angus biocides, Union Carbide biocides in progress)		
Present Day	AMSA, Inc. continues to develop, sell, and promote DTEA technology exclusively under private label to small and mid-size water treatment companies as an organic deposit inhibitor, removal agent, and corrosion inhibitor.		

AMSA DTEA IITM

The active ingredient of DTEA II^{TM} has several key atom groupings and each set of atom groupings in combination with neighboring atoms and groupings provides a different function. Each part can act as a specific molecule. These multiple functions give DTEA II^{TM} a broad range of properties that enhance many aspects of water treatment programs.

AMSA, Inc.



DTEA II[™] Product Data Sheet

DTEA IITM is a powerful organic penetrating agent and organic deposit dispersant for use in industrial water systems. AMSA Inc. is an OEM supplier and manufacturer of the DTEA IITM product.

Stand-Alone Use: Use of DTEA II[™] as a stand alone treatment in place of a corrosion inhibitor and scale control is not recommended without first testing it. DTEA II[™] is generally recommended to be used in conjunction with a scale and corrosion program and it has been found to be sufficient in many systems, depending on the specifics of the system. Contact us for more details.

Formulations: DTEA II[™] select and proprietary formulations which provide corrosion inhibition, scale control, and inorganic dispersion control has been developed by distributors and customers of AMSA Inc. AMSA Inc. can provide assistance to its customers but it has intentionally left such formulation development to its customers as a value-added niche. AMSA Inc. is an OEM supplier and manufacturer of the DTEA II[™] product.

DTEA technology is powerful as it disperses hydrocarbon and organic contaminants for easy removal from the system. Final removal of deposits is accomplished by blow-down, side stream filtration, or diversion to waste treatment plant. As DTEA IITM has a quick degradation rate, and because it can be totally degraded prior to release with select cooling tower treatments now being commonly used, it has an environmental friendly profile.

In addition, it will promote and maintain the overall cleanliness of heat transfer surfaces, reduce corrosion, and minimize the use of biocides.

Metal Corrosion inhibition: It is especially useful for yellow metals (brass, copper) as well as aluminum, carbons steel, stainless steel, mild steel, and select alloys. If it is to be used as a stand-alone corrosion inhibitor, it is recommended that corrosion coupons and instantaneous corrosion testing methods be used to determine if any other corrosion inhibitors can be eliminated. Its corrosion inhibition mode of action is based on its film forming properties and its control of organic deposition.

Recent laboratory results have shown that the DTEA II[™] all-in-one formulation for scale and corrosion, can replace traditional azole yellow metal corrosion chemistries.





Biocide Demand & Use: The reduction of biocide use and related chemicals is an additional benefit to the need to have environmentally friendly technologies in our plants.

DTEA II^{TM} can be applied with both oxidizing and non-oxidizing microbiocides to disperse deposits into the water where they will be more susceptible to the toxic effects of applied microbiocides.

Please note that DTEA has been shown, in other formulations, to exhibit antimicrobial effects but such formulations are not sold in the USA. *It is sold and used as a broad spectrum biocide in those regions where USA EPA registration or similar regulations allow its use.*

Regulatory & Handling Considerations: $DTEA II^{TM}$ is biodegradable (OECD guidelines), not approved for direct discharge to rivers and waterways, and is considered to be toxic to fish at concentrated use levels as this or any other material which is surface active. DTEA II^{TM} is 7 - 20x safer than ADBAC suited for once-through use.

DTEA IITM contains no heavy metals or any regulated chemicals as it is composed of an all organic active ingredient chemistry and formulated in water.

It requires no special handling other than typical handling procedures required of soap, detergent, or general non-corrosive chelant type of chemicals. Shipping is not regulated as per DOT standards. Spill cleanup is simple and easy with disposal considerations.

Features

- Penetrates, disperses and eliminates organic mass from cooling water systems
- Reduces corrosion by keeping metal surfaces free of organic deposition
- Disperses hydrocarbon foulants in cooling water systems
- Increases biocidal effectiveness and lowers their use levels and subsequent costs (use levels of glutaraldehyde in the oil field are reduced by 5X)
- Extends oxidizer residual, thereby decreasing use & costs of oxidizers biocides
- Not affected by high pH
- Biodegradable
- Persistent in closed systems with a friendly degradation profile in open systems which makes this an ideal choice in difficult to manage waste streams
- Excellent compatibility with cooling water treatment programs with the exception of glutaraldehyde (call us before using with glutaraldehyde)
- Not affected by high organic load
- Not affected by high ammonia, high sulfur, and other strong nucleophiles
- Excellent freeze-thaw properties requiring no re-mix or product separation
- Allows use in high re-cycle, high solids systems





AMSA, Inc.



Product Description

Physical State	-	Liquid
Color	-	Off white to light amber
рН	-	6 - 7
Density	-	8.3 lbs./gallon
Clarity	-	slightly cloudy

Dosage

Used as a water solution that should be fed or it can be diluted with water to a point of good agitation to insure proper dispersal in the system. Typical dosage will be between 50 & 100 ppm (1/2 to 1 gallon per 10,000 gallons) based on system total volume. Very large systems (1 million gallons or greater) require 10 - 25 ppm of product due to the high system volume to treatment surface area ratio. For additional information and cost effective use of product, contact AMSA Inc. for details.

Handling

DTEA IITM is a concentrated organic chemical. Do not take internally. Avoid contact with skin and eyes. Should contact occur, flush promptly with water. If any discomfort occurs, consult a physician. Read relevant Material Safety Data Sheet before handling this product.

Packaging

DTEA II^{TM} is packaged in bulk containers, 55 gallon (net 450 pounds) non returnable near-clear plastic drums, or in 30 and 15 gallon near-clear plastic drums and near-clear 5 gallon pails (net 40.5 pounds).





DTEA II[™] Applications Overview

DTEA IITM is a multifunctional product that has found utility in many types of water treatment systems as an organic cleaner and dispersant. More recently its excellent capability as a yellow metal corrosion inhibitor has been established. It has also shown improved mild steel corrosion control with several typical corrosion control treatments. Additionally, formulations have been developed to include DTEA IITM in All-In-One formulations containing both scale and corrosion control. These formulations will allow efficient maintenance of most water systems with addition from a single drum. Biocide addition will still need to be addressed on an as needed basis

Typical Treatment

Typical treatment levels for DTEA II^{TM} in a clean-up mode are 100 ppm of the standard DTEA II^{TM} 15% product. It is added at the rate of 1 gallon per 10,000 gallons of water in a system. Ideally this addition is done while the blow down and biocide treatment is turned off. After 2 – 4 hours recirculation, the biocide addition is restarted to kill the organisms that have been released from the surfaces with the organic deposits by the DTEA II^{TM} . The blow down should also be restarted to wash out released deposits and organisms.

Specific Applications

- Recirculating Cooling water
 - Geothermal, Nuclear and Fossil Fuel Power Plants
 - Industrial Process Cooling Systems
 - Commercial and Residential Building Cooling Systems
- Open Loop systems
- Closed loop systems
- Sand filters
- RO, Nano and Micro Filtration Systems
- Oil Field Produced and Injection Water
- Decorative Pond systems





Antimicrobial Specialists & Associates, Inc. P.O. Box 88 • Midland, MI 48640 • Phone: 989-839-0377 • Fax: 989-839-4440 • <u>sales@amsainc.com</u> • <u>support@amsainc.com</u>

Page 8



Page 9



DTEA II[™] Products



AMSA, Inc.

Antimicrobial Specialists & Associates, Inc. P.O. Box 88 • Midland, MI 48640 • Phone: 989-839-0377 • Fax: 989-839-4440 • <u>sales@amsainc.com</u> • <u>support@amsainc.com</u>

Page 10



DTEA II[™] All-In-One Formulations

Historically, water treatment services companies have used DTEA II[™] in emergency mode to cleanup cooling systems with organic deposits resulting in loss-of-heat transfer. Typical utilization of DTEA II[™] has been 100 ppm slug fed three times a week to clean up heavily fouled recirculating water systems. Historically we have recommended a maintenance dose of 30 to 50 ppm to also be slug fed two to three times a week after the system has been cleaned up.

One option for the use of DTEA IITM is to formulate it with commercially available corrosion and scale inhibitor programs to create an all-in-one-drum formulation. This allows water service companies to maintain levels of DTEA IITM which keep the cooling towers free of organic deposits in addition to providing yellow metal protection.

Examples of All-In One formulations with DTEA II[™] replacing the azole yellow metal are:

- Generic Acidic formulation
 - DTEA IITM (15% formula) 3%
 - Iron Corrosion Control Chemicals 14-18%
 - Scale Control Chemicals 32-36%
 - o Water 43-51%
- Published Chemical Manufacturer formulation
 - DTEA II[™] (15% formula) 3%
 - Sulfuric Acid 2-8%
 - o ZnCl₂
 - MEV* 10%
 - HPA** 5%
 - o Water 71.4-77.4%

MEV* - Such as Belclene® 283 HPA** - Such as Belcor® 575



Please contact us for more information:

Antimicrobial Specialists & Associates, Inc. P.O. Box 88 • Midland, MI 48640 • Phone: 989-839-0377 • Fax: 989-839-4440 • <u>sales@amsainc.com</u> • <u>support@amsainc.com</u>





Westward Ho Hotel & Casino - Las Vegas, Nevada; Cleanup of a Marley Induced Draft Cross Flow Cooling Tower











Antimicrobial Specialists & Associates, Inc. P.O. Box 88 • Midland, MI 48640 • Phone: 989-839-0377 • Fax: 989-839-4440 • sales@amsainc.com • support@amsainc.com