



What is Mirachem 500 Cleaner / Degreaser Concentrate?

Mirachem 500 Cleaner / Degreaser is a concentrated, aqueous (water based) cleaner developed to clean grease, oil, lubricants and other organic soils in mission-critical industrial applications. Mirachem 500 delivers advanced industrial strength cleaning and degreasing with accelerated safety and material compatibility benefits. Mirachem 500 has been formulated to be used successfully in a variety of critical cleaning applications, including aviation and aerospace, process cleaning for manufacturing, industrial process applications, and cleaning activities subject to extensive environmental and/or worker safety regulations.

Why should I choose Mirachem 500?

Mirachem 500 is Mirachem's flagship product and represents the most advanced aqueous cleaner / degreaser technology available today. Mirachem 500 has been tested in the lab and proven in the field to consistently deliver high performance cleaning performance, advanced material compatibility and superior worker safety and regulatory compliance. Whether looking for a solvent alternative or simply a high quality cleaner / degreaser, Mirachem 500 is an excellent choice.

Mirachem 500 Cleaner / Degreaser Concentrate offers the following features and benefits:

- **Outstanding Performance:** Mirachem 500 outperforms traditional water-based chemistries and can handle cleaning jobs usually reserved for hazardous solvents and petrochemicals.
- **Economical Use:** This product is concentrated allowing you to dilute with water and use only the amount of product you need.
- **Versatility:** Mirachem 500 has an extensive range of uses. It can be used in virtually any industrial cleaning application or commercial cleaning process from jet engine rebuild to routine janitorial cleaning, allowing you to do more cleaning with fewer products.
- **Regulatory Compliance:** Mirachem understands today's regulatory climate. This product simplifies the task of meeting air and water quality regulations, as well as waste and fire management requirements.
- **Material Compatibility:** Mirachem 500 has been documented to conform to many OEM and industry standards for use in the most demanding applications including aviation / aerospace, marine and nuclear power industries.

What does Mirachem 500 clean?

This product is a cleaner / degreaser designed to remove organic soils. Organics (materials originating from the chemical element carbon) originate primarily from people/animals, plants and petroleum (hydrocarbons), or the Three P's for short. Common examples of organic soils include:

- Animal Fats
- Adhesives
- Blood
- Body Oils
- Buffing Compound
- Carbon
- Carbon Smut
- Coolants
- Cosmetics
- Cutting Fluid
- Diesel
- Dirt & Grime
- Dyes
- Honey Oil
- Hydraulic Fluids
- Jet Fuel
- Lapping Compound
- Lube Oil
- Lubricants
- Machining Oils
- Metal Working Fluids
- Petroleum
- Plant and Vegetable Matter and Oils
- Protein Stains
- Rubber Residue
- Sealants

- Extruding Oil
- Exhaust Residue
- Fuels
- Gasoline
- Gelatins
- Glue
- Grease
- Soy Oils
- Smoke and Fire Residue
- Starches
- Syrups
- Tar
- Transformer Oils
- Waxes

On what surfaces can I use Mirachem 500?

Mirachem 500 may be used effectively on nearly any surface that is compatible with water. This includes a wide range of materials, including base metals, alloys, minerals and stone, various elastomers and polymers, and composites created from these materials. Some specific examples include:

- Acrylic
- Alucobond and Alpollic
- Aluminum
- Aluminum Alloys
- BR (*butadiene rubber*)
- Brass
- Bronze
- Buna
- Carbon Composites
- Carbon Steel
- Chrome
- Concrete
- Copper
- EPDM* (*Ethylene Propylene Diene Monomer*)
- EP70
- Fiberglass
- Gold
- Glass
- HNBR / HSN (*Hydrogenated Nitrile Butadiene Rubber or Highly Saturated Nitrile*)
- Hypalon® (*Chlorosulfonated Polyethylene*)
- Iron
- Magnesium Alloys
- Neoprene
- Nitrile
- Painted Surfaces
- Plastics
- Polyethylene and Polypropylene
- Pot Metal
- SBR (*Styrene-Butadiene Rubber*)
- Silicones
- Stone, Brick, Masonry
- Tin
- Silver
- Stainless Steel
- Steel (Mild and Carbon)
- Titanium
- Urethane
- Viton
- Vinyl

* EPDM is often mis-abbreviated as "EDPM".

What are some common uses and cleaning applications where Mirachem 500 is used?

Mirachem 500 is used successfully in many cleaning applications throughout many industries. These include:

- Aircraft inspection, repair, and maintenance
- Aqueous Parts Washing
- Auto Repair and Maintenance
- Carpet and Upholstery Care
- Citrus Cleaner / D-Limonene Alternative
- CNC Machine Maintenance
- Component Disassembly & Cleaning
- Compressors, Condensers, HVAC, Chillers & Coils
- Construction
- Container & Package Manufacturing
- Conveyance Equipment (belts, bearings, rollers, etc)
- Detail and Appearance Cleaning
- Facilities / Plant Cleaning & Maintenance
- Food & Beverage Manufacturing
- Interior / Exterior Appearance
- Machining
- Manufacturing Process Cleaning
- Metal Cutting, Bending, Forming, Shaping, Drilling, Stamping or Extrusion
- Mission Critical Cleaning
- Petrochemical Alternative
- Parts Cleaning / Degreasing
- Plant shutdowns / Retooling
- Plastics & Rubber Products Manufacturing
- Pressure Washing
- Plastic Extrusion, Molding, Forming
- Routine and janitorial cleaning

- Drive Train & Engine Teardown
- Equipment Repair and Maintenance
- Floor Cleaning
- Engine Cleaning Overhaul / Rebuild
- Engine Blocks
- Food Processing / Storage Equipment
- Heads
- Heavy Duty Degreasing
- Injection Molding Equipment
- Environmental Services / Waste Management
- Solvent Parts Washer Replacement
- Surface preparation for Painting, Sealing, Coating, etc.
- Transmission & Carburetor Teardown
- Underground Storage Tank Cleaning
- Vapor Degreaser Replacement
- Fleet Maintenance
- Wheel & Brake Assembly Inspection & Rebuild

How is Mirachem 500 different from other cleaners?

Most cleaner / degreaser products are based on either solvent or high-alkaline chemistries. These types of formulations have been in use for several decades and generally perform adequately and are relatively inexpensive. However, they also carry numerous environmental, worker safety and material compatibility risks, and performance tends to become questionable in mission-critical process cleaning applications.

Unlike these older chemistries, Mirachem 500 is an advanced aqueous technology that was developed specifically to perform successfully in critical cleaning applications, without the safety and compatibility risks found with solvents and high-alkaline products. Mirachem 500 will address the needs of both the user and the risk management officer.

How does Mirachem 500 work?

Mirachem 500 is an aqueous (water based) cleaning product. Normally, many sticky soils, such as grease or oil, cannot be solubilized (suspended in solution) in water. This is the origin of the adage “oil and water don’t mix”. As with most Mirachem technologies, Mirachem 500 makes water “wetter”, allowing it to penetrate chemical structures that would normally repel water, and allowing water to go into suspension with normally non-soluble materials.

Mirachem 500 allows water to break the sticky bonds between soils and surfaces, allowing them to be safely rinsed or wiped away. By using Mirachem 500, water becomes the final cleaning agent.

What is the “secret ingredient” in Mirachem 500?

All Mirachem product formulations are proprietary and are a closely guarded trade secret. Mirachem 500’s formulation can generally be described as a proprietary non-hazardous aqueous detergent blend, that does not contain any chelating ingredients such as EDTA, phosphates, petroleum distillates, or chlorinated (halogenated) or hydrocarbon solvents.

Mirachem’s unique combination of performance and safety are not as much about “secret ingredients” as they are about innovative development and manufacturing techniques, and our commitment to develop comprehensive cleaning solutions. Our products are the result of extensive experience in the field and exhaustive laboratory development and testing, an expensive and time consuming process. Most companies that sell cleaning chemistries are unable or unwilling to undertake similar development processes because it is easier and much less expensive to simply market the existing commodity formulas. Mirachem focuses its energies on finding ways to take basic cleaning elements, such as water, heat or agitation, and making them efficient enough to outperform hazardous chemistries.

The result of our approach is a quality product offering that is truly different, rather than an exhaustive line of “me too” chemicals that offer no real advantages.

Customers with a requirement for more detailed ingredient information should contact Mirachem to discuss their specific needs.

Who uses Mirachem 500?

Anyone who needs to remove organic soils can use this product, whether rebuilding a carburetor, mopping a floor or cleaning a jet engine. Some common industries where Mirachem 500 is in use include:

- Agriculture, Forestry, Fishing & Hunting
- Aerospace / Aviation
- Automotive Manufacturing & Repair
- Construction
- Electronics
- Environmental Waste Management
- Facilities Maintenance
- Food Manufacturing / Processing
- Forestry / Timber
- Government Services / Public Administration
- Health Care & Nursing Homes
- Oil & Lubricants
- Janitorial
- Marine
- Metal Fabrication
- Mining
- Power Generation / Public Utilities
- Performance Racing
- Petroleum & Petrochemicals
- Printing
- Pulp & Paper
- Restaurant, Hospitality & Lodging
- Railroads & Transit Operations
- Schools, Colleges & Universities
- Textile Manufacturing
- Transportation & Fleet Maintenance
- Warehousing & Material Handling

What are the methods of application?

- Spray & Wipe
- Bucket & Rag
- Parts Washer*
- Soak, Dip, Immersion Tanks
- Mop & Bucket
- Pressure Washers
- Tumbling Cleaners
- Ultrasonic Parts Washer
- Vibratory Cleaning Equipment

Parts cleaning is an application where Mirachem products are used frequently with great success. Please refer to Mirachem's Cleaning Process Reference Guide on parts washing for specific information relating to this cleaning activity or for using Mirachem 500 as a parts washing solvent.

How do you use the product?

There are four components involved in efficient cleaning with an aqueous technology. They are:

- Time
- Agitation
- Concentration
- Temperature

It is easy to remember these control factors with the acronym TACT. By adjusting these variables to optimum value, the performance of an aqueous cleaning solution can be maximized.

Time

The length of time the contaminated surface remains in contact with the cleaning solution is commonly called *dwelt time*. In general, the longer the dwell time, the more cleaning efficiency you will get from the aqueous solution. It is important to remember, however, that extended dwell times can also lead to unexpected results and material compatibility issues.

Agitation

The addition of *kinetic energy* (movement) to the cleaning process aids any cleaning activity. Common forms of agitation include brushing, scrubbing, wiping, spraying, or even a flow of fluid across a surface. Not all forms of agitation will be compatible with all substrates, and in some cases, improper agitation can cause damage to the item being cleaned.

Concentration

Most aqueous cleaning technologies are designed to be diluted with water to deliver cost savings. Often, the more concentrated (also described as *less dilute*) the product used, the better the cleaning efficiency. However, some applications will require a less concentrated (*more dilute*) solution for better performance. In some cases, higher concentrations of an aqueous product can lead to undesirable results such as streaking or residue.

Temperature

As in the case of kinetic energy, the addition of *caloric energy* (heat) can make cleaning more efficient. As with any water based cleaning process, including your washing machine or dishwasher at home, warmer water will improve cleaning performance. At higher temperatures, product evaporation can become a cost efficiency or equipment safety issue, and extreme temperatures can lead to personal safety risks.

Mirachem recommends that users always read the Material Safety Data Sheet (*MSDS*) before using any cleaning products.

What is the recommended dwell time?

For hand wipe applications or mop and bucket applications, we recommend applying the product and allowing 5-10 seconds for the product to emulsify the soil. In general, the longer the dwell time, the less agitation will be required. Please ensure that the surface stays wet while the product loosens deposits.

For soaking or dip tank applications, timing is generally from 10 to 30 minutes. More difficult soils and encrusted deposits may take longer. Under most circumstances, soak times in excess of three (3) hours are not recommended. Soaking applications also require increased monitoring of product concentration.

What are the concentration parameters?

Below are some basic concentration suggestions; we encourage you to try several dilutions to find the precise concentration for your specific cleaning needs.

<u>Cleaning Method</u>	<u>Dilution (Mirachem 500:water)</u>
- Spray & Wipe	Full strength to 5:1
- Bucket & Towel	1:1 to 10:1
- Parts Washing	1:1 to 4:1
- Soak / Dip Tanks	2:1
- Vibratory & Tumbler Cleaning	5:1 to 10:1
- Ultrasonic Cleaning	10:1
- Mop & Bucket Cleaning	10:1 & Higher
- Pressure Washing / Steam Cleaning	20:1 & Higher

What are the temperature parameters?

Please keep in mind that Mirachem 500 is a water-based technology; it will evaporate like water. Increased use temperatures will increase the rate of evaporation. Use caution when working with extremely elevated temperatures. Do not exceed manufacturer's recommended temperature for your equipment.

We recommend using Mirachem 500 at:

- Spray & Wipe	Ambient to 100°F
- Bucket & Towel	Ambient to 105°F
- Parts Washer	105° to 110°F
- Soak / Dip Tanks	105° to 165°F
- Mop & Bucket	Ambient to 105°F

What are Mirachem's "Industrial" products?

Mirachem has developed several product lines designed to meet specific types of cleaning needs. These include our Printing, Industrial, Commercial, Professional and Specialty lines.

Products in Mirachem's Industrial line, such as Mirachem 500, are high performance cleaning technologies designed to be used in a wide range of cleaning applications, and formulated to be effective at removing multiple soils. Our industrial products also offer the greatest cost effectiveness by allowing one product technology to be used to address virtually all cleaning applications that an industrial operation might encounter. Industrial line products are backed by extensive technical support and have been certified compliant with many industry, regulatory and OEM standards.

If your requirements call for a specific use product in a cleaning application that does not demand advanced technical support or top-of-the-line performance, we recommend our Commercial line of products. For janitorial and general duty cleaning applications, Mirachem's Professional line is likely to be the most cost effective choice. If you have an unusual cleaning need that doesn't fit traditional cleaning categories, look to our Specialty line for assistance. And finally, those with cleaning needs in the printing industry should look to our Printing Products line for help with their specific challenges.

What kind of results can I expect when using Mirachem 500?

Mirachem 500 will leave a clean, residue free surface. This product will not leave behind an oily film, as is common with solvent or soy-based chemistries, or alkaline deposits, which are common when using high alkaline products. This product rinses easily and cleanly. Mirachem 500 includes an advanced corrosion protection package to ensure compatibility with ferrous metal surfaces.

What are the storage requirements?

Mirachem 500 is a water-based technology, and will freeze like water. We recommend that the product be protected from extreme high or low temperatures. Do not store in direct sunlight. If the product freezes, allow to thaw completely and mix thoroughly. Since Mirachem is non-hazardous, it does not require any special permitting or equipment to store in your facility.

What is the shelf life?

Mirachem 500 has a guaranteed shelf life of 5 years from date of manufacture.

How do you dispose of Mirachem 500?

Waste disposal is a necessary part of cleaning. The points to remember when considering waste are:

- He who controls the hazard, owns the risk
- Where you are located determines the guidelines
- If you have a hazard, you have responsibility
- The responsibility never goes away

If you are currently using a hazardous product, your responsibility for what happens to the waste material does not end when it is removed from your facility. It has always been a goal of Mirachem to help customers reduce or eliminate the costs and liabilities associated with their cleaning products. Using Mirachem instead of traditional, higher-risk products can help to reduce the costs of waste transportation and disposal, fees and permitting, recordkeeping and manpower.

Unused Mirachem 500 in its concentrated form would be categorized as a Federal non-RCRA (Resource Conservation and Recovery Act (42 U.S.C. 6901-6992), waste, and in nearly all jurisdictions, can be sewer disposed in accordance with federal, state and local regulations.

Once used, the Mirachem 500 solution contains additional components that have come out of the cleaning process, and will, in all likelihood, no longer have the same waste characteristics of the unused product. The proper course of action is to have your waste streams analyzed by a reputable firm to determine the exact nature of the waste materials, and therefore, how they should be handled.

A local environmental services or waste transportation company should be able to assist you with obtaining the lab analysis, interpreting the results and handling your waste in an efficient and legally compliant manner. If you need help locating a reputable waste management company, Mirachem may be able to refer you to a local company with whom we have experience.

You may also choose to handle your own waste management needs internally. You can locate an appropriate lab yourself, and local, county, state and Federal agencies can assist you in determining handling and disposal options.

Alternative options, subject to applicable regulations, to off site transport and disposal may include:

- Discharge to local waste water treatment facility
- Utilize waste fluid in other third party processes that may qualify as a recycling procedure
- Evaporation or minimization
- On-site treatment

For additional information, please refer to the Mirachem 500 Cleaner / Degreaser Material Safety Data Sheet (MSDS), Section XIII – Disposal Considerations, which is available from Mirachem.

Does my cleaning process have to change to use Mirachem 500?

That depends on your current cleaning process, including products and equipment used, as well as the various steps in the process. There are four major areas to evaluate in answering this question:

Product Technology

If you are converting from a solvent product to an aqueous cleaner, you can expect to make adjustments to both equipment and cleaning processes. Often, equipment designed for use with solvents is incompatible with aqueous technologies. Drying is also often an area that requires modification.

If you are converting from a high-alkaline chemistry to Mirachem, you can reasonably expect to need to make some minor adjustments to equipment, but probably not process.

Parts Washer / Tank Construction

Aqueous cleaners work best when used with equipment constructed of stainless steel, polyethylene or polypropylene. Carbon steel or mild steel construction will eventually corrode, most often due to water vapor being generated above the liquid level by heated equipment.

Corrosion Management Practices

Mirachem 500 contains an advanced corrosion protection package that has been developed to be effective in virtually any industrial application. However, as with any water-based technology, in some cases additional attention to corrosion management may be appropriate.

Solvent cleaners typically “flash dry”, that is, they evaporate (*volatilize*) very quickly in air. Unlike these solvents, aqueous cleaners usually dry at about the same rate as water. Under some circumstances, this increased dry time can lead to potential corrosion issues and may require adjustments to process.

Mirachem 500 also cleans to a film-free surface. Most solvents and high-alkaline formulations leave behind a film or residue which often “accidentally” acts as a corrosion barrier. Users of Mirachem 500 should be aware that unpainted surfaces are cleaned to “bare metal”. In cases of extreme environmental or storage conditions, additional corrosion protection consideration may be appropriate.

Dilution Maintenance

Aqueous cleaners are usually sold as a concentrate, designed to be diluted with water before use. The degree of dilution appropriate for your application will be determined based on four points:

1. Cost - The more dilute, the less it costs to use the product
2. Method of Application - Example: spray & wipe vs. parts washer

3. Product Performance - How fast the product cleans
4. Corrosion Management - The more dilute, the less efficient the corrosion protection

Once the proper dilution level is determined, you will want to exercise some care to maintain this dilution level to ensure consistent, efficient and cost effective cleaning. Mirachem recommends that product be prepared for use at the proper dilution ratio outside of the use container, using some method to ensure accuracy. Estimating is not a recommended dilution method.

Your cleaning application may also be sensitive to changes in dilution. This is common in parts washing applications. Fluid in a heated parts washer will evaporate, and will also “drag out” (small amounts of fluid still left on or in parts) in the course of normal use. For this reason, we again recommend that make-up fluid be pre-diluted before being added to the parts washer.

Does using an environmentally safe cleaning product require a sacrifice in performance?

Not if you choose your product wisely.

Many companies are taking advantage of the current market awareness surrounding environmental issues and cashing in by promoting “green” products. This is especially true in the category of environmentally safe cleaners and chemistries. However, just because a product is marketed as safe, does not mean that it delivers on its claims.

In many markets, regulatory agencies have put restrictions in place that prohibit the use of older chemistries that have been accepted in the industry for many years. Often, vendors will promote their compliance with these regulations as a selling point. Again, the making of these claims does not prove their validity, and even if a product does meet a regulatory requirement, this is no assurance that it will perform in a given application.

It is for these reasons that a stigma has developed concerning environmentally safe products. It is a common perception, especially where cleaners are concerned, that “green” products don’t work. While there is certainly cause to question every marketing claim made, there are reputable companies that offer quality products, and they deserve a fair opportunity to take these products to market. In addition, there are numerous benefits that can be realized from adopting a strategic objective of improving the overall environmental safety of any operation.

While it may be necessary to make adjustments in process to achieve satisfactory results with safer technologies, it should not be necessary to impact production efficiency. As with all purchasing decisions, the best course of action is to fully evaluate products to your specific requirements *before* you purchase them.

**MATERIALS SUCCESSFULLY REPLACED WITH
MIRACHEM 500 CLEANER / DEGREASER CONCENTRATE**

Mirachem 500 Cleaner / Degreaser Concentrate has successfully replaced a variety of cleaning materials including:³

Aquaworks		
Aquaworks G		
Aquaworks G-2		
Aquaworks Cold		
Aquaworks MM-Dip		
Aquaworks MM -Recycle		
Aquaworks Mpc		
Armakleen M-Aero-NS		
Armakleen M-HP		
Armakleen M-GP		
Armakleen M-Aero		

Chlorinated Hydrocarbon Solvents	Hurrisafe 8015 Exterior Aircraft Cleaner	
Castrol Super Clean	Hurrisafe 9030 Original Formula Concentrate	Seawash 8
Crystal Simple Green [®]	Hurrisafe 9450 Parts Washer Concentrate	Simple Green [®]
Daraclean 200	Ipax GREEN UNIKLEEN	
Daraclean 238	Naptha	Simple Green [®] Extreme
Daraclean 257	Ozzy Juice (SW-1)	
Daraclean 282 GF		
Gemtek Safecare [®] Aircraft	Penair HD-1, HD-3, HD-4	
Gemtek [®] SC-1000 Solvent		
Halogenated Solvents	Penetone [®] Citrikleen HD	Stoddard Solvent
		ZEP [®] Recalculating Detergent

PRODUCT AVAILABILITY, PURCHASING & LOGISTICS DATA

Product Availability

Mirachem 500 is available in the following package configurations:

Mirachem 500 Cleaner / Degreaser Concentrate

- 12 count, 32 oz trigger-bottle case
- 4 count, 1-gallon bottle case
- 5-gallon pail
- 55-gallon drum
- 275-gallon tote
- Bulk tanker (1,500 gallons and up)

Mirachem 500 Foaming Aerosol Cleaner / Degreaser¹

- 3 count, 18 oz Aerosol can case
- 12 count, 18 oz Aerosol can case

Purchasing Information

PART #	PACKAGE DESCRIPTION	FREIGHT STATUS	STOCK STATUS
<i>Mirachem 500 Cleaner / Degreaser Concentrate</i>			
0101-3300032012	32 oz Trigger - 12 Count Case	Delivered	Stocked at selected distribution points. (Delivery in 2-6 transit days; average = 3.)
0101-3300128004	1 Gal - 4 Count Case	Delivered	Stocked at selected distribution points. (Delivery in 2-6 transit days; average = 3.)
0101-3300640001	5 Gal Pail	Delivered	Stocked at selected distribution points. (Delivery in 2-6 transit days; average = 3.)
0101-3300055001	55 Gal Drum - Each	Freight Added	Stocked at all distribution points. (Delivery in 1-4 transit days; average = 2.)
0101-3300275001	275 Gal Tote - Each	Freight Added	Stocked at all distribution points. (Delivery in 1-4 transit days; average = 2.)
0101-3300BLK001	Bulk Tanker (Min 1,000 gallons)	Freight Added	Non-Stocked item. (Special delivery and transit standards apply)
<i>Mirachem 500 Foaming Aerosol Cleaner / Degreaser</i>			
0101-6000018003	18 oz Aerosol - 3 Count Case	Delivered	Stocked at selected distribution points. (Delivery in 2-6 transit days; average = 3.)
0101-6000018012	18 oz Aerosol - 12 Count Case	Delivered	Stocked at all distribution points. (Delivery in 1-4 transit days; average = 2.)

Logistics Data

ITEM	WEIGHT (lbs)	LENGTH (in)	WIDTH (in)	HEIGHT (in)	FULL PALLET CUBE	PIECES / FULL PALLET	FULL PALLET LENGTH	FULL PALLET WIDTH	FULL PALLET HEIGHT	FREIGHT CLASS	NMFC
Trigger Case	32	15	12	12	58.89	36	48	40	53	55	48580-3
Gallon Case	39	15	9	13	63.3	48	48	40	57	55	48580-3
Pail	47	18	18	28	57.22	42	48	48	51.5	55	48580-3
Drum	500	24	24	36	43.6	4	48	48	34.5	55	48580-3
Tote	2,500	48	40	42	46.66	1	48	40	42	55	48580-3
Bulk	9.2 lbs/gal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	55	48580-3
Aerosol 3-count	5	9	8	4	N/A	N/A	N/A	N/A	N/A	55 ² ORM-D	48580-3
Aerosol 12 count	18	11	9	10	73.33	72	48	48	55	55 ² ORM-D	48580-3

OEM APPROVALS, INDUSTRY & MATERIAL COMPATIBILITY

General Material Compatibility

Mirachem 500 has been formulated to be compatible with surfaces, equipment and materials found in an industrial or commercial environment. Mirachem has prepared a comprehensive collection of test data concerning material compatibility and specific industry and regulatory standards on this product. Please contact Mirachem for additional information on any specific questions you may have.

Aviation / Aerospace Compatibility

The following chart summarizes results of independent laboratory tests or manufacturer screening conducted to evaluate Mirachem 500's conformity with several compatibility standards commonly required in the aviation/aerospace industry.

TEST DESCRIPTION	RESULTS
Exterior and General Cleaners Boeing D6-17487 Revision J	Sandwich Corrosion Test Conforms Acrylic Crazing Test Conforms Paint Softening Test Conforms Hydrogen Embrittlement Test Conforms
Exterior and General Cleaners Boeing D6-17487 Revision K	Sandwich Corrosion Test Conforms Acrylic Crazing Test Conforms Paint Softening Test Conforms Hydrogen Embrittlement Test Conforms
General Purpose Cleaner Douglas Aircraft Company Customer Service Document CSD#1	Effect on Painted Surfaces Test Conforms Residue Test Conforms Sandwich Corrosion Conforms Stress Crazing of Acrylic Plastics Conforms Immersion Corrosion Test Conforms Cadmium Removal Conforms Hydrogen Embrittlement Conforms
Effect of Cleaning Agents on Aircraft Engine Materials - ARP 1755B Stock Loss Test Method	See report for details. Conforms
Effect of Cleaning Agents on Aircraft Engine Materials - ARP 1755B	AZ92 Magnesium Conforms

Stock Loss Test Method		
Stress Corrosion of Titanium Alloys by Aircraft Maintenance Materials (ASTM F 945)	No surface reaction or cracking No cracking observed	Conforms Conforms
Hot Corrosion Testing of Standard Gas Turbine Engine Alloys PWA 36604 Appendix A Pratt & Whitney	AMS 4037 Aluminum AMS 4375 Aluminum AMS 6359 Fe AMS 5508 Fe AMS 5536 Hastalloy X AMS 5544 Ni Waspalloy AMS 5608 Co Haynes 188	Conforms Conforms Conforms Conforms Conforms Conforms Conforms
Determination of the Effect of Chemicals Cleaners on Non-Metallic (O-ring) Materials Pratt & Whitney	AMS 7267 (Silicone Rubber) AMS 7271 (Butadiene-Acrylonitrile) AMS 7273 (Fluorosilicone) AMS 7276 (Fluorocarbon)	Conforms Conforms Conforms Conforms
Hot Dip Galvanizing Corrosion (per Mil-C-87973B)	Type III (Undiluted) Type I, II, & IV (1:9)	Conforms Conforms
Cleaner for Aircraft Exterior Surfaces Water-Miscible, Pressure-Spraying Type AMS 1526B	Sandwich Corrosion Total Immersion Corrosion Low-Embrittling Cadmium Plate Hydrogen Embrittlement Flash Point Effect on Transparent Acrylics Effect on Painted Surfaces Effect on Unpainted Surfaces Storage Stability Performance Quality	Conforms Conforms Conforms Conforms Conforms Conforms Conforms Conforms Conforms Cert. by Mfg. Conforms
Special Immersion Corrosion (per ASTM F 483)	Insignificant Weight Loss	Conforms
Effect on Neoprene Seals	No change was noted in hardness of the seal No swelling was noted.	
Effect on Non-Metallics O-Ring Material Test	No Evidence of swelling or degradation. AMS 7267 (Silicone Rubber) AMS 7271 (Butadiene-Acrylonitrile) AMS 7273 (Fluorosilicone) AMS 7276 (Fluorocarbon)	
Mechanical Hydrogen Embrittlement Testing of Plating Process and Aircraft Maintenance Chemicals (per ASTM F 519-93, Type 1C)	No failures. Conforms	
Mechanical Hydrogen Embrittlement Testing of Plating Process and Aircraft Maintenance Chemicals (per ASTM F 519-93, Type 1A)	No failures. Conforms	
Mechanical Hydrogen Embrittlement Testing of Plating Process and Aircraft Maintenance Chemicals (per ASTM F 519-93, Type 1A)	No failures. Conforms	
General Electric Aircraft Engine Specification S-421 GEAE S-421 Titanium Hardware Cleaner	Approved	
Pratt & Whitney - SPOP209	Approved – SPMC195	
Honeywell (Allied Signal) Consumables Section, Standard Practices Manual Report Number 256.2 – Highlights Group Item No: 0751	Approved – Oil, grease carbon and other organic deposits.	

Agriculture / Food Processing

- NSF International (*formerly USDA Guidelines for Obtaining Authorization of Compounds to be Used in Meat and Poultry Plants*)
 - o [NSF Registration No. 128742](#)
 - A8 – Degreaser / Carbon Remover
 - B2 – Laundry Product

- C1 – Inedible Product Areas

Paints & Finishes

- Alcan Composites
[Alucobond® / Megaflon® surfaces](#) – recommended cleaning product.
- Mitsubishi Chemical FP America
[ALPOLIC® Coil Plated Panels](#) – recommended cleaning product

Underground Storage Tank (UST) Cleaning

- ExxonMobil UST removal – required product

US Department of Defense (USDOD) / Defense Logistics Information Service (DLIS) / NATO Supplier Information

- **DLIS Central Contractor Registry (CCR):** Mirachem Corporation
- **Commercial And Government Entity (CAGE) Code:** 63247
- **National Stock Number (NSN)**
Mirachem 500 Cleaner / Degreaser Concentrate 7930-01-392-8911
Mirachem 500 Foaming Aerosol Cleaner / Degreaser 6850L400715F

US Small Business Administration (SBA)

- Qualifying SBA Small Business as defined in [Title 13 of the Code of Federal Regulations, part 121](#).

COST EFFECTIVENESS

Business and Tax Incentives

Many states, local jurisdictions, and insurance carriers are introducing tax credits or other incentives for switching to clean air and/or environmentally responsible technologies and processes.

Concentration

Mirachem 500 is a concentrated product that is designed to be diluted with water. By diluting, you pay only for the product that you actually need.

When comparing the cost of cleaning products, remember to evaluate the cost *per use gallon*, as opposed to the actual purchase price. Mirachem offers a Cost Evaluation Worksheet to assist in this process.

Equipment & Material Life

High alkaline and other hazardous cleaners can cause undue wear and tear on cleaned materials, as well as the equipment used in the process. Mirachem 500 is compatible with multiple metals, elastomers, polymers and synthetics, including aluminum, natural and synthetic rubber, buna, EPDM, neoprene, BR, nitrile, Hypalon and viton, and can help extend material life. This results in cost savings.

Flexibility

The ability to dilute Mirachem 500 makes this product flexible for uses throughout your facility. With use dilutions of full strength to 10:1, and higher, and usefulness in applications ranging from floor cleaning to repair and maintenance, Mirachem 500 may be the only cleaner / degreaser you need, reducing the cost of multiple vendors and larger inventories.

Manifesting

Mirachem 500 does not constitute a [Federal RCRA waste under 40CFR261.3](#) and does not require manifesting. This is not the case when disposing of used solvent material. Additions to the fluid, such as contaminants being removed in the

cleaning process, may alter this waste profile. We recommend that users have a sample of their waste evaluated with a Toxicity Characteristic Leaching Procedure (TCLP) and compare with their local or regional standards.

In the State of California, most Mirachem 500 waste streams are considered a “Non-RCRA” or “California Only” waste as defined in the [California Health & Safety Code, Chapter 6.5, Section 25117](#) and may require manifesting.

Personal Protective Equipment (PPE)

Because of Mirachem’s advanced worker safety properties, the need for PPE may be eliminated or reduced, which reduces the cost of the overall cleaning process.

Property & Liability Insurance

Eliminating hazardous and/or flammable products from your inventory by replacing them with Mirachem 500 may help reduce your operation’s risk characteristics and costs of insurance and risk management.

Recyclable

For those customers who have on site waste treatment/minimization, or have volume to warrant the establishment of a fluid management system, Mirachem 500 is recyclable and/or treatable.

Right to Know Compliance

Mirachem 500 does not contain any component materials that require disclosure under the [OSHA Hazard Communication Standard \(29CFR 1910.120\)](#) or [US Environmental Protection Agency’s \(EPA\) Emergency Planning and Community Right-To-Know Act \(EPCRA\)](#) regulations under [SARA Title III Section 311-312 - 42USC9601](#). Therefore, the costs of manpower and record keeping associated with this area of compliance may be reduced or eliminated.

Toxic Substances Control Act (TSCA)

All components of this product are in compliance with the [US Toxic Substances Control Act \(TSCA - 15USC2602\)](#).

Transportation Costs

Mirachem 500 ships as USDOT Class 55, NMFC Compound Cleaning Fluid, NOI 48580-3, which allows for less expensive shipping charges than hazardous products.

Waste Disposal

Mirachem 500 is a non-hazardous product as defined in [40CFR 261.33 – US Environmental Protection Agency’s \(EPA\) regulations concerning the Identification And Listing Of Hazardous Waste](#), that can usually be disposed of at a lesser cost per gallon than solvent waste. In addition, minimizing your waste stream(s) may lower your hazardous generator status, and reduce the cost and hassle of regulatory code compliance and record keeping. See the Mirachem Technical Release on this subject or review the MSDS.

Worker Compensation Insurance & Claims

Due to the increased worker safety benefits offered by Mirachem 500, worker exposure to several risks associated with traditional chemistries may be reduced or eliminated. This may have a positive effect on worker’s compensation insurance rates and claims.

Worker Training & Administration

Since Mirachem 500 is non-hazardous under [OSHA Hazard Communication Standard \(29CFR 1910.120\)](#), use of the product requires less worker training and less waste management administration.

Warranty / Guarantee

All Mirachem products carry our manufacturer’s warranty, and customer satisfaction is guaranteed. For details, see our Warranty and Guarantee Policy.

ENVIRONMENTAL RESPONSIBILITY

Mirachem 500 is an environmentally responsible product. This helps you meet air, water and pollution standards of EPA and local environmental authorities.

Air Quality

Mirachem 500 is a low VOC, non-hazardous, non-photochemically reactive product that is acceptable for use under the most stringent air quality regulations in the United States. Some air quality authority specifics are included below.

Bay Area Air Quality Management District (BAAQMD), CA

[Regulation 8 – Organic Compounds, Rule 16 – Solvent Cleaning Operations](#)

Product used at 1:1 dilution or greater meets 50 g/L

Maricopa County, AZ Air Quality Department

[Regulation III, Control of Air Contaminants, Rule 331 – Solvent Cleaning](#)

Product used at full strength qualifies as a conforming solvent as defined in Section 207, and as a low VOC cleaner as defined in Section 291.

[Regulation III, Control of Air Contaminants, Rule 337 – Graphic Arts](#)

Full Strength use complies with the requirements of Section 303 – Standards – Cleaning Solutions.

Sacramento Metropolitan Air Quality Management District (SMAQMD), CA

[Rule 466 – Solvent Cleaning & Rule 454- Degreasing Operations](#)

Product used at 1:1 dilution or greater meets 50 g/L requirement.

San Diego County, CA Air Quality Pollution Control District

[Rule 67.6 – Solvent Cleaning Operations](#)

Product used at full strength meets Vapor Pressure requirements.

[Rule 67.16 – Graphic Arts Operations](#)

Product used at full strength meets VOC requirements.

San Joaquin Air Quality Management District (SJAQMD), CA

[Rule 4662 – Organic Solvent Degreasing Operations](#)

- Product used at 1:1 dilution or greater meets 50 g/L requirement.

- [Certified Clean Air Solvent](#)

South Coast Air Quality Management District (SCAQMD), CA

[Rule 1171- Solvent Cleaning Operations](#) and [Rule 1122 – Solvent Degreasers](#)

- Product used at 2:1 dilution or greater meets 25 g/L requirements.

- [Certified Clean Air Solvent](#).

**For This
Application**

**To Meet The
Requirements of**

Use Product At
(Mirachem 500:water)

Parts Washing
General Cleaning

Rules 1171 and 1122
Rule 1171

2:1 dilution or greater
2:1 dilution or greater

Ventura County, CA Air Pollution Control District (VCAPCD)

[Rule 76.G.6 Federally Enforceable Limits on Potential to Emit](#)

Product used at 1:1 dilution or greater meets 50 g/L requirement.

Product used at 2:1 dilution or greater meets 25 g/L requirement.

Biodegradability

Mirachem 500 has been tested for Aerobic Aquatic Biodegradation ([EPA Method 796.3100](#)). The percentage of biodegradation in 28 days is 85.8%.

Community Right to Know Compliance

Mirachem 500 is not a hazardous chemical under [OSHA Hazard Communication Standard \(29CFR 1910.120\)](#) and therefore is not covered by [Superfund Amendments and Reauthorization Act \(SARA\) Title III Section 311-312 \(42 U.S.C.9601\)](#). Mirachem 500 does not contain a chemical, which is listed in Section 313 at or above de minimis concentrations.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

Releases of this product to air, land, or water are not reportable to the [National Response Center](#) under the [Comprehensive Environmental Response, Compensation, and Liability Act \(CERCLA - 42 USC. s/s 9601 - 9628\)](#) or to state and local emergency planning committees under the [Superfund Amendments and Reauthorization Act \(SARA\)](#), section 304.

European Union EINECS

All materials in Mirachem 500's formulation are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS). This product is not a hazardous preparation according to the EC-Directive 88/379/EEC.

Global Warming Compounds (GWC)

Mirachem 500 contains no Global Warming Compounds (GWC) according to the [United Nations Framework Convention on Climate Change's 1997 Kyoto Protocols \(Kyoto Protocols\)](#).

Japan ENCS

All materials in this formulation are listed in Japan's Inventory of "Existing and New Chemical Substances"(ENCS).

Korean ECL

All materials in Mirachem 500 are listed in the Korean "Existing Chemicals List" (ECL). No material in this product is made from animal by-products.

NFPA (National Fire Prevention Association) 704 Standards System (NFPA Hazard Diamond)

Health = 1 Flammability = 0 Reactivity = 0 Special = 0

Non-Solvent Product

Mirachem 500 is a proprietary non-hazardous aqueous detergent blend, that does not contain any chelating ingredients such as EDTA, phosphates, petroleum distillates, or chlorinated (halogenated) or hydrocarbon solvents.

NPCA-HMIS (National Paint & Coatings Association – Hazardous Materials Information System) Rating

Health = 1 Flammability = 0 Reactivity = 0 Protective Equipment = None

Ozone Depleting Compounds

Mirachem 500 contains no Ozone Depleting Compounds (ODC) according to the [United Nations Environment Programme - Ozone Secretariat's Montreal Protocol on Substances That Deplete The Ozone Layer \(Montreal Protocols\)](#).

Philippines PICCS

All materials used Mirachem 500's formulation are listed in the "Philippines Inventory of Chemicals and Chemical Substances" (PICCS).

US Clean Air Act

Under the 1990 amendments to the [US Clean Air Act \(42USC7401\)](#), Mirachem 500 Cleaner / Degreaser Concentrate contains no materials that:

- Are restricted under the [National Ambient Air Quality Standards \(NAAQS\)](#).
- Are restricted or phased out under the [National Emissions Standards for Hazardous Air Pollutants \(NESHAPS\)](#).

- Require reduction under EPA rules for the [Synthetic Organic Chemical Manufacturing Industry \(40CFR63, Table 1 to subpart F\)](#), the so-called SOCOMI chemicals.
- Are found on EPA's [List of Regulated Toxic Substances and Threshold Quantities for Accidental Release Prevention](#) under the [Clean Air Act Risk Management Program \(RMP\) / Accidental Release Prevention, EPA Rule 112\(r\)](#).

US Department of Transportation (USDOT) Classification

This product is not regulated by the [USDOT](#) under [49CFR172](#).

US Federal Hazard Classification

This product is not a hazardous material as defined in the [Federal Hazardous Materials Transportation Law, \(49USC5101\)](#)

Volatile Organic Compounds (VOC's) / Vapor Pressure

The VOC content of Mirachem 500 is:

- 80 grams/liter (0.67 pounds/gallon) at full strength
 - 40 g/L (0.33 pounds/gallon) at 1:1 dilution
 - 25 g/L (0.21 pounds/gallon) at 2:1 dilution
- with a partial composite vapor pressure at 20°C of less than 1mm Hg (Mercury).

Volatile Organic Hazardous Air Pollutants

Mirachem 500 contains no Volatile Organic Hazardous Air Pollutants (VOHAP's) as defined by the US [Environmental Protection Agency \(EPA\)](#) in [40CFR63](#).

Toxicity

None of the components in this material are considered toxic as defined by:

- [International Agency for Research on Cancer \(IARC\)](#)
- [US Department of Health and Human Services's National Toxicology Program \(NTP\)](#)
- [Occupational Safety & Health Administration \(OSHA\)](#)
- [American Conference of Governmental Industrial Hygienists \(ACGIH\)](#)

Worker Right to Know Compliance

Mirachem 500 does not contain any component materials that require disclosure under the [OSHA Hazard Communication Standard \(29CFR 1910.120\)](#) or [US Environmental Protection Agency's \(EPA\) Emergency Planning and Community Right-To-Know Act \(EPCRA\)](#) regulations of the [Superfund Amendments and Reauthorization Act \(SARA\) Title III Section 311-312 \(42 U.S.C.9601\)](#).

WORKER SAFETY

Australian Worker Safety Regulations

Mirachem 500 is not classified as hazardous according to the criteria of Worksafe Australia. Mirachem has reviewed Australia's List of Hazardous Substances and Australia's Standard of the Uniform Scheduling of Drugs and Poisons and determined that no ingredient in this product is present in either listing. We have also verified with NICNAS at the Australian National Occupational Health & Safety Commission (NOHSC) that all of the components in this formulation are listed in the Australian Inventory of Chemical Substances (AICS) and that no notification will be necessary under the Industrial Chemicals (Notification and Assessment) Act of 1989.

California Proposition 65

This product does not contain any material currently listed by the state of California as a chemical known to cause cancer or known to have reproductive toxicity under [Proposition 65 - California Health and Safety Code section 25249.5](#).

Canadian Workplace Hazardous Materials Information System

Mirachem 500 is non-controlled under WHMIS. All of the components in this product are listed in the Canadian "Domestic Substances List" (DSL).

Carcinogenicity

None of the components in this material are listed as a carcinogen by:

- [International Agency for Research on Cancer \(IARC\)](#)
- [US Department of Health and Human Services's National Toxicology Program \(NTP\)](#)
- [Occupational Safety & Health Administration \(OSHA\)](#)
- [American Conference of Governmental Industrial Hygienists \(ACGIH\)](#)

Hazard Identification

Eye Contact: May cause mild temporary irritation.

Skin Contact: Prolonged or repeated exposure may cause mild irritation.

Inhalation: No adverse effects expected.

Ingestion: No adverse health effects are anticipated to occur as a result of acute ingestion.

Mild pH

Concentrated Mirachem 500 has a pH of 8.7- 9.5. Water has a pH of 7 (neutral) on the pH scale of 0-14. In general, products with a pH higher than 12.5 or less than 2 are corrosive. The pH of Mirachem 500 will help avoid potential [Occupational Safety & Health Administration \(OSHA\)](#) compliance issues.

NPCA-HMIS (National Paint & Coatings Association – Hazardous Materials Information System) Rating

Health = 1 Flammability = 0 Reactivity = 0 Protective Equipment = None

OSHA Hazard Standard

Mirachem 500 is considered non-hazardous under the [OSHA Hazard Communication Standard \(29CFR 1910.120\)](#).

Personal Protective Equipment

Mirachem 500 has a mild pH and does not give off harmful vapors. Much of the Personal Protective Equipment (PPE) required for use of traditional chemistries is not needed when using Mirachem 500. As when using any cleaning product, Mirachem recommends using good personal hygiene and work practices.

Please consult the [Mirachem 500 Material Safety Data Sheet \(MSDS\)](#) for more information. Refer to our Product Comparison table to see how other products compare in HMIS rating and safety precautions.

OTHER TECHNICAL INFORMATION

FOOTNOTES

¹ Not all details in this Product Information Guide are relevant to Mirachem 500 Foaming Aerosol Cleaner / Degreaser. For specific details on this product, please refer to its Product Information Guide.

² Special shipping regulations apply. Refer to the Mirachem 500 Aerosol Cleaner / Degreaser Product Information Guide for further details.

³ Registered trademarks are the property of their respective holders.