



Paratene Product Technical Information

Information regarding the
application of Paratene
product blends available for
Chemical Cleaning

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Paratene[®] Product Data Sheets

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Degreasers

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Paratene[®] D707

Degreaser Concentrate

Description

Paratene[®] D707 is a specialized blend of surfactants and solvents designed to aid in the removal of hydrocarbon fouling from process equipment and vessels. Paratene[®] D707 is a water-based alternative to solvent based degreasers, and was created to be a low toxicity, non-flammable and effective on even heavy hydrocarbon fouling. Paratene[®] D707 is a concentrate and should be diluted prior to use.

Features and Advantages

- ❑ Excellent water wetting and solids carrying capacity.
- ❑ Non-emulsifying – simplifies disposal, and some solutions may be re-used.
- ❑ Water based.
- ❑ Non-flammable.
- ❑ Low toxicity.
- ❑ Alkaline solution – reduces the release of H₂S and the creation of polythionic acids.
Non-damaging to coatings, paint, nylon and rubber.
- ❑ Contains no inorganic phosphates
- ❑ Excellent Freeze thaw stability

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.04 at 15.5 °C
Flash Point	None
pH	10.1
Freeze Point	-10°C
Ionic Character	Anionic

Methods of Application

Paratene[®] D707 should be mixed with water, or alkaline solutions at concentrations ranging from 10 - 50 percent to form a cleaning solution. It can be applied using standard cleaning industry techniques including spraying, cascading, or circulating.

The cleaning solution is typically applied at temperatures ranging from 5 to 90°C and circulated for several hours until all of the hydrocarbons have been removed and carried in the cleaning solution. Circulation is then stopped and the cleaning solution stands idle to allow the hydrocarbons and solids to separate out of the solution. The hydrocarbons can be recovered and the remaining solution can be sent to a facility's water treatment unit, to a disposal facility, or in some circumstances re-used.

Paratene[®] D707 is an excellent cleaning agent for use with industrial ultrasonic baths. It must be diluted 1:1 with water prior to application to ensure best results. It improves penetration and removal on even the hardest hydrocarbon deposits and its low toxicity and moderate pH makes it compatible with most metals including aluminum.

Where required, Paratene[®] D707 can be combined with other Paratene[®] products to satisfy site-specific degreasing challenges. Consult with the Clean Harbors Research laboratory to determine the best application for your problem.

Safety and Handling

Paratene[®] D707 is an alkaline solution which may cause irritation to eyes and skin. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] D708

Water-Based Degreaser Concentrate and Coke Descalant

Description

Paratene[®] D708 is a specialized blend of surfactants and solvents designed to aid in the removal of hydrocarbon fouling from process equipment and vessels. Paratene[®] D708 is a water-based alternative to solvent based degreasers, and was created to be a low toxicity, non-flammable and effective on even heavy hydrocarbon fouling. Paratene[®] D708 is a concentrate and should be diluted prior to use. Paratene[®] D708 contains special Wetting agents to improve the removal of coke, carbon, and soot from metal surfaces.

Features and Advantages

- ❑ **Excellent water wetting and solids carrying capacity.**
- ❑ **Non-emulsifying – simplifies disposal, and some solutions may be re-used.**
- ❑ **Water based.**
- ❑ **Non-flammable.**
- ❑ **Low toxicity.**
- ❑ **Alkaline solution – reduces the release of H₂S and the creation of polythionic acids.**
Non-damaging to coatings, paint, nylon and rubber.
- ❑ **Contains no inorganic phosphates**
- ❑ **Excellent Freeze thaw stability**
- ❑ **Excellent wetting and removal of soot, coke and carbon from metal and ceramic surfaces.**

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.04 at 15.5 °C
Flash Point	None
pH	10.1
Freeze Point	-10°C
Ionic Character	Anionic

Methods of Application

Paratene[®] D708 should be mixed with water, or alkaline solutions at concentrations ranging from 10 - 50 percent to form a cleaning solution. It can be applied using standard cleaning industry techniques including spraying, cascading, or circulating.

The cleaning solution is typically applied at temperatures ranging from 5 to 90°C and circulated for several hours until all of the hydrocarbons have been removed and carried in the cleaning solution. Circulation is then stopped and the cleaning solution stands idle to allow the hydrocarbons and solids to separate out of the solution. The hydrocarbons can be recovered and the remaining solution can be sent to a facility's water treatment unit, to a disposal facility, or in some circumstances re-used.

Paratene[®] D708 is an excellent cleaning agent for use with industrial ultrasonic baths. It must be diluted 1:1 with water prior to application to ensure best results. It improves penetration and removal on even the hardest hydrocarbon deposits and its low toxicity and moderate pH makes it compatible with most metals including aluminum.

Where required, Paratene[®] D708 can be combined with other Paratene[®] products to satisfy site-specific degreasing challenges. Consult with the Clean Harbors laboratory to determine the best application for your problem.

Safety and Handling

Paratene[®] D708 is an alkaline solution which may cause irritation to eyes and skin. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] D728

Water Based Degreaser

Description

Paratene[®] D728 is a specialized blend of surfactants designed to aid in the removal of hydrocarbon fouling from process equipment and vessels. Paratene[®] D728 is a water-based alternative to solvent based degreasers, and was created to be a low toxicity, non-flammable and effective on even heavy hydrocarbon fouling.

Features and Advantages

- ❑ Excellent water wetting and solids carrying capacity.
 - ❑ Non-emulsifying – simplifies disposal, and some solutions may be re-used.
 - ❑ Water based.
 - ❑ Non-flammable.
 - ❑ Low toxicity.
 - ❑ Alkaline solution – reduces the release of H₂S and the creation of polythionic acids.
- Non-damaging to coatings, paint, nylon and rubber.

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.03 at 15.5 °C
Flash Point	None
pH	10.1
Freeze Point	-5°C
Ionic Character	Nonionic

Methods of Application

Paratene[®] D728 can be mixed with water, or alkaline solutions at concentrations ranging from 2 to 10 percent to form a cleaning solution. It can be applied using standard cleaning industry techniques including spraying, cascading, or circulating.

The cleaning solution is typically applied at temperatures ranging from 5 to 90°C and circulated for several hours until all of the hydrocarbons have been removed and carried in the cleaning solution. Circulation is then stopped and the cleaning solution stands idle to allow the hydrocarbons and solids to separate out of the solution. The hydrocarbons can be recovered and the remaining solution can be sent to a facility's water treatment unit, to a disposal facility, or in some circumstances re-used.

Paratene[®] D728 may also be applied undiluted to heavily fouled surfaces and allowed to soak for 5 – 30 minutes and then rinsed with water.

Paratene[®] D728 can also be used to adsorb and carry hydrocarbons. When added to an emission scrubber system, D728 can carry up to 5% by volume of hydrocarbon liquids such as benzene, toluene, xylene, terpene, and hexane. Lighter liquid hydrocarbons are too volatile to be emulsified in Paratene[®] D728.

Paratene[®] D728 is an excellent cleaning agent for use with industrial ultrasonic baths. It improves penetration and removal on even the hardest hydrocarbon deposits and its low toxicity and moderate pH makes it compatible with most metals including aluminum.

Where required, Paratene[®] D728 can be combined with other Paratene[®] products to satisfy site-specific degreasing challenges. Consult with the Clean Harbors laboratory to determine the best application for your problem.

Safety and Handling

Paratene[®] D728 contains trisodium phosphate which may cause irritation to eyes and skin. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] D734-OC

Water Based Degreaser and Odor Control

Description

Paratene[®] D734-OC is a concentrated blend of solvents and surfactants designed to aid in the removal of hydrocarbons and hydrocarbon vapour. Paratene[®] D734-OC binds and encapsulates hydrocarbons and rapidly reduces LEL levels in tanks and vessels. Paratene[®] D734-OC also contains compounds to neutralize both mercaptans and hydrogen sulfide.

Features and Advantages

- ❑ Excellent water wetting and solids carrying capacity.
- ❑ Non-emulsifying – simplifies disposal, and some solutions may be re-used.
- ❑ Water based.
- ❑ Non-flammable.
- ❑ Low toxicity.
- ❑ Alkaline solution – reduces the release of H₂S and the creation of polythionic acids.
- ❑ Non-damaging to coatings, paint, nylon and rubber.
- ❑ Exceptional Vapour Control
- ❑ Odour Neutralizing Properties: will react with mercaptans and H₂S

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.03 at 15.5 °C
Flash Point	None
pH	11.4
Freeze Point	-5°C
Ionic Character	Nonionic

Methods of Application

Paratene[®] D734-OC can be mixed with water, or alkaline solutions at concentrations ranging from 2 to 10 percent to form a cleaning solution. It can be applied by spraying or misting to remove hydrocarbon deposits from the surfaces of tanks or vessels.

The cleaning solution is typically applied at temperatures ranging from 5 to 90°C (lower temperatures are better for odour and LEL control) and circulated or sprayed for several hours until all of the hydrocarbons have been removed and carried in the cleaning solution. Circulation is then stopped and the vessel can be pumped out.

Paratene[®] D734-OC may be applied undiluted to heavily fouled surfaces and allowed to soak for 5 – 30 minutes and then rinsed with water.

Where required, Paratene[®] D734-OC can be combined with other Paratene[®] products to satisfy site-specific degreasing challenges. Consult with the Clean Harbors Research laboratory to determine the best application for your problem.

Safety and Handling

Paratene[®] D734-OC contains sodium metasilicate which may cause irritation to eyes and skin. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] D731

Solvent Based Emulsion Degreaser

Description

Paratene[®] D731 is a specialized blend of solvents and surfactants designed to aid in the removal of hydrocarbon fouling from process equipment and vessels. Paratene[®] D731 acts to both dissolve and emulsify hydrocarbon deposits, and can be used to eliminate the presence of light hydrocarbons which are a source of high LELs.

Features and Advantages

- ❑ Superior water wetting and degreasing chemical.
- ❑ Hydrocarbons easily separate out of recovery and disposal
- ❑ Aggressive product promoting efficient removal of hydrocarbons from fouled surfaces
- ❑ Contains no product detrimental to refinery operations
- ❑ Compatible with a broad range of pH media including water, acids and alkaline solutions

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	0.94 at 15.5 °C
Flash Point	63°C
pH	7.5-8.0 @ 2% concentration
Freeze Point	<-35°C
Ionic Character	Nonionic

Methods of Application

Paratene[®] D731 can be mixed with water, acids or alkaline solutions at concentrations ranging from 2 to 10 percent to form a cleaning solution. Depending on the application, the cleaning solution may be heated to 50-90°C and circulated for several hours until all the hydrocarbons have been removed, and dissolved into the cleaning solution. Circulation is then stopped, and the cleaning solution stands idle to allow the hydrocarbons to separate out of the solution. The hydrocarbons can then be recovered and the remaining solution can be sent to the facility's water treatment unit or to a disposal facility.

Where required, Paratene[®] D731 can be combined with other Paratene[®] products to satisfy site-specific degreasing challenges. Consult with the Clean Harbors Research laboratory to determine the best application for your problem.

Safety and Handling

Paratene[®] D731 is a combustible liquid. Avoid contact with heat and open flames. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] D740

Degreasing Surfactant

Description

Paratene[®] D740 is a blend of low toxicity surfactants in water intended to aid in the removal of hydrocarbon contaminants from process equipment. Paratene[®] D740 will also act as mild oxidizing agent to aid in the removal of hydrogen sulfide and pyrophoric iron compounds.

Paratene[®] D740 water wets metal surfaces and loosely emulsifies hydrocarbons improving their removal by hot water or steam from process equipment and tanks.

Features and Advantages

- ❑ High Temperature performance
- ❑ Low Toxicity
- ❑ Non flammable
- ❑ Water Soluble
- ❑ High performance
- ❑ Acts as scavenger for H₂S and pyrophoric Iron compounds

Typical Physical Properties

Appearance	Clear liquid
Specific Gravity	1.01
Flash Point	>95°C
pH	8 – 8.5
Freeze Point	0°C
Ionic Character	Nonionic

Methods of Application

Paratene[®] D740 can be added to hot water or steam at concentrations between 0.5 and 3%.

The amount used depends on the composition and amount of hydrocarbon to be removed. When added to steam Paratene[®] D740 should be first diluted in water and added to the flowing steam as a mist. Adding the product to the boiler feed water is ineffective.

Paratene[®] D740 is compatible with alkaline additives such as trisodium phosphate and sodium hydroxide. These should be added in strongly sour systems to improve the removal of hydrogen sulfide.

Paratene[®] D740 is also compatible with some mineral and organic acid solutions such as Hydrochloric acid, Paratene[®] M390, acetic and formic acid.

Paratene[®] D740 can also be combined with H₂S scavengers to substantially improve the removal of hydrogen sulphide.

Safety and Handling

Paratene[®] D740 is non-flammable. It will cause irritation to the eyes and skin. Refer to the material safety data sheet for more detailed information

Paratene[®] D742

Vapour Phase Micro Emulsion Degreaser

Description

Paratene[®] D742 is a blend of low toxicity surfactants and solvents in water intended to aid in the removal of hydrocarbon contaminants from process equipment.

Paratene[®] D742 water wets metal surfaces and emulsifies hydrocarbons improving their removal by hot water or steam from process equipment and tanks. The solvents in Paratene[®] D742 aid in the efficient removal of heavy hydrocarbons that cannot be removed by the action of steam or surfactants alone. Paratene[®] D742 contains no inorganic components and is completely soluble in water.

Features and Advantages

- ❑ High Temperature performance
- ❑ Low Toxicity
- ❑ Non flammable
- ❑ Water Soluble
- ❑ High performance

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.04 at 15.5 °C
Flash Point	None
pH	10.1
Freeze Point	-10°C
Ionic Character	Anionic

Methods of Application

Paratene[®] D742 can be added to hot water or steam at concentrations between 0.5 and 3%.

The amount used depends on the composition and amount of hydrocarbon to be removed. When added to steam Paratene[®] D742 should be first diluted in water and added to the flowing steam as a mist. Adding the product to the boiler feed water is ineffective.

Paratene[®] D742 can be added to alkaline solutions at rates up to 20% to improve removal of hydrocarbons.

Safety and Handling

Paratene[®] D742 is non-flammable. It will cause irritation to the eyes and skin. Refer to the material safety data sheet for more detailed information

Corrosion Inhibitors

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Paratene[®] I207

Hydrochloric Acid Corrosion Inhibitor

Description

Paratene[®] I207 is a revolutionary product for the corrosion inhibition of hydrochloric acid. Typical acid inhibitors contain highly toxic products such as propargyl alcohol and alkyl pyridine quaternary amines. Paratene[®] I207 contains none of these materials making it less dangerous to handle and apply. Yet Paratene[®] I207 provides excellent corrosion inhibition properties.

Features and Advantages

- ❑ High Temperature performance
- ❑ Contains no acetylenic alcohols, nonyl phenol ethoxylates or quaternary amines.
- ❑ Low flammability
- ❑ Highly Dispersible
- ❑ High performance

Typical Physical Properties

Appearance	amber
Specific Gravity	1.05 at 15.5 °C
Flash Point	17.2°C
pH	2.4
Freeze Point	-5°C
Ionic Character	Nonionic

Methods of Application

Paratene[®] I207 is added to hydrochloric acid at various concentrations depending on the concentration of the acid, the temperature of the system and the expected contact time of the acid with the metal surface.

The recommended concentrations for use are given in the tables below. The table given refers to the rates required for carbon steel. For other materials such as Cr-13 or coiled tubing please call the Clean Harbors Calgary Research Laboratory.

Safety and Handling

Paratene[®] I207 contains formic acid and is moderately flammable. Care should be taken in applying the product to prevent exposure to eyes and skin. Refer to the material safety data sheet for more information.

Table 1 Recommended Inhibitor Concentrations

Acid Concentration	Temperature Range (°C)				
	20-50	51-70	71-90	91-100	101-120
%					
5	0.1	0.2	0.2	0.3	0.5
10	0.1	0.2	0.2	0.5	1.0
15	0.1	0.2	0.4	0.5	1.0
28	0.2	0.4	0.6	1.0	2.0

Paratene[®] I209

Acetylenic Alcohol Free HCl Corrosion Inhibitor

Description

Paratene[®] I209 is a cost effective product for the corrosion inhibition of Hydrochloric Acid. Paratene[®] I209 provides excellent corrosion protection without the use of propargyl alcohol, quaternary amines, aromatic solvents, or alkylphenol ethoxylates, giving Paratene[®] I209 a much lower overall toxicity than found in common HCl corrosion inhibitors.

Features and Advantages

- ❑ Propargyl Alcohol Free
- ❑ Excellent Performance in HCl from 2-15%
- ❑ Good Temperature Range, 20°C to 120°C
- ❑ Highly Dispersable
- ❑ Nonylphenol Free

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.046 at 15.5 °C
Flash Point	12.7 °
pH	3.4 @ 5%
Freeze Point	-5°C
Ionic Character	Non-Ionic

Methods of Application

Paratene[®] I209 is intended as an additive to Hydrochloric Acid. The amount of Paratene[®] I209 required depends on the temperature, contact time, metal alloy, acid concentration, other additives, and metal ions in solution.

The recommended concentration of inhibitor for temperatures up to 80°C, for hydrochloric acid concentration up to 10%, and carbon steel base metal is 0.25%. For other conditions, please consult the Clean Harbors Research lab to obtain a recommendation.

Safety and Handling

Paratene[®] I209 is a flammable corrosive liquid; avoid heat, open flames, and other sources of ignition. Refer to the material safety data sheet for more detailed information

Paratene[®] I210

Low Toxicity Acid Corrosion Inhibitor for HCl

Description

Paratene[®] I210 is a blend of surfactants and inhibitors designed to inhibit the corrosion of carbon steel by hydrochloric acid. Paratene[®] I210 is free of many of the very toxic compounds found in the previous generation of acid inhibitors.

Paratene[®] I210 is acid soluble and does not have problems of separation or “oiling out” seen in some inhibitors. It is highly effective for chemical cleaning operations.

Features and Advantages

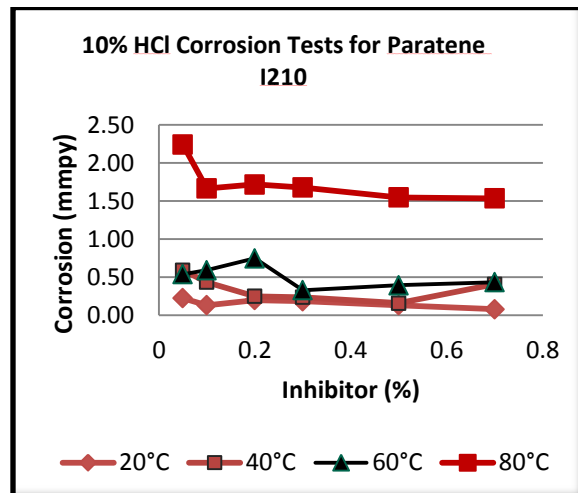
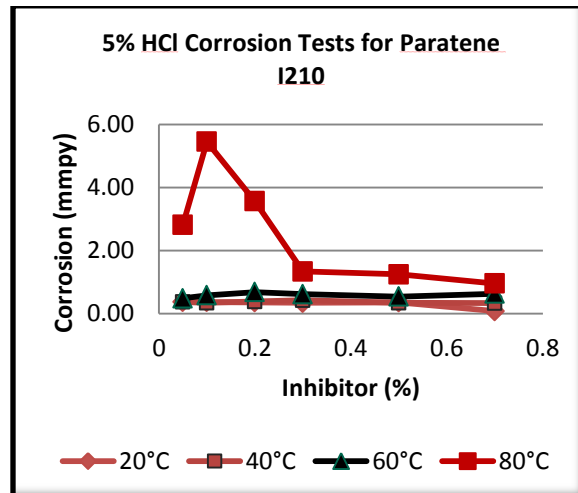
- ❑ High Temperature performance
- ❑ Low Toxicity
- ❑ Acid soluble
- ❑ High efficiency

Typical Physical Properties

Appearance	Yellow to Water White Liquid
Specific Gravity	1.04 at 15.5 °C
Flash Point	55°C
pH	3.4
Freeze Point	-10°C
Ionic Character	anionic

Methods of Application

Paratene[®] I210 is intended for use as an additive to hydrochloric acid. Paratene[®] I210 give functional control of acid corrosion in HCl up to 28% HCl and 150°C (when combined with intensifiers. Corrosion Rates for Paratene[®] I210 are shown in the graphs below:



For HCl concentrations of less than 10% HCl and temperatures below 70°C the recommended inhibitor concentration is 0.2%. Contact the Clean Harbors Research laboratory for other specific conditions.

Safety and Handling

Paratene[®] I210 is flammable and corrosive. Care should be taken when handled in the concentrated form. Refer to the material safety data sheet for more information.

Hydrogen Sulfide Scavengers

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Website: www.paratene.com



Paratene[®] M310

Hydrogen Sulfide Scavenger – Water Soluble

Description

Paratene[®] M310 is a unique hydrogen sulfide scavenger for use in industrial cleaning operations. Paratene[®] M310 reacts rapidly with hydrogen sulfide to form water-soluble by-products. Paratene[®] M310 is unaffected by CO₂ and works efficiently even at low temperatures

Features and Advantages

- ❑ **Fast**
- ❑ **Effective**
- ❑ **Irreversible**
- ❑ **Compatible with common Cleaning solutions**

Typical Physical Properties

Appearance	Viscous Liquid
Specific Gravity	1.16
Flash Point	>200°C
pH	10 -12
Freeze Point	-40°C
Ionic Character	Cationic

Methods of Application

Paratene[®] M310 has a theoretical limit of 1 kg of H₂S reacted per 1 – 1.5 kg of product applied. Unlike reactions with alkaline agents like caustic or amines, the reaction is irreversible and the H₂S cannot be released from the cleaning solution when the pH is neutral or acidic.

Paratene[®] M310 lends itself to a variety of different applications, it may be added by itself in an aqueous solution to remove H₂S residue. It may be added in combination with cleaners and degreasers, such as Paratene[®] D731 or Paratene[®] D740 in caustic or neutral solutions. A typical concentration for Paratene[®] M310 in these applications is from 1 – 2%. Some reactions of the Paratene[®] M310 with iron sulfides have been observed in laboratory studies.

Paratene[®] M310 can also be used as a scrubbing solution to remove H₂S from acid cleaning of sour systems. It can be added directly to the caustic in a typical scrubber or used by itself at concentrations as high as 50%. The benefit of using Paratene[®] M310 for this application is the irreversibility of the product. When the caustic is neutralized for disposal there is no possibility of H₂S release.

Safety and Handling

Paratene[®] M310 is corrosive to eyes and skin and should be handled with care. Consult the Material safety datasheet for further information.

Paratene[®] M320

Hydrogen Sulfide Scavenger – Water Soluble

Description

Paratene[®] M320 is a blend of alkaline salts and a unique hydrogen sulfide scavenger for use as hydrogen sulfide scrubber solution. Paratene[®] M320 reacts rapidly with hydrogen sulfide to form water-soluble by-products. Paratene[®] M320 is only partially affected by CO₂ and works efficiently even at low temperatures.

Features and Advantages

- ❑ **Fast**
- ❑ **Effective**
- ❑ **Irreversible**
- ❑ **Compatible with common Cleaning solutions**
- ❑ **Reacts with H₂S and mercaptans**
- ❑ **No objectionable odors**
- ❑ **Non-corrosive to most materials**
- ❑ **Will not form precipitates with H₂S or CO₂**

Typical Physical Properties

Appearance	Viscous Liquid
Specific Gravity	1.12
Flash Point	>200°C
pH	14
Freeze Point	-40°C
Ionic Character	Cationic

Methods of Application

Paratene[®] M320 is applied by filling a sealed vessel and sparging the gas stream to be scrubbed through the solution. The ability of the solution to strip the unwanted components is a function of the contact time, temperature, and bubble size. Under high flow rate conditions, the vessel should be arranged so that the path of the gas is bent or distorted by the use of baffles.

Paratene[®] M320 has a theoretical limit of 94.0 g of H₂S reacted per liter of product applied. The blend is designed to react irreversibly with the first 50% of the H₂S the solution is exposed to. Unlike reactions with alkaline agents like caustic or amines, the reaction is irreversible and the H₂S cannot be released from the cleaning solution when the pH is neutral or acidic.

The remaining 50% of the solution capacity allows the Paratene[®] M320 to provide a safe buffer range to prevent over-run of irreversible reaction.

The effectiveness of the solution can be monitored by observing the solution pH. Due to the formulation of Paratene[®] M320 once the pH begins to drop it is time to replace the solution, and a pH of 8.5 or below indicates that the solution is spent.

Safety and Handling

Paratene[®] M320 is corrosive to eyes and skin and should be handled with care. Consult the Material safety datasheet for further information.

Paratene[®] M311

Hydrogen Sulfide Scavenger – Oil Based

Description

Paratene[®] M311 is a unique hydrogen sulfide scavenger for use in oilfield operations. Paratene[®] M311 reacts rapidly with hydrogen sulfide to form oil-soluble by-products. Paratene[®] M311 is unaffected by CO₂ and works efficiently even at low temperatures.

Features and Advantages

- ❑ Fast
- ❑ Effective
- ❑ Irreversible
- ❑ Oil Soluble
- ❑ Highly Active

Typical Physical Properties

Appearance	Viscous liquid
Specific Gravity	0.80
Flash Point	> 60°C
pH	10-12
Freeze Point	-40°C
Ionic Character	Cationic

Methods of Application

Paratene[®] M311 has a theoretical limit of 1.0 kg of H₂S reacted per 1.5 kg of product applied. Unlike reactions with alkaline agents such as caustic or amines, the reaction is irreversible and the H₂S cannot be released from the solution when the pH is neutral or acidic.

Paratene[®] M311 can be added to oil or condensate. It may also be added directly to a gas stream at a rate of 0.06 litres to 0.08 litres per MMSCF per ppm of H₂S.

Paratene[®] M311 can be diluted with diesel fuel, aromatic solvents, kerosene or low molecular weight alcohols.

It may also be added by continuous injection into gas gathering lines, transmission lines, or refinery vapour overheads.

Safety and Handling

Paratene[®] M311 is corrosive to the eyes and skin and should be handled with care. Refer to the material safety data sheet for more information.

Dispersants

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Website: www.paratene.com



Paratene[®] S620

Wax Dispersant

Description

Paratene[®] S620 is a solvent based blend of anionic and non-ionic surfactants designed to disperse sludge deposits found within crude oil storage vessels, pipelines and well tubulars.

Paratene[®] S620, when mixed and circulated with hydrocarbon sludge, will aid in converting the sludge back into a marketable crude oil.

Typical Sludge deposits are composed of a mixture of waxes, asphaltenes, water, light hydrocarbons and solids. Paratene[®] S620 acts to disrupt the paraffin micelles that constitute the major source of viscosity for most typical hydrocarbon sludges.

Paratene[®] S620 is produced in a highly concentrated form and is typically applied at a rate in the order of 500 ppm based on the sludge volume.

Features and Advantages

- ❑ Permits the recovery of crude oil from tank bottom sludges
- ❑ Acts as a pour point inhibitor for some waxy crudes
- ❑ Promotes solid settling and demulsification
- ❑ Contains no products detrimental to refinery operations

Typical Physical Properties

Appearance	Yellow liquid
Specific Gravity	0.8 @ 15.5°C

Flash Point	65°C
pH	Not Applicable
Freeze Point	-20°C
Ionic Character	Anionic

Methods of Application

Paratene[®] S620 is typically applied at concentrations of 250 – 1000 ppm. It can be added directly to the sludge, but it is more typically used in combination with a diluent such as light naphtha, crude oil or aromatic solvent.

The resulting mixture is circulated for several hours until all the sludge has been dispersed. The circulation is then stopped and the solids and water is allowed to settle. The clean crude oil can then be pumped out of the vessel.

Paratene[®] S620 can be combined with other Paratene[®] products depending on the composition of the deposit to achieve maximum effectiveness. Consult with the Clean Harbors Research laboratory to determine the best application for your product.

Safety and Handling

Paratene[®] S620 is a combustible liquid. Avoid contact with heat and open flames. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information.

Paratene[®] S627

Asphaltene Dispersant

Description

Paratene[®] S627 is a unique blend of surfactants and solvents designed to aid in the dispersion of asphaltenes and asphaltic materials into crude oil or aliphatic solvents. Paratene[®] S627 acts to improve the stability of these mixtures and as well as reduce their pour points.

Paratene[®] S627 may be used in treatment of heavy oil residues, visbreaker bottoms and heavy oil to improve the mixing speed and final viscosity when blending these materials with light naphthas or other cutter stocks.

Features and Advantages

- ❑ Permits the recovery of Crude oil from tank Bottom Sludges
- ❑ Contains no products detrimental to refinery operations.
- ❑ Aids in the removal of asphaltic deposits.
- ❑ Lowers the Viscosity of Asphaltene containing materials.
- ❑ Improves the pour point of heavy oils.

Typical Physical Properties

Appearance	Dark Amber Liquid
Specific Gravity	0.9 at 15.5 °C
Flash Point	25°C
pH	Not applicable
Freeze Point	-5°C
Ionic Character	Anionic

Methods of Application

Paratene[®] S627 is typically applied at concentrations of 250 – 10,000 ppm. It can be added directly to the sludge, but it is more typically used in combination with a diluent such as a light naphtha, crude oil or aromatic solvent.

The resulting mixture is circulated for several hours until all of the sludge has been dispersed. The circulation is then stopped and the solids and water allowed to settle. The clean crude can then be pumped out of the vessel.

Paratene[®] S627 can be combined with other Paratene products depending on composition of the deposit to achieve maximum effectiveness. Consult with the Clean Harbors Research laboratory to determine the best application for you problem.

Safety and Handling

Paratene[®] S627 is a Flammable liquid. Avoid contact with heat and open flames. Always handle with gloves and eye protection. Paratene[®] S627 contains strong solvents, which may have an adverse effect on some polymeric materials, particularly polyvinyl chlorides. Refer to the material safety data sheet for more detailed information

Specialty Chemicals

Clean Harbors Energy & Industrial Services Corp.
15715 121A Avenue Edmonton, AB T5V 1B1
Website: www.paratene.com



Paratene[®] M390

Organic Acid

Description

Paratene[®] M390 is a highly concentrated (40% active) liquid organic acid. Paratene[®] M390 is a strong acid and can be used in place of hydrochloric or sulphuric acid for cleaning and dip tank applications.

Paratene[®] M390 can be used in cleaning process equipment, acid pickling, oilwell stimulation or other forms of equipment clean out.

Features and Advantages

- ❑ Low Toxicity
- ❑ Contains No Chlorides – Safe on Stainless steel
- ❑ High performance
- ❑ Highly Concentrated
- ❑ Biodegradable
- ❑ Versatile
- ❑ High solubility limits for cations

Typical Physical Properties

Appearance	Clear liquid
Specific Gravity	1.25
Flash Point	None
pH	0
Freeze Point	-45°C
Ionic Character	Nonionic

Methods of Application

Paratene[™] M390 should be diluted before use. Concentrations of 5% - 10% are recommended for removing scale and oxides. The product should be heated to obtain the best reaction rate.

Paratene[®] M390 contains a corrosion inhibitor that provides excellent corrosion protection up to 80°C at any dilution of Paratene[®] M390. No additional inhibitor is required. Paratene[®] M390 has low corrosion rates on a variety of metals and alloys and has been found to be compatible with aluminum, galvanized iron and steel as well as stainless and duplex steel.

Paratene[®] M390 can be combined with other products such as Paratene[®] M301 or M302 to control ferric ion corrosion and improve iron oxide removal. Paratene[™] M310 to control the release of hydrogen sulfide or with Thiourea to aid in the removal of copper.

M390 has been tested and found effective in removing magnetite (Fe₃O₄), hematite (Fe₂O₃) calcium carbonates (CaCO₃), iron sulfide (FeS) and dolomite (CaMg(CO₃)₂). Other scales and deposits should be tested prior to use.

Safety and Handling

Paratene[®] M390 contains a strong acid and is corrosive to the eyes and skin, avoid prolonged contact and inhalation of mists or fogs. Refer to the material safety data sheet for more detailed information

Paratene[®] SHP

Stabilized Hydrogen Peroxide

Description

Paratene[®] SHP is a blend of stabilizers and hydrogen peroxide designed for the effective removal of iron sulfides polysulfides and oxidizable organic matter. The stabilization in SHP prevents the generation of oxygen and reduces the problems of uncontrolled decomposition.

Features and Advantages

- ❑ Stable at all temperatures
- ❑ Removes Iron sulfides and polysulfides
- ❑ Does not generate H₂S
- ❑ Reactive at low temperatures
- ❑ Safe on Aluminum, carbon steel and stainless steel

Typical Physical Properties

Appearance	Clear liquid
Specific Gravity	1.03 at 15.5 °C
Flash Point	None
pH	3.5
Freeze Point	0°C
Ionic Character	Non-ionic

Methods of Application

Paratene[®] SHP is applied by filling the system and then heating it to 40°C. The system should be monitored to determine the progress of the reaction. Following the application of SHP the system can be flushed with a dilute acid to remove precipitated iron compounds. Please consult with the Clean Harbors Laboratory for more information.

Safety and Handling

Paratene[®] SHP is a strong oxidizing agent and can cause burns to eyes and skin. Refer to the material safety data sheet for more detailed information

Paratene[®] S700

Sulphur Solvent

Description

Paratene[®] S700 is a blend of solvents, chelants and surfactants designed to dissolve and disperse elemental sulphur. Paratene[®] S700 converts elemental sulfur into water soluble salts that will not re-precipitate. The wetting agent aids with the rate of sulphur removal and also permits the removal of any hydrocarbon that may have co-deposited with the sulphur.

Features and Advantages

- ❑ **Fast**
- ❑ **Effective**
- ❑ **Non-Flammable**
- ❑ **Simple to Apply**
- ❑ **No Objectionable Odours**

Typical Physical Properties

Appearance	Viscous Liquid
Odour	None
Specific Gravity	1.21 at 15.5 °C
Flash Point	>100°C
pH	14
Freeze Point	-14°C
Ionic Character	Non-ionic

Methods of Application

Paratene[®] S700 is designed to be used undiluted for the removal of sulphur deposits. The system should be filled with Paratene[®] S700 and then heated to between 60°C and 80°C. The solution should then be allowed to soak or circulated for 4 – 6 hours while maintaining the temperature above 60°C. Higher temperature will give a better reaction rate.

The system should be flushed with water to flush out any undissolved deposits. In some cases multiple applications may be required due to flow restrictions. Paratene[®] S700 will dissolve a maximum of 150 kg of sulphur per cubic meter of product.

Safety and Handling

Paratene[®] S700 contains potassium hydroxide and is very corrosive to eyes and skin. Proper protective equipment and eye protection must be worn when handling the product. Refer to the material safety data sheet for more detailed information.

Paratene[®] S701

Sulphur Solvent

Description

Paratene[®] S701 is blend of alkaline reactants, chelants and surfactants designed to react with silicates deposits and remove those deposits from process equipment. Paratene[®] S701 will react with most silicates but is particularly effective on those containing calcium, magnesium or aluminum. Paratene[®] S701 contains no fluorides.

Features and Advantages

- ❑ **Fast**
- ❑ **Effective**
- ❑ **Non-Flammable**
- ❑ **Simple to Apply**

Typical Physical Properties

Appearance	Viscous Liquid
Odour	Amine
Specific Gravity	1.21
Flash Point	>100°C
pH	14
Freeze Point	-14°C
Ionic Character	Non-Ionic

Methods of Application

Silicates

Paratene[®] S701 is intended to be applied neat with no dilution. The contaminated system can be cascaded, circulated or soaked to remove silicate based deposits. To get best results the solution should be heated to 70 – 80°C with a contact time of 3 – 4 hours. It may be necessary to combine the product with and acid treatment when the scale is mixed.

Elemental Sulphur

Paratene[®] S701 will remove elemental sulphur when reacted at temperatures between 60 and 90°C.

Safety and Handling

Paratene[®] S701 contains Sodium hydroxide and is very corrosive to eyes and skin. Proper protective equipment and eye protection must be worn when handling the product. Consult the Material safety datasheet for further information.

Paratene[®] M500

Amorphous Silicate Dissolver

Description

Paratene[®] M500 is a blend of solvents, chelating agents and surfactants designed to dissolve colloidal and amorphous silica deposits from steam systems.

Paratene[®] M500 reacts directly with the Silica dissolving it. The product reacts even in the presence of divalent cations such as calcium and magnesium that block the use of HF.

Features and Advantages

- ❑ **Good scale dissolution at temperature**
- ❑ **Biodegradeable**
- ❑ **Dissolves Amorphous silicate**
- ❑ **Non-Flammable**

Typical Physical Properties

Appearance	Amber liquid
Specific Gravity	1.13
Flash Point	None
pH	14
Freeze Point	<-20°C
Ionic Character	Cationic

Methods of Application

Paratene[®] M500 should be applied undiluted. It needs to be heated to at least 40°C and allowed to contact the deposit for at least 6 hours preferably 12 – 24 hours.

It can be neutralized after use to form a non-toxic solution.

Safety and Handling

Paratene[®] M500 is Corrosive. It will cause burns to the eyes and skin. Refer to the material safety data sheet for more detailed information

Paratene[®] R800

Paint and PVC Remover

Description

Paratene[®] R800 is a solvent based product intended for the removal of paint and PVC based plastics from metal surfaces. Paratene[®] R800 is applied neat in a tank or ultrasonic cleaning bath. Parts are cleaned by suspending or soaking in the bath for 1-3 hours, followed by a water rinse.

Features and Advantages

- ❑ Contains no Chlorinated Solvents
- ❑ Very High Flash Point
- ❑ Non-Toxic
- ❑ Biodegradable

Typical Physical Properties

Appearance	Yellow liquid
Specific Gravity	1.03 @ 15.5°C
Flash Point	91°C
pH	Not Applicable
Freeze Point	-40°C
Ionic Character	Cationic

Methods of Application

Paratene[®] R800 is designed to be used undiluted. It can be applied to the painted surface directly by spray and soaking or by immersion into an ultrasonic cleaning bath or heated vat.

The contact time required varies and can be accelerated by increasing the temperature. Ideally a temperature of 50-60°C will allow for the most rapid removal. The parts can then be rinsed with water and allowed to air dry.

Paratene[®] R800 does not saturate and can be used for months without loss of activity.

Safety and Handling

Paratene[®] R800 is a combustible liquid. Avoid contact with heat and open flames. Always handle with gloves and eye protection. Refer to the material safety data sheet for more detailed information

Additives

Paratene[®] M50

Oxidizing agent – Paratene[®] D728 additive

Description

Paratene[®] M50 is a blend of hydrogen peroxide and stabilizing agents intended for use as an additive to Paratene[®] D728 or Paratene[®] D742.

Paratene[®] M50 is intended to be added at a concentration of 2 – 5% and will add an effective concentration of 1 – 2%. Solutions of Paratene[®] D728 are stable and can be stored for up to 6 months without significant loss of peroxide activity

Features and Advantages

- ❑ **Low Toxicity**
- ❑ **Contains No Chlorides – Safe on Stainless steel**
- ❑ **High performance**
- ❑ **Highly Concentrated**
- ❑ **Biodegradable**

Typical Physical Properties

Appearance	Clear liquid
Specific Gravity	1.15
Flash Point	None
pH	2.5
Freeze Point	-5°C
Ionic Character	Cationic

Methods of Application

Paratene[®] M50 is intended for use in combination with Paratene[®] D728 or Paratene[®] D742. It can be added at concentrations of between 2 and 5%.

For best results it's recommended that the solution be heated to a minimum of 40°C.

Safety and Handling

Paratene[®] M50 contains hydrogen peroxide, a strong oxidizing agent. It is not flammable but will support the combustion of flammable materials. Refer to the material safety data sheet for more information.