

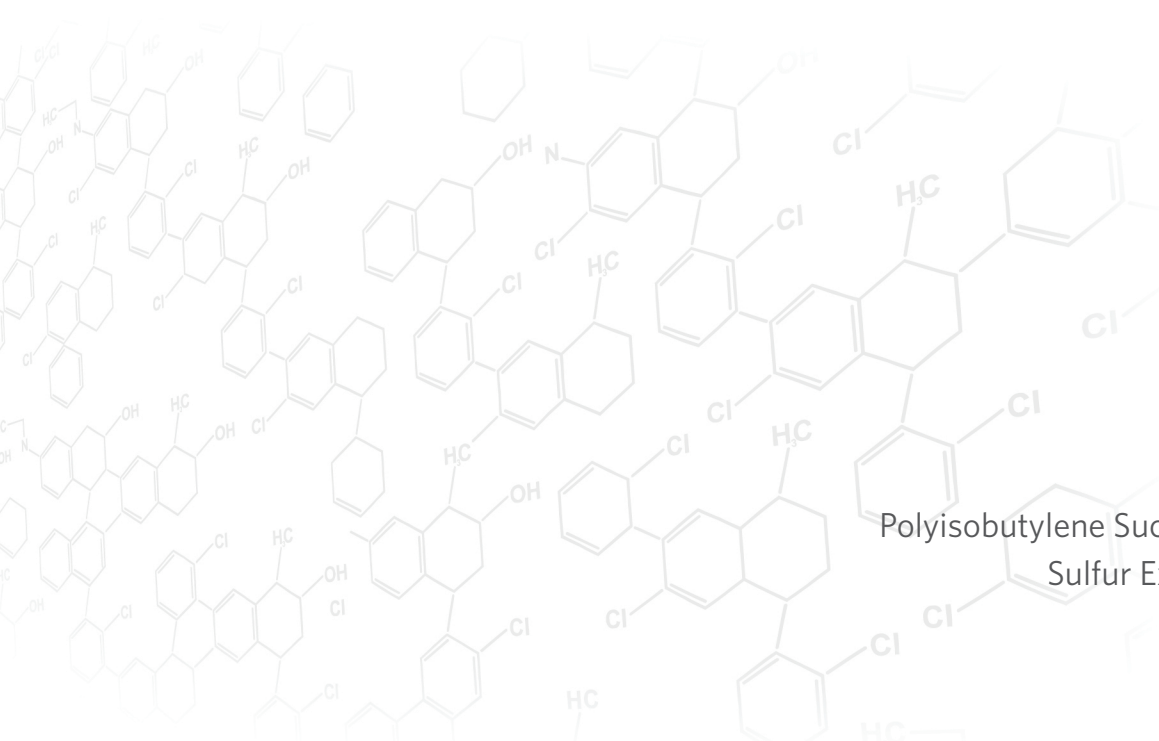
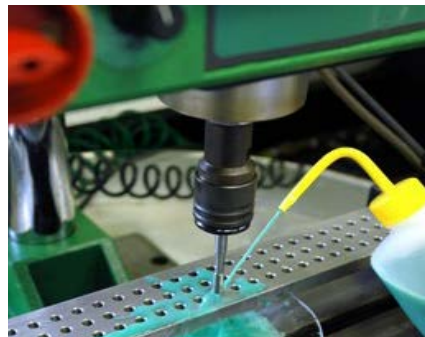


We don't simply sell products...*we sell solutions.*™



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Metalworking Specialties



- Corrosion Inhibitors
- Rust Preventatives
- Polymeric Esters
- Phosphate Esters
- Lubricants
- Block Polymers
- Wetting Agents
- Specialty Emulsifiers
- Additive Packages
- Specialty Additives
- Polyisobutylene Succinic Anhydride Additives
- Sulfur Extreme Pressure Additives

www.pcc-chemax.com

Phone: 864-277-7000

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COMPANY OVERVIEW

PCC Chemax was founded in 1973 to develop specialty surfactant additives for specific markets and individual customer needs. We specialize in servicing the industrial compounders in Metalworking, Metal Finishing, Plastics, and Oil Field Industries. Our products are used as processing aids, property enhancers, and chemical additives in the manufacture of a wide variety of industrial products. As a service oriented company, we focus on product development and cooperative research with our customers. The research, product development, and laboratory personnel of our customers become our partners in the development of unique surfactant additives to meet their specific and specialized needs.

CAPABILITIES

The Metals group at PCC Chemax offers extensive technical support in addressing formulation and functional challenges as well as introducing new materials that include corrosion inhibitors, specialty emulsifiers, and lubricants for our metalworking customers. Our laboratories provide support for the metalworking, metal cleaning, plating, polymer, and oil field industries by developing additives that can withstand harsh processing conditions while maintaining functionality.

The research and development team are supported by a state of the art analytical lab which expands our ability to offer solutions to the most daunting problems currently faced by our industry.

This scientific creativity has enabled PCC Chemax to position itself as a specialty supplier to the most discriminating customers. PCC Chemax has a reputation for providing value added products which solve the most challenging performance issues.

Located in Piedmont, SC, our research labs are comprised of synthesis and application capabilities for each industry we serve.

In 2006, Chemax was acquired by PCC SE, headquartered in Duisburg, Germany. The acquisition connected our company with PCC Rokita, in Brzeg Dolny, Poland, whose alkoxylation capabilities enhance our global synergies to supply our customers around the world.

This brochure is offered as a starting point. It presents some of the more standard commercial products, many of which are currently maintained in inventory. Additions to the product line and potential variations of listed products make the information presented only representative. We invite your inquiries for specific requirements of related homologues. Please see our website for the most complete list of products and corresponding information.



Piedmont, SC



Duisburg, Germany

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PCC Chemax offers a series of corrosion inhibitors including oil and water soluble materials. These products offer ease of formulation by being predominantly low foaming and hard water stable.

Maxhib 1041

An amine borate corrosion inhibitor designed as an additive for use in metalworking applications for cutting, grinding, and anti-rust preparations.

Maxhib 1061

An amine borate corrosion inhibitor designed as an additive for use in metalworking applications for cutting fluids and anti staining preparations. It offers non-staining protection on non-ferrous metals and provides a medium foam profile.

Maxhib AA-0223

An oil and solvent soluble, water dispersible aluminum anti-stain additive. Designed to give excellent anti-staining protection on many grades of aluminum alloys. This product also provides lubrication properties to metalworking water extendable fluids as well as protects the aluminum when a high pH is desired. The product does not contain DEA or nitrites.

Maxhib AB-400

A borate containing compound designed to be used as a corrosion inhibitor in metalworking fluids and industrial cleaners. Low foaming with good lubrication properties. Recommended for ferrous metals. Does not contain DEA, contains nitrite, phosphate. Contains 4% Boron.

Maxhib AB-450

A borate containing compound with 5.6% boron, designed to be used as a corrosion inhibitor in metalworking fluids and industrial cleaners. Low foaming with good lubrication properties. Recommended for ferrous metals. Does not contain DEA, nitrite, phosphate.

Maxhib AB-550

A borate containing compound with 6.5% boron designed to be used as a corrosion inhibitor in metalworking fluids and industrial cleaners. Low foaming with good lubrication properties. Recommended for ferrous metals. Does not contain DEA, nitrite, phosphate.

Maxhib ABC-5050

A dual-purpose corrosion inhibitor for the formulation of cutting fluids, drawing compounds and industrial cleaners. Offers excellent protection on a variety of substrates and reduces the tacky film usually associated with borate based inhibitors. Does not contain DEA, nitrite, phosphate.

Maxhib AC-790

An amine carboxylate blend recommended for use in synthetic and water extendable cutting fluids and drawing compounds. It is low foaming, nitrite, phosphate and chlorine free. Contains DEA.

Maxhib AC-999

A synthetic corrosion inhibitor designed for use in metalworking fluids.

It offers protection on ferrous and non-ferrous substrates. Maxhib AC-999 does not contain MEA, DEA, phosphates, boric acid, P-Tert-Butyl Benzoic Acid or nitrite and is low foaming.

Maxhib AC-5000

An amine carboxylate based corrosion inhibitor designed for use in metalworking fluids and industrial cleaners. It offers protection on copper and ferrous substrates. Does not contain DEA, phosphates or nitrite. A low foaming product with good lubrication properties. Does not leave a residual tacky film.

Maxhib AC-5080

Designed for use in cutting fluids, drawing compounds and industrial cleaners. Safe for galvanized metal, aluminum and copper. Low foaming with good lubrication properties. Does not contain DEA, nitrite or phosphate. Assists as a demulsifier in synthetic formulas.

Maxhib AC-5144

Designed for use in cutting fluids, drawing compounds and industrial cleaners. This product is safe on all metals, especially aluminum and its alloys. Low foaming, provides lubricity properties. Does not contain DEA, nitrite or phosphate.

Maxhib AC-5105

A water soluble highly effective, synthetic corrosion inhibitor designed for cast iron and steel alloys metalworking. It does not affect aluminum alloys and other non-ferrous materials. It does not contain MEA, DEA, or TEA. Maxhib AC-5105 is virtually non-foaming and has moderate stability in hard water and can also be used in as a corrosion inhibitor in industrial cleaners.

Maxhib AC-5480

An amine carboxylate based inhibitor designed for use in metalworking fluids and industrial cleaners. It offers protection on ferrous substrates. Because of its solubility in glycols and water this product is a great choice when formulating synthetic water extendable fluids. Contains DEA.

Maxhib AC-8150

Recommended for use as a corrosion inhibitor in industrial cleaners and metalworking fluids. Very effective in alkaline cleaners and rinse solutions where residual protections is required. Recommended over standard amine carboxylates when corrosion inhibition of copper and other yellow metals is required.

Maxhib AC-9000

An amine carboxylate based corrosion inhibitor designed for use in metalworking fluids and industrial cleaners. It offers protection on copper and ferrous substrates. Does not contain MEA, Boric Acid, DEA, phosphates or nitrite. Provides a low foam with good lubrication properties. Does not leave a residual tacky film.

Maxhib OA-3090

Recommended for use in metalworking fluids and industrial cleaners when vapor phase corrosion inhibition is required. Low foaming product that does not contain DEA, sodium nitrite, phosphate.

Maxhib OS-4300

An oil and solvent soluble corrosion inhibitor that, when diluted, is recommended as an inhibitor in acid atmospheres. It is recommended for slushing oils and straight oil metalworking products. Provides good humidity protection from a thin waxy film coating the product leaves on the substrate.

Maxhib OS-4401

A solvent and oil soluble corrosion inhibitor that is recommended as a general-purpose rust inhibitor when a thin film coating is needed on the

part for short term protection. It is used in slushing oils, metalworking formulations and metal cleaning products. This product contains Barium.

Maxhib PT-10T

Low foaming, water soluble corrosion inhibitor for ferrous and non-ferrous substrates when used alone or with a combination of other PCC Chemax additives. This product contains phosphorous providing extreme pressure properties and lubrication to metalworking water extendable fluids. DEA free.

Maxhib ST-2220

A balanced blend of powdered ingredients designed to replace sodium nitrite in industrial cleaners. Provides protection on ferrous and non-ferrous metals. This material is water soluble and does not contain DEA or nitrites.

Maxhib	FLUID TYPES					CORROSION INHIBITION				PROCESS	
	Straight Oil	Soluble Oil	Semi-Synthetic	Synthetic	Cleaner	Ferrous	Aluminum	Copper	Galvanize	Low Foam	Hard Water Stable
1041			■	■	■	■				■	■
1061			■	■	■	■	■				■
AB-400		■	■			■				■	■
AB-450		■	■	■	■	■				■	■
AB-550		■	■	■	■	■				■	■
ABC-5050		■	■	■	■	■	■		■	■	■
AC-790			■	■		■				■	■
AC-999		■	■	■	■	■				■	■
AC-5000		■	■	■	■	■	■			■	■
AC-5080				■	■	■	■		■	■	■
AC-5105			■	■	■	■			■ ¹	■	■ ²
AC-5144			■	■	■	■	■		■	■	■
AC-5480		■	■	■	■	■	■			■	■
AC-8150			■	■	■	■		■		■	■
AC-9000		■	■	■	■	■				■	■
OA-3090			■	■	■	■	■	■			
OS-4300	■					■					
PT-10T		■	■	■	■	■	■			■	■
ST-2220					■	■		■		■	■

1 - at 10%

2 - to 200 ppm

Maxhib AA-0223

Aluminum Anti-stain

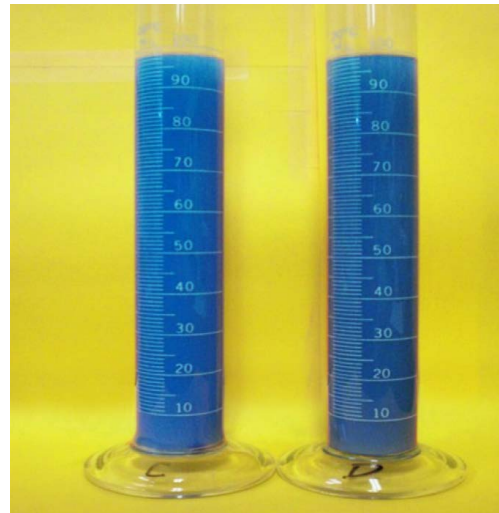
Aluminum reacts with air to grow its own thin oxide coating. This hard dark gray coating helps to protect the metal against corrosion. Unfortunately, when machining aluminum, the aluminum oxide film provides only minimal protection of the surface against further corrosion is not stable above pH 8.5. As a result, these highly alkaline metalworking fluids tend to cause staining of aluminum. **Maxhib AA-0223** is the solution to eliminate aluminum anti-stain.

Benefits

- Silicate free
- Low treat rate
- Easy to formulate
- Stable over a wide range of temperatures stability

Semi-Synthetic Formula

IP-263 400PPM hard water stability after 24 hours, ambient temperature



Without
Maxhib-AA
0223

With 5%
Maxhib-AA
0223

Semi-Synthetic Formulation

Tested on a variety of aluminum



W/O Maxhib AA-0223
@ 20:1 dilution

With Maxhib AA-0223
@ 5% at 20:1 dilution

Synthetic Formulation

Tested on a variety of aluminum



W/O Maxhib AA-0223
@ 20:1 dilution

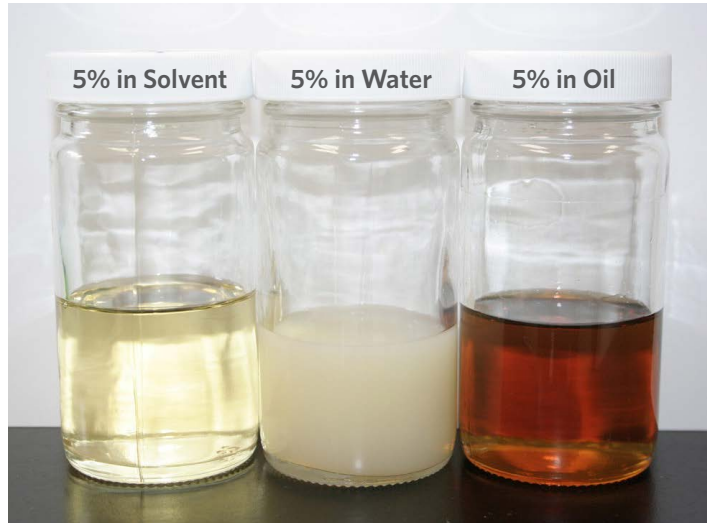
With Maxhib AA-0223
@ 5% at 20:1 dilution

Maxhib AA-0223

Aluminum Anti-stain

Maxhib AA-0223 provides anti-staining on aluminum at a pH of 9.5 which allows formulators to provide more reserve alkalinity in systems that are used to machine aluminum. This product is easily formulated into soluble oils, semi-synthetics, and synthetics without concentrate stability issues.

Solubility of Maxhib AA-0223



Synthetic Formulation with and without Maxhib AA-0223

	W/O	With
Water	62.5	59.5/57.5
Maxhib AB-400	12.5	12.5
Chemal BP-3174	5.5	5.5
Maxhib AC-5000	12.5	12.5
Maxhib AA-0223	0.0	3.0/5.0
Isononanoic Acid	3.0	3.0
Neo-decanoic Acid	2.0	2.0
Triadene 10	2.0	2.0
5% pH	9.5	9.4
400 ppm Appearance	Translucent	Translucent

PCC Chemax offers a series of Rust Preventatives. The actives only products offer the benefit to formulate your own solvent and oil.

MaxCor® RP-2105

MaxCor® RP-2105 is a water soluble rust preventative comprised of a complex mixture of calcium dinonylnaphthalene sulfonate, film forming agents, water dispersible corrosion inhibitors and proprietary functional components. As a concentrate, it forms a stable macro emulsion designed for humidity protection on galvanized and steel components, and is ideal for dipping metal parts when cutback with water at a use rate of 2-10% depending on the severity of the application. It provides indoor storage protection and in-transit protection for ferrous and non-ferrous metals, exhibits excellent dry to touch, non-staining and non-sticking thin film on parts, and the coatings are easily removed with alkaline cleaners. The product does not contain any mineral oils.

MaxCor® RP-2128

MaxCor® RP-2128 is a Barium Soap of an oxidized Petrolatum, esters and other proprietary components providing good boundary lubrication for forming operations and is used for indoor and outdoor humidity protection. It is designed to be cutback with solvent, oil, or kerosene depending on the type of film and coating desired. It offers excellent rust and water displacing properties, even in the presence of alkali, providing a waxy, dry, non-staining, thin film when cut back with solvents, or a soft oily film when cut back with oil, providing

MaxCor® RP-2240

MaxCor® RP-2240 is comprised of a complex mixture of organic acids, aryl sulfonic acid, film forming agents, water dispersible corrosion inhibitors and proprietary functional components designed to provide an excellent concentrate that forms a stable micro emulsion designed for humidity protection on steel. It forms a quick drying, hydrophobic, thin film on parts for indoor and outdoor humidity storage protection for both ferrous and non-ferrous metals. Dilutions maintain clarity and stability, even in hard water.

MaxCor® RP 4405

MaxCor® RP 4405 is a biodegradable ashless rust preventative for industrial and auto-motive lubricants, including greases. Can also be used to formulate metalworking fluids- oil soluble and water extendable, hydraulic oils, paper machine oils, as well as gear oils. Actives only.

MaxCor® RP 4165

MaxCor® RP-4165 is a liquid corrosion preventative additive designed where water contact is likely such as dewatering fluids. Provides corrosion protection for ferrous metals with superior water separation characteristics. It is very effective for multi-metal corrosion inhibition, and is particularly effective on galvanized steel. Has excellent solubility in a wide range of oils including Groups I, II, and III paraffinic oils, vegetable oils, esters, and polyalphaolefins. It is also designed to use with solvents such as mineral spirits or kerosene. Rust prevention is enhanced when 10-20% mineral oil is used in combination with solvent. Actives only. 10% in canola oil will give 60+ days of protection in humidity cabinet

MaxCor® RP 4165D

MaxCor® RP-4165D is a calcium soap of an oxidized petrolatum.

It is designed to impart excellent water displacing properties and humidity protection. MaxCor® RP-4165D is non-emulsifiable, and alkaline resistant. MaxCor® RP-4165D can be blended with kerosene, solvent and oil. Solvent and kerosene cutbacks will leave a waxy, dry protective, non-staining film. Contains actives, oil, solvent and wax.

MaxCor® RP 5575

MaxCor® RP-5575 is a liquid, wax containing rust preventative formulated for rust preventative fluids for use in harsh environments, such as salt fog exposure. It is also recommended for use in less demanding humidity or normal indoor storage. MaxCor® RP-5575 has much improved solubility in highly paraffinic base oils compared to other wax containing additives. It is **NOT** recommended for applications where oil or oil/solvent solutions will be heavily contaminated with water. Actives Only.

MaxCor RP-5575D

A sodium and barium (<1%) sulfonate emulsifiable rust preventative that is designed to produce a long-term rust prevention coatings. It can be used in formulations for indoor and outdoor protection. It exhibits excellent salt fog protection. Contains actives, oil, solvent, and wax.

MaxCor® RP 6655

MaxCor® RP-6655 is a liquid, wax containing rust preventative formulated for rust preventative fluids for use in harsh environments, such as salt fog exposure. It is also recommended for use in high humidity or normal indoor storage. MaxCor® RP-6655 shows no tendency to gel when exposed to water and so can be used in a wide range of environmental conditions. Actives only. 10% in canola oil will give 60+ days of protection in humidity cabinet

MaxCor® RP-6655D

MaxCor® RP-6655D is a calcium soap of an oxidized petrolatum. It is designed to produce a long-term rust prevention coating. It can be used in formulations for indoor and outdoor protection. It exhibits excellent salt fog protection. Contains actives, oil, solvent, and wax.

MaxCor® RP-7280

MaxCor® RP-7280 is an overbased gelled calcium sulfonate based rust preventative designed for use in metalworking applications as the main formulating ingredient for hot melt and high solids rust preventative coatings. It provides moisture barrier protection, rheology control, forms an oily film with good penetrating and lubricating properties, offers excellent wetting properties, resists corrosion of steel, and is environmentally friendly.

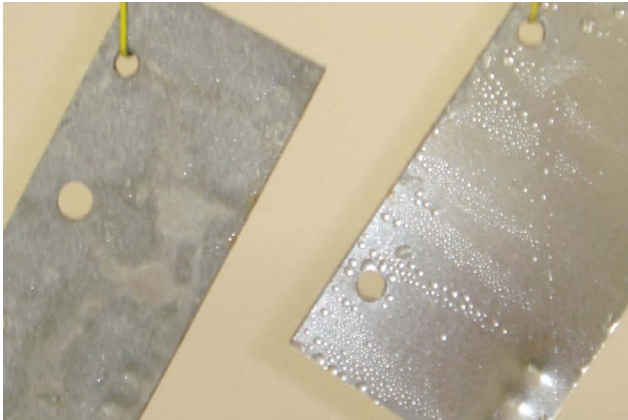
MaxCor RP-7500

A high solids, thixotropic overbased calcium sulfonate rust preventative designed for use in metalworking applications as the main formulating ingredient for rust preventative coatings in a salt laden environment. It provides moisture barrier protection, rheology control, forms an oily film with good penetrating and lubricating properties, offers excellent wetting properties, resists corrosion of steel, solvent free, and is environmentally friendly.

MaxCor® RP-2105

Humidity Cabinet (ASTM D 1748)

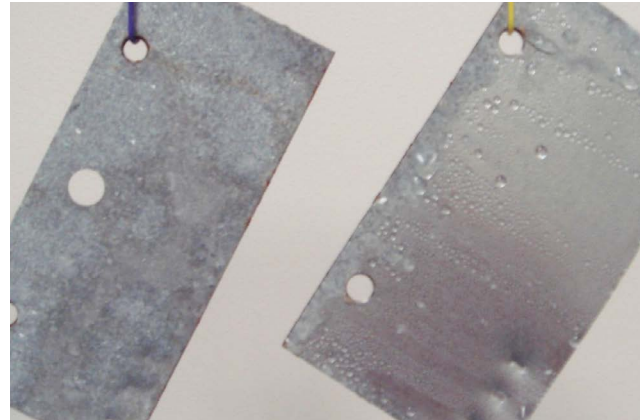
27 Hours Galvanized



5% Competitor
Tap Water

5% MaxCor® RP-2105
Tap Water

100 Hours Galvanized



5% Competitor
Tap Water

5% MaxCor® RP-2105
Tap Water

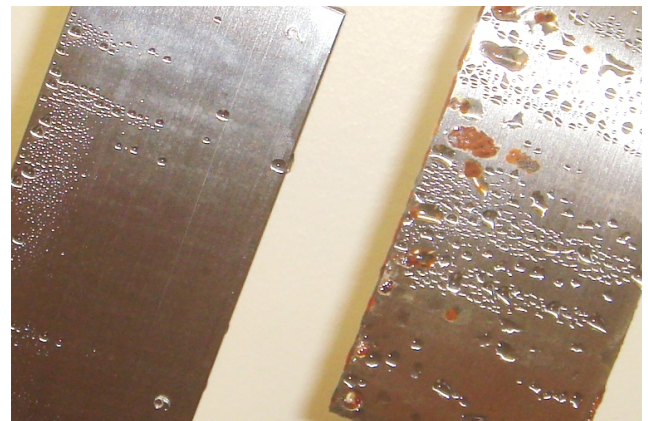
192 Hours Galvanized



10% MaxCor® RP-2105
Tap Water

10% Competitor
Tap Water

504 Hours Exposure



5% MaxCor® RP-2240
Tap Water

5% Tap Water

MaxCor® RP-2105

5% Tap Water

96 Hours Steel

1128 Hours Steel

MaxCor®
RP-2105



MaxCor®
RP-2105

Competitor
Sample

Competitor
Sample

Humidity Cabinet (ASTM D 1748)

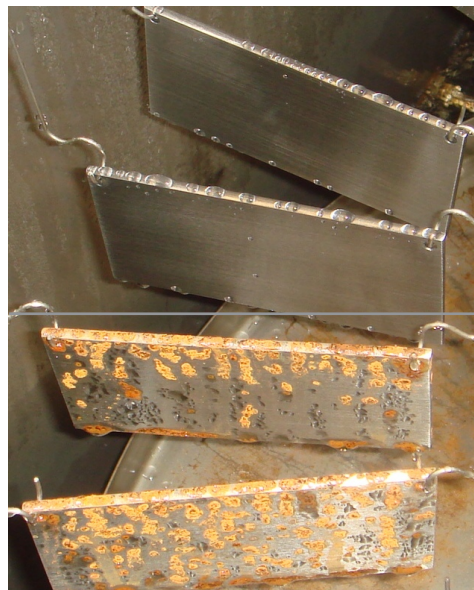
MaxCor® RP-2105

10% Tap Water

144 Hours Steel

744 Hours Steel

MaxCor®
RP-2105



MaxCor®
RP-2105

Competitor
Sample

Competitor
Sample

Humidity Cabinet (ASTM D 1748)

Chemax NDO - 250

Chemax NDO-250 is a synthetic polymerized ester designed to boost lubricity in severe metalworking applications. Chemax NDO-250 has a high molecular weight that gives it the structure to replace chlorinated paraffins. Chemax NDO-250 is a fully saturated branched chain fatty acid, which offers the highest level of hydrolytic, oxidative, and biostability properties. Chemax NDO-250 is formulated into emulsion systems to provide exceptional lubricity. Treatment levels of 1%-15% into a concentrate are suggested. Chemax NDO-250 has the perfect structure to be used in straight oils and water-extendable fluids for drawing and stamping. Chemax NDO-250 can be used to replace or reduce treatment levels of all other EP additives such as chlorine, phosphorus, active and inactive sulfur, lard oil and other fatty friction modifiers.

Chemax NDO - 300

Chemax NDO-300 is a polymerized water soluble specialty ester. Chemax NDO-300 provides hydrodynamic lubrication, as well as wetting and corrosion protection. Chemax NDO-300 can help to reduce or eliminate chlorine, sulfur, and fatty acid additives that are used in metalworking to make more environmentally friendly coolants. Chemax NDO-300 can be formulated into soluble oils, semi-synthetics, synthetics and drawing and stamping compounds.

Chemax NDO - 350

Chemax NDO-350 is a polymerized water dilutable specialty ester. Chemax NDO-350 provides hydrodynamic lubrication, as well as wetting and corrosion protection. Chemax NDO-350 can help to reduce or eliminate chlorine, sulfur, and fatty acid additives that are used in metalworking to make a more environmentally friendly coolant. Chemax NDO-350 can be formulated into soluble oils, semi-synthetics, synthetics, and drawing and stamping metalworking operations.

Chemax NDO - 917

Chemax NDO-917 is a synthetic polymerized ester designed to enhance performance and finish in severe metalworking applications. Chemax NDO-917 has a molecular weight that gives it the right structure to replace chlorinated paraffins. It is a branch chain fatty acid which has excellent hydrolytic, oxidation and biostability properties. This ester can also be used to replace or reduce levels of other boundary and extreme pressure additives such as phosphorous, sulfur, lard oil, and other fatty friction modifiers. **Because of a higher unsaturation level, this ester is not recommended for neat oil or drawing and stamping applications.**

Chemax NDO - 1017

Chemax NDO-1017 is a synthetic polymerized ester designed to enhance performance and finish in severe metalworking applications. Chemax NDO-1017 can be used in both straight oils and water extendable fluids for drawing and stamping applications. Its high molecular weight gives it the right structure to replace chlorinated paraffins, and it can also be used to replace or reduce treatment levels of other boundary and extreme pressure additives such as phosphorus, sulfur, lard oil, and other fatty friction modifiers. Chemax NDO-1017 has a high degree of saturation offering excellent thermal, oxidative, and hydrolytic stability. Its high viscosity index provides great film strength in hot and cold temperatures. Chemax NDO-1017 is ashless and has a very low iodine value. Treatment levels of 1%-15% into a concentrate are suggested.

Chemax VO -100

Chemax VO-100 is an ethoxylated self emulsifying ester that is low foaming and functions as a lubricant, coemulsifier, and corrosion inhibitor for water extendable metalworking fluids. With the addition of small amounts of amines, this product will be clear in water.



PCC Chemax offers a series of synthetic polymeric esters. They can be used to reduce or eliminate chlorine, sulfur, and fatty acid additives that are used in metalworking to make more environmentally friendly coolants.

Chemax	FLUID TYPES					CORROSION INHIBITION				PROCESS	
	Straight Oil	Soluble Oil	Semi-Synthetic	Synthetic	Cleaner	Ferrous	Aluminum	Copper	Galvanize	Low Foam	Hard Water Stable
NDO - 250	■	■				■	■	■	■	■	■
NDO - 300		■	■	■		■	■	■	■		■
NDO - 350	■	■	■			■	■	■	■	■	■
NDO - 917	■	■	■			■	■		■	■	■
NDO - 1017	■	■				■	■	■	■	■	■
VO-100		■	■	■		■	■	■	■	■	■

Chemfac NB-159

A water soluble ester with 4.0% phosphorus. Low foaming and provides excellent lubricity properties.

Chemfac NF-100

Glycol ether phosphate with 15.8% phosphorus. Water soluble and non-foaming, it provides excellent extreme pressure and lubricity properties.

Chemfac PA-080

Oil soluble ester with 11.6% phosphorus that provides excellent extreme pressure and lubrication properties.

Chemfac PA-800

An oil soluble ester containing 10.8% phosphorus. Excellent emulsification, extreme pressure and lubricity properties in soluble, semi-synthetics, and straight oils.

Chemfac PA-1315

An oil soluble ester made from a branched alcohol that provides emulsification and lubricity properties in soluble, semi-synthetics, and straight oils. Contains 5.35% phosphorus.

Chemfac PB-133

Oil soluble with 5.5% phosphorus provides excellent extreme pressure and lubrication properties in soluble and semi-synthetics for the replacement of APE's.

Chemfac PB-136

Water-soluble lubricant and emulsifier with 3.8% phosphorus. Used in water based cutting fluids and hydraulic compounds. Excellent wetting properties.

Chemfac PB-184

Oil soluble lubricant, rust inhibitor and emulsifier used in straight oils, soluble oils and semi-synthetics. Contains 5% phosphorus.

Chemfac PB-264

Oil soluble lubricant additive and emulsifier used in straight oils, soluble oils and semi-synthetics. Also provides good wetting properties. Contains 6.1% phosphorus.

Chemfac PC-006

Water-soluble additive with 4.7% phosphorus most commonly used in water based cutting fluids. Provides lubrication properties in water extendable formulas.

Chemfac PC-099

Water-soluble lubricant additive with 2.8% phosphorus. Commonly used in synthetic and semi-synthetic formulations.

Chemfac PC-188

Oil soluble, water dispersible emulsifier and lubricant typically used in straight oils, soluble oils and semi-synthetics. Product contains 2.7% phosphorus.

Chemfac PF-636

A water soluble, glycol based phosphate with 13.1% phosphorus providing extreme pressure and lubricity properties. Low foaming.

When used in metalworking formulations, Chemfac phosphate esters combine properties of emulsification and lubrication to exhibit corrosion inhibition properties. Due to the presence of phosphorus they also boast extreme pressure properties in addition to conventional lubricity properties in soluble, semi-synthetic, and synthetic metalworking formulations. The following table is a quick reference of properties our Chemfac products demonstrate.

Chemfac	Aliphatic	Aromatic	Straight Oil	Soluble Oil	Semi-Synthetic	Synthetic	Low Foam	Water Soluble	Oil Soluble	E. P.	Wetting
NB-159					■	■	■	■		■	
NF-100					■	■	■	■		■	
PA-080	■		■	■	■				■	■	
PA-800	■			■	■				■	■	
PA-1315	■			■	■				■	■	■
PB-133	■		■	■	■				■	■	
PB-136	■				■	■		■ ¹			■
PB-184	■		■	■	■		■	■ ¹	■		
PB-264	■		■	■	■			■ ¹	■		■
PC-006		■			■	■	■	■			
PC-099		■			■	■		■			■
PC-188		■	■	■	■		■		■	■	
PF-636					■	■	■	■		■	

¹ if neutralized

Chemax DFO-199M

POE/PO Distearate ester used in metalworking for lubricity in coolants made for machining of aluminum. It provides excellent lubricity, is low foaming, and also gives so-emulsification attributes.

Chemax EMX- 1155

Excellent water dispersible additive for metal forming fluids. This product provides superior boundary lubrication properties. Performance has been confirmed with Twist Compression Tests data.

Maxlube 40X

A unique micro-synthetic base specially designed for use in synthetic metalworking coolants that are completely free of petroleum and vegetable oils. This product consists of special blend of a water insoluble polyalkylene glycol lubricant and a chemically modified, anionic polyalkylene glycol emulsifier. Maxlube 40X is effective in removal and metal forming operations on a variety of substrates including steel alloys, aluminum alloys, cast aluminum and other non-ferrous alloys.

Maxlube 155

Oil soluble, water dispersible ester. Maxlube 155 provides extreme boundary lubrication and was designed especially for aluminum machining.

Maxlube 200

This water-soluble ester provides excellent lubricity at low concentrations. It also exhibits extreme pressure, anti-wear and good cleaning properties in water extendable metalworking formulations.

Maxlube 331

A water soluble Fatty Acid Polymer Ester specially designed for synthetic coolants for non-ferrous drawing and forming applications. Besides providing lubricity, it also provides a cleaner operational environment.

Maxlube 450X

A modified polyalkylene glycol which provides extreme pressure lubrication in water reducible synthetic metalworking fluids. Completely water soluble at ambient temperatures, but at elevated temperatures it exhibits inverse water solubility properties which makes it an excellent candidate to provide lubricity at low concentrations in water.

Maxlube 510

Due to its high viscosity and excellent water solubility it is ideally suited for use in synthetic and semi-synthetic metalworking coolants to increase hydrodynamic lubricity.

Maxlube MV

Excellent lubricity additive for oil systems. Maxlube MV acts as a defoamer and a viscosity modifier.

Maxlube RO-100

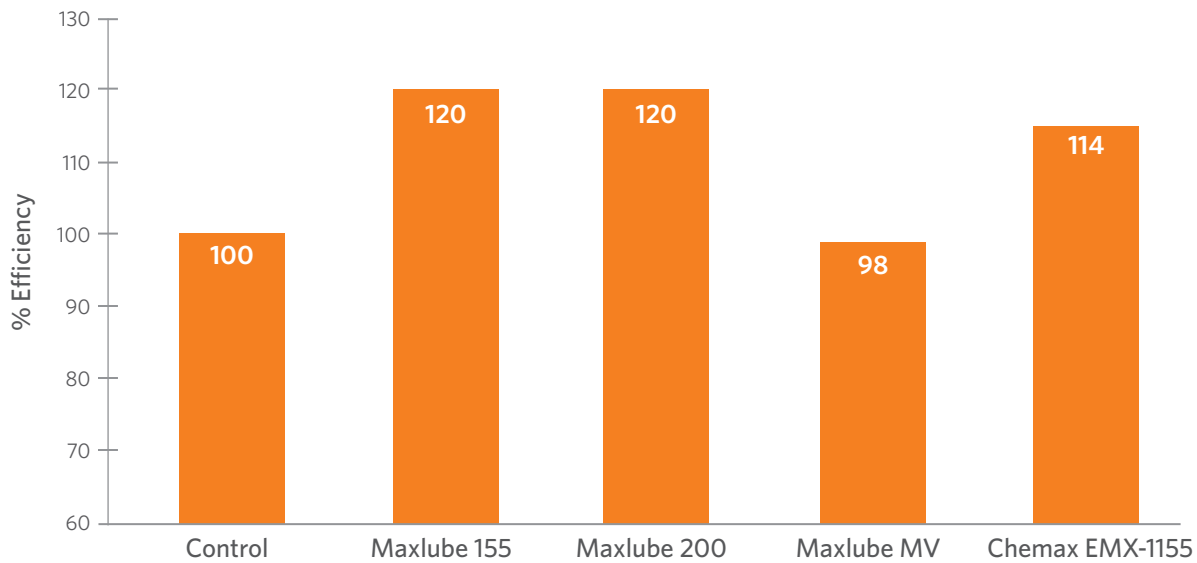
A vegetable based polymerized branched chained ester designed to boost performance and enhance finish in severe metalworking applications, especially aluminum applications and drawing and stamping. A unique medium molecular weight ester designed to offer the highest lubricity and film strength.

PROPERTIES

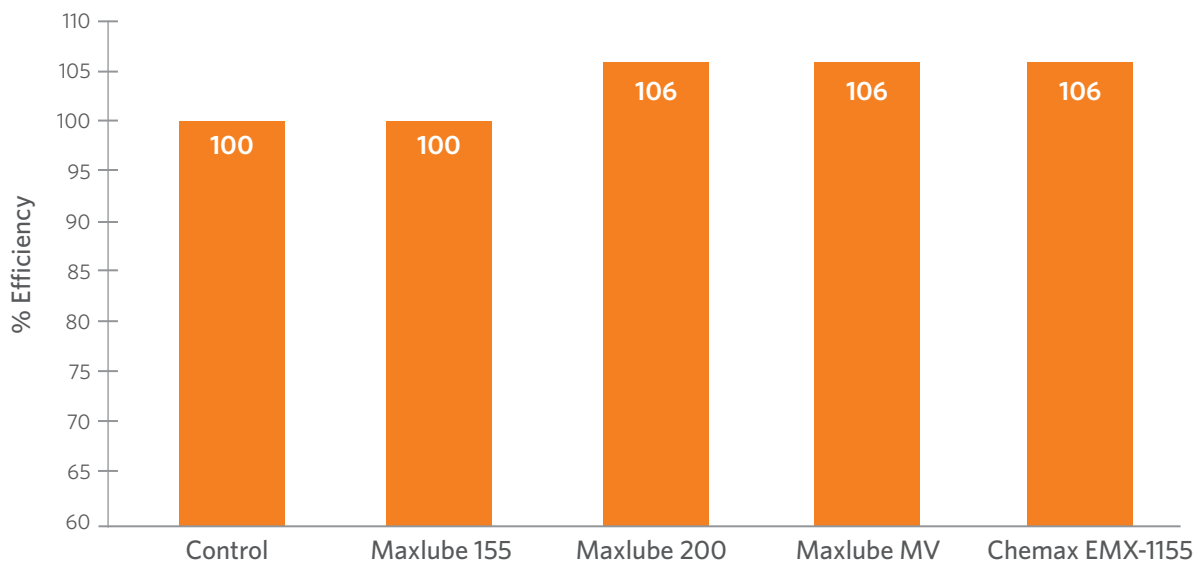
The Maxlube line of lubricant additives represents water and oil soluble materials which enhance lubricity characteristics as well as providing anti-wear and extreme pressure properties.

Product	Straight Oil	Soluble Oil	Semi-Synthetic	Synthetic	Emulsification	Wetting	Boundary Lubrication	Metal Removal	Metal Forming
Chemax EMX-1155		■	■	■	■	■	■		■
Maxlube 155	■	■	■			■	■		
Maxlube 200		■	■	■	■	■	■	■	■
Maxlube 450X			■	■			■	■	■
Maxlube 510			■	■			■	■	■
Maxlube MV	■		■				■	■	
Maxlube RO-100	■	■					■	■	■

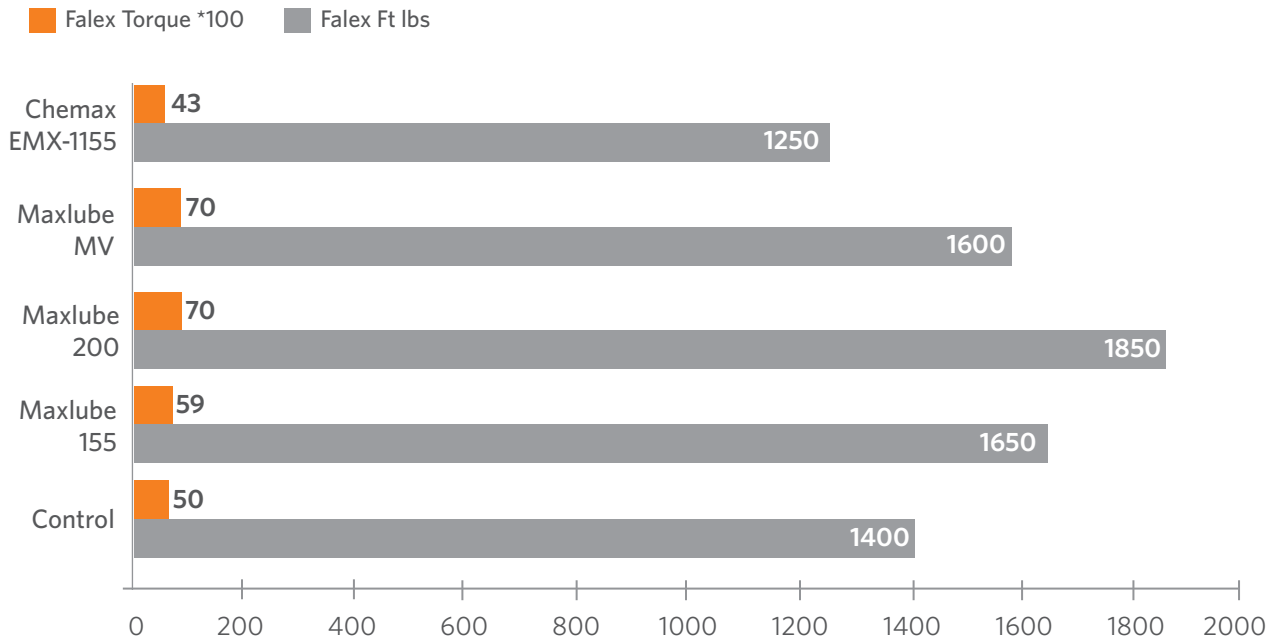
Soluble Oil Maxlube Micro Tap Aluminum with 3% Additive Load



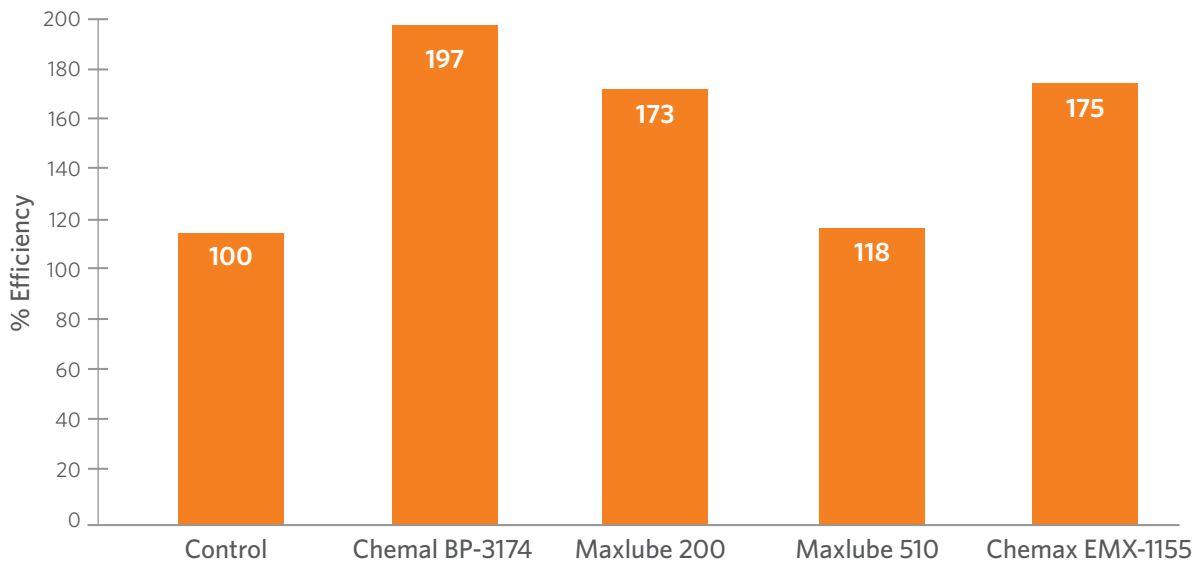
Soluble Oil Maxlube Micro Tap CRS with 3% Additive Load



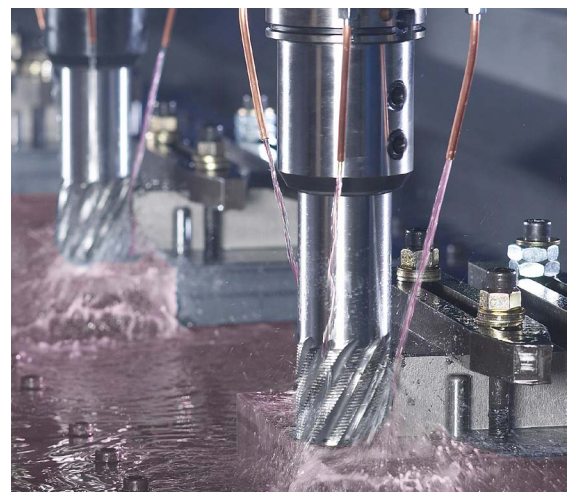
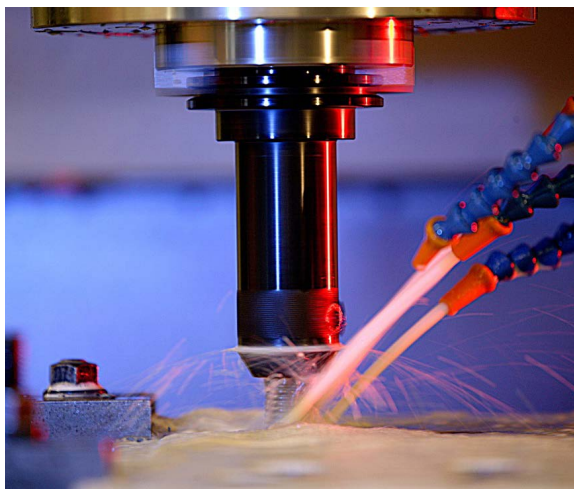
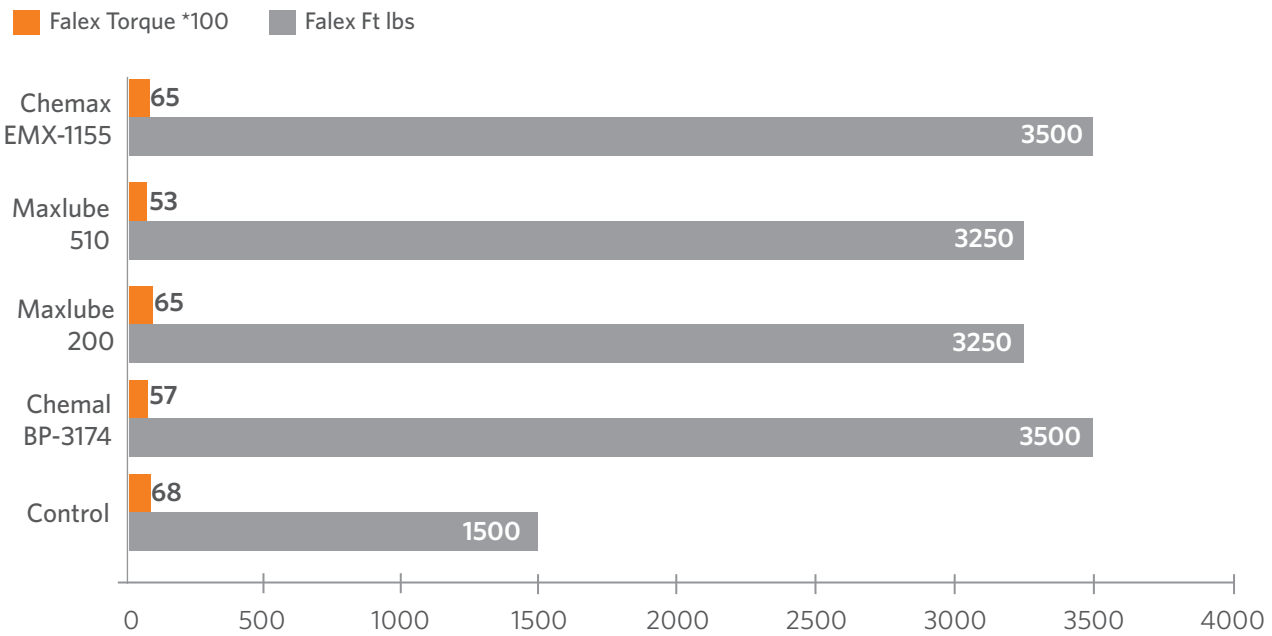
Soluble Oil Maxlube Falex Testing with 3% Additive Load



Micro Tap Synthetic 1018 CRS % Efficiency 10% Additive Load



Soluble Oil Maxlube Falex Testing with 3% Additive Load



Chemal alkoxyated Block Polymers are versatile nonionics that provide lubricity, emulsification, and wetting to a variety of metalworking fluids. These products act to minimize foam at temperatures which exceed their cloud points. Block Polymers can be formulated as defoaming agents, mechanical dish washing detergents and rinse aids, or synthetic lubricant bases for metalworking, cosmetic, paper, and textile industries. The following is a series of 100% active nonionic difunctional block polymers ending in primary hydroxyl groups.

Product	Molecular Weight	Form @ 25° C	Cloud Point (°C)*	HLB
Chemal BP-235	1900	Liquid	77	18.5
Chemal BP-261	2000	Liquid	24	3.0
Chemal BP-261 PO	2000	Liquid	24	3.0
Chemal BP-262	2500	Liquid	30	7.0
Chemal BP-262PO	2500	Liquid	32	7.0
Chemal BP-262LF	2450	Liquid	28	6.5
Chemal BP-264	2900	Liquid	61	15.0
Chemal BP-268FLK	8350	Waxy Flake	>100	29.0
Chemal BP-2101	3800	Liquid	15	1.0
Chemal BP-2121	4400	Liquid	14	0.5
Chemal BP-2122	5000	Liquid	19	4.0

* 1% Aqueous

Chemax also offers a series of reversed block polymers. This family of products has a reversed chemical structure [(PO)n-(EO)m-(PO)n] which while similar in properties to the standard block polymers, have the additional features of being lower foaming and provide lubrication.

Product	Molecular Weight	Form @ 25° C	Cloud Point (°C)*	HLB
Chemal BP-3172	2100	Liquid	39	8.0
Chemal BP-3174	2700	Liquid	47	16.0
Chemal BP-3252	3120	Liquid	33	6.3
Chemal BP-3258	9000	Solid	80	30.3
Chemal BP-3311	3200	Liquid	25	1.7

* 1% Aqueous

For applications in which the surfactant is insoluble due to temperature of chemical incompatibility, all block polymers may function as defoamers and lose both wetting and detergent characteristics.

Product	Defoamer	Wetting Agent	Emulsifier	Detergent	Rinse Aid Antistreaking Agent	Viscosity Control Agent	Dispersant/Solubilizing Agent	Lubrication
Chemal BP-235			▪	▪				
Chemal BP-261			▪					
Chemal BP-261PO	▪							
Chemal BP-262	▪	▪			▪			
Chemal BP-262PO		▪			▪			
Chemal BP-262LF	▪	▪			▪			
Chemal BP-264			▪			▪	▪	
Chemal BP-268						▪	▪	
Chemal BP-2101	▪	▪	▪					
Chemal BP-2121	▪	▪						
Chemal BP-2122	▪	▪						
Chemal BP-3172	▪							▪
Chemal BP-3174	▪						▪	▪
Chemal BP-3252	▪	▪		▪	▪		▪	▪
Chemal BP-3258		▪		▪	▪			▪
Chemal BP-3311	▪		▪				▪	▪

Chemal 2EH-2

Detergent, dispersant and defoamer for metalworking and textile cleaners.

Chemal DA-4

High speed wetting and penetrating agent for textile processing and fire fighting products. Emulsifiers for polyethylene emulsions.

Chemal DA-6

High speed wetting and penetrating agent for textile processing and fire fighting products. Emulsifiers for polyethylene emulsions.

Chemal LA-4

O/W emulsifier for metalworking, cosmetic and textiles. Useful for emulsification of silicone polish and mold release agent.

Chemal LA-9

O/W emulsifier for metalworking, cosmetic and textiles. Useful for emulsification of silicone polish and mold release agent.

Chemal LF-25B

Low foaming detergent and wetting agent used in metalworking and industrial applications.

Chemal LF-40B

Low foaming detergent and wetting agent used in metalworking and industrial applications.

Chemal LFL-17

Product for use in rinse aids, spray cleaners and detergent formulations that require low foaming properties.

Chemal LFL-47

Product for use in rinse aids, spray cleaners and detergent formulations that require low foaming properties.

Chemal OA-9

Emulsifier, dispersant and detergent additive for waxes and oils in metalworking, textiles and cosmetics.

Chemax DOSS/75E

Exceptionally fast wetter for applications that can tolerate foam.

Chemfac PB-082

Functions as oil soluble wetting agent and detergent.

Chemfac PB-106

Compatible with alkaline systems, provides coupling of nonionics while providing wetting and detergency characteristics.

Chemfac PB-135

Compatible with alkaline systems, provides coupling of nonionics while providing wetting and detergency characteristics.

Chemfac PB-184

Aliphatic based lubricant additive, rust inhibitor and emulsifiers for straight oils, soluble oils and semi-synthetics.

Chemwet 133

Defoamer, emulsifier and wetting agent for metalworking, textile and industrial applications.

Chemwet 1042

Defoamer, emulsifier and wetting agent for metalworking, textile and industrial applications.

Chemwet 1058

Defoamer, emulsifier and wetting agent for metalworking, textile and industrial applications.



In many aqueous and oil based systems, the need for additional wetting may be encountered. Chemax offers a variety of oil and water soluble surfactants which offer exceptional wetting attributes.

Product	Aqueous Solubility	Oil Solubility	Low Foam	Cloud Point (1% aqueous) °C	HLB	Surface Tension ¹ (d/cm)
Chemal 2EH-2	I	S	Y	< 25	8.0	Insoluble
Chemal DA-4	I	S	N	< 25	10.5	24.4
Chemal DA-6	S	I	N	41	12.4	25
Chemal LA-4	I	S	Y	< 25	9.2	35.4
Chemal LA-9	S	I	N	76	12.3	35.7
Chemal LF-25B	S	I	Y	25	13.0	30
Chemal LF-40B	S	I	Y	40	15.0	31.2
Chemal LFL-17	I	S	Y	17	9.0	29.6
Chemal LFL-47	S	I	Y	47	16.0	31.7
Chemal OA-9	S	I	N	52	11.9	49.0
Chemax DOSS/75E	S	I	N	> 100	-	24.5
Chemfac PB-082	S ²	I	N	< 25	-	28.3
Chemfac PB-106	S	I	N	72	-	27.9
Chemfac PB-135	S	I	N	76	-	29.4
Chemfac PB-184	S ²	S	Y	< 25	-	53.1
Chemwet 133	I	S	Y	< 25	7.9	28.6
Chemwet 1042	I	S	Y	19	9.0	26.8
Chemwet 1058	I	S	Y	17	8.5	32.2

¹ Test performed at 0.5% aqueous / 20 °C

² Soluble when neutralized

S - Soluble

I - Insoluble

Chemal EM-500

Phenol and sulfonate free emulsifier for mineral and vegetable oils.

Chemax EM-481

Excellent emulsifier for mineral oils.

Chemax EM-1169

Sustainable, surfactant based product designed specifically for making stable emulsions with soybean oil that offers emulsification and lubricity properties. It can also be used for other seed oil emulsification. Please see PERFORMANCE TEST for details.

Chemax EMX-1016

Phenol free emulsifier for d-limonene at concentrations of 30%.

Chemax EMX-1032

Sulfonate and phenol free versatile emulsifier.

Chemax EMX-1033

Phenol free, amide based emulsifier for d-limonene at concentrations of 5%.

Chemax EMX-1154

Surfactant based product designed specifically for making stable emulsions with canola oil. It can also be used for other seed oil emulsification.

Chemax EMX-5000

Proprietary Surfactant, Olyel alcohol, Phenol and Sulfonate free emulsifier for mineral and vegetable oils.

Sorbax HO-50

High molecular weight sorbitan ester which forms extremely stable emulsions of mineral and vegetable oils as well as mineral spirits.

PROPERTIES

PCC Chemax offers a series of Specialty Emulsifiers.

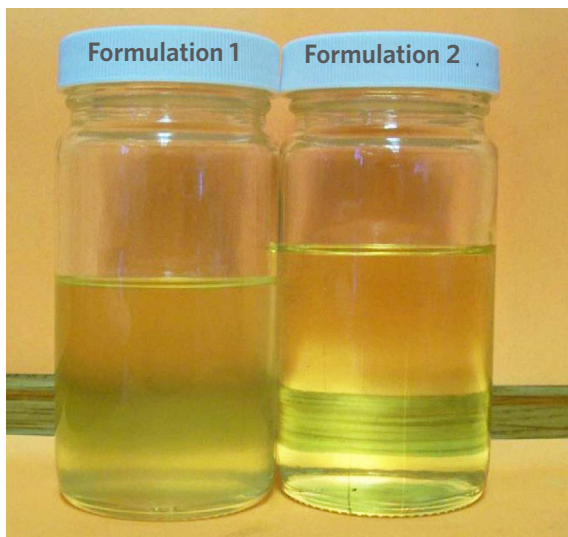
Product	Naphthenic Oil	Paraffinic Oil	d-limonene	Vegetable Oil	Polybutene	Mineral Spirits	Polyalpha Olefin
Chemal EM-500	■	■		■			
Chemax EM-481	■	■					
Chemax EM-1169				■			
Chemax EMX-1016			■			■	
Chemax EMX-1032	■	■	■	■	■		■
Chemax EMX-1033			■				
Chemax EMX-1154	■	■		■			
Sorbax HO-50	■	■		■		■	

Chemax EMX-1154

Vegetable Oil Emulsifier

Concentrate Stabilities

at RT, 24 hours



Emulsion Stabilities

in 30ppm water, 24 hours



Formulates & Data Testing

% weight	Formulation 1	Formulation 2
Industry Standard Vegetable Oil emulsifier	20.0	----
Chemax EMX-1154 emulsifier	-----	20.0
Canola Oil (60% oleic acid content)	80.0	80.0
Testing (20:1 dilution)		
Concentrate appearance	Hazy/Unstable	Clear/Stable
Emulsion appearance	Milky White	Milky White
pH @ 5%	4.7	6.5
IP 263, Emulsion Stability (% oil/ % cream)		
30ppm, RT, 24 hours	0/2.0	0/1.0
200ppm, RT, 24 hours	0.4/1.3	0/1.0
IP 287, Corrosion testing (% corrosion) @ 5%	90%	60%

Chemax EMX-1154

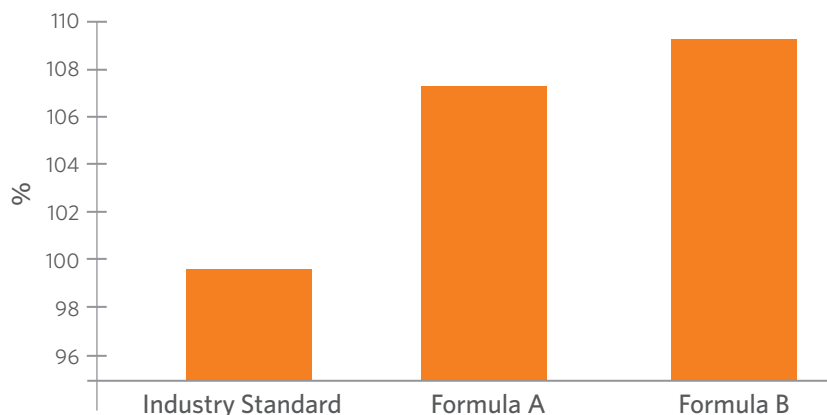
Vegetable Oil Emulsifier

Heavy Duty Vegetable Oil without Chlorine Testing Data

% weight	Industry Standard	Formula A	Formula B
Chlorinated paraffin (Lubrication and EP)	15.0	----	----
37% active sulfur (EP)	7.0	5.0	----
Industry standard vegetable oil emulsifier (Primary emulsifier)	20.0	----	----
Chemax EMX 1154 (Primary emulsifier)	----	20.0	20.0
Maxlube 155 (Boundary lubrication)	----	5.0	5.0
Chemid TODA 100 (Reserve alkalinity, corrosion, & secondary emulsifier)	----	5.0	5.0
Chemax NDO-917 (Chlorine replacement, lubrication)	----	10.0	7.0
Chemfac PB 106K (EP)	----	----	3.0
Canola Oil	56.0	53.5	58.5
Angus P1487 (Biocide & fungicide mix)	2.0	1.5	1.5
Testing (20:1 dilution)			
Concentrate appearance	Clear amber	Clear amber	Clear amber
Emulsion appearance	White chalky	White bluish	White bluish
pH @ 5% in 600ppm hard water	7.55	8.5	8.5
IP 263, Emulsion stability (% oil/ % cream)* 600ppm, RT, 24 hours	0/0.5	0/0	0/0
IP 287, Modified corrosion testing (% rust) @ 5%	90%	60%	30%
Microtap @ 5%, Aluminum, form tap, 600rpm*	100%	108%	110%

* See chart below

MicroTap Percent Efficiency Aluminum Form Tap



Chemax EMX-1169

Soybean Oil Emulsifier

Benefits

- Makes stable concentrates
- Makes stable emulsions with soybean oil
- Excellent hard water stability
- Excellent performance on aluminum
- Easily formulated with other PCC Chemax Metalworking Additives

IP263, 24 hour Hard Water Stability Test

Emulsifier into Soybean Oil @ 20%



Formulation A



Formulation B

Formulates & Data Testing

Test Data	Formulation A 20% Competitor A	Formulation B 20% Chemax EM-1169
Concentrate appearance	Unstable	Stable
Emulsion appearance 5% in Tap	Milky White	Milky White
IP 263, Emulsion Stability (% oil/ % cream)		
30ppm, RT, 24 hours	0/0.2	0/0.2
200ppm, RT, 24 hours	0.1/3.0	0.1/1.5

Soluble Oil Additive Packages

Maxbase 109

Maxbase 109 is a high sulfonate low soap soluble oil emulsifier package designed to emulsify naphthenic base oils. MaxBase 109 provides hard water stability, corrosion inhibition and is compatible with a variety of extreme pressure additives and esters.

Maxbase 110

Maxbase 110 is a "fighting grade" soluble oil emulsifier package designed to emulsify naphthenic base oils. MaxBase 110 provides hard water stability, corrosion inhibition and is compatible with a variety of extreme pressure additives and esters. It can also be used for the primary emulsifier for semi-synthetic concentrates.

Maxbase 115

Maxbase 115 is an emulsifier base made from natural sulfonate that is designed for use in a variety of naphthenic base oil. Because the primary emulsifier is natural sulfonate, Maxbase 115 exhibits excellent emulsification and corrosion properties.

Maxbase 190

Maxbase 190 is an emulsifier base made from synthetic sulfonate and succinate ester chemistry providing excellent emulsification with additive levels as low as 15%. It provides emulsion stability in soft and hard waters as well as cold water, helps to emulsify high amounts of chlorine and sulfur, provides corrosion inhibition, and is compatible with other extreme pressure and lubrication additives. The product does not contain chlorine, free sulfur, nitrites, phenols or heavy metals.

Maxbase 1122

Maxbase 1122 is a sulfonate free soluble oil emulsifier package designed to emulsify hydrotreated base oils like Group I and Group II paraffinic. MaxBase 1122 provides hard water stability, corrosion inhibition and is compatible with a variety of extreme pressure additives and esters.

Maxbase SS-1150

Maxbase SS-1150 is based on polyisobutylene succinate emulsifier chemistry, and is designed to produce a general purpose, semi-synthetic, water extendable concentrate, for use on ferrous and non-ferrous metals (including aluminum). The usual treat rate is 35% in water to make a finished fluid concentrate along with biocide. It provides excellent corrosion protection, hard water stability, has a high degree of lubricity, offers exceptional wetting and cooling properties, and offers lower foaming than traditional semi-synthetic bases. It does not contain sulfur and is therefore less susceptible to sulfur reducing bacteria which causes bad odors, and is diethanolamine free.

Maxbase SS-2090

Maxbase SS-2090 is a natural sulfonate and surfactant blend designed to produce a general purpose semi-synthetic water extendable concentrate for use on ferrous and non-ferrous metals (including aluminum). Blend levels as low as 30% produce a clear, transparent concentrate. It provides emulsion stability in soft and hard waters, provides corrosion inhibition, and is compatible with other extreme pressure and lubrication additives. The product does not contain any chlorine, nitrites, phenols, sulfur or heavy metals.

PCC Chemax has introduced functional products which provide a variety of attributes when formulated with our emulsifiers and lubricity additives.

Chemax WHA-100

Prevents formation of hard water soaps (similar to EDTA) while reducing leaching of iron, copper and aluminum. This product is oil soluble and water dispersible.

Chemax WHA-200

Prevents formation of hard water soaps (similar to EDTA) while reducing leaching of iron, copper and aluminum. This product is water soluble.

Chemid CDE-505

This product is an water soluble ethoxylated alkanolamide that enhances corrosion protection and is also used as a thickener for synthetics and for down hole drilling. This

product is a reaction of MEA and coconut fatty acid with ethoxylation. It is the ideal choice when viscosity modification and/ or corrosion protection is needed in semi-synthetic and synthetics.

Chemid TODA-100

This product is an oil soluble, water dispersible alkanolamide that enhances corrosion protection and is an excellent primary or secondary emulsifier. This product is a reaction of DIPA and tall oil fatty acid that has a low acid value, 7, which gives you excellent hard water stability and minimum soap content. It is an ideal choice for adding lubricity in soluble oils and semi-synthetics and water extendable drawing and stamping fluids.

POLYISOBUTYLENE SUCCINIC ANHYDRIDE ADDITIVES

PRODUCT DESCRIPTIONS

Chempib C

Chempib C is a polyisobutylene succinic anhydride that is 85% active, has a molecular weight of 950 and contains no mineral oil. It is used as a lower cost primary emulsifier or a dispersant for engine oils, hydraulics, or metalworking fluids. It has a light yellow straw color and contains NO residual chlorine, and keeps systems running cleaner than other competitive materials.

Chempib HN

Chempib HN is a polyisobutylene succinic anhydride that is 70% active in naphthenic base stock with a molecular weight of 950. It is used as a lower cost primary emulsifier or dispersant for soluble and semi-synthetic oils. It allows for easier formulation of metalworking fluids that use naphthenic base oil, and is easily neutralized with potassium hydroxide along with amines such as triethanolamine and/or amides with high reserve alkalinity like "Chemid TODA-100" to replace natural sodium sulfonates. The product contains no residual chlorine, and keeps systems running cleaner than other competitive products.

Chempib HP

Chempib HP is a polyisobutylene succinic anhydride that is 70% active in paraffinic base stock with a molecular weight of 950. It is used as a lower cost primary emulsifier or dispersant for soluble oils. It allows for easier formulation of metalworking fluids that use paraffinic base oil, and is easily neutralized with potassium hydroxide along with amines such as triethanolamine and/or amides with high reserve alkalinity like "Chemid TODA-100" to replace natural sodium sulfonates. The product contains no residual chlorine, and keeps systems running cleaner than other competitive products.

Chempib W

Chempib W is an 89% ashless, water soluble salt of polyisobutylene succinic anhydride for use as a primary emulsifier and/or lubricant to develop high and low oil synthetic and semi-synthetic metalworking fluid formulations. It can be used at low treat levels as a dispersing aid to keep water extendable systems clean, as a coupling aid, and as a lubricant.

Chemsulf SA-10WS

Water soluble 10% active sulfur based on succinic ester chemistry. Formulators can reduce or eliminate the need for additional additives such as chlorinated paraffin's, overbased sulfonates, and additional synthetic esters, because Chemsulf SA-10WS provides lubricity, friction modification, and extreme pressure properties all in one water soluble package.

Chemsulf SA-36E

Chemsulf SA-36E is a 36% active sulfurized ester that is soluble in Naphthenic Base Oils as well as Group I, II, III and Bright Stock Base Oils. It is light in color and odor, and has good oxidation and thermal stability. It is designed for use in any application where extreme pressure and friction modification is needed like drawing and stamping, pipe threading, broaching, pipe tapping, among many other applications in metalworking and industrial oil formulations. This product provides lubricity, friction modification, and extreme pressure properties all in one package, which allows the formulator to reduce or eliminate the need for additional additives such as any type of additional esters.

Chemsulf SA-40D

Chemsulf SA-40D is a 40% active dark sulfur polysulfide with good solubility in a variety of base oils, and is used in metalworking and industrial oils formulations for medium to heavy duty applications as an extreme pressure additive where color and odor are not an issue. It is non-corrosive to yellow metals.

Chemsulf SI-10D

Chemsulf SI-10D is a 10% in-active dark sulfur polysulfide with good solubility in a variety of base oils, and is used in metalworking and industrial oils formulations as an extreme pressure additive where color and odor are not an issue. It is non-corrosive to yellow metals.

Chemsulf SI-10E

Chemsulf SI-10E is a 10% in-active sulfurized ester, soluble in Naphthenic Base Oils as well as Group I, II, III and Bright Stock Base Oils. It is light in color and odor, and has good oxidation and thermal stability. It is designed for use in any application where extreme pressure and friction modification is needed like drawing and stamping, pipe threading, broaching, pipe tapping, among many other applications in

metalworking and industrial oil formulations. This product provides lubricity, friction modification, and extreme pressure properties all in one package, which allows the formulator to reduce or eliminate the need for additional additives such as any type of additional esters. It is also non-corrosive to yellow metals and also can be used as a "copper passivator" when active sulfur has to be used.

Chemsulf SI-10L

Chemsulf SI-10L is a 10% in-active sulfurized lard oil based ester that is soluble in Naphthenic Base Oils as well as Group I, II, III, and Bright Stock Base Oils, it is light in color and odor, and has good oxidation and thermal stability. It is designed for use in any application where extreme pressure and friction modification is needed like drawing and stamping, pipe threading, broaching, pipe tapping, and gear shaping among many other applications in metalworking and industrial oils formulations. This product provides lubricity, friction modification, and extreme pressure properties all in one package, which allows the formulator to reduce or eliminate the need for additional additives such as any type of lard oil including "Prime Burning Lard Oil", chlorinated paraffins, overbased sulfonates, and additional synthetic esters. It can be used by any finished fluid manufacturer that makes solubles, semi-synthetics, and straight oils. It is non-corrosive to yellow metals.

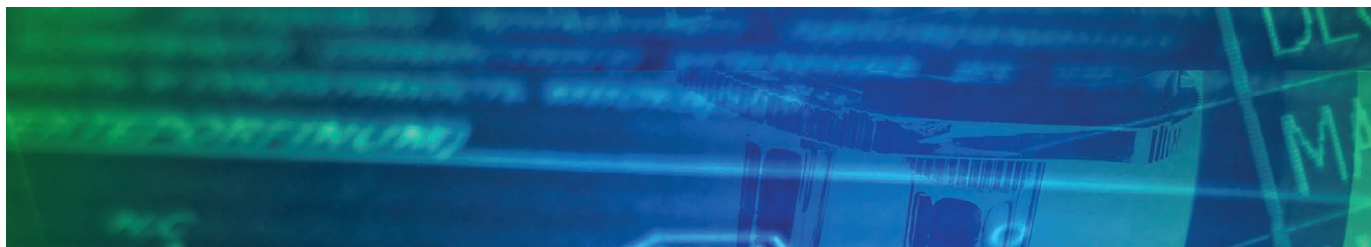
Chemsulf SI-20VEG

Chemsulf SI-20VEG is a 20% in-active sulfurized vegetable oil that is soluble in Naphthenic Base Oils as well as Group I, II, III, and Bright Stock Base Oils, it is light in color and odor, and has good oxidation and thermal stability. It is designed for use in any application especially medical metalworking applications, where extreme pressure is needed like drawing and stamping, pipe threading, broaching, pipe tapping, and gear shaping among many other applications. This product provides lubricity, friction modification, and extreme pressure properties all in one package, which allows the formulator to reduce or eliminate the need for additional additives such as any type of lard oil including "Prime Burning Lard Oil", chlorinated paraffins, overbased sulfonates, and additional synthetic esters. It can be used by any finished fluid manufacturer that makes solubles, semi-synthetics, and straight oils. It is non-corrosive to yellow metals and contains no natural triglycerides.

Please see our website's Products tab for the most complete list of products and corresponding information.

PCC Chemax, Inc. offers specialty chemicals for the Metalworking, Metal Plating, Metal Cleaning, Polymer Additives, and Oilfield Industries. Industry specific guides outlining our products' chemistries are available upon request. More detailed information regarding specific product data or MSDS can be found via our website under the Literature tab.

Contact our Piedmont, SC office us with other questions or sample requests.



pcc
CHEMAX

We don't simply sell products...*we sell solutions.*™

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