

Calciate™ Calcium Overbased Sulfonates Additives for Industrial Lubricants



Chemtura. *Value is our strongest additive.*



Chemtura Corporation's Petroleum Additives business is the leading global component supplier to the lubricants industry. With manufacturing sites in North and South America, Europe and Asia-Pacific, we are positioned to deliver products that significantly improve performance, with timely supply and exceptional Customer Care.

Our high-performance components find broad application in lubricants, fuel additive packages, water-soluble metalworking fluids and industrial greases.

Our component-additives family includes Naugalube® antioxidants, Synton® polyalphaolefins, Petronate® sodium sulfonates, Hybase® and Lobase® overbased sulfonates, G-2000® high-performance grease, as well as Kemester®, Kemamide®, Kemamine®, Industrene® and Hystrene® fatty acids and derivatives for lubricity.

Key Features and Benefits

- Lowest sediment/best clarity crystalline calcium sulfonates commercially available
- Compatible with most mineral base oils, white oils, and synthetic base stocks
- Synergistic EP/AW performance with other additives
- Corrosion inhibition properties
- Acid scavenging
- Low reactivity with other components
- Contains no chlorine, phosphorous or active sulfur
- Globally registered

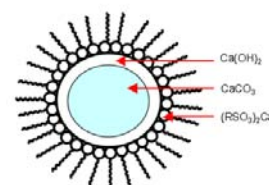
Applications

Overbased calcium sulfonates are used for friction modification, anti-wear protection, anti-weld protection, extreme pressure performance and as acid neutralizers. Suggested applications:

Industrial		Metalworking	
<i>Machine Oil</i>	<i>Rust Preventatives</i>	<i>Metal Removal</i>	<i>Metal Deformation</i>
Gear Oil	Rolling Oils	Cutting Oil	Rolling Oil
Turbine Oil	Mill Oils	Drilling Oil	Drawing Oil
Hydraulic Oil	Slushing Oils	Broaching Oil	Stamping Oil
Circulating Oil		Turning Oil	Forming Oil
Compressor Oil		Grinding Oil	Forging Oil
Way Oil		Honing Oil	
Grease		Lapping Oil	

Product Description:

Our complete line of Calcinate overbased calcium sulfonates are used for both acid scavenging and EP/AW performance in industrial and metalworking lubricant applications. They are composed of a colloidal suspension of calcium carbonate/calcium hydroxide surrounded by a natural/synthetic blend of calcium sulfonate detergent in oil. The major differences between these products are the composition of the natural/synthetic blend, the size of the dispersed calcium carbonate particles, the physical form, and the amount of calcium hydroxide



	Calcinate NC	Calcinate C-300CS	Calcinate C-300R	Calcinate OTS	Calcinate OR	Calcinate C-400CLR	Calcinate C-400W
Composition	I	II	II	III	II	II	I
Physical Properties							
Form	–	cryst	amorph	amorph	amorph	amorph	cryst
Calcium, wt %	2.7	10.5	12.0	12.0	15.2	15.2	14.5
Calcium Sulfonate, wt %	44.5	18.5	28.0	28.3	18.5	18.5	17.6
TBN, mgKOH/g	30	285	305	305	405	405	385
Water, wt %	0.2	0.2	0.3	0.3	0.3	0.3	0.5
Viscosity @ 100°C, cSt	55	100	75	75	75	75	40,000
Flash Point, COC, °C	220	220	220	220	220	220	220
Specific Gravity @ 15°C	0.96	1.10	1.13	1.13	1.20	1.20	1.15
Color (dilute)	5	5	5	5	5	5	5
Free Alkalinity, mgKOH/g	–	20	21	30	40	1	–
Performance Properties¹							
Copper Strip Corrosion (ASTM D130)							
Rating @ 100°C, 3 hrs.	1b	1b	1b	1b	1b	1b	1b
Demulsibility (ASTM D1401)							
Oil Layer, mL	42	0	0	0	42	40	0
Water Layer, mL	38	0	0	0	38	37	0
Emulsion Layer, mL	0	80	80	80	0	3	80
Separation Time min. (54°C)	20	30	30	30	20	15	30

¹ diluted 10% in 100 SUS naphthenic oil

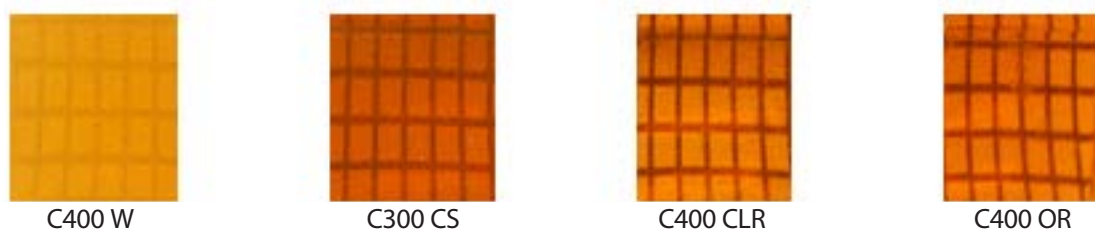
Recommended Use Levels

Product	Metal Working Fluids			Industrial Oils	
	Straight Oil	Semi-Synthetics	Soluble Oils	Machine Oils	Rust Preventatives
Calcinate NC	1 - 5	-	-	0.5 - 5	0.5 - 5
Calcinate C-300R	5 - 10	-	-	0.5 - 2	0.5 - 2
Calcinate OTS	5 - 20	2 - 5	2 - 5	0.5 - 2	0.5 - 2
Calcinate OR	5 - 20	2 - 5	2 - 5	0.5 - 2	0.5 - 2
Calcinate C-400CLR	5 - 20	2 - 10	2 - 10	0.5 - 5	0.5 - 5
Calcinate C-300CS	5 - 20	2 - 5	2 - 5	0.5 - 1	0.5 - 1
Calcinate C-400W	5 - 20	2 - 5	2 - 5	0.5 - 1	0.5 - 1

Performance Data

Clarity

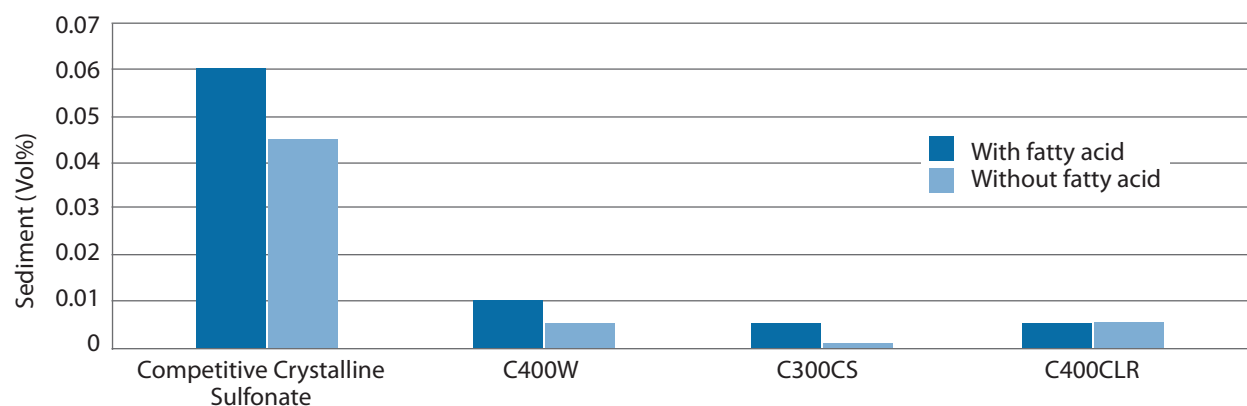
The crystalline products contain larger particles than the amorphous products and these result in a hazy appearance, but the reduced clarity is offset by the improved EP/AW performance.



Sediment

The interaction of the overbased calcium sulfonates with the other components in the formulation can cause precipitation of calcium carbonate. By adjusting the composition and the free alkalinity of our products, the amount of calcium carbonate precipitate can be reduced.

Sediment



Corrosion

Depending on the formulation used, the crystalline and amorphous overbased calcium sulfonates can be formulated to provide corrosion protection under a variety of conditions.

Product ¹	Humidity Cabinet (ASTM D1748)			Rust (ASTM D665)
	Rating	Rust Area (%)	Time (hrs)	
Calcinate NC	Pass	0	>100	Pass
Calcinate C-300R	Pass	0	>100	Pass
Calcinate OTS	Fail	20	24	Pass
Calcinate OR	Fail	20	24	Pass
Calcinate C-400CLR	Fail	100	24	Pass
Calcinate C-300CS	Fail	<5	48	Pass
Calcinate C-400W	Fail	10	48	Pass

¹tests run on a 10% blend in 200 SUS naphthenic oil

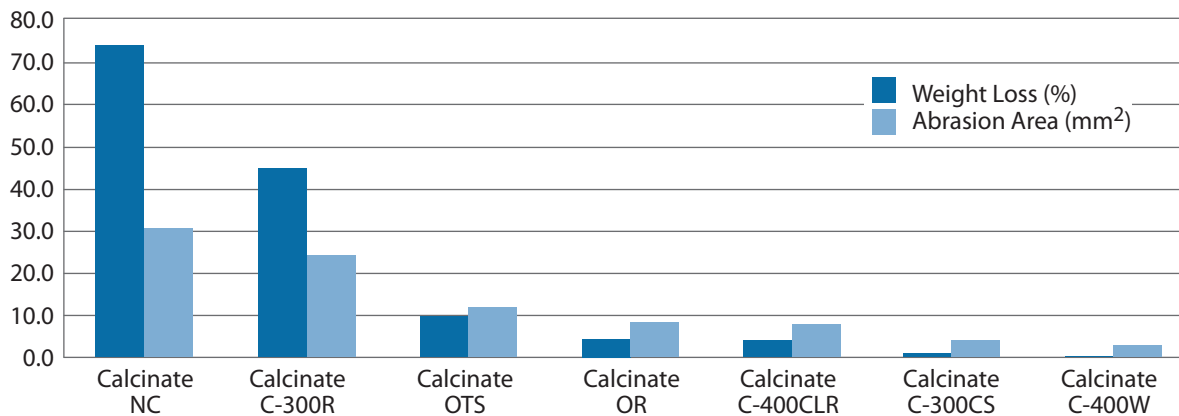
Extreme Pressure/Anti-Wear Performance

Our complete line of Calcinate overbased calcium sulfonates are transparent, dark brown liquids which are readily soluble in mineral oils, white oils and synthetic oils and can be used for improving the EP/AW performance in industrial and metalworking lubricant applications. The amorphous overbased calcium sulfonates are excellent for acid scavenging and clarity, while the crystalline products provide excellent acid scavenging and EP/AW performance. In industrial lubricants the amorphous products are preferred, while in the metalworking market the crystalline products are recommended.

	<i>Calcinate NC</i>	<i>Calcinate C-300R</i>	<i>Calcinate OTS</i>	<i>Calcinate OR</i>	<i>Calcinate C-400CLR</i>	<i>Calcinate C-300CS</i>	<i>Calcinate C-400W</i>
Four-Ball EP (ASTM D2783)							
Non-Seizure Load, kg	50	80	80	80	126	80	80
Weld Point, kg	160	200	200	200	250	200	250
Load-Wear Index, kgf	23.1	35.1	34.9	37.1	38.2	39.9	42.0
Four-Ball Wear (ASTM D4172)							
Average Scar Diameter, mm	0.63	0.33	0.31	0.31	0.32	0.35	0.36
Pin and Vee-Block EP (ASTM D3233A)							
True Load, lbs.	977	1315	1963	1618	1686	2353	4500
Pin and Vee-Block Wear (ASTM D2670)							
Total Teeth Wear	seize	4	4	2	4	1	1

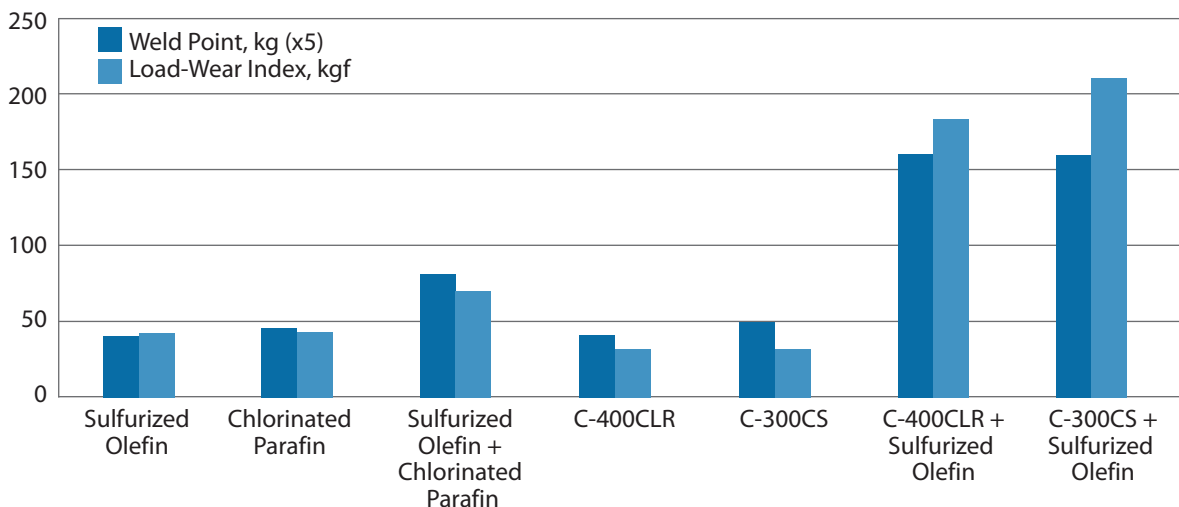
diluted 10% in 100 SUS naphthenic oil

Reichert Wear Test



The crystalline and amorphous overbased calcium sulfonates were found to possess synergistic EP/AW performance when used in combination with other additives like sulfurized olefins.

Four-Ball EP (ASTM D2783)



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Chemtura Corporation (NYSE:CEM) is the world's largest producer and marketer of plastic additives and one of the largest publicly traded specialty chemicals companies in the U.S.

It is the world leader in antioxidants, manufacturing and marketing all four families globally.

The company is also a leading supplier of pool and spa products, a top marketer of niche agricultural products, and a top producer of urethane polymers.

Chemtura's specialty chemicals improve the performance and quality of products in automotive, construction, packaging, industrial and consumer applications. Its crop protection products increase crop yield and quality worldwide.

Please visit www.Chemtura.com.

Storage and Handling

Please read the Material Safety Data Sheet (MSDS) and container label before using this or any product. The MSDS contains important information regarding the safety, handling and storage of this product.

The information contained herein is correct to the best of our knowledge. Your attention is directed to the pertinent Material Safety Data Sheets for the products mentioned herein.

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