

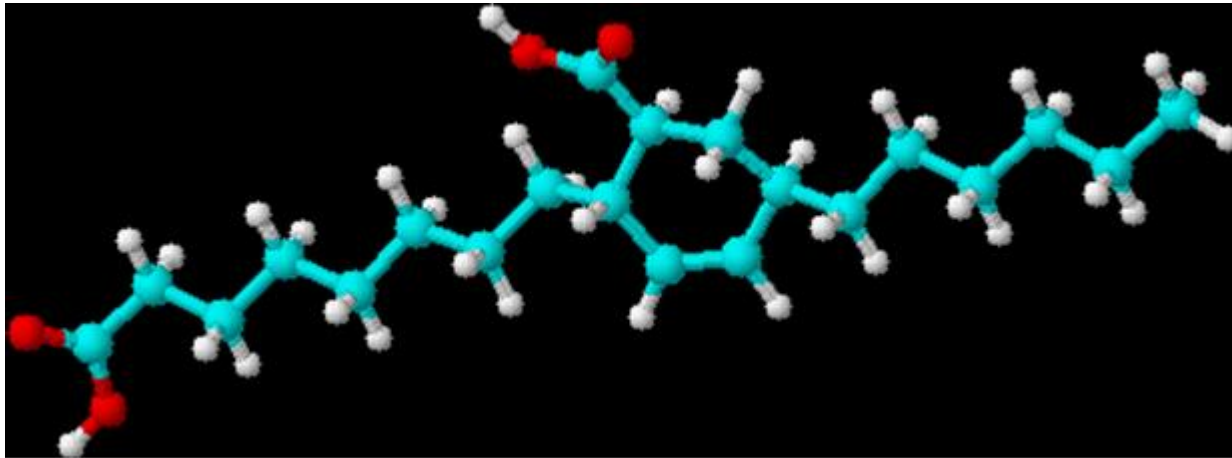
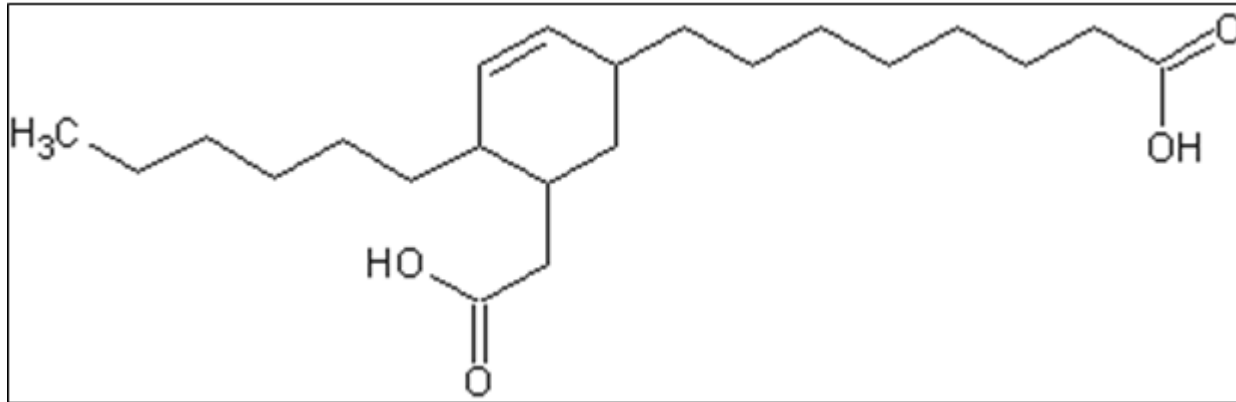


Formulating Successes with Diacid 1550

2018 STLE Commercial Forum

ingevity

Diacid 1550 chemical composition



Diacid 1550 chemical composition

5(or 6)-Carboxy-4-hexyl-2-cyclohexene-octanoic acid containing about 10% oleic- and other fatty acids

CAS-No. 53980-88-4

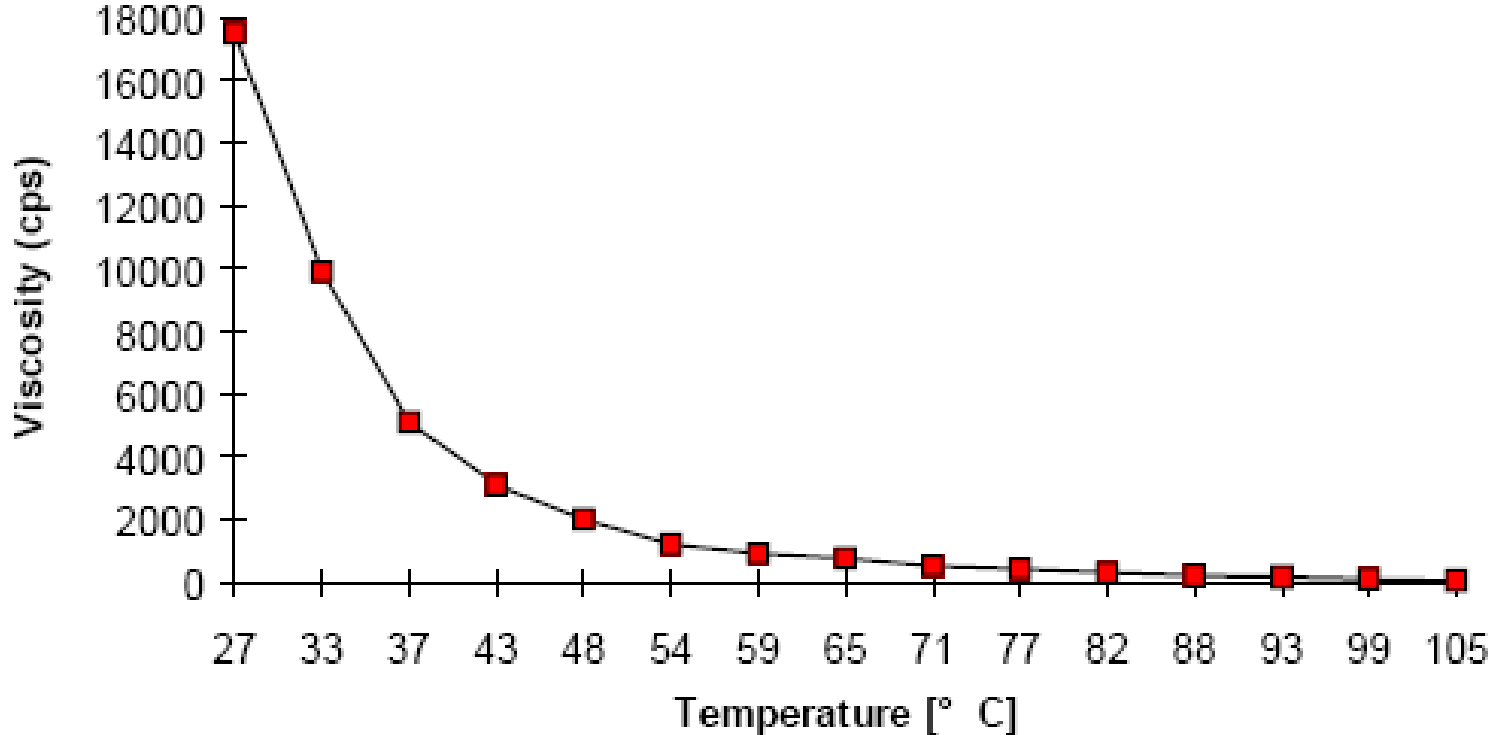
EINECS-No. 258-897-1

ECL Serial No. 9212-1059

Listed under TSCA, DSL and AICS

Properties	Min	Max	Method	Typical Values
Acid Number	265	277	ASTM D 465-92	271
Color Gardner	-	9	ASTM D 1544-68	7+

Diacid 1550 Viscosity Profile



Why is Diacid 1550 so useful?



Derived from a bio-renewable resource (TOFA)

Multi-functional specialty additive

Resistant to bioactivity, yet still biodegradable

Proven value over more than 40 years

What can Diacid 1550 do?

Multifunctional additive with key benefits:



- **Co-emulsification**

It's the best additive on the market for tightening emulsions

- **Corrosion Inhibition**

It's a great addition to a corrosion inhibition package

- **Lubrication**

It's a great lubricity additive, especially in aluminum forming applications



Co-emulsification

Diacid 1550 is the best additive for tightening emulsions.

Bringing everything together...

See for yourself...

Co-emulsification with Diacid 1550

Before

After



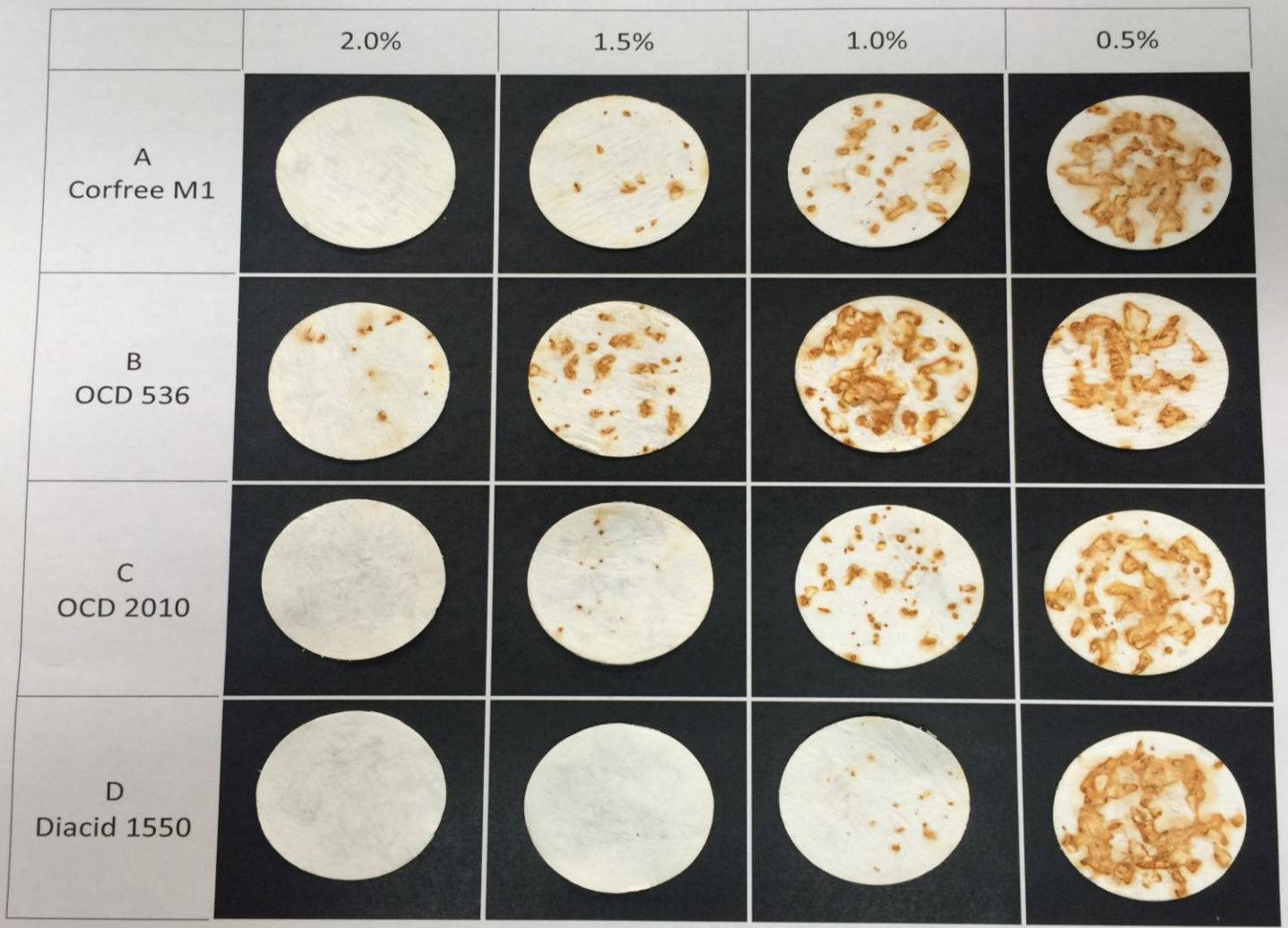


Corrosion Inhibition

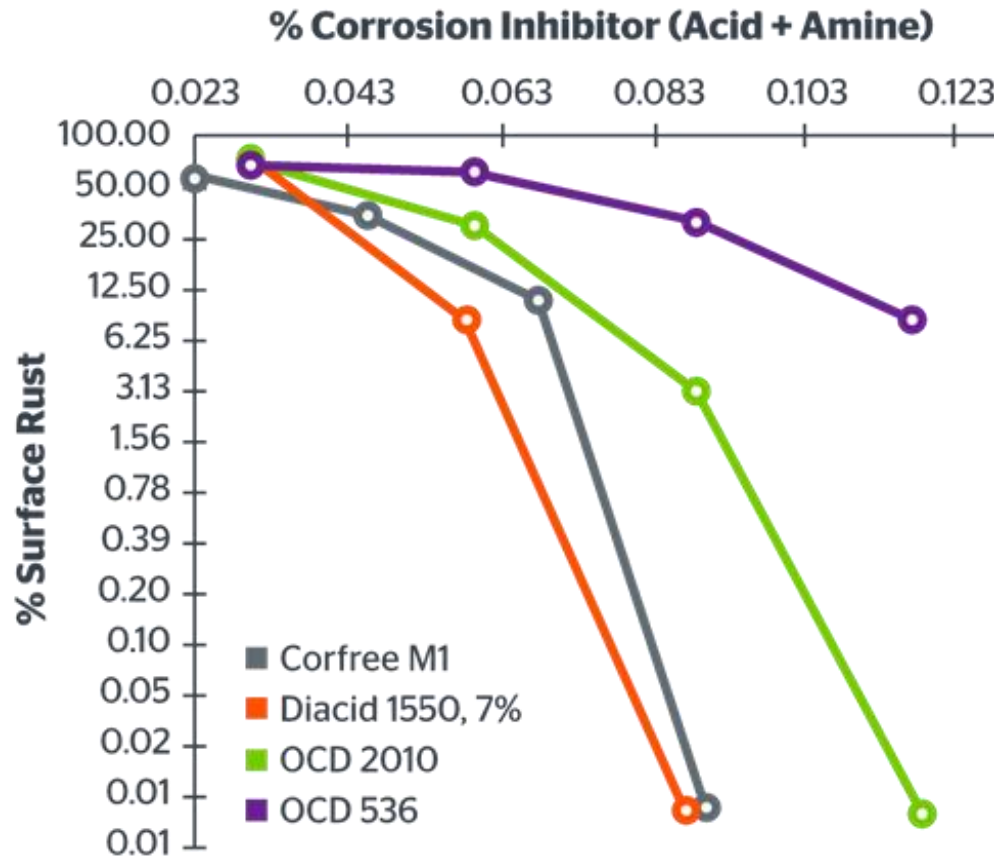
Diacid 1550 is a great addition to a corrosion inhibition package.

- Great cast iron chip performance
- Boron-free

Corrosion CIC test picture in formulation



Corrosion CIC test picture in formulation





Lubrication

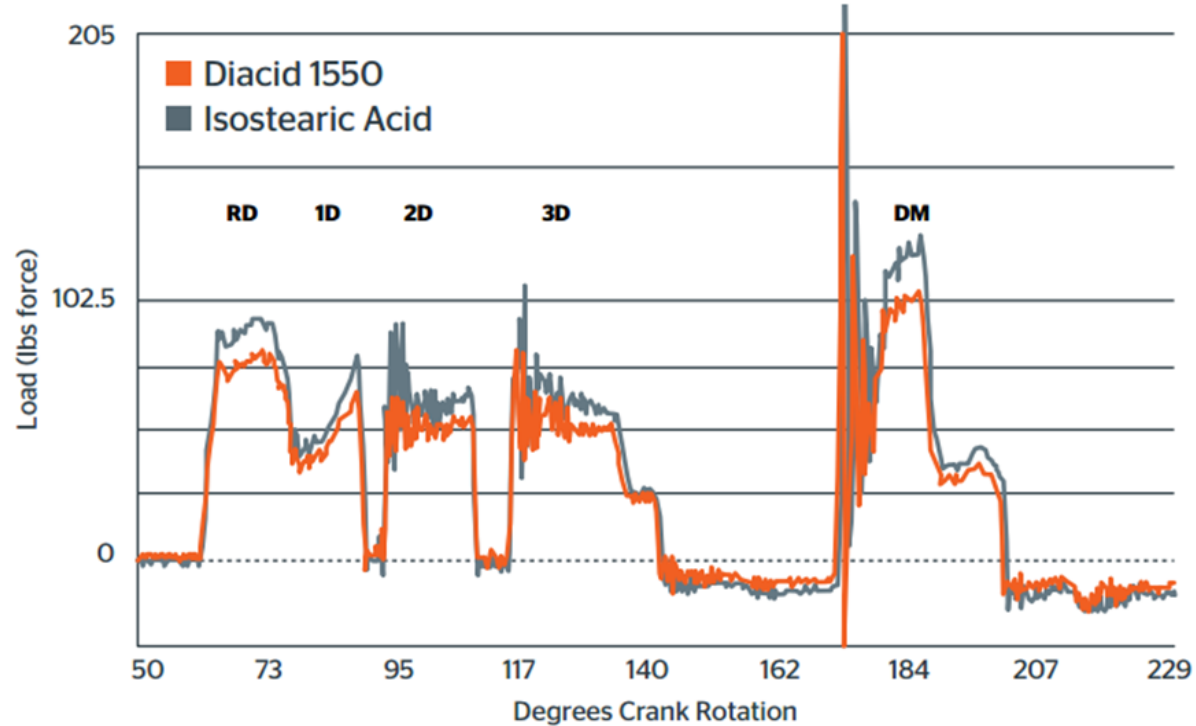
The long chain of Diacid 1550 provides added lubricity, particularly in aluminum forming applications.

Smoothing things over...

Lubricity

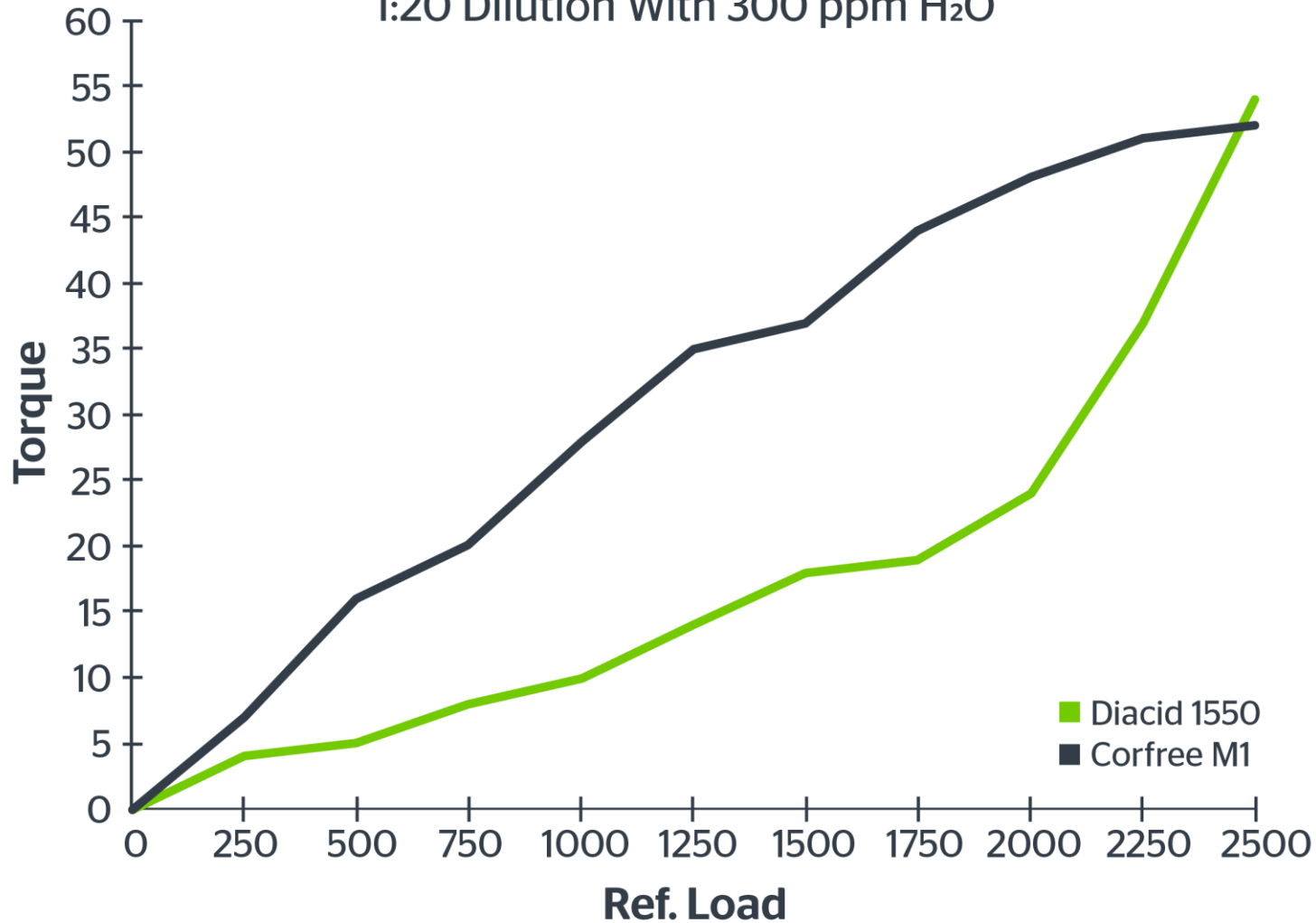
Aluminum can drawing trial

TEA salt formulation



Lubricity

Diacid 1550 vs. Corfree M1
Synthetic MWF
1:20 Dilution With 300 ppm H₂O





Supplementary Benefits

Diacid 1550 can also increase hard water tolerance and wetting properties.

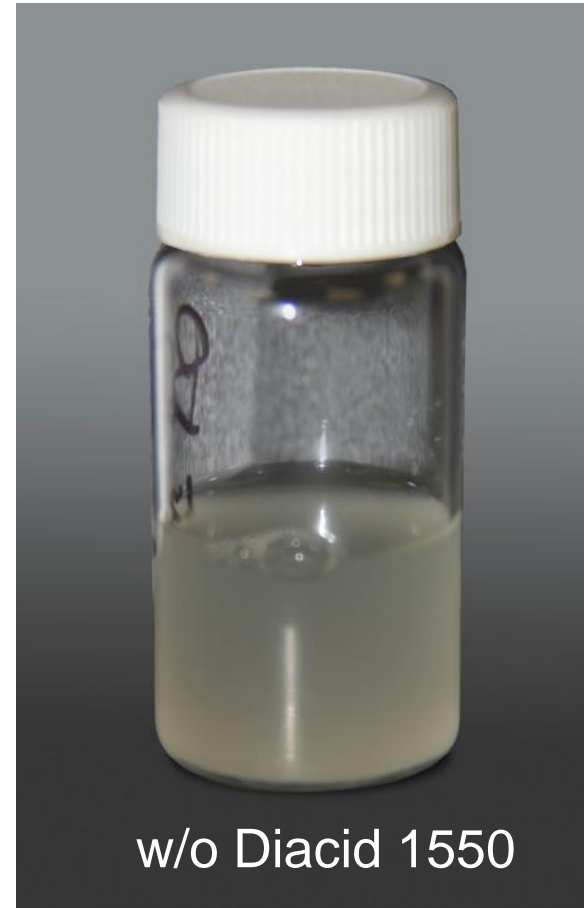
Helping out in tough environments...

Hard water tolerance



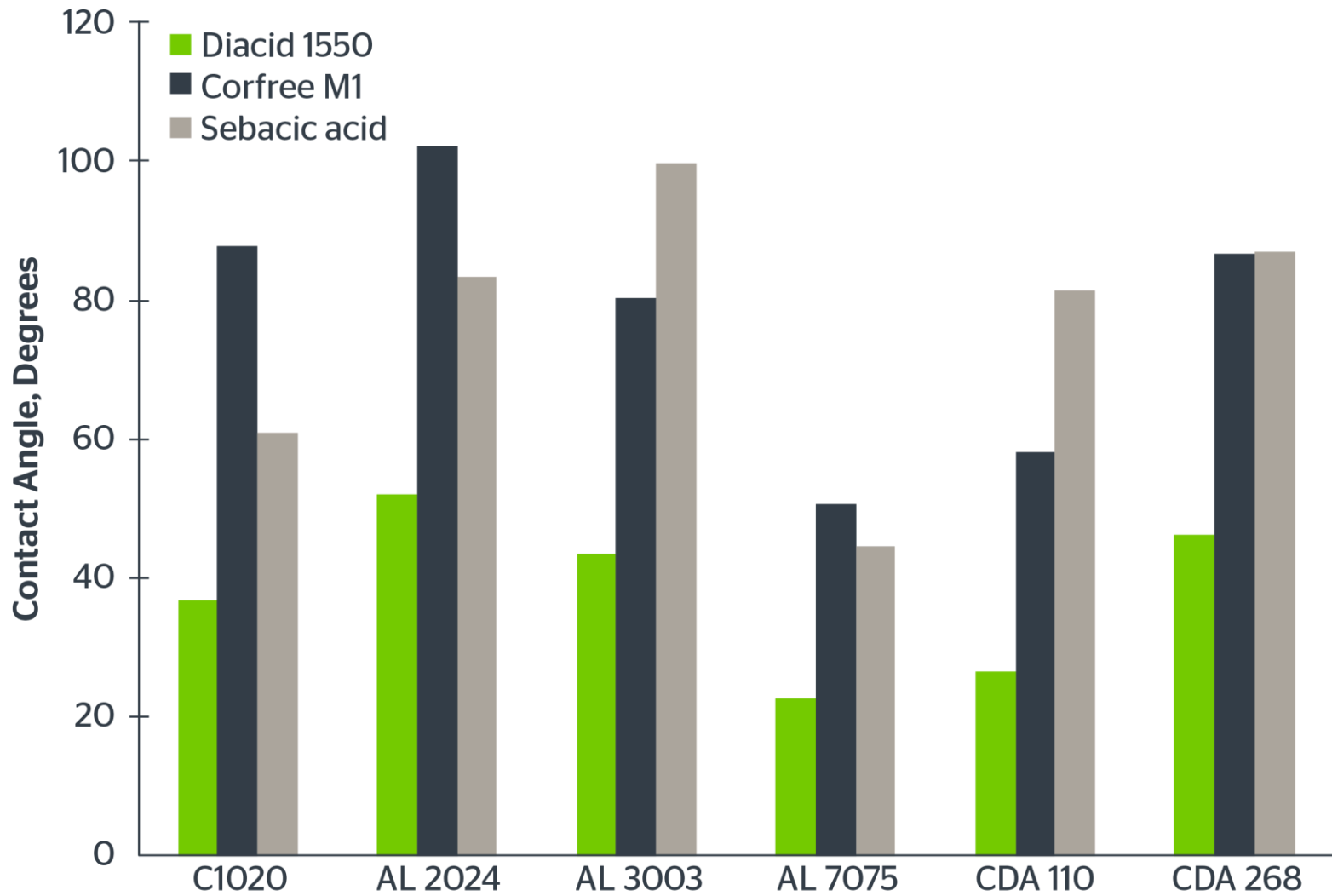
**Surfactant
available**

500 PPM Ca⁺²



**Surfactant
consumed**

Wetting Properties





Formulation Tips

There are a variety of factors to consider when formulating for multi-metal applications...

How to formulate with Diacid 1550

Diacid 1550 is oil-soluble or lipophilic. When neutralized with an appropriate base (sodium or potassium hydroxide, or an alkanolamine such as TEA), the resulting salt is water soluble.

- Easiest to formulate with when added into the oil phase of a semi-synthetic or soluble oil.
- From there, the water soluble components and bases can be added later, effectively neutralizing Diacid 1550 and allowing it to function.
- Once the effects of Diacid 1550 in a particular system are realized, the formulator can adjust the percentage to optimize the benefits.
- Minimize foam by reducing the non-ionic emulsifier dose and increasing Diacid 1550.

Neutralization of Diacid 1550

The production of salts is readily accomplished by the addition of Diacid 1550 to the appropriate neutralizing reagent.

Commonly used neutralizing agents:

Neutralizing Agent	Neutralization Weight (grams/gram of Diacid 1550)
Monoethanolamine	0.29
Triethanolamine 99.5%	0.71
Potassium Hydroxide	0.27
Sodium Hydroxide	0.19



Future of Diacid 1550

Metal finishing chemicals

Exploration in the following markets:

- Multi-metal corrosion inhibition
- Metal cleaning and protection
- Hydro-trope

Summary

- Diacid 1550 is a unique product offering superior multifunctional performance.
- Diacid 1550 provides co-emulsification, corrosion inhibition, lubrication and more!
- The multifunctionality of Diacid 1550 can facilitate streamlined formulations, ultimately saving time and money.
- Ingevity can provide formulating tips to help with Diacid 1550, and achievement of lower foam.
- Ingevity is exploring metal cleaning and protection applications.

Special thanks to our team



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