



Product Focus • Customer Commitment • Performance Flexibility

NAXONAC[®] 817LF

Product Data Sheet

LOW FOAMING PHOSPHATE ESTER

Description:

Nease Co. LLC offers a growing list of phosphate esters under the **NAXONAC[®]** trade name. As an anionic surfactant, one of the main advantages of phosphate esters is their stability and solubility in alkali systems. They can be used as hydrotropes to couple nonionic surfactants systems which are not soluble and at the same time increase wetting and detergency properties. The presence of the phosphate group interacts with metallic surfaces, thereby exhibiting anti-corrosion and metal-adhesion characteristics. They can be used as additives in oil and water-soluble lubricant systems to improve lubricity, anti-frictional properties of the formula. Phosphate esters also find use as emulsifiers in emulsion polymerization.

CAS

Proprietary

Naxonac[®] 817LF is designed to meet your needs as an emulsifier, wetting agent, anti-wear additive, corrosion inhibitor and extreme pressure (EP) additive in lubricants and various metalworking fluids. It has a unique property as a low foam metalworking fluid additive.

Typical Properties:

| | |
|-------------------------|------------------------|
| Appearance | Clear to yellow liquid |
| Flash Point, (open cup) | > 212 °F |
| Pour Point | 15°C |
| Solubility in Water | Dispersible |

Product

Specifications:

| Property | Specification |
|-------------------------------------|---------------|
| Appearance | Clear liquid |
| Acid number (1 st infl.) | 190.0-210.0 |
| Phosphoric acid (%) | 3.0 Max |

Applications:

Lubricants, Corrosion inhibitors, detergents, metalworking fluids and wetting agents

Performance data:

Foaming test:

As the graph (Figure 1) illustrates, Naxonac[®] 817LF has the best low foaming ability compared to the Control (a well-known metalworking fluids additive) and our other metalworking phosphate ester additives (Naxonac[®] 184). The low foaming trend was similar in different types of metalworking fluid formulations.

The foam test was carried out at 0.125% concentration (neat ester) or 5% as metalworking fluid formulation. This is a hand shake foam test where the foam height is measured over 10 min.

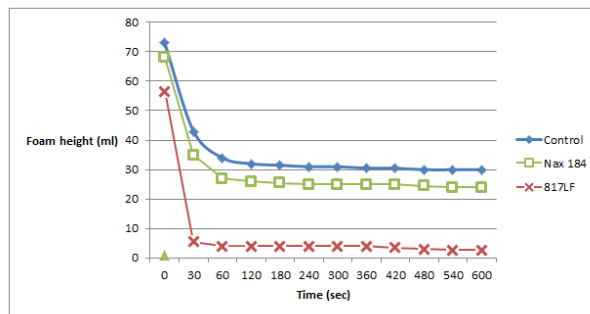


Figure 1: Foam test result for Naxonac[®] 817LF

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Iron Chip Corrosion test:

MWF formulations containing Naxonac® 817LF behaved the same as other phosphate ester based metalworking fluid. Their formulations passed the 24hr iron chip corrosion test (ASTM D4627) in soluble oil, semi synthetic and synthetic metalworking fluid (MWF) formulations at 5% concentration in 100ppm hard water. The results of the corrosion test in semi-synthetic MWF is shown in figure 2.

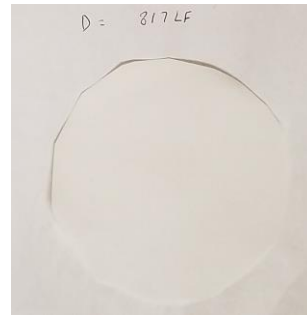


Figure 2: Iron chip corrosion test result for Naxonac® 817LF

Aluminum Corrosion test:

This product also showed no aluminum staining in a 24 hour period in most metalworking formulations at 5% concentration in the pH range of 8.8-9.2 at room temperature. Figure 3 illustrates the results of the non-staining of aluminum in soluble oil metalworking fluid formulation containing Naxonac® 817LF.



Figure 3: Aluminum corrosion test result for Naxonac® 817LF

Lubricity test:

The lubricity test was obtained from testing on a Microtap Tauro 120T instrument on aluminum 6061-T6. This test measures the average torque over the specified portion of the metal cut. The lower the torque, the better the metalworking formulation; which generally means the higher the efficiency of the additive in the formulation. Naxonac® 817LF was tested against the Control (a commercial product) and Naxonac® 184 in soluble oil, semi-synthetic and synthetic metalworking formulas. The results of the testing done at 5% concentrations are presented below.

Soluble oil MWF Formulation:

From the data below (Figure 4) the formulations with Naxonac® 817LF shows slightly better lubricity performance than the Control and equal or slightly better than Naxonac® 184.

| Components | % |
|-----------------------|-------|
| Alkyl Aryl Sulfonate | 12.96 |
| Alcohol Ethoxylate | 5.4 |
| Alkanoamine | 1.14 |
| Fatty Acid | 2.14 |
| Glycol Coupler | 2.16 |
| Water | 1.26 |
| Naxonac® 817LF | 6.00 |
| Base Oil | 68.94 |

Table 1: Components of Soluble oil MWF formulations

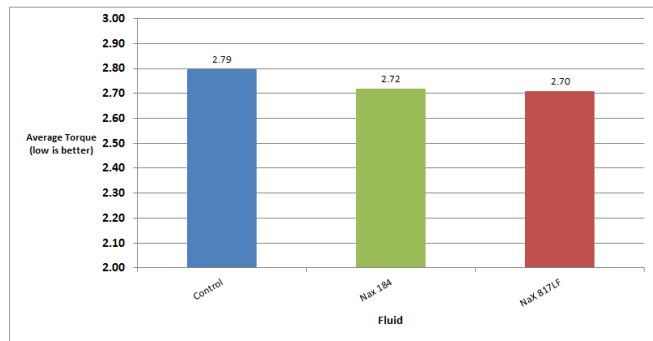


Figure 4: Aluminum 6061 tapping data for Naxonac® 817LF

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Semi-Synthetic MWF Formulation:

The results depicted below (Figure 5) further shows that the addition of Naxonac® 817LF to a semi-synthetic metalworking fluid (MWF) formulation enhanced the performance of the formulation. This product is better than the Control and Naxonac® 184 in this formulation

| Components | % |
|------------------------------|-------|
| Natural Alkyl Aryl Sulfonate | 14.00 |
| Glycol Coupler | 8.00 |
| Base Oil | 10.00 |
| Fatty Acid | 8.00 |
| Substituted Oxazoline | 4.00 |
| Naxonac® 817LF | 2.40 |
| Alkanolamine | 4.70 |
| Alkali Hydroxide | 1.34 |
| DI Water | 47.56 |

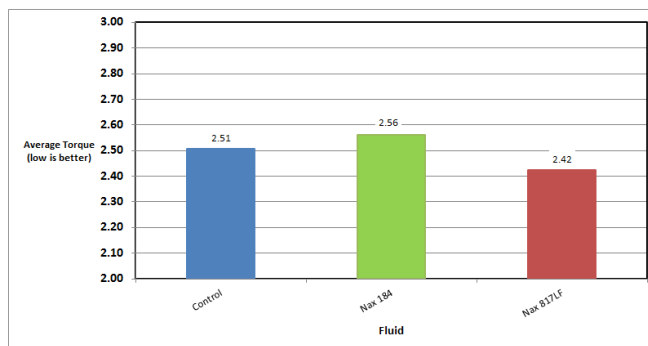


Table 2: Components of Semi-synthetic MWF formulations

Figure 5: Aluminum 6061 tapping data for Naxonac® 184

Synthetic MWF Formulation:

As shown in Figure 6 Naxonac® 817LF has good lubricity performance compare to the Control and other metalworking phosphate ester additive (Naxonac® 184) tested in the same synthetic metalworking formulations

| Components | % |
|-----------------------|-------|
| Fatty Acid | 5.00 |
| Glycol Ester | 9.00 |
| Naxonac® 817LF | 4.00 |
| Alkanolamine | 12.00 |
| DI Water | 70.00 |

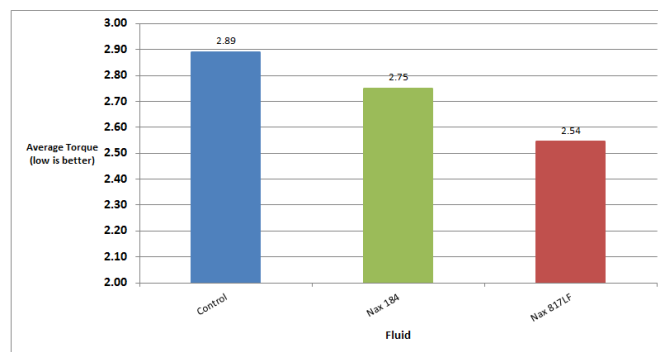


Table 3: Components of Synthetic MWF formulation

Figure 6: Aluminum 6061 Tapping data for Naxonac® 817LF

Storage and Handling:

Store covered in a dry, well ventilated area. Keep container tightly closed when not in use. Prevent from freezing. Store material above 20°C (68°F).

Availability:

55 gallon drum, 275 gallon tote

Chemical Control Law Status:

This product is in compliance with the inventory listing requirements of the Chemical Control Laws in the following countries: United States of America, Canada (NDSL), Europe, Korea, and Japan

Transport Regulations

Shipping Description: DOT Non-Regulated
Hazard Class: NA ID Number: NA Packing Group: NA Label: None

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