NAXONATE® Hydrotropes

Product focus.
Customer commitment.
Performance flexibility.
Leading Hydrotrope Production

For Over 50 Years

Nease has always been a specialist, and a leader, in hydrotrope production. Our innovative expertise generates customized solutions for each customer’s unique needs. We either recommend an existing product or develop a new one, depending on the application.

Our NAXONATE® hydrotropes offer:

- Cost-effective performance
- Reformulation for the optimum product
- Answers to solubility problems in a wide variety of commercial applications
- Widespread usage in today’s increasingly complex formulas
- Broad formulation, compatibility and effectiveness

NAXONATE® hydrotropes are the most widely used and impact the performance of surfactant systems in a number of ways:

- Solubilize (couple) complex formulas
- Modify cloud point
- Control viscosity
- Minimize cost
Our broad range of products gives you more formulation flexibility than anyone else in the industry.

Get Greater Performance

Optimum hydrotrope selection can result in enhanced system performance. NAXONATE® hydrotrope products generate essentially no foam and no wetting action and have minimal influence on surface tension. What they offer is a cost-effective way to solubilize complex formulas, elevate cloud points and control viscosity.

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<th>Product Features and Application</th>
<th>PRIMARY APPLICATIONS</th>
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<td>Heavy-duty Laundry Detergents</td>
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<tr>
<td>Naxonate® Hydrotropes</td>
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<tr>
<td>Sodium Xylene Sulfonate</td>
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<tr>
<td>Naxonate® 4LS</td>
<td>Liquid</td>
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<tr>
<td>Naxonate® 4LOF</td>
<td>Liquid</td>
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<tr>
<td>Naxonate® SX</td>
<td>Powder</td>
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<tr>
<td>Sodium Cumene Sulfonate</td>
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<tr>
<td>Naxonate® 40SC</td>
<td>Liquid</td>
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<tr>
<td>Naxonate® 4SSC</td>
<td>Liquid</td>
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<tr>
<td>Naxonate® SC</td>
<td>Powder</td>
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<tr>
<td>Toluene Sulfonates</td>
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<tr>
<td>Naxonate® 4ST</td>
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<tr>
<td>Naxonate® ST</td>
<td>Powder</td>
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<tr>
<td>Naxonate® 4KT</td>
<td>Liquid</td>
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<tr>
<td>Naxonate® 4AX</td>
<td>Liquid</td>
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Liquid hydrotropes are clear, colorless liquids • Low viscosity and easy to handle

Call Customer service at 888-762-7373 for product specifications and Safety Data Sheets.
The effectiveness of a hydrotrope is determined by the concentration required to clear or solubilize a formulation at room temperature. The rate of increase of the cloud point is a measure of the efficiency of the hydrotrope.

Increase Efficiency

% Hydrotrope needed to raise Cloud Point of Surfactant Solutions to Target CP

Hydrotrope (100% act.) Needed to Raise Cloud Point of Neodol 25-7 Solution to 70C
5% Neodol in DI water

Hydrotrope (100% active) effect on Cloud Point
5% Neodol 25-9 in DI Water
Viscosity with NAXONATE® hydrotropes is an advantage when formulating products. Component interactions in more complex formulations affect solubility and viscosity. NAXONATE® hydrotropes effectively modify these properties to provide a commercial product meeting market requirements. In some instances, modifying system viscosity can be a more important function than hydrotrope performance.

Formulation Freeze/Thaw Stability Enhancement
A dishwasher formulation, which is not freeze/thaw stable, is coupled with the hydrotrope at various concentrations and run through freeze thaw cycles (0º to 50ºC). Stability of the formulation after each cycle is observed and recorded.

<table>
<thead>
<tr>
<th>Premium Dishwash Liquid</th>
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<tbody>
<tr>
<td>Naxolate® ES-360</td>
<td>8.56</td>
</tr>
<tr>
<td>Naxsoft®40S</td>
<td>18.86</td>
</tr>
<tr>
<td>Alkanolamide</td>
<td>5.10</td>
</tr>
<tr>
<td>Hydrotrope (40%)</td>
<td>4.80</td>
</tr>
<tr>
<td>Sodium sulfate</td>
<td>0.64</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>1.04</td>
</tr>
<tr>
<td>Water</td>
<td>to 100</td>
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</table>

Pictures of the Dishwash formulation with respective hydrotrope (100% active) added. These formulations have gone through three freeze/thaw cycles (cycle: 0ºC to 50ºC). Note that the Sodium Cumene Sulfonate remained stable at 4% addition. Sodium Xylene Sulfonate did not remain stable until 6% hydrotrope was added.
Handling Characteristics

Storage Temperatures:
NAXONATE® hydrotropes should be stored at temperatures 10°C greater than their crystallization temperatures.

Materials of Construction:
Nease recommends using stainless steel or fiberglass reinforced plastic tanks for storing NAXONATE® hydrotrope solutions. Resins such as Bisphenol A/Fumarate and vinyl ester can be used for construction. Stainless steel of welded or flanged construction is suitable for pumps, transfer lines, and other production accessories. Iron tanks or lines may result in corrosion and contamination.

Safety & Environment:
NAXONATE® solutions and powders have been used safely for many years and are generally regarded as nontoxic, low-hazard and readily biodegradable products.

Health Hazard
Acute Toxicity:
Oral LD50 >16,200 mg/kg (SXS), >7,000 mg/kg (SCS)
Dermal LD50 >2,000 mg/kg (SXS and SCS)
Dermal Irritation Not a skin sensitizer
Eye Irritation Causes eye irritation

Environmental Hazard
Static Acute Toxicity:
Rainbow Trout 96 hour, LC50 > 1,000 mg/L (SXS and SCS)
Daphnia magna 48 hour, EC50 > 40.3 mg/L (SXS), 54 mg/l (SCS)

Aerobic Biodegradation
Readily Biodegradable

Nease Overview…
- Founded in 1951 as the Pedlow-Nease Company
- Began hydrotrope production in Cincinnati in 1958
- Formerly owned by Ruetgers AG
- In 2005 Nease Corporation became wholly owned subsidiary of International Chemical Investors (ICI).
- Nease Corporation changes name to Nease Co. LLC in 2014.

Nease PERFORMANCE CHEMICALS

Product focus • Customer commitment • Performance flexibility

The products sold by Nease Co., LLC (“Seller”) shall conform to the Seller’s current published specifications. Seller makes no other warranty, express or implied, including warranty of merchantability or fitness for particular use, whether product is used singly or in combination with other substances or in any process. Nothing contained herein should be considered as a recommendation for use of any product or method in violation of any valid patent now effective or which may issue hereafter. Prior testing for fitness for use and compliance with all applicable statues by the user is a strict condition on the sale of any and all of Seller’s products.

Customer Service: 1-888-762-7373
9774 Windisch Road · West Chester, OH 45069
www.neaseco.com