Chemical and Mineral Global Supply Chain Services

Distributing – Blending – Application Solutions

For

Upstream and Downstream – Hydrocarbon Processing

Water Treatment

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Mission Statement

Pan Asian Chemicals Inc. strives to be the preferred supply chain provider choice for customers of chemicals and minerals for the Oil – Gas - and water treatment sectors. We take pride in our services and quality of our products, and our relationships with our suppliers and customers.

Chemical and Mineral Global Supply Chain Services

Pan Asian Chemicals Inc. provides expert solutions for your chemical and mineral requirements, with warehousing, distribution, blending application solutions for, hydrocarbon processing, water treatment, and other applications.

Our objective is to expand our North American and global business relationships with superior services, agility, speed and exceptional logistics services. We provide product expertise, effective solutions for procurement, and extend total confidentiality and discretion for all aspects of services provided.

For sourcing of any products not included in our brochure, please contact us at info@panasianchem.com +1 713 621 1888.
Pan Asian Chemicals Inc. (Pan Asian) is a 15-year-old privately held company headquartered in Houston, with offices in New York, Shanghai, and a global network of representatives, agents, consultants, and distributors.

Specializing in the oil - gas - and water treatment sectors, Pan Asian provides complete turnkey supply chain services – for chemicals and minerals (Borons) to customers in the United States, and other countries.

Pan Asian Chemicals competes effectively with speed and agility, timely deliveries and superior QC and QA. The Company engages in custom tolling/blending, provides on-call deliveries from various warehouses, and distribution services. Pan Asian has implemented several staging and rotating inventory facilities in strategic locations domestically and overseas, to ensure on-time and on-call deliveries for sustained contractual commitments.

Pan Asian typically provides pre-shipment quality inspections for compliance with Tier II C-TPAT partner status with the US Customs and Border Protection Authorities, whereby all USA importations receive priority for clearing customs. (avoiding drug - and explosive - random customs inspections) This provides important competitive advantages.

The company has obtained three prime EPA registrations: Pan Asian PanaX 500™ 50 and PanaX 500™ 25 for pure Glutaraldehyde, and Pan Asian PanaX 100™ THPS 75, with more to follow, soon.

In close cooperation with its customers, universities, chemical institutions, laboratories, and manufacturers; Pan Asian provides technical expertise and support, research and development, and new alternative supply options, blends, and products. The Company’s steady and consistent growth allows for optimal ocean - and trucking – volume contract rates. Which provide our Logistics Department with leverage, economies of scale, and best rates.

Pan Asian operates a warehouse and terminal in Shanghai, for staging, labelling, custom markings, custom packaging (pails, drums, totes, ISO tanks) and other services for export sales.

Pan Asian has a record of servicing ISO Tanks in permanent rotation to provide customers products, and storage, and reliable long term contracts for manufacturers.

Main office:
Pan Asian Chemicals Inc.
5444 Westheimer, Suite 1570
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+1 713-621-1888
CERTIFICATIONS AND REGISTRATIONS

Customers-Trade Partnership Against Terrorism (C-TPAT) – Tier 2 Certification
C-TPAT certified members are considered low risk by the Customs and Border Patrol. PanAsian received C-TPAT Tier 2 certification by demonstrating a high-level implementation of its security processes and risk assessment procedures.

EPA Prime Registrations: 88951-1, 88951-2, 88951-3
Registered Under FIFRA
PanAsian has prime EPA registrations for PanaX 500™ 25% and PanaX 500™ 50% pure Glutaraldehyde with various Methanol specifications and PanaX 100™ THPS 75%. The EPA has issued a Letter of Waiver to PanAsian for non-registered THPS and Glutaraldehyde for importation into the U.S.

U.S. Drug Enforcement Administration (DEA) Registration
PanAsian is Registered and authorized by the DEA to import controlled substances / regulated chemicals into the U.S. and is in full compliance with the Texas Department of Health, Food, and Licensing.

Centre for Environment, Fisheries & Aquaculture Science (CEFAS) Registration
PanAsian Glutaraldehyde 50% and 25% and its prime EPA registered PanaX 500™ 50 and PanaX 500™ 25 pure Glutaraldehyde with various maximum Methanol specifications, have been certified on the Cefas list of notified chemicals for use by North Sea offshore and other hydrocarbon applications. PanAsian PanaX 100™ THPS 75 registration is pending.

Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
REACH is pending approval for imports to Europe.

The European Chemicals Agency (ECHA) – Biocidal Products Regulation (BPR) for
PanAsian’s PanaX 500™ 25%, and 50%: pending for inclusion on the BPR active substance list.

MEMBERSHIPS
# Priority Product List

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CAS. NO</th>
<th>APPLICATION</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANAX 500™ 50, 45, 25, 15% (Prime EPA Registered Pure Glutaraldehyde)</td>
<td>111-30-8</td>
<td>Pumped as a liquid additive with fracturing fluids to reduce, or eliminate, formation of bacterial populations (specifically Acid Producing Bacteria and Sulfate Reducing Bacteria) that create corrosive by-products and fracture conductivity damage.</td>
<td>Biocide/Pesticide</td>
</tr>
<tr>
<td>PanAsian Glut 50, 45, 25, 15%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANAX 100™ 75 (Prime EPA Registered THPS 75%)</td>
<td>55566-30-8</td>
<td>Eliminates bacterial populations (specifically Acid Producing Bacteria and Sulfate Reducing Bacteria) and serves as a fast-acting, environmentally “green” biocide. In addition, THPS is also an Iron Sulfide dissolver.</td>
<td>Biocide</td>
</tr>
<tr>
<td>PanAsian THPS 75%</td>
<td></td>
<td></td>
<td>For non-biocide/pesticide application only</td>
</tr>
<tr>
<td>ULEXITE 200 and 325 Mesh</td>
<td>1319-33-1</td>
<td>Delayed crosslinking mechanism that decreases the friction pressure while pumping the fracturing fluids down into the reservoir.</td>
<td>Cross-Linker/Boron</td>
</tr>
<tr>
<td>AMMONIUM BISULFITE 64% and others</td>
<td>10192-30-0</td>
<td>Oxygen gas and Chlorine Scavenger</td>
<td>Oxygen Scavenger</td>
</tr>
<tr>
<td>BARIUM SULFATE</td>
<td>7727-43-7</td>
<td>Weighting agent/densifier for drilling fluids in oil and gas exploration to suppress high formation pressures, and prevent blowouts.</td>
<td>Weighting Agent/Densifier</td>
</tr>
<tr>
<td>GILSONITE</td>
<td>12002-43-6</td>
<td>Fluid-loss control agent for use in oil-based drilling fluids.</td>
<td>Fluid-Loss Control Agent</td>
</tr>
<tr>
<td>PanAsian CDU 12 (Welan Gum)</td>
<td>96949-22-3</td>
<td>Drilling fluids/mud component for rheology modification using shear thinning effect for formation protection, hole cleaning, and solids suspension.</td>
<td>Rheological Modifier</td>
</tr>
</tbody>
</table>

**Note:**
1) Our EPA Registrations for PanaX500 45% and 15% assays, are expected April 2016
2) Maximum methanol contents are: 0.3%, 0.5%, 3% and 3.9%
3) Please do not hesitate to submit inquires for products not listed.
<table>
<thead>
<tr>
<th>Product Name</th>
<th>CAS Number</th>
<th>Description</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PanAsian CDU 16 (Welan Gum)</td>
<td>96949-22-3</td>
<td>Drilling fluids/mud component for rheology modification using shear thinning effect for formation protection, hole cleaning, and solids suspension. Is more efficient and thermally stable than CDU 12 as it can withstand higher downhole temperatures.</td>
<td>Rheological Modifier</td>
</tr>
<tr>
<td>PanAsian TD and PLUS D (Xanthan Gum)</td>
<td>11138-66-2</td>
<td>Drilling fluids/mud component for rheology modification, formation protection, hole cleaning, and solids suspension.</td>
<td>Rheological Modifier</td>
</tr>
<tr>
<td>BORIC ACID</td>
<td>1333-73-9</td>
<td>Used as a cross-linker to create a viscous gel. Reacts with polymer chains to bind the molecules, thus increasing and controlling the viscosity, even when temperatures increase.</td>
<td>Cross-Linker/Boron</td>
</tr>
<tr>
<td>BORAX DECAHYDRATE (SODIUM TETRABORATE DECAHYDRATE)</td>
<td>1303-96-4</td>
<td>Used as a cross-linker to create a viscous gel. Reacts with polymer chains to bind the molecules, thus increasing and controlling the viscosity, even when temperatures increase.</td>
<td>Cross-Linker/Boron</td>
</tr>
<tr>
<td>2-MERCAPTOETHANOL (2-ME)</td>
<td>60-24-2</td>
<td>Initial product for organic chemical synthesis, and as a corrosion inhibitor. Can also be used in: PVC stabilization, crop protection, and</td>
<td>Corrosion Inhibitor/Organic Synthesis Intermediate</td>
</tr>
<tr>
<td>BENZALKONIUM CHLORIDE (BAC80)</td>
<td>8001-54-5/ 63449-41-2/139-07-1</td>
<td>Used as a preservative biocide, and surfactant.</td>
<td>Biocide/Surfact</td>
</tr>
<tr>
<td>DBNPA</td>
<td>10222-01-2</td>
<td>Non-oxidizing biocide used as a preservative for: coatings, slurries, and to control microbial fouling (specifically Acid Producing Bacteria and Sulfate Reducing Bacteria) of the fluids.</td>
<td>Biocide</td>
</tr>
<tr>
<td>BARIUM CHLORIDE</td>
<td>10326-27-9</td>
<td>To purify caustic chlorine plants and waste water treatments of brine solutions.</td>
<td>Water Treatment</td>
</tr>
<tr>
<td><strong>Priority Product List</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>DOTS (Disodium Octaborate Tetrahydrate)</strong></td>
<td>12280-03-04</td>
<td>Delayed viscosity, pH, flowrate, thermal stability, modifier and enhancer, and filter clogging reducer, for guar gum and gelling.</td>
<td></td>
</tr>
<tr>
<td><strong>Naphthenic Acid</strong></td>
<td>1338-24-5</td>
<td>Corrosion inhibitor, fuel additive, and to produce metallic naphthenates.</td>
<td></td>
</tr>
<tr>
<td><strong>PanAsian Propargyl Alcohol</strong></td>
<td>107-19-07</td>
<td>Corrosion inhibitor, metal complex solution, solvent stabilizer, electroplating brightener, intermediate in organic synthesis.</td>
<td></td>
</tr>
<tr>
<td><strong>Formic Acid</strong></td>
<td>64-18-6</td>
<td>Dissolves and removes calcium, rust, scale, and iron oxide deposits. In addition, can be used as a corrosion inhibitor.</td>
<td></td>
</tr>
<tr>
<td><strong>DL Malic Acid</strong></td>
<td>617-48-1</td>
<td>When combined with Tartaric acid, used to descale and pick in metal treatment; Acidizer.</td>
<td></td>
</tr>
<tr>
<td><strong>4-Hydroxy Tempo</strong></td>
<td>2226-96-2</td>
<td>Alkenes from self-polymerization, control and adjust the degree of polymerization, and serves as an organic synthesis intermediate.</td>
<td></td>
</tr>
<tr>
<td><strong>Ammonium Persulfate</strong></td>
<td>7727-54-0</td>
<td>Allows for a delayed breakdown of gels.</td>
<td></td>
</tr>
<tr>
<td><strong>Castor Oil</strong></td>
<td>80001-79-4</td>
<td>Used in: adhesives, dyes, and hydraulic fracturing.</td>
<td></td>
</tr>
<tr>
<td><strong>Cinnamaldehyde</strong></td>
<td>104-55-2</td>
<td>Remediate biofouling of fluids by inhibiting acid producing and sulfate reducing bacterial populations. Corrosion inhibitor for steel and other ferrous alloys.</td>
<td></td>
</tr>
<tr>
<td><strong>Cyclohexanone</strong></td>
<td>108-94-1</td>
<td>Mutual solvent used for emulsifying, degreasing, activator in oxidation reactions, other solvents, and as a thinner in lacquers, resins, and insecticides.</td>
<td></td>
</tr>
<tr>
<td><strong>DTPMPA</strong></td>
<td>22042-96-2 or 68155-78-2</td>
<td>Scale inhibitor of barium sulfate, and as a chelating agent. Stabilizer for: peroxide bleaching and detergent auxiliaries, industrial and municipal cleaning water, terrestrial heat water, and oilfield water.</td>
<td>Scale Inhibitor/Chelating Agent</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td><strong>FERRIC SULFATE</strong></td>
<td>10028-22-5</td>
<td>Coagulants/flocculants for water clarifications, minimize hydrogen sulfide gas release, phosphorous removal, sludge thickening, conditioning, and dewatering agent.</td>
<td>Water Treatment/Weighting Agent/Depositor</td>
</tr>
<tr>
<td><strong>HEXANOL</strong></td>
<td>111-27-3</td>
<td>Mutual solvent used in the petroleum distillation process.</td>
<td>Mutual Solvent</td>
</tr>
<tr>
<td><strong>ISOTHIAZOLINONE</strong></td>
<td>26172-55-4/2682-20-4</td>
<td>Remediates biofouling of fluids by inhibiting Acid Producing and Sulfate Reducing Bacterial</td>
<td>Biocide</td>
</tr>
<tr>
<td><strong>MONOETHANOLAMINE</strong></td>
<td>141-43-5</td>
<td>Organic synthesis intermediate used in the production of: anionic and non-ionic surfactants, corrosion inhibitors, and</td>
<td>Organic Synthesis Intermediate</td>
</tr>
<tr>
<td><strong>N-OCTY-2-PYRROLIDONE</strong></td>
<td>2687-94-7</td>
<td>Pigment dispersion aid and conditioning</td>
<td>Mutual Solvent</td>
</tr>
<tr>
<td><strong>POLY L-ASPARTIC ACID SODIUM SALT</strong></td>
<td>181828-06-08 or 35608-40-6</td>
<td>Biodegradable corrosion and scale inhibitor for metal equipment, industrial circulating water systems, boiler waters, reverse osmosis, oilfield water, and desalination plants and as an alternative of phosphor-containing water treatment chemicals.</td>
<td>Corrosion Inhibitor/Scale Inhibitor</td>
</tr>
<tr>
<td><strong>POTASSIUM CARBONATE</strong></td>
<td>584-08-7</td>
<td>Adjusts the pH of drilling fluids to maintain the effectiveness of other drilling fluid components and serves as an ion exchanging agent.</td>
<td>pH Modifier/Ion Exchange Agent</td>
</tr>
<tr>
<td><strong>SODIUM CARBONATE</strong></td>
<td>497-19-8</td>
<td>Adjusts the pH of drilling fluids to maintain the effectiveness of other drilling fluid components and serves as a scale inhibitor.</td>
<td>pH Modifier/Scale</td>
</tr>
<tr>
<td><strong>SODIUM HYPOPHOSPHITE MONOHYDRATE</strong></td>
<td>10039-56-2</td>
<td>Dissolves and removes calcium, rust, scale, and iron oxide deposits as a scale inhibitor.</td>
<td>Scale Inhibitor</td>
</tr>
</tbody>
</table>
# Priority Product List

<table>
<thead>
<tr>
<th>SODIUM PERBORATE TETRAHYDRATE</th>
<th>10486-00-07</th>
<th>Viscosity reducing agent that enhances fluid recovery and reduces damages that are created by long chain polymers.</th>
<th>Deflocculant/Dispersant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-ETHYLHEXYL ACRYLATE</td>
<td>n/a</td>
<td>An emulsified copolymer used for clayless formulations necessary for suspension of drill</td>
<td>Polymer</td>
</tr>
<tr>
<td>2-HYDROXYETHYL ACRYLATE</td>
<td>n/a</td>
<td>Used as a polymeric composition for fluid-loss control in drilling fluids/muds, and cement drilling additives.</td>
<td>Vinyl Monomer</td>
</tr>
<tr>
<td>2-HYDROXYPROPYL ACRYLATE</td>
<td>n/a</td>
<td>Used as a polymeric composition for fluid-loss control in drilling fluids/muds, and cement drilling additives.</td>
<td>Vinyl Monomer</td>
</tr>
<tr>
<td>2-HYDROXYETHYL METHACRYLATE</td>
<td>n/a</td>
<td>Used as a polymeric composition for fluid-loss control in drilling fluids/muds, and cement drilling additives.</td>
<td>Vinyl Monomer</td>
</tr>
<tr>
<td>2-HYDROXYPROPYL METHACRYLATE</td>
<td>n/a</td>
<td>Used as a polymeric composition for fluid-loss control in drilling fluids/muds, and cement drilling additives.</td>
<td>Vinyl Monomer</td>
</tr>
<tr>
<td>ETHANOLAMINE PRODUCTS</td>
<td>n/a</td>
<td>Used in a process to remove hydrogen sulfide and carbon dioxide from a gas stream, known as “sweetening.” Removes acidic gas that would cause corrosion problems in gas pipelines.</td>
<td>Acid Gas Scavenger</td>
</tr>
</tbody>
</table>

Detailed product description, SDS, and TDS available upon request.
Pan Asian Chemicals Inc. offers high molecular weight anionic polysaccharide Biogums that can serve as rheological modifiers in the oil and gas industry.

- **Xanthan Gum** (Dispersible, Non-Dispersible, and Custom Made)
  - Has larger molecular weight than Welan gum.
- **Welan Gum** (CDU 12 and CDU 16)
  - Welan gum has higher thermal stability than Xanthan gum.

Biogums can modify viscosity by the shear thinning principle:

- At low shear rates, the fluid will have a high viscosity.
  - The long chained polysaccharide molecules form a web like structure, thus thickening the fluid.
- At high shear rates, the fluid will have a low viscosity.
  - The applied force causes the polysaccharide molecules to line together in straight lines parallel to direction of flow.

Rheological modifiers for:

- Drilling
- Drill-In
- Completions
- Coiled Tubing
- Fracturing Fluids/Drilling Muds:
  - The low shear rate viscosity (LSRV) allows for high viscosity fluid at low shear rates, suspending the particles when drilling ceases, and keeping the cuttings out of the drilled holes.
  - Picks up trimmings
  - Suspends cuttings
  - Controls pressure
  - Stabilizes exposed rock
  - Provides buoyancy
  - Coolant
  - Lubricant
  - Flow reduction for pipelines

With their unique and inherent properties, both Biogums can be used in the following applications:

- **Deep Sea Drilling as a Mud Spacer:**
  - Can be used as an additive.
  - Removes all the drilling fluid/mud.
  - Zonal isolation can be achieved due to Biogum’s properties
BIOGUMS continued

- Friction Reducers
  - Biogums can reduce the fluid’s viscosity, which reduces the amount of friction applied by the fluid.
  - Reduces amount of energy required to pump fluids downhole.
- Foundry Coatings
- Pigment Suspensions
- Cement Viscosifiers
- Tire Sealants
- Paint Thinners
- Food Industry

PanAsian Xanthan Gum Specifications:
- High purity Xanthan gum.
- Thermal stability: up to 250°F
- Specific gravity: 1.0-1.05 g/cm³
- Appearance: off yellow to tan color-dry powder.
- Particle size: 40 mesh
- pH: 5.5-8.0
- Compatible with glycol fluids.

PanAsian CDU 12 Specifications:
- Welan gum
- Thermal stability: up to 270°F
- Appearance: off yellow to tan color-dry powder.
- Particle size: 60 mesh
- pH: 7.5-9.5
- Oxygen scavengers increase the efficacy.

PanAsian CDU 16 Specifications:
- Higher quality Welan gum than CDU 12
- Thermal stability: up to 290°F
- Specific gravity: 1.45 g/cm³
- Appearance: Cream to tan colored-dry powder.
- Particle size: 80 mesh
- pH: 6.3-7.0
- Compatible with glycol fluids.
- Oxygen scavengers increase the efficacy.
PanAsian’s Prime EPA-registered PanaX 500™ 50% and 25% glutaraldehyde is a biocide that controls and eliminates bacterial populations, specifically Acid Producing (APB) and Sulfate Reducing Bacteria (SRB), the main oilfield detractors. It has a relatively short half-life and decreases as temperatures increase, which allows for glutaraldehyde to be environmentally “green.”

**APPLICATIONS**

PanaX 500™ is used in most oilfield applications; general preservative, reverse osmosis membranes, concrete drilling additives, waterfloods, fracture, drilling, completion, packer, and workover fluids, oil and gas production transmission pipelines and systems, gas storage wells and systems, and pipeline pigging and scraping.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>50%</th>
<th>45%</th>
<th>25%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3 – 3.9% Methanol</td>
<td>0.3 – 3.9% Methanol</td>
<td>0.3 – 3.9% Methanol</td>
<td>0.3 – 3.9% Methanol</td>
</tr>
<tr>
<td>Appearance:</td>
<td>Colorless to light yellowish liquid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH:</td>
<td>3.0 – 5.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde:</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADVANTAGES:**

- Controls anaerobic and aerobic bacteria; specifically APB and SRB.
- Excellent at penetrating and eliminating biofilms (sessile bacteria).
- Prevents biofouling (souring) of drilling fluids, mud, oil, gases, and the entire system.
- Inhibits Microbial Influenced Corrosion (MIC) by eliminating APB and SRB, which later produce the corrosive hydrogen sulfide gas as a byproduct.
- Biodegradable as defined by a number of different and widely accepted biodegradation protocols.
- Efficacious over a broad temperature range.
- Does not react with Hydrogen Sulfide gas, or other organic acids inherent in oilfields, thus its efficacy is not diminished.
- Stable and effective at pH levels ≤ 10.

**STORAGE**

Store in a cool, dry, and well-ventilated area. Keep away from ignition sources; heat and flames. Store in a tightly closed container. Incompatible with strong oxidizing agents and foods.

**PACKING**

Drums, IBC Totes, ISO tanks.
PanAsian’s Prime EPA-registered PanaX 100™ 75 is a broad-spectrum biocide developed to inhibit the growth of algae, bacteria, yeasts and fungi in process waters used in various industrial applications. PanaX 100™ 75 is effective in both acid and alkaline environments. It is especially effective against sulfate-reducing bacteria (SRB) which are particularly troublesome in enhanced oil recovery operations, such as injection water treatment, top-side systems, pipeline protection and storage.

APPLICATIONS
PanaX 100™ 75 is used primarily to control microbial growth in oil field applications such as injection water systems, drilling muds, packer fluids, completion and workover fluids. The unique mechanism of action of THPS enables it to not only kill microorganisms but also reduce hydrogen sulfide concentrations. PanaX100™ 75 can also dissolve iron sulfide in the presence of ammonium ions.

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>55566-30-8</td>
<td>THPS</td>
<td>75</td>
<td>259-709-0</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>25</td>
<td>231-791-2</td>
</tr>
</tbody>
</table>

ADVANTAGES:

- Inhabits microbial growth in enhanced oil recovery systems, industrial recirculating cooling waters, and non-food contact paper manufacturing.
- Broad spectrum biocide against a range of bacteria, especially sulfate reducing bacteria (SRB) and algae (blue-green), green and other types such as yellow-green, brown, and mustard algae.
- Miscible in all proportions with every type of water, including seawater.
- Is readily deactivated under controlled conditions.
- No organic solvents/ aqueous formulation.
- Outstanding chemical stability and good compatibility with most water treatment chemicals.

STORAGE

Store in a cool, dry and well ventilated area. Keep away from ignition source, heat and flame. Store in a tightly closed container. Incompatibilities: strong oxidizing agents and foods.

PACKING

Drums, IBC Totes, ISO tanks.
PanAsian Ulexite – CAS Number 1319-33-1

Ulexite is a uniquely sized, soluble borate crosslinking additive, which is suspended in a hydrocarbon based solution. It provides a delayed crosslinking mechanism that decreases the friction pressure when pumping the drilling fluids downhole, and the pH sensitivity allows for crosslinking reversal via buffers. Crosslinker of choice for Guar Gum, to form impermeable subterrain basis for oil and gas.

APPLICATIONS
Ulexite is ideally suited for oilfield applications; drilling fluids/mud, well stimulation, and fracking.

<table>
<thead>
<tr>
<th>Component</th>
<th>Content (%)</th>
<th>Component</th>
<th>Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B₂O₃</td>
<td>36-38</td>
<td>Al₂O₃</td>
<td>≤ 0.25</td>
</tr>
<tr>
<td>CaO</td>
<td>≤ 19</td>
<td>MgO</td>
<td>≤ 2.5</td>
</tr>
<tr>
<td>SiO₂</td>
<td>≤ 4</td>
<td>SrO</td>
<td>≤ 1.0</td>
</tr>
<tr>
<td>SO₄</td>
<td>≤ 0.25</td>
<td>Na₂O</td>
<td>≤ 3.5</td>
</tr>
<tr>
<td>As</td>
<td>≤ 0.004</td>
<td>Moisture</td>
<td>≤ 1.0</td>
</tr>
<tr>
<td>Fe₂O₃</td>
<td>≤ 0.04</td>
<td>Density</td>
<td>1 (ton/m³)</td>
</tr>
</tbody>
</table>

ADVANTAGES:

- Winter soluble due to low pour point.
- Provides delayed crosslinking effects; friction reducer and crosslinking is reversible due to its pH.
- Thermally stable at temperatures ≥ 175° F.
- Excellent proppant carrying capability.
- Fluid loss control allows for a more efficient fracturing fluid/mud.
- The alkalinity and buffering properties of boron compounds are useful in preventing corrosion of ferrous metals.
- Preferred cross-linker for guar gels and other slurries.

STORAGE
Storage Temperature: Room Temperature (72°F). Storage Pressure: Atmospheric. Special Sensitivity: Moisture (Caking). Although Ulexite does not require any special precautions; it is sensitive to moisture and will cake. Therefore, the bags should be kept tightly sealed and stored indoors in a dry environment.

SAFETY
Ulexite is a white, odorless, powdered substance that isn’t flammable, combustible, or explosive, and it presents no unusual hazard if involved in a fire. Presents little or no hazard to humans, and has low acute oral and dermal toxicities. Care should be taken to minimize the amount released to the environment to avoid ecological effects.

PACKING
1000kgs super sacks on pallets.

RELATED PRODUCTS
Boric Acid, Zirconium Oxychloride, Sodium Tetraborate, Sodium Decahydrate.

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5444 Westheimer Rd., #1570, Houston, Texas ● Tel: +1 713 621 1888 ● Fax: +1 713 840 0050
PanAsian Welan Gum CDU 12 and CDU 16 – CAS Numbers: 96949-22-3 / 125005-87-0

Specialty fermented anionic polysaccharides used as a component in drilling fluids/mud for rheology modification using shear thinning effect for formation protection, hole cleaning, and solids suspension at elevated temperatures with excellent stability.

APPLICATIONS
CDU 12 and CDU 16 can be used for injection of drilling fluids/mud in order to maintain viscosity of water-based drilling fluids, control its rheological properties, and at tertiary oil recovery wells to improve oil recovery rate. CDU 12 and 16 can also be used in: deep sea drilling as mud spacers, friction reducers, work over and completion fluids, foundry coatings, pigment suspensions, and cement drilling additives.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>CDU 12</th>
<th>CDU 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Stability</td>
<td>&gt; 270°F</td>
<td>&gt;290°F</td>
</tr>
<tr>
<td>Particle Size (mesh)</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>pH</td>
<td>7.5-9.5</td>
<td>6.3-7.0</td>
</tr>
<tr>
<td>Appearance</td>
<td>Off-yellow to tan color-dry powder</td>
<td>Cream to tan colored-dry powder</td>
</tr>
</tbody>
</table>

ADVANTAGES:
- Thickens, suspends, and stabilizes water-based systems, while imparting rheological control.
- Suited for use when downhole/reservoir temperatures exceed 270°F.
- Remains stable in the presence of calcium ions, under basic pH conditions, and compatible in solutions continuing high levels of glycols.
- Not absorptive to mineral substrates, thus has minimal damage on producing formation.
- Exceptional ultra-low sheer rate viscosity for non-Newtonian fluids.
- Oxygen scavengers increase the overall efficacy of both.

STORAGE
Handle in accordance with good industrial hygiene and safety practices, which include: avoiding unnecessary exposure and removal of material from eyes, skin, and clothing, keeping away from heat, sparks and flame, and avoiding creating dust clouds in handling transfer and clean-up.

SAFETY
Non-hazardous, combustible dust. Ensure appropriate electrical classification and avoidance of ignition sources in dusty environments. Handle in a manner consistent with good industrial hygiene practices – avoid creating or inhaling aerosols of this, or any other material.

PACKING
20kgs bags on pallets; 20MT / 40’FCL
GENERAL PRODUCT LIST

Acidizers
Acetic Acid
Ammonium Bifluoride
D,L Malic Acid
Formic Acid
Glycolic Acid
Hydrochloric Acid
Methanesulfonic Acid
Nitriloacetic Acid
Sodium Erythorbate
Sulfuric Acid

Anti-Freeze Agents/Gas Hydrate Inhibitors
Diethylene Glycol
Ethylene Glycol
Isopropyl Glycol Acetate
Methanol
Monoethylene Glycol (MEG)
Polyethylene Glycol
Polypropylene Glycol
Propylene Glycol
Succinic Anhydride
Triethylene Glycol (TEG)

Biocides
Ammonium Dimolybdate
BIS (4-hydroxyphenyl) Sulfdie
Calcium Hypochlorite
Cinnamaldehyde
CMIT/MIT (5-Chloro-2-Methyl-4-Isothiazolin-3-One)
Copper Pyrithione
Dazomet
DBNPA (2,2-Dibromo-3-Nitropropionamide)
Dichloroisocyanuric Acid (Euchlorine)
Dodecyl Dimethyl Benzy Ammonium Chloride
(Benzalkonium Chloride)
Ethylparaben
Glutaraldehyde (PanaX 500 25% and 50% Prime EPA Registered)
Isothiazolinone
N-Dimethyl-2-Hydroxypropyl Ammonium Chloride
Polymer
Potassium Chlorate
Propylparaben
Quaternary Ammonium Chloride
Sodium Dichloroisocyanurate
Sodium Nitrate

Sodium Nitrite
Sodium Pyrithione
THPC (Tetakis Hydroxymethyl Phosphonium Chloride)
THPS (Tetakis Hydroxymethyl Phosphonium Sulfate) –PanaX 100 75% Prime EPA Registered
Trichloroisocyanuric Acid

Breakers
Ammonium Persulfate
Dimethyl Diallyl Ammonium Chloride
Dipropylene Glycol Monoethyl Ether (DPE)
Dipropylene Glycol Monomethyl Ether (DPM)
Magnesium Peroxide
Potassium Persulfate
Propylene Glycol Monoethyl Ether (PE)
Propylene Glycol Monomethyl Ether (PM)
Sodium Bromate
Sodium Persulfate

Cement Drilling Additives
Calcium Formate
Cenospheres
EF601
Magnesium Oxide
Sodium Metasilicate Anhydrous
Sodium Polynaphthalene Sulfonate
Sodium Silicate
Sodium Silicate Solid

Chelating Agents
Diethylene Triamine Penta Methylenephosphonic Acid (DTPMPA)
Ethylenediaminetetraacetic Acid (EDTA)
Ethylenediaminetetraacetic Acid 2-Na (EDTA 2-NA)
Ethylenediaminetetraacetic Acid 4-Na (EDTA 4-Na)
Gluconic Acid

Clay/Shale Stabilizers
Choline Chloride
Glycerol
Maleic Anhydride
Tetramethylammonium Chloride
## General Product List

### Corrosion Inhibitors
- 1-Hydroxyethylidene-1,1-Diphosphonic Acid (HEDP)
- 2-Hydroxy Phosphonoacetic Acid (HPAA)
- 2-Mercaptoethanol (2-ME)
- 2-Phosphonobutane-1,2,4-Tricarboxylic Acid (PBTCA)
- Acetaldehyde
- Acetophenone
- Amino Trimethylene Phosphonic Acid (ATMP)
- Cinnamaldehyde
- Copolymer of Phosphono and Carboxylic Acid (PCA)
- Copper Sulfate
- Diethylene Triamine Penta Methylene Phosphonic Acid (DTPMPA)
- Disodium Salt of 1-Hydroxyethylidene-1,1-Diphosphonic Acid (HEDP.2-Na)
- Ethylene Diamine Tetra Methylene Phosphonic Acid Solid (EDTMPS)
- Formic Acid
- Hexamethylenetetramine
- Naphthenic Acid
- Propargyl Alcohol
- Polyamino Polyether Methylene Phosphonate (PAPEMP)
- Polyepoxysuccinic Acid (PESA)
- Polyhydric Alcohol Phosphate Ester (PAPE)
- Potassium Salt of 1-Hydroxyethylidene-1,1-Diphosphonic Acid (HEDP.Kx)
- Propargyl Alcohol
- Sodium of Polyaspartic Acid (PASP)
- Thioglycolic Acid
- Zinc Sulfate Monohydrate

### Cross-Linkers/Gelling Agents
- 1,5-Hexadiene
- Boric Acid (Oxide)
- Chromium (III) Oxide
- Diethylene Glycol Divinyl Ether
- Diethylene Glycol Vinyl Ether
- Disodium OctaborateTetrahydrate
- Glutaric Acid
- Potassium Metaborate
- Sodium Tetraborate
- Tetramethyl Urea
- Triethanolamine Zincinate

### Deflocculants/Dispersants
- Acrylic Acid-2-Acrylamido-2-Methylpropanesulfonic Acid (AA/AMPS)
- Acrylic Acid-2-Hydroxypropyl Acrylate Copolymer (T-225)
- Acrylic-Acrylate-Sulfosalt Copolymer (PAC-613)
- Amorphous Silica
- Calcium Lignosulfonate
- Distillates
- Maleic and Acrylic Acid Copolymer (MA/AA)
- PAC Carboxylate-Sulfonate-Nonion Tri-Polymer
- Polyacrylic Acid (PAA)
- Sodium Perborate Tetrahydrate
- Sodium Acid Pyrophosphate
- Sodium p-Styrene Sulfonate

### Defoamers
- Aluminum Stearate
- Barium Stearate
- Calcium Stearate
- Sorbitan Monolaurate
- Zinc Stearate

### Drilling Fluids/Mud Components:

#### Fluid Loss Control Agents
- Allyl Trimethyl Ammonium Chloride
- Copolymer of Acrylamide and Sodium Acrylate
- Cyclohexyl Vinyl Ether
- Ethyl Vinyl Ether
- Gilsonite
- Guar Gum
- Manganese Oxide
- Methyl Vinyl Ether
- Phosphoric Acid
- Polyanionic Cellulose (PAC)
- Polycarboxylic Acid

#### Ion Exchange Agents
- Potassium Acetate
- Potassium Carbonate
- Potassium Chloride
- Potassium Hydroxide
- Potassium Perchlorate

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**GENERAL PRODUCT LIST**

**Rheological Modifiers**
- Anionic Polyacrylamide (A767)
- Bentonite
- Copolymer of Acrylamide and Sodium Acrylate
- Ferric Sulfate
- Guar Gum
- Hydroxyethyl Cellulose (HEC)
- Manganese Oxide
- Poly Dimethyl Diallyl Ammonium Chloride (polyDADMAC)
- Polyacrylamide
- Polysaccharide Blend
- Sodium Salicylate
- Welan Gum (CDU 12 and 16)
- Xanthan Gum

**Weighting Agents/Densifiers**
- Barite
- Calcium Carbonate
- n-Butyl Stearate

**Emulsifiers**
- Glycerol Diacetate
- Glycerol Monostearate
- Glycerol Triacetate
- Sorbitan Monostearate

**Epoxide Resins**
- UVR6110
- UVR6128

**Fuel Additives**
- 2-Ethylhexyl Nitrate
- Dimethyl Carbonate
- Ethanol
- Fatty Acid Esters
- Ferrocene

**Hydrogen Sulfide Scavengers**
- Acrolein
- Hexamethylenetetramine
- Zinc Carbonate
- Zinc Oxide

**Iron Sulfide Dissolvers**
- Acrolein
- THPS

**Minerals**
- Silicon Dioxide
- Talc

**Mutual Solvents**
- Cyclohexane
- Cyclohexanone
- d-Limonene
- Ethanol
- Ethylbenzene
- Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)
- Hexanol
- Hydrochloric Acid
- Isopropyl Alcohol
- Methanol
- Methyl Ethyl Ketone
- Naphthalene
- n-butanol
- n-Hexane
- Propylene Carbonate
- Propylene Glycol Monomethyl Ether Acetate
- Tert-Amyl Alcohol (2-Methyl-2-butanol)
- Toluene

**Oilfield Brine Additives**
- Boric Acid
- Calcium Bromide
- Calcium Chloride
- Sodium Bromide
- Zinc Bromide
- Ammonium Chloride

**Organic Synthesis Intermediates**
- 1,4-Butanediol Vinyl Ether
- 2,2-Dichlorodiethyl Ether
- 2,3-Dichloropyridine
- 4,4-Dihydroxybenzophenone
- 4-Hydroxy TEMPO
- 5-Methylfuran-2-Propionaldehyde
- 6-Nitro-1-Diazoo-2-Naphtol-4-Sulfonic Acid
- Acrolein Diethyl Acetal
- Acrolein Dimer
- Acrolein Dimethyl Acetal
- Alkylbenzene Sulfonic Acid
GENERAL PRODUCT LIST

Aminoguanidine Bicarbonate
Aminoguanidine Hydrochloride
Benzaldehyde
Benzy1 Benzoate
Benzy1 p-Hydroxybenzoate
beta-Alanine
Cyclohexanone
Ethyl Acetate
Guanidine Carbonate
Guanidine Hydrochloride
Guanidine Nitrate
Isobutyl Vinyl Ether
L-Tyrosine
Methyl Salicylate
Monoethanolamine
n-Butyl Vinyl Ether
p-Hydroxybenzoic Acid
Sodium Allyl Sulfonate

Oxygen Scavengers
Ammonium Bisulfite
Sodium Sulfite

pH Modifiers:
Acidic
Ammonium Bifluoride
Citric Acid
Hydrochloric Acid

Basic
Ammonium Bicarbonate
Calcium Hypochlorite
Caustic Soda
Potassium Carbonate
Potassium Hydroxide
Sodium Acetate Trihydrate
Sodium Bicarbonate
Sodium Carbonate
Sodium Chloride
Sodium Hexametaphosphate
Sodium Hydroxide

Pigment Dyes
Lemon Chrome Yellow
Middle Chrome Yellow

Rubber Accelerators
Accelerator DM (MBTS)
Accelerator DPG
Accelerator MBT

Scale Inhibitors
2-Hydroxy Phosphonoacetic Acid (HPAA)
2-Phosphonobutane-1,2,4-Tricarboxylic Acid
(PBTPCA)
Acrylic Acid/Acrylate/Phosponic Acid/Sulfosalt
Tetra-Copolymer (PAC-241)
Acrylic Acid-2-Acrylamido-2-Methylpropanesulfonic
Acid (AA/AMPS)
Acrylic Acid-2-Hydroxypropyl Acrylate Copolymer (T-225)
Acrylic-Acrylate-Sulfosalt Copolymer (PAC-613)
Amino Trimethylene Phosphonic Acid (ATMP) Azodicarbonamide
Bis Hexamethylene Triamine Penta Methylene
Phosphonic Acid (BHMTMPMA)
Calcium Oxide
Copolymer of Phosphono and Carboxylic Acid (PCA)
D,L Malic Acid
Diethylene Triamine Penta Methylene Phosphonic
Acid (DTPMPA)
Disodium Salt of 1-Hydroxyethylidene-1,1-
Diphosphonic Acid (HEDP.2-Na)
Formic Acid
Hepta Sodium Salt of Diethylene Triamine Penta
Methylene Phosphonic Acid (DTPMP.7-Na)
Hexamethylenediamine Tetra Methylene hosphonic
Acid (HMDTMPA)
Hydrolyzed Polymaleic Anhydride (HPMA)
Sodium Carbonate
Sodium Hypophosphite Monohydrate
Sodium of Polyaspartic Acid (PASP)
Sodium Polycarboxylate
Sodium Salt of bis Hexamethylene Triamine Penta
Methyleneophosphonic Acid (BHMTPH.PN.X-Na)
Sodium Salt of Diethylene Triamine Methylene
Phosphonic Acid (DTPMP.X-Na)
Tetra Sodium Salt of 1-Hydroxyethylidene-1,1-
Diphosphonic Acid (HEDP.4Na)
Tetra Sodium Salt of Amino Trimethylene
Phosphonic Acid (ATMP.4-Na)
GENERAL PRODUCT LIST

Surfactants
Alcohol Ethoxylated
Lauryl Sulfate
Sodium Tripolyphosphate
Sodium Xylene Sulfonate
Trimethyl Octadecyl Ammonium Chloride

Other Speciality Chemicals
2-Ethylhexyl Acetate (Polymer)
2-Ethylhexyl Acrylate (Polymer)
Benzoic Acid (Chemical Diverter for Acid Jobs)
Butyl p-Hydroxybenzoate (Preservative)
Ceramic Proppants (Hydraulic Fracturing Sand)
Cobalt Oxide (Hydroprocessing Catalyst)
Dimethylamine (Demulsifier)
Potassium Ferrocyanide (Plugging Solution Additive)
Sodium Thiocyanate (Chemical Tracer)
NEWS ANNOUNCEMENT

Awarded Tier II Status with the U.S. Customs and Border Protection for C-TPAT

February 2015, Houston, Texas

Pan Asian has been awarded The Customs-Trade Partnership Against Terrorism (C-TPAT) the highest Tier II level, status following a successful verification compliance examination led by U.S. Customs and Border Protection (CBP). In 2012, Pan Asian Chemicals was certified and successfully validated to be a partner with C-TPAT.

To qualify as an Importer Partner with C-TPAT, Pan Asian Chemicals signed an agreement to work with CBP to protect the supply chain, identify security gaps, and implement specific security measures and best practices. Additionally, Pan Asian Chemicals provided CBP with a security profile outlining the specific security measures the company has in place, addressing a broad range of security topics and presenting security profiles that list action plans to align security throughout its supply chain.

Achieving Tier II level status, benefits Pan Asian Chemicals as the company is considered low risk by the CBP and the importation of its chemicals are 3.5 times less likely to undergo a security exam, reducing the time and cost of getting cargo released by CBP.

C-TPAT is a voluntary supply chain security program led by CBP and focused on improving the security of private companies’ supply chains with respect to terrorism. The program was launched in November 2001 with just seven major importers as members. Today more than 10,000 certified partners that span the gamut of the trade community have been accepted into the program.

Benefits of Customs-Trade Partnership Against Terrorism (C-TPAT) Certification

- C-TPAT members are considered low risk by the Customs and Border Patrol (CBP), and the importation of all chemicals are less likely to be examined
- Reduces time and cost of getting cargo released by CBP
- Reduces time in CBP secondary cargo inspection lines
- Improves predictability in moving goods and services across borders
- Generates significant opportunities for cost avoidance
- Improves security for workforce
- Reduces cargo theft and pilferage
- Access to FAST program
- Reduces insurance rates

For more information please visit the U.S. Customs and Border Protection website www.cbp.gov
Certified Under Cefas List of Notified Chemicals for Use in North Sea Offshore and Other Hydrocarbon Applications

January 19, 2015 – Houston, Texas

Eight Biocides were approved by The Centre for Environment, Fisheries & Aquaculture Science (Cefas) and authorized by the Offshore Chemicals Notification Scheme (OCNS), which manages chemical use and discharge by the UK and Netherlands offshore petroleum industries.

- PanX 500™ 50 – PanAsian Glutaraldehyde 50%
- PanX 500™ 25 – PanAsian Glutaraldehyde 25%

- PanAsian Glutaraldehyde 50 (0.5% Methanol)
- PanAsian Glutaraldehyde 50 (3% Methanol)
- PanAsian Glutaraldehyde 50 (3.9% Methanol)

- PanAsian Glutaraldehyde 25 (0.5% Methanol)
- PanAsian Glutaraldehyde 25 (3% Methanol)
- PanAsian Glutaraldehyde 25 (3.9% Methanol)

Cefas Definitive Ranked Lists of Registered Products listed on www.cefas.defra.gov.uk/.
Pan Asian Chemicals Concluded a Warehouse / Hub Terminal Joint Venture at Shanghai, China

July 2014, Shanghai, China

This terminal enables the company to provide a full range of additional value-added supply chain services for chemical exports, and provide our customers with local procurements.

Services include:

- Cargo assembly / staging / warehousing
- Coordination of shipper owned tanks / containers
- Cargo receiving, storage, repacking, pre-shipment inspections
- HAZMAT
- Relabeling / marking of tanks, containers, totes, and drums
- Palletization
- ISO tank container cleaning, maintenance & inspections
- ISO tank, totes, and drums storage
- ISO tank turnkey export with re-importation to China, to provide temporary liquid storage
- Port drayage services
- Quality pre-shipment inspection(s)
- Coordination of shipments and all export documentation
Pan Asian Chemicals Inc. Awarded Three Prime Registrations from the Environmental Protection Agency

December 12, 2012, and April 15, 2013 – Houston, Texas

EPA awarded two Prime Registrations for Glutaraldehyde: PanaX 500™ 50 and PanaX 500™ 25, and a third Prime Registration for THPS PanaX100™ 75. These products are made and sold in USA by only two leading manufacturers, and suppliers with close and long term strategic alliances. In accordance with the dominant incumbents in the USA, and prime EPA registrations, each of the above Glutaraldehyde products are pure and do not contain any Glycols, Formaldehyde, and/or other Aldehydes; often sold and misrepresented as “pure product” at substantially discounted pricing.

**EPA awarded Prime Registrations for Glutaraldehyde:**

- PanaX 500™ 50 – PanAsian Glutaraldehyde 50%
- PanaX 500™ 45 – PanAsian Glutaraldehyde 45%
- PanaX 500™ 25 – PanAsian Glutaraldehyde 25%
- PanaX 500™ 15 – PanAsian Glutaraldehyde 15%

**EPA awarded one Prime Registration for THPS:**

- PanaX100™ 75 – PanAsian THPS 75%