SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : NANOBYK-3610
Product Use Description : Additive to Improve Mechanical Properties
Company : BYK USA Inc.
524 South Cherry Street
Wallingford CT 06492
Prepared by : J.Nole, Safety; M.McCutcheon, Regulatory
Telephone : (203) 265-2086
Visit our web site : www.byk.com
E-mail address : ehs.byk.usa@altana.com
Emergency telephone number : CHEMTREC 800-424-9300

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview
Form : dispersion
Colour : off-white
Odour : solvent-like

OSHA Regulatory Status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR1910.1200)

Potential Health Effects
Eyes : Contact will probably cause irritation.
Skin : Contact will probably cause irritation.
Ingestion : Ingestion may irritate the digestive tract; high dosages may cause CNS depression.
Inhalation : High concentrations of vapors may be irritating to the respiratory tract. May cause headaches, dizziness, nausea and vomiting. May cause CNS depression (drowsiness, loss of coordination and fatigue).
Chronic Exposure : Solvent absorption by inhalation and/or repeated skin contact may cause injury to liver, kidney and respiratory system. Studies suggest that 2-Methoxy-1-propanol acetate is teratogenic in animals. There is also evidence of fetotoxicity. This product contains dispersed nano-particles. Since the toxicological effects of this nano-particle have not been explored, protect employees from all potential routes of exposure.
Aggravated Medical Condition: May be aggravating to some skin conditions, asthma-type conditions, pre-existing liver and/or kidney disorders

Primary Routes of Entry:
- Skin contact
- Skin absorption
- Inhalation
- Eyes
- Ingestion

Carcinogenicity:

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Environmental Effects:
Environmental Effects: No information available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature:
Dispersion of surface treated alumina nanoparticles

Hazardous components:
The specific chemical identity/weight percent of proprietary ingredient(s) is a trade secret

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Methoxy-2-propanol acetate</td>
<td>108-65-6</td>
<td>60.00 - 100.00</td>
</tr>
<tr>
<td>Phosphoric acid polyester</td>
<td>-</td>
<td>5.00 - 10.00</td>
</tr>
<tr>
<td>2-Methoxy-1-propanol acetate (impurity)</td>
<td>70657-70-4</td>
<td>0.10 - 1.00</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

First aid procedures

Inhalation : Remove to fresh air. Administer artificial respiration if necessary. Get medical aid as soon as possible.

Skin contact : Remove contaminated clothing. Wash thoroughly with soap and water.

Eye contact : Immediately flush with plenty of water for at least 20 minutes. Get medical aid.

Ingestion : Do not induce vomiting; aspiration hazard. Dilute with 1-2 glasses of water. Get medical aid. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs.

Notes to physician

Risks : No information available.

SECTION 5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point : 40 °C (104 °F) at 1,013 hPa

Ignition temperature : 333 °C (631 °F) at 1,013 hPa

Lower explosion limit : 1.5 %(V)

Upper explosion limit : 10.8 %(V)

Suitable extinguishing media : Foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : No information available.

Special protective equipment for fire-fighters

In the event of fire, wear self-contained breathing apparatus.

Specific hazards during fire fighting

Cool closed containers exposed to fire with water spray. Will not explode on mechanical impact.

Hazardous decomposition : Carbon oxides
products due to incomplete combustion.

Oxides of phosphorus
Sulphur oxides
silicone compounds
formaldehyde
chlorinated compounds

Further information: Keep away from heat and sources of ignition.
Keep away from oxidizing agents.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Eliminate all sources of ignition. Ventilate area if indoors. Wear self-contained breathing apparatus and full protective clothing.

Environmental precautions: Prevent spilled material from entering the ground, water and/or air by using appropriate containment methods.

Methods for containment: Stop leak. Dike and contain spill.

Methods for cleaning up: Pump into salvage tanks and/or absorb with suitable material. Use sparkless shovels to remove material.

Additional advice: No further information is available.

SECTION 7. HANDLING AND STORAGE

Handling

Handling: Harmful in contact with skin.
Avoid contact with skin and eyes.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Handle as an industrial chemical.
Keep container tightly closed.
Keep away from oxidizing agents.

Storage

Advice on common storage: Keep product and empty container away from heat and sources of ignition.
Take precautionary measures against static discharges.
Avoid exposure to excessive heat, light, and air for prolonged periods of time.
Keep in a dry, cool and well-ventilated place.

SECTION 8. EXPOSURE CONTROLS/PERSOAL PROTECTION

Exposure Guidelines
Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
</table>

Engineering measures

Engineering measures : Use with local exhaust ventilation.

Personal protective equipment

Eye protection : Safety Glasses Goggles

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : Use an air purifying respirator with organic vapor (OV) cartridges. When there are exposures to mists (both solid and/or liquid droplets), a Class 1 particulate respirator is required (N, P, or R 100 filter) with the OV cartridge.

Hygiene measures : At a minimum, clean long-legged, long-sleeved work clothes. Use chemical-resistant clothing for more comprehensive skin protection. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form : dispersion
Colour : off-white
Odour : solvent-like
Odor Threshold : no data available
Flash point : 40 °C (104 °F) at 1,013 hPa
Method:

Ignition temperature : 333 °C (631 °F) at 1,013 hPa

Lower explosion limit : 1.5 % (V)
Upper explosion limit : 10.8 % (V)

pH : no data available
Melting point/range : < -65 °C (< -85 °F)
Initial boiling point: 146 °C (295 °F) at 1,013 hPa

Vapour pressure: 4.9 hPa at 20 °C (68 °F)

Evaporation rate: no data available

Density: 1.25 g/cm³ at 20 °C (68 °F) (1,013 hPa)

Bulk density: not applicable

Water solubility: 190.00000 g/l at 1,013 hPa partly miscible

Partition coefficient: n-octanol/water: no data available

Viscosity, dynamic: 10 mPa.s Method: 11 (NV, 20°C) no data available

Viscosity, kinematic: at 20 °C (68 °F) no data available

at 40 °C (104 °F) no data available

Relative vapour density: no data available

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid: Prolonged heat/light/air exposure

Materials to avoid: Strong oxidizing agents

Metals
Gives off hydrogen by reaction with metals.

Hazardous decomposition products: None expected

Chemical stability: Stable; polymerization will not occur

Further information: 1-Methoxy-2-propanol acetate may form peroxides of unknown stability. See PREVENTIVE MEASURES.
### SECTION 11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute oral toxicity (Product)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Acute oral toxicity (Component)</strong></td>
<td>Component: 108-65-6 1-Methoxy-2-propanol acetate</td>
</tr>
<tr>
<td></td>
<td>LD50 rat</td>
</tr>
<tr>
<td></td>
<td>Dose: 8,532 mg/kg</td>
</tr>
<tr>
<td><strong>Acute dermal toxicity (Component)</strong></td>
<td>Component: 108-65-6 1-Methoxy-2-propanol acetate</td>
</tr>
<tr>
<td></td>
<td>LD50 rabbit</td>
</tr>
<tr>
<td></td>
<td>Dose: &gt; 5,000 mg/kg</td>
</tr>
<tr>
<td><strong>Acute inhalation toxicity (Component)</strong></td>
<td>Component: 108-65-6 1-Methoxy-2-propanol acetate</td>
</tr>
<tr>
<td></td>
<td>LC50 rat</td>
</tr>
<tr>
<td></td>
<td>Dose: &gt; 100 ppm</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 4 h</td>
</tr>
<tr>
<td><strong>Skin irritation (Product)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Skin irritation (Component)</strong></td>
<td>Component: 108-65-6 1-Methoxy-2-propanol acetate</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td>Result: Moderate skin irritation</td>
</tr>
<tr>
<td><strong>Eye irritation (Product)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Eye irritation (Component)</strong></td>
<td>Component: 108-65-6 1-Methoxy-2-propanol acetate</td>
</tr>
<tr>
<td></td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td>Result: Eye irritation</td>
</tr>
<tr>
<td><strong>Sensitisation (Product)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Further information (Product)</strong></td>
<td>no data available</td>
</tr>
</tbody>
</table>

### SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information (Product): There is no data available for this product.

### SECTION 13. DISPOSAL CONSIDERATIONS

Further information: Dispose of in accordance with applicable local/municipal, state/provincial and federal regulations.

### SECTION 14. TRANSPORT INFORMATION

Container sizes: 55 gallon drums, 5 or 6-gallon pails, 2oz/16oz samples
DOT
UN Number : 3272
Proper shipping name : ESTERS, N.O.S. (1-Methoxy-2-propanol acetate)
Class : 3
Packing group : III
Emergency Response Guidebook Number : 127

IATA
UN Number : 3272
Description of the goods : ESTERS, N.O.S. (1-Methoxy-2-propanol acetate)
Class : 3
Packing group : III
ICAO-Labels : 3
Packing instruction (cargo aircraft) : 366
Packing instruction (passenger aircraft) : 355
Package Instruction (Limited quantity) : Y344

IMDG
UN Number : UN 3272
Description of the goods : ESTERS, N.O.S. (1-Methoxy-2-propanol acetate)
Class : 3
Packing group : III
IMDG-Labels : 3
EmSNumber1 : F-E
EmSNumber2 : S-D
Marine pollutant : no

SECTION 15. REGULATORY INFORMATION

HMIS Classification : Health hazard: 2
Chronic Health Hazard: *
Flammability: 2
Reactivity: 0
PPI:X

National Fire Protection Association (NFPA) Class : II

Emergency Planning Community Right-To-Know (EPCRA)
SARA 302 Components : Not applicable
If listed below, this product contains toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

**SARA 311/312 Hazards**
- Acute Health Hazard
- Chronic Health Hazard
- Fire Hazard

**Toxic Substances Control Act (TSCA)**
- We certify that all of the components of this product are either listed on the TSCA Inventory or are not subject to the notification requirements per 40 CFR 720 30(h).

**Section 5**
- SNUR 40 CFR 721.10120. New Uses: Other than described in PMN. Approved Uses: Additive for radiation curable coatings - industrial, wood and furniture, and PVC plastisols. Restrictions: Must be distributed in liquid form. Where there are exposures to mists (both solid and/or liquid droplets), a Class 1 particulate respirator (APF10) is required. Gloves required. Refer to Section 8 for PPE.

**Clean Air Act & Related Information**
- Non-volatile (Wt): 37 %
  - Method: 22 (10min/150°C)
  - DIN EN ISO 3251

**Ozone Depleting Substances**
- Not applicable.

Non-volatile information is not a specification.

**Hazardous Air Pollutants**
If not listed above, this product does not contain HAPs at 1% or 0.1% or greater. Refer to Section 3 for HAP weight percentage.

**Resource Conservation and Recovery Act**

**EPA Hazardous Waste Code(s)**
- D001 Ignitable

**State Laws**
- **Massachusetts Right To Know Components**: No components are subject to the Massachusetts Right to Know Act.
- **Pennsylvania Right To Know Components**: 1-Methoxy-2-propanol acetate 108-65-6
Material Safety Data Sheet

NANOPYK-3610

Version 4  
Revision Date 01/28/2011  
Print Date 01/28/2011

Phosphoric acid polyester -

New Jersey Right To Know Components:
- 1-Methoxy-2-propanol acetate 108-65-6
- Phosphoric acid polyester -

New Jersey Trade Secret Registry Number for the product (NJ TSRN):
- 800963-5326

California Prop. 65 Components:
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

CONEG Heavy Metal: We certify that this product does not contain Lead, Mercury, Cadmium or hexavalent chromium in the sum concentration of 100 ppm by weight or greater.

Canadian Environmental Protection Act

Domestic Substances List DSL Status:
The following component(s) is/are not listed on the DSL:

CEPA Category: Polymer
Weight percent: 31 %
NSN Filed: None
Max. NSN Required: Schedule 10
WHMIS Classification:
- B2
- D2A
- D2B

SECTION 16. OTHER INFORMATION

Further information
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.