Vinac
Polyvinyl Acetate Beads

Table 1
Typical properties (Specification will be furnished on request)

<table>
<thead>
<tr>
<th>GRADES</th>
<th>B – 15</th>
<th>B – 25</th>
<th>B – 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molar viscosity</td>
<td>10.0 – 12.0</td>
<td>15.0 – 18.0</td>
<td>60.75</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>90,000</td>
<td>1,40,000</td>
<td>5,00,000</td>
</tr>
<tr>
<td>%)</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Acid (as actic)</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Softening Point</td>
<td>130 – 10</td>
<td>155 – 10</td>
<td>---</td>
</tr>
</tbody>
</table>

Form: Spherical granules, all pass 8 mesh Screen
Density 20C: 1.19 Grams/cc
Specific Heat: 0.39 cal/gram/C
Burning rate: Slow
Tensile Strength: Up to 5000 psi
Water resistance: Prolonged immersion results in sight water absorption, Particularly in low viscosity grades

The viscosities of the B 15 , B – 25 & ASB – 516 beads are determined in a No 200 ostwald - fenek Tube at 20 C . The viscosity of the B – 100 beads is determined by a Brookfield Viscometer , Model RVO at 20 C with a No. 2 Spindle at 20 r.P.M. To make the determinations, the B – grades are dissolved in toluene.

General

Vinac resins are small, glass like beads of high purity poly – vinyl create used in laminating label & hot melt adhesives pigmented & grease – proof paper coating overprint varnishes industrial lacquers & coating printing inks textile & finishes. & numerous other applications. They are odorless, testless & nontoxic are resistant to attack by weak acids alkalies & salts, But are soluble in many organic solvents.

Being thermoplastics VINAC heads will soften with increasing temperature. Their heat stability is good below 100 C
slight discoloration occurs above 150 C but decomposition does not start until 200 – 250 C.

VINAC resins are produced in a range of molecular weights. As with other resins. Physical properties such as solution viscosity, tensile strength & softening point increase with increasing molecular weight.

VINAC ASB – 516 polyvinyl acetate resin is modified to obtain solubility in alkaline systems while still retaining the valuable properties of polyvinyl acetate.

Firms made from VINAC resins are clear, colorless, greaseproof & heat sealable. VINAC resins are generally modified with plasticizers to obtain the flexibility desired & in many uses. They are also combined with a wide variety of other resins with which they are compatible.

**Applications of VINAC polyvinyl Acetate Beads**

**Adhesives**

VINAC resins are widely used in the adhesives industry. VINAC polyvinyl acetate is an excellent adhesives for a variety of porous & nonporous surfaces, including paper, cloth, cellophane, board, cork, metal, leather, wood, china, glass & many plastic materials. VINAC prepared into two forms – hot melt & solvent adhesives.

**Hot Melt Adhesives**

Hot Melt Adhesives are solid materials which become sufficiently fluid at elevated temperature to be applied to bonding surfaces & solidify immediately afterwards. Neither bonding surface has to be porous because no solvent evaporation is involved. The application speed & fast set are important advantages of hot melts. Also the absence of solvents from hot melt greatly reduce toxicity & fire hazards.

A typical hot melt formulation contains 30 – 50% VINAC polyvinyl acetate (low viscosity) resin as the primary adhesives component. 23 – 35% co – resin or extender resin to increase fluidity at the application temperature & reduce cost, & 25-35% plasticsizer(s) to increase flexibility & adhesion. 7 reduce cost. VINAC ASB-516 resin is particularly recommended for hot melts in paper & board, & because it permits recovery of scrap paper.
Two main uses of hot melts are packaging adhesives & book binding adhesives are usually applied at about 162°C in packaging application & hot melt coating, the temperature can range from 82°C to 162°C. The pot life of a hot melt at 162°C generally does not exceed eight hours. But with the continual addition of ingredients. In definitely. It is often necessary however. To prolong pot life at high temperature.

**SOLVENT ADHESIVES**

Plasticized VINAC resin solution can be applied to bonding surfaces by any of the common methods such as dipping, brushing, knife coating, roll coating or spraying. Only low molecular weight VINAC resin should be used when spraying, solution because the higher polymers tend to “cobweb”.

Solvent adhesives require that at least one of the surfaces to be bonded be porous enough to permit solvent evaporated. Generally, after the solution has been applied, baking or forced air is used to complete drying. Bonding can also be together under pressure, using no heat, until the solvent has evaporated sufficiently to initiate adhesion. More time is required, however, to obtain a permanent bond.

VINAC solution adhesives are useful in laminating plastic, cellophane, metal foil & many other materials. They are also used in the packaging industry in the manufacture of containers.

**PAPER**

VINAC resin are used in the paper industries as binders in pigmented coatings (e.g. duplicating paper), overprint varnishes, greaseproof coating heat sensitive adhesives coating (e.g. end labels for bread wrapping) & as adhesives for laminating paper.

Unpigmented VINAC coating are transparent, glossy, nontoxic & heat sealable & are also resistant to oil, grease, abrasion & aging. Pigmented compositions containing extenders, pigmented & plasticizers retain these good strength & aging properties, oil resistance & heat sealing properties.

**INDUSTRIAL COATING & LACQUERS**
VINAC beads are used with nitrocellulose in industrial coating & lacquers. Polyvinyl acetates nitrocellulose blends form tough, nontacky, glossy coatings. VINAC ASB 516 resin in alkaline solutions or in organic solvents can be used in temporary protective coating for metals & hair spray & in anti-tarnish sprays for silver.

➢ **TEXTILES**

In the textile industries, VINAC resin are useful as sizes, finishes & coatings.

Alkali soluble VINAC ASB –516 resin may be used as a size for cotton, rayon & acetate yarns, & for synthetics such as Dacron, Orlon & Acrilan. The beads are solubilized using an alkaline solution & similarly removed.

VINAC ASB 516 resins is also an excellent sizing agent & finish for straw. As a hand modifier for finishes, including wash & wear finishes, This resin imparts the desired stiffness or hand to fabrics.

In combination with nitro-cellulose, VINAC beads can be used as a coating on the cloth used in the book covers. The excellent adhesion, transparency, heat sealing properties & resistance to water, gases & abrasion make VINAC resin well suited to this application.

➢ **PRINTING INKS**

The excellent clarity, solubility & adhesives properties of VINAC beads make them effective binders. VINAC beads are particularly suitable for use in metallic inks. VINAC beads are particularly suitable for use in metallic inks because of their good adhesion to metal & nonyellowing properties. Colored inks prepared with VINAC resins are bright & glossy. VINAC based inks show good adhesion to cellophane & glassine.

➢ **MISCELLANEOUS**

Miscellaneous application of VINAC resin include molding compounds (When combined with form – stabilizing resins & fillers). Bases for self-polishing floor waxes, artificial snow, & in
the shoe industry as laminants for fabric shoe appers & stiffeners for box toes.

**SOLBILITY OF VINAC B – GRADE RESINS**

Solvents & non – solvents for VINAC B –grades resins are shown in a table 2 Although VINAC beads are insoluble in anhydrous lower alcohols other than methanol. They will dissolve in these alcohols containing 5 –10% water.

Solution of VINAC B – grade resins can be prepared at room temperature by slowly adding the temperature by slowly adding the beads to the solvent while maintaining good agitation if heat is applied the solution rate is increased.

Diluents which are non solvent alone can be used in conjunction with active solvents to modified the viscosity evaporation rate or cost of a solvent system

- **PLASTICIZERS:**

  Plasticizers are added to VINAC resins to increase their flexibility & tack, lower the heat sealing temperature & increase water resistence two type of plasticizers used with VINAC RESINS are liquid plasticizers (Usually of the ester type) & resinous plasticsizers. The latter(e.g Resoftex R – 296 plasticsizers) migration (crocking).

- **RESINS & EXTENDERS**

  To Modify the properties of VINAC B – grade beads various other resins & extenders are used. Their addition can after the heat sealing temperature . impact strength grease resistance adhesives properties & Cost of 6 lists compatible & incompatible resins & natural products for VINAC B grade . contains similar information for VINAC ASB –516 resin.

  The compatibility of various resins with VINAC B –15 50parts aroctor 5442 & 40 parts dibutyl phthalate. The compatibility of the resins in this specific formulation may vary from their compatibility at other ratios in solvents with different plasticizers.

  Change in Compatibility in the formulation resulting from the addition of various extender results (see legend that follows table for qualification on compatibility.
STORAGE OF VINAC POLYVINYL ACETATE BEADS

VINAC beads exhibit excellent stability when stored under normal conditions. However being thermoplastic materials, it is suggested that the lower molecular weight grade particularly be stored at a cool temperature (7 – 13 C) to prevent caking. All VINAC beads will retain their free flowing characteristics when stored in a cool, dry place.

* Polyvinyl Acetate --Glass Transaction temperature: 32