

# Brief Project Profile for Polyvinyl Acetate Emulsion & Wood Glue Manufacturing Unit (India)

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# Ergo Engineers Private Limited

DESIGN | ENGINEERING | SUPPLY | COMMISSIONING

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# Introduction & Chemistry

This Brief Project Profile outlines a compact, scalable plan to manufacture Polyvinyl Acetate (PVAc) emulsion via aqueous free-radical polymerization of vinyl acetate monomer (VAM), and to formulate downstream PVAc wood glue (PVA wood adhesive) and PVAc textile sizing agent.

Two plant scales are assessed: **2-ton/batch** and **10-ton/batch**. It covers chemistry, process, markets, capex/opex, unit economics, and expected returns under present cost conditions.

### **Chemistry**

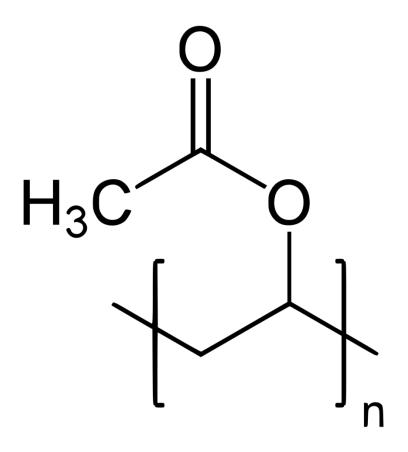
Vinyl acetate is characterized by having an activated double bond. While being an acceptably stable material under normal ambient storage, it is readily attacked by a free radical. This simple addition gives another free radical, and the addition of a series of monomer units results in a polymer chain.

Vinyl acetate monomer is polymerized in water using partially hydrolyzed polyvinyl alcohol (PVA) as protective colloid and surfactants as emulsifiers. Ammonium/Potassium persulfate (or redox systems) initiate polymerization. Optional chain transfer agent (CTA) sets molecular weight.

We, Ergo Engineers Pvt. Ltd., are glad to assist and support you to set up such a unit whether in India or abroad.

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### A. Market & Applications

**Woodworking/Carpentry** Interiors, furniture, plywood/laminates, edge bonding

Paper & Packaging Laminating, labelling

**Textiles & Nonwovens**Binders / lamination

**Paints/Construction** Primer binders, RDP precursors

# B. Capacity & Throughput Assumptions

Batch cycle time (PVAc)

12–14 h including heat up, feeds, conversion, cooling,

transfer, CIP

On stream days 300 days/year

**Average batches/day** 1.3 (allowing for maintenance and grade change)

**Annual capacity nameplate (emulsion)** 

2 t/batch line: ~780 TPA

10 t/batch line: ~3900 TPA

# C. Capital Costs – 2 tons/batch line

Item	₹ Lakh		
PVAc Reactor	8		
Reflux condenser, Packed column	6		
Monomer/initiator feed tank, fume hood	8		
PVA dissolution tank, blend tank	14		
Filter	2		
VAM storage	10		
Pumps (flameproof), valves, instruments, PLC	20		
Cooling tower	5		
Thermopack & DM plant	14		
Air compressor & N₂ manifold, tonners	8		
Vent scrubber & VOC controls	7		
Electricals, cabling, earthing, lighting (FLP), UPS	15		
Piping, insulation	15		
QA/QC lab setup	8		
Fire hydrant system	12		
PCB CTE/CTO, Fire NOC, EC, PESO licenses	15		
Erection, freight, contingencies (~15%)	25		
GST	34		
Civil construction	60		
Total Capital Costs excl. Working Capital	₹ 286 Lakh		

Note: Indicated Capital Costs are indicative for a plant set up in India. Actual costs may vary considerably. Land costs are not included since land prices vary on the basis of location.

# D. Capital Costs – 10 tons/batch line

Item	₹ Lakh		
PVAc Reactor	40		
Reflux condenser, Packed column	14		
Monomer/initiator feed tank, fume hood	20		
PVA dissolution tank, blend tank	45		
Filter	7		
VAM storage	35		
Pumps (flameproof), valves, instruments, PLC	45		
Cooling tower	15		
Thermopack & DM plant	35		
Air compressor & N₂ manifold, tonners	25		
Vent scrubber & VOC controls	12		
Electricals, cabling, earthing, lighting (FLP), UPS	45		
Piping, insulation	45		
QA/QC lab setup	8		
Fire hydrant system	15		
PCB CTE/CTO, Fire NOC, EC, PESO licenses	20		
Erection, freight, contingencies (~15%)	64		
GST	88		
Civil construction	200		
Total Capital Costs excl. Working Capital	₹ 778 Lakh		

Note: Indicated Capital Costs are indicative for a plant set up in India. Actual costs may vary considerably. Land costs are not included since land prices vary on the basis of location.

### E. Operating Economics P&L – 2 tons/batch line

Sales volume	663 tons/year (@85%)
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**Revenue** ₹ 630 Lakhs

**Cost of Goods Sold (blended)** ₹ 464 Lakhs

**Gross Margin** ₹ 166 Lakhs

**QC + Compliance Costs** ₹ 20 Lakhs

**Rent** ₹ 18 Lakhs

**EBITDA** ₹ 128 Lakhs (20.31%)

**Depreciation (P&M only)** ₹ 43 Lakhs

**EBIT** ₹ 85 Lakhs

**Interest (@10%; 60% debt)** ~₹ 17 Lakhs

**Profit Before Tax** ₹ 68 Lakhs

**Estimated Return on Equity** Approx. 45%

<u>Note</u>: The operating economics is indicative. It is for second year with operations having achieved a steady state. Actual operational P&L may vary considerably.

Assumptions: 85% capacity utilization; Product mix = 50% PVAc bulk, 50% converted to wood glue; Working days 300; Debtor days 45; creditor days 30; GST netted out. Cost of land assumed to be 10000 sqft @ 1,50,000 per month.

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# F. Approvals, Health Safety & Environment (HSE) & Staffing

### Approvals

- Factory license
- Consent to Establish/Operate (SPCB)
- Petroleum & Explosives approvals for Nitrogen and VAM storage (PESO)
- Fire NOC.

### HSE

- Classified area zoning
- Intrinsically safe instruments
- Earthing, PPE, Spill control
- VOC capture
- Process safety (MOC, SOPs, HAZOP).

### Staffing

For 2 tons setup - 14 persons;
 (3 shift operations, QA/QC, utilities, stores, admin).



# G. Timeline

Month	1	2	3	4	5	6	7	8	9	10
BED/FEED										
EC										
PCB CTE AND OTHER LICENSES										
PROCUREMENT										
DETAILED ENGINEERING										
CIVIL CONSTRUCTION										
ERECTION										
PCB CTO AND OTHER COMPLIANCES COMMISSIONING AND										
HANDOVER										



We look forward to hearing from you.

We look forward to helping you set up a Polyvinyl Acetate plant.

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