Brief Project Profile for
Acrylic and Styrene Acrylic Emulsion Unit (India)

September 2025

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 acrylic and styrene acrylic emulsion via aqueous free-radical polymerization.

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

Chemistry

Acrylic and styrene–acrylic emulsions are waterborne dispersions of acrylic or styrene–acrylic copolymers stabilized with surfactants and protective colloids. These emulsions form the backbone of modern water-based paints, adhesives, construction chemicals, and textile coatings due to their excellent film-forming ability, UV resistance, alkali stability, and adhesion to diverse substrates.

The technology involves free radical emulsion polymerization of monomers (butyl acrylate, methyl methacrylate, ethyl hexyl acrylate, styrene, etc.) in water with the aid of surfactants and initiators. The process can be tuned to achieve specific glass transition temperature, particle size, and performance characteristics.

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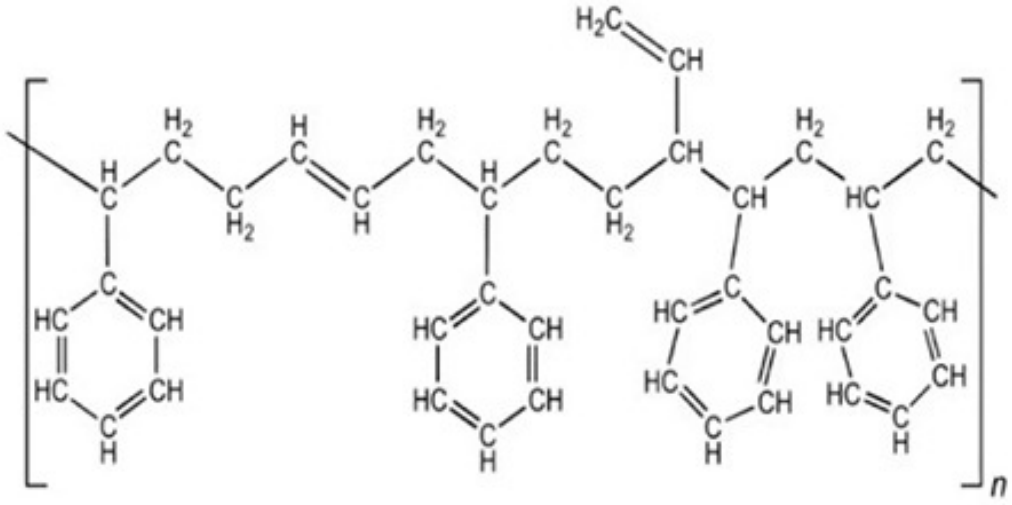

Styrene Acrylic Copolymer Emulsion is a water-based dispersion emulsion.

A. Market & Applications

Paints & Coatings	Water-based paints, exterior emulsions, and primers
Construction Chemicals	Tile adhesives, waterproofing membranes, crack fillers, and cement modifiers
Textiles & Nonwovens	Bindery applications in nonwoven fabrics
Adhesives	Packaging, paper lamination, and woodworking adhesives

B. Capacity & Throughput Assumptions

Batch cycle time	8-9 hours, including pre-feed, heating, continuous monomer feed, final hold
On stream days	300 days/year
Average batches/day	1.8 (allowing for maintenance and grade change)
Annual capacity nameplate (emulsion)	
	2 t/batch line: ~1080 TPA
	10 t/batch line: ~5400 TPA

C. Capital Costs – 2 tons/batch line

Item	₹ Lakh
Reactor	8
Reflux condenser, Packed column	6
Monomer/initiator feed tank, fume hood	8
Filter	4
Monomer storage	30
Pumps (flameproof), valves, instruments, PLC	20
cooling tower	5
Thermopack & DM plant	14
Air compressor & N_2 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%)	26
GST	36
Civil construction	60
Total Capital Costs excl. Working Capital	**₹ 297 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
Reactor	40
Reflux condenser, Packed column	14
Monomer/initiator feed tank, fume hood	20
Filter	7
Monomer storage	75
Pumps (flameproof), valves, instruments, PLC	45
cooling tower	15
Thermopack & DM plant	35
Air compressor & N_2 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%)	63
GST	87
Civil construction	200
Total Capital Costs excl. Working Capital	**₹ 771 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	918 tons/year (@85%)
Revenue	₹ 826 Lakhs
Cost of Goods Sold (blended)	₹ 661 Lakhs
Gross Margin	₹ 165 Lakhs
QC + Compliance Costs	₹ 20 Lakhs
Rent	₹ 18 Lakhs
EBITDA	₹ 127 Lakhs (15.28%)
Depreciation	₹ 45 Lakhs
EBIT	₹ 82 Lakhs
Interest (@10%; 60% debt)	~₹ 18 Lakhs
Profit Before Tax	₹ 64 Lakhs
Estimated Return on Equity	Approx. 40%

Note: 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% Acrylic, 50% styrene acrylic; 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.

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

- Approvals
  - Factory license
  - Consent to Establish/Operate (SPCB)
  - Petroleum & Explosives approvals for 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										

Thanks!

We look forward to hearing from you.

We look forward to helping you set up an Acrylic and Styrene acrylic emulsion plant.

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