Brief Project Profile for Epoxy Resins Unit (India)

September 2025

Ergo Engineers Private Limited

DESIGN | ENGINEERING | SUPPLY | COMMISSIONING

www.ergoengineers.com consulting@ergoengineers.com

Introduction & Chemistry

This Brief Project Profile outlines a compact, scalable plan to manufacture epoxy resins.

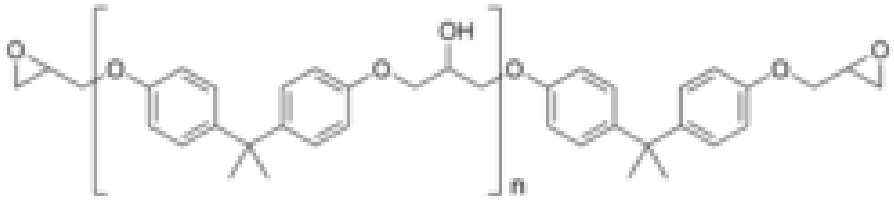
Two plant scales are assessed: **2-ton/batch** and **10-ton/batch**. This Profile covers chemistry, process, markets, capex/opex, unit economics, and expected returns under present cost conditions.

Chemistry

Epoxy resins are thermosetting polymers. The manufacturing process involves reacting an acidic hydroxy-containing compound, usually bisphenol A (BPA) (BPA), with epichlorohydrin (ECH) in the presence of an alkali (like sodium hydroxide) to form an epoxy resin monomer. This is a two-step process: first, the hydroxy groups of BPA react with epichlorohydrin in a coupling reaction, and then the product is dehydrohalogenated by the alkali to form the epoxide group. After the reaction, the resulting liquid or solid epoxy resin is separated from salt byproducts and purified for commercial use.

Primary Reaction: Bisphenol-A + Epichlorohydrin → Diglycidyl ether of bisphenol-A (DGEBA) is carried out in presence of caustic soda (NaOH) as base.

Contents



A. Market & Applications

Paints & Coatings	Anti corrosive paints, marine paints, industrial coatings, floorings
Adhesives	Structural and construction, electrical encapsulation
Composites	Wind turbine blades, aerospace
Adhesives	Packaging, paper lamination, and woodworking adhesives

B. Capacity & Throughput Assumptions

Batch cycle time	10-12 hours including pre-feed, reaction, reactant and solvent recovery, purification
On stream days	300 days/year
Average batches/day	1.8 (allowing for maintenance and grade change)
Annual capacity nameplate	
	2 tons/batch line: ~1080 TPA
	10 tons/batch line: ~5400 TPA

C. Capital Costs – 2 tons/batch line

Item	₹ Lakh
Reactor	25
Reflux condenser, Packed column	10
Feed tank, fume hood	8
Boilup tank, distillate receiver	40
Vacuum condenser	10
Vacuum receiver and vacuum pump	10
Filter	4
Epichlorohydrin storage	30
MEE	20
Pumps (flameproof), valves, instruments, PLC	20
Cooling tower	5
Thermopack	12
Air compressor & N_2 tonners	8
Vent scrubber & VOC controls	10
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%)	42
GST	57
Civil construction	60
Total Capital Costs excl. Working Capital	**₹ 436 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	90
Reflux condenser, Packed column	35
Feed tank, fume hood	25
Boilup tank, distillate receiver	100
Vacuum condenser	30
Vacuum receiver and vacuum pump	35
Filter	15
Epichlorohydrin and toluene storage	80
MEE	60
Pumps (flameproof), valves, instruments, PLC	50
Cooling tower	15
Thermopack	25
Air compressor & N_2 tonners	15
Vent scrubber & VOC controls	25
Electricals, cabling, earthing, lighting (FLP), UPS	45
Piping, insulation	50
QA/QC lab setup	8
Fire hydrant system	18
PCB CTE/CTO, Fire NOC, EC, PESO licenses	15
Erection, freight, contingencies (~15%)	110
GST	152
Civil construction	100
Total Capital Costs excl. Working Capital	**₹ 1099 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	₹ 1836 Lakhs
Cost of Goods Sold (blended)	₹ 1607 Lakhs
Gross Margin	₹ 229 Lakhs
QC + Compliance Costs	₹ 20 Lakhs
Rent	₹ 18 Lakhs
EBITDA	₹ 192 Lakhs (10.46%)
Depreciation	₹ 65 Lakhs
EBIT	₹ 127 Lakhs
Interest (@10%; 60% debt)	About ₹ 26 Lakhs
Profit Before Tax	₹ 101 Lakhs
Estimated Return on Equity	Approx. 43%

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; 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
  - Environmental Clearance
  - Consent to Establish/Operate (SPCB)
  - Petroleum & Explosives approvals for Nitrogen and other 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!

Ergo Engineers

We look forward to hearing from you.

We look forward to helping you set up an Epoxy Resins plant.

ERGO ENGINEERS PRIVATE LIMITED

Registered Office – MF-104, Ajay Tower
E5/1(Commercial), Arera Colony, Bhopal – 462016 (MP) INDIA

consulting@ergoengineers.com / ergoengineers@gmail.com

www.ergoengineers.com

WhatsApp - +91-9967254934