

**Commissioner of Industries
Hyderabad
Andhra Pradesh**

Anaerobic Adhesives

1. Introduction

Anaerobic adhesives are advanced bonding agents for special applications. They are also called as hitech adhesives. These adhesives are product of esterification of polyhydric alcohols with methacrylic acid using suitable catalyst. Conventional anaerobic adhesive composition are made by mixing the anaerobic monomer with an hydrogen peroxide initiator, an accelerator, a dye etc. They contain no solvents.

II. Market Status and Scope

Major applications of anaerobic adhesives are in bonding locked threaded assembly (aircrafts), structural bonding in aircrafts, pipe sealants, gasket eliminators in automobile industry, maintenance and repair works etc. The products generally comprises diethylene glycol dimethacrylate, polyethylene glycol 200 dimethacrylate as monomers. These monomers exhibit following properties:

Product Specifications

a) Anaerobic Monomers : (Two)

Properties	Diethyleneglycol dimethacrylate	Polyethyleneglycol 200 dimethacrylate
Colour	Yellow	Yellow
Refractive Index(24 C)	1.4565	-1.4607
Density g/cc (24 C)	-1.0572	-1.1150
Purity (%) GLC	90-92	90-92
Yield (%)	90	90

b) Anaerobic Adhesive Compositions

Thread Lockers	Torque Values (Kg. M)	Curing time* (Min)
1	0.8 - 1.0	30
2	2.5 - 2.8	30

Pipe Sealants

1	0.7 - 0.9	25
2	0.9 - 1.1	30

Retaining Compositions Shear Kg/Cm

1	125 - 150	30
2	150 - 170	30

* Curing time can be reduced by primer treatment

A few firms are marketing adhesive compositions based on imported monomers under the brand name Fevicol-ANR, TECH-TITE, LOCK-TITE, FIT-TITE. It is reported that manufacture anaerobic monomers in the country is nil. At present the country is importing entire requirement of anaerobic monomers. However, adhesive formulations are being made by a few firms. The indigenous demand for adhesive formulations is to the tune of Rs. 300 lakhs to Rs. 400 lakhs.

III. Installed Capacity

The proposed project shall have an annual installed capacity of 3 Tonnes per annum based on 3 shift operation in 300 working in a year.

IV. Manufacturing Processing and Technology

The anaerobic monomers are prepared by esterification for polyhydric alcohols with methacrylic acid using a suitable catalyst and then subsequent treatment yields a product of 90% purity which is useful for making anaerobic adhesive composition.

V. Land and Buildings

The proposed project shall require 1000 sq. mtrs of land for establishment the various requirements such as factory building, administrative building, stores and godown etc. The total civil works for the main plant and the others shall be 3000 sq. ft. The Proposed budget estimate for procurement of land, site development, civil works shall be Rs. 8.50 lakhs. Out of the amount allocated Rs. 1.00 lakhs for land and site development and the rest is for the civil works.

VI. Plant and Machinery

The major plant equipment comprises of stainless steel kettle for reaction, filter press and other vessels. The plant and machinery cost for the proposed installed capacity will be Rs. 10.00 lakhs. The technical know-how fee for the project is Rs. 2.00 lakhs has been included in the project cost.

VII. Raw Materials

The major raw materials required for the manufacturing of anaerobic adhesives are Polyethylene glycol, methacrylic acid, hydroperoxide, quinones and tertiary amines. Most of the raw materials are produced in the country and are available indigenously. The total raw material cost at the installed capacity is estimated at Rs. 4.11 lakhs.

VIII. Utilities

The Unit shall have a connected load of 15 HP power, the total power consumption in terms of money shall be Rs. 1.44 lakhs at installed capacity. The cost of utilities during 1st, 2nd and 3rd year is Rs. 0.86 lakhs, Rs. 1.01 lakhs and Rs. 1.15 lakhs respectively.

IX. Manpower Requirement

The unit provides employment to 9 persons comprising of one supervisor, one manager for administration, one officer for marketing etc. numbering 4 persons in the supervisory cadres and the rest are skilled and unskilled workmen. The salary and wages are assumed to increase @ 5% annually and 10% of the salary fringe benefits has been considered in the estimates.

S.No.	Particulars	No.	Salary p.m.	Total Amount
ADMINISTRATION				
1.	Manager	1	5000	0.60
2.	Assistants	1	2000	0.24
3.	Mktg. Assistants	1	2500	0.30
4.	Office Boy	1	800	0.10
PRODUCTION				
1.	Supervisor	1	3000	0.36
2.	Skilled Worker	1	2000	0.24
3.	Unskilled Workers	2	1000	0.24
4.	Watchman	1	800	0.10
Total				2.17

X. Working Capital Requirement

The working requirement of the unit are calculated for the 1st three years of operation. The unit requires one month stock of raw materials and consumables, one month stock of packing material and utilities. The finished goods and bills receivables also considered for one month operation. The monthly expenditure for salaries and wages also included in the working capital. The margin money for individual items has been followed according to guidelines laid down by the financial institutions and banks. Accordingly the working capital requirement during 1st, 2nd and 3rd years of operation of the unit is Rs.2.59 lakhs, Rs.3.02 lakhs and Rs.3.43 lakhs respectively.

XI. Preliminary & Pre-operative Expenses

This includes preliminary expenditure to be incurred by the unit during project formulation, loan acquisition costs and preoperative expenditure like interest during construction, salaries, travel expenditure and trial run expenditure. The preliminary and preoperative expenses for the proposed project has been estimated as Rs.1 .97 lakhs.

XII. Project Cost and Means of Finance

(Rs. Lakhs)	
Land	1.00
Buildings & Civil Works	7.50
Plant & Machinery	1.00
Other Fixed Assets	2.50
Technical Knowhow	2.50
Prel. & Pre-op. Expenses	1.97
Margin Money for W.C.	0.84

Deposits, Rent etc.	0.50
Contingencies	1.60
Total:	27.91
Means of Finance:	
Promoter's Equity	10.31
Term Loan	17.60
Total:	27.91

XIII. Cost of Production and Profitability (3rd year of operation)

Cost of Production:	(Rs. in Lakhs)
1. Raw Materials	3.29
2. Consumables	0.24
3. Utilities	1.15
4. Salary & Wages - Prodn.	1.13
5. Packing Materials	0.48
6. Repairs & Maintenance	0.22
7. Depreciation	0.88
8. Telephone & Posts	0.60
9. Selling Expenses	0.48
10. Admn. Salaries	1.49
11. Admn. Overheads	1.14
12. POP Expn. Written Off	0.20
13. Interest on Term Loans	2.14
14. Interest on Working Capital Loan	0.43
Total:	12.33
Net Sales @ Rs.1.00 lakh per ton	Rs. 24.00 Lakhs
Profit before Tax	Rs. 11.70 Lakhs
Debt Service Coverage Ratio (DSCR) ..	1.94
Break Even Point: % at Installed Capacity ..	25.26
Cumulative Cash Surplus at the end of 5th year ..	Rs. 27.40 Lakhs