



AN ISO 9001 : 2015 CERTIFIED COMPANY

Detailed project report

Sample edition

Projections from FY 2027-28

Project report

Titanium Dioxide

Installed capacity 3.7 MT per day

Sector Inorganic chemicals

Total project cost ₹878.04 lakh

Illustrative sample
Figures are representative

Project at a glance

Titanium Dioxide
3.7 MT per day

Product	Titanium Dioxide	Sector	Inorganic chemicals
Installed capacity	3.7 MT per day	Annual capacity	1,221 MT per year
Selling price (ex-GST)	₹2,07,000 per MT	Working days	330 a year
Manpower	46 people	Plant and machinery	₹436.58 lakh
Total project cost	₹878.04 lakh	Promoter's contribution	₹219.51 lakh (25%)
Term loan	₹658.53 lakh (75%)	Cash credit limit	₹173.66 lakh
Revenue, Year 3	₹1,769.23 lakh at 70%	Net profit, Year 3	₹196.55 lakh
Return on investment	22.4% a year	Break-even, Year 3	38.9% of capacity
Average DSCR	1.85	Payback period	3.5 years

This is an illustrative sample. Its figures are generated from industry-typical ratios to show the format and depth of an NPCS project report. They are not taken from any NPCS report or any real project, and should not be used for investment or lending decisions.

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1 Introduction

The product covered in this sample is titanium dioxide, made in a plant sized at 3.7 MT per day (1,221 MT per year at full capacity). The unit is costed as a complete project, from land and building through to working capital, and its applications range from interior paints, distempers and primers to printing inks and ceramics.

The sections that follow show how such a unit would be costed and financed, and how its profit, cash flow and loan repayment would look over the first five years. At 70% capacity utilisation in Year 3, the model unit earns revenue of ₹1,769.23 lakh and a net profit of ₹196.55 lakh.

2 Uses and applications

The main applications and markets for the product are:

- Interior paints, distempers and primers
- Paper and paper coatings
- Rubber and plastic goods
- Delustering of synthetic fibres
- Printing inks and ceramics

3 Market potential

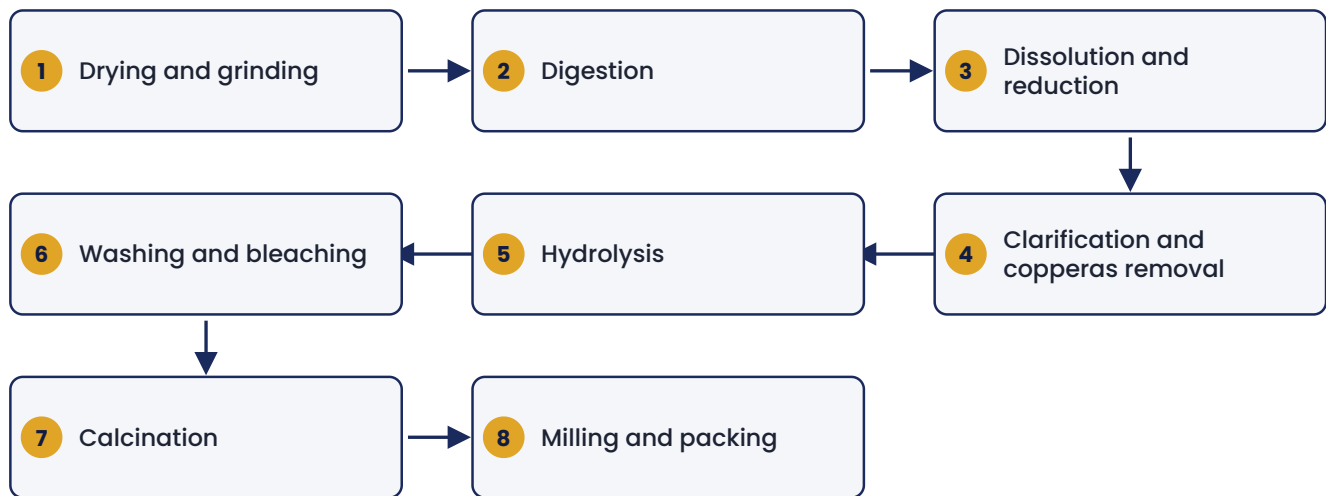
Paint makers are the largest buyers of titanium dioxide, followed by plastics, paper, printing ink and rubber producers. India imports a large share of the pigment it uses, so a domestic unit competes on delivered price, steady quality and short lead times. Anatase grade from the sulphate route suits interior paints, paper and fibres, while exterior paints mostly use rutile grade.

The usual customers for a unit of this kind are paint and distemper manufacturers, masterbatch and plastic compounders, paper and laminate mills, printing ink makers, synthetic fibre producers, and chemical traders and distributors.

A full NPCS report adds a market survey with present demand, expected growth and the names and addresses of existing manufacturers, worked out for the location you choose.

4 Manufacturing process

The manufacturing process runs in eight stages. Each stage is described below, and the flow chart shows the sequence.



Process flow for titanium dioxide

- 1 Drying and grinding.** Ilmenite is dried and ground in a ball mill so that the acid can reach every particle.
- 2 Digestion.** The ground ore reacts with concentrated sulphuric acid in a digester to form a porous solid cake.
- 3 Dissolution and reduction.** The cake is dissolved in water and scrap iron is added to turn ferric iron into the ferrous form.
- 4 Clarification and copperas removal.** The liquor is settled and filtered, then cooled so that iron separates out as ferrous sulphate crystals.
- 5 Hydrolysis.** The clear titanium liquor is concentrated and boiled with seed to precipitate titanium hydrate.
- 6 Washing and bleaching.** The hydrate is filtered and washed to remove iron and other metals that would spoil the white colour.
- 7 Calcination.** The washed hydrate is heated in a rotary calciner to drive off water and acid and form anatase crystals.
- 8 Milling and packing.** The calcined pigment is milled, surface treated, dried, micronized and packed in 25 kg bags.

5 Raw materials

The main raw materials are ilmenite (beach sand grade), sulphuric acid, scrap iron for reduction, surface treatment chemicals, calcination additives and seed, and lime for neutralisation. In Year 3, at 70% utilisation, raw materials cost ₹914.23 lakh, about 51.7% of sales. The table shows how this cost splits between materials.

Raw material	Share of cost	Year 3 cost (₹ lakh)
Ilmenite (beach sand grade)	32.0%	292.55
Sulphuric acid	38.0%	347.41
Scrap iron for reduction	4.0%	36.57
Surface treatment chemicals	8.0%	73.14
Calcination additives and seed	6.0%	54.85
Lime for neutralisation	12.0%	109.71
Total raw materials	100.0%	914.23

6 Plant and machinery

Plant and machinery for the model unit is estimated at ₹436.58 lakh, before the contingency allowance. The rotary calciner with cooler is the largest single item. A full NPCS report adds specifications and supplier names for each machine.

Machinery and equipment	Indicative cost (₹ lakh)
Ore dryer and ball mill	34.93
Acid-resistant digesters	61.12
Reduction and settling tanks with filter press	61.12
Vacuum crystalliser and copperas centrifuge	43.66
Evaporator and hydrolysis vessels	52.39
Leaf filters and hydrate washing system	30.56
Rotary calciner with cooler	78.58
Wet mill, dryer and steam micronizer	43.66
Acid scrubber and effluent neutralisation plant	30.56
Total plant and machinery	436.58

7 Land, building and utilities

Land and site development is taken at ₹69.85 lakh and building and civil works at ₹200.74 lakh. Other fixed assets, including electrification, furniture, testing equipment and power backup, add ₹61.12 lakh. Land rates vary widely by location, so these are the figures most likely to change in a real project.

Power and fuel cost ₹128.94 lakh in Year 3, about 7.3% of sales. Water is needed for cleaning, domestic use and, where the process calls for it, production.

8 Manpower

The unit employs 46 people. Wages and salaries come to ₹103.92 lakh in Year 1 and are assumed to rise by 5% a year.

Category	Number	Monthly wage (₹)	Annual cost (₹ lakh)
Management, supervision and administration	7	32,500	27.30
Skilled workers and operators	16	20,500	39.36
Semi-skilled and unskilled workers	23	13,500	37.26
Total (Year 1)	46		103.92

9 Licences and approvals

A unit of this kind typically needs the following registrations and approvals. Requirements vary by state and by the exact product, so confirm them with the local authorities before applying.

- Udyam (MSME) registration
- GST registration
- Consent to establish and consent to operate from the State Pollution Control Board
- Factory licence or registration under the applicable labour law, where the workforce threshold applies
- Fire safety NOC, where required
- Trade licence from the local body
- BIS standard IS 411 for anatase titanium dioxide for paints, used by buyers as the quality reference

10 Project cost and means of finance

Setting up the unit costs ₹878.04 lakh in all, of which plant and machinery is ₹436.58 lakh. The estimate includes a 5% contingency on building and machinery, pre-operative expenses and the margin money needed to start working capital.

Cost of project	₹ lakh
Land and site development	69.85
Building and civil works	200.74
Plant and machinery	436.58
Other fixed assets (electrification, furniture, lab equipment, DG set)	61.12
Contingencies	31.87
Preliminary and pre-operative expenses	20.00
Margin money for working capital	57.88
Total cost of project	878.04

Means of finance

Funding follows a 75:25 split between bank loan and promoter's contribution, with a term loan of ₹658.53 lakh and promoter funds of ₹219.51 lakh. The bank also provides a cash credit limit of ₹173.66 lakh for working capital.

Source of funds	₹ lakh
Promoter's contribution (25%)	219.51
Term loan from bank (75%)	658.53
Total means of finance	878.04
<i>Cash credit limit for working capital (separate)</i>	<i>173.66</i>

11 Working capital

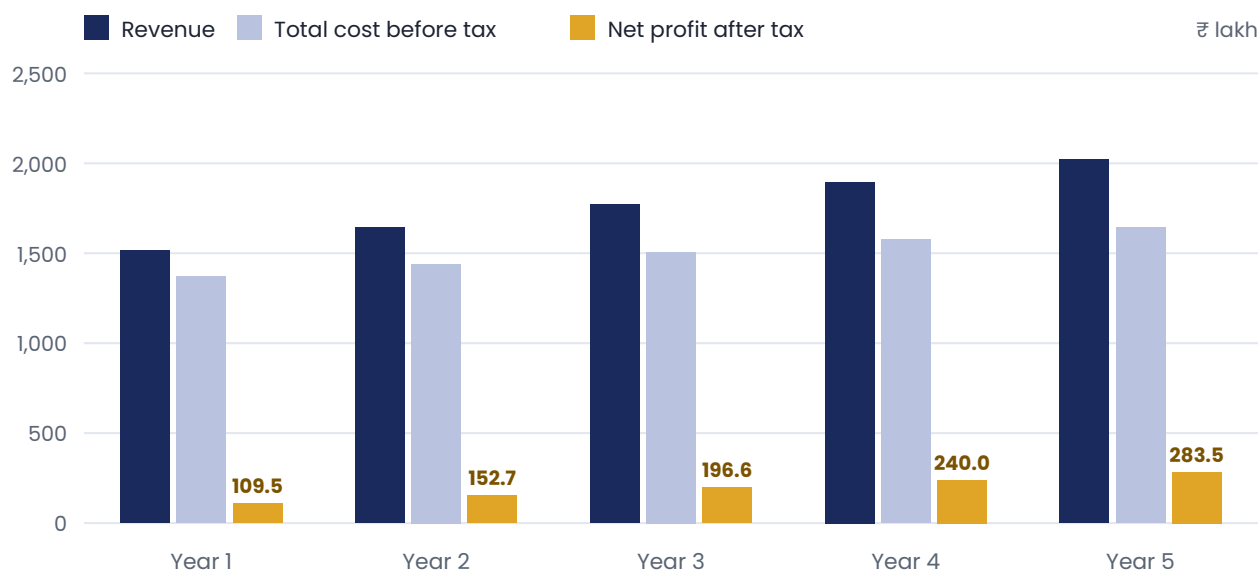
Working capital is worked out from holding periods: 30 days of raw material, 15 days of finished goods and 45 days of credit to customers, less 30 days of credit from suppliers. In Year 1 the requirement is ₹231.54 lakh. The bank funds ₹173.66 lakh through cash credit and the promoter's margin covers ₹57.88 lakh.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Raw material stock (30 days)	64.41	69.78	75.14	80.51	85.88
Work in progress (2 days)	5.47	5.91	6.34	6.78	7.22
Finished goods (15 days)	43.89	47.38	50.88	54.40	57.93
Trade receivables (45 days)	186.96	202.54	218.12	233.70	249.29
Total current assets	300.73	325.61	350.48	375.39	400.32
Less: trade creditors (30 days)	69.19	74.95	80.72	86.48	92.25
Working capital requirement	231.54	250.66	269.76	288.91	308.07

12 Projected profitability

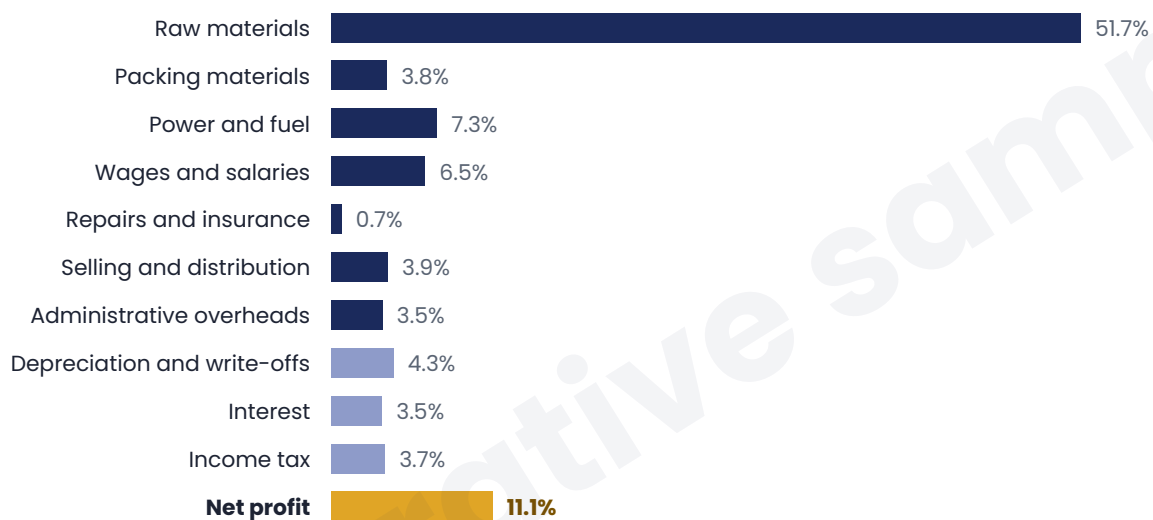
As utilisation climbs from 60% to 80%, sales increase from ₹1,516.48 lakh to ₹2,021.98 lakh. Operating profit in Year 3 is ₹399.80 lakh, a margin of 22.6%, and net profit after tax grows from ₹109.52 lakh in Year 1 to ₹283.48 lakh in Year 5.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Capacity utilisation (%)	60%	65%	70%	75%	80%
Revenue from operations	1,516.48	1,642.86	1,769.23	1,895.60	2,021.98
Raw materials consumed	783.63	848.93	914.23	979.53	1,044.84
Packing materials	58.16	63.00	67.85	72.70	77.54
Power and fuel	110.52	119.73	128.94	138.15	147.36
Wages and salaries	103.92	109.12	114.57	120.30	126.32
Repairs and maintenance	8.73	9.17	9.63	10.11	10.61
Insurance	2.92	2.92	2.92	2.92	2.92
Cost of production	1,067.88	1,152.87	1,238.14	1,323.71	1,409.59
Gross profit	448.60	489.99	531.09	571.89	612.39
Selling and distribution expenses	58.96	63.87	68.79	73.70	78.61
Administrative overheads	56.69	59.53	62.50	65.63	68.91
Operating profit (EBITDA)	332.95	366.59	399.80	432.56	464.87
Depreciation	95.95	82.92	71.70	62.06	53.73
Preliminary expenses written off	4.00	4.00	4.00	4.00	4.00
Interest on term loan	67.87	56.96	42.93	27.36	10.07
Interest on cash credit	19.10	19.10	19.10	19.10	19.10
Profit before tax	146.03	203.61	262.07	320.04	377.97
Income tax	36.51	50.90	65.52	80.01	94.49
Profit after tax	109.52	152.71	196.55	240.03	283.48



Revenue, total cost before tax and net profit after tax, ₹ lakh

Where each rupee of sales goes in Year 3



Each cost head as a percentage of Year 3 sales

13 Cash flow statement

The cash flow statement sets out the sources and uses of funds year by year. The unit stays cash positive throughout and closes Year 5 with a cash balance of ₹633.59 lakh after meeting the loan repayments due.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Sources of funds					
Promoter's contribution	219.51	–	–	–	–
Term loan from bank	658.53	–	–	–	–
Cash credit (working capital) from bank	173.66	–	–	–	–
Net profit after tax	109.52	152.71	196.55	240.03	283.48
Depreciation	95.95	82.92	71.70	62.06	53.73
Preliminary expenses written off	4.00	4.00	4.00	4.00	4.00
Increase in trade creditors	69.19	5.76	5.77	5.76	5.77
Total sources	1,330.36	245.39	278.02	311.85	346.98
Application of funds					
Fixed assets	800.16	–	–	–	–
Preliminary and pre-operative expenses	20.00	–	–	–	–
Increase in inventories	113.77	9.30	9.29	9.33	9.34
Increase in trade receivables	186.96	15.58	15.58	15.58	15.59
Repayment of term loan	58.83	127.29	141.32	156.90	174.19
Drawings	–	–	–	–	–
Total application	1,179.72	152.17	166.19	181.81	199.12
Net cash flow	150.64	93.22	111.83	130.04	147.86
Opening cash balance	–	150.64	243.86	355.69	485.73
Closing cash balance	150.64	243.86	355.69	485.73	633.59

14 Projected balance sheet

The projected balance sheet balances in every year. Net worth grows from ₹313.03 lakh at the end of Year 1 to ₹1,201.80 lakh at the end of Year 5, while the term loan outstanding falls from ₹599.70 lakh to nil.

As at year end (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Liabilities					
Promoter's capital	219.51	219.51	219.51	219.51	219.51
Reserves and surplus	109.52	262.23	458.78	698.81	982.29
Term loan	599.70	472.41	331.09	174.19	–
Cash credit from bank	173.66	173.66	173.66	173.66	173.66
Trade creditors	69.19	74.95	80.72	86.48	92.25
Total liabilities	1,171.58	1,202.76	1,263.76	1,352.65	1,467.71
Assets					
Gross fixed assets	800.16	800.16	800.16	800.16	800.16
Less: accumulated depreciation	(95.95)	(178.87)	(250.57)	(312.63)	(366.36)
Net fixed assets	704.21	621.29	549.59	487.53	433.80
Preliminary expenses not written off	16.00	12.00	8.00	4.00	–
Inventories	113.77	123.07	132.36	141.69	151.03
Trade receivables	186.96	202.54	218.12	233.70	249.29
Cash and bank balance	150.64	243.86	355.69	485.73	633.59
Total assets	1,171.58	1,202.76	1,263.76	1,352.65	1,467.71

15 Depreciation

Fixed assets are depreciated on the written-down value method, at 15% a year for plant and machinery, 10% for building and 10% for other assets. Land carries no depreciation.

Preliminary and pre-operative expenses are written off in equal parts over five years.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Building and civil works (cost ₹210.78 lakh, 10% WDV)					
Opening written-down value	210.78	189.70	170.73	153.66	138.29
Depreciation	21.08	18.97	17.07	15.37	13.83
Closing written-down value	189.70	170.73	153.66	138.29	124.46
Plant and machinery (cost ₹458.41 lakh, 15% WDV)					
Opening written-down value	458.41	389.65	331.20	281.52	239.29
Depreciation	68.76	58.45	49.68	42.23	35.89
Closing written-down value	389.65	331.20	281.52	239.29	203.40
Other fixed assets (cost ₹61.12 lakh, 10% WDV)					
Opening written-down value	61.12	55.01	49.51	44.56	40.10
Depreciation	6.11	5.50	4.95	4.46	4.01
Closing written-down value	55.01	49.51	44.56	40.10	36.09
Total depreciation	95.95	82.92	71.70	62.06	53.73
Preliminary expenses written off	4.00	4.00	4.00	4.00	4.00

16 Term loan repayment

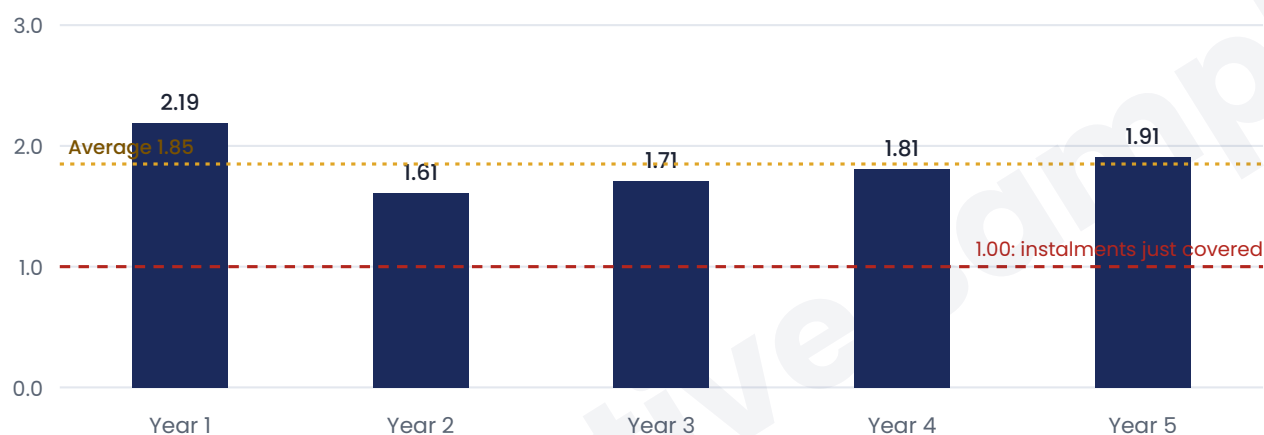
The term loan of ₹658.53 lakh carries interest at 10.5% a year. Only interest is paid during the 6-month moratorium, after which the loan is repaid in 54 equal monthly instalments of ₹15,35,441. The month-by-month schedule is in the annexure.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Opening balance	658.53	599.70	472.41	331.09	174.19
Interest	67.87	56.96	42.93	27.36	10.07
Principal repaid	58.83	127.29	141.32	156.90	174.19
Closing balance	599.70	472.41	331.09	174.19	—

17 Debt service coverage

Cash available for debt service covers the term loan instalments 1.85 times on average, and never less than 1.61 times (Year 2).

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Net profit after tax	109.52	152.71	196.55	240.03	283.48
Depreciation and write-offs	99.95	86.92	75.70	66.06	57.73
Interest on term loan	67.87	56.96	42.93	27.36	10.07
Total available for debt service (A)	277.34	296.59	315.18	333.45	351.28
Principal repayment	58.83	127.29	141.32	156.90	174.19
Interest on term loan	67.87	56.96	42.93	27.36	10.07
Total debt service (B)	126.70	184.25	184.25	184.26	184.26
DSCR (A / B)	2.19	1.61	1.71	1.81	1.91

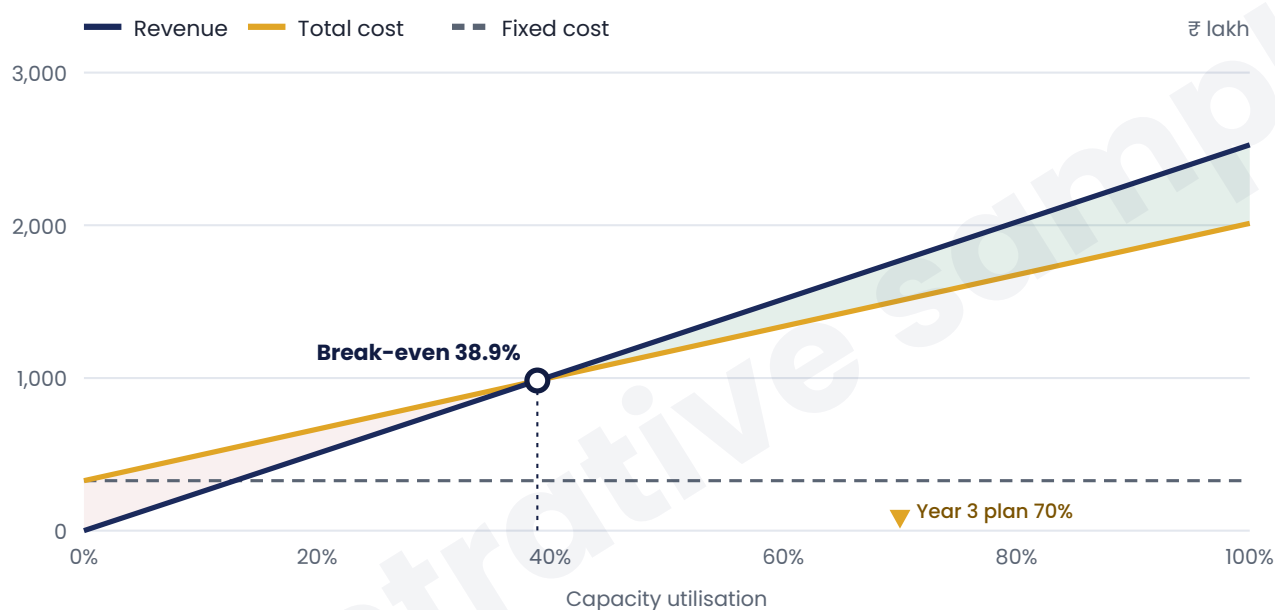


DSCR by year. A ratio above 1.00 means cash accruals cover the term loan instalments.

18 Break-even analysis

At Year 3 levels the unit breaks even at 38.9% of installed capacity, against planned utilisation of 70%. On a cash basis, leaving out depreciation and write-offs, break-even falls to 29.9%.

Particulars (₹ lakh)	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Revenue from operations	1,516.48	1,642.86	1,769.23	1,895.60	2,021.98
Variable costs	1,011.27	1,095.53	1,179.81	1,264.08	1,348.35
Contribution	505.21	547.33	589.42	631.52	673.63
Fixed costs (incl. depreciation and interest)	359.18	343.72	327.35	311.48	295.66
Break-even as % of installed capacity	42.7	40.8	38.9	37.0	35.1
Cash break-even as % of installed capacity	30.8	30.5	29.9	29.1	28.3
Break-even sales	1,078.14	1,031.71	982.59	934.95	887.46



Break-even chart at Year 3 prices and costs, scaled to full capacity. Shaded areas show the loss zone (left) and profit zone (right).

19 Financial ratios

Liquidity and leverage improve over the projection. The current ratio stays at or above 1.86, while debt-equity drops from 1.92 to zero as the term loan is repaid.

Ratio	Year 1 FY 2027-28	Year 2 FY 2028-29	Year 3 FY 2029-30	Year 4 FY 2030-31	Year 5 FY 2031-32
Current ratio	1.86	2.29	2.78	3.31	3.89
Quick ratio	1.39	1.80	2.26	2.77	3.32
Debt-equity ratio (term loan / net worth)	1.92	1.01	0.49	0.19	0.00
Total outside liabilities / net worth	2.69	1.53	0.87	0.48	0.22
Interest coverage ratio	2.68	3.68	5.22	7.89	13.96
DSCR	2.19	1.61	1.71	1.81	1.91
Gross profit margin (%)	29.6	29.8	30.0	30.2	30.3
Operating profit (EBITDA) margin (%)	22.0	22.3	22.6	22.8	23.0
Net profit margin (%)	7.2	9.3	11.1	12.7	14.0
Return on capital employed (%)	21.4	25.1	27.6	29.0	29.6
Break-even (% of installed capacity)	42.7	40.8	38.9	37.0	35.1

20 Key assumptions

- Commercial production starts in April 2027, and all assets are in use from the first year.
- Capacity utilisation of 60% in Year 1, rising to 80% by Year 5, over 330 working days a year.
- Selling price of ₹2,07,000 per MT, excluding GST, held constant through the projection.
- Raw materials at 51.7% of sales, packing materials at 3.8%, power and fuel at 7.3%, and selling and distribution at 3.9%.
- Wages and salaries rise by 5% a year; repairs and administrative overheads rise by 5% a year.
- Working capital based on 30 days of raw material, 2 days of work in progress, 15 days of finished goods and 45 days of receivables, less 30 days of creditors.
- Term loan at 10.5% interest with a 6-month moratorium and 54 monthly instalments; cash credit at 11% on 75% of the working capital requirement.
- Depreciation on the written-down value method at Income Tax Act rates; income tax at a flat 25% of profit for simplicity.
- Contingency of 5% on building and machinery; preliminary and pre-operative expenses written off over five years.
- All amounts in ₹ lakh unless stated otherwise, excluding GST.

21 Conclusion

The model shows that a titanium dioxide unit sized at 3.7 MT per day can be financed 75:25 by a bank and its promoter, service its loan with an average DSCR of 1.85, and return about 22.4% a year on a project cost of ₹878.04 lakh. These are sample figures. A real project needs a report built on its own site, quotations and market.

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A Annexure: monthly loan repayment schedule

Term loan of ₹658.53 lakh at 10.5% a year. Amounts in ₹ lakh.

No.	Month	Opening balance	Interest	Principal	Instalment	Closing balance
1	Apr 2027	658.53	5.76	–	5.76	658.53
2	May 2027	658.53	5.76	–	5.76	658.53
3	Jun 2027	658.53	5.76	–	5.76	658.53
4	Jul 2027	658.53	5.76	–	5.76	658.53
5	Aug 2027	658.53	5.76	–	5.76	658.53
6	Sep 2027	658.53	5.76	–	5.76	658.53
7	Oct 2027	658.53	5.76	9.59	15.35	648.94
8	Nov 2027	648.94	5.68	9.68	15.35	639.26
9	Dec 2027	639.26	5.59	9.76	15.35	629.50
10	Jan 2028	629.50	5.51	9.85	15.35	619.65
11	Feb 2028	619.65	5.42	9.93	15.35	609.72
12	Mar 2028	609.72	5.34	10.02	15.35	599.70
13	Apr 2028	599.70	5.25	10.11	15.35	589.60
14	May 2028	589.60	5.16	10.20	15.35	579.40
15	Jun 2028	579.40	5.07	10.28	15.35	569.12
16	Jul 2028	569.12	4.98	10.37	15.35	558.74
17	Aug 2028	558.74	4.89	10.47	15.35	548.28
18	Sep 2028	548.28	4.80	10.56	15.35	537.72
19	Oct 2028	537.72	4.71	10.65	15.35	527.07
20	Nov 2028	527.07	4.61	10.74	15.35	516.33
21	Dec 2028	516.33	4.52	10.84	15.35	505.49
22	Jan 2029	505.49	4.42	10.93	15.35	494.56
23	Feb 2029	494.56	4.33	11.03	15.35	483.53
24	Mar 2029	483.53	4.23	11.12	15.35	472.41
25	Apr 2029	472.41	4.13	11.22	15.35	461.19
26	May 2029	461.19	4.04	11.32	15.35	449.87
27	Jun 2029	449.87	3.94	11.42	15.35	438.45
28	Jul 2029	438.45	3.84	11.52	15.35	426.93
29	Aug 2029	426.93	3.74	11.62	15.35	415.31
30	Sep 2029	415.31	3.63	11.72	15.35	403.59
31	Oct 2029	403.59	3.53	11.82	15.35	391.77
32	Nov 2029	391.77	3.43	11.93	15.35	379.84
33	Dec 2029	379.84	3.32	12.03	15.35	367.81
34	Jan 2030	367.81	3.22	12.14	15.35	355.68
35	Feb 2030	355.68	3.11	12.24	15.35	343.43
36	Mar 2030	343.43	3.01	12.35	15.35	331.09
37	Apr 2030	331.09	2.90	12.46	15.35	318.63
38	May 2030	318.63	2.79	12.57	15.35	306.06
39	Jun 2030	306.06	2.68	12.68	15.35	293.38

No.	Month	Opening balance	Interest	Principal	Instalment	Closing balance
40	Jul 2030	293.38	2.57	12.79	15.35	280.60
41	Aug 2030	280.60	2.46	12.90	15.35	267.70
42	Sep 2030	267.70	2.34	13.01	15.35	254.69
43	Oct 2030	254.69	2.23	13.13	15.35	241.56
44	Nov 2030	241.56	2.11	13.24	15.35	228.32
45	Dec 2030	228.32	2.00	13.36	15.35	214.96
46	Jan 2031	214.96	1.88	13.47	15.35	201.49
47	Feb 2031	201.49	1.76	13.59	15.35	187.90
48	Mar 2031	187.90	1.64	13.71	15.35	174.19
49	Apr 2031	174.19	1.52	13.83	15.35	160.36
50	May 2031	160.36	1.40	13.95	15.35	146.41
51	Jun 2031	146.41	1.28	14.07	15.35	132.33
52	Jul 2031	132.33	1.16	14.20	15.35	118.14
53	Aug 2031	118.14	1.03	14.32	15.35	103.82
54	Sep 2031	103.82	0.91	14.45	15.35	89.37
55	Oct 2031	89.37	0.78	14.57	15.35	74.80
56	Nov 2031	74.80	0.65	14.70	15.35	60.10
57	Dec 2031	60.10	0.53	14.83	15.35	45.27
58	Jan 2032	45.27	0.40	14.96	15.35	30.31
59	Feb 2032	30.31	0.27	15.09	15.35	15.22
60	Mar 2032	15.22	0.13	15.22	15.35	–