APPLICATION

FOR

ANTI-DUMPING DUTY INVESTIGATION

CONCERNING IMPORTS OF

PHTHALIC ANHIDRIDE

FROM

TAIWAN

APPLICANT

IGPL I G PETROCHEMICALS LIMITED	Thirumalai Chemicals Ltd.	TCL INTERMEDIATES PRIVATE LIMITED (A SUBSIDIARY OF THIRUMALAI CHEMICALS LIMITED)

IG PETROCHEMICALS LIMITED,
THIRUMALAI CHEMICAL INDUSTRIES LIMITED, AND
TCL INTERMEDIATES PRIVATE LIMITED

FILED THROUGH

TPM
CENTRE FOR TRADE REMEDIES

TPM CONSULTANTS
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Confidentiality reasoning

Application for initiation of anti-dumping investigation into imports of Phthalic Anhydride from Taiwan

SN	Information where confidentiality has been claimed	The reason/ justification for claiming confidentiality	Whether information is available in public domain	Page no/ annexures
1.	Write up of the application	The information with respect to the cost of sales, selling prices, price undercutting, inventory (opening, closing and average), total production, capacity, capacity utilisation, captive transfer, and profitability parameters, is based on confidential business sensitive information of the domestic producers. The disclosure of the same will be of significant advantage to the competitors and would seriously impact the interest of such producers in the market. However, non-confidential summary of confidential information has been provided, in the form of indexed trends.	No	2-32
2.	Proforma IV-A part 1 and part 2	Information related to production, sales, capacity, capacity utilization, inventories, salary and wages, cost of sales, profitability, depreciation, interest cost, cash profits, total profits, profits per unit, capital employed, return on investment, net fixed assets and working capital of the domestic industry are confidentiality business sensitive information. Disclosure of such information will be of significant advantage to the competitors. However, the non-confidential summary of confidential information has been provided in the form of indexed trends.	No	35-36
3.	Proforma IV B	The injury margin and price undercutting has been determined based on the non-injurious price and net selling price of the domestic industry. The non-injurious price as well as the selling price are business sensitive information, disclosure of which would provide significant advantage to the competitors and would adversely impact the interest of the applicants. However, non-confidential summary of confidential information has been provided, in the form of range of injury margin and the non-injurious price.	No	38

4.	Annexure 1.1 Production process	The flowchart of the production process is business sensitive information, the disclosure of which would be detrimental to the interests of the applicants. However, a non-confidential summary of confidential information has been provided in the form of a brief write up of the process in the narrative.	No	39
5.	Annexure 2.2 - Details of shutdown	The details of the plants shutdown of the applicants is business sensitive information, disclosure of which would provide significant advantage to the competitors and would seriously impact the interest of the said domestic producers. The information has been claimed confidential.	No	74
6.	Annexure 2.4 – Standing	The production volumes of the applicant are confidential information, disclosure of which would be of significant competitive advantage to the competitors and would seriously impact the applicant's interest in the market. The information is not amenable to summarisation.	No	
7.	Annexure 3.2 Calculation of normal value	Normal value is determined based on the facts available which takes into account the cost of production of the applicant domestic producers. The cost of production is business proprietary information not amenable to summarisation. Disclosure of such information will be of significant advantage to the competitors and would seriously impact the interest of the said domestic producers. However, an appropriate non-confidential summary in the form of range of normal value has been disclosed.	No	78
8.	Annexure 3.5 Calculation of dumping margin	Dumping margin has been determined based on the constructed normal value which is confidential in nature normal value constructed based on the cost of production of the domestic industry. The cost of production of the applicant domestic producers is confidential business sensitive information, disclosure of the same will be of significant advantage to the competitors and would seriously impact the interest of such producers in the market. An appropriate non-confidential summary has been provided in the form of range of normal value.	No	94
9.	Annexure 6.1 Costing information	The costing formats are confidential in nature, as they contain business sensitive information, disclosure of which would cause serious prejudice to the interests of the domestic industry. Such information is not amenable to summarization.	No	106
10.	Annexure 6.2 Cost Audit Report	The cost audit formats are confidential in nature, as they contain business sensitive information, disclosure of which would provide undue advantage to competitors and cause serious prejudice to the interests of the domestic industry. They are not amenable to summarization.	No	107

11.	Annexure 6.3 Financial Statements-TCL Intermediates Limited	TCL Intermediates Limited are privately held company, and their financial reports are not publicly disclosed as they contain business sensitive information, disclosure of which would provide undue advantage to competitors and cause serious prejudice to the interests of the domestic industry. Such financial statements are not amenable to summarization.	No	108
12.	Annexure 6.4- Project Report	Project report of applicants contains complete details of the cost and benefit analysis of the project, disclosure of which would provide undue advantage to competitors and cause serious prejudice to the interests of the domestic industry. They are not amenable to summarization.	No	109

Requirements of Trade Notice 10/2018 dated 7th September 2018

The applicants request the Authority to kindly consider the facts that through the application is filed on behalf of three domestic producers, TCL Intermediates Private Limited only started production during the proposed period of investigation. Thus, the information prior to the proposed period of investigation pertains only to Thirumalai Chemical Industries Limited and IG Petrochemicals Limited. Disclosure of information on actual basis for period of investigation would lead to disclosure of the information for previous years as well, which defeats the trade notice. Further, TCL Intermediates Private Limited is a 100% owned subsidiary of Thirumalai Chemical Industries and hence part of the same group company. Based on these facts, the applicants are adhering to the confidentiality requirements applicable to two producers applicants.

SN	Particulars	Two Producers	Remarks
1.	Write-up on broad stage-wise manufacturing process	Actual Information	Provided on page 11-12
2.	Names of major raw materials used in production of PUC	Actual Information	Provided on page 11-12
3.	Country-wise Volume and Value of import of subject goods	Aggregate Data	Provided at Annexure 1.3 at page 63
4.	Relationship, if any, of Petitioners with Foreign Producers /Exporters/Importers/domestic producers of subject goods	Actual Information	Provided on page 19
5.	Names and addresses of all other Indian Producers	Actual Information	Provided on page 14-15
6.	Volume and Value of Production by all other producers except DI	Best information available with the DI and the source thereof Aggregate Basis	Provided at Annexure A on page 39. Information on value of other producer is not available with the applicants.
7.	Country wise estimates of Normal Value in Petition	Best information available with the DI and the source thereof	Provided in range at Annexure 3.1 on page 82
8.	Country wise estimates of Export Price in Petition	Best information available with the DI and the source thereof	Provided at Annexure 3.2 on page 84

9.	Installed Capacity of the domestic industry	Data must be provided as trend	Provided at Annexure A on page 39
10.	Production Quantity of the domestic industry	Data must be provided as trend	Provided at Annexure A on page 39
11.	Capacity Utilisation Percentage	Data must be provided as trend	Provided at Annexure A on page 39
12.	Average Industry Norm for Capacity Utilisation, If any	Best information available with the DI and the source thereof	Not applicable since such information has not been prescribed under Trade Notice 05/2021
13.	Sales Quantity: (a) Domestic Sales (b) Export sales (c) Captive consumption	Data must be provided as trend	Provided at Annexure A on page 39
14.	Sales Value: (a) Domestic Sales-Small Scale Industry** (SSI) (b) Domestic Sales- other than SSI (c) Export sales (d) Captive consumption	Data must be provided as trend	Provided at Annexure A on page 39[1]
15.	Sales Realisation per Unit: (a) Domestic Sales (b) Export sales (c) Captive consumption	Data must be provided as trend	Provided at Annexure A on page 39
16.	No. of Employees	Aggregated data in case two producers	Provided at Annexure A on page 39
17.	Productivity per day	Average data in case two producers	Provided at Annexure A on page 39
18.	Average Industry norm for Productivity per day, if any	Best information available with the DI and the source thereof	Not applicable since such information has not been prescribed under Trade Notice 05/2021
19.	Inventory	Data must be provided as trend	Provided at Annexure A on page 39
20.	Inventory as No. of days of Production	Data must be provided as trend	Provided at Annexure A on page 39
21.	Inventory as No. of days of Sales	Data must be provided as trend	Provided at Annexure A on page 39

22.	Average Industry Norm for Inventory, if any	Best information available with the DI and the source thereof	Not applicable since such information has not been prescribed under Trade Notice 05/2021
23.	R&D Expenses	Data must be provided as trend	Not applicable since such information has not been prescribed under Trade Notice 05/2021
24.	Funds Raised: (a) Equity (b) Loans and Advances (c) Working Capital (d) Other, if any	Data must be provided as trend	Not applicable since such information has not been prescribed under Trade Notice 05/2021
25.	Cost of Sales per unit Domestic Sales (excluding Outward Freight, outward insurance etc.)	Data must be provided as trend	Provided at Annexure A on page 39
26.	Cost of Sales per unit- Exports	Data must be provided as trend	Not applicable since such information has not been prescribed under Trade Notice 05/2021
27.	Selling Price Per unit - Domestic Sales (excluding excise duty or GST Whichever is applicable)	Data must be provided as trend	Provided at Annexure A on page 39
28.	Export price/unit	Data must be provided as trend	Provided at Annexure A on page 39
29.	PBIT per unit - Domestic sales	Data must be provided as trend	Provided at Annexure A on page 39[1]
30.	Total profit before interest and tax - Domestic sales	Data must be provided as trend	Provided at Annexure A on page 39[1]
31.	Interest/Finance Cost Domestic Sales	Data must be provided as trend	Provided at Annexure A on page 39[1]
32.	Depreciation and Amortisation expense	Data must be provided as trend	Provided at Annexure A on page 39[1]
33.	Average Industry Norm for PBIT as % of Avg. Capital Employed, if any	Best information available with the DI and the source thereof	Not applicable since such information has not been prescribed

			under Trade Notice 05/2021
34.	Purchase (Qty. as well as Value) of PUC	Data must be provided as trend	Not applicable. The applicants have not purchased the subject goods.
35.	Imports made by the Domestic Industry	Data must be provided as a % of total imports into India -Range ±5%	The applicants have not imported the subject goods.
36.	Non-Injurious Price Calculation	Aggregate actual data must be provided in actual figure range- ±10%	Provided on page 42

List of Annexures

SN	Annexure	Description
1	Annexure A	Proforma IV A-1 and proforma IV A.
2	Annexure B	Proforma IV B and price undercutting.
3	Annexure 1.1	Manufacturing process and flow chart.
4	Annexure 1.2	Copy of BIS standard on the subject goods
5	Annexure 1.3	Statement of imports
6	Annexure 1.4	List of known producers in subject country
7	Annexure 1.5	List of known importers and users in India
8	Annexure 1.6	List of user association
9	Annexure 2.1	Authorization letter
10	Annexure 2.2	Plant shutdown details
11	Annexure 2.3	Impact of duty
12	Annexure 2.4	Standing
13	Annexure 3.1	Calculation of normal value
14	Annexure 3.2	Calculation of export price
15	Annexure 3.3	Evidence for adjustments claimed in calculation of export price
16	Annexure 3.4	Calculation of exchange rate
17	Annexure 3.5	Calculation of dumping margin
18	Annexure 4.1	Capacity expansion in Taiwan
19	Annexure 4.2	Exports of product under consideration from Taiwan
20	Annexure 6.1	Costing formats
21	Annexure 6.2	Cost audit reports
22	Annexure 6.3	Financial statements
23	Annexure 6.4	Project report of IGPL and TCL Intermediates Private Limited

INTRODUCTION AND BACKGROUND

A. Introduction

1. The present application has been filed by IG Petrochemicals Limited Thirumalai Chemical Industries Limited, and TCL Intermediates Private Limited (a 100% owned subsidiary of Thirumalai Chemical Industries) (hereinafter referred to as "applicants", "domestic industries" or "TCL" and "IGPL" and "TCL-IPL") seeking initiation of anti-dumping investigation on the imports of "Phthalic Anhydride" (hereafter referred to as "subject goods", "product under consideration" or "PAN") from Taiwan (hereafter referred to as "subject country").

2. Besides applicants, KLJ Petroplast Limited is a new producer of subject goods in India, which has commenced the production of the product in April 2023 in the GIDC Jhagadia Industrial Estate in Bharuch, Gujarat. The company has a 1,00,000 MT plant.

3. The applicants have adequate standing to file the present application by satisfying the requirements of the Rule 5 of the Customs Tariff (Identification, Assessment and Collection of Antidumping Duty on Dumped Articles and for Determination of Injury) Rules, 1995 (hereinafter also referred to as "Rules").

4. The applicants have provided all relevant information that is reasonably available to it. The application is in the form and manner prescribed by the Authority and contains sufficient information to justify initiation of anti-dumping investigation. In case any further information is required, the applicants may be appropriately directed to provide such additional information. The applicants extend its willingness to provide any further information which may be required in this connection, and which is reasonably available or accessible to it. The applicants request the Designated Authority to kindly:

    a. Initiate the anti-dumping investigation to determine whether there is dumping of the product under consideration from subject country that is causing consequent injury to the applicants.
    b. Advise the applicants of any further information that the Designated Authority considers relevant and necessary for the present purpose.
    c. Call relevant information from concerned parties, including information from the foreign producers, Indian consumers and other interested parties before arriving at a final decision.
    d. Provide an opportunity to the applicants to further supplement their submissions on the need for anti-dumping duties, after the applicants have received and reviewed the responses and information that is required to be provided by the other interested parties in general and foreign producers in particular.

e. Provide an opportunity for oral hearing.
f. Recommend imposition of anti-dumping duty.
g. Recommend imposition of interim anti-dumping duty on the basis of provisional estimates of dumping margins.
h. Determine the quantum of dumping and injury margin and recommend anti-dumping duty for a period of five years.

B. About the Indian Industry.

5. Phthalic Anhydride industry in India is over 50 years old. Globally, India has the second highest capacity for Phthalic Anhydride. At present, the product is produced in India by the following three companies.

a. IG Petrochemicals Limited,
b. Thirumalai Chemicals Limited.
c. TCL Intermediates Private Limited (a 100% owned subsidiary of Thirumalai Chemical Industries)
d. KLJ Group (commenced production in April 2023).

6. Asian Paints Limited, Indian Dyestuff Industries, Herdillia Chemicals Limited, Mysore Petrochemicals Limited and SI Group India Private Limited are few producers who had Phthalic Anhydride capacity in India but have now shut down their operations.

7. The four producers have combined capacity to cater to the entire demand in the country. The industry provides direct employment to around *** people with wages amounting to more than Rs *** crores. These do not include indirect employment being given by the industry.

8. The present application is being filed on behalf of IG Petrochemical Limited and Thirumalai Chemicals Limited. KLJ Group considered as neutral party for the present investigation.

C. Indian Industry of product under consideration.

9. The Phthalic Anhydride industry in India is one of the consistently growing Chemical industry in India. The Indian Phthalic Anhydride industry takes prides in keeping the country totally Atma-Nirbhar. The table below shows the capacity and demand over the years.

SN	Year	Capacity	Demand
1	2008-09	***	***
2	2013-14	***	***

3	2018-19	***	***
4	2020-21	***	***
5	2023-24	***	***
6	2024-25	***	***

10. Since 2023- 24, the industry has brought on stream investment of Rs. *** crores. KLJ Group has set up a 1,00,000 MT plant in India. Thirumalai Chemicals Limited has set up a new green filed plant in India of 23,000 MT. TCL Intermediates Private Limited is the subsidiary company of Thirumalai Chemicals Private Limited and has commenced commercial production in the proposed period of investigation with effect from March 2025. IG Petrochemicals Limited has also set up a new production line which will enhance the capacity of subject goods by 53,000 MT.

11. While the industry has been taking all steps at its command, the industry is periodically facing significant unfair competition from subject country, as elaborated hereinbelow. The present market situation is causing significant damage to Indian industry and is leading to significant deterioration in market share and profitability and also threatening fresh investments made by the industry.

D. <u>Sudden change in the market situation in India.</u>

12. The applicants were operating under profitable conditions at the beginning of April 2024. However, the situation has undergone a sharp deterioration over the subsequent eighteen months period. While the applicants earned profits during the initial period, the proposed period of investigation of October 2024 to September 2025 shows a complete reversal, with the applicants incurring significant financial losses.

13. The table below shows the volume and landed price of imports and the domestic sales and selling price of the applicants since April 2024 till the end of the proposed period of investigation on quarterly basis.

SN	Quarter	Import volume	Landed Price	Domestic sales	Net selling price
		MT	₹/MT	MT	₹/MT
1	2024-25 Q1	7,780	1,02,314	***	***
2	2024-25 Q2	8,517	1,11,623	***	***
3	2024-25 Q3	12,475	92,319	***	***
4	2024-25 Q4	12,026	95,685	***	***
5	2025-26 Q1	11,771	93,896	***	***
6	2025-26 Q2	9,924	88,781	***	***

14. The above clearly establishes that the landed price of imports has witnessed a steep decline over this period. While the landed price of imports was higher than the selling price of the applicants in the first two quarters, the price has declined steeply over the period. The import volume has increased whereas the domestic sales have declined. The applicants have lost significant sales volume.

15. The applicants have made substantial investments in the business, and the continued dumping of the subject goods has placed these investments under serious jeopardy. In light of the deteriorating performance indicators, the Authority is requested to consider recommending the imposition of interim anti-dumping duties to prevent further injury pending the conclusion of the investigation.

SECTION I: PRODUCT INFORMATION.

I. Complete description of alleged dumped goods, including information on its size, quality, category and uses of such goods along with any applicable technical specifications or standards (national or international) and the ITC (HS) Code, Basic Customs Duty and applicable cess, Existing Import Policy (free/ restricted/ prohibited/ imports through STE) and change in import policy, if any, during the POI.

A. Product description.

16. The product under consideration in the present investigation is “Phthalic Anhydride (PAN)”, the principal commercial form of Phthalic Acid.

17. Phthalic anhydride is the organic compound with the formula CaH4(C0)20. It is the anhydride of phthalic acid. Properties of product are given below:

Molecular Formula	C8H4O3
Molar Mass	148.1 g/mol
Appearance	White Flake
Density 1.53 g/cm3Solid	Density 1.53 g/cm3Solid
Melting Point 131°C	Melting Point 131°C
Boiling point	285 degree centigrade
Soluble in water	0.62/100g reacts slowly

B. Unit of measurement.

18. The product under consideration is produced and sold in terms of weight expressed in MT.

C. Uses.

19. It is an important chemical intermediate in plastic industry. Various uses of the product include plasticizers, polyester resins, alkyd resins used in paints and lacquers, polyester polyols, dyes and pigments etc.

D. Manufacturing process.

20. Phthalic Anhydride is produced through catalytic gas-phase oxidation process of either Ortho-xylene or Naphthalene. Most of the manufacturers globally use ortho-xylene in production of Phthalic Anhydride. Naphthalene route is known to contain carcinogenic substances and is discouraged. Taiwanese producers operate through ortho-xylene route. In India as well, Phthalic Anhydride is manufactured only through the ortho-xylene route.

Ortho-xylene based process of making Phthalic Anhydride.

21. In the Ortho-xylene based process, following manufacturing steps are involved:
    i. Mixing: a stream of vaporized Ortho-xylene is mixed with compressed air in certain ratio.
    ii. Feed: Air-Ortho xylene mixture is fed to a reactor containing vanadium pentoxide-based catalyst.
    iii. Reaction: Mixture of Air-Ortho xylene is allowed to react in presence of catalysts at around 370 deg C and below prescribed pressure (1 bar to 2 bar). The reaction is of exothermic nature; so, a suitable heat transfer media is used to remove the same, through a heat removal set-up.
    iv. Cooling: The stream leaving the reactor is cooled in one or more heat exchangers.
    v. Sublimation: Gases are then allowed to enter switch condensers, where Phthalic anhydride gets collected on walls as a solid and recovered by sublimation. The condensers use a cyclic process to separate the condensable organics (almost 98% or more recovery) from the non-condensable gases.
    vi. Purification: The organic material, containing Phthalic, other anhydrides and any unreacted xylene are fed to two distillation columns to recover the products.
    vii. Storage: The product is either stored in a molten state or as flakes.
    viii. Package: Flakes are packed into bags for transportation.

Naphthalene based process of making Phthalic Anhydride.

22. Steps involved in production process of Phthalic Anhydride using Naphthalene are similar. The processes for producing PAN by o-xylene or naphthalene are the same except for reactors, catalyst handling, and recovery facilities required for fluid bed reactors.

23. Phthalic Anhydride made from Naphthalene contains impurities like Naphthoquinones which are suspected as cancer causing compounds and any

product which uses Phthalic Anhydride from it will be a potential health hazard.

24. The Indian industry as well as the producers in Taiwan produce through Ortho-xylene route.

25. The flow chart of the production process is enclosed as **Annexure 1.1**.

E. Custom Classification.

26. Phthalic Anhydride has a dedicated classification- 2917 35 00 under Chapter 29 of the Customs Tariff Act, 1975.

Tariff Item	**Description of goods**
Chapter 29	Organic Chemicals
Subheading 2917	Polycarboxylic acids, their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulphonated, nitrated or nitrosated derivatives.
2917 35 00	Phthalic Anhydride

F. Customs duty.

27. The basic custom duty applicable on the imports of the product under consideration is 7.5%.

G. BIS Standards.

28. The Government of India on 24th December 2021 issued Quality Control Order (QCO) on Phthalic Anhydride, which came into effect from 22nd June 2022. The QCO is in place now. The Quality Control order mandates that all article in India should conform to Indian Standard - IS 5158:1987. A copy of standard is also **Annexure 1.2**.

II. Country(ies) of origin of the alleged dumped goods:

29. The present application seeks imposition of anti-dumping duties in dumped imports from Taiwan.

30. Apart from subject country, imports are entering the Indian market from China, Japan, Korea and Thailand in the proposed period of investigation. At present, imports from China, Indonesia, Korea and Thailand are attracting anti-dumping duties.

III. Details of concluded or ongoing investigation, if any, relating to the product under consideration.

31. The details of concluded or ongoing investigation relating to the product under consideration is provided as below: -

    a. Final Findings No. 29/1/99, DGAD dated November 13th, 2000- The

Authority recommended imposition of anti-dumping duty on imports of subject goods from Indonesia.

b. Final Findings No. 14/1/2011, DGAD dated September 28th, 2012- The Authority recommended imposition of anti-dumping duty on imports of subject goods from Korea RP, Taiwan and Israel.
c. Final Findings No. SSR 18/2017, DGAD dated September 13th, 2018- The Authority recommended discontinuation of anti-dumping duty on imports of subject goods from Korea RP, Taiwan and Israel.
d. Final Findings No. 14/6/2014, DGAD dated November 3, 2015- The Authority recommended imposition of anti-dumping duty on imports of subject goods from Japan and Russia.
e. Final Findings No. SSR 7/11/2020, DGTR dated January 5, 2021- The Authority recommended continuation of anti-dumping duty on imports of subject goods from Japan and Russia.
f. Final Findings No. 6/16/2020, DGTR dated May 19th, 2021- The Authority recommended imposition of anti-dumping duty on imports of subject goods from China PR, Indonesia, Korea RP, and Thailand.
g. Final findings G S R D- 22011/8/2011 dated 29th March 2012 - Safeguard measures concerning imports of Phthalic Anhydride (PAN)
h. Final Findings No. 22/8/2019- DGTR dated 28th September 2020- The Authority imposed safeguard duty under India- Korea Comprehensive Economic Partnership Agreement (Bilateral Safeguard Measures) Rules, 2017 on imports from Korea.

IV. The proposed period of investigation (POI) and the injury period. If the proposed POI is not a period of 12 months, then justification for the same.

32. The applicants propose 1st October 2024 to 30th September 2025 (a period of 12 months), which is the most recent period of applicants' performance, as period of investigation. The injury period covers the period of 2022-23, 2023-24, 2024-25, and the proposed period of investigation.

V. Country-wise volume, value and average CIF value of the subject good imported into India, from all countries whether alleged to be dumped or not, for the past three years and the proposed POI and the source of information thereof.

33. The applicants do not have authorization to collect transaction-wise import data from DGCI&S. The applicants have therefore considered import data as per market field research. A table showing the country wise import volume and value is enclosed as **Annexure 1.3**.

VI. Name(s), address(es), phone numbers and functional email ids of the following:

a. known producers/exporters of the alleged dumped goods in each of the subject countries.

34. A list of known exporters and manufacturers of the product under consideration in the subject country is enclosed as **Annexure 1.4**.

b. known importers of the alleged dumped goods in India and/or the associations thereof.

35. A list of known importers of the product under consideration in India is enclosed as **Annexure 1.5**.

c. known users of the alleged dumped goods in India and/or the associations thereof.

36. The name and addresses of the known associations of users are given below. The list of associations is enclosed as **Annexure 1.6**.

d. Other domestic producers of the like product in India and/or the associations thereof.

37. Besides the applicants, KLJ Petroplast Limited is another producer of subject goods, which has commenced the production in April 2023. The details are as below.

KLJ Petroplast
Plot No. 2, 3, 4, 17 & 18,
Jhagadia Industrial Estate,
Bharuch, Gujarat, 393110

Contact Details
Mr. Pushp Jain, Deputy Managing Director
Contact details: - ***

SECTION II: INDIAN INDUSTRY PROFILE

I. Provide following relating to the Indian producers of the subject goods who are filing the application:

38. The present application is being filed by Thirumalai Chemical Industries Limited IG Petrochemicals Limited and TCL Intermediates Private Limited (a 100% owned subsidiary of Thirumalai Chemical Industries). The applicants have provided necessary information for the purpose of the present application and is willing to provide any further information that the Designated Authority may require during the course of the proposed investigation. The applicants have no

objection to the necessary verification, which the Designated Authority may wish to carry out.

39. The applicants have authorized TPM Consultants to represent them in the present matter. TPM Consultants has been authorized for the following: -

a. to file application on its behalf
b. to make submissions on its behalf
c. to appear on its behalf
d. to receive communication on its behalf

40. Complete address of TPM Consultants is as under:

TPM Consultants,
Ish Kriti, J-209, Saket, New Delhi – 110 017
Email – akg@tpm.in , shailesh@tpm.in, kalpesh@tpm.in, and sarika@tpm.in

41. Letter authorizing TPM Consultants by the applicants for the purpose of present investigation has been enclosed as **Annexure 2.1**. It is requested that all correspondence in this matter may please be addressed to TPM Consultants at the address/email given above.

a. Functional email id, address and phone numbers of the Regd./Head Office including the Name, email id and mobile number of its contact person.

42. The relevant information is given below.

IG Petrochemicals Limited
401/402 Raheja Centre, 214, Nariman Point, Mumbai- 400 021

Contact Details
Mr. S.N. Maheshwari (Vice President (F & A))
***
Mr. Sanjay Gupta (President – New Business Initiatives)
***

Thirumalai Chemical Industries Limited
Thirumalai House, Plot No. 101-102, Road No. 29, SION (East), Mumbai- 400 022

Contact Details
Mr. Sanjay Sinha (Chief Executive Officer)
***

TCL Intermediates Private Limited
NO. 556, Vanagaram Road, Ambattur, Chennai, Tamil Nadu 600053, India

Contact Details
Mr. Sanjay Sinha (Chief Executive Officer)
***

b. Name, Functional email id, address and phone numbers of the manufacturing unit(s) of the subject goods including the Name, email id and mobile number of its contact person.

43. The details of the plants of Thirumalai Chemical Industries Limited manufacturing the product is as follows:

Ranipet Plant 25-A SIPCOT Industrial Complex, Ranipet, Tamil Nadu – 632 403.	Dahej Plant Plot No. D-2/CH/171/B, GIDC, Industrial Estate, Dahej Phase 2, Bharuch, Gujarat – 392130

44. The details of the plants of IG Petrochemicals Limited manufacturing the product is as follows:

T-2, MIDC Industrial Area,
Taloja, Navi Mumbai, Maharashtra 410208

45. The details of the plants of TCL Intermediates Private Limited manufacturing the product is as follows:

Plot No. D1/CH/171/B, GIDC Industrial Estate, Dahej Phase 2, Tal. Vagra, District Bharuch – 392130

46. It is requested that all correspondence on this matter be addressed to TPM Consultants at the address given above.

II. Name(s), Functional email ids and address(es) of all Indian producers including the applicant(s) along with their production volume of the subject goods during the injury period (proposed period of investigation and past three financial years in continuity). Also indicate the status of each such producer (i.e. whether supporter, opposer or neutral).

47. Apart from applicants, KLJ Petroplast Limited is another producer of subject goods, which has commenced the production in April 2023. The details of the producer are as below.

KLJ Petroplast Limited
Plot No. 2, 3, 4, 17 & 18, Jhagadia Industrial Estate, Bharuch, Gujarat, 393110

Contact Details
Mr. Pushp Jain, Deputy Managing Director
***

48. KLJ Petroplast Limited is importing the product under consideration from Taiwan and therefore, should not be considered as eligible domestic industry under definition of Rule 2(b). The calculation is standing is enclosed as Annexure 2.4.

49. Even if the production of KLJ Petroplast Limited is taken into account, the applicants satisfy the requirement of standing in terms of Rule 5.

III. The supporter must provide (relating to the subject goods) the Installed capacity with supporting evidence, production quantity and Sales Volume & Value (separately for Domestic, Export and Captive consumption).

50. Not applicable.

IV. Provide the details of the concerned line ministry and department in Govt. of India for the subject goods.

51. The concerned ministry and department in the Government of India for the product is the Ministry of Chemical and Petrochemical. The contact details are as below.

Designation	Secretary, Department of Chemicals & Petrochemicals
Address	Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers, 236 A, A-wing, 2nd Floor, Shashtri Bhawan, New Delhi – 110011
Phone number	23384196/ 23382467
Email id	sec.cpc@nic.in

V. Provide the following details relating to the end-use product(s) manufactured out of the subject goods.
a. Concerned line ministry and department in Govt. of India.
b. The impact of the duty on the end-use product(s)

52. The concerned line ministry and department in the Government of India is Ministry of Chemicals and Fertilizers and Department of Chemical and Petrochemical, details of which are given above.

53. The product under consideration has been subject to measures in past. The

Authority has consistently found that duties have not had any adverse impact. The calculation of the impact of the product under consideration is enclosed as **Annexure 2.3**.

54. The Authority in the anti-dumping investigation concerning the subject goods from China PR, Indonesia, Korea RP, and Thailand has held as below: -

i. The interested parties have not established impact of anti-dumping duty on the user industry with verifiable information.
ii. The product under consideration was attracting anti-dumping duty earlier from some sources. No evidence has been provided by the user to show that the duties imposed in past have had any adverse impact on the users or the consumers at large.
iii. The imposition of anti-dumping duties will also discourage the import of low-priced subject goods produced from Naphthalene.
iv. Even the domestic industry has made significant capital investment and expanded its capacity in the recent period
v. Imposition of duties will be in interest of the domestic industry which has suffered injury due to dumped imports. The duties will ensure that domestic industry can compete in the market and will ensure wider availability of options to the users which will be in large public interest.

VI. Whether the product(s) manufactured by the applicant are commercially and technically substitutable for the alleged dumped.

55. There is no known difference in the goods produced by the applicants and exported from the subject country. Both the goods are comparable in terms of physical & chemical characteristics, manufacturing process & technology, function & uses, product specifications, pricing, distribution & marketing. The two are technically and commercially substitutable. The consumers have used and are using the two interchangeably.

VII. The subject goods (including size, type, range, and models) that applicant(s) produces.

56. The details of the like article produced by the applicants can be seen on the link given below:

IG Petrochemicals Limited
https://www.igpetro.com/phthalic-anhydride-product/

Thirumalai Chemicals Limited and TCL Intermediates Private Limited
https://thirumalaichemicals.com/phthalic-anhydride/

VIII. (a) Do any of the applicant(s) import the subject goods. If yes, provide the country-wise value and volume of such imports from all countries. Also provide the detailed reasons for importing the subject goods. Give details of selling price to the end-users of such imported goods including a list of such end users.

(b) Are any of the applicant related to the exporters or importers of the alleged dumped article? If yes, provide the country-wise value and volume of such imports from all countries relating to such exports / imports so made by that related entity.

57. The applicants have neither imported the product under consideration, nor are related to any producer/exporter of the product under consideration in the subject country or any importer of the product under consideration in India.

IX. Whether the concerned product of the applicant is a like-article of the subject goods in terms of AD Rules. Also, indicate any difference in the production process employed by the petitioner(s) and the foreign producers. Quantify the impact of such differences, if any, on cost and/or prices.

58. There is no significant difference in the subject goods produced by the applicants and exported from the subject country. Subject goods produced by the applicants and imported from the subject country are comparable in terms of characteristics such as physical & chemical characteristics, manufacturing process & technology, functions & uses, product specifications, pricing, distribution & marketing, and tariff classification of the goods. The two are technically and commercially substitutable. The consumers are using the two interchangeably. The product produced by the applicants are like article to the product being imported from the subject country.

X. Provide the details of end-users/ consumers of like product in India including sales quantity and value for each of them. Quantify the impact of duty on cost of the end product, if possible, with detailed calculations.

59. The impact of the anti-dumping duty is provided **Annexure 2.3**. It can be seen that the impact is insignificant.

XI. Details of volume losses during the injury period due to:

a. shutdown (normal/maintenance/planned and abnormal/unplanned) and reasons therefore along with stock position during the shutdown

b. force-majeure situations like flood, earthquake, fire, other natural calamities, etc.

60. The information is enclosed as **Annexure 2.2**.

SECTION III – EVIDENCE OF DUMPING.

A. Normal value.

Provide the estimates of normal value of the subject goods in subject countries as below:

a. If domestic sales can be used, then provide or price lists, commercial / sales invoices, trade journals, etc. indicating domestic prices. OR

b. Evidence of export price to an appropriate third country. OR

c. Cost of Production (COP) of the subject goods in the country of export/origin for construction of normal value (provide source of data and calculation of such COP).

61. Under Section 9A (1)c, normal value in relation to an article means:

i) the comparable price, in the ordinary course of trade, for the like article when meant for consumption in the exporting country or territory as determined in accordance with the rules made sub-section (6); or

ii) when there are no sales of the like article in the ordinary course of trade in the domestic market of the exporting country or territory, or when because of the particular market situation or low volume of the sales in the domestic market of the exporting country or territory, such sales do not permit a proper comparison, the normal value shall be either-

a) comparable representative price of the like article when exported from the exporting country or territory or an appropriate third country as determined in accordance with the rules made under sub-section (6); or

b) the cost of production of the said article in the country of origin along with reasonable addition for administrative, selling and general costs, and for profits, as determined in accordance with the rules made under sub-section (6):

Provided that in the case of import of the article from a country other than the country of origin and where the article has been merely transshipped through the country of export or such article is not produced in the country of export or there is no comparable price in the country of export, the normal value shall be determined with reference to its price in the country of origin.

62. According to the above, the following can form the basis for determination of normal value in the exporting countries.

a. The price of the like article in the domestic market of the exporting country in the ordinary course of trade,

b. Comparable representative price of the like article when exported from the

exporting country or territory or an appropriate third country,

c. The cost of production of the said article in the country of origin along with reasonable addition for administrative, selling & general costs and for profits.

63. The applicants have made efforts to get information/evidence for prices of the subject goods in the domestic market of Taiwan. However, the evidence of prices of subject goods in the domestic market of Taiwan is not available in the public domain. The applicants have checked the Taiwan custom data to find out the import and export of the subject goods.

64. It is seen that there is a very miniscule quantity of imports of the product into Taiwan from China. Since China is a non-market economy, unless it is substantiated that these exports are at un-dumped prices, these imports cannot be considered. As regards to export prices from Taiwan, it is seen that Taiwan, apart from India, has also majorly exported to Saudi Arabia, Malaysia, United Arab Emirates and Vietnam. The applicants have compared the export price of the subject goods to these countries with the estimated cost of production. It is seen that the export price to other countries is below the estimated cost of production. Therefore, these prices cannot be considered as a basis for determination of normal value. Calculation of normal value is enclosed as **Annexure 3.1**.

65. The applicants have therefore determined normal value on the estimates of cost of production with reasonable addition for margins. For this purpose, the applicants have considered the following:

a. Raw material prices- based on international import prices of raw material and DI norms.
b. Other conversion costs- based on facts available.
c. Selling/General and administrative expenses- based on facts available.
d. Reasonable addition of profits.

B. Estimates of net export price

Provide the following information, country-wise, with respect to the net export price of the product for the period of investigation.

I. Average export price to India and its basis (e.g. FOB, CIF, FOR, ETC)
II. Adjustments for export price at ex-factory level (supported with evidence)
III. Net export (after adjustments)

66. For the determination of export price, the applicants have considered the CIF price as per the market field research data. Since the import price reported is at CIF level, this has been adjusted to arrive at ex-factory level.

67. The information regarding ocean freight, marine insurance, commission, bank charges, port expenses, inland freight expenses, credit cost, inventory carrying cost incurred by the exporter being a business proprietary information, the applicants are unable to quantify the actual impact other expenses in the net export price.

68. Therefore, the applicants have made adjustment based on estimates. The following adjustments have been made:
    a. Ocean Freight- The adjustment has been made as per the evidence **enclosed**.
    b. Marine Insurance- The applicants have considered an adjustment of 0.05%.
    c. Bank Charges- The adjustment has been made as per the evidence **enclosed**.
    d. Port Expenses- The adjustment has been made as per the evidence **enclosed**.
    e. Handling Charges– The adjustment has been made as per the evidence **enclosed**.
    f. Credit costs– The applicants have considered a 90-day credit period for calculation of credit cost. Interest rate has been considered as per evidence enclosed.
    g. Inventory carrying costs– The applicants have considered 45 days as the inventory holding period. Interest rate has been considered as per evidence enclosed.

69. Calculation of export price is enclosed as **Annexure 3.2**. Evidence in support of the claimed adjustments is enclosed as **Annexure 3.3.**

C. Estimates of dumping margin.

70. Considering the normal value and export price determined as discussed above, dumping margin has been determined, details of which are enclosed as **Annexure 3.5**. It would be seen that the normal value based on all the three approaches is not only significant but is positive. There have been fluctuations in the import price during the proposed period of investigation, the Authority may decide if there is need for examination and determination of monthly margin.

SECTION IV – EVIDENCE OF INJURY.

A. Market conditions in Taiwan.

71. There are only two producers in Taiwan - Nan Ya Plastics Corporation and UPC Technology Corporation. The total capacity in Taiwan is more than 400,000 MT.

Against this it is industry understanding that the domestic demand in Taiwan is only 200,000 MT. Despite having surplus capacities, the capacity in Taiwan has expanded by 90,000 MT in 2024. Evidence enclosed as Annexure 4.1. The below data provides information on total exports of the subject goods from Taiwan (evidence enclosed as Annexure 4.2). The average exports from Taiwan in the last five years amounted to 109,208 MT.

SN	Particulars	Unit	2022-23	2023-24	2024-25	POI
1.	Export volume in MT	MT	1,12,000	1,05,219	1,05,328	1,14,285

Source- Trademap

72. The primary producer of ortho-xylene (OX), a major raw material for producing the subject goods, is Formosa Chemicals & Fibre Corporation. Both Nan Ya and Formosa are part of Formosa Plastics Group. Formosa Plastics Group is Taiwan's largest private-sector industrial conglomerate in terms of assets. This vertical integration likely results in transfer of ortho-xylene from Formosa to Nan Ya at or near to cost, providing significant unfair advantage in terms cost.

73. The producers of subject goods in Taiwan operate predominantly as export-oriented units and are highly dependent on overseas markets for capacity utilisation. The producer structurally relies on exports to maintain viable operating rates of the plant. This is evidenced by the fact that a substantial proportion of total production is consistently exported, making exports an integral and planned component of their business model. The product as a result, is being exported at materially lower prices.

B. <u>Decline in landed price without proportionate decline in raw material costs has forced the applicants to reduce the prices.</u>

74. The table below shows the movement of raw material cost and selling price of the applicants and the landed price of imports.

SN	Quarter	Landed Price	Raw material cost	Difference	NSR
		₹/MT	₹/MT	₹/MT	₹/MT
1	2022-23	1,05,820	84,408	21,412	***
2	2023-24	99,496	85,453	14,043	***
3	2024-25 H1	1,07,179	92,828	14,351	***
4	2024-25 H2	93,971	81,869	12,102	***
5	2025-26 H1	91,556	84,040	7,516	***

75. It can be seen that the difference between the landed price of imports and raw material cost has significantly declined over the injury period. As the gap declined, the applicants was forced to reduce the prices and as a result, the applicants

have been forced to sell at losses.

C. <u>Raw material commitments limit the ability of the applicants to easily reduce production.</u>

76. In India, there is only one domestic supplier of raw material (Ortho-xylene). The applicants, therefore, has option to either buy from the sole supplier or import. In order to ensure continued supply at suitable prices, the Indian industry enters into long term contractual agreement. Consistent requirement requires the industry to enter into fixed supply contracts for volumes. Since volumes are already committed, the industry has no option but to source the raw material, irrespective of the market conditions for the product.

77. Once the material has been procured, there is a compulsion to consume the same, produce the product and sell in the domestic market. Storage capacity and capability for both raw materials and finished products is limited with any producer. This has a significant disadvantage to the domestic producers in India. Therefore, the increase in the production over the injury period is partially attributable to the production compulsions with the applicants. In any case, the production has declined during the proposed period of investigation in comparison the immediately preceding previous year.

D. <u>Production can either be completely suspended, or plants are run at optimum utilisation.</u>

78. The production process of the Phthalic Anhydride is a continuous process and therefore, production can either be completely suspended, or plants are run at optimum utilisation. The phthalic anhydride is produced by gas-phase catalytic oxidation of o-xylene which is highly exothermic reaction and requires stable temperature profiles. Continuous operation in plants for product under consideration is not merely a matter of commercial optimisation but is also a technical and safety necessity inherent to the process design and chemistry. Frequent shutdowns and restarts materially impair plant safety, reliability, and operability.

79. Therefore, faced with such situation of dumping, the applicants only had two options – either to run units at optimum level or shutdown plants. Both the applicants have been forced to shut down operations at their units in the proposed period of investigation. It is clarified that while there are shutdowns of *** as well due to ***, the shutdown below is only because of the adverse market conditions. The shutdown details are as below: -

a. In case of IGPL, ***.
b. In case of TCL, ***.

c. In case of TCL, ***.
d. In case of TCL, ***.

80. The total production loss suffered by the applicants due to adverse market conditions is more than 55,000 MT.

SN	Location	Shutdown start	Shutdown days	Capacity in MT	Production loss in MT
1	IGPL – PA 5	***	***	***	***
2	TCL - Dahej	***	***	***	***
3	TCL - Ranipet	***	***	***	***
4	TCL - Ranipet	***	***	***	***
		Total			***

E. <u>Demand in India.</u>

81. The demand has been determined based on domestic sales of the applicants, the estimated sales of the other producer and the imports from all sources. The information is provided below.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	Sales of applicants (including captive)	MT	100	101	107	105
2	Estimated sales of other producer	MT	-	100	133	131
3	Imports from subject country	MT	28,221	25,304	40,797	46,196
4	Import from other countries subject to investigation	MT	49,821	44,135	28,422	17,043
5	Import from other countries	MT	11,246	6,266	735	2,095
6	**Total demand including captive**	MT	100	112	121	118

Source- Proforma IVA-I

82. It would be seen that the demand for the product has consistently increased over the injury period.

83. The demand in the proposed period of investigation has declined in comparison to the previous year due to weak demand from key downstream sectors like plasticizers and construction. The key sectors that use phthalic anhydride, such as construction and the automotive industry, have experienced subdued global demand. As the demand of the downstream products declined, the demand for the product under consideration has also declined.

F. Imports from the subject country.

84. The table below shows the imports from the subject country over the injury period.

SN	Particulars	Unit	2022-23	2023-24	2024-25	POI
1.	Imports - Volume	MT	28,221	25,304	40,797	46,196
2.	Imports - Value	lacs	27,587	23,257	37,404	39,618
3.	Imports - Price	₹/MT	97,755	91,914	91,683	85,762
4.	**Subject imports in relation to**					
a.	Indian production	%	100	73	111	126
b.	Indian demand	%	100	92	140	163
c.	Total imports	%	32%	33%	58%	71%

Source- Proforma IVA-I and Proforma IVA-II

85. The imports from subject country during 2022-2023 was 28,221 MT, which declined to 25,304 MT during 2023-2024. However, the imports increased to 40,797 MT in 2024-2025 which further increased to 46,196 during the proposed period of investigation.

86. The imports from the subject country have declined in absolute terms and relative terms in 2023-24, then increased almost to double in 2024-25 and further increased in the proposed period of investigation.

87. During the injury period, the import price has declined from 97,755 ₹/MT in 2022-2023 to 85,762 ₹/MT in the proposed period of investigation.

88. It is also submitted that the increase in the imports is required to be seen in line with the demand and supply gap situation in India. Till the period 2024-25, there was a demand and supply gap in the Indian market. As the capacities increased, the demand and supply gap situation reduced. The entire imports volume from Taiwan is above the demand and supply gap therefore making the imports completely unnecessary. When the imports for the demand and supply gap are excluded, it can be seen that the imports are significant.

SN	Particulars	Unit	2022-23	2023-24	2024-25	POI
1.	Demand	MT	100	112	121	118
2.	Capacity	MT	100	102	116	128
3.	Gap	MT	***	***	***	No gap
4.	Imports from Taiwan	MT	28,221	25,304	40,797	46,196
5.	Imports from other countries	MT	61,066	50,401	29,157	19,137

6.	Imports from Taiwan over and above gap	MT	***	Nill	Nill	***

Source- Proforma IVA-I and Proforma IVA-II

G. Price effect of the imports.

a. Price undercutting.

89. The table below shows the selling price of the applicants and the landed price of imports.

SN	Particulars	Unit	POI
1.	Net Selling Price	Rs./MT	105
2.	Landed price	Rs./MT	92,837
3.	Price undercutting	Rs./MT	***
4.	Price undercutting	%	***
5.	Price undercutting	Range	0-10%

Source- Proforma IVB

90. The landed price of imports in the proposed period of investigation is below the selling price of the applicants. This is resulting in significant positive price undercutting.

b. Suppression/depression.

91. The table below shows the information on the cost of sales, selling price and landed price of imports from the subject country.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	Cost of sales	₹/MT	100	100	98	98
2	Selling prices	₹/MT	100	94	96	89
3	Landed price	₹/MT	1,05,820	99,496	99,247	92,837

Source- Proforma IVA and IVB

92. The cost of sales of the applicants declined in 2023-24, but the decline in the selling price was higher as the landed price was below the cost of sales of the applicants. The cost declined in 2024-25 and the selling price improved marginally.

93. The cost of sales further declined in the proposed period of investigation. As the imports volume increased with decline in the landed price in the proposed period of investigation, the applicants were forced to reduce their selling price. The selling price in the proposed period of investigation was below the cost of sales. Therefore, the applicants' selling prices have been depressed during the proposed period of investigation.

H. Economic parameters of the applicants.

a. Capacity, production, capacity utilization and domestic sales.

94. The table below shows the relevant information.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1.	Capacity	MT	100	102	116	128
2.	Production	MT	100	104	107	106
3.	Capacity utilization	%	100	103	93	83
4.	Captive Transfer	MT	100	119	119	123
5.	Domestic sales	MT	100	101	107	105
6.	Demand	MT	100	112	121	118

Source- Proforma IVA-II

95. The applicants have increased the capacity over the injury period. Thirumalai Chemicals Limited has set up a greenfield plant at Dahej, Gujarat, with a capacity of approximately 120,000 MT per annum. Similarly, IG Petrochemicals Limited has set up new production line (PA-5) at the existing plant in Taloja, Maharashtra. TCL Intermediates Private Limited has also started production in the proposed period of investigation from March 2025.

96. The production of the applicants increased till 2024-2025 and has declined in the proposed period of investigation. While the imports increased, the production of the applicants have declined. When seen over the injury period, the overall production of the applicants has increased.

97. The domestic sales of the applicants increased in 2023-24, further increased in the year 2024-25 but declined in the proposed period of investigation. While the imports increased, the domestic sales of the applicants have declined. When seen over the injury period, the domestic sales of the applicants have increased.

98. The production and domestic sales increased over the injury period due to the fact that the production process of the product under consideration is continuous in nature. Plants of Phthalic Anhydride are so designed and maintained that shutting the production is not an option for the industry. This is because (a) shutting and resumption of the production results in a huge cost; (b) compulsion to buy raw material; and (c) reduction in production will anyway lead to increase in per unit cost of production. Therefore, any Phthalic producer has compulsion to sell even at low profits rather than suspend or stop production.

99. As a result, the applicants were forced to continue production and sell the product in the domestic market, even under adverse pricing conditions caused by dumped imports. While the industry has been able to hold onto its market share, but it has come at a huge cost of significant erosion of the profitability. The industry has

been forced to match the import price to sell in the market, even at the cost of profitability. The Indian industry is now reached a stage where both the domestic producers are suffering financial losses.

100. The capacity utilization of the applicants has declined in the proposed period of investigation.

b. Profitability of the applicants.

101. The table below shows the relevant information.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	Profit/(Loss)	₹/MT	100	(20)	47	(83)
2	Profit/(Loss)	₹ Lacs	100	(20)	50	(86)
3	PBIT	₹ Lacs	100	10	63	(36)
4	Cash Profit	₹ Lacs	100	16	77	(16)
5	ROCE	%	100	10	42	(23)

Source- Proforma IVA-II

102. The applicants were profitable in the base year. However, as the import price declined in the year 2023-24, the applicants' profitability was adversely affected. The applicants recorded losses. The performance improved in the year 2024-25. With intensified dumping in the proposed period of investigation, the applicants have again suffered losses, situation of cash losses and negative return on capital employed.

103. Over the injury period, the profitability of the applicants has declined by close to Rs *** cr. At the same time, cash profit before interest and tax have declined by Rs *** cr and cash profits have declined by Rs *** cr.

104. When seen just over the 18 months period from April 2024, the applicants have erosion of profit by Rs *** cr.

c. Market share of the applicants.

105. The table below shows the relevant information.

SN	Market share in demand	UOM	2022-23	2023-24	2024-25	POI
1	Applicants	%	70-80%	70-80%	70-80%	70-80%
2	Other domestic producer	%	NA	0-5%	0-5%	0-5%
3	Subject country imports	%	0-10%	0-10%	0-10%	10-20%
4	Countries attracting duty	%	10-20%	10-20%	0-10%	0-10%
5	Other countries	%	0-10%	0-10%	0-5%	0-5%

Source- Proforma IVA-I

106. The increase in market share of the applicants has very marginally increased in the proposed period of investigation. As submitted above, the increase in the production has come at the significant cost of erosion of profitability. The Indian industry has capacity to cater the entire demand in the country. However, dumping of the product has forced the applicants to suspend production leading to reduced share.

107. The market share of the subject country has increased from 0-10%% to 10-20% over the injury period. The market share of the countries attracting duty has declined over the injury period.

d. Inventories.

108. The average inventory with the applicants has sharply increased in the proposed period of investigation. The closing inventory with the applicants in the proposed period of investigation increased by 7 times from the base year and which was worth more than Rs [***] cr at cost.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	Opening	MT	100	75	126	326
2	Closing	MT	100	169	319	762
3	Average	MT	100	115	209	512

Source- Proforma IVA-II

e. Ability to raise capital investment.

109. The applicants are suffering significantly in price and volume parameters. While the applicants have expanded its capacity, the decision to expand the capacity was undertaken after the imposition of anti-dumping duty with the hope that the market will be free of dumped imports and with the view to bridge the demand-supply gap created with the continuous increase in demand. The losses suffered by the applicants do not justify any investment in the business. The working capital needs of the applicants have also been seriously jeopardised by the dumping of the product. Therefore, the ability to raise capital investment or raise money for capital employed has been impacted.

SN	Particulars	Unit	2022-23	2023-24	2024-25	POI
1.	Demand	MT	100	112	121	118
2.	Capacity	MT	100	102	116	128
3.	Gap	MT	***	***	***	No gap
4.	Imports from Taiwan	MT	28,221	25,304	40,797	46,196
5.	Imports from other countries	MT	61,066	50,401	29,157	19,137
6.	Imports from Taiwan over and above gap	MT	***	Nill	Nill	***

Source- Proforma IVA-I and Proforma IVA-II

f. Magnitude of dumping margin.

110. The dumping margin determined against subject country is above *de minimis* and significant.

g. Productivity, employment and wages.

111. The productivity per day of the applicants increased over the injury period. With the capacity expansion undertaken by the applicants, the employment generated, and the wages paid have increased.

112. The industry provides direct employment to more than 1100 direct labour in the plant. This does not include indirect and contractual labour deployed by the industry. The salaries and wages amounted to more than Rs 120 crores.

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	No of Employees	Nos	100	111	128	129
2	Salary & Wages	₹ Lacs	100	112	135	143
3	Productivity per day	MT/Day	100	104	107	106
4	Productivity per Employee	MT/Nos	100	94	84	82

Source- Proforma IVA-II

h. Growth of the applicants.

113. The table below shows the information on growth of the applicants.

SN	Particulars	UOM	2023-24	2024-25	POI
1	Production	YOY	4%	2%	-0.63%
2	Sales quantity	YOY	0%	6%	-2%
3	Profit/Loss per unit	YOY	-120%	332%	-276%
4	Profit/loss before interest	YOY	-90%	527%	-158%
5	Cash profits	YOY	-84%	364%	-121%
6	ROCE	YOY	-90%	344%	-153%

Source- Proforma IVA-II

114. The applicants have recorded a negative growth in both volume and price parameters in the proposed period of investigation.

i. Factors affecting prices.

115. The import price is directly affecting the prices of the applicants in the domestic market. The landed prices of the product from the subject country are below the cost and selling price the applicants which has depressed the prices of the applicants in the proposed period of investigation, leading to the applicants suffering significantly on price parameters.

116. Apart from subject country, the imports are also entering in the Indian market from

China PR, Indonesia, Japan, Russia, South Korea, and Thailand. At present, the imports from China PR, Indonesia, Korea RP and Thailand are attracting duties and under a sunset review investigation proceeding. Thus, admittedly imports from these countries also has an impact on the prices of the applicants. But the imports from subject also factored in impacting the domestic prices.

117. The table below shows the landed price of imports from China and Taiwan.

Country	UOM	Landed price	ADD	Landed price of ADD
Taiwan	Rs/MT	92,837		
China	Rs/MT	89,851	3,468	93,319

118. During the proposed period of investigation, the import from both Japan and Russia is below the de-minimis limit. Since, these imports volume from these countries are substantially low, therefore, cannot be a cause of injury.

I. <u>Conclusions on injury.</u>

119. Based on the above, the imports from the subject country were necessary in past because of demand and supply gap in past. The unnecessary imports have increased substantially in the proposed period of investigation. The imports have increased in absolute and relative terms. The price undercutting is positive. Due to the increased imports at dumped prices, the applicants had to reduce their prices drastically and sell at losses. The imports have depressed the prices of the applicants in the proposed period of investigation as a result of which the applicants have suffered financial losses, cash losses, and negative return on capital employed.

120. While imports increased, the production and sales of the applicants have declined in the proposed period of investigation. Despite taking such a price reduction, both the producers had to shut down the production lines. The production lost by the applicants on these production lines is almost equal to the import volume from the subject country. The applicants are operating with significant idle capacity. The growth of the applicants has been significantly affected, as both volume and price parameters have recorded a steep decline.

121. It is thus evident that the applicants have suffered material injury.

SECTION V – CAUSAL LINK

I. Volume and value of imports from countries other than the subject countries and an explanation as to why imports from these countries especially from where the imports are above de-minimis are not causing injury to domestic industry.

122. Apart from subject country, the imports are also entering in the Indian market from China PR, Indonesia, Japan, Russia, South Korea, and Thailand. At present, the imports from China PR, Indonesia, Korea RP and Thailand are attracting duties and under a sunset review investigation proceeding. Thus, admittedly imports from these countries also has an impact on the prices of the applicants. But the imports from subject also factored in impacting the domestic prices.

123. During the proposed period of investigation, the import from both Japan and Russia is below the de-minimis limit. Since, these imports volume from these countries are substantially low, therefore, cannot be a cause of injury.

II. In case the demand has undergone decline substantially, an explanation on why such decline has not caused injury to the domestic industry.

124. The demand has increased over the injury period. While the demand for the product has declined marginally in the proposed period of investigation, the imports have increased. The increase in the imports despite marginal decline in demand shows that the decline in demand is not the cause of the claimed injury.

III. State whether trade restrictive practices of and competition amongst the foreign and/or domestic producers, developments in technology, export performance or the productivity of the domestic industry or any other known factors have cause injury to the domestic industry. If no, explain why.

125. The relevant information is given below:

a. Conditions of competition and trade restrictive practices -There is no trade restrictive practice, which could have contributed to the injury to the applicants.
b. Technology -There has been no significant development in technology which could have caused injury to the applicants.
c. Export performance - The data provided by the applicants relate only to the domestic performance. Therefore, performance of export performance cannot be a cause of injury to the applicants.
d. Performance of other products of the company -The data provided by the applicants relates only to the performance of the product under

consideration. Therefore, performance of other products that are being produced and sold by the applicants is not a possible cause of injury.

IV. Provide the production during any shut-down month/ quarter (segregating between normal and abnormal) in the plant during the injury period. Also provide the inventory levels and other relevant details during that time.

126. The relevant information is same as provided above.

V. Provide whether there are any constraints (related to raw materials shortage, power shortage, impact of any tax differential, lack of adequate capacity or investment constraints, etc. as applicable to the domestic industry in relation to the production or sales of subject goods. Provide the relevant details in this regard.

127. There was no such material constraint faced by the applicants during the proposed period of investigation.

VI. Evidence of lost contracts.

128. The communications are majorly held orally. The customers interact with the producers on the basis of the price of the imported product. If the customer is satisfied with the price offered by the applicants, the order is placed. If the customer finds a better price offered by the exporters, they purchase from that source. No written communication is received for not placement of the order.

VII. Factors establishing causal link.

129. The factors listed below clearly establish that injury to the applicants have been caused because of dumped imports from the subject country: -
    a. The imports from subject country are coming at dumped prices.
    b. The imports from subject country are entering in the market at prices below the applicants' cost of sales and selling price.
    c. Imports below the prices of applicants have prevented it from charging adequate remunerative prices.
    d. The imports have depressed the prices of the applicants.
    e. As a result of low-priced imports, the applicants' profitability turned into losses in the proposed period of investigation.
    f. The imports increased because they are at low prices. As the imports increased, the domestic sales of the applicants declined.
    g. Faced with decline in domestic sales, the applicants were forced to suspend production in their production lines.

SECTION VI – COSTING INFORMATION

I. Production Process: Stage-wise process of manufacturing including its various routes of such manufacturing along with process-flow chart indicating cycle time taken at each process.

130. The production process of the applicants is enclosed as **Annexure 1.1**.

II. Statement of consumption of raw materials, packing materials and utilities used for product under consideration production and details of expenses (procured domestically / imported or from related/unrelated party) during the period of investigation as per Format VI - I.

131. The statement of consumption of raw material, packing materials, and utilities used for the product under consideration and details of expenses has been enclosed herewith as Format VI-I as **Annexure 6.1**.

III. Statement of cost of production as per Format VI - 2. The basis of allocation may be clearly mentioned. The product under consideration figures in format VI-2 must be provided as per the financial records. Further, in case the Cost Audit Report has dedicated cost of production for the PUC, then provide the Cost Audit Report for the injury investigation period along with the reconciliation of the financial and cost records maintained by the company.

132. The statement of cost of production has been enclosed as Format IV-2 as **Annexure 6.1**.

IV. Provide the calculation of the ratios used in the costing formats for allocation of expenses, working capital or net fixed assets as per Format VI-2R which shall be duly linked with the respective formats, wherever used.

133. The calculation of ratios used in costing formats for allocation of expenses, working capital, or net fixed assets is enclosed as Format VI-2R as **Annexure 6.1**.

V. Provide PCN-wise summarised statement of expenses, if proposed/ claimed, as per Format VI - 3.

134. Not applicable.

VI. Calculations in excel of average Working Capital (for opening & closing period of period of investigation) and average Net fixed Assets (for the

injury investigation period) as per Format VI - 4. The basis of allocation may be clearly mentioned.

135. The calculation of average working capital and average net fixed assets is enclosed herewith as Format VI-4 as **Annexure 6.1**. The basis of allocation is also mentioned in the information enclosed with this application.

VII. In case of major new investment (i.e. beyond small de-bottlenecking etc.) for the product under consideration during the injury investigation period, provide the date of installation of machinery, its average useful life on such date and its detailed project report as submitted to the relevant authorities / financial institutions or, if not so submitted, as approved by the management of the company.

136. IGPL has expanded its capacity in the injury period, and the project report is enclosed as **Annexure 6.4**. Project report of TCL Intermediates Private Limited is also enclosed as **Annexure 6.4**.

VIII. Statement showing plant-wise NIP for the applicant companies constituting domestic industry separately along with the weighted average NIP for the domestic industry as a whole as per Format VI - 5.

137. Plant wise non-injurious price is enclosed as **Format VI – 5 as Annexure 6.1.**

IX. A statement showing installed capacity, production and net sales realisation (Qty. and value for the product under consideration (month-wise for the period of investigation).

138. Company wise statement showing monthly capacity, production, capacity utilisation and sales quantity and value for the proposed period of investigation is enclosed as **Annexure 6.1**.

X. Provide for the period of investigation, the Audited / certified signed (searchable pdf document) annual financial statements (and notes annexed thereto) including director's auditor's report. Also provide for the period of investigation, relevant excel of P&L and balance sheet including notes to financial statements and 'trial balance relevant to product under consideration as per Format VI - 2T duly linked with costing formats.

139. The relevant information is provided in the Format VI-2T enclosed with **Annexure 6.1**.

XI. Provide for the past three fiscal years, the Audited annual financial statements including director's and auditor's report (searchable pdf document).

140. The financial statements of the applicants for the proposed period of investigation and the past three years are enclosed as **Annexure 6.3**.

Annexure A

Proforma IV A-1 and Proforma IV A.

Product Name: Phthalic Anhydride
Demand & Market Share

Non-Confidential
Format IVA-II
POI :Oct'24-Sep'25

SN	Particulars	UoM	2022-23	2023-24	2024-25	POI
1	**Import Volume**					
i	Subject Country- Taiwan	MT	28,221	25,304	40,797	46,196
ii	Countries under Investigation	MT	49,821	44,135	28,422	17,043
iii	Other Countries	MT	11,246	6,266	735	2,095
iv	Total	MT	89,287	75,705	69,954	65,333
2	**Import Value**					
i	Subject Country- Taiwan	₹ Lacs	27,587	23,257	37,404	39,618
ii	Countries under Investigation	₹ Lacs	49,410	41,578	26,441	14,228
iii	Other Countries	₹ Lacs	10,703	5,803	551	1,674
iv	Total	₹ Lacs	87,700	70,638	64,397	55,520
3	**CIF Price**					
i	Subject Country- Taiwan	₹/MT	97,755	91,914	91,683	85,762
ii	Countries under Investigation	₹/MT	99,176	94,207	93,032	83,485
iii	Other Countries	₹/MT	95,173	92,604	75,009	79,916
iv	Total	₹/MT	98,223	93,308	92,056	84,980
4	**Share in Imports**					
i	Subject Country- Taiwan	%	32%	33%	58%	71%
ii	Countries under Investigation	%	56%	58%	41%	26%
iii	Other Countries	%	13%	8%	1%	3%
iv	Total	%	100%	100%	100%	100%
5a	**Demand (Excluding Captive)**					
i	Domestic Sales of Applicant	MT-Index	100	100	106	104
ii	Sales of Supporter	MT-Index	-	100	324	324
iii	Import from Subject Country	MT	28,221	25,304	40,797	46,196
iv	Import from Countries under Investigation	MT	49,821	44,135	28,422	17,043
v	Import from other countries	MT	11,246	6,266	735	2,095
vi	Total	MT-Index	100	98	103	100
5b	**Demand (Including Captive)**					
i	Domestic Sales of Applicant	MT-Index	100	101	107	105
ii	Sales of Supporter	MT-Index	-	100	133	131
iii	Import from Subject Country	MT	28,221	25,304	40,797	46,196
iv	Import from Countries under Investigation	MT	89,287	75,705	69,954	65,333
v	Import from other countries	MT	18,061	4,366	3,335	659
vi	Total	MT-Index	100	112	121	118
6a	**Market Share in Demand (Excl Captive)**					
i	Share of Applicant	%-Index	100	103	103	104
ii	Share of Supporter	%-Index	-	100	307	315
iii	Share of subject country imports	%-Index	100	92	140	163
iv	Share of Countries under investigation imports	%-Index	100	91	55	34
v	Share of other countries imports	%-Index	100	57	6	19
7	**Subject imports in relation to:**					
i	Indian Production	%-Index	100	73	111	126
ii	Indian Demand	%-Index	100	92	140	163
iii	Total Imports	%	32%	33%	58%	71%

SN	Information Related to Product Under Consideration only	Units	2022-23	2023-24	2024-25	POI
Section-A						
1	**Installed Capacity***	MT-Indexed	100	102	116	128
2	Total Production Qty (PUC+NPUC)*	MT-Indexed	100	104	107	106
3	Capacity Utilization	%-Indexed	100	103	93	83
4	Production Qty of PUC	MT-Indexed	100	104	107	106
5	Captive Consumption of PUC	MT-Indexed	100	119	119	123
6	Sales Quantity	MT-Indexed	100	103	105	103
6a	Domestic Sales	MT-Indexed	100	100	106	104
6b	Export Sales	MT-Indexed	100	138	88	83
7	**Gross Sales Value (excluding taxes)**					
7a	Domestic Sales	₹ Lacs-Indexed	100	94	102	93
7b	Export Sales	₹ Lacs-Indexed	100	124	81	70
8	**Average Selling Price Per Unit:**					
8a	Domestic Sales	₹/MT-Indexed	100	94	96	89
8b	Export Sales	₹/MT-Indexed	100	90	92	85
9a	No of employees	Nos.-Indexed	100	111	128	129
9b	Salaries & Wages	₹ Lacs-Indexed	100	112	135	143
9c	Productivity Per day	MT-Indexed	100	104	107	106
9d	Productvity Per employee	MT-Indexed	100	94	84	82
9e	Productvity Per day per employee	MT-Indexed	100	94	84	82
10a	Opening Inventory	MT-Indexed	100	75	126	326
10b	Closing Inventory	MT-Indexed	100	169	319	762
10	**Average Inventory**	MT-Indexed	100	115	209	512
10c	Average Inventory as no. of days of production	MT-Indexed	100	110	195	482
10d	Average Inventory as no. of days of Sales	MT-Indexed	100	115	196	491
11	**Cost and Profits for Domestic Sales:**					
11a	Cost of Sales (ex-factory)	₹ Lacs-Indexed	100	100	104	102
11b	Commision, Discounts, Rebate, Frieght, etc.	₹ Lacs-Indexed	-	-	-	-
11c	Net Sales Realisation	₹ Lacs-Indexed	100	94	102	93
11d	PBT (Profit before Tax)	₹ Lacs-Indexed	100	-20	50	-86
11e	Interest Cost	₹ Lacs-Indexed	100	123	111	150
11f	PBIT (Profit before Interest & Tax)	₹ Lacs-Indexed	100	10	63	-36
11g	Depreciation	₹ Lacs-Indexed	100	116	149	175
11h	PBDIT (Profit before Depreciation, Interest & Tax)	₹ Lacs-Indexed	100	34	82	11
11i	Cash Profit (PBT+ Depreciation)	₹ Lacs-Indexed	100	16	77	-16
11j	Cost of Sales (ex-factory)	₹/MT-Indexed	100	100	98	98
11k	Net Sales Realisation per Unit	₹/MT-Indexed	100	94	96	89
11l	PBT (Profit before Tax)	₹/MT-Indexed	100	-20	47	-83
11m	Interest Cost	₹/MT-Indexed	100	122	104	144
11n	PBIT (Profit before Interest & Tax)	₹/MT-Indexed	100	10	59	-35
11o	Depreciation	₹/MT-Indexed	100	116	140	168
11p	PBDIT (Profit before Depreciation, Interest & Tax)	₹/MT-Indexed	100	34	77	11
11q	Cash Profit (PBT+ Depreciation)	₹/MT-Indexed	100	16	72	-15
12	Average capital employed	₹ Lacs-Indexed	100	105	149	161
12a	Net Fixed Assets	₹ Lacs-Indexed	100	123	186	177
12b	Working Capital	₹ Lacs-Indexed	100	77	90	136
12c	PBIT as % of Average Capital Employed (ROI)	%-Indexed	100	10	42	-23
13	**Detals of Self-Imports by the Applicant:**					
13a	Import Volume	MT	**Not Applicable**			
13b	Import Value (CIF)	₹ Lacs				
13c	Import Price (CIF)	₹/MT				
13d	Resale price of self-imported goods	₹/MT				
Section-B						
14	**Import Volumes:**					
i	Imports from Subject Country- Taiwan	MT	28,221	25,304	40,797	46,196
ii	Imports from Subject Countries	MT	49,821	44,135	28,422	17,043
a	China P Rp	MT	21,815	29,840	20,953	16,183
b	Indonesia	MT	-	-	-	-
c	Korea RP	MT	18,172	4,565	3,140	720
d	Thailand	MT	9,834	9,730	4,329	140
iii	Aggregate Imports from Other Countries	MT	11,246	6,266	735	2,095
14	**Total Imports**	MT	89,287	75,705	69,954	65,333
iv	Sales of the domestic industry	MT-Indexed	100	100	106	104
v	Sales of Other Domestic Producers	MT-Indexed	-	100	324	324
vi	Total Demand/Consumption excluding Captive	MT-Indexed	100	98	103	100
vii	Total Demand/Consumption including Captive	MT-Indexed	100	98	104	101
15	**Import Value (CIF):**					
i	Imports from Subject Country- Taiwan	₹ Lacs	27,587	23,257	37,404	39,618
ii	Imports from Countries under Investigation	₹ Lacs	49,410	41,578	26,441	14,228
a	China P Rp	₹ Lacs	21,777	28,124	18,844	13,432
b	Indonesia	₹ Lacs	-	-	-	-
c	Korea RP	₹ Lacs	18,061	4,366	3,335	659
d	Thailand	₹ Lacs	9,572	9,088	4,262	137
iii	Aggregate Imports from Other Countries	₹ Lacs	10,703	5,803	551	1,674
iv	**Total Imports**	**₹ Lacs**	**60,113**	**47,381**	**26,993**	**15,902**
16	**Import Price(CIF)**					
i	Imports from Subject Country- Taiwan	₹/MT	97,755	91,914	91,683	85,762
ii	Imports from Countries under Investigation	₹/MT	99,176	94,207	93,032	83,485
a	China P Rp	₹/MT	99,829	94,250	89,939	83,004
b	Indonesia	₹/MT	-	-	-	-
c	Korea RP	₹/MT	99,389	95,636	1,06,208	91,487
d	Thailand	₹/MT	97,333	93,404	98,450	97,995
iii	Aggregate Imports from Other Countries	₹/MT	95,173	92,604	75,009	79,916
iv	**Total Imports**	**₹/MT**	**67,325**	**62,586**	**38,586**	**24,340**

Annexure B

Proforma IV B and price undercutting.

Product Name: Phthalic Anhydride
Statement of Landed Price and Injury Margin

Non-Confidential
Proforma IVB
POI :Oct'24-Sep'25

Taiwan

SN	Particulars	UOM	2022-23	2023-24	2024-25	POI
1	Import Volume	MT	28,221	25,304	40,797	46,196
2	Import Values	₹ Lacs	27,587	23,257	37,404	39,618
3	CIF Price	₹/MT	97,755	91,914	91,683	85,762
4	Exchange Rate	₹/$	81	84	85	87
5	CIF Price	$/MT	1,206	1,098	1,073	989
6	Assessable Value	$/MT	1,206	1,098	1,073	989
7	Basic Custom Duty, including SWS @8.25%	$/MT	99	91	89	82
8	**Landed Price (6+7)**	**$/MT**	**1,305**	**1,189**	**1,162**	**1,071**
		₹/MT	**1,05,820**	**99,496**	**99,247**	**92,837**
9	Non- Injurious Price (NIP) claimed by domestic industry as per formate VI-5	$/MT	Not Applicable			1050-1250
10	**Injury Margin (9-8)**	**$/MT**	Not Applicable			***
		%				**0-10%**
11	Net Sales Realisation	₹/MT	***	***	***	***
12	**Price Undercutting (11-8)**	**₹/MT**	***	***	***	***
		%	**0-10%**	**Negative**	**0-10%**	**0-10%**

Annexure 1.1

Manufacturing process and flow chart.

The flow chart of the applicant constitute business sensitive information not susceptible to summarization. The information is confidential in nature and cannot be disclosed. A write up has been provided.

Annexure 1.2

BIS Standard on the subject goods

इंटरनेट मानक

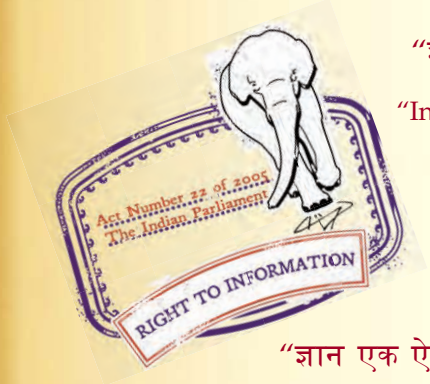
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 5158 (1987): Phthalic Anhydride, Technical [PCD 9: Organic Chemicals Alcohols and Allied Products and Dye Intermediates]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS : 5158 - 1987
(Reaffirmed 2005

Indian Standard

SPECIFICATION FOR PHTHALIC ANHYDRIDE, TECHNICAL

(Second Revision)

UDC 661·7 : 547·584

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 6

July 1988

Indian Standard

SPECIFICATION FOR PHTHALIC ANHYDRIDE, TECHNICAL

(Second Revision)

0. FOREWORD

0.1 This Indian Standard was (Second Revision) adopted by the Bureau of Indian Standards on 17 December 1987, after the draft finalized by the Organic Chemicals (Miscellaneous) Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 This standard was first published in 1969 and revised in 1977 in view of the quality of the product being made available at that time. In the first revision, the requirements of crystallizing point, colour of the molten material and total available acidity content were modified. However, the Committee decided to revise it again as a result [illegible] the requirements of crystallizing point, colour of molten material before and after heat treatment, free acidity, total available acidity and maleic anhydride content have been modified. The requirements of naphthalene and naphthaquinone content have been retained since some of the old plants are reported to still produce phthalic anhydride from naphthalene. However, tests need not be conducted for these requirements in case the product is obtained by oxidation of *o*-xylene (*see* Table 1).

0.3 The largest single use of phthalic anhydride, the anhydride of benzene *o*-dicarboxylic acid, is in the preparation of alkyd resins and similar high polymeric polyester compounds by reaction with polyhydric alcohols. It is also used in the manufacture of diester of monohydric aliphatic alcohols, which find widespread application as plasticizers and in the manufacture of various types of dyes and intermediates, benzoic acid and some pharmaceuticals. The end-use requirement for purity in most of the application is quite stringent. It is hoped that this standard will help the consumers in obtaining the supply of an acceptable quality of material.

0.4 Phthalic anhydride, in the form in which it reaches the market, is a flammable solid and constitutes moderate fire hazard. It has been known [illegible] even though there is no record of injury as a result of short exposure even to high concentration. Those handling the material are cautioned to use care ordinarily exercised to avoid bodily contact and exposure to dust or fumes (*see* 3).

0.5 For tbe purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements, and methods of sampling and test for phthalic anhydride, technical, suitable for industrial purposes.

2. REQUIREMENTS

2.1 Description — The material may be either solid or molten. When solid, it shall be in the form of flakes, pellets or crystals free from agglomerates, coloured or stained pieces and other extraneous matter.

2.1.1 When heated to 160°C, the material shall form a clear, transparent melt without decomposing, which sets to a white cake on cooling.

2.2 The material shall also comply with the requirements given in Table 1, when tested according to the method prescribed in Appendix A. Reference to the relevent clauses of Appendix A is given in col 4 of Table 1.

3. PRECAUTIONS IN HANDLING AND STORAGE

3.1 Handling — In view of its moderate fire hazard and irritating properties, precautions shall be taken while handling the material. The material shall not come in contact with skin. Exposure to its vapour, fume and dust shall be minimum and safety goggles shall he worn to protect eyes. Use of a respirator is also

TABLE 1 REQUIREMENTS FOR PHTHALIC ANHYDRIDE, TECHNICAL

(*Clauses* 0.2 *and* 2.2)

Sl No.	Characteristic	Requirement	Method of Test (Ref to Cl No. in Appendix A)
(1)	(2)	(3)	(4)
i)	Crystallizing point, °C, *Min*	130·8	A-2
ii)	Colour of the molten material, Hazen unit, *Max*	20	A-3
iii)	Colour of the molten material after heat treatment, Hazen unit, *Max*	60	A-3
iv)	Free acidity [as C_6H_4 ($COOH_2$)], percent by mass, *Max*	0·1	A-4
v)	Total available acidity (as $C_8H_4O_3$), percent by mass, *Min*	99·8	A-5
vi)	Maleic anhydride and other oxidizable impurities (as $C_4H_2O_3$), percent by mass, *Max*	0·1	A-6
vii)	Ash, ppm, *Max*	50	A-7
viii)	Iron (as Fe), ppm, *Max*	3	A-8
ix)	*Naphthaquinone, ppm, *Max*	5	A-9
x)	*Naphthalene, ppm, *Max*	20	A-10

*Applicable for material ex-naphthalene only (*see* 0.2)

recommended if the odour is found to be disagreeable or to have a choking effect (*see* IS : 7420-1974*).

3.2 Storage — It is recommended to store the material in a cool, ventilated area, away from open flames, other sources of possible ignition and powerful oxidizing agents.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in suitable drums (*see* IS : 2552-1979†) or multi-walled paper bags or in any other suitable containers as agreed to between the purchaser and the supplier.

a) Name of the material;

b) Source of the material;

c) Name of the manufacturer and recognized trade-mark, if any;

d) Net mass of the material in the container; and

e) Lot or batch number.

4.2.1 The container may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard

of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standrads.

5. SAMPLING

5.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix B.

*Code of safety for phthalic anhydride.

†Specification for steel drums (galvanized or ungalvanized) (*second revision*).

APPENDIX A

(*Clause* 2.2, and *Table* 1)

METHODS OF TEST FOR PHTHALIC ANHYDRIDE, TECHNICAL

A-1. QUALITY OF REAGENTS

A-1.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be used in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2. DETERMINATION OF CRYSTALLIZING POINT

A-2.0 Outline of the Method — The material is melted and then slowly cooled to determine its crystallizing point by observation of the temperature during crystallization under prescribed conditions.

NOTE — This determination shall be carried out without preliminary dehydration but as soon as possible after the sample is opened as the free acid content increases when the sample is in contact with moist air.

A-2.1 Apparatus — The crystallizing point apparatus shall be as shown in Fig. 1. A thick glass tube of nominal size 100 × 25 mm is placed inside a larger glass test tube of nominal size 150 × 50 mm. The latter tube is flanged so that it may be supported centrally by the metal cover plate.

A-2.1.1 The wider tube is weighted with lead shots, or similar material and the inner tube is closed by means of a cork, which carries a glass stirrer and through its centre a standard thermometer. The stirrer is a loop which surrounds the thermometer. The thermometer is so fixed in the cork that the thermometer's immersion mark is level with the top of the cork and if the thermometer has a contraction chamber, the distance from the bottom of the bulb to the top of the contraction chamber shall not be more than 35 mm.

A-2.1.2 The wider tube is supported in 1 000 ml tall-form beaker filled with cooling liquid to within 20 mm of the top. A thermometer for the cooling bath passes through a hole in the cover plate and is held by a rubber ring.

A-2.1.3 *Thermometer* — conforming to the following requirements:

Range	98 to 152°C
Graduation	0·2 deg
Immersion	100 mm
Overall length, *Max*	385 mm
Stem diameter	5·5 to 8·0 mm
Bulb shape	Cylindrical
Bulb length	15 to 20 mm
Length of main scale, *Min*	190 mm
Distance from bottom of bulb to bottom of main scale, *Min*	125 mm
Longer lines at each	1 deg
Scale error not to exceed	± 0·4°C

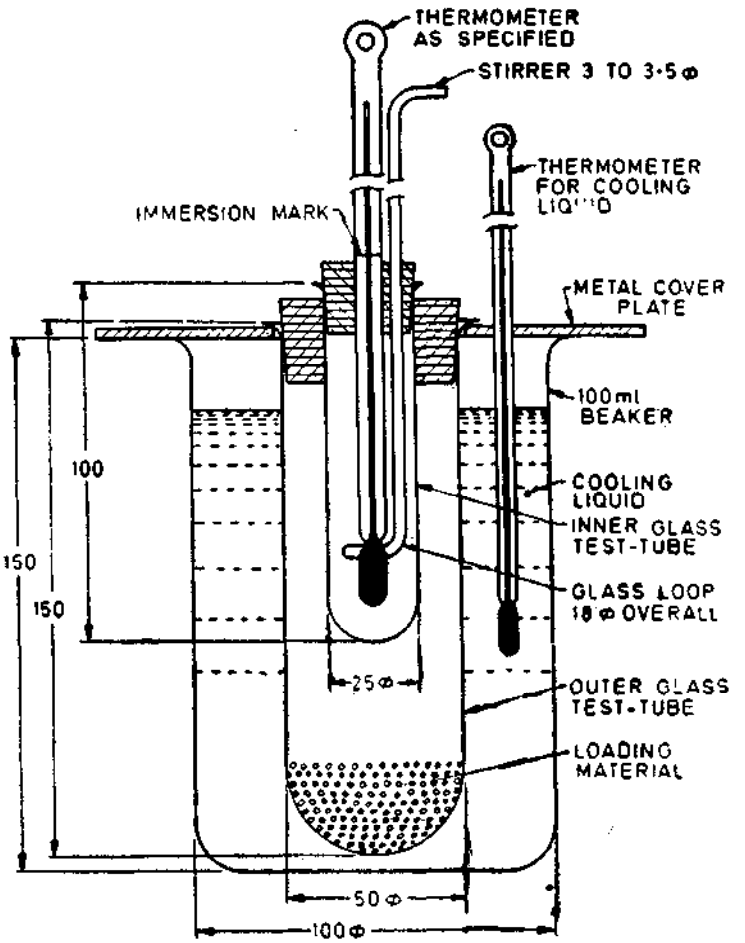
NOTE — Any other thermometer of convenient range and similar requirements and accuracy may also be used.

A-2.1.3.1 The thermometer shall bear a certificate from the National Physical Laboratory, New Delhi or any other institution authorized by the Government of India to issue such a certificate.

A-2.2 Procedure — Remove the inner tube from the crystallizing point apparatus and introduce about 30 g of the material for test. Warm the tube in a bath at about 140°C until all but last traces of crystals are melted. Replace the inner tube in its jacket with the cooling liquid in the apparatus maintained at 122 to 124°C. Stir the material gently and continuously, and record thermometer readings at 30 seconds intervals, make sure that a seed crystal is present as the temperature of the material falls to that at which crystallization commences. The crystallizing point corresponds to the highest of the first five consecutive readings corrected for thermometer error during which the temperature remains constant within 0·1°C.

A-2.2.1 If supercooling occurs as shown by a rise in temperature, observe the constant temperature after the rise. If five consecutive readings within 0·1 deg are not obtained, record six readings commencing with the point at which the maximum temperature is first attained. Plot the complete cooling curve of temperature against time and draw a staight line to lie evenly between the first and second, and between the fifth and sixth points mentioned above. Extend this line to meet the section of the cooling curve before the temperature rise. Report the temperature corresponding to the point of intersection, corrected for thermometer error, as the crystallizing point.

*Specification for water for general laboratory use (*second revision*).



All dimensions in millimetres.

FIG. 1 CRYSTALLIZING POINT (ASSEMBLY OF APPARATUS)

A-3. MEASUREMENT OF COLOUR OF THE MOLTEN MATERIAL

A-3.0 Outline of the Method — The material is melted and the colour of the melted material and that of the melted material after heat treatment are compared with that of the permanent colour standard, and expressed in terms of Hazen colour units. [The Hazen colour unit is defined as the colour of an aqueous solution containing 1 part per million of platinum in the form of chloroplantinic acid and 2 parts per million cobalt chloride ($CoCl_2.6H_2O$)].

A-3.1 Apparatus

A-3.1.1 *Identical Flat-Based Colorimetric* mark 100 mm above the base.

A-3.1.2 *One-Mark Graduated Flasks* — of 250- and 500-ml capacity (*see* IS : 915-1975*).

A-3.1.3 *Electrically-Heated Aluminium Block* — capable of maintaining temperature at 140 ± 3°C and 250 ± 3°C with holes 22 mm in diameter and at least 120 mm in depth but such that the flat-based tubes project above the surface of the block.

A-3.2 Reagents

A-3.2.1 *Cobaltous Chloride, Hexahydrate*

A-3.2.2 *Hydrochloric Acid* — relative density 1·16 (*see* IS : 265-1976*).

A-3.2.3 *Chloroplatinic Acid* — Dissolve 250 mg of platinum in a small quantity of aqua regia contained in a glass or porcelain basin by heating on a water-bath. When the metal has dissolved, ness. Repeat the operation twice more.

A-3.2.4 *Potassium Chloroplatinate*

A-3.3 Preparation of Colour Standard — Dissolve 0·50 g of cobaltous chloride hexahydrate and the

*Specification for one-mark graduated flask (*first revision*).

*Specification for hydrochloric acid (*second revision*).

whole of the chloroplatinic acid (*see* A-3.2.3) or 0·622 5 g of potassium chloroplatinate in 50 ml of hydrochloric acid. Warm, if necessary, to obtain a clear solution and, after cooling, pour into the 500-ml one-mark graduated flask. Dilute with water up to the mark.

A-3.3.1 Pipette 15 ml of this solution into one of the 250-ml one-mark graduated flasks and 40 ml into the other one. Dilute with water up to graduation marks. These diluted solutions are equivalent to 30 and 80 Hazen units respectively and should always be freshly prepared.

A-3.4 Procedure

A-3.4.1 Introduce into one of the colorimetric tubes (*see* A-3.1.1), a quantity of the material sufficient to reach graduation mark after melting. Pour the specified Hazen colour standard into the other tube to the mark.

A-3.4.2 Place the tube containing the material in the electrically heated block maintained at 140 ± 3°C (*see* A-3.1.3) and as soon as it is melted, compare the colour with that of the colour standard against white background.

A-3.4.3 Immediately after the comparison has been made, raise the temperature of the electrically heated block to reach 250 ± 3°C (*see* A-3.1.3) within 15 minutes and maintain it at that temperature. At the end of 90 minutes from reaching 250°C, allow the tube containing the material to cool to about 160°C and compare the colour with that of the second Hazen colour standard.

A-4. DETERMINATION OF FREE ACIDITY

A-4.0 Outline of the Method — The material is dissolved in ethyl methyl ketone and titrated with standard triethylamine solution using bromophenol blue as indicator. Free acidity is then calculated from the amount of standard triethylamine solution used up.

NOTE — This determination shall be carried out immediately after the sample is opened as the free acidity content increases when the material is in contact with moist air.

A-4.1 Reagents

A-4.1.1 *Phthalic Acid*

A-4.1.2 *Ethyl Methyl Ketone* — Neutralized to bromophenol blue by addition of an approximately 0·1 N solution of triethylamine in ethyl methyl ketone and containing not more than 0·1 percent (*m/m*) of water.

NOTE — Sufficiently dry ethyl methyl ketone may be obtained by refluxing over calcium chloride for approximately three hours followed by decantation and distillation.

A-4.1.3 *Bromophenol Blue Indicator* — Dissolve 0·1 g of bromophenol blue in 100 ml of the ethyl methyl ketone.

A-4.1.4 *Standard Triethylamine Solution (in Ethyl Methyl Ketone)* — 0·1 N; standardize as follows:

Weigh accurately about 0·1 g of the phthalic acid. Dissolve in 50 ml of the ethyl methyl ketone contained in a 150-ml conical flask. Add 0·5 ml of the bromophenol blue indicator and titrate with the standard triethylamine solution until the colour changes from green to bluish purple. The factor, F, for the standard triethylamine solution will be:

$$F = \frac{M_1}{0{\cdot}166\ 1\ V_1}$$

where

M_1 = mass in g of phthalic acid taken, and

V_1 = volume in ml of standard triethylamine solution used.

A-4.2 Procedure — Weigh, to the nearest 0·1 g, about 10 g of the material and dissolve without heating in 150 ml of the ethyl methyl ketone contained in a 500-ml conical flask. Add 1 ml of the bromophenol blue indicator and titrate with the 0·1 N triethylamine solution until the colour changes from green to blue.

A-4.3 Calculation

$$\text{Free acidity [as } C_6H_4(COOH)_2\text{]} = \frac{16{\cdot}61\ V \times F}{M}$$

percent by mass

where

V = volume in ml of standard triethylamine solution used,

F = factor for the standard triethylamine solution (*see* A-4.1.4), and

M = mass in g of the material taken for the test.

A-5. DETERMINATION OF TOTAL AVAILABLE ACIDITY

A-5.0 Outline of the Method — The material is dissolved in warm water and titrated with standard sodium hydroxide solution using phenolphthalein as indicator. Total available acidity is calculated from the amount of standard sodium hydroxide solution used.

A-5.1 Reagents

A-5.1.1 *Potassium Hydrogen Phthalate* — previously dried for 2 hours at 120°C.

A-5.1.2 *Phenolphthalein Indicator* — Dissolve 0·5 g of phenolphthalein in 100 ml of rectified

spirit (*see* IS : 323-1959*). Add standard sodium hydroxide solution until the indicator is faintly pink.

A-5.1.3 *Standard Sodium Hydroxide Solution* — 0·5 N, free from carbonate; standardize as follows:

Weigh accurately about 4 g of potassium hydrogen phthalate and transfer to a 500 ml conical flask. Add 120 ml of water and dissolve by warming on a water-bath. Add three drops of the phenolphthalein indicator and titrate hot (about 60°C) with the 0·5 N sodium hydroxide solution to the first pink colour. The factor, *F*, for the standard sodium hydroxide solution will be:

$$F = \frac{M_1}{0{\cdot}102\,11 \times V_1}$$

where

M_1 = mass in g of potassium hydrogen phthalate taken, and

V_1 = volume in ml of standard sodium hydroxide solution used.

A-5.2 Procedure — Weigh accurately about 1·5 g of the material and transfer to a 500-ml conical flask. Add 100 ml of water and dissolve by warming on a water-bath. Add three drops of the phenolphthalein indicator and titrate hot (about 60°C) with the freshly standardized 0·5 N sodium hydroxide solution to the pink colour used in the standardization.

A-5.3 Calculation

$$\text{Total available acidity (as } C_8H_4O_3\text{)} = \frac{3{\cdot}703 \times V \times F}{M}$$

where

V = volume in ml of standard sodium hydroxide solution used,

F = factor for the standard sodium hydroxide solution (*see* A-5.1.3), and

M = mass in g of the material taken for the test.

A-6. DETERMINATION OF MALEIC ANHYDRIDE AND OTHER OXIDIZABLE IMPURITIES

A-6.0 Outline of the Method — Phthalic acid is unattacked by cold potassium permanganate solution in the presence of sulphuric acid, whereas for maleic acid, the reaction at room temperature is represented by the equation:

$$\begin{matrix}\text{CH. COOH} \\ \| \\ \text{CH. COOH}\end{matrix} + 5\text{O} \longrightarrow 2H_2O + 3CO_2 + CO.$$

Excess of standard permanganate is used and the amount remaining is determined iodometrically. Maleic anhydride and other oxidizable impurities are calculated from the amount of standard potassium permanganate solution used.

NOTE — This method is not satisfactory for determining amounts of oxidizable impurities greater than 0·5 percent.

A-6.1 Reagents

A-6.1.1 *Sulphuric Acid* — concentrated (*see* IS : 266-1977*).

A-6.1.2 *Potassium Iodide* — solid.

A-6.1.3 *Potassium Permanganate* — approximately 0·1 N solution.

A-6.1.4 *Standard Sodium Thiosulphate Solution* — 0·1 N.

A-6.2 Procedure — Take two 50-ml conical flasks. Weigh, to the nearest 0·1 g, into one of the two 500-ml conical flasks about 5 g of the material, add to both flasks 100 ml of water and heat both gently until solution is complete in the flask containing the material. Cool as rapidly as possible to room temperature, thus avoiding the formation of large crystals which may lead to low results being obtained.

A-6.2.1 Add 1 ml of sulphuric acid and again cool. Add 25 ml of the potassium permanganate solution from a pipette. Mix thoroughly and leave to stand for 7 to 10 minutes. At the end of this time, add 1 g of potassium iodide and titrate the iodine released with the standard sodium thiosulphate solution.

A-6.3 Calculation

$$\text{Maleic anhydride and other oxidizable impurities (as } C_4H_2O_3\text{), percent by mass} = \frac{0{\cdot}098\,(V - V_1)}{M}$$

where

V = volume in ml of standard sodium thiosulphate (0·1 N) solution used in the determination without the material,

V_1 = volume in ml of standard sodium thiosulphate (0·1 N) solution used in the determination with the material, and

M = mass in g of the material taken for the test.

A-7. DETERMINATION OF ASH

A-7.1 Apparatus

A-7.1.1 *Platinum or Silica Basin*

*Specification for rectified spirit (*revised*).

*Specification for sulphuric acid (*second revision*).

A-7.1.2 *Furnace* — capable of maintaining temperature within 600 ± 25°C.

A-7.2 Procedure — Slowly burn, in several portions, approximately 5 g ± 0·1 mg of the material, weighed to the nearest gram, in a tared platinum or silica basin and ignite finally in a furnace at 600 ± 25°C until all carbonaceous matter has disappeared. Cool in a desiccator and weigh. Retain the residue for the determination of iron content (*see* **A-8**).

A-7.3 Calculation

$$\text{Ash, parts per million} = \frac{M}{M_1} \times 100$$

where

M = mass in g of the residue after ignition, and

M_1 = mass in g of the material taken for the test.

A-8. DETERMINATION OF IRON CONTENT

A-8.0 Methods — Two methods, namely, Method A and Method B have been prescribed. In case of dispute, Method A shall be used.

A-8.1 Method A (2,2-bipyridyl Method)

A-8.1.0 *Outline of the Method* — Ferrous iron gives with 2,2'-bipyridyl a red coloured complex. The residue obtained after ignition (*see* **A-7.2**) is dissolved in hydrochloric acid and the iron content is determined photometrically using 2'2'-bipyridyl.

A-8.1.1 *Apparatus*

A-8.1.1.1 *One-mark graduated flask* —1 000-ml capacity, two (*see* IS : 915-1975*).

A-8.1.1.2 *One-mark graduated flask* — 100-ml capacity (*see* IS : 915-1975*).

A-8.1.1.3 *Spectrophotmeter or electrophotometer*

A-8.1.1.4 *Stirrer* — of glass or platinum wire.

A-8.1.2 *Reagents*

A-8.1.2.1 *Concentrated hydrochloric acid* — Relative density 1·16 (*see* IS : 265-1976†).

A-8.1.2.2 *Dilute sulphuric acid* — Add carefully, with stirring, one volume of sulphuric acid (*see* IS : 266-1977‡) to 6 volumes of water.

A-8.1.2.3 *Dilute nitric acid* — Dilute one volume of nitric acid (*see* IS : 264-1976§) with 3 volumes of water.

A-8.1.2.4 *Urea solution* — Dissolve 100 g of urea in 100 ml of water.

A-8.1.2.5 *Hydroxyammonium chloride solution* — Dissolve 100 g of hydroxyammonium chloride in 1 000 ml of water.

A-8.1.2.6 *Ammonium acetate solution* — Dissolve 50 g of ammonium acetate in 100 ml of water.

A-8.1.2.7 *2,2'-bipyridyl solution* — Dissolve 0·5 g of 2,2'-bipyridyl in 100 ml of dilute hydrochloric acid (1 N).

A-8.1.2.8 *Standard iron solution* — Dissolve 0·702 g of ammonium ferrous sulphate [$(NH_4)_2 SO_4 . FeSO_4 , 6 H_2O$] in 50 ml of dilute sulphuric acid and then transfer to one of the 1 000-ml one-mark graduated flasks. Dilute with water to 1 000-ml mark. Pipette out 100 ml of this solution into the second 1 000-ml one-mark graduated flask. Dilute 100 ml of this solution again to 1 000 ml. One millilitre of this solution contains 10 μg of iron.

A-8.1.3 *Calibration Charts* — Place in 100-ml one-mark graduated flask 0 ml, 2·0 ml, 4·0 ml, 7·0 ml, 10·0 ml, 15·0 ml and 20·0 ml of the standard iron solution. To each add 20 ml of dilute nitric acid, 2 ml of urea solution and 2 ml of hydroxyammonium chloride solution. Mix and allow to stand for two minutes. Then add 30 ml of ammonium acetate solution and 5 ml of 2,2'-bipyridyl solution, and dilute to 100 ml mark. Measure the optical densities of the solutions in the spectrophotometer or electrophotometer at a wavelength between 510 and 520 nm. Draw a graph plotting optical densities as a function of quantities of iron (in micrograms) in 100 ml of the solution.

A-8.1.4 *Procedure* — To the platinum or silica basin containing the residue from the determination of ash (*see* **A-7.2**), add 5 ml of hydrochloric acid. Heat the basin on a boiling water-bath, agitating with a stirrer until all the residue has dissolved. Allow to cool and transfer the solution to a 100-ml one-mark graduated flask. Add 2 ml of urea solution, stir, add 2 ml of hydroxyammonium chloride solution, mix and allow to stand for two minutes. Then add 30 ml of ammonium acetate solution, 5 ml of the 2, 2'-bipyridyl solution and dilute to 100 ml. Measure the optical density of the solution on the spectrophotometer or electrophotometer at a wavelength between 510 and 520 nm, and by reference to the calibration chart (*see* **A-8.1.3**), read the iron content (μg of iron/100 ml) corresponding to this optical density.

A-8.1.5 *Calculation*

$$\text{Iron content (as Fe), parts per million} = \frac{M}{M_1}$$

where

M = mass in μg of iron found, and

*Specification for one-mark graduated flasks (*first revision*).
†Specification for hydrochloric acid (*second revision*).
‡Specification for sulphuric acid (*second revision*).
§Specification for nitric acid (*second revision*).

M_1 = mass in g of the material taken for determination of ash (*see* A-7.2).

A-8.2 Method B (Thioglycolic Acid Method)

A-8.2.0 *Outline of the Method* — In an alkaline medium, thioglycolic acid gives a reddish violet colouration with ferrous and ferric iron. The residue from the ash determination is dissolved in hydrochloric acid, thioglycolic acid added and then made alkaline by the addition of ammonia. The colour developed is then compared with that obtained with standard iron solution similarly treated. The iron content is then determined from the amount of standard iron solution required for matching the colour.

A-8.2.1 *Apparatus*

A-8.2.1.1 *One-mark graduated flasks* — 1 000 ml capacity, two (*see* IS : 915-1975*).

A-8.2.1.2 *One-mark graduated flasks* — 25-ml capacity (*see* IS : 915-1975*).

A-8.2.1.3 *Nessler cylinders* — 100-ml capacity, two (*see* IS : 4161-1967†).

A-8.2.2 *Reagents*

A-8.2.2.1 *Concentrated hydrochloric acid* — relative density 1·16 (*see* IS : 265-1976‡).

A-8.2.2.2 *Ammonium hydroxide* — relative density 0·88.

A-8.2.2.3 *Thioglycolic acid solution* — 10 percent (*v/v*).

A-8.2.2.4 *Citric acid solution* — 30 percent (*m/v*).

A-8.2.2.5 *Standard iron solution* — same as in **A-8.1.2.8**.

A-8.2.3 *Procedure* — To the platinum or silica basin containing the residue from the determination of ash (*see* A-7.2), add 5 ml of concentrated hydrochloric acid. Heat the basin on a boiling water-bath, agitating with a stirrer until all the residue has dissolved. Allow to cool, transfer to the 25-ml volumetric flask, dilute to the mark with water and mix thoroughly. For each determination, transfer 10 ml of this solution to a 100-ml Nessler cylinder, dilute to about 30 ml and add 0·5 ml of the citric acid solution followed by 1 ml of thioglycolic acid solution. Add ammonium hydroxide carefully until a reddish-purple colour just appears and then add 0·5 ml in excess. Dilute to 100-ml and mix thoroughly. To about 90 ml of water in the second 100-ml Nessler cylinder, add 2 ml of the concentrated hydrochloric acid, then 0·5 ml of the citric acid solution followed by 1 ml of the thioglycolic acid solution and 3 ml of the ammonium hydroxide. Add the standard iron solution slowly from a burette shaking with each addition, until the depth of colour in the two cylinders is identical when they are viewed along their axes. Record the volume of standard iron solution added.

A-8.2.4 *Calculation*

$$\text{Iron content (as Fe), parts per million} = \frac{25\,V}{M}$$

where

V = volume in ml of standard iron solution used, and

M = mass in g of sample taken for the test.

*Specification for one-mark graduated flasks (*first revision*).

†Specification for Nessler cylinders.

‡Specification for hydrochloric acid (*second revision*).

A-9. TEST FOR NAPHTHAQUINONE

A-9.0 Outline of the Method — The presence of 1, 4-naphthaquinone causes the development of an intense pink colour when the phthalic anhydride is heated with stannous chloride. The colour produced is compared with that of a freshly prepared reference colour.

A-9.1 Apparatus

A-9.1.1 *Two Similar Boiling Tubes* — 175 × 38 mm, of Type I glass conforming to IS : 2303-1963*.

A-9.1.2 *Two Similar Thermometers* — covering a suitable range.

A-9.2 Reagents

A-9.2.1 *Phthalic Anhydride* — naphthaquinone-free. (If necessary, recrystallize phthalic anhydride from benzene until the product gives no pink colouration when tested by the method described under **A-9.4**).

A-9.2.2 *Stannous Chloride Dihydrate*

NOTE — The anhydrous material is not satisfactory.

A-9.2.3 *Standard 1, 4-naphthaquinone Solution* — Dissolve 0·010 g of 1, 4-naphthaquinone in benzene and dilute to 100 ml. This reagent shall be freshly prepared.

A-9.3 *Preparation of Reference Colour* — Weigh 50 g of the naphthaquinone-free phthalic anhydride into one of the clean, dry boiling tubes. Introduce by means of a pipette, 2·5 ml of the standard 1, 4-naphthaquinone solution so that it falls on the phthalic anhydride. Finally, add 0·10 ± 0·01 g of the finely powdered stannous chloride to the contents, and heat in the same way and at the same time as the material under test (*see* **A-9.4**).

*Method of grading glass for alkalinity.

A-9.4 Procedure — Weigh 50 g of the material into the other clean, dry boiling tube and add 0·10 ± 0·01 g of the finely powdered stannous chloride. Heat to a temperature of 170 ± 2°C over a period of 20 minutes side by side with the reference colour described in **A-9.3**. Stir the contents of the tubes throughout the heating period to ensure that there is no solid material remaining in the tubes, and maintain the temperature for a further 5 minutes. At the end of the time, compare the colour of the molten mixtures against a white background.

A-9.4.1 The material shall be taken to have satisfied the requirement of Table 1, if the colour produced in the test sample is not more intense than that of the prepared colour standard.

A-10. TEST FOR NAPHTHALENE

A-10.0 General — The aromatic hydrocarbon most likely to be present as an impurity in phthalic anhydride is naphthalene, but certain other

A-10.1 Apparatus

A-10.1.1 *Round-Bottom Flask* — 1 000-ml capacity [*see* IS : 1381 (Part 1)-1976*], fitted for distillation with a rubber stopper carrying an anti-splash head and a dropping funnel.

A-10.1.2 *Separating Funnel* — 250-ml capacity (*see* IS : 1575-1960†).

A-10.1.3 *One-Mark Volumetric Flask* — 50-ml capacity (*see* IS : 915-1975 ‡).

A-10.1.4 *Glass-Stoppered Test Tubes* — 125 × 16 mm, two.

A-10.2 Reagents

A-10.2.1 *Sodium Hydroxide*

A-10.2.2 *Chloroform* — *See* IS : 5296 - 1979§.

A-10.2.3 *Naphthalene*

A-10.2.4 *Concentrated Sulphuric Acid* — relative density 1·84 (*see* IS : 266-1977*).

A-10.2.5 *Formaldehyde Solution* — 36 percent (*m/v*).

A-10.3 Procedure — Weigh 50 g of the sample and 30 g of sodium hydroxide into the round-bottom flask. Close the flask with the rubber stopper, add 40 ml of water through the dropping funnel and immediately close the stop-cock. Heat and distil about 75 ml of distillate into the separating funnel.

A-10.3.1 Extract the distillate obtained with two 20 ml portions of chloroform, first washing out the condenser tube with the chloroform to remove traces of naphthalene. Combine the chloroform extracts, transfer to the 50-ml volumetric flask and dilute with chloroform to the graduation mark.

down the side of the tube, 2 ml of sulphuric acid. Shake well and add 5 drops of the formaldehyde solution. Shake vigorously for 2 to 3 minutes. If naphthalene is present, a greenish-blue ring is formed at the junction of the two layers. [This is due to a flocculant precipitate in the acid layer, but it rapidly separates on the surface of the acid layer and is conveniently regarded as a ring at the interface.]

A-10.3.3 Compare the intensity of this ring with that obtained by treating at the same time and in the same manner 0·1 ml of a freshly prepared 0·1 percent (*m/v*) solution of naphthalene in chloroform. It is preferable to allow the solution to stand for an hour before making the comparison in order to allow the ring to become better defined.

A-10.3.4 The material shall be taken to have satisfied the requirement prescribed in Table 1, if the ring produced in the test sample is not more intense than that produced in the standard.

*Specification for boiling flasks : Part 1 Flasks with plain neck (*first revision*).

†Specification for separating funnels.

‡Specification for one-mark volumetric flasks.

§Specification for chloroform, technical and analytical.

*Specification for sulphuric acid (*second revision*).

APPENDIX B

(*Clause* 5.1)

SAMPLING OF PHTHALIC ANHYDRIDE, TECHNICAL

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

B-1.2 Sampling instrument shall be clean and dry.

B-1.3 Precautions shall be taken to protect the sample, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination (*see* **3.1**).

B-1.4 To draw a representative sample, the contents of each container selected for sampling shall be mixed as thoroughly as possible by suitable means.

B-1.5 The samples shall be placed in clean, dry and air-tight glass or other suitable containers on which the material has no action.

B-1.6 The sample containers shall be of such a size that they are almost completely filled by the sample.

B-1.7 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and other details given under **4.2.**

B-1.8 Samples shall be stored in a cool and dry place.

B-2. SAMPLING INSTRUMENT

B-2.1 The sampling instrument is a closed type sampling tube, undivided (*see* Fig. 2), consisting of two concentric cylindrical tubes made of a metal which is not affected by the material being sampled (preferably of stainless steel) closely fitting into each other throughout their entire length so that it is possible to rotate one tube within the other, a suitable handle being provided for the purpose. Longitudinal openings of about one-third the circumference are cut in both tubes throughout their length. In one position, the two openings coincide and admit the material into the hollow inner tube. By rotating the inner tube through 180°, the opening is tightly closed and a 'core' of material being enclosed therein may be withdrawn. This type of sampler is usually provided with a locking arrangement so that the tubes are held together in any desired position. The outer tube is provided with a sharp conical end to facilitate penetration but the base of the cone shall be closed so that no material is entrapped in this portion. The height of the cone shall be equal to its base diameter. The whole instrument shall be of sufficient length to penetrate an entire diagonal of the container being sampled. The diameter of the inner cylindrical space may vary from 20 to 40 mm proportionately to the length. A length of 150 cm and a diameter of 30 mm can cater for most needs.

B-2.1.1 *Use of Sampling Instrument* — The instrument is inserted in closed position in an oblique direction till it touches bottom. The material is admitted by rotating and opening the tubes, and finally closing them withdrawing the sample in this process. In case the minimum quantity of material required for test from each container is more than the capacity of the instrument, further 'cores' shall be taken from different parts of the same container such that they are at least 75 mm in the case of drums, bags, etc, and 25 mm in the case of small containers from the wall of the container. In all cases, the instrument shall be inserted till it touches bottom so that an entire cross-section is withdrawn.

B-3. SCALE OF SAMPLING

B-3.1 Lot — All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of containers pertaining to different batches of manufacture, the containers belonging to the same batch of manufacture shall be grouped together and each group shall constitute a separate lot.

B-3.2 For ascertaining the conformity of the lot to the requirement of this specification, tests shall be carried out for each lot separately. The number (n) of containers to be selected for drawing the samples shall depend upon the size of the lot and shall be in accordance with Table 2.

B-3.3 The containers shall be selected at random from the lot. In order to ensure the randomness of selection, a random number table shall be used. For guidance and use of random number tables, IS : 4905-1968* may be referred. In the absence of a random number table, the following procedure may be adopted.

'Starting from any container, count them as 1, 2, 3,..... ....., up to r and so on, where r is an integral part of N/n, N being the lot size

*Methods for random sampling.

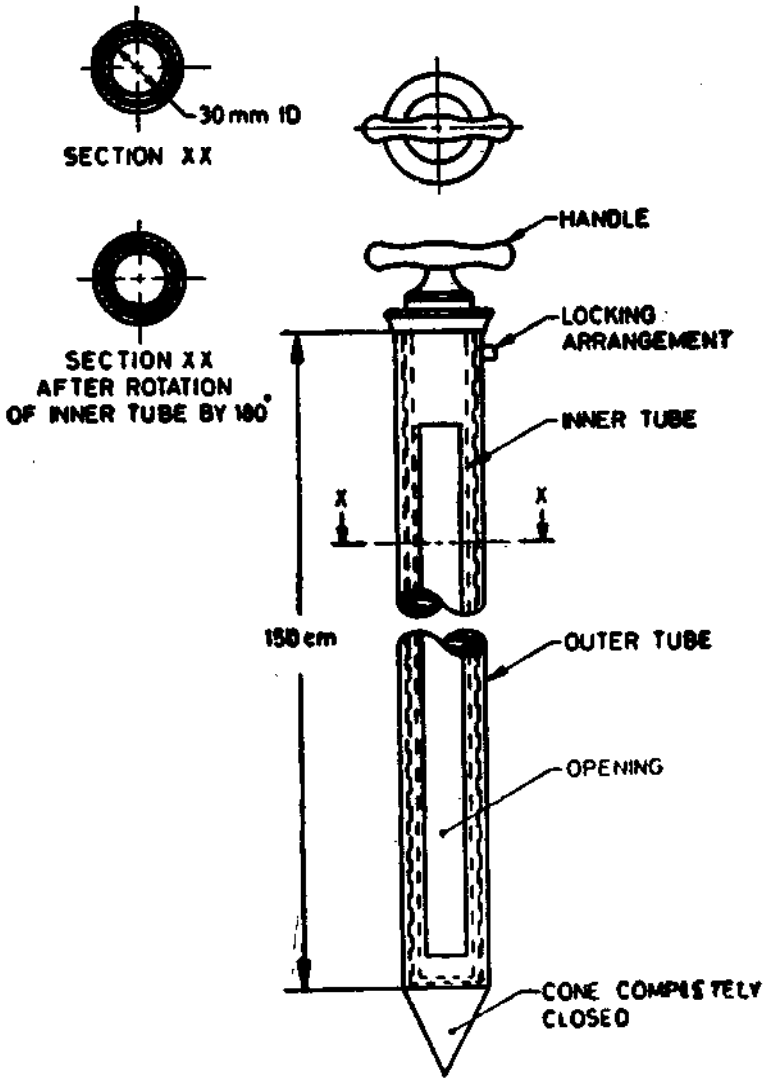


FIG. 2 CLOSED TYPE SAMPLING TUBE, UNDIVIDED

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

(*Clause* B-3.2)

LOT SIZE (*N*)	NO. OF CONTAINERS TO BE SELECTED (*n*)
Up to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 and above	8

and *n* the sample size respectively. Every *r*th container thus counted shall be withdrawn so as to give the required sample size.

B-4. TEST SAMPLE AND REFEREE SAMPLE

B-4.1 From each of the containers selected according to **B-3.2**, a representative portion of the material about 100 g shall be drawn. These samples shall constitute individual samples.

B-4.2 From each of these individual portions (**B-4.1**), an equal quantity of the material shall be taken and thoroughly mixed to constitute a composite sample not less than 600 g. The composite sample shall be transferred to clean bottles and labelled with full identification particulars of the sample. This composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third to be used as a referee sample.

B-5. NUMBER OF TESTS

B-5.1 Tests for the determination of all the characteristics given in Table 1 shall be carried out on the composite sample.

B-6. CRITERIA FOR CONFORMITY

B-6.1 For declaring the characteristics of the lot to the requirements of all the charactistics, the test results on the composite sample shall meet the corresponding requirement specified.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 3 31 01 31, 3 31 13 75 — Telegrams : Manaksanstha (Common to all Offices)

Regional Offices:	*Telephone*
*Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95
†Eastern : 1/14, C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	41 24 42 41 25 19 41 29 16
Branch Offices:	
'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48 2 63 49
'F' Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002	22 48 05
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 67 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No. 29, R. G. Barua Road, 5th Bylane, GUWAHATI 781003	—
5-8-56C, L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71 6 98 32
117/418B Sarvodaya Nagar, KANPUR 208005	21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001	7 66 37
Inspection Offices (With Sale Point):	
Pushpanjali, 205-A West High Court Road, Bharampeth Extension, NAGPUR 440010	2 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 — 89 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 — 27 68 00

Printed at Kapoor Art Press, New Delhi, India

AMENDMENT NO. 1 NOVEMBER 1992
TO
IS 5158 : 1987 SPECIFICATION FOR PHTHALIC ANHYDRIDE, TECHNICAL

(Second Revision)

(*Page* 7, *clause* A-7.2, *line* 2) — Substitute '10 g ± 0.1 mg' *for* '5 g ± 0.1 mg'.

(PCD 9)

Reprography Unit, BIS, New Delhi, India

Annexure 1.3

Statement of Imports.

Product- Phthalic Anhydride (PAN)
Imports Summary

POI- Oct'24-Sept'25
Source- Secondary Source

		Volume in MT				Values in ₹ Lacs			
SN	**Country**	**2022-23**	**2023-24**	**2024-25**	**POI**	**2022-23**	**2023-24**	**2024-25**	**POI**
1	Subject Country- Taiwan	28,221	25,304	40,797	46,196	27,587	23,257	37,404	39,618
2	Countries under investigation	49,821	44,135	28,422	17,043	49,410	41,578	26,441	14,228
i	China	21,815	29,840	20,953	16,183	21,777	28,124	18,844	13,432
ii	Indonesia	-	-	-	-	-	-	-	-
iii	Korea RP	18,172	4,565	3,140	720	18,061	4,366	3,335	659
iv	Thailand	9,834	9,730	4,329	140	9,572	9,088	4,262	137
3	Other Countries	11,246	6,266	735	2,095	10,703	5,803	551	1,674
4	Total	89,287	75,705	69,954	65,333	87,700	70,638	64,397	55,520

		₹/MT				Share (%)			
SN	**Country**	**2022-23**	**2023-24**	**2024-25**	**POI**	**2022-23**	**2023-24**	**2024-25**	**POI**
1	**Subject Country- Taiwan**	**97,755**	**91,914**	**91,683**	**85,762**	**32%**	**33%**	**58%**	**71%**
2	**Countries under investigation**	**99,176**	**94,207**	**93,032**	**83,485**	**56%**	**58%**	**41%**	**26%**
i	China	99,829	94,250	89,939	83,004	24%	39%	30%	25%
ii	Indonesia	-	-	-	-	0%	0%	0%	0%
iii	Korea RP	99,389	95,636	1,06,208	91,487	20%	6%	4%	1%
iv	Thailand	97,333	93,404	98,450	97,995	11%	13%	6%	0%
3	**Other Countries**	**95,173**	**92,604**	**75,009**	**79,916**	**13%**	**8%**	**1%**	**3%**
4	**Total**	**98,223**	**93,308**	**92,056**	**84,980**	**100%**	**100%**	**100%**	**100%**

Annexure 1.4

List of known producers in subject country.

List of known exporters in subject country

SN	Known Producer	Address
1.	Nan Ya Plastics Corporation	Add:3F., No.201, Dunhua N. Rd., Songshan Dist., Taipei City 105, Taiwan (R.O.C.) Email:- nanya@npc.com.tw
2.	UPC Technology Corporation	Add:9th Fl., Building A, No.209 Nangang Rd., Sec.1, Nangang Dist., Taipei, 115 Taiwan, R.O.C. Email:- info@upc.com.tw
3.	Union Chemical Ind Co Ltd	9 De-Hui Street, Floor 6 Jhong-Shan District Taipei, 104 Taiwan Email:- administrator@unionchemical.com.tw; ray.tsai@unionchemical.com.tw; and w.s.leu@unionchemical.com.tw
4.	Methyl Co. Ltd	Add:7F-2, No.1, Kuang-Fu South Road, Taipei 105, Taiwan Email:- methyl@methylcorp.com

Annexure 1.5

List of known importers and users in India.

List of Known Importers of subject goods in India

SN	Details of Importers	SN	Details of Importers
1.	**Mazda Colors Limited** NKM International178, Backpay Reclamation, Maharashtra **Email**:info@mazdacolours.com	**2.**	**Pck Oil & Solvents Ltd.** M-105 2nd Floor, Connaught Place, New Delhi **Email:** hopclgroup@live.com
3.	**Lana Industries Limited** Alta Bhavan 532 Senapati Bapat Marg, Dadar, Mumbai, Maharashtra **Email:** export@lona.com	**4.**	**Silvassa Plast** KLJ House, 63 Rama Marg, Najafgarh Road, New Delhi **Email:** vpislv@gmail.com
5.	**Aarti Industries Limited** Udyog Kshetra 2nd Floor Mulund Goregaon Link Road, Mulund (W), Mumbai, Maharashtra **Email**: info@aartihndustries.com	6.	**Mechemco Industries** 170/6 Shiv Smruti 27th Road Sian West, Mumbai, Maharashtra **Email**: info@mechemco.co
7.	**Rachna Plasticizers** Plot No. 116&117, Piparia Jndl. Estate, U.T. of Dadar & Nagar Haveli Silvassa **Email**: info@rachnaplasticizers.com	**8.**	**Micro Inks Ltd.** 512/513, Midas, 5th Floor, Saharplaza Complexe, J.B. Nagar, M.V.R.D., Andheri (E), Mumbai, Maharashtra **Email**; mhm-microinks@intimespectrum.com
9.	**Phthalo Colors & Chemicals (I) Ltd**. Nanavati Mahalya, 18, Homi Mody Street Fort Mumbai, Maharashtra **Email**: headoffice@nanavatigroup.com	**10.**	**Heubach Colour Pvt. Ltd.** Plot No 9002-9010, GIDC Estate, Ankleshwar, Gujarat **Email**: heubach.india@heubach.com
11.	**Ramniklal S. Gosala & Co.** National House, 608, B. J. Marg, Jacob Circle, Mumbai, Maharashtra **Email:** info@rsgchemicals.com	**12.**	**KLJ Plasticizers** KLJ House 63 Rama Marg, Najafgarh Road, New Delhi **Email**:delhi@kljindia.com; kljresources@kljindia.com
13.	**Pertochem Middle East (India) Pvt.** 201, Business Square, B. Wing, Andheri Kurla Road, Mumbai, Maharashtra **Email**: manda.pawar@petrocheme.com	**14.**	**Sanman Trade Impex Pvt. Ltd.** 1410, Maker Chamber V, Nariman Point, Mumbai, Maharashtra **Email**: companysecretarial@groupeveritas.com
15.	**Amjey Chemicals** 5-1, Old Nagardas Road, 101, Adinath Tower, Andheri (E), Mumbai, Maharashtra **Email**: amjey.chemicals@vsnl.net	**16.**	**A-One Chern Trade Pvt. Ltd.** 302, Shanti House, Nr. Madhushudan house, Opp. Navranpura Telephone Exchange, Off C. G. Road, Ahmedabad **Email**: name@chemtrade.in
17.	**Hazel Mercantile Limited** 181, Ashoka Shopping Centre, 2nd, Floor, G.T. Hospital Complex, Mumbai, Maharashtra **Email**: corp@hmlindia.com	**18.**	**Sanjay Chemicals (India) Pvt. Ltd**. 507, MatruChhaya, 378/380, Narshinatha Street, Mumbai, Maharashtra **Email**: sanjay@sanjaychemindia.com

Annexure 1.6

List of user Associations.

Indian Plasticizers Manufacturers Association Hansa Tower, 25, Central Market, Ashok Vihar, New Delhi - 110 052. Email- office@aipma.net	**All India Federation of Plastic Industries** 1st Floor,40, DLF Industrial Area, Kirti Nagar, New Delhi-110015. Email- secretarygeneral@ipfindia.org
Plastic Export Promotion Council Crystal Tower, Crystal co-operative housing society (Ltd.), Gundwali Road No.3, Offsin MV Road, Andheri (E), Mumbai -400005 Email- **ed@plexconcil.org**	**Gujarat State Plastics Manufacturers Association** 7th Floor, Span Trade Center, Nr. Paldi Char Rasta, Ellisbridge, Ahmedabad-380 006 Email- **info@gspma.in**
All India Plastics Manufacturers Association AIPMA House, A-52, Street No.1, MIDC, Andheri (East) Mumbai-400093. Email- **office@aipma.net**	**Chemical Industries Association** 602/Sir Vithaldas Chambers, 6th Floor, Bombay Samachar Marg, Fort-400001, Mumbai Email- **iccmumbai@iccmail.in**
Indian Chemical Council 206, Ansal Bhawan, KG Marg, New Delhi, 110001 Email- **iccmumbai@iccmail.in**	**Indian Paint Association** 6, Netaji Subhas Road, Kolkata 700 001, India Email-indian.paint.association@gmail.com
Indian Plastics Federation 13A, Govt. Place East, 2nd floor Calcutta-700069 Email- **office@ipfindia.org**	

Annexure 2.1

Authorization letter.

TCL INTERMEDIATES PRIVATE LIMITED
(A SUBSIDIARY OF THIRUMALAI CHEMICALS LIMITED)

NO. 32, 5TH FLOOR
"SPIC HOUSE", GUINDY
CHENNAI – 600 032
TAMIL NADU
INDIA

11th January 2026

Shri Amitabh Kumar,
Joint Secretary & Director General.
Directorate General of Trade Remedies,
Ministry of Commerce & Industry,
4th Floor, Jeevan Tara Building,
5, Parliament Street, New Delhi

Subject: Application for imposition of anti-dumping duty on the imports of "Phthalic Anhydride (PAN)" from Taiwan.

Dear Sir,

We are filing an application in the form and manner prescribed for imposition of anti-dumping duty on the imports of Phthalic Anhydride (PAN)" from Taiwan. We have provided all relevant information which may be required in this connection. We have no objection to any verification which you may wish to carry out at our premises in this regard. We request the Designated Authority to kindly:

a. Initiate investigation to determine whether the goods are being imported at dumped prices and whether the same is causing injury to the Domestic Industry.
b. Describe the product that should be subject to the antidumping duty, including an appropriate definition of the product under consideration and relevant custom classification.
c. Advise us of any further information that the Designated Authority considers relevant and necessary for the present purpose.
d. Call relevant information from concerned parties with regard to dumped imports and/or injury including information from foreign producers, Indian consumers, and other interested parties before arriving at final decision.
e. Provide an opportunity to us to further supplement our submissions on the need for imposition of anti-dumping duty, after we have received and reviewed the responses and information by other interested parties in general and foreign producers in particular.
f. Provide an opportunity for oral hearing.
g. Recommend imposition of interim antidumping duties pending outcome of the investigation.
h. Recommend imposition of definitive antidumping duties.

TCL INTERMEDIATES PRIVATE LIMITED
(A SUBSIDIARY OF THIRUMALAI CHEMICALS LIMITED)

NO. 32, 5TH FLOOR
"SPIC HOUSE", GUINDY
CHENNAI – 600 032
TAMIL NADU
INDIA

It is further clarified that:

a. We have not imported the product under consideration from the subject country.
b. We are not related to any producer or exporter of the product under consideration in the subject country or an importer in India.

We hereby appoint the following consultants to represent us before the Designated Authority.

TPM Consultants,
J-209, Ish Kriti, Saket,
New Delhi – 110017
Phone: +91-11-49892200
Email: akg@tpm.in, kalpesh@tpm.in, shailesh@tpm.in, sarika@tpm.in

TPM Consultants have been authorized, inter-alia, for the followings:
a. to file application on our behalf.
b. to receive communication on our behalf.
c. to make submissions on our behalf.
d. to appear for and on our behalf.
e. to hold interactions on our behalf.

We hereby certify that the information provided by us is true, complete, and correct, on the basis of records available and generally maintained by the company, and no material has been concealed or misrepresented.

With warm regards,

For,

TCL Intermediates Private Limited
Signature:

Name of Signatory: Sanjay Sinha

Thirumalai Chemicals Limited

5th Floor, SPIC House, 88, Mount Road, Guindy, Chennai - 600 032, Tamil Nadu, India
Telephone : +91 44 6605 7700, +91 44 2230 1242 / 47 / 48 Fax : +91 44 2230 1240
Email : info@thirumalaichemicals.com Website : www.thirumalaichemicals.com
CIN: L24100MH1972PLC016149

11th January 2026

Shri Amitabh Kumar,
Joint Secretary & Director General.
Directorate General of Trade Remedies,
Ministry of Commerce & Industry,
4th Floor, Jeevan Tara Building,
5, Parliament Street, New Delhi

Subject: Application for imposition of anti-dumping duty on the imports of "Phthalic Anhydride (PAN)" from Taiwan.

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g. Recommend imposition of interim antidumping duties pending outcome of the investigation.
h. Recommend imposition of definitive antidumping duties.

5th Floor, SPIC House, 88, Mount Road, Guindy, Chennai - 600 032, Tamil Nadu, India
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Email : info@thirumalaichemicals.com Website : www.thirumalaichemicals.com
CIN:L24100MH1972PLC016149

It is further clarified that:

a. We have not imported the product under consideration from the subject country.
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TPM Consultants,
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c. to make submissions on our behalf.
d. to appear for and on our behalf.
e. to hold interactions on our behalf.

We hereby certify that the information provided by us is true, complete, and correct, on the basis of records available and generally maintained by the company, and no material has been concealed or misrepresented.

With warm regards,

For,

Thirumalai Chemicals Limited
Signature:

Name of Signatory: Sanjay Sinha

I G PETROCHEMICALS LIMITED

12th January 2026

Shri Amitabh Kumar,
Joint Secretary & Director General.
Directorate General of Trade Remedies,
Ministry of Commerce & Industry,
4th Floor, Jeevan Tara Building,
5, Parliament Street, New Delhi

Subject: Application for imposition of anti-dumping duty on the imports of "Phthalic Anhydride (PAN)" from Taiwan.

Dear Sir,

We are filing an application in the form and manner prescribed for imposition of anti-dumping duty on the imports of Phthalic Anhydride (PAN)" from Taiwan. We have provided all relevant information which may be required in this connection. We have no objection to any verification which you may wish to carry out at our premises in this regard. We request the Designated Authority to kindly:

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b. Describe the product that should be subject to the antidumping duty, including an appropriate definition of the product under consideration and relevant custom classification.
c. Advise us of any further information that the Designated Authority considers relevant and necessary for the present purpose.
d. Call relevant information from concerned parties with regard to dumped imports and/or injury including information from foreign producers, Indian consumers, and other interested parties before arriving at final decision.
e. Provide an opportunity to us to further supplement our submissions on the need for imposition of anti-dumping duty, after we have received and reviewed the responses and information by other interested parties in general and foreign producers in particular.
f. Provide an opportunity for oral hearing.
g. Recommend imposition of interim antidumping duties pending outcome of the investigation.
h. Recommend imposition of definitive antidumping duties.

Corp. Office : 401-404, Raheja Centre, Free Press Journal Marg, 214, Nariman Point, Mumbai - 400 021. India.Tel.: (91) 22 - 4058 6100, Fax : (91) 22 - 2204 0747, E-mail : igpl@igpetro.com, http://www.igpetro.com
Regd. Office : T-10, 3rd Floor, Jairam Complex, Mala, Neugi Nagar, Panaji, Goa - 403 001, India Tel.: 0832 - 2434973 • E-mail : igplgoa@gmail.com • CIN : L51496GA1988PLC000915

It is further clarified that:

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New Delhi – 110017
Phone: +91-11-49892200
Email: akg@tpm.in, kalpesh@tpm.in, shailesh@tpm.in, sarika@tpm.in

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c. to make submissions on our behalf.
d. to appear for and on our behalf.
e. to hold interactions on our behalf.

We hereby certify that the information provided by us is true, complete, and correct, on the basis of records available and generally maintained by the company, and no material has been concealed or misrepresented.

With warm regards,

For,

I G Petrochemicals Limited
Signature:

Name of Signatory: Pramod Bhandari
Designation: Chief Financial Officer

Annexure 2.2

Details of shutdown.

The shutdown details of the applicants constitute business sensitive information not susceptible to summarization. The statement shows the operating rate, the production volume and the inventory details of the applicants. The information is confidential in nature and cannot be disclosed.

Annexure 2.3

Impact of Duty.

SN	Particulars	UOM	Disperse Yellow 64	Source
1	Selling price of PAN	Rs/Kg	300	https://www.indiamart.com/proddetail/yellow-inorganic-pigment-26119661012.html?pos=3&kwd=disperse%20yellow%2064&tags=rk:C||dt:46|db:01|prc:1|dtp:p||sv:M|rsf:localhgmct|prv:300|ri:M_C_50_NP-|-res:RC2|ktp:N0|stype:attr=1|mtp:G|wc:3|lcf:2|cq:greater%20noida|qr_nm:localhgmct-gl-gd|cs:21093|com-cf:nl|ptrs:na|mc:26576|cat:65|qry_typ:P|lang:en|tyr:2|qrd:251111|mrd:251111|prdt:251111|msf:hs|pfen:1|gli:U0G0I1|gc:Greater%20Noida|ic:New%20Delhi|scw:1|v=4|crs=city-landing|r=3
2	Import price	Rs/Kg	83	Import price
3	Proposed ADD	%	10	
4	Proposed ADD	Rs/Kg	8	
5	Consumption norm of PAN	Kg	0.176	SION Norms
6	Impact of ADD	Rs/Kg	1.461	
7	Impact of ADD	%	0.5%	

SN	Particulars	UOM	Rhodamine Dye	Source
1	Selling price of PAN	Rs/Kg	1100	https://www.indiamart.com/proddetail/basic-rhodamine-dye-powder-2851531023473.html?pos=2&kwd=rhodamine%20b%20500&tags=rk:A|plc:1|dt:46|db:01|prc:1|dtp:p||sv:T|rsf:gd|prv:1100|ri:T_A_50_P-|-res:RC2|ktp:N0|stype:attr=1|mtp:S|wc:3|lcf:1|cq:greater%20noida|qr_nm:gl-gd|cs:19621|com-cf:nl|ptrs:na|mc:158267|cat:65|qry_typ:P|lang:en|tyr:2|qrd:251108|mrd:251111|prdt:251111|msf:hs|pfen:1|gli:U0G0I1|gc:Greater%20Noida|ic:New%20Delhi|scw:1|v=4|crs=city-landing|r=3
2	Import price	Rs/Kg	83	Import price
3	Proposed ADD	%	10	
4	Proposed ADD	Rs/Kg	8	
5	Consumption norm of PAN	Kg	0.460	SION Norms
6	Impact of ADD	Rs/Kg	3.818	
7	Impact of ADD	%	0.3%	

SN	Particulars	UOM	Diceto Stearyl Phthalate	Source
1	Selling price of PAN	Rs/Kg	1550	https://dir.indiamart.com/search.mp?ss=Vat+Dark+Blue+DO+&prdsrc=1&v=4&mcatid=68741&catid=64&cq=greater+noida&tags=res:RC2|ktp:N0|stype:attr=1|mtp:G|wc:4|lcf:2|cq:greater%20noida|qr_nm:localhgmct-gl-gd|cs:20744|com-cf:nl|ptrs:na|mc:2705|cat:65|qry_typ:P|lang:en|tyr:2|qrd:251111|mrd:251111|prdt:251111|msf:hs|pfen:1|gli:U0G0I1|gc:Greater%20Noida|ic:New%20Delhi|scw:1
2	Import price	Rs/Kg	83	Import price
3	Proposed ADD	%	10	
4	Proposed ADD	Rs/Kg	8	
5	Consumption norm of PAN	Kg	0.680	SION Norms
6	Impact of ADD	Rs/Kg	5.644	
7	Impact of ADD	%	0.4%	

Annexure 2.4

Standing of Domestic Industry.

Statement of Indian Production **Non-Confidential**
Product Name: Phthalic Anhydride **POI- Oct'24-Sept'25**

Including Captive

SN	Particulars	2022-23	2023-24	2024-25	POI
		Production-MT			
1	**Applicants**	***	***	***	***
i	IG Petrochemicals Limited	***	***	***	***
ii	Thirumalai Chemicals Limited	***	***	***	***
iii	TCL Intermediates Private Limited	***	***	***	***
2	KLJ Petroplast Limited	NA	***	***	***
3	**Total Indian Production**	***	***	***	***
		Share-%			
1	**Applicants**	**100.00%**	**80-90%**	**80-90%**	**80-90%**
i	IG Petrochemicals Limited	***	***	***	***
ii	Thirumalai Chemicals Limited	***	***	***	***
2	KLJ Petroplast	NA	10-20%	10-20%	10-20%
3	**Total Indian Production**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Excluding Captive

SN	Particulars	2022-23	2023-24	2024-25	POI
		Production-MT			
1	**Applicants**	***	***	***	***
i	IG Petrochemicals Limited	***	***	***	***
ii	Thirumalai Chemicals Limited	***	***	***	***
iii	TCL Intermediates Private Limited	***	***	***	***
2	KLJ Petroplast Limited	NA	***	***	***
3	Total Indian Production	***	***	***	***
		Share-%			
1	**Applicants**	**100.00%**	**90-100%**	**90-100%**	**90-100%**
i	IG Petrochemicals Limited	***	***	***	***
ii	Thirumalai Chemicals Limited	***	***	***	***
2	KLJ Petroplast	NA	0-5%	0-10%	0-10%
3	Total Indian Production	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Annexure 3.1

Calculation of normal value.

Product Name: Phthalic Anhydride **Non-Confidential**
Statement of Constructed Normal Value (CNV) **POI :Oct'24-Sep'25**

Taiwan

SN	Particulars	UoM	Price	Norms	Amount	Remarks
1	Raw Material cost					
i	*Orthoxylene*	₹/MT	91,328	***	***	International Import Prices of RM and DI Norms
ii	Other raw material cost (including credit for by-product)	₹/MT			***	DI Data
iii	**Total Raw material Cost**	**₹/MT**			***	
2	Other Conversion Cost	₹/MT			***	As per DI Data
3	**Total Cost of Production**	**₹/MT**			***	
4	Add: Interest Cost	₹/MT			***	
5	Add: Profit @5%	₹/MT			***	
6(a)	**Constructed Normal Value**	**₹/MT**			***	
6(b)	**Constructed Normal Value**	**$/MT**			**1100-1300**	

Annexure 3.2

Calculation of export price.

Product Name: Phthalic Anhydride **Non Confidential**
Statement of Net Export Price **POI :Oct'24-Sep'25**

Subject Country- Taiwan

SN	Particulars	UoM	Taiwan
1	Import Volume	MT	46,196
2	Import Value	₹ Lacs	39,618
3	**CIF Price**	**₹/MT**	**85,762**
4	**CIF Price**	**$/MT**	**989**
5	Ocean freight	$/MT	86
6	Marine Insurance @ 0.05%	$/MT	0
7	**FOB Price**	**$/MT**	**902**
8	Bank charge @ 0.5%	$/MT	4.51
9	Port & Handling expenses	$/MT	10.90
10	Credit Costs	$/MT	4.45
11	Inventory Carrying Cost	$/MT	2.44
12	**Net export price**	**$/MT**	**880**
13	Exchange rate	₹/$	86.69
14	**Net export price**	**₹/MT**	**76,306**

Annexure 3.3

Evidence for adjustments claimed in calculation of export price.

Freight Rates from Kaohsiung to Nhava-Sheva **Non- Confidential Version**

Are you shipping container cargo from port Kaohsiung to Nhava-Sheva?
Get instant freight prices and find the best shipping options from Kaohsiung to Nhava-Sheva.
Our Logistics Calculator will help you to find the best freight rates among the carriers. Get shipping cost instatly, compare rates, and book immediately.

Ocean Routes 4

Hapag — Type of container 20ST — Valid until 11.04.2025

Kaohsiung Port → Nhava Sheva Port

Shipping time 7d 18h — Distance 8261.87 km

$900.00

Book now

Hapag-Lloyd — Type of container 20ST — Valid until 20.02.2026

Kaohsiung Port → Nhava Sheva Port

Shipping time 21h — Distance 8261.87 km

$1,308.00

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Hapag-Lloyd — Type of container 20ST — Valid until 20.02.2026

Kaohsiung Port → Nhava Sheva Port

Shipping time 21h — Distance 8261.87 km

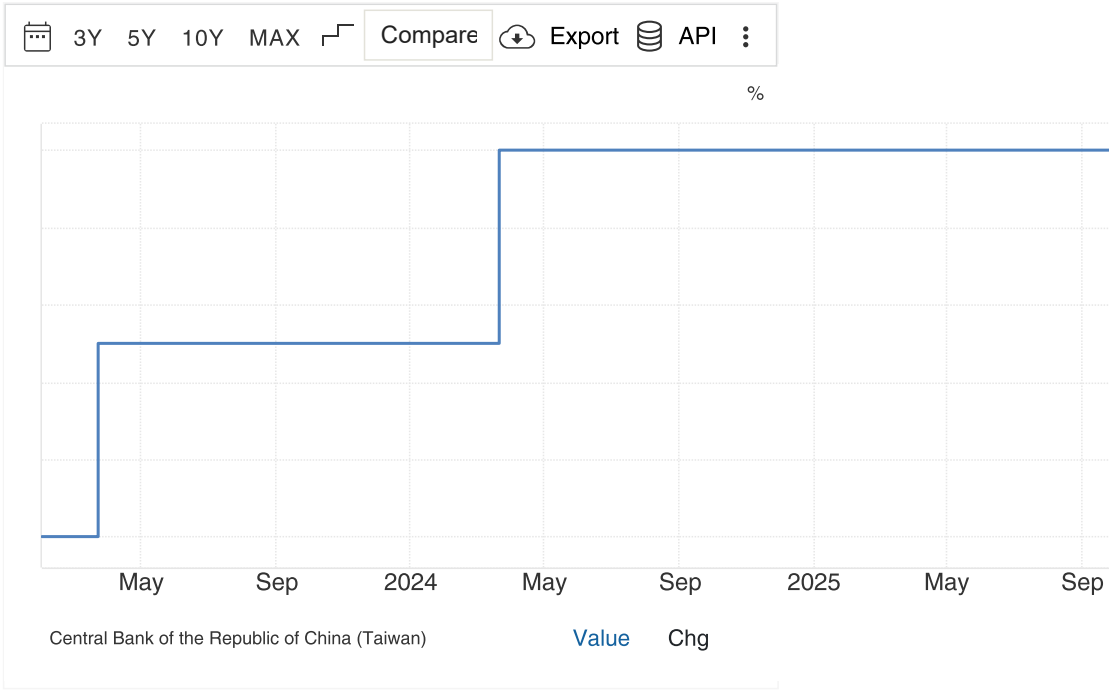
$1,308.00

Book now

TRADING ECONOMICS

Taiwan Interest Rate

Taiwan's central bank left its key discount rate unchanged at 2% at its December 2025 meeting, in line with market expectations and extending a pause in policy since March 2024. Policymakers cited moderate inflation, with headline CPI forecast to rise 1.66% year on year and core CPI at 1.65%, both lower than in 2024 and expected to ease further to 1.63% in 2026. Economic growth has remained robust, with GDP expanding 7.18% year-on-year in the first three quarters, surpassing forecasts, and full-year growth expected at 7.31%, well above the September projection of 4.55%, supported by strong demand for emerging technologies such as AI, which has driven substantial export growth. The central bank noted ongoing global uncertainties, including potential US trade-policy shocks, slower growth in China, and geopolitical and climate risks, while Taiwanese goods remain subject to a 20% US tariff amid ongoing negotiations for a more favorable agreement. source: Central Bank of the Republic of China (Taiwan)



Calendar	GMT	Reference	Actual	Previous	Consensus
2025-06-19	08:30 AM	Interest Rate Decision	2%	2%	2.0%
2025-09-18	08:30 AM	Interest Rate	2%	2%	2%

TRADING ECONOMICS

Taiwan Interest Rate

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		Rate Decision
2026-09-17	08:30 AM	Interest Rate Decision

+

Related	Last	Previous	Unit
Banks Balance Sheet	67406482.00	67087399.00	TWD Milli
Central Bank Balance Sheet	20901258.00	20569242.00	TWD Milli
Foreign Exchange Reserves	5997.90	6002.00	USD Hun
Interest Rate	2.00	2.00	percent
Loan Growth	5.62	5.82	percent
Loans to Private Sector	17324622.00	17386439.00	TWD Milli
Money Supply M0	3468915.00	3430810.00	TWD Milli
Money Supply M1	11977384.00	11805587.00	TWD Milli
M2 Money Supply YoY	66845027.00	66577274.00	TWD Milli

+

Taiwan Interest Rate

In Taiwan, interest rate decisions are taken by Central Bank of the Republic of China (Taiwan). The official interest rate is the discount rate on 10-day loans to banks.

Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
2.00	2.00	4.63	1.13	2000	percent	Daily

TRADING ECONOMICS

Taiwan Interest Rate

News Stream

Taiwan Central Bank Holds Key Rate at 2%
Taiwan's central bank left its key discount rate unchanged at 2% at its December 2025 meeting, in line with market expectations and extending a pause in policy since March 2024. Policymakers cited moderate inflation, with headline CPI forecast to rise 1.66% year on year and core CPI at 1.65%, both l... more
2025-12-18

Taiwan Keeps Key Rate at 2% as Expected
The Central Bank of Taiwan maintained its key discount rate at 2% in its September 2025 meeting, in line with market expectations. The decision reflects a cautious approach amid global uncertainties, including US trade policy, major central bank actions, slowing growth in China, and geopolitical ris... more
2025-09-18

Taiwan Holds Rates Steady as Expected
The Central Bank of Taiwan kept its key discount rate unchanged at 2% during its June 2025 meeting, in line with market expectations. The decision reflects ongoing global economic uncertainties, a stable domestic outlook, and continued easing of inflationary pressures. Taiwan's economy outperformed ... more
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Taiwan Jobless Rate Edges Higher in November
Taiwan Central Bank Holds Key Rate at 2%
Taiwan M2 Money Supply Hits Record High
Taiwan Import Growth Hits Nine-Month High
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Taiwan Interest Rate

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TAIWAN - LOCAL CHARGES
Effective As of 01 July 2023

Dear Valued Customers
Please find below the basic / usual local charges applicable until further notice:

TYPE	CATEGORY	SERVICE DESCRIPTION	EXP / IMP	LOCATION	UNIT	CURRENCY	RATE							ADDITIONAL INFORMATION	VALIDITY
							DRY				REEFER				
							20'	40'	HC	45'	20'	40'	HC		
SYSTEMATIC	Doc & Admin	Documentation fee at origin	EXP	All	Per BL	TWD				1800				Applicable for ESI & Web-OBL	
										2000				Applicable for ESI & OBL	
										2500				Applicable for Manual SI & OBL	
										2100				Applicable for ESI & Web-OBL (incl. SWB)	Effective 10 Sep 2023
										2300				Applicable for ESI & OBL (incl. SWB)	Effective 10 Sep 2023
										2800				Applicable for Manual SI & OBL (incl. SWB)	Effective 10 Sep 2023
		Documentation fee at destination	IMP	All	Per BL	TWD				2000					
		Advanced Manifest Declaration documentation	EXP	All	Per BL	USD				32				CMA CGM, APL, ANL - USA/Canada/Mexico/Japan	
						USD				27				CMA CGM, APL - Europe/Turkey/Russia Baltic	
						USD				35				CMA CGM, APL - South Africa	
						TWD				1000				Applicable for CNC from TW to JP/CN Hong Kong when Delivery in China	
	Port & Terminal	Terminal handling (THC) at origin/destination	Both	All	Per Cntr	TWD	6170	7710	8670	9760	7880	11090	11090		
						TWD	6170	7710	8670	9760				Applicable for Hazardous	
						TWD	6170	7710						Applicable for OOG	
	Equipment	Container maintenance service at destination**	IMP	All	Per Cntr	TWD	1675	1675	1675	1675				Container Maintenance Charge (CMC) for Taiwan will apply to dry equipment cargo only to cover any damage costs up to amount of USD 500. If damage is higher than this, the consignee or any involved party will be invoiced the surplus repair amount. Applicable for CMA/ANL & for Special Cargos of Scrap Metals (Exempt and Nonexempt) Not Applicable for SOC	
		Container return services at destination*	IMP	All	Per Cntr	TWD	600	600	600	600	1100	1100	1100	The fee covers equipment cleaning and damage repair costs up to USD 250 Does not apply to Metal scrap,Marble,Stone,Ore & Quickline commodities	
		Sealing service export*	EXP	All	Per Cntr	TWD	280	280	280	280	280	280	280		
		Sealing service import	IMP	All	Per Cntr	TWD	280	280	280	280	280	280	280	Applicable for CMA/ANL/APL	
SPOT	Doc & Admin	Express Release*	EXP	All	Per BL	USD				34					
		Switch of Bill of Lading	EXP	All	Per BL	TWD				3300					Effective 10 Sep 2023
		Bill of Lading Amendment	EXP	All	Per BL	TWD				500					Effective 10 Sep 2023
		Customs Manifest Amendment	EXP	All	Per BL	USD				40				Applicable for US/MX/EU	
										50				Applicable for CA	
		Reissuance of Bill of Lading	EXP	All	Per BL	TWD				1800					
		Late Bill of Lading Pick-Up*	EXP	All	Per BL	TWD				1500					
		Cancellation of Booking (Before Empty Container Pick up)*	EXP	All	Per Cntr	TWD	700	700	700	700	1400	1400	1400	Free time since O/B date + 10 calendar days, 11th day onward for all trades Reefer levels applicable for Special Containers Applicable for CMA/ANL/APL: Booking cancellation received less than 7 days before vessel scheduled sail date.	
		Cancellation of Booking (After Empty Container Pick up)*					1400	1400	1400	1400	2800	2800	2800	Applicable for CNC: Booking cancellation received less than 3 days before vessel scheduled sail date.	
		Late Delivery Order Pickup Fee	IMP	All	Per BL	TWD				1500				1st-10th calendar days free of charge Tier 1 rate charge from 11th-18th calendar days	
										3000				Tier 2 rate charge from 19th calendar days onwards	
		Cross Payment service	Both	All	Per BL	TWD				2200					
		Manual VGM	EXP	All	Per Cntr	USD	25	25	25	25	25	25	25		
	Equipment	Container cleaning service	IMP	All	Per Cntr	TWD	600	800	800	800	600	800	800	Water clean	
							1000	1400	1400	1400	1000	1400	1400	Chemical clean	
		Genset hiring*	EXP	All	Per Set	TWD						1500		Applicable for first 2 days Lumpsum charge per genset. Daily rate thereafter: TWD 1500	
		Tailored Container dressing	EXP	All	Per Cntr	USD	10	10	10	10				Applicable per bag	
		Container Grade Selection	EXP	All	Per Cntr	USD	100	100	100	100	100	100	100		
		Container Pre cooling*	EXP	All	Per time	TWD					1000	1000	1000	Applicable as per shipper's request	
		Empty Pick-Up Merchant's Haulage	EXP	Kaohsiung	Per Cntr	USD	110				120	240	240		Expires 30 Sep 2023
				Kaohsiung	Per Cntr	USD	110	200							Effective 01 Oct 2023
				Keelung	Per Cntr	USD									
				Taichung	Per Cntr	USD	160	240	240			240	240		Expires 30 Sep 2023
				Taichung	Per Cntr	USD	160	240				240	240		Effective 01 Oct 2023
				Taoyuan	Per Cntr	USD	210	250	250			240	240		Expires 30 Sep 2023
				Taoyuan	Per Cntr	USD	210	250				240	240		Effective 01 Oct 2023
				Taipei	Per Cntr	USD									Effective 01 Oct 2023
		Empty Drop Off Merchant's Haulage	IMP	Kaohsiung	Per Cntr	USD		200	200						Expires 30 Sep 2023
				Kaohsiung	Per Cntr	USD			200						Effective 01 Oct 2023
				Keelung	Per Cntr	USD	175	190	190		120	240	240		
				Taichung	Per Cntr	USD					120				Expires 30 Sep 2023
				Taichung	Per Cntr	USD			240		120				Effective 01 Oct 2023
				Taoyuan	Per Cntr	USD					120				Expires 30 Sep 2023
				Taoyuan	Per Cntr	USD			250		120				Effective 01 Oct 2023
				Taipei	Per Cntr	USD	230	250	250						Effective 01 Oct 2023
	Customs & Authorities	Customs Clearance at origin***	EXP	All	Per Shipment	USD	85	85	85	85	85	85	85	Applicable for 1st Container (Includes EDI for the first 6 pages) Additional container(s) per shipment: USD 30 per container	
		Customs Clearance at destination***	IMP	All	Per Shipment	USD	95	95	95	95	95	95	95	Applicable for 1st Container (Includes EDI for the first 6 pages) Additional container(s) per shipment: USD 30 per container	

Notes:
1) *Subject to + 5%VAT
2) **Subject to GST or VAT per local regulations
3) ***EDI per data entry for customs per shipment whether 1 or multiple container shipment.
Catalog of services and tariffs of surcharges related to SpotOn booking are available on this link:
http://www.cma-cgm.com/my-cma-cgm/my-prices

Annexure 3.4

Calculation of exchange rate.

Non- Confidential Version

TWD/USD - Taiwan Dollar US Dollar

Real-time Currencies Currency in USD

Add to Watchlist

0.03163 +0.00001 (+0.02%)

Real-time Data · 18:09:17

General Chart News & Analysis Technical Forum

TWD/USD 0.03163 +0.00001 (+0.02%)

WD/USD Historical Data

Search the website...

Monthly 22-01-2024 - 22-01-2026

Date	Price	Open	High	Low	Vol.	Change %

Open in App

Forex Single Currency Crosses Currency Rates Live Currency Cross Rates Exchange Rate

01-11-2025	0.03185	0.03247	0.03267	0.03175	-1.94%
01-10-2025	0.03248	0.03284	0.03298	0.03239	-%
01-09-2025	0.03283	0.03272	0.03344	0.03242	+0.37%

Non- Confidential Version

01-08-2025	0.03271	0.03338	0.03363	0.03256	-2.15%
01-07-2025	0.03343	0.03425	0.03472	0.03328	-2.39%
01-06-2025	0.03425	0.03346	0.03479	0.03327	+2.45%
01-05-2025	0.03343	0.03121	0.03457	0.03109	+7.15%
01-04-2025	0.03120	0.03006	0.03134	0.03001	+3.79%
01-03-2025	0.03006	0.03035	0.03055	0.03004	-1.05%
01-02-2025	0.03038	0.03029	0.03068	0.03006	+0.20%
01-01-2025	0.03032	0.03048	0.03075	0.03014	-0.48%
01-12-2024	0.03047	0.03080	0.03097	0.03034	-1.07%
01-11-2024	0.03080	0.03132	0.03153	0.03059	-1.63%
01-10-2024	0.03131	0.03148	0.03154	0.03087	-0.51%
01-09-2024	0.03147	0.03124	0.03179	0.03104	+0.78%
01-08-2024	0.03122	0.03058	0.03152	0.03042	+2.17%
01-07-2024	0.03056	0.03077	0.03091	0.03037	-0.57%
01-06-2024	0.03074	0.03087	0.03112	0.03062	-0.12%
01-05-2024	0.03077	0.03066	0.03126	0.03062	+0.42%
01-04-2024	0.03064	0.03125	0.03134	0.03057	-2.02%
01-03-2024	0.03128	0.03160	0.03197	0.03113	-0.98%
01-02-2024	0.03159	0.03199	0.03209	0.03148	-1.14%

Highest:
0.03479

Change %:
-1.01862

Average:
0.03155

Difference:
0.00478

Lowest:
0.03001

Annexure 3.5

Calculation of Dumping Margin.

Product Name: Phthalic Anhydride **Non-Confidential**
Statement of Dumping Margin **POI :Oct'24-Sep'25**

SN	Particulars	UOM	Taiwan
1	Constructed Normal Value	$/MT	1000-1200
2	Net Export Price	$/MT	881
3	Dumping Margin	$/MT	***
4	Dumping Margin	%	30-40%

Annexure 4.1

Capacity expansion in Taiwan.

Phthalic Anhydride Market Size, Share, Growth and Industry Analysis, By Type (O-Xylene Catalytic Oxidation,Naphthalene Catalytic Oxidation), By Application (Plasticizers,UPR,Alkyd Resins,Others), Regional Insights and Forecast to 2033

Non- Confidential Version

No of Pages: 115
Report ID: 110134
SKU ID: 21328690

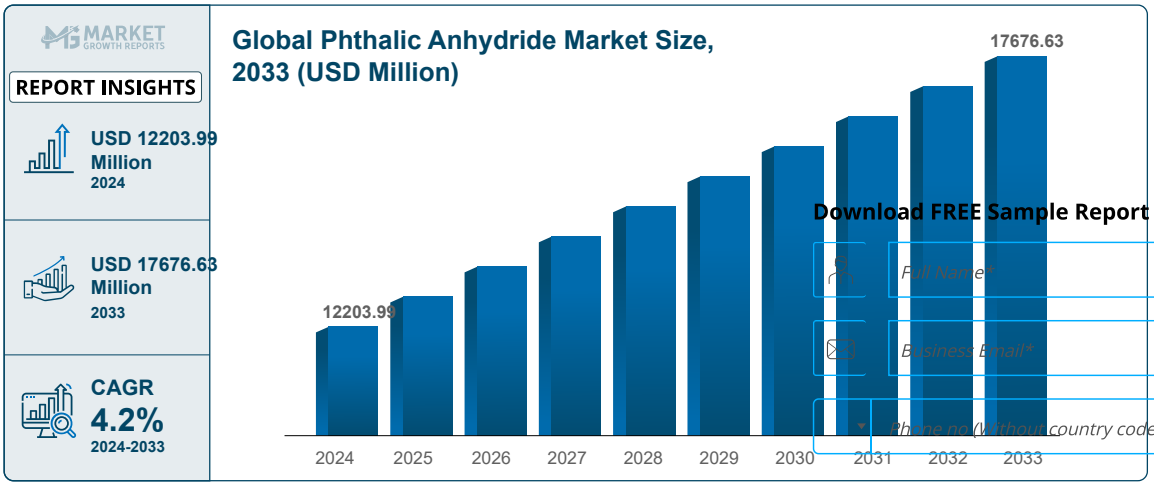
Last Updated: 10 November 2025
Base Year: 2023
Historical Data: 2019 - 2022
Region: Global

PHTHALIC ANHYDRIDE MARKET OVERVIEW

Global Phthalic Anhydride market size, valued at USD 12203.99 million in 2024, is expected to climb to USD 17676.63 million by 2033 at a CAGR of 4.2%.

The phthalic anhydride market is a crucial segment within the petrochemical industry, serving as a base chemical for producing a wide range of plasticizers, resins, and dyes. In 2024, global consumption of phthalic anhydride surpassed 5.6 million metric tons, with over 68% used in plasticizer production alone. Major manufacturers have expanded their capacity, particularly in Asia-Pacific, where China alone accounted for more than 2.1 million metric tons of production. This compound is primarily synthesized through the catalytic oxidation of orthoxylene or naphthalene. More than 75% of the production process is based on orthoxylene due to its higher yield efficiency and lower operational cost.

In the last five years, the number of end-use applications has increased due to rising construction, automotive, and electronics industries, which are key users of resins and plasticizers. Regulatory pressures in Europe and North America have also prompted a shift towards phthalate-free alternatives, prompting increased R&D activity in biodegradable and non-toxic variants. India and Southeast Asian countries have reported significant expansion, with India's production capacity reaching over 300,000 metric tons in 2023. The market also saw a surge in demand from unsaturated polyester resin (UPR) applications, especially in marine and corrosion-resistant industrial components.



KEY FINDINGS

Top Driver reason: Rising consumption of plasticizers in construction and automotive sectors.

Top Country/Region: China dominates with more than 38% of global phthalic anhydride production.

Top Segment: Plasticizers remain the top application, consuming over 3.8 million metric tons in 2024.

PHTHALIC ANHYDRIDE MARKET TRENDS

The phthalic anhydride market has been experiencing notable trends shaped by increasing downstream demand and technological advancements in production. One prominent trend is the rising usage of phthalic anhydride in flexible PVC production, which has led to an annual consumption of over 3.8 million metric tons globally. The construction sector alone accounted for 42% of this demand due to the need for flexible pipes and vinyl flooring. Furthermore, alkyd resins, extensively used in paints and coatings, have seen growing utilization, with over 950,000 metric tons of phthalic anhydride directed to this segment in 2024.

Another significant trend is the transition toward environment-friendly alternatives in Europe and the U.S., resulting in a steady shift from traditional phthalate plasticizers to bio-based and non-phthalate alternatives. However, this has led to an increase in innovation for developing phthalic anhydride derivatives with better biodegradability. Over 120 patent applications for modified phthalic anhydride compounds were filed globally in 2023 alone. The industry is also witnessing a strong expansion in manufacturing capacities across Asia-Pacific. In 2024, South Korea increased its annual production by 150,000 metric tons, while Taiwan expanded by 90,000 metric tons.

Digital integration and process automation are becoming more prevalent in production units, improving efficiency by 12% on average. Companies are deploying AI and IoT-based monitoring tools to enhance oxidation processes, thus reducing emissions by up to 18% compared to conventional methods. Finally, trade dynamics have seen a rise in exports from Asia-Pacific to Europe, accounting for over 800,000 metric tons in 2024.

PHTHALIC ANHYDRIDE MARKET DYNAMICS

DRIVER

"Rising demand for plasticizers in PVC production."

The most significant driver of the phthalic anhydride market is the surging demand for plasticizers used in PVC production, especially within the construction and automotive industries. In 2024, global PVC production exceeded 56 million metric tons, with 45% involving phthalate-based plasticizers. Phthalic anhydride acts as a key intermediate in producing dioctyl phthalate (DOP), one of the most widely used plasticizers. The increased consumption of flexible plastics in piping, wire insulation, and synthetic leather products has directly fueled the rise in phthalic anhydride demand. Additionally, rising urbanization, particularly in developing countries, has led to an increase in residential and commercial construction, further accelerating plasticizer use.

RESTRAINT

"Environmental and regulatory restrictions."

One major restraint hindering market expansion is the tightening of environmental regulations against phthalate plasticizers. Europe's REACH legislation has banned several high-molecular phthalates in consumer goods, while the U.S. EPA added phthalic anhydride to its Toxics Release Inventory, resulting in stricter compliance for manufacturers. In 2023, more than 70% of European manufacturers had to reduce their phthalate-related output or shift to alternative chemicals. These regulations have increased operational costs by 8-12%, driven by necessary investments in emissions control and product reformulation. As a result, many companies are now investing in R&D to explore alternative production processes and phthalate-free plasticizers.

OPPORTUNITY

"Growth in unsaturated polyester resins (UPR) for industrial applications."

A strong opportunity lies in the growing demand for unsaturated polyester resins used in fiber-reinforced plastics, automotive components, and marine structures. In 2024, global consumption of UPR surpassed 3.2 million metric tons, with phthalic anhydride constituting nearly 26% of raw material input. Increasing demand for lightweight yet durable materials in wind turbine blades and corrosion-resistant industrial equipment is expected to further augment phthalic anhydride consumption. Countries like India and Vietnam have expanded their UPR production capacity by over 15% since 2022, making them key consumers of phthalic anhydride. This demand surge is supported by rising infrastructure and clean energy projects in these regions.

CHALLENGE

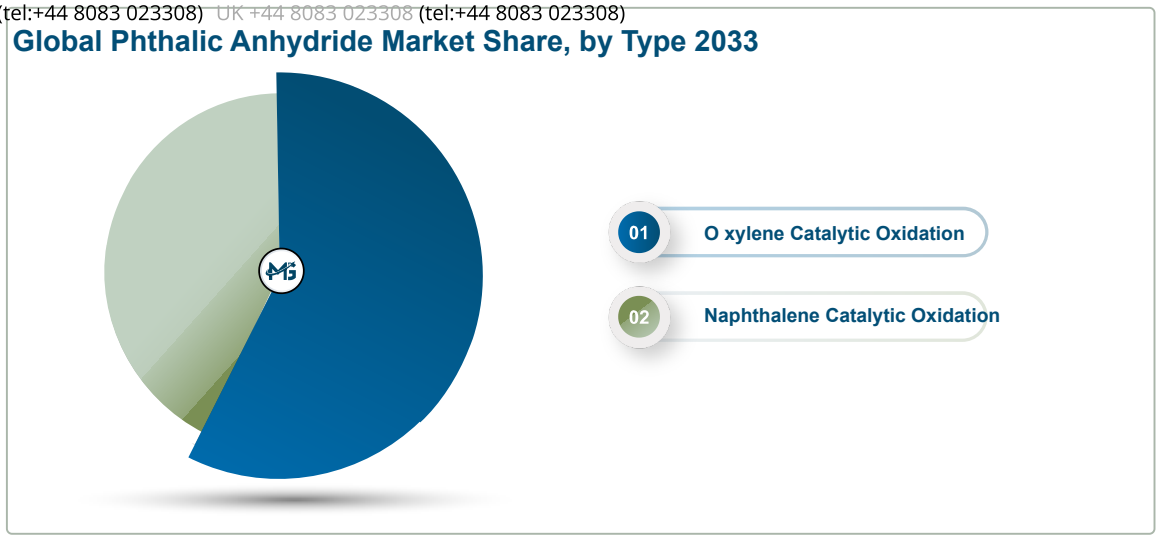
"Volatility in raw material prices."

One of the major challenges faced by the phthalic anhydride industry is the fluctuating prices of raw materials such as orthoxylene and naphthalene. In 2023, orthoxylene prices rose by 23% year-on-year due to supply constraints and rising crude oil costs. Similarly, naphthalene prices surged by 18% in the Asia-Pacific region owing to demand from agricultural

and dye intermediates. These fluctuations lead to unpredictable production costs, impacting price stability and profit margins for phthalic anhydride manufacturers. Companies are increasingly adopting dual-feedstock systems and long-term procurement contracts to mitigate price risk, but challenges remain in achieving consistent raw material availability.

PHTHALIC ANHYDRIDE MARKET SEGMENTATION

The phthalic anhydride market is segmented based on type and application. By type, it includes O-xylene Catalytic Oxidation and Naphthalene Catalytic Oxidation. By application, it is segmented into Plasticizers, UPR, Alkyd Resins, and Others.



By Type

» O-xylene Catalytic Oxidation: This type remains the dominant production route, accounting for over 75% of the global phthalic anhydride supply in 2024. The process is favored due to its high conversion rate and lower cost compared to naphthalene oxidation. In China alone, more than 1.8 million metric tons of phthalic anhydride were produced using O-xylene as the feedstock in 2023. This method yields over 90% product purity and enables continuous processing, making it suitable for large-scale industrial production.

» Naphthalene Catalytic Oxidation: This method is used primarily in regions where naphthalene is more accessible as a byproduct of coal tar distillation. In 2024, approximately 1.2 million metric tons of phthalic anhydride were produced via this route globally. Although it is less efficient than O-xylene oxidation, it is still preferred in areas like Eastern Europe and parts of India. The process typically yields a lower purity rate, around 85-88%, and requires additional purification steps.

By Application

» Plasticizers: Plasticizers accounted for more than 68% of total phthalic anhydride consumption in 2024. These are primarily used in the manufacture of PVC, which consumed over 3.8 million metric tons of phthalic anhydride globally. Flexible pipes, synthetic leather, and wire insulation are key applications in this segment.

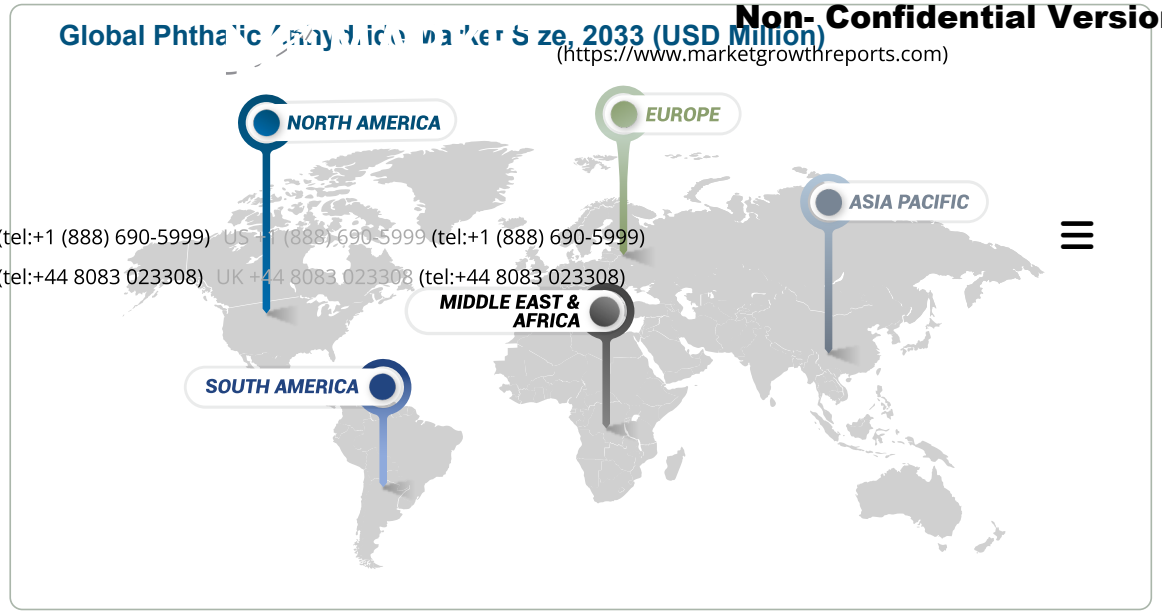
» UPR: Unsaturated polyester resins used in composites consumed about 1.3 million metric tons of phthalic anhydride in 2024. These resins are utilized in applications requiring high mechanical strength, such as automotive parts and storage tanks. India, South Korea, and Vietnam have expanded UPR output by 15% annually since 2022.

» Alkyd Resins: The alkyd resins segment used nearly 950,000 metric tons of phthalic anhydride in 2024. These are widely employed in decorative and industrial coatings. Demand is particularly strong in South America and Southeast Asia, where the decorative paint market is growing at a steady rate.

» Others: Applications such as dyes, pigments, and insect repellents consumed around 400,000 metric tons of phthalic anhydride in 2024. Innovations in specialty chemicals have led to the use of phthalic anhydride in developing novel colorants and intermediates.

PHTHALIC ANHYDRIDE MARKET REGIONAL OUTLOOK

The global phthalic anhydride market demonstrates strong regional variation in terms of production and consumption. The Asia-Pacific region remains the largest producer and consumer, followed by Europe and North America.



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» North America

In 2024, North America consumed approximately 700,000 metric tons of phthalic anhydride, with the U.S. accounting for 82% of regional demand. Demand is driven by the plasticizer and alkyd resin sectors. Regulatory constraints have prompted a gradual shift to alternatives, yet industrial usage continues, especially in coatings and construction. The region saw investments in modernization of old facilities, improving efficiency by 10%.

» Europe

Europe accounted for nearly 1.2 million metric tons of phthalic anhydride consumption in 2024. Germany, Italy, and France are the major consumers, primarily using it in UPR and coatings. Strict regulations on phthalate usage have affected plasticizer consumption, which fell by 6% compared to 2022. However, industrial and marine coatings continue to support steady demand.

» Asia-Pacific

Asia-Pacific dominated the market with over 3.1 million metric tons of consumption in 2024. China leads the region with over 2.1 million metric tons, followed by India at 300,000 metric tons. Expanding infrastructure, high plasticizer demand, and increased UPR production are key drivers. South Korea and Taiwan also reported annual capacity additions of 150,000 and 90,000 metric tons respectively.

» Middle East & Africa

This region showed consumption of about 350,000 metric tons in 2024, led by industrial growth in the UAE, Saudi Arabia, and South Africa. Demand was primarily focused on alkyd resins and plasticizers. The region is gradually moving toward establishing local production facilities, with two new plants under construction in the UAE with a combined capacity of 75,000 metric tons.

LIST OF TOP PHTHALIC ANHYDRIDE COMPANIES

- BASF
- ExxonMobil
- Aekyung
- Thirumalai
- Stepan
- Koppers
- UPC Group
- Polynt
- Proviron
- Lanxess
- CEPSA
- Deza
- Perstorp

- Shenghe
- Bluesail
- Henan Qing'an Chemical
- HongXin Company
- Anhui Tongling Chemical
- New Solar
- Jiangsu Sanmu Group
- Mitsubishi Gas Chemical

BASF: BASF produced over 650,000 metric tons of phthalic anhydride in 2024, making it the largest global supplier. The company operates advanced O-xylene oxidation facilities across Europe and North America.

Nan Ya Plastics: Nan Ya Plastics, based in Taiwan, produced over 400,000 metric tons of phthalic anhydride in 2024. The company supplies downstream applications in both domestic and international markets with a focus on plasticizer and resin segments.

INVESTMENT ANALYSIS AND OPPORTUNITIES

The phthalic anhydride market continues to attract significant investments, particularly in Asia-Pacific and the Middle East, where industrial expansion and infrastructure development are on the rise. Between 2022 and 2024, over $1.8 billion was invested globally in new phthalic anhydride production facilities. India saw the commissioning of two major plants with a combined annual capacity of 250,000 metric tons in Gujarat and Maharashtra, boosting regional supply and reducing import dependency by 40%.

In China, state-owned enterprises allocated $600 million in 2023 towards plant upgrades and the development of downstream resin integration units. These efforts are expected to increase national output by over 300,000 metric tons by the end of 2025. In the Middle East, the UAE and Saudi Arabia are building dedicated chemical parks, with two phthalic anhydride units under development totaling 75,000 metric tons per year. These investments are driven by increased regional demand for construction-grade coatings and UPR-based products.

Green and sustainable production processes are becoming a priority for investors. Over 30% of newly announced capacity in 2024 included environmental technology provisions such as energy-efficient reactors and waste heat recovery systems. Companies integrating renewable energy sources into production lines reported a 15% cost advantage and 12% fewer emissions.

International trade routes are also a focus area. The increase in maritime exports of phthalic anhydride from Asia to Europe exceeded 800,000 metric tons in 2024, and new port infrastructure in Vietnam and South Korea is expected to double export capacity by 2026. Additionally, long-term strategic partnerships between raw material suppliers and chemical producers have increased by 28% from 2022 to 2024, offering stable pricing and consistent supply chains.

NEW PRODUCT DEVELOPMENT

Innovation in phthalic anhydride-based products has accelerated due to environmental regulation and evolving application demands. In 2023, over 110 new formulations were developed for non-phthalate plasticizers, showing increased market potential for alternative compounds. Multinational chemical firms in Germany and Japan launched new grades of phthalic anhydride resins tailored for automotive coatings with higher UV resistance and 20% faster curing times.

There has also been a shift towards high-purity phthalic anhydride for electronics and pharmaceutical intermediates. Companies in South Korea and Taiwan introduced purification systems that increased product purity from 99.5% to 99.9%, enabling new applications in semiconductor-grade materials. In addition, new blends of alkyd resins incorporating biobased phthalic anhydride substitutes were commercialized in 2024 across Europe.

In India, R&D initiatives led to the introduction of flexible packaging resins with 15% improved tensile strength. These innovations expanded the usage of phthalic anhydride in non-traditional sectors such as agrochemical coatings and barrier films. Meanwhile, IG Petrochemicals partnered with regional institutes to pilot modified UPRs for electric vehicle parts, reducing weight by 22% without compromising structural integrity.

The trend of digitizing R&D pipelines is also noteworthy. Over 35% of manufacturers now use AI-driven analytics to predict performance characteristics of phthalic derivatives. This has reduced product development time by 18% on average. The number of patent filings for phthalic anhydride derivatives rose by 12% in 2023 compared to the previous year, underscoring the competitive innovation landscape.

FIVE RECENT DEVELOPMENTS

- In 2024, BASF expanded its phthalic anhydride capacity in Belgium by 120,000 metric tons through plant modernization.
- IG Petrochemicals announced a new production line in India with a 90,000 metric ton capacity operational by Q3 2024.
- Nan Ya Plastics introduced a high-purity phthalic anhydride product line in 2023 targeting the electronics industry.

- Polynt partnered with European automotive OEMs in 2023 to deliver UPR solutions with 22% enhanced heat resistance.
- Aekyung in South Korea launched a low-emission process in 2024 that cut CO_2 output per ton of phthalic anhydride by 17%.

REPORT COVERAGE

This report provides a comprehensive analysis of the global phthalic anhydride market, covering its production, consumption, and demand trends across regions. The scope includes historical and projected data from 2020 to 2025, with emphasis on consumption volumes, end-use industries, and regional trade patterns. The segmentation by type and application identifies growth areas such as O-xylene oxidation-based production and applications in plasticizers and UPR.

The report explores evolving regulatory environments across key markets like the EU, U.S., China, and India. These insights allow stakeholders to assess operational risks and compliance requirements. Coverage includes environmental impacts, sustainability initiatives, and the transition to bio-based alternatives. Industry trends such as feedstock volatility, green chemistry, and digitalization are addressed in depth, with quantifiable impacts highlighted.

Investment trends, capacity additions, plant upgrades, and joint ventures from 2022 to 2024 are detailed, showcasing the competitive landscape and expansion strategies of leading companies. Innovations in product development, such as advanced resins and plasticizer alternatives, are examined with technical and market performance metrics.

Additionally, the report evaluates the supply chain from raw materials (orthoxylene, naphthalene) to finished goods distribution. Regional profiles for North America, Europe, Asia-Pacific, and the Middle East & Africa provide detailed market snapshots, identifying production hubs, consumption centers, and emerging players. The analysis aids manufacturers, investors, policy makers, and researchers in making informed decisions across the phthalic anhydride value chain.

PHTHALIC ANHYDRIDE MARKET REPORT COVERAGE

REPORT COVERAGE	DETAILS
Market Size Value In	US$ 12203.99 Million In 2024
Market Size Value By	US$ 17676.63 Million By 2033
Growth Rate	CAGR of 4.2% from 2024-2033
Forecast Period	2024-2033
Base Year	2023
Historical Data Available	Yes
Regional Scope	Global
Segments Covered	**By Type** » O-xylene Catalytic Oxidation » Naphthalene Catalytic Oxidation **By Application** » Plasticizers » UPR » Alkyd Resins » Others

Frequently Asked Questions

What value is the Phthalic Anhydride market expected to touch by 2033

The global Phthalic Anhydride market is expected to reach USD 17676.63 Million by 2033.

What is CAGR of the Phthalic Anhydride market expected to exhibit by 2033?

Non- Confidential Version

Which are the top companies operating in the Phthalic Anhydride market? (https://www.marketgrowthreports.com) +

What was the value of the Phthalic Anhydride market in 2024? +

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Annexure 4.2

Exports of the product under consideration from Taiwan.

Statement of Exports from Taiwan to World
Product- Phthalic Anhydride

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POI-Oct'24-Sept'25
Source- Trademap

SN	Countries	Volume in MT					USD/MT					% Share				
		2021-22	2022-23	2023-24	2024-25	POI	2021-22	2022-23	2023-24	2024-25	POI	2021-22	2022-23	2023-24	2024-25	POI
		Phthalic Anhydride														
A	India	32,544	27,641	25,215	37,970	42,493	904	1,105	1,051	994	933	26%	25%	24%	36%	37%
B	ROW	94,981	84,359	80,004	67,358	71,792	923	1,134	1,041	997	919	74%	75%	76%	64%	63%
1	Saudi Arabia	16,866	18,839	14,881	16,696	17,276	928	1,137	1,047	983	913	13%	17%	14%	16%	15%
2	Malaysia	18,109	13,599	11,021	10,808	12,853	936	1,150	1,037	996	914	14%	12%	10%	10%	11%
3	United Arab Emirates	5,634	12,451	10,480	9,772	9,118	956	1,114	1,050	989	909	4%	11%	10%	9%	8%
4	Viet Nam	8,968	5,755	6,081	4,811	6,379	933	1,154	1,068	969	906	7%	5%	6%	5%	6%
5	Brazil	180	592	728	877	3,539	1,000	1,164	1,030	1,015	933	0%	1%	1%	1%	3%
6	Australia	5,735	4,328	4,777	3,636	3,356	968	1,177	1,061	1,004	912	4%	4%	5%	3%	3%
7	Singapore	1,962	1,278	2,502	3,222	3,186	917	1,117	1,000	1,006	907	2%	1%	2%	3%	3%
8	Egypt	612	1,628	2,907	1,063	3,000	856	1,109	1,020	1,025	924	0%	1%	3%	1%	3%
9	Türkiye	-	5,308	200	2,324	2,120	-	1,117	1,145	1,053	960	0%	5%	0%	2%	2%
10	Thailand	2,606	2,018	2,005	1,584	2,086	884	1,121	987	974	935	2%	2%	2%	2%	2%
11	Bangladesh	5,328	4,079	5,777	3,863	1,784	960	1,150	1,074	1,049	959	4%	4%	5%	4%	2%
12	China	19,296	1,295	1,382	1,457	1,693	863	1,043	986	982	936	15%	1%	1%	1%	1%
13	Indonesia	6,537	5,447	5,687	2,987	1,556	949	1,120	1,032	1,020	933	5%	5%	5%	3%	1%
14	Kuwait	-	-	1,012	1,007	1,444	-	-	1,024	1,032	965	0%	0%	1%	1%	1%
15	Pakistan	1,026	875	1,155	820	573	970	1,094	1,058	996	923	1%	1%	1%	1%	1%
16	Poland	-	1,482	1,776	792	504	-	1,154	1,014	1,013	988	0%	1%	2%	1%	0%
17	Philippines	1,115	552	579	266	285	940	1,145	986	959	919	1%	0%	1%	0%	0%
18	Jordan	522	223	861	380	273	929	1,085	1,066	937	868	0%	0%	1%	0%	0%
19	Korea, Republic of	-	91	915	510	231	-	1,220	1,040	1,035	974	0%	0%	1%	0%	0%
20	Morocco	-	-	-	104	104	-	-	-	913	913	0%	0%	0%	0%	0%
21	Japan	-	37	-	119	97	-	1,135	-	1,067	979	0%	0%	0%	0%	0%
22	Nigeria	-	-	168	95	95	-	-	1,226	947	947	0%	0%	0%	0%	0%
23	Sri Lanka	36	37	95	57	76	1,056	1,216	1,021	1,035	947	0%	0%	0%	0%	0%
24	Germany	60	459	212	-	51	850	1,124	1,071	-	961	0%	0%	0%	0%	0%
25	United States of America	-	1,322	381	-	40	-	1,203	1,089	-	875	0%	1%	0%	0%	0%
26	Canada	-	148	210	-	40	-	1,054	962	-	975	0%	0%	0%	0%	0%
27	Greece	-	18	-	-	18	-	1,111	-	-	944	0%	0%	0%	0%	0%
28	Panama	-	-	-	15	15	-	-	-	1,000	1,000	0%	0%	0%	0%	0%
29	Belgium	-	-	-	-	-	-	-	-	-	-	0%	0%	0%	0%	0%
30	Netherlands	15	-	-	30	-	867	-	-	1,033	-	0%	0%	0%	0%	0%
31	Italy	-	200	-	-	-	-	1,220	-	-	-	0%	0%	0%	0%	0%
32	Norway	62	-	47	-	-	1,161	-	1,064	-	-	0%	0%	0%	0%	0%
33	South Africa	18	144	-	-	-	833	1,021	-	-	-	0%	0%	0%	0%	0%
34	Tunisia	18	234	323	-	-	889	1,192	1,093	-	-	0%	0%	0%	0%	0%
35	Costa Rica	24	-	-	-	-	1,167	-	-	-	-	0%	0%	0%	0%	0%
36	Peru	96	494	-	-	-	906	998	-	-	-	0%	0%	0%	0%	0%
37	Kenya	108	92	102	38	-	981	1,196	1,078	1,026	-	0%	0%	0%	0%	0%
38	Mexico	48	547	155	-	-	875	1,084	1,181	-	-	0%	0%	0%	0%	0%
39	United Kingdom	-	63	201	-	-	-	1,079	1,124	-	-	0%	0%	0%	0%	0%
40	Spain	-	15	150	-	-	-	1,133	980	-	-	0%	0%	0%	0%	0%
41	Colombia	-	399	2,967	-	-	-	980	978	-	-	0%	0%	3%	0%	0%
42	Algeria	-	240	-	-	-	-	1,125	-	-	-	0%	0%	0%	0%	0%
43	Slovenia	-	36	54	-	-	-	1,000	963	-	-	0%	0%	0%	0%	0%
44	Romania	-	34	136	-	-	-	1,059	1,029	-	-	0%	0%	0%	0%	0%
45	Chile	-	-	77	-	-	-	-	948	-	-	0%	0%	0%	0%	0%
46	Argentina	-	-	-	25	-	-	-	-	1,040	-	0%	0%	0%	0%	0%
C	**Total**	**1,27,525**	**1,12,000**	**1,05,219**	**1,05,328**	**1,14,285**	**918**	**1,127**	**1,044**	**996**	**924**	**100%**	**100%**	**100%**	**100%**	**100%**

Annexure 6.1

Costing formats.

Costing data of the applicants contain complete details of the cost structure of the applicants which is business sensitive information and cannot be disclosed. The information is not amenable to summarization and hence been claimed confidential.

Annexure 6.2

Cost audit report

The cost audit report of the applicants constitute business sensitive information not susceptible to summarization. The cost audit report contains complete details of the cost breakup of the applicant which is sensitive in nature and cannot be disclosed.

Annexure 6.3

Financial Statement- TCL intermediates Limited.

TCL intermediates Limited is a private limited. Thus, the financial statement of TCL intermediates Limited is not publicly available information. The information is business sensitive information and cannot be disclosed. The information is not amenable to summarization and hence been claimed confidential.

Annexure 6.4

Project report

Project report of applicants contains complete details of the cost and benefit analysis of the project. The information is business sensitive information and cannot be disclosed. The information is not amenable to summarization and hence been claimed confidential.