

India

Underweight (no change)

Highlighted Companies

Atul Ltd

REDUCE, TP Rs4971, Rs7303 close

After two quarters of channel filling, exports of 2,4 D are slowing down. Consensus EPS is too high and needs a cut. We retain our REDUCE rating and target price of Rs4,971.

Clean Science and Technology

REDUCE, TP Rs665, Rs1299 close

The company's MEHQ business is under stress (spreads are at a multi-year low) and HALS' margins are even lower. As a result, it is margin-dilutive. On the other hand, MEHQ is also facing margin pressure because of rising domestic competition and declining exports.

Vinati Organics

ADD, TP Rs2772, Rs1835 close

Butyl phenols, guaiacol and anisole will start contributing meaningfully from FY26F, driving a 20% revenue CAGR over FY24-27F. We believe that higher EPS growth compared to the last three years (24% CAGR vs. -3% CAGR) deserves a 10% premium to the last five-year mean P/E. We have an ADD rating on the stock with a 12-month target price of Rs2,772.

Summary Valuation Metrics

P/E (x)	Mar24-A	Mar25-F	Mar26-F
Atul Ltd	61.63	49.86	39.48
Clean Science and Technology	56.57	51.39	52.72
Vinati Organics	58.82	43.67	36.16
P/BV (x)	Mar24-A	Mar25-F	Mar26-F
Atul Ltd	4.36	4.06	3.73
Clean Science and Technology	11.98	9.93	8.52
Vinati Organics	7.69	6.79	5.93
Dividend Yield	Mar24-A	Mar25-F	Mar26-F
Atul Ltd	0.19%	0.24%	0.3%
Clean Science and Technology	0%	0%	0%
Vinati Organics	0.39%	0.52%	0.63%

Chemicals - Others

Export Chemicals-III

- In this edition, we will cover 2,4 D, DASDA, ATBS, BHA and TBHQ.
- The US has imposed ADD on Indian 2,4D. DASDA exports are stagnant. Standalone BHA and TBHQ exports are declining as customers prefer blends.
- We retain REDUCE ratings on Atul, Deepak Nitrite, and Clean Science. Vinati remains our ADD-rated stock as ATBS is likely to do well in coming quarters.

Anti-dumping duty on 2,4D; exports of TBHQ and BHA are falling

Anti-dumping duty (ADD) has been imposed on Indian 2,4-D exports to the US. While the duty on Atul is approximately 13%, Chinese suppliers face a significantly higher anti-dumping duty or ADD of 127%. We believe the ADD will not negatively impact Atul's export prices; however, exports volume may decline in 3QFY25F, as 1Q and 2Q saw inventory stocking in the US in anticipation of the upcoming ADD. It's also important to note that multiple herbicides are currently performing better than 2,4-D in the US. On the other hand, standalone exports of TBHQ and BHA are declining. This is because neither TBHQ nor BHA is highly effective on its own, which is why customers prefer blends of antioxidants like TBHQ and BHA. Developing such blends is a time-consuming process as it requires close coordination with customers. Additionally, as TBHQ and BHA do not react with each other, a wide variety of combinations can work for different products. In fact, each product may require a unique combination of TBHQ and BHA (in percentage terms).

DASDA was always more hype, however ATBS is doing well

DASDA (diamino stilbene disulphonic acid) is a critical intermediate used in the production of optical brightening agents (OBAs), which are widely employed in textile, detergent, and paper industries. DASDA exports saw an increase during the post-COVID supply chain crisis; however, since then, they have not shown significant growth, and prices have remained very soft. On the other hand, an Indian company, Vinati Organics, is at the forefront of manufacturing high-purity ATBS, which has diverse applications across multiple sectors. After a soft FY24, ATBS exports are now increasing, and prices are recovering. This comes at a time when the key raw material, acrylonitrile, witnesses steady-to-declining prices, indicating robust demand for ATBS. It is worth noting that Vinati Organics continues to lead in the production of high-purity ATBS.

REDUCE rating on Deepak Nitrite, Clean Science & Atul; ADD Vinati

Earnings estimates of Deepak Nitrite, Clean Science and Technology (Clean Science), and Atul remain overly optimistic and far from reality. These companies are likely to face disappointment in FY25F and beyond. Deepak Nitrite's capex plans are particularly concerning, as they are unlikely to generate even a single-digit RoCE on this investment. Such capex often strains the balance sheet and can lead to a collapse in stock prices. In contrast, Vinati Organics is likely to perform well, driven by the recovery in ATBS demand and prices.

Research Analyst(s)



Satish KUMAR

T (91) 22 4161 1562
E satish.kumar@incredresearch.com

Abbas PUNJANI

T (91) 22 4161 1598
E abbas.punjani@incredresearch.com

Figure 1: Snapshot of our coverage universe

Company Name	Rating	Target Price (Rs)	INCRED's Estimates			Consensus Estimates	
			FY24	FY25F	FY26F	FY25F	FY26F
Aarti Industries	REDUCE	435	12.1	14.5	17.4	10.2	14.0
Ami Organics	REDUCE	714	21.9	22.8	24.1	28.9	43.4
Astec Lifesciences	REDUCE	778	-12.1	-4.8	7.8	-10.2	24.2
Clean Science and Technology	REDUCE	665	23.0	25.3	24.6	26.4	34.2
Deepak Nitrite	REDUCE	1,514	57.5	55.7	59.3	66.9	85.5
Gujarat Fluorochemicals	REDUCE	1,946	39.6	48.3	64.5	59.8	95.3
Laxmi Organic Industries	REDUCE	168	3.9	5.1	6.3	5.6	7.2
PI Industries	REDUCE	3,091	114.9	118.2	129.1	113.4	128.4
SRF	REDUCE	1,540	45.1	46.5	52.3	43.4	60.9
UPL	ADD	694	-36.3	6.7	34.7	13.7	36.7
Vinati Organics	ADD	2,772	31.2	42.0	50.7	37.9	49.4
Jubilant Ingrevia	REDUCE	364	13.3	14.6	18.1	16.0	21.6

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Export Chemicals-III

In this edition, we will cover 2,4 D, DASDA, ATBS, BHA and TBHQ. Out of these chemicals 2,4D appears to be at risk and Indian companies are under ADD inquiry in the US and CVD has already been imposed on Atul. We retain our REDUCE rating on Atul, Deepak Nitrite, and Clean Science. Vinati Organics remains our ADD-rated stock.

2,4 D: Anti-dumping duty in the US is a big headwind

2,4-dichlorophenoxyacetic acid, commonly known as 2,4-D, is a systemic herbicide widely used in agriculture to control broadleaf weeds. Some market participants believe that the 127% anti-dumping duty (compared to 13% on Atul) on Chinese suppliers will lead to higher imports from India and grant pricing power to Indian producers. However, 1) China is known to supply even below cost price, and 2) higher prices may deter users accustomed to prices of US\$3-3.1/kg over multiple years. In fact, the first signs of this shift are already visible as 2,4-D imports have fallen sharply in the US. It appears that US farmers are substituting 2,4-D with other herbicides, such as glyphosate.

2,4 D is a common herbicide ►

2,4-D works by disrupting plant cell growth in broadleaf species, causing them to grow uncontrollably and die, which selectively targets weeds without affecting most grasses (e.g., in cereal crops, lawns, and turf). It has agricultural as well as non-agricultural usage.

1. **Agriculture:** Used in cereal grains, pastures, rangelands, and rice paddy.
2. **Non-agricultural:** Used to control weeds in non-crop areas like roadsides, railways, and rights-of-way.
3. **Aquatic use:** Certain formulations are applied in aquatic environments to control invasive water weeds.

2,4-D is available in several formulations, including acid, salt, and ester forms, each having different properties and application purposes. Esters, for example, are more volatile and often used for foliar applications.

2,4 D is banned or its usage is restricted in many countries ►

2,4-D is banned or restricted in some countries due to concerns about its environmental and health impacts, particularly its potential toxicity to humans and wildlife, persistence in the environment, and risk of contaminating water sources. Here are a few examples:

1. Norway

Norway banned 2,4-D in the 1990s, citing concerns about potential harm to the environment and human health.

2. Sweden

Sweden implemented a ban on 2,4-D for similar reasons, primarily related to environmental contamination and public health risks.

3. Canada

While not fully banned, 2,4-D use is restricted in Canada. Specific formulations and application methods are regulated to reduce exposure risks, particularly to limit its use in residential areas.

4. Brazil

Brazil regulates 2,4-D usage heavily, particularly in agricultural settings. Though not banned, strict guidelines are in place for its handling, application, and storage to minimize risks.

5. Denmark

Denmark has taken restrictive measures, including bans on certain uses of 2,4-D, largely due to groundwater contamination concerns.

6. India

India does not have a full ban on 2,4-D, but regulatory authorities have placed restrictions on certain formulations and usage practices to minimize risks to farm workers and non-target crops.

7. European Union

While 2,4-D is approved for use in the European Union or EU, there are strict regulations on how and where it can be used. Certain formulations and derivatives may be restricted or banned based on the risk assessments conducted by the European Food Safety Authority (EFSA).

In many other countries, including the US, 2,4-D is allowed but is subject to stringent regulatory requirements regarding its sale, handling, and application. Given concerns about toxicity, environmental persistence, and contamination, some countries have taken a precautionary approach, especially where organic agriculture or stringent environmental protections are prioritized.

2,4 D is being investigated for dumping in the US >

2,4-D has indeed been investigated for anti-dumping practices in the US, primarily to address concerns that imported 2,4-D products from certain countries were being sold at unfairly low prices. These investigations are typically conducted by the US Department of Commerce (DoC) and the International Trade Commission (ITC) to determine if foreign manufacturers are "dumping" 2,4-D into the US market at prices below fair market value, which can harm domestic producers.

Prima facie, the US has found dumping by Indian and Chinese companies >

ADD has been imposed on Meghmani Organics and Atul. Please see the notification: <https://www.trade.gov/preliminary-determinations-antidumping-duty-investigations-24-dichlorophenoxyacetic-acid-peoples>.

Figure 2: ADD has been imposed on Atul, Meghmani Organics

India		
Exporter/Producer	Dumping Margin (Percent)	Cash Deposit Rate (Adjusted for Subsidy Offset) (percent)
Atul Limited	13.23	7.99
Meghmani Organics Limited	3.91	0.87
All Others	8.57	4.43

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 3: However, ADD imposed on Chinese companies is much higher

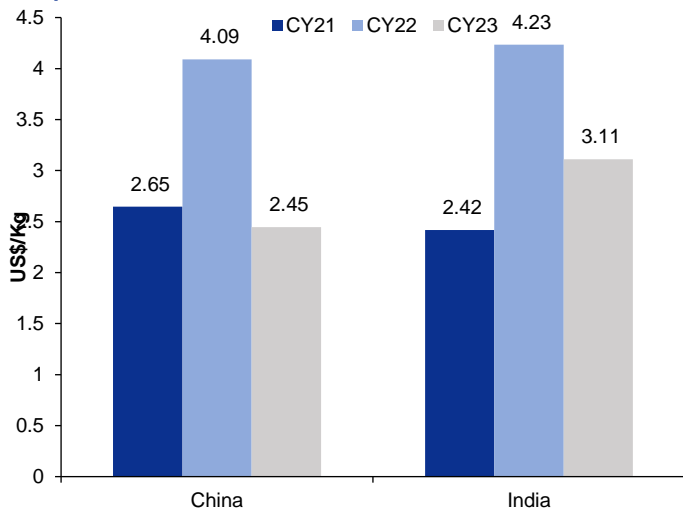
China			
Exporter	Producer	Estimated Weighted-Average Dumping Margin (percent)	Cash Deposit Rate (Adjusted for Subsidy Offset(s)) (percent)
Thai Harvest Ltd ¹	Jiangxi Tianyu Chemical Co., Ltd	17.07	16.44
China-Wide Entity		127.21*	126.58*

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Please note that as per US data, China has been dumping material in the US at much lower prices >

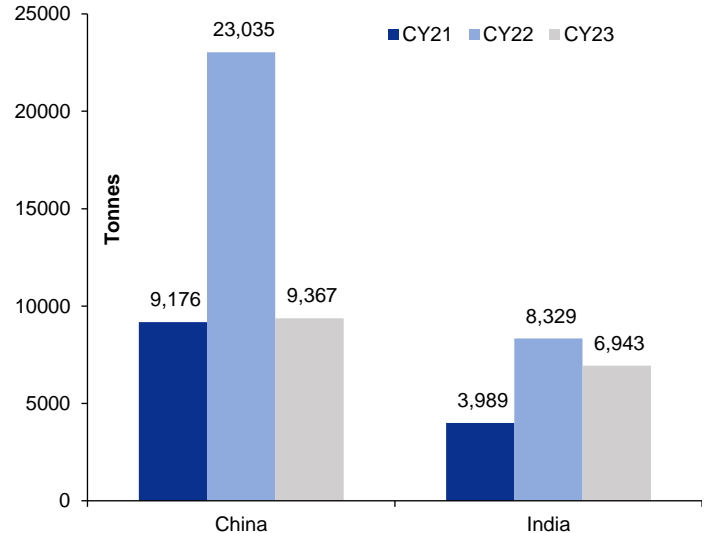
India's 2,4 D exports to the US have taken place at ~30% higher price in 2023. Also, please note that the US' 2,4D import volume is coming down.

Figure 4: Indian prices of 2,4 D are at least 30% higher compared to China



SOURCE: INCRED RESEARCH, COMPANY REPORTS

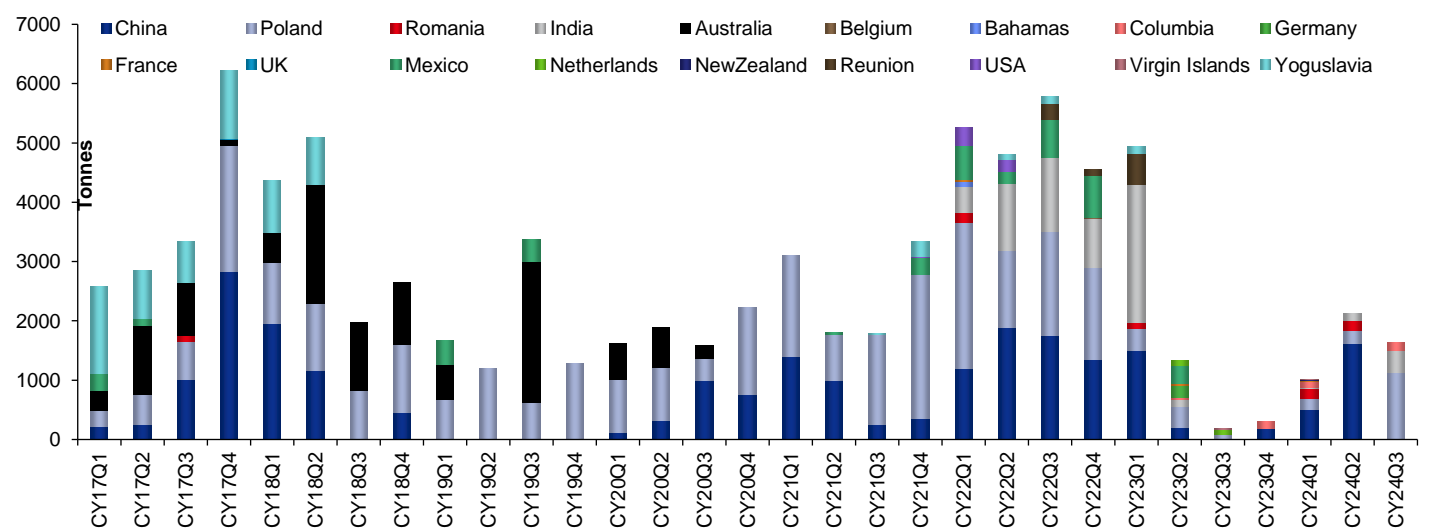
Figure 5: Indian imports in the US are also coming down



SOURCE: INCRED RESEARCH, COMPANY REPORTS

It appears that demand for 2,4D in the US is declining as imports are decreasing significantly ➤

Figure 6: The import of 2,4 D is falling in USA



SOURCE: INCRED RESEARCH, COMPANY REPORTS

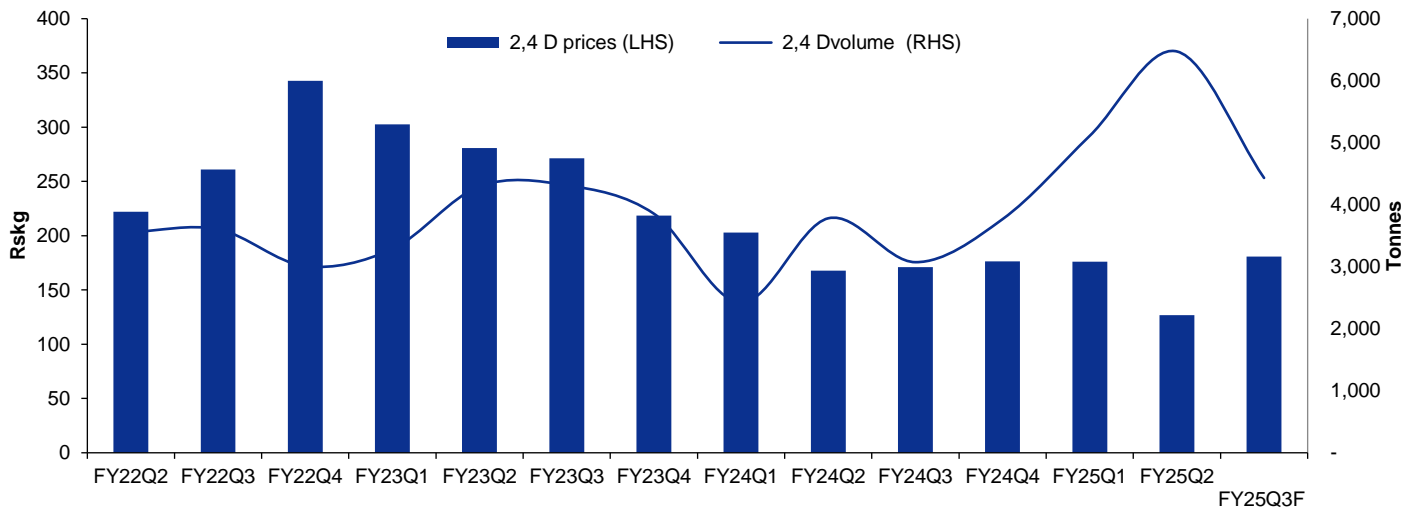
It appears that 2,4 D is replaced by other herbicides in the US ➤

There are several alternatives to 2,4-D, with triclopyr appearing to be a primary replacement, as dicamba is already banned in the US. Other alternatives include:

1. **Glyphosate** - Effective for broad-spectrum weed control, though non-selective, so it kills most plants on contact.
2. **Natural and organic herbicides** - These include acetic acid (vinegar-based), citric acid, and clove oil. While effective on young weeds, they may require more frequent applications and offer less residual control.
3. **Imazapyr** - A non-selective herbicide commonly used in industrial and non-crop areas; however, it is highly residual and can persist in the soil.

Export prices of 2,4 D are falling for Atul ▶

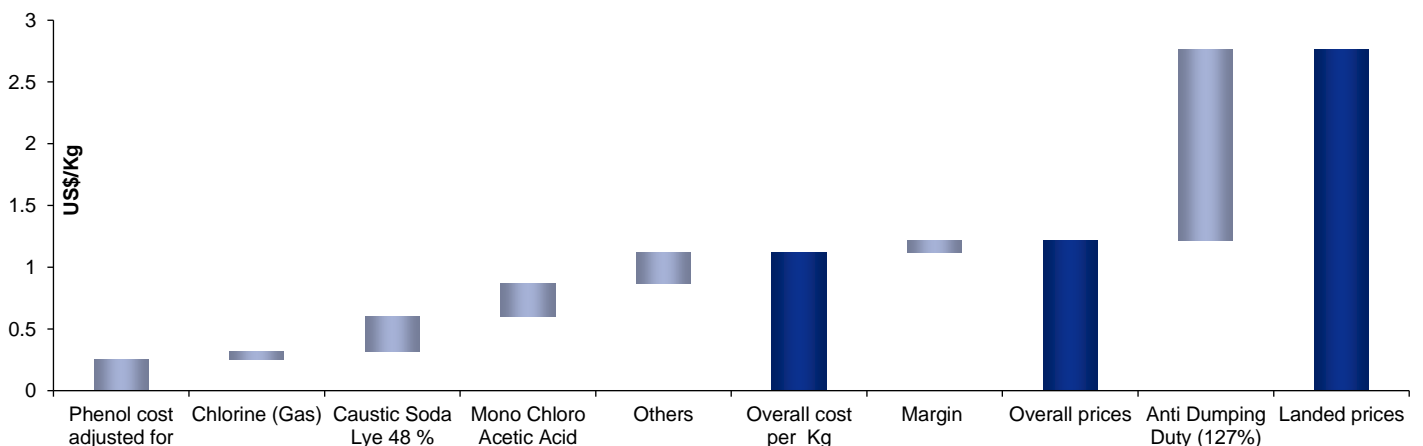
Figure 7: Export prices collapsed for Atul in 2QFY25, as China may have been selling in the export market before the likely imposition of ADD in the US



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Even with 127% ADD, we don't think that in US 2,4 D imports from China will go down ▶

Figure 8: Even with a 127% anti-dumping duty, China can continue supplying 2,4-D at well below the Indian price of US\$3.1/kg; in fact, even if they supply at 10% below the Indian price, they can still make a margin of 10-12 cents per kilogram



SOURCE: INCRED RESEARCH, COMPANY REPORTS

DASDA never fulfilled its hyped-up promise

DASDA (diamino stilbene disulfonic acid) is a chemical compound primarily used in the production of fluorescent whitening agents (FWAs) and optical brighteners. These are chemicals added to materials like paper, textiles, and detergents to enhance their brightness by absorbing ultraviolet or UV light and emitting blue light. DASDA is also used in the manufacture of dyes and certain types of high-performance plastics. In India, Deepak Nitrite is a significant producer of DASDA.

DASDA is a common chemical used in fluorescent whitening agents ▶

DASDA is primarily used in the following applications:

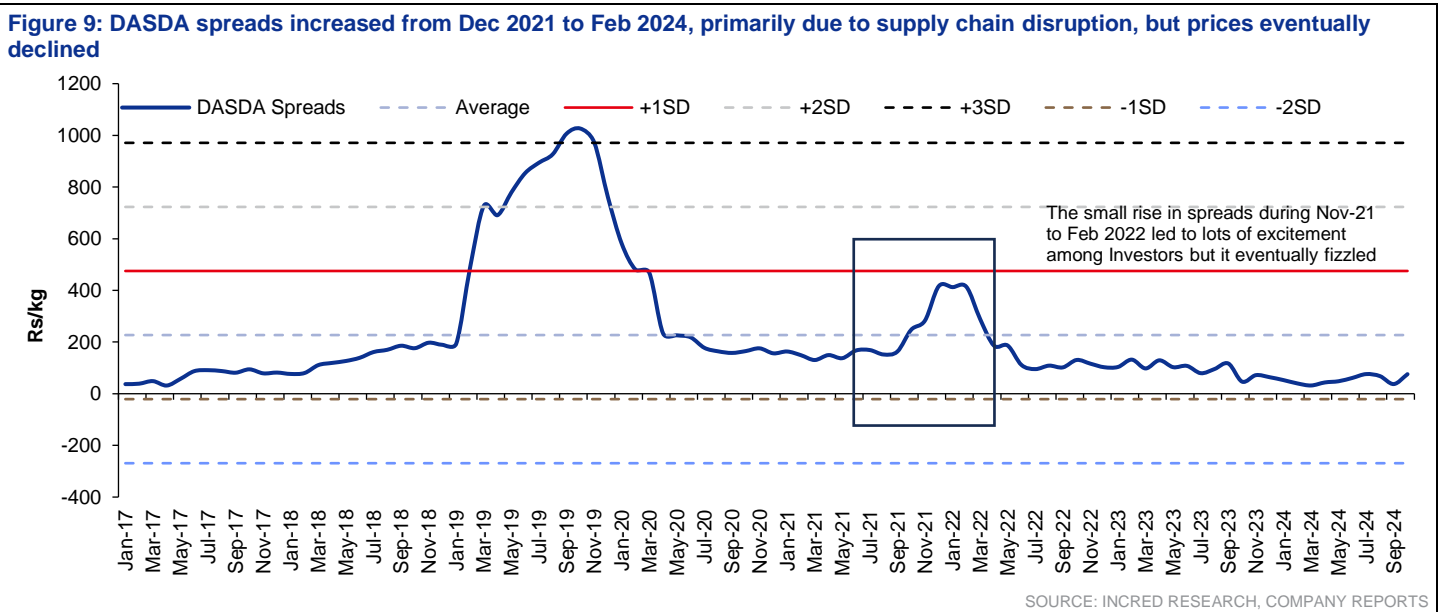
- Fluorescent whitening agents (FWAs):** DASDA is a key intermediate in the production of optical brighteners and fluorescent whitening agents. These chemicals are used to enhance the brightness of materials by absorbing

ultraviolet light and re-emitting it as visible blue light. This makes products like textiles, paper, and detergents appear whiter and brighter. For example:

- a. **Textiles and fabrics:** DASDA-based brighteners are used in the textile industry to make fabrics appear whiter and brighter.
 - b. **Paper industry:** DASDA is used in the paper industry to give paper a brighter appearance.
 - c. **Detergents:** It is used in detergents to make laundry appear brighter by reducing the yellowish tint on fabrics.
2. **Dyes and pigments:** DASDA is used as a precursor in the manufacture of certain types of dyes, especially in the textile industry, where it is part of the process for producing vibrant colours.
 3. **High-performance polymers:** DASDA is sometimes used in the production of high-performance polymers, especially in cases where the material needs to maintain stability under UV light exposure. DASDA's properties allow it to function as a UV stabilizer.
 4. **Electronics and special coatings:** In some cases, DASDA derivatives are used in the production of coatings and materials for the electronics industry, where UV stability and brightening properties are essential.

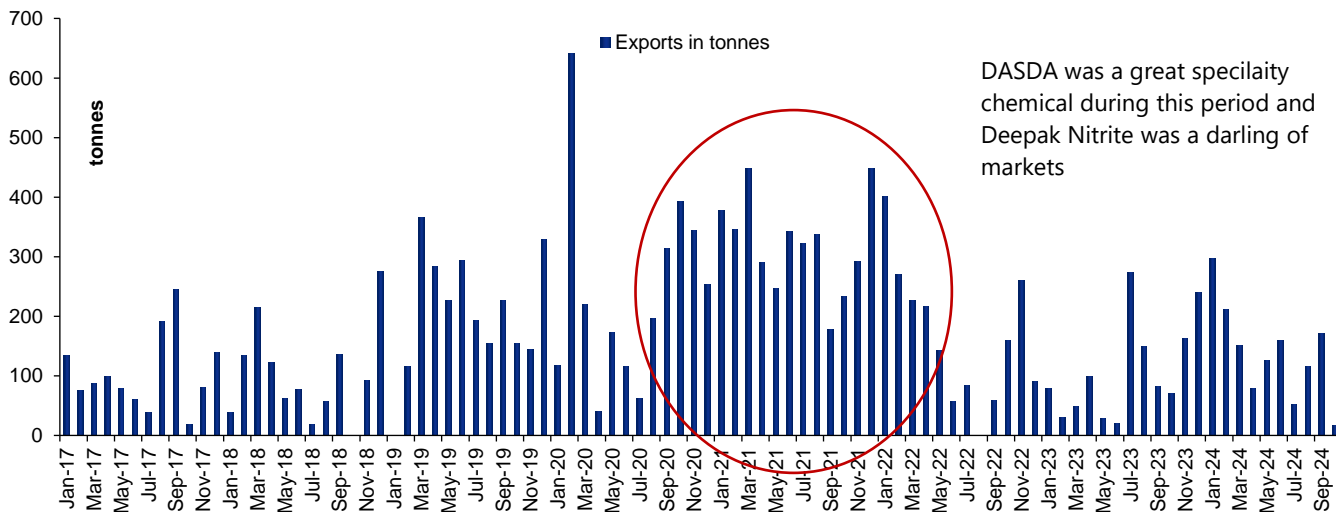
Deepak Nitrite is a major exporter of DASDA ▶

In Dec 2021, the market was abuzz with excitement over the potential of this chemical. A minor rally driven by inventory challenges was extrapolated, but it eventually fizzled out.



Global slowdown is weighing on DASDA exports which are slowing down ➤

Figure 10: During the period of euphoria, DASDA was perceived as a specialty chemical by markets



SOURCE: INCRED RESEARCH, COMPANY REPORTS

TBHQ – Clean Science is now manufacturing it; don't be surprised if it gets positioned as a super-specialty chemical in the narrative

TBHQ (tertiary butylhydroquinone) is a synthetic phenolic antioxidant widely used in food, cosmetic, and industrial sectors. TBHQ is manufactured by multiple producers in India.

TBHQ is primarily used as an antioxidant in food and pharmaceutical industries >

Food industry

TBHQ is added to oils and fats to improve oxidative stability and extend shelf life by preventing rancidity. It is commonly used in vegetable oils, processed foods (e.g., snacks, fried foods, and frozen meat products).

Cosmetic and pharmaceutical industries: Used as a stabilizer in cosmetics to prevent degradation of oils. Acts as an antioxidant in certain pharmaceutical formulations.

Industrial applications: Used in biodiesel, lubricants, and resins to prevent oxidation.

TBHQ is a commodity grade antioxidant >

TBHQ is classified as a commodity antioxidant. Its demand is tied to its primary use in the food processing industry, particularly in regions with a high consumption of processed and packaged foods.

TBHQ has competition from BHT, BHA and other natural antioxidants >

Competes with other antioxidants like BHT (butylated hydroxytoluene), BHA (butylated hydroxyanisole), and natural antioxidants like tocopherols. TBHQ is preferred when cost and effectiveness are critical considerations, particularly in high-temperature frying applications.

TBHQ doesn't have major health concerns, but it is a highly competitive market >

Although deemed safe within prescribed limits, excessive intake has been linked to potential health risks like DNA damage or carcinogenicity in animal studies. Consumer preference is shifting towards natural antioxidants, posing a challenge to TBHQ demand. Indian companies like Clean Science, and Vinati Organics are venturing into commodity-grade antioxidants, including TBHQ. However, these companies face stiff competition from Chinese and Western manufacturers, and the market is highly price-sensitive.

Hydroquinone and tert-butanol is needed to make TBHQ >

TBHQ (tertiary butylhydroquinone) is manufactured via a chemical synthesis process that typically involves the following steps:

Raw materials

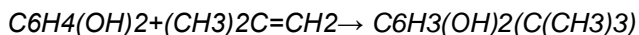
1. Hydroquinone (HQ): A dihydroxybenzene compound that acts as the core reactant.
2. Isobutylene (or tert-butanol): Provides the tertiary butyl group for the reaction.
3. Catalysts: Acid catalysts (e.g., sulfuric acid, phosphoric acid, or other acidic resins) are used to facilitate the alkylation reaction.

Process

Preparation of hydroquinone: Hydroquinone is often derived from benzene via the oxidation of phenol or through the reduction of quinone. This step is usually upstream of TBHQ production if hydroquinone is not directly purchased.

Alkylation reaction: Hydroquinone reacts with isobutylene or tert-butanol in the presence of an acid catalyst to produce TBHQ.

Conditions: Moderate temperatures (50–100°C) are typically maintained. The reaction may require slight pressurization if isobutylene gas is used.



Separation and purification: The reaction mixture is cooled, and TBHQ is separated by crystallization or distillation.

While reaction of the process is quite simple, however key is to stabilize the catalytic process ►

As usual, the reaction is simple, however key to stabilize the catalytic process during the reaction.

TBHQ is rarely used on a standalone basis and is often used in a mixture with BHA ►

TBHQ (tertiary butylhydroquinone) is often used in combination with other antioxidants, particularly **BHA (butylated hydroxyanisole)**, rather than as a standalone antioxidant. This synergistic use is common in food preservation and other applications for several reasons:

Why combine TBHQ with BHA? ►

- Enhanced antioxidant efficiency:**
 - TBHQ is more effective at stabilizing unsaturated fats and oils.
 - BHA performs better at stabilizing saturated fats and certain food products.
 - The combination provides broader protection against oxidation, leveraging the strengths of both antioxidants.
- Extended shelf life:**
 - Combining antioxidants can slow down the entire oxidative process by targeting different phases or mechanisms of lipid peroxidation, extending the shelf life of products more effectively than using either antioxidant alone.
- Cost-effectiveness:**
 - TBHQ is highly effective at low concentrations, but can be expensive. Mixing it with BHA can reduce overall formulation costs while achieving the desired oxidative stability.
- Regulatory limits:**
 - Food safety regulations often impose limits on the amount of a single antioxidant that can be used. By using a mixture, manufacturers can stay within legal limits for each antioxidant while achieving the required level of protection.
- Thermal stability:**
 - TBHQ has excellent thermal stability and is particularly effective in high-temperature applications, such as frying oils.
 - BHA complements TBHQ in lower-temperature applications, making the combination versatile across a wider range of food processing environments.

The typical challenge faced in making the mixture is deciding on the ratio of TBHQ and BHA ➤

TBHQ (tertiary butylhydroquinone) and **BHA (butylated hydroxyanisole)** do not chemically react with each other under normal conditions. They are both phenolic antioxidants, but their roles in mixtures are complementary rather than interactive.

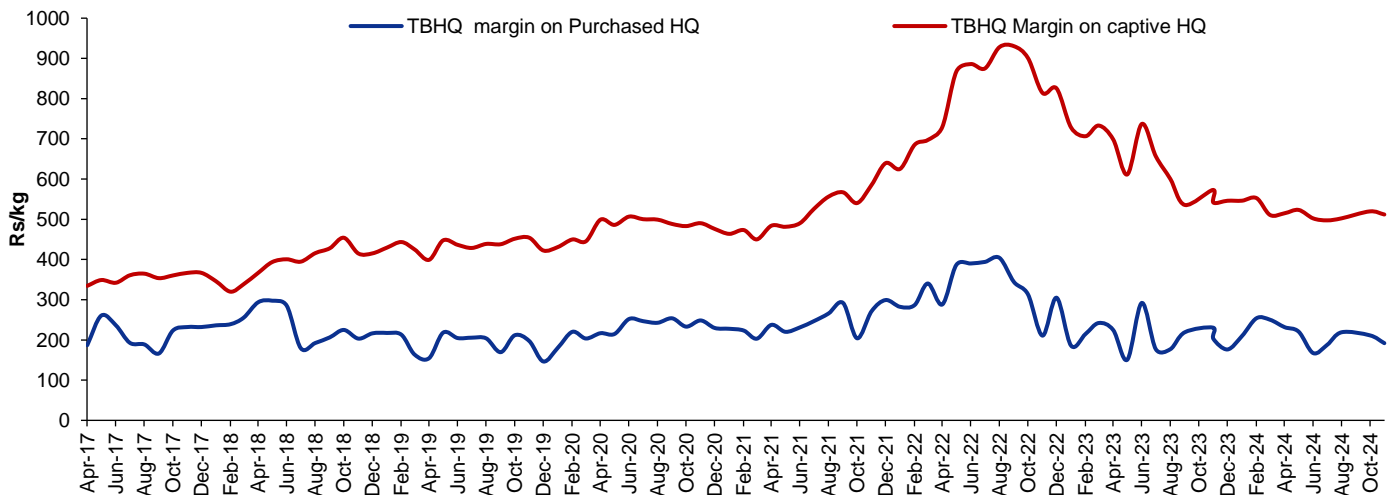
Hence, deciding on the ratio of mixing becomes a challenge while a typical ratio of BHA and TBHQ is in the range of **1:1 to 3:1 (TBHQ)** by weight, however it varies widely.

Deciding on the exact ratio is a trial-and-error process that requires close interaction with customers ➤

- Normally, a product requires a specific ratio based on its requirements, which can be achieved through a trial-and-error process.
- It requires significant back-and-forth communication between the customer and the supplier. Hence, being close to the customer is advantageous.
- Additionally, the amount of antioxidant used in kilograms of food items is minimal, which is why quality is critical
- Suppliers of food products have a significant stake in just a few grams of antioxidants. If the antioxidant quality is poor, their products will fail. Typically, if customers have even one bad experience with a food brand, they will discard it permanently.
- This is why the entry barrier in the blends business is very high, resulting in a relatively high Return on Capital Employed (RoCE).

Making TBHQ from purchased HQ is not very lucrative, as its margin is much lower compared to captive HQ-based manufacturing ➤

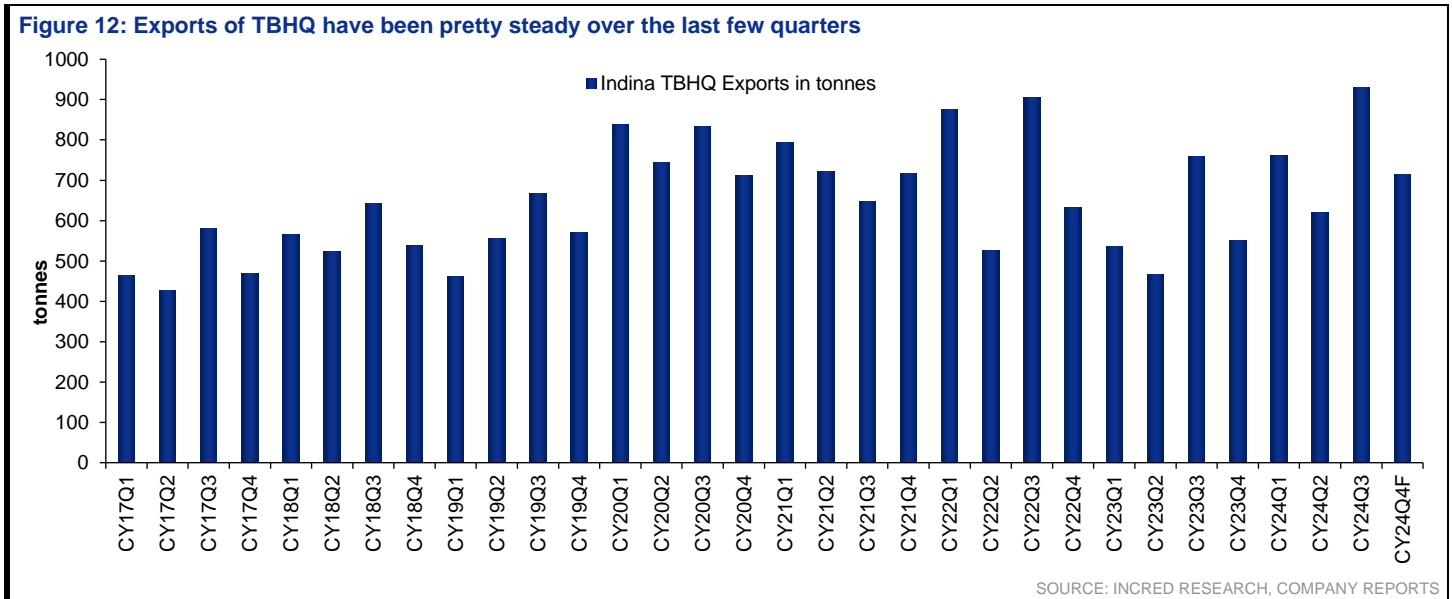
Figure 11: The gross profit from TBHQ via the captive HQ route is three times higher than the purchased HQ route; at least partially, this explains why Clean Science's gross margin is falling



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Standalone TBHQ exports from India have been steady over the years, which is attracting lots of new players in the TBHQ market ➤

Figure 12: Exports of TBHQ have been pretty steady over the last few quarters



ATBS- a definite edge to Vinati Organics

High-purity ATBS is in high demand and there only a handful of companies in the world who can supply such material and Vinati Organics is the clear leader. Many other companies have tried to attain the same purity levels, but have failed.

ATBS has multiple usage ➤

Acrylamido tertiary butyl sulfonic acid (ATBS) is a versatile monomer used in a wide range of applications due to its unique properties such as hydrophilicity, thermal and chemical stability, and resistance to hydrolysis under extreme pH and temperature conditions. Below are its key usages across various industries:

Water treatment

- Scale Inhibitors:** ATBS is used in formulations to prevent scale formation in boilers, cooling systems, and reverse osmosis membranes.
- Dispersants:** Its hydrophilic properties make it effective in dispersing suspended particles, ensuring smooth water flow in treatment systems.
- Flocculants:** Combined with other polymers to enhance the removal of impurities in water and wastewater treatment.

Oilfield chemicals

- Enhanced oil recovery (EOR):** ATBS improves the viscosity of polymer floods, making it easier to extract oil from reservoirs.
- Drilling fluids:** Used as a rheology modifier to stabilize the drilling fluid, reducing friction and preventing wellbore collapse.
- Cement additives:** Improves the mechanical properties and stability of cement used in oil well construction.

Adhesives and coatings

- Adhesives:** Enhances adhesion to various surfaces due to its polar sulfonic acid group.
- Paints and coatings:** Improves paint durability and resistance to cracking, UV degradation, and chemical corrosion.

Personal care products

- Rheology modifiers:** Used in formulations like gels, creams, and lotions to improve texture and spread ability.

2. **Conditioning agents:** Provides moisturizing and conditioning effects in hair and skin care products.

Textile and paper industry

1. **Textile processing:** Used in fabric sizing and dyeing processes to improve dye uptake and enhance fabric quality.
2. **Paper strength:** Increases the wet and dry strength of paper products.

Superabsorbent polymers (SAPs)

1. ATBS is a critical monomer in manufacturing SAPs used in diapers, adult incontinence products, and water retention gels in agriculture.

Electronics

1. **Conductive polymers:** Used in the production of electro-conductive polymers for antistatic coatings and electronic applications.
2. **Lithium-ion batteries:** Improves the performance of separators and binders in battery technologies.

Mining and metallurgy

1. **Flotation agents:** ATBS is used as a depressant in the flotation process to enhance the separation of minerals.
2. **Corrosion inhibitors:** Protects equipment and pipelines from chemical damage.

Construction

1. **Concrete additives:** Enhances the workability, durability, and water resistance of concrete mixtures.
2. **Anti-cracking agents:** Prevents shrinkage and cracking in building materials.

Agriculture

1. **Water retention:** Polymers containing ATBS are used in soil conditioners to retain moisture and improve crop yield.
2. **Seed coatings:** Enhances germination and nutrient absorption.

Medical and pharmaceutical

1. **Hydrogels:** Used in hydrogels for wound dressings, contact lenses, and drug delivery systems.
2. **Biocompatible polymers:** Provides stability and non-toxicity for medical applications.

Making high-purity ATBS is a challenge➤

Producing high-purity acrylamido tertiary butyl sulfonic acid (ATBS) is challenging due to the following reasons:

Complex reaction chemistry

- **Highly reactive monomer:** ATBS is prone to polymerization due to the reactive double bond in the acrylamide structure, making it essential to maintain precise reaction conditions to prevent undesired side reactions.
- **Sulfonation step sensitivity:** The introduction of the sulfonic acid group requires tight control over temperature and catalyst concentrations. Any deviations can lead to by-products that lower purity.

Impurity control

- **Residual sulphates:** Sulphates from the sulfonation reaction can remain as impurities and are difficult to remove without advanced purification techniques.
- **By-products:** Side reactions can produce oligomers, unreacted intermediates, or other contaminants, which are challenging to separate from the desired ATBS.

Purification challenges

- **Thermal sensitivity:** ATBS degrades at high temperatures, limiting the use of conventional purification methods like distillation.

- **High hydrophilicity:** Its water solubility complicates the separation of ATBS from aqueous impurities and by-products, necessitating specialized crystallization or membrane filtration technologies.

Handling polymerization risks

- **In-process polymerization:** Even trace impurities or improper cooling can trigger polymerization during synthesis, leading to significant yield loss and equipment fouling.
- **Storage stability:** High-purity ATBS requires careful handling and stabilizers to prevent polymerization during storage, especially under warm or humid conditions.

Raw material dependence

- **High-quality acrylonitrile:** Impurities in the starting materials, such as acrylonitrile, can lead to contamination of the final product.
- **Catalyst sensitivity:** The catalysts and reagents used must be of ultra-high purity to avoid introducing unwanted elements into the product.

Cost and scale limitations

- **High cost of purification:** Achieving ultra-high purity involves advanced, energy-intensive processes like multi-stage crystallization, which increase production costs.
- **Scalability:** Maintaining consistent purity across large-scale production is more complex than small-batch processes.

Environmental and safety concerns

- **Toxic intermediates:** The process may involve handling hazardous chemicals like acrylonitrile, requiring stringent environmental and safety controls.
- **Waste management:** Proper treatment and disposal of reaction by-products and residual catalysts add operational complexity.

In fact, the pioneer, Lubrizol, was outpaced by Vinati Organics in the race for high-purity ATBS >

Vinati Organics has emerged as a leader in the high-purity ATBS market, even outpacing Lubrizol, the original pioneer in commercializing ATBS. Several factors contributed to this shift, including advancements in process optimization, cost efficiency, and strategic focus.

Lubrizol pioneered ATBS production and developed it for use in water treatment, oilfield chemicals, and specialty applications. Despite its early start, Lubrizol struggled to maintain dominance due to:

- High production costs at Western facilities.
- Limited focus on scaling production to meet rising global demand.
- Competition from emerging economies with cost advantages.

Vinati Organics emerged as the challenger to Lubrizol because of the following reasons:

- **Process optimization:** Vinati Organics invested heavily in R&D to develop proprietary technologies that enabled the production of high-purity ATBS at a competitive cost.
- **Vertical integration:** The company secured a reliable supply chain for critical raw materials, ensuring consistent quality and cost efficiency.
- **Focus on purity:** Vinati Organics achieved purity levels exceeding industry benchmarks (>99%), making it a preferred supplier for industries with stringent quality requirements.
- **Economies of scale:** By expanding capacity significantly, Vinati Organics became the world's largest ATBS producer, leveraging scale to outcompete smaller and less efficient players.

Ultimately, Lubrizol was forced out of the ATBS market because of the following factors:

- Shift in focus: Lubrizol diversified into other specialty chemicals and polymer additives, deprioritizing ATBS.
- Market dynamics: The rise of cost-competitive producers like Vinati Organics disrupted Lubrizol's market share.
- Higher costs: Operating in high-cost regions with less focus on economies of scale made Lubrizol less competitive in the ATBS segment.

Global demand for ATBS is approximately 40-45kt and is driven by multiple sectors ➤

The global demand for acrylamido tertiary butyl sulfonic acid (ATBS) is estimated to be around 40,000 to 45,000t per year, with steady growth driven by its diverse industrial applications. The market is expected to grow at a compounded annual growth rate (CAGR) of around 5-6% due to its rising usage in water treatment, oilfield chemicals, and personal care industries.

Water treatment:

1. Accounts for 30-35% of ATBS demand.
2. Growth is fuelled by stricter environmental regulations and the need for efficient water management solutions.

Oilfield chemicals:

3. Represents 25-30% of the market.
4. Enhanced oil recovery (EOR), drilling fluids, and cementing operations are the primary drivers, especially in North America, the Middle East, and Russia.

Personal care and pharmaceuticals:

- Comprises 15-20% of demand.
- Used as a rheology modifier and in hydrogels for personal care and medical applications.

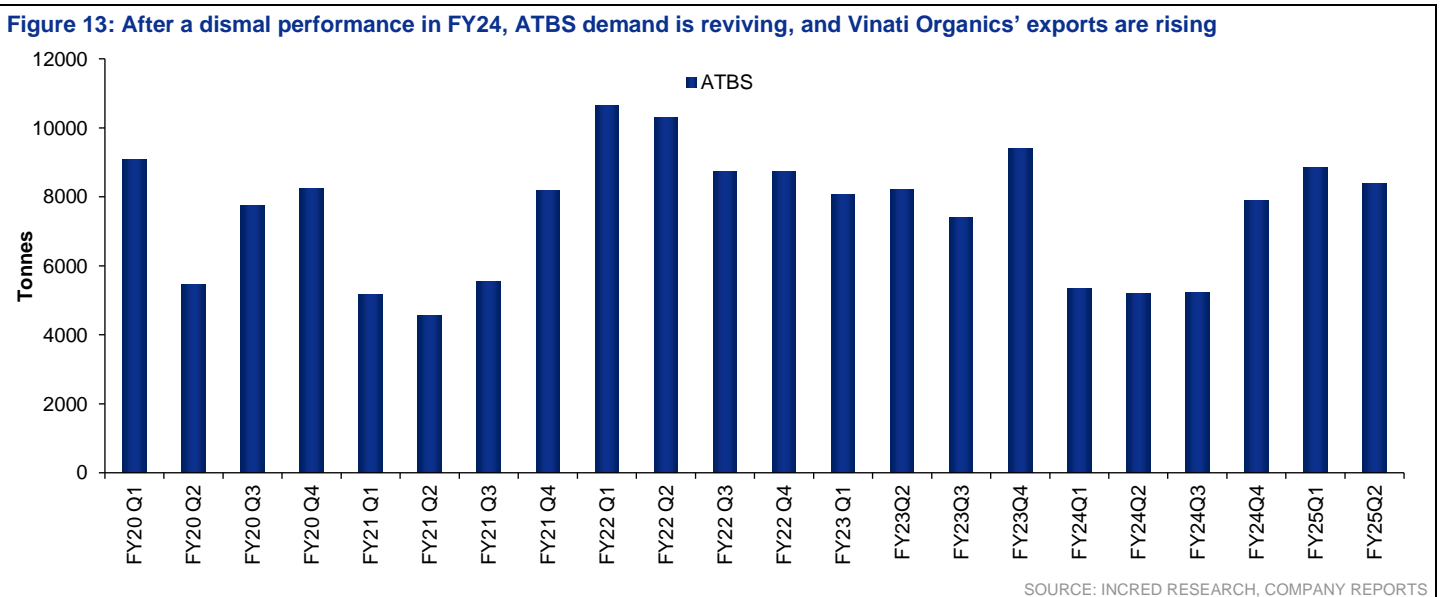
Adhesives, coatings, and construction:

5. Makes up 10-15% of the market.
6. Increasing usage in paints, coatings, and concrete additives is driving growth.

Others:

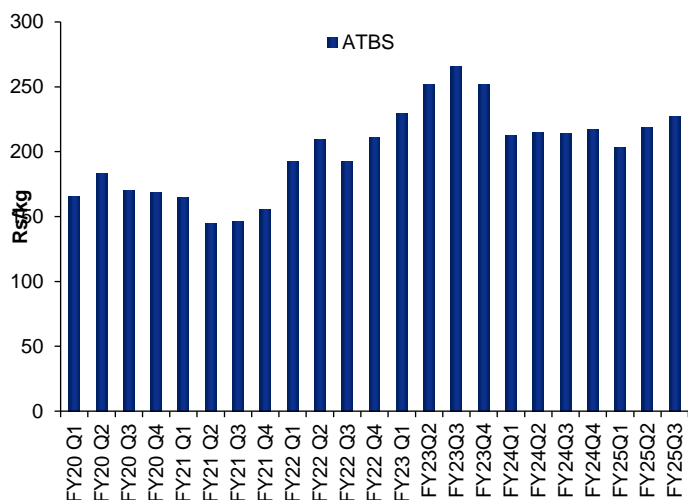
7. Includes applications in textiles, paper, mining, and electronics.
8. Contributes the remaining 5-10%.

After a dismal FY24, ATBS demand is seen reviving in FY25F and Vinati Organics' exports are rising ➤



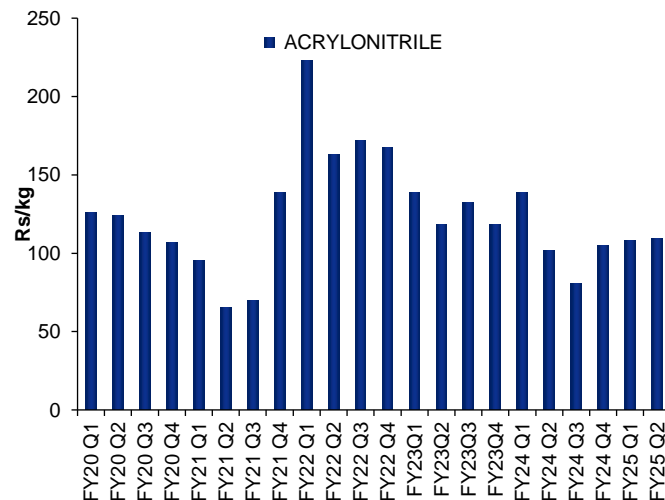
Export prices are also recovering while acrylonitriles (key raw material) prices are going down ➤

Figure 14: ATBS prices are rising



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 15: At the same time, acrylonitrile prices are going down



SOURCE: INCRED RESEARCH, COMPANY REPORTS

BHA- Limited scope unless one develops blend business with TBHQ

Like TBHQ, BHA has usage as an anti-oxidant➤

Butylated hydroxyanisole (BHA) is a synthetic antioxidant widely used across various industries to preserve products and enhance their shelf life. Below are the primary areas of BHA usage:

1. **Food industry** - Used to prevent oxidation in fats, oils, and fat-containing foods such as snacks, baked goods, cereals, and packaged foods. Helps retain flavour and prevent rancidity in products like margarine, shortening, and vegetable oils.
2. **Processed foods**: Found in processed meats like sausages and hot dogs to prevent discoloration and spoilage.
3. **Cosmetics and personal care** - Used in lipsticks, moisturizers, and other cosmetics to maintain stability and prevent oxidation of oils and fats. Helps preserve scents in perfumes and deodorants.
4. **Pharmaceuticals** - Used as a stabilizer to prevent active ingredients from degrading due to oxidation. Common in vitamin and supplement formulations to enhance stability.
5. **Animal Feed** - Used in animal feed to extend the shelf life of feed ingredients, particularly fats and oils.
6. **Industrial applications** - Acts as an antioxidant in synthetic rubbers, polyethylene, and other plastics to prevent degradation. Used to inhibit oxidation in lubricating oils and waxes.

BHA- Limited scope unless one develops blend business with TBHQ➤

Why BHA alone has limited scope?

1. Market saturation: BHA has been in use for decades, and its applications are well established. The growth potential in standalone usage is constrained.
2. Regulatory challenges: BHA faces scrutiny in many markets due to concerns over its safety, especially related to potential carcinogenicity in high doses. Some regions have either limited its usage or prefer alternatives.
3. Commodity nature: As a single antioxidant, BHA competes in a price-sensitive market, offering limited differentiation or value addition.
4. Customer preferences: Many customers prefer antioxidant blends that offer synergistic benefits over standalone antioxidants like BHA.

Value of blends business (BHA + TBHQ):

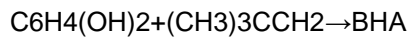
1. Synergistic benefits: Blends of BHA and TBHQ enhance oxidative stability more effectively than either compound alone, especially in complex formulations. TBHQ complements BHA by providing better stability at high temperatures and in frying applications.
2. Diverse applications: Blends are preferred in food formulations (e.g., snacks, oils, processed meats) and cosmetics where tailored oxidative stability is required.
3. Higher margins and stickiness: Custom antioxidant blends create customer stickiness by embedding the supplier deeper into product formulations. Approvals for blends often involve a lengthy qualification process, ensuring long-term contracts.
4. Adaptability across industries: Blends can be tailored for diverse needs, including food, animal feed, cosmetics, and industrial lubricants, offering scalability.
5. Barriers to entry: Developing effective blends requires technical expertise and close collaboration with customers, creating a competitive moat.

BHA can be manufactured through two different routes: 1) anisole, and 2) through HQ

Yes, butylated hydroxyanisole (BHA) can be manufactured using two primary routes, depending on the starting material and the desired process economics. The routes involve hydroquinone (HQ) and anisole, and each has its own advantages and challenges. Here's an analysis:

Hydroquinone (HQ) route

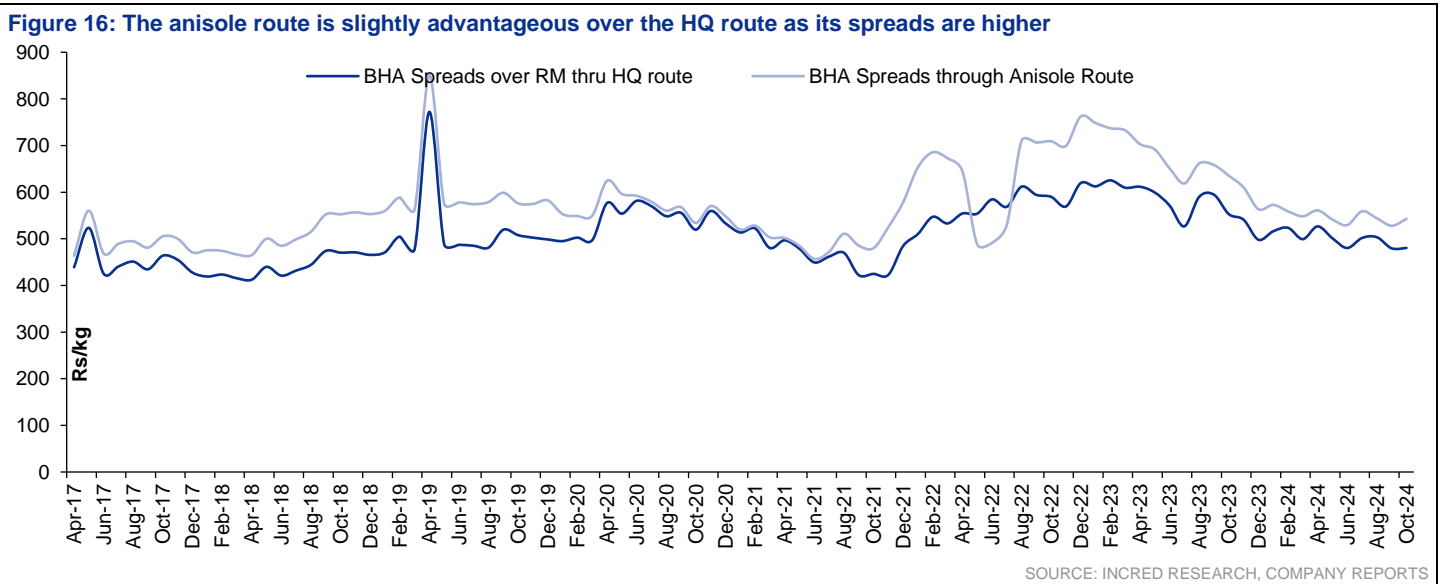
Hydroquinone reacts with isobutylene or tert-butanol in the presence of an acid catalyst to yield mono- and di-tert-butylated hydroquinones.



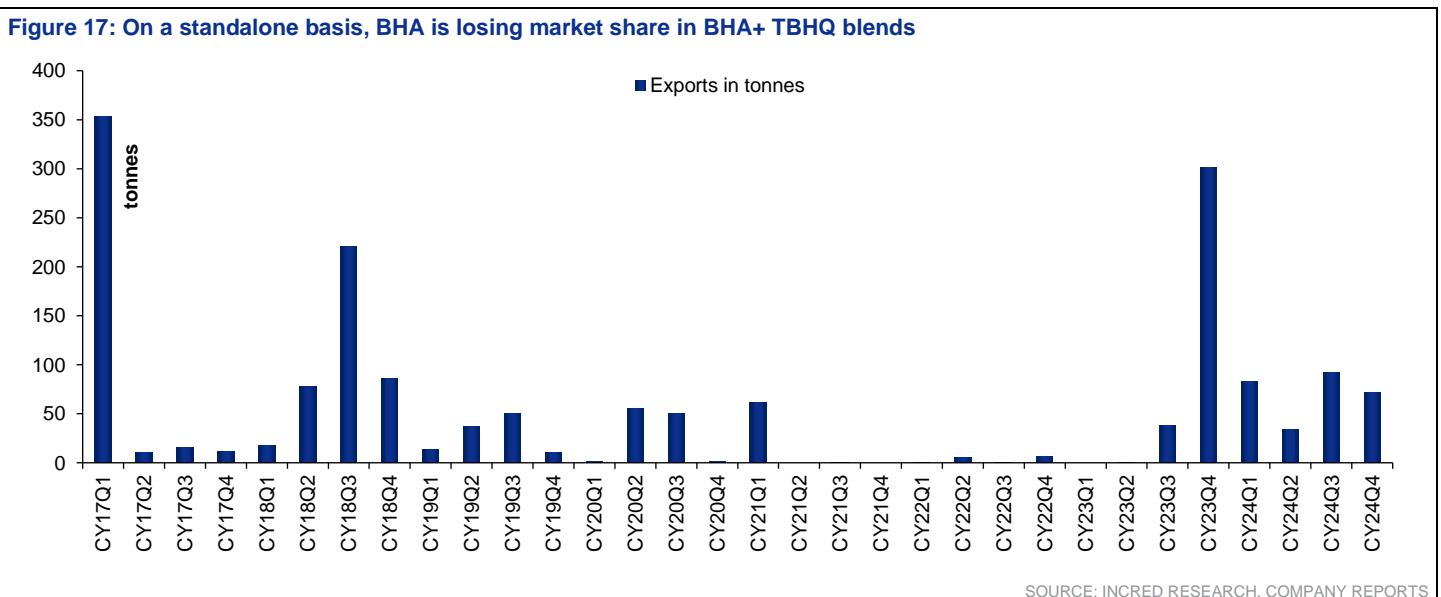
Anisole route

Anisole undergoes tert-butylation at the ortho or para positions using isobutylene or tert-butanol in the presence of a catalyst. The tert-butylated anisole is then demethylated to produce BHA.

- $C_6H_5OCH_3 + (CH_3)_3CCH_2 \rightarrow \text{tert-Butylated Anisole}$
- Demethylation to yield BHA.



Given the limited scope of BHA as a product, its exports from India are not rising



DISCLAIMER

This report (including the views and opinions expressed therein, and the information comprised therein) has been prepared by Incred Research Services Private Ltd. (formerly known as Earnest Innovation Partners Private Limited) (hereinafter referred to as "IRSPL"). IRSPL is registered with SEBI as a Research Analyst vide Registration No. INH000011024. Pursuant to a trademark agreement, IRSPL has adopted "Incred Equities" as its trademark for use in this report.

The term "IRSPL" shall, unless the context otherwise requires, mean IRSPL and its affiliates, subsidiaries and related companies. This report is not directed or intended for distribution to or use by any person or entity resident in a state, country or any jurisdiction, where such distribution, publication, availability or use would be contrary to law, regulation or which would subject IRSPL and its affiliates/group companies to registration or licensing requirements within such jurisdictions.

This report is being supplied to you strictly on the basis that it will remain confidential. No part of this report may be (i) copied, photocopied, duplicated, stored or reproduced in any form by any means; or (ii) redistributed or passed on, directly or indirectly, to any other person in whole or in part, for any purpose without the prior written consent of IRSPL.

The information contained in this report is prepared from data believed to be correct and reliable at the time of issue of this report.

IRSPL is not required to issue regular reports on the subject matter of this report at any frequency and it may cease to do so or change the periodicity of reports at any time. IRSPL is not under any obligation to update this report in the event of a material change to the information contained in this report. IRSPL has not any and will not accept any, obligation to (i) check or ensure that the contents of this report remain current, reliable or relevant; (ii) ensure that the content of this report constitutes all the information a prospective investor may require; (iii) ensure the adequacy, accuracy, completeness, reliability or fairness of any views, opinions and information, and accordingly, IRSPL and its affiliates/group companies (and their respective directors, associates, connected persons and/or employees) shall not be liable in any manner whatsoever for any consequences (including but not limited to any direct, indirect or consequential losses, loss of profits and damages) of any reliance thereon or usage thereof.

Unless otherwise specified, this report is based upon reasonable sources. Such sources will, unless otherwise specified, for market data, be market data and prices available from the main stock exchange or market where the relevant security is listed, or, where appropriate, any other market. Information on the accounts and business of company(ies) will generally be based on published statements of the company(ies), information disseminated by regulatory information services, other publicly available information and information resulting from our research. While every effort is made to ensure that statements of facts made in this report are accurate, all estimates, projections, forecasts, expressions of opinion and other subjective judgments contained in this report are based on assumptions considered to be reasonable as of the date of the document in which they are contained and must not be construed as a representation that the matters referred to therein will occur. Past performance is not a reliable indicator of future performance. The value of investments may go down as well as up and those investing may, depending on the investments in question, lose more than the initial investment. No report shall constitute an offer or an invitation by or on behalf of IRSPL and its affiliates/group companies to any person to buy or sell any investments.

The opinions expressed are based on information which is believed to be accurate and complete and obtained through reliable public or other non-confidential sources at the time made (information barriers and other arrangements may be established, where necessary, to prevent conflicts of interests arising. However, the analyst(s) may receive compensation that is based on his/their coverage of company(ies) in the performance of his/their duties or the performance of his/their recommendations. In reviewing this report, an investor should be aware that any or all of the foregoing, among other things, may give rise to real or potential conflicts of interest. Additional information is, subject to the duties of confidentiality, available on request. The report is not a "prospectus" as defined under Indian Law, including the Companies Act, 2013, and is not, and shall not be, approved by, or filed or registered with, any Indian regulator, including any Registrar of Companies in India, SEBI, any Indian stock exchange, or the Reserve Bank of India. No offer, or invitation to offer, or solicitation of subscription with respect to any such securities listed or proposed to be listed in India is being made, or intended to be made, to the public, or to any member or section of the public in India, through or pursuant to this report.

The research analysts, strategists or economists principally responsible for the preparation of this research report are segregated from the other activities of IRSPL. Information barriers and other arrangements have been established, as required, to prevent any conflicts of interests.

The research analysts, strategists or economists principally responsible for the preparation of this research report are segregated from the other activities of IRSPL. Information barriers and other arrangements have been established, as required, to prevent any conflicts of interests.

IRSPL may have issued other reports (based on technical analysis, event specific, short-term views, etc.) that are inconsistent with and reach a different conclusion from the information presented in this report.

Holding of Analysts/Relatives of Analysts, IRSPL and Associates of IRSPL in the covered securities, as on the date of publishing of this report

Research Analyst or his/her relative(s) or InCred Research Services Private Limited or our associate may have any financial interest in the subject company.

Research Analyst or his/her relatives or InCred Research Services Limited or our associates may have actual or beneficial ownership of 1% or more securities of the subject company(ies) at the end of the month immediately preceding the date of publication of the Research Report.

Research Analyst or his/her relative or InCred Research Services Private Limited or our associate entities may have any other material conflict of interest at the time of publication of the Research Report.

In the past 12 months, IRSPL or any of its associates may have:

- Received any compensation/other benefits from the subject company,
- Managed or co-managed public offering of securities for the subject company,
- Received compensation for investment banking or merchant banking or brokerage services from the subject company,
- Received compensation for products or services other than investment banking or merchant banking or brokerage services from the subject company

We or our associates may have received compensation or other benefits from the subject company(ies) or third party in connection with the research report.

Research Analyst may have served as director, officer, or employee in the subject company.

We or our research analyst may engage in market-making activity of the subject company.

Analyst declaration

- The analyst responsible for the production of this report hereby certifies that the views expressed herein accurately and exclusively reflect his or her personal views and opinions about any and all of the issuers or securities analysed in this report and were prepared independently and autonomously in an unbiased manner.
- No part of the compensation of the analyst(s) was, is, or will be directly or indirectly related to the inclusion of specific recommendations(s) or view(s) in this report or based on any specific investment banking transaction.
- The analyst(s) has(have) not had any serious disciplinary action taken against him/her(them).
- The analyst, strategist, or economist does not have any material conflict of interest at the time of publication of this report.
- The analyst(s) has(have) received compensation based upon various factors, including quality, accuracy and value of research, overall firm performance, client feedback and competitive factors.

IRSPL and/or its affiliates and/or its Directors/employees may own or have positions in securities of the company(ies) covered in this report or any securities related thereto and may from time to time add to or dispose of, or may be materially interested in, any such securities.

IRSPL and/or its affiliates and/or its Directors/employees may do and seek to do business with the company(ies) covered in this research report and may from time to time (a) buy/sell the securities covered in this report, from time to time and/or (b) act as market maker or have assumed an underwriting commitment in securities of such company(ies), and/or (c) may sell them to or buy them from customers on a principal basis and/or (d) may also perform or seek to perform significant investment banking, advisory, underwriting or placement services for or relating to such company(ies) and/or (e) solicit such investment, advisory or other services from any entity mentioned in this report and/or (f) act as a lender/borrower to such company and may earn brokerage or other compensation. However, Analysts are forbidden to acquire, on their own account or hold securities (physical or uncertificated, including derivatives) of companies in respect of which they are compiling and producing financial recommendations or in the result of which they play a key part.

Recommendation Framework

Stock Ratings

Definition:

- Add** The stock's total return is expected to exceed 10% over the next 12 months.
Hold The stock's total return is expected to be between 0% and positive 10% over the next 12 months.
Reduce The stock's total return is expected to fall below 0% or more over the next 12 months.

The total expected return of a stock is defined as the sum of the: (i) percentage difference between the target price and the current price and (ii) the forward net dividend yields of the stock. Stock price targets have an investment horizon of 12 months.

Sector Ratings

Definition:

- Overweight** An Overweight rating means stocks in the sector have, on a market cap-weighted basis, a positive absolute recommendation.
Neutral A Neutral rating means stocks in the sector have, on a market cap-weighted basis, a neutral absolute recommendation.
Underweight An Underweight rating means stocks in the sector have, on a market cap-weighted basis, a negative absolute recommendation.

Country Ratings

Definition:

- Overweight** An Overweight rating means investors should be positioned with an above-market weight in this country relative to benchmark.
Neutral A Neutral rating means investors should be positioned with a neutral weight in this country relative to benchmark.
Underweight An Underweight rating means investors should be positioned with a below-market weight in this country relative to benchmark.