India

Underweight *(no change)*

Highlighted Companies

Clean Science and Technology

REDUCE, TP Rs660, Rs1347 close

We see a significant disappointment in consensus earnings estimates. We have cut our target multiple to 20x FY25F EPS and retained REDUCE rating on the stock with a new target price of Rs660.

Camlin Fine Sciences

ADD, TP Rs300, Rs159 close

We have baked in vanillin benefits in our FY24F estimates to arrive at an EPS of Rs 15.1 for FY24F and Rs21.8 for FY25F. We have valued the stock at 20x FY24F EPS to arrive at our higher target price of Rs300 from Rs180 earlier.

Summary Valuation Metrics

P/E (x)	Mar22-A	Mar23-A	Mar24-F
Clean Science and Technology	62.65	50.31	45.87
Camlin Fine Sciences	37.41	25.49	10.55

P/BV (x)	Mar22-A	Mar23-A	Mar24-F
Clean Science and Technology	18.63	14.96	12.34
Camlin Fine Sciences	3.33	2.63	1.95

Dividend Yield	Mar22-A	Mar23-A	Mar24-F
Clean Science and Technology	0%	0%	0%
Camlin Fine Sciences	0.24%	0.39%	0.95%

Chemicals - Overall

Sell Clean Science and buy Camlin Fine

- Camlin Fine Sciences (CFSL) has a distinct cost advantage vs. Clean Science in making MEHQ. CFSL's re-entry in a slowing market led to the fall in its price.
- Falling margins in MEHQ, lower margins in TBHQ and barely double-digit EBITDA margin of HALS can lead to single-digit EPS growth of Clean Science.
- On the other hand, CFSL is likely to show a 193% EPS CAGR over FY23-25F. ADD Camlin Fine Sciences and REDUCE Clean Science.

Clean Science's MEHQ spreads decline as CFSL's HQ plant stabilizes

The chemistry of hydroquinone (HQ) production is such that if HQ is made using phenol and hydrogen peroxide, the process will produce 55% catechol and 45% HQ. Although MEHQ spreads from the HQ route are much higher than that of anisole, due to catechol losses and the HQ plant not being stable, CFSL was not able to undercut Clean Science and Technology (Clean Science) and capture market share. However, now the HQ plant is stable, and it is operating at more than 80% of its capacity. Even after accounting for catechol losses at the EBITDA level, CFSL's captive HQ-led MEHQ spreads are equal to the current spreads of Clean Science's MEHQ. However, if we account for vanillin production (which recovers total cost of catechol and still makes Rs400+/ kg EBITDA), then CFSL's spreads are higher than that of Clean Science's spreads over raw material by Rs 150/kg. This is leading to a fall in MEHQ prices and Clean Science's MEHQ spreads in 1QFY24F will be down by 25% over 4QFY23 (the entire fall led by MEHQ prices).

CFSL's captive HQ ended Clean Science's advantage in BHA

CFSL uses captive HQ to make TBHQ, which is then used to make BHA (butylated hydroxy anisole). On the other hand, Clean Science uses MEHQ to make BHA. Because of captive HQ, CFSL has a distinct cost advantage so much that as of now, BHA spreads of Clean Science and CFSL are equal.

TBHQ will barely make money for Clean Science

While Clean Science has ventured into making TBHQ, it is dependent on imported /bought-out HQ to make TBHQ and hence, gross margins will be at a bare minimum at ~Rs250/kg. On the other hand, CFSL, due to its captive HQ, will make ~600/kg gross profit. Also, TBHQ is mostly sold as a blend with BHA. CFSL took years to master this, as it's an iterative process. May be Clean Science will take less time, but still it can't happen in 3-4 quarters.

HALS can make at best 25% gross margin for Clean Science

Clean Science is planning to foray into the HALS market by initially installing 2,000t capacity, or 2% of the global market size, and later increase it to 10,000t. The global demand for HALS is ~100,000t, and Asia-Pacific is the largest market, with the automotive industry being the top user. There are at least 34 players in the market, and entry barriers for new suppliers are high. It's simply impossible to make any gross profit using Pt/C catalyst. It's possible that Clean Science will recover Pt from waste catalyst which will add to gross profit and hence, we believe it will make Rs150-200/kg gross profit in HALS.

Figure 1: CFSL will show much better earnings growth than Clean science

Revenue	FY23A	FY24F	FY25F	CAGR%
Camlin Fine Sciences	16,816	21,5164	25,816	23.9%
Clean Science and Technology	9,358	10,471	12,595	16.0%
EPS	**FY23A**	**FY24F**	**FY25F**	**CAGR%**
Camlin Fine Sciences	2.5	15.1	21.8	193.0%
Clean Science and Technology	27.8	29.4	33.8	10.3%

SOURCE: INCRED RESEARCH, COMPANY REPORTS

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Sell Clean Science and buy Camlin Fine

REDUCE Clean Science

Clean Science is the most hyped commodity chemical manufacturer in the Indian market. It makes eight chemicals. The names of these chemicals are 1) MEHQ, 2) BHA, 3) TBHQ, 4) anisole, 5) guaiacol, 6)4- methoxy acetophenone, 7) ascorbic palmitate, and 8) N N-dicyclohexylcarbodiimide. The company is planning to make HALS as well. All of them are commodity chemicals with a small market size and limited growth opportunities. Moreover, incrementally, the margins in this business will decline as competition intensifies in MEHQ.

Clean Science's dominance in MEHQ is over

MEHQ (mono methyl ether of hydroquinone) has a small market size with limited growth opportunities ➤

Clean Science is a leading manufacturer of specialty chemicals in India. The company is the largest producer of mono methyl ether of hydroquinone (MEHQ) in the world, with a market share of over 55%. The overall global market size of this market is ~13,000t.

MEHQ is a versatile chemical that has a wide range of applications. It is used as an antioxidant, stabilizer, and polymerization inhibitor in various industries. In the polymer industry, MEHQ is used to stabilize acrylic acid and other monomers. It is also used in the cosmetics industry as a skin lightener and as a preservative. In the paints and adhesives industry, MEHQ is used as a stabilizer and as a cross-linker. In the rubber industry, MEHQ is used as a stabilizer and as a vulcanization accelerator.

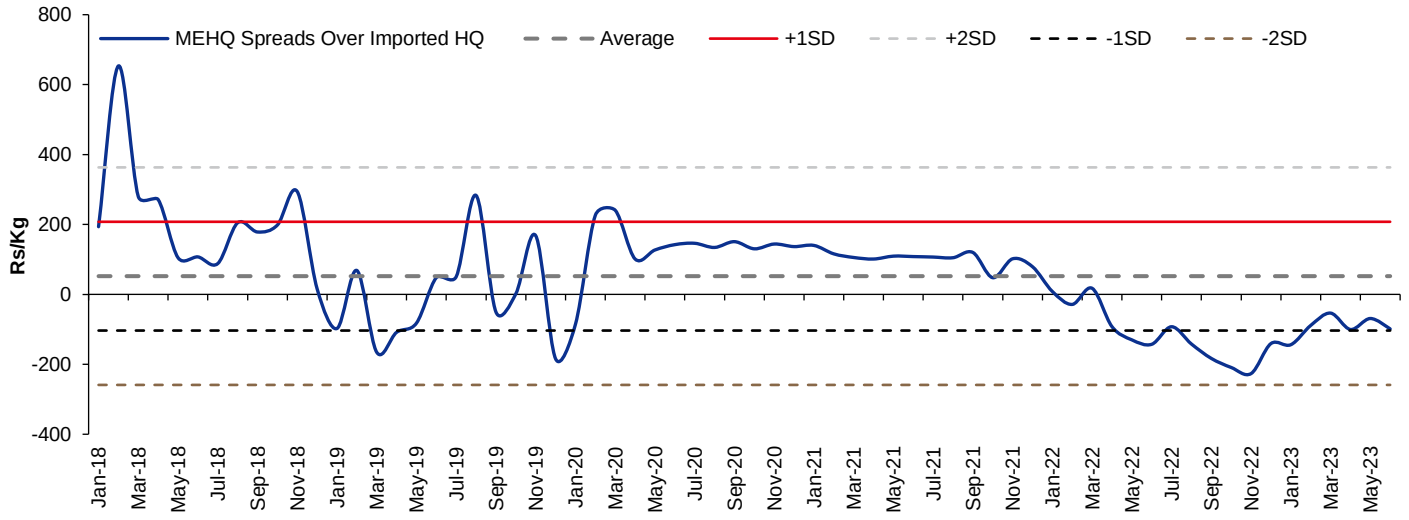
MEHQ can be produced by two methods - anisole route and hydroquinone (HQ) route ➤

MEHQ can be manufactured by two different processes - hydroquinone and anisole.

1. The most common method for the synthesis of MEHQ from anisole is by using a transition metal catalyst. This method is relatively selective and produces high yields of MEHQ - this process is used by Clean Science.
2. On the other hand, it can also be produced through the hydroquinone route. In this route, firstly hydroquinone (HQ) is reacted with methanol and H_2O_2 to make para-benzoquinone (PBQ). Now HQ and PBQ are reacted in the presence of methanol to make MEHQ. Camlin Fine Sciences or CFSL follows this process of making MEHQ.
3. The key for Camlin Fine Sciences' process is the access to cheap HQ, which will lead to lower cost of production. On imported HQ, it is not viable to make MEHQ.

Imported HQ is not viable to make MEHQ ➤

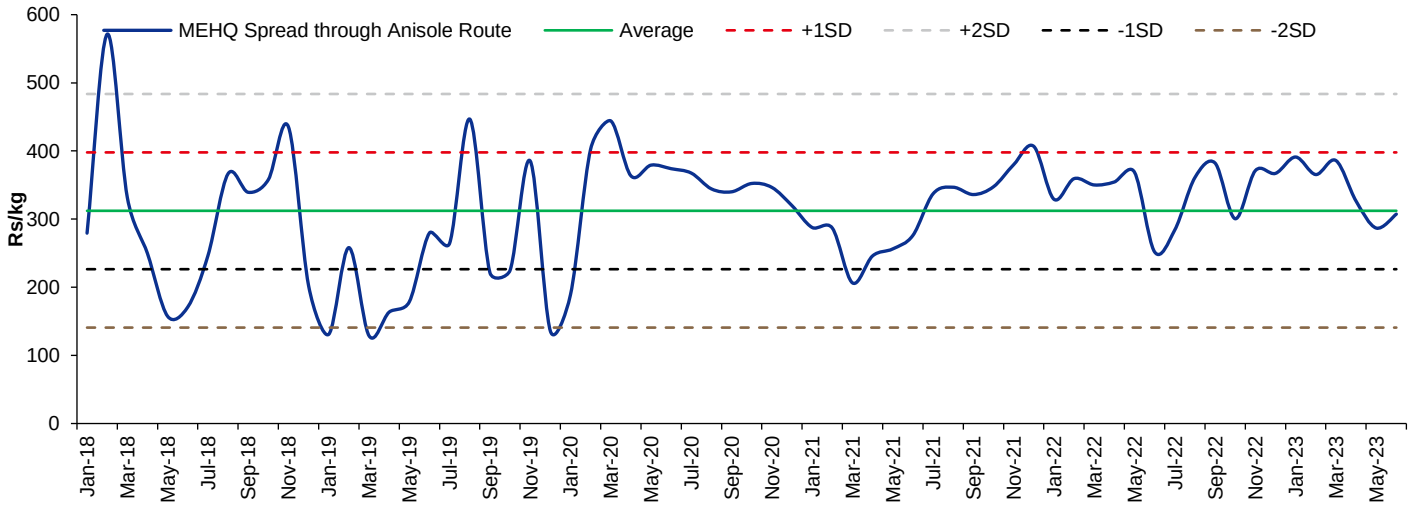
Figure 2: MEHQ makers using imported HQ will not be able to recover even their raw material cost, forget about making any EBITDA



SOURCE: INCRED RESEARCH, COMPANY REPORTS

However, MEHQ makers through the anisole route are minting money ➤

Figure 3: On the other hand, MEHQ spreads through the anisole route have never been bad - on an average, they have been at Rs 312/kg with a gross margin of ~51%



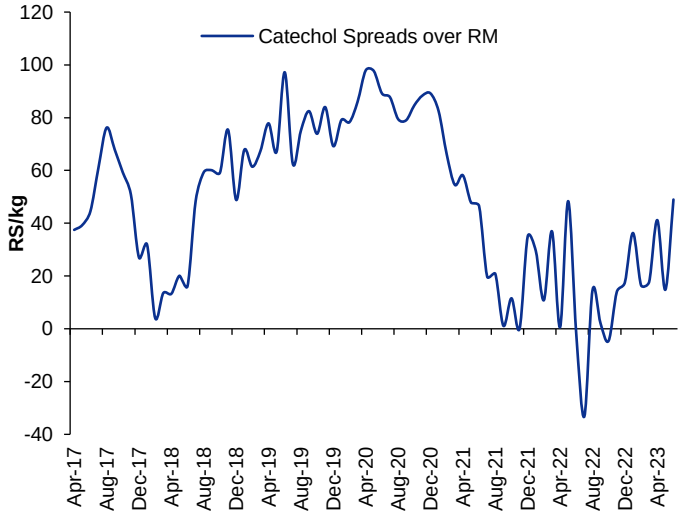
SOURCE: INCRED RESEARCH, COMPANY REPORTS

But things have changed as CFSL is making captive HQ and is using HQ's isomer catechol to make vanillin ➤

- The key problem in making HQ is not the process stabilization but the usage of its isomer which comes out along with HQ. In fact, 1t of HQ leads to the manufacture of 1.22t of catechol. The prices of catechol are so low that one will barely recover the raw material cost. Hence, the problems for Camlin Fine Sciences were two-fold like 1) stabilizing the HQ plant - which it could do only after trial and error for a couple of years, and 2) finding the usage for catechol by making vanillin.
- As of now, Camlin Fine Science's Dahej plant produces 8,250t of catechol which can be used for making vanillin. The company's vanillin capacity at Dahej is 6,000t, which needs ~7,000t of catechol. This still leaves Camlin Fine Sciences with 1,250t of excess catechol for sale in overseas markets.

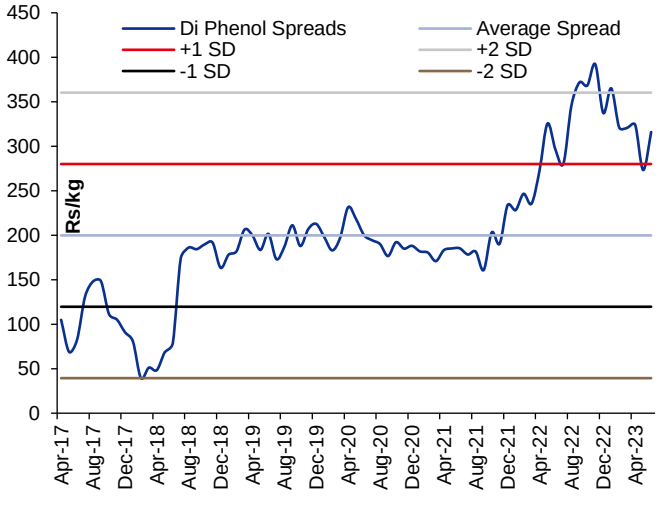
Even now, selling catechol on its own will result in losses at the EBITDA level, but di phenol (55% catechol+ 45% HQ) makes Rs200/kg EBITDA ➤

Figure 4: Catechol spreads over raw material are barely enough to cover for raw material and catalyst costs while EBITDA-level losses can be ~Rs100/kg



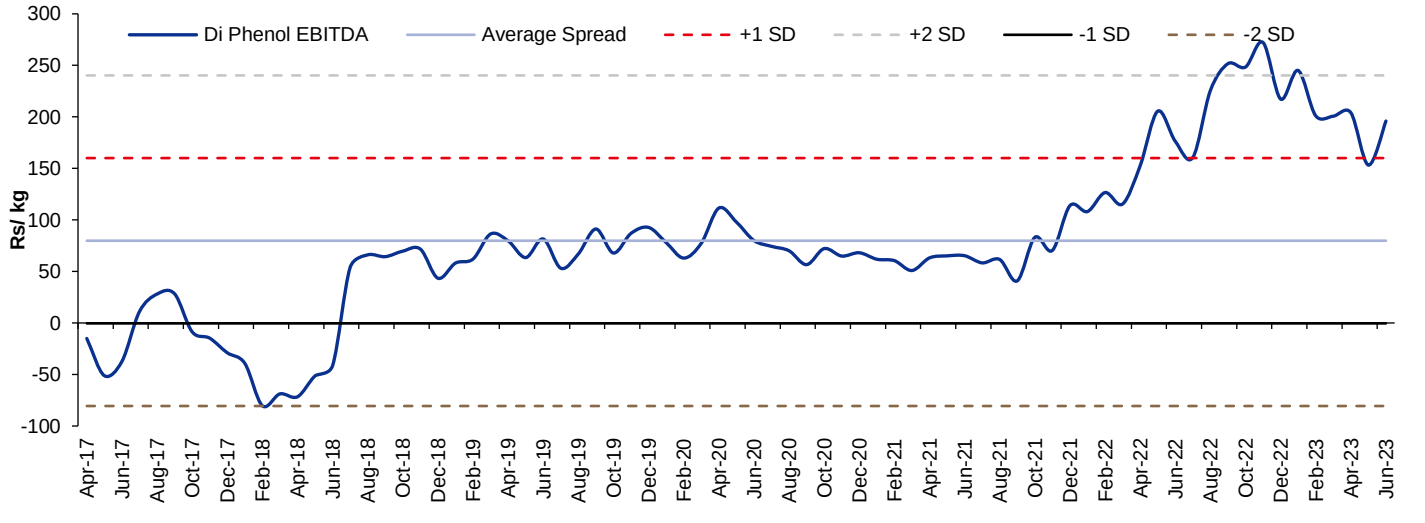
SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 5: However, di phenol spreads (55% catechol+ 45% HQ) are enough to make Rs200/kg EBITDA



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 6: As of now, Camlin Fine Sciences is making Rs 200/kg EBITDA on di phenol sales (i.e., combined sales of catechol and HQ, 1t of di phenol= 550kg catechol and 450kg HQ)

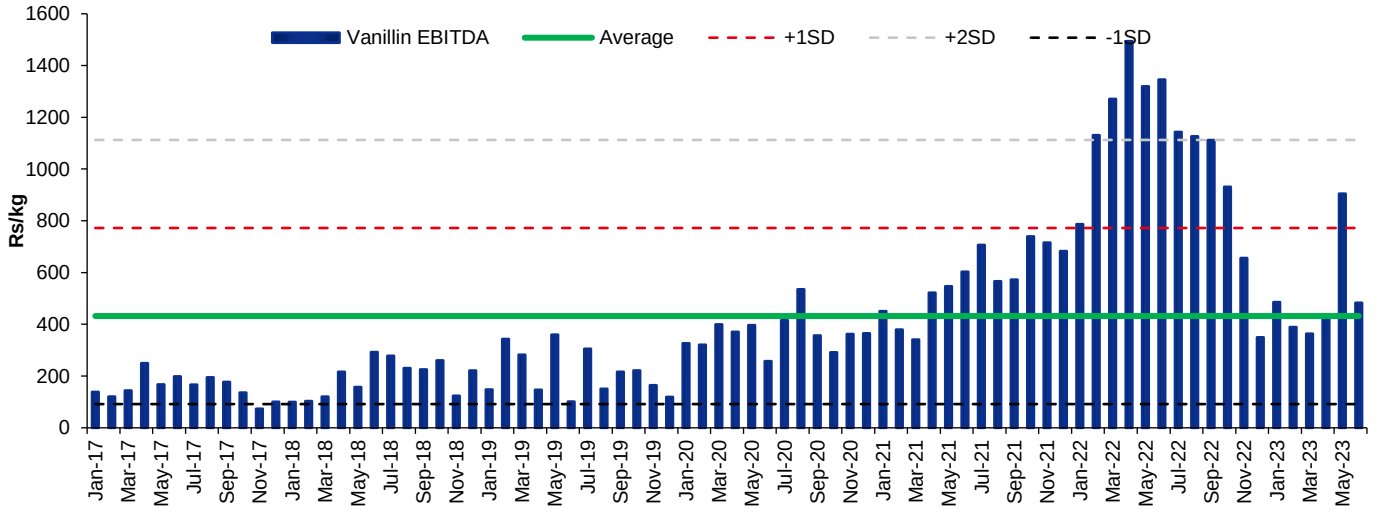


SOURCE: INCRED RESEARCH, COMPANY REPORTS

Now, Camlin Fine Sciences is converting catechol to vanillin and thus, it is recovering catechol cost and making Rs400/kg EBITDA ➤

Camlin Fine Sciences has started vanillin sales from its Dahej plant. During the first couple of months of the current quarter, vanillin sales have been 50t. As of now, the company is creating enough inventory for sale in the coming quarters.

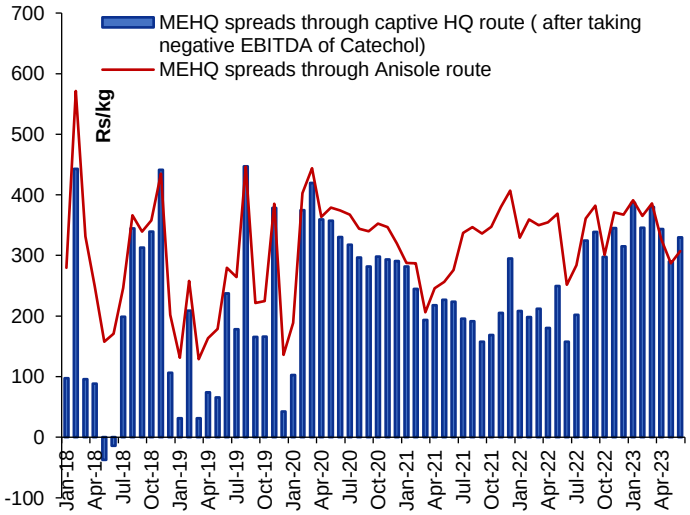
Figure 7: Camlin Fine Sciences can recover total cost of making catechol and still make at least Rs400/kg EBITDA on vanillin



SOURCE: COMPANY REPORTS, INCRED RESEARCH

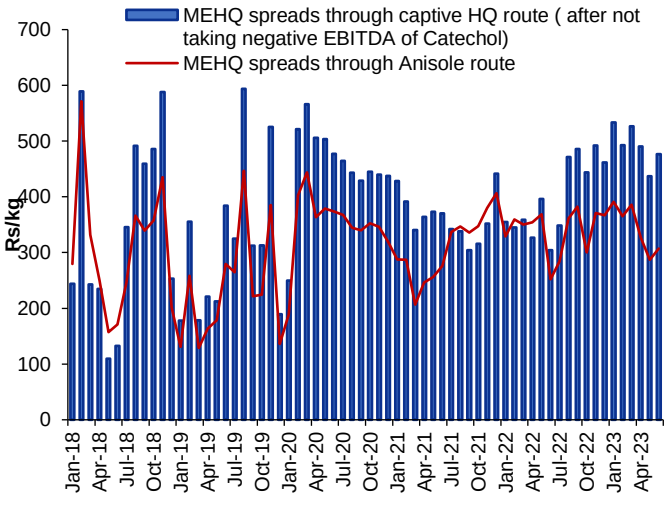
In MEHQ, the situation is considerably better for Camlin Fine Sciences as till now it had to depend on imported HQ, but it has captive capacity now ➤

Figure 8: Even after compensating for negative EBITDA of catechol, Camlin Fine Sciences will have the same spreads as that of Clean Science



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 9: However, as Camlin Fine Sciences is recovering total cost of catechol from vanillin sales, its gross profit is much better than that of Clean Science

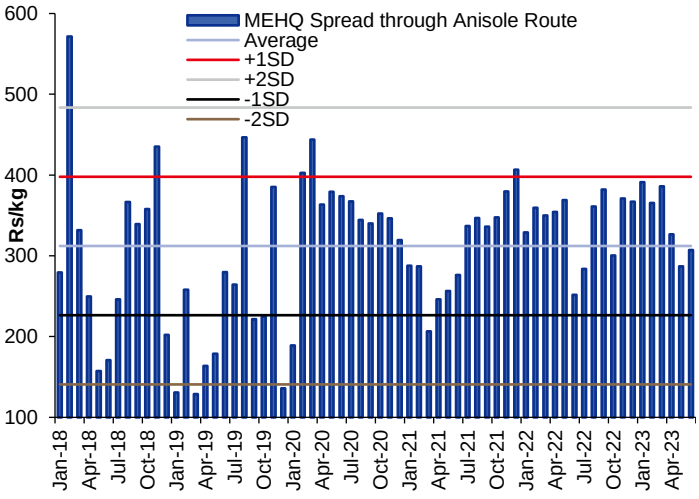


SOURCE: INCRED RESEARCH, COMPANY REPORTS

Till now, Clean Science was having a party because of non-stabilization of Camlin Fine Sciences' di phenol plant ➤

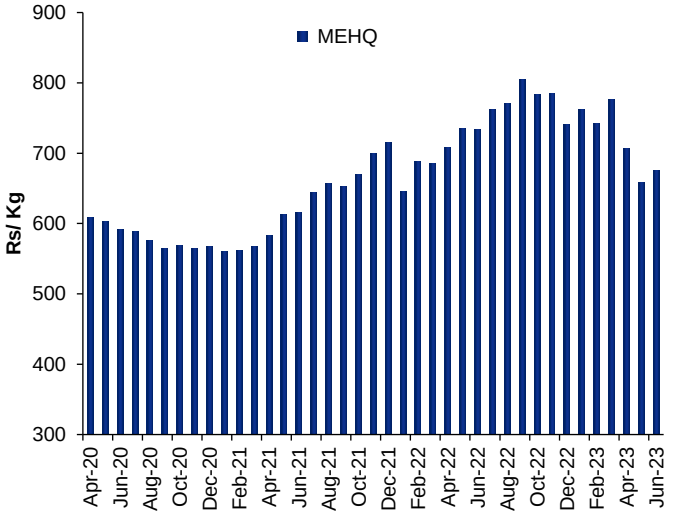
Camlin Fine Sciences' inability to ramp up production at its di phenol plant resulted in market dominance of Clean Science. However, as Camlin Fine Sciences has started selling MEHQ, prices have started falling and consequently MEHQ spreads of Clean Science have also started declining.

Figure 10: The best days for Clean Science's MEHQ profitability are over



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 11: Clean Science's decline in spreads is not because of rising raw material prices but due to their falling prices



SOURCE: INCRED RESEARCH, COMPANY REPORTS

BHA – Camlin Fine Sciences to beat Clean Science in this product as well

BHA is used as an anti-oxidant in a variety of products that are used daily ➤

BHA is a mixture of two isomeric organic compounds, 2-tert-butyl-4-hydroxyanisole and 3-tert-butyl-4-hydroxyanisole. It is prepared from 4-methoxyphenol and isobutylene. The conjugated aromatic ring of BHA can stabilize free radicals, sequestering them. By acting as free radical scavengers, further free radical reactions are prevented.

BHA is effective at preventing the oxidation of fats and oils, which can lead to rancidity. It is also effective at preventing the oxidation of vitamins, which can cause them to lose their potency. BHA is generally considered safe for human consumption, but it has been shown to be carcinogenic in some animal studies.

- **Foods**: Cereals, baked goods, candy, chips, gum, shortening, vegetable oils, and fried foods.
- **Cosmetics**: Lipsticks, moisturizers, sunscreens, and hair products.
- **Pharmaceuticals**: Some over-the-counter medications, such as antacids and laxatives.
- **Rubber**: Tyres, hoses, and gaskets.
- **Petroleum** products: Fuels, lubricants, and asphalt.

Clean Science makes BHA through the MEHQ route while Camlin Fine Sciences makes it through the TBHQ route ➤

Figure 12: Camlin Fine Sciences uses MEHQ, which it makes through the anisole route to make BHA

Output		
BHA	1	Kg
Input		
MEHQ	0.7705	Kg
Tertiary Butanol	0.3805	Kg
Water	3.25	Kg
Catalyst	0.1	Kg

SOURCE: INCRED RESEARCH, COMPANY REPORTS

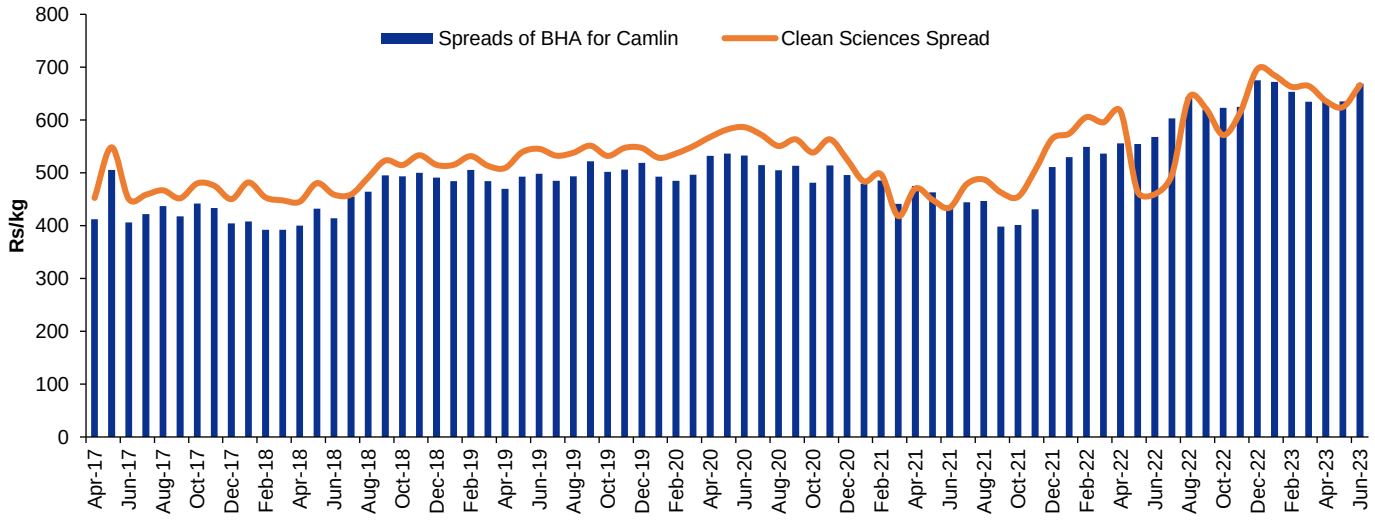
Figure 13: Camlin Fine Sciences makes BHA through the TBHQ route

Out Put		
BHA	1.00	Kg
Input		
N Hexane	0.08	Kg
TBHQ	1.20	Kg
Di Methyl Sulphate	1.20	Kg
Caustic Soda 34%	0.39	Kg
Sulphuric Acid 50%	0.03	Kg

SOURCE: INCRED RESEARCH, COMPANY REPORTS

There is hardly any spread difference over raw material between Clean Science and Camlin Fine Sciences in case of BHA ➤

Figure 14: Clean Science has no advantage over Camlin Fine Sciences in manufacturing BHA as the latter has got captive HQ capacity



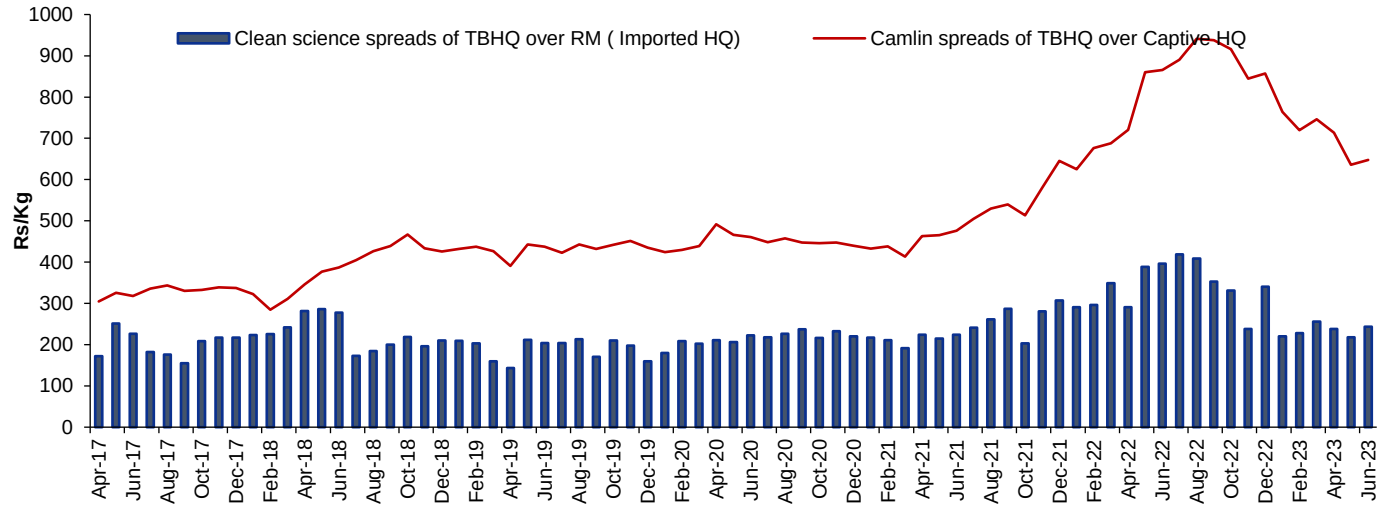
SOURCE: INCRED RESEARCH, COMPANY REPORTS

TBHQ – Very diffcult for Clean Science to penetrate this market

1. It doesn't make any sense for Clean Science to import HQ and make TBHQ. 1t of TBHQ needs ~0.71t of HQ, 0.06t of toluene and 0.39t of iso butylene. If one doesn't have captive HQ, then it's just not possible to make gross margin like in other products for Clean Science.
2. The only alternative for Clean Science is to develop the blends business, which is extremely difficult to develop. Please note that in blends, TBHQ and BHA don't react and hence, theoretically a single blend can have an infinite combination of BHA+ TBHQ and the customer needs only one such combination. If one is lucky, one can hit the jackpot in the first trial itself but the probability is extremely remote.
3. After the successful exports of vanillin, Camlin Fine Sciences' losses on di phenol have come down significantly and hence, the company has started cutting MEHQ prices in the domestic market. Please note that MEHQ is a highly niche market of ~13,000t. Camlin Fine Sciences had stalled its capacity for a better part of the last 12 months but as vanillin sales commenced, its effective cost of MEHQ is coming down, thereby leading to its price decline.
4. We had published a report on HALS and its likely impact on Clean Science in the recent past. Please click: IN: Clean Science and Technology - Still pricing in dreams - REDUCE (REDUCE - Maintained)

Clean Science's TBHQ margins are way below Camlin Fine Sciences' margins ➤

Figure 15: CFSL's TBHQ spreads are 220% higher than that of Clean Science's TBHQ spreads



SOURCE: INCRED RESEARCH, COMPANY REPORTS

HALS (hindered amine light stabilizer) - much ado about nothing

While the investors perceive HALS as the next big molecule for Clean Science, this belief is misplaced. HALS is a widely known molecule and has multiple producers globally. The global market size of the molecule is US$1bn currently.

Globally, there are multiple producers of HALS ➤

There are several companies that produce HALS, including:

1. **BASF**: The company offers a range of HALS under its Tinuvin brand, including Tinuvin 770, Tinuvin 622, and Tinuvin 123.
2. **Clariant**: The company produces a variety of HALS under its Hostavin brand, including Hostavin 3070, Hostavin 3326, and Hostavin N30.
3. **Solvay:** The company produces HALS under its Cyasorb brand, including Cyasorb UV 3638, Cyasorb THT 833, and Cyasorb THT 3903.
4. **Songwon**: The company offers a range of HALS under its Songstab brand, including Songstab CZ-425, and Songstab CZ-950.
5. **Chitec:** The company produces HALS under its Chinox brand, including Chinox 168, and Chinox 1010.

These companies are some of the leading producers of HALS, but there are also other manufacturers in the market. The choice of HALS depends on the specific application and performance requirements of the polymer material.

HALS has multiple usage ➤

Hindered amine light stabilizer (HALS) is used as an additive in polymer materials to improve their resistance to ultraviolet or UV light and weathering. HALS is particularly effective in stabilizing plastics and other polymers that are exposed to sunlight and other environmental factors that can cause degradation and discolouration. Some common uses of HALS include:

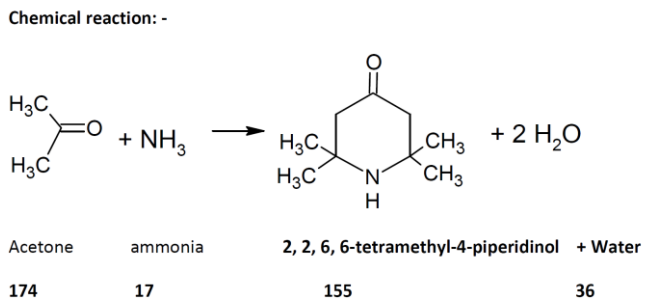
1. **Packaging materials**: HALS is often added to plastic films and containers used for packaging food in order to increase their resistance to light and prevent spoilage.
2. **Construction materials:** HALS is commonly used in building materials such as PVC pipes, window profiles, and roofing membranes to protect them from the effects of sunlight and other environmental factors.

3. **Automotive components**: HALS is used in the manufacture of automotive components such as bumper, trim, and interior parts to improve their durability and prevent fading.
4. **Coatings:** HALS is used in coatings for a variety of applications, including automotive finishes, industrial coatings, and wood coatings, to enhance their resistance to ultra violet or UV light and weathering.

Overall, HALS plays a critical role in extending the lifespan of polymers and improving their performance in a variety of applications.

There is a standard production technique for manufacturing HALS ➤

Figure 16: Acetone +ammonia in the presence of Pt/C and zeolite makes 2, 2, 6, 6-tetramethyl-4-piperidinol



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 17: 2, 2, 6, 6-tetramethyl-4-piperidinol, dimethyl sebacate, and toluene makes HLAS-770, which is going to be the main product of Clean Science

2,2,6.6 Tetramethyl- 4- Piperidinol
Dimethyl Sebacle
Dibutyl tin Oxide
Toluene
Mintroleum

SOURCE: INCRED RESEARCH, COMPANY REPORTS

The highest-cost item in the manufacture of HALS is Pt/C catalyst ➤

As per the Environmental Clearance or EC document of Clean Science, it uses platinum on activated carbon as a catalyst to make HALS. By its nature itself, platinum on activated carbon is a costly catalyst. Please note that in the manufacture of 2, 2, 6, 6-tetramethyl-4-piperidinol, 20gm of Pt/C catalyst is needed per kg of the molecule. Normally, 10gm platinum 5 wt.% on activated carbon costs Rs1,900/gm.

Figure 18: What is the meaning of 10g platinum 5 wt.% on activated carbon?

'10gm platinum 5 wt.% on activated carbon' means there is a mixture of platinum and activated carbon, and the platinum constitutes 5% of the total weight of the mixture. Specifically, the mixture contains 10gm of platinum and a total of 200gm (10gm of platinum + 190gm of activated carbon) to make up a total weight of 200gm, resulting in a 5 wt.% platinum loading.

This type of mixture is often used as a catalyst, where the activated carbon provides a support structure for the platinum and enhances its surface area, allowing for increased catalytic activity. The specific application and performance requirements will dictate the appropriate percentage of platinum on activated carbon needed for the catalyst.

SOURCE: INCRED RESEARCH, COMPANY REPORTS

Is there any other way to manufacture HALS i.e without costly platinum over activated carbon ctalayst? Yes, it's possible with an organic catalyst? ➤

Platinum on activated carbon is not typically used to make HALS. HALS is a type of stabilizer that is used to protect polymers from degradation due to UV radiation. These stabilizers typically contain a hindered amine functional group, which can absorb UV radiation and prevent it from causing damage to the polymer.

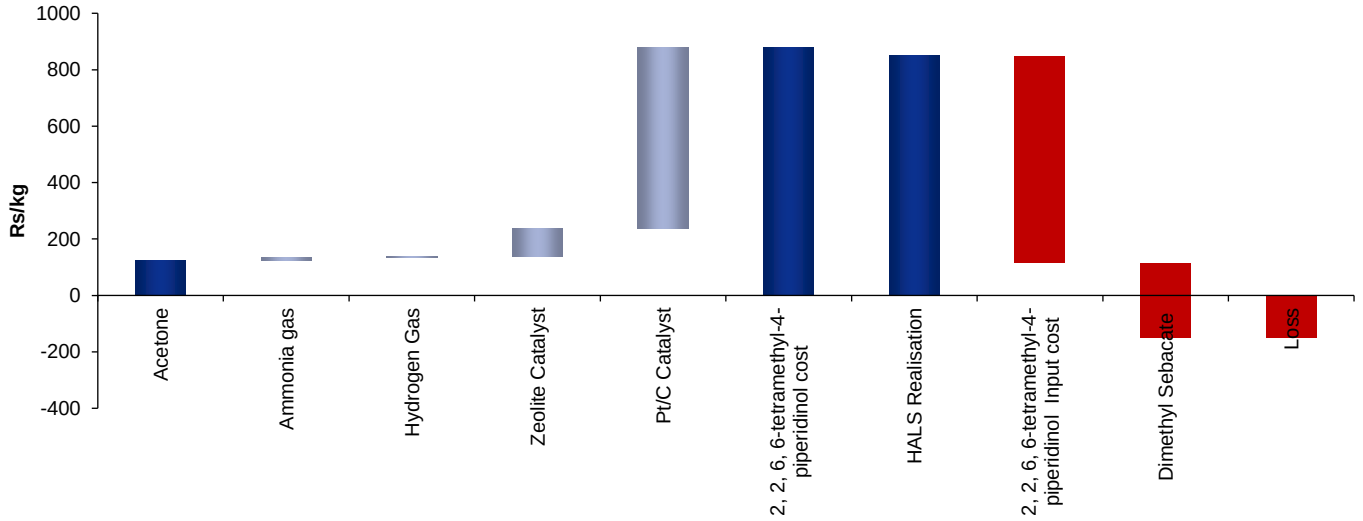
The most commonly used catalysts in the production of HALS are organic compounds such as triethanolamine, triethylamine, and pyridine. These

compounds are often used in a combination with other reagents and solvents to produce HALS.

While platinum catalysts are widely used in many other types of reactions, they are not typically used in the production of HALS due to their high cost and limited efficacy for this particular application. Instead, organic catalysts are preferred because they can be more easily tailored to produce the desired chemical structure and properties of HALS.

The spread analysis of HALS indicates that Clean Science cannot make money using Pt/C catalyst ➤

Figure 19: It's just not possible to make money in HALS by using Pt/C catalyst (as stated in the EC document) and Clean Science will have to use an alternate catalyst

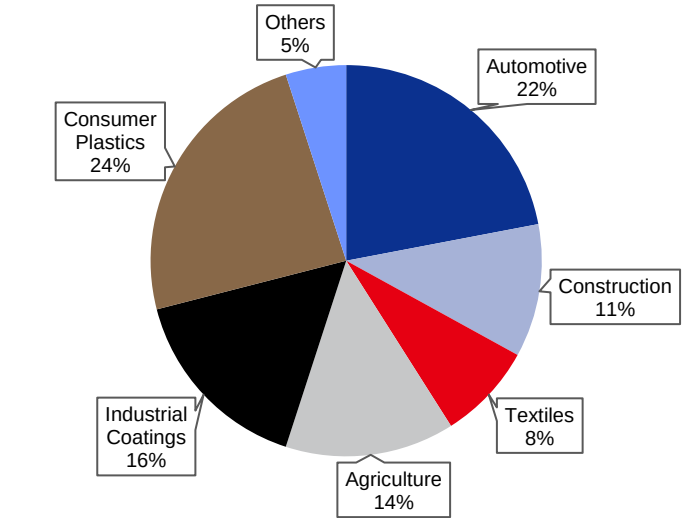


SOURCE: INCRED RESEARCH, COMPANY REPORTS

How easy is it for Clean Science to penetrate the HALS market? It's very difficult ➤

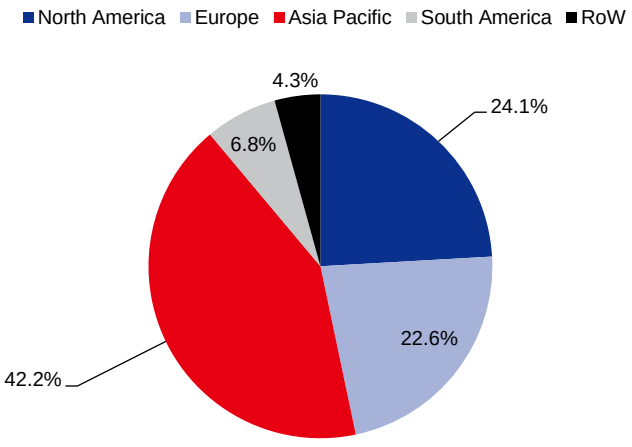
There are at least 34 incumbent players in this market, and global demand for HALS is ~100,000t. Asia-Pacific is the largest market for HALS, and the consumer goods industry followed by the automotive industry are the largest consumers of HALS.

Figure 20: Entry barriers for a new supplier will be very high in segments like industrial coatings, automotive, consumer plastics, etc



SOURCE: INCRED RESEARCH, COMPANY REPORTS

Figure 21: Asia-Pacific region is the biggest consumer of HALS

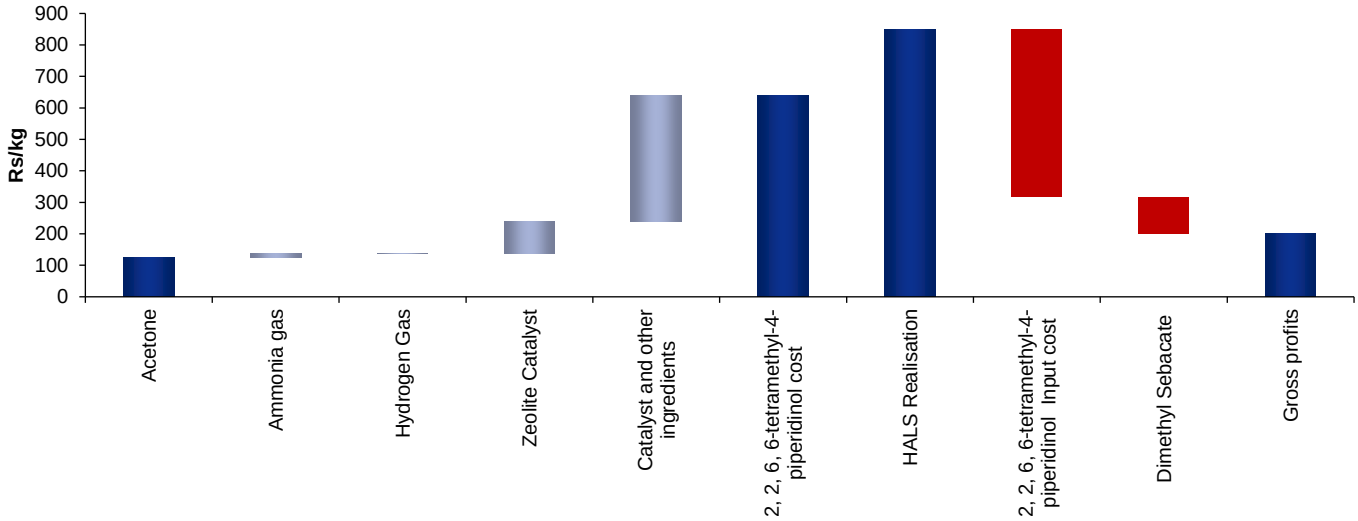


SOURCE: INCRED RESEARCH, COMPANY REPORTS

Clean Science is planning to install 2,000t capacity (2% of global market) initially and later on it will increase this to 10,000t (10% of global market). Entry barriers for a new supplier will be very high in segments like industrial coatings, automotive, consumer plastics, etc. May be Clean Science can get an entry into agriculture and construction segments but garnering a 10% market share appears to be a distant dream as of now.

What can be the probable spread for Clean Science using other catalysts? In our view, not more than Rs200/kg ➤

Figure 22: On an average, we expect Clean Science to make Rs200/kg gross profit on incremental HALS volume



SOURCE: INCRED RESEARCH, COMPANY REPORTS

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