

ENROUTETM

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FLAMMABLE



CORROSIVE



TOXIC



REACTIVE



HEALTH
HAZARD

Chemical Logistics: Challenges and Growth Opportunities



Contents

03 Editorial

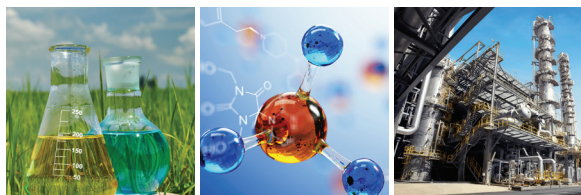
Improving efficiency of
Chemical Logistics in India

04 Did you know?

Chemicals in our everyday life
Safety Precautions

06 Cover Story

Chemical Industry in India



12 TCI Chemical Logistics Solutions

Movement of Liquid bulk in ISO
Tank containers & Flexi Tank



Chemical Movement in
Dedicated Containers



16 Delivering Value



17 Case Study

4 PL for Polyester Films: RMS to
FGS to Distribution

20 Corporate News





Editorial

Dear Readers,

We welcome you to this year's first edition of Enroute based on a topic of today's and tomorrow's relevance: Chemical Logistics. The edition covers insights on Chemical Industry Outlook, its critical nature and growth opportunities for chemical logistics in India.

Over the years, chemical industry in India has witnessed growth and has become 6th largest in the world today; yet safe movement of chemicals remains to be one of the biggest challenges. Learn how the industry is moving ahead to improve overall efficiency whilst maintaining safety standards.

Don't miss reading TCI Group's recent updates in 'Corporate News' section.

Please drop your valuable feedback at enroute@tcil.com

Have an Interesting Read!



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Did You Know?

How big a part chemicals have become in our everyday life?

Baking Powder, Nail paint Remover, Mouth Wash, Camphor, Naphthalene Balls, Phenyl and Vinegar are to name a few. However, it is important to take necessary precautions to handle chemical products with utmost safety. This is because many such household products contain chemicals that can cause injury or death if not handled, stored or used properly.

Some of the household products that contain hazardous chemicals are oven cleaners, tile cleaners, toilet-bowl cleaners, liquid drain openers, antifreeze, chrome-wheel cleaners, rust removers, gasoline, motor oil, lead paint, turpentine, lacquer thinner, and muriatic acid.

HOME SAFE HOME?

The Silent Spring Institute found concentrations of toxic chemicals in homes linked to **cancer can be 200-500 times higher than outside**, when they selected 50 random households for the study.

The same study also found women who work at home have a **55% higher risk of breast cancer** than women who work outside of home.

80% of chemicals found in everyday-use products lack detailed toxic information. Less than 20% have actually been tested for acute effects, and less than 10% have been tested for chronic damages.

THE POISONOUS FLAG

91% of all human poison exposure reported occurs in a patient's own home, states the American Association of Poison Control.

SUBSTANCES MOST FREQUENTLY INVOLVED IN POISON EXPOSURES:



1. **Painkillers,**
over the counter and prescribed, such as ibuprofen and acetaminophen.



2. **Cosmetics**
and personal care products, such as soap, perfume, or lotion.



3. **Household cleaning**
substances, such as dishwasher detergent, bleach, and pest repellent.

Safety musts

Follow these safety precautions:

- Read the ingredient list of the chemical product you use. That can also tell you how to use the proper protective equipment, how to handle that particular chemical product, and how to respond to emergencies. The label also explains if the substance is flammable, corrosive, or may cause cancer. Adding to that, the information stated on the label tells if you should use eye protection, gloves, or other equipment.
- Purchase the proper personal protective equipment like gloves or goggles. Do the clean and care process properly.
- Be vary of the hazardous materials you come in contact with. Learn about the specific characteristics and dangers.
- Follow safe procedures when you handle hazardous material. Do not fall for shortcuts.

Handle, store, and get rid of hazardous materials safely and according to approved procedures. Never pour them down sewers or drains.

- Don't mix or combine hazardous materials unless you know you can do so safely. Many products can cause violent reactions or release poisonous fumes when combined.
- Transferring flammable liquids like gasoline, from one container to another can make static electricity that could ignite the fumes.
- Always carry chemicals in approved containers.
- Always wash your hands after using any unsafe material.
- Store materials properly, as directed on their labels. Flammable chemicals should be stored in a cool, dry place away from heat and sunlight. Some chemicals like acids must be stored separately from each other.



Cover Story

Chemical Industry Outlook

The Indian chemical industry ranks as 6th largest in the world and 3rd largest in Asia, contributing nearly 3% of the total global chemical industry. The industry has grown rapidly in last five years, currently standing at USD 163 billion. It has the potential to reach around USD 304 billion by 2025, growing at a CAGR of 9.3% till then. The sector employs more than 2 million people and accounts for 7% of India's GDP by value.

This industry is highly diverse in terms of the number of products it covers with an array of applications across a wide range of categories. Products exist in all forms – solid, liquid and gaseous with some possessing highly inflammable and “hazardous” properties. Pertaining to their chemical and physical properties, each product requires specific handling, storage and transportation techniques.

Key subsectors include:

- **Agrochemicals**

India is the 4th largest producer of agrochemicals and 13th largest exporter of pesticides and disinfectants in the world. It stands at USD 6.3 billion, with domestic demand growing by 6.5% annually.

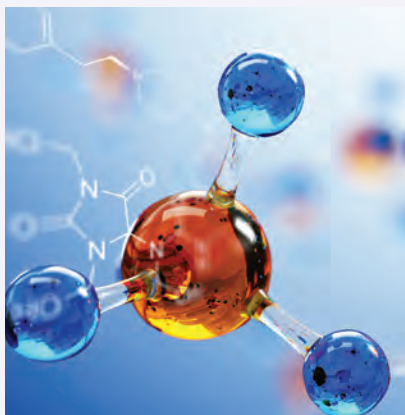
- **Specialty Chemicals**

The specialty chemicals market currently stands at USD 70 billion and is likely to clock a compounded annual growth rate of 12-13 % over the next 5 years. All key segments

of specialty chemicals are set for double digit growth in coming years, including a CAGR of 13% in personal care and 10% in paints and coatings.

- **Petrochemicals**

The petrochemical market in India is expected to grow at a CAGR of over 10% in the next 5 years and reach around USD 100 billion by 2022. Combining the demand for all the key segments in the petrochemical industry, aggregate demand for the entire petrochemical sector in India has reached to 48 MMT in 2020-21.



Determining Critical Nature of Chemical Logistics

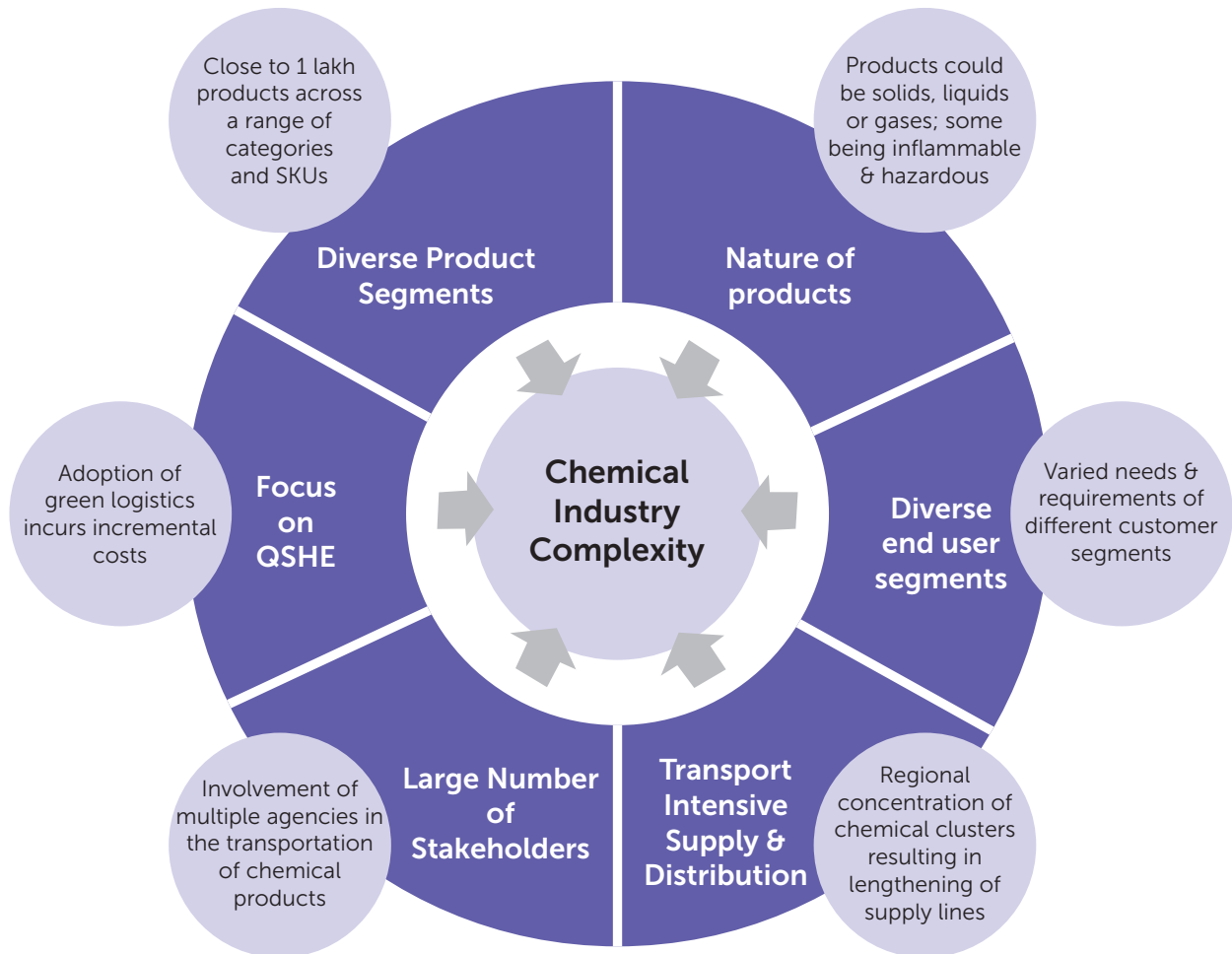
During the second wave of COVID-19 in India, the Union ministry of road transport and highways asked states and union territories to create a pool of drivers trained especially to transport 'hazardous cargo' amid an increase in transportation and supply of liquid medical oxygen. As per ministry's statement issued in May'21, only trained drivers with adequate training and having 'hazardous cargo' license would be allowed to operate the Liquid Medical Oxygen (LMO) trucks.

This is one of the recent examples that demonstrate the highly critical nature of Chemical Logistics; and how it differs itself from many other logistics disciplines because of the potential danger posed by the cargo and its impact on health, safety, security, and the environment (HSSE).

Dangerous goods can be transported only if handled properly and with care. All DG containers have to be checked for proper label/placard as required by the IMDG code and shall be rejected if it poses hazard prior loading. DLDS [(DMIDC) Logistics Data Services Ltd.] provides digital container tracking solution that helps reduce logistics cost from present 14% of the GDP to international standards of 8%.

Challenges faced in Chemical Logistics

The complexity and criticality of the chemical industry makes chemical logistics very challenging even for experienced logistics players.



Though India is the fourth-largest producer of agrochemicals in the world, 6th largest producer of chemicals in the world and produces 16% of the world's dyes yet safe movement of chemicals still remains to be one of the biggest challenges.

Another challenge that comes into picture whilst maintaining safety & statutory standards throughout the value chain is managing the cost. Although chemical

Inadequate supply of trained drivers, labors, proper understanding of products and its handling is a serious concern. Understanding of chemicals, its classes, reading and understanding of MSDS is not available. Chemicals being treated as normal goods while they are transported or stored without knowing the consequences

industry is hell bent on logistics players to maintain safety standards, they are not ready to bear the cost of sustaining these standards. No matter how much we pretend to be committed to safety, it will not be effective unless the manufacturer, trader, worker, logistics service provider (LSP) or inspecting authority do not share the financial responsibility thus accountability towards safety.

of inherent hazards. Chemicals are classified in various classes, Class 1: Explosives, Class 2: Gases, Class 3: Flammable and so on. It is very important for the logistics service providers to know what they are carrying and storing, equal importance to be given on safety while goods are in transit as it is given inside manufacturing plant while it is manufactured.

Bulk liquid transportation in India is not in line with international standards. International standards are followed till the time product is manufactured or at the port level. After that all comes is what is “Freight Cost”, no matter how it is transported, what is the vessel type, capacity, safety features and so on. Though ISO tank containers





are considered to be the safest mode of bulk transportation of chemicals, yet their availability in the market is less. The reason behind logistics players' ambivalence to invest in this relatively costly asset is again non-willingness of chemical companies in sharing the cost. To rectify these problems, a serious re-appraisal of the following guiding principles of the industry is an urgent need of the hour:

- 1) Training
- 2) Legal requirements

- 3) Planned risk management
- 4) Ongoing improvements
- 5) Community interactions
- 6) Policy documentation
- 7) Provision of information and
- 8) Emergency response capacity building

Continuous efforts to improve safety during the storage, movement and the associated handling of chemicals have become a part of the objective to advance safety performance of both the chemical and logistics industry.

TCI Chemical Logistics Solutions

TCI, through its sub-division, TCI Chemical Logistics Solutions handle nearly **1 million tons** of liquids, solids and gases annually. From last 4 years, we would have handled **3 million tons, six sigma** level operations. We manage an asset base of **750+** ISO T11 tank containers, **4** dry bulk cargo steel containers and **20** T20 Tank containers (*under process*). We own fleet of **100+** vehicles for Chemical operations.

At TCI, we have PESO compliant warehouses that meet modern fire safety infrastructure standards for safe storage of a wide range of hazardous & non-hazardous chemicals. Safe in-plant services include – Bagging & Debagging, Silo Charging, Line Charging, Quality check at all steps, End of line packaging and labeling, & Customized Palletization.

We have:

1. HSE Compliant Warehousing
2. Separate Storage of both Solid & liquid Chemicals.
3. Chemically compliant warehouse with HSE standards.
4. Custom Clearance: Handling the complexity of the norms related to the product.
5. Container de-stuffing and storage as per specific norms.
6. Order management and last mile delivery.
7. Record and MIS management.





TCI's safety standards also include:

- Being member of Nicer Globe Responsible Care initiative of Indian Chemical Council (ICC) for emergency response
- ISO Tank Containers Fleet Data Uploaded Online on Bureau International des Containers et du Transport Intermodal (B.I.C)
- Membership with International Tank Container Organization (ITCO)

Encouraging Green Logistics through Multimodal

The future belongs to multimodal logistics by rail and coastal. The increasing demand for sustainability in logistics has made 'green logistics' a buzz word in the recent times.

Railway Transportation (Modal Shift)

In line with the above, TCI also does ISO Tank Containers Movement through Rake to reduce carbon footprints. We have 7+ years' experience in Multimodal Rail-Road logistics and manage an asset base of 750+ tank containers.

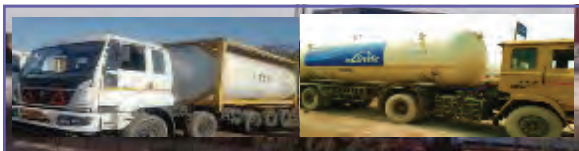


Coastal Transportation (Modal Shift)

Coastal being the most cost effective mode of transportation, we provide coastal shipping services for transporting container and bulk cargo along the Western & Eastern coast of India. We own 7 domestic ships with a total capacity of 91,880 DWT and 7600+ marine containers (multipurpose).

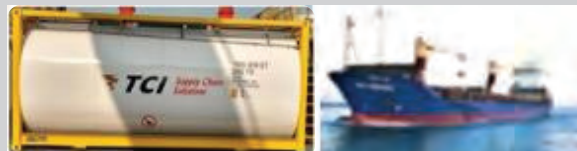


Growth opportunities for Chemical Logistics in India



■ Road transportation of Liquid and Gas bulk

Scope for movements of bulk liquids and gases in T-11, T-50 tanks



■ Coastal movements of Chemicals

The most cost effective mode of transportation



■ Rail movements of Chemicals

Best suited mode for hazardous bulk liquids, cost effective as well



■ ISO Tank Cleaning Center

India is lacking in tank cleaning ecosystem as per international standards



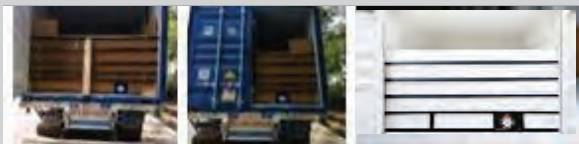
■ Chemical Complaint warehouses

For speciality chemicals, industrial gases



■ Liquid storage terminals at port

In 2017-18, India imported 6 million tons and 1.5 million tons exported (Chemicals-non POL)



■ Flexi tank for Non-Haz bulk liquids

Suitable for Bulk Lubricant, base oil, polyols, surfactant



■ Less than truck loads using FLC

LCL shipments, packed in bags (master-batches, chemicals in powder form, paints)

Delivering Value: TCI Chemical Logistics Solutions

Please click on the below image to watch the video



TCI
LEADERS IN LOGISTICS



TCI Chemical Logistics
Solutions
(A Sub-Division of Transport Corporation of India Ltd.)





Solid. Liquid & Gas Bulk

SECURE YOUR BUSINESS



Case Study

As part of our end-to-end chemical logistics solutions, we did **4 PL for Polyester Films: RMS to FGS to Distribution**. Client being one of the world's largest producer of thin polyester film, having manufacturing facilities in India, Thailand and Turkey.

Solid Petrochemical-Polymers

4 PL for Polyester Films : RMS to FGS to Distribution

Raw Material Stone



SILO Charging



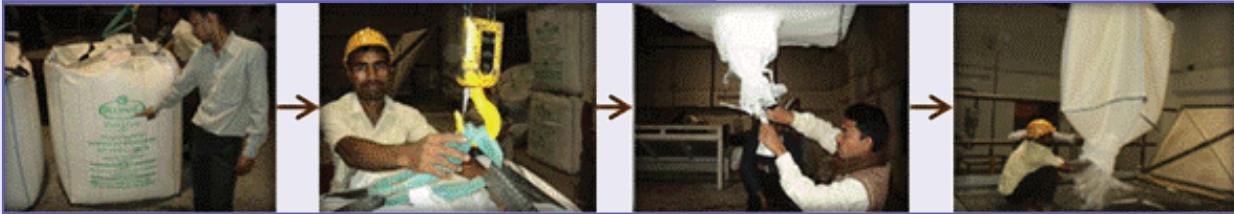
Product

- BOPP, BOPET, BOPT

Raw Material Store Operations

- a. Receipt as per Invoiced material & quantity
- b. Sorting, Storage & Stacking
- c. Charging of HP & Silica through Hoppers

SILO Charging (For Jumbo Bags)



Finished Goods Store for domestic material



Finished Goods Store for exportable material



Finished Goods Store For Export

1. Space Arrangement for Finished Goods (FG) Storage
2. Implementation of FIFO & 5's
3. Documentation-Dispatch, Loading and Abnormality Record
4. FG Packaging-Domestic & Export
 - a. Labeling
5. FG Dispatch
 - b. Vehicle Planning & Deployment
 - c. Visual Checking of Vehicle
 - d. Material Picking using Forklifts (with delivery documents)
 - e. Loading Through Forklift & Overhead Crane
6. Scrap Management

Secondary Distribution

1. Destination (Secondary Distribution): All India preferably Delhi, NCR, South, west and Kolkata



Corporate News

Mr. Vineet Agarwal, MD – TCI in a live interview with ET Now



Mr. Vineet Agarwal, MD – TCI was in a live interview with ET Now on 28th December 2021. He shared his insights on “AI-Based Logistics Demand Trend and TCI’s growth target for FY22. He also spoke about how TCI is working to serve the new age service sector.

To watch the full interview, click here: <https://www.timesnownews.com/videos/et-now/news/ai-based-logistics-demand-trend-vineet-agarwal-md-tci/117052>

Mr. Chander Agarwal, MD - TCI Express Ltd. & Director - TCI participated in a panel discussion at OPENAP21, Dubai – UAE



Mr. Chander Agarwal, MD - TCI Express Ltd. & Director - TCI participated in the panel discussion at OPENAP21 about “eCommerce Global Boom and its Impact on Airfreight” organized during the 5th Annual Neutral Air Partner Global Meeting at Dubai – UAE from 14th to 17th November, 2021. The panel discussion revolved around exploring ways to untangle the e-business and managing the reality of service and cost. They also discussed about the challenges involved in enabling traditional airfreight forwarders to adopt the modern-day changes.

TCI Foundation in association with State AIDS Control Society organised health camps



1st December is celebrated as “World Aids Day” to raise awareness and demonstrate international solidarity in the face of the pandemic. Abiding by this year’s theme **“End inequalities. End AIDS”**, TCI Foundation in association with State AIDS Control Society organised health camps at various locations. During the camp, HIV & RPR testing, street plays, session on HIV/AIDS Awareness, mask & sanitizer distribution, HIV awareness rally was also conducted.

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