IVC
INDIAN VINYL COUNCIL

# News Letter

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## Vinyl is an integral part of our day to day life

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# From the desk of Editor

*You and I cannot do without plastics. How on earth will you brush your teeth early in the morning? Aren't the brush and the toothpaste tube both made of plastic? And the story goes on: throughout our daily lives in the modern world, plastic use is just unavoidable.*

*But we are aware that improperly disposed of plastics do create environmental problems. A few months back, global negotiators met in Geneva for over a week bargaining over a mooted UN treaty on plastic pollution.*

*Seventy nations from six continents pushed for an agreement, including a commitment to reduce the primary production of plastics. This move, however, was resisted by a group of major oil-producing nations, including the US, Russia, and several Gulf states.*

*The bad news is that no agreement could be reached despite the global plastic industry's big daddies, including the user businesses like Unilever and Nestle, being present.*

*The big question is: why should the industry bigwigs want to enter into such a treaty? Shouldn't it bring more complications to their operations? Needless to mention, the motivations differ for plastic producers and user industries.*

*The producing industry does not want to impose any limits on plastic production but would instead promote 'recycling'. Both the USA and the petro-producing nations were aligned on this objective.*

*The producers lobbied for a particular sort of treaty: one that would not impose limits on plastic production but would instead promote recycling. (As of now, one-tenth of global plastic is recycled; hence, a long way to go to make the planet safe and environmentally friendly).*

*Essentially, the text says that the industry would solve the potential environmental crisis through 'recycling'.*

*While improperly disposed of plastics will indeed be a danger, the world can ill afford to function without this critical material. Therefore, other steps need to be taken if the recycling does not work in all places.*

*There are startups that are promoting "mycoremediation", a type of fungi that can break down materials that defeat traditional recycling, including plastics. Mycelium, a threadlike root structure of fungi, secretes enzymes capable of dismantling complex carbon-based molecules. This is a way to address the human problem of throwing away stuff, including plastic.*

*The modern civilisation can neither live without plastics, nor can it afford to dispose of them irresponsibly. We are all required to be responsible producers and users of this wonderful material– the plastics, including our very own PVC.*

Robin Banerjee

*You can write to us @ info@indianvinylcouncil.com*

# All about the Indian Vinyl Council


The Indian Vinyl Council is set up and exclusively dedicated to the cause of entire PVC value chain. The objective of the forum is to serve all the stakeholders of Vinyl Family, i.e the resin producers, additives and related chemical producers, converters, processing and ancillary equipment manufacturers, recyclers of Vinyl products and the end users. With the active and harmonious participation; the members, end users and the public at large will all stand to reap considerable benefits.

The Council will play a pivotal role as the hub of advocacy between the government (state and central), policy makers, regulatory bodies and industry stakeholders to pave the way for the industry by eliminating obstacles and opening the doors to expand the market for the Vinyl industry.

Adding greater momentum to the growth of the Vinyl industry through networking will also be one of the core responsibilities of the Council. It will work towards increasing access to the industry's leaders and enabling them to connect seamlessly with suppliers, academia, regulators, scientists and experts through seminars, conferences, technical meetings and other events.

One of our top priorities is to ensure the efficient diffusion of knowledge to all our members, on the state of art technology, market perspectives, statistics & information and details of global initiatives on sustainability… all relevant to the Vinyl and allied industries.

Our focused approach is to work towards the welfare of mankind and encourage responsible care in an environmentally sustainable manner as practiced and specified in circular economy principles and models.

We strongly believe in supporting & encouraging innovation, and training & skill development within the Vinyl value chain, to facilitate raising the competency and the level of industry to global standards.

We are also committed to developing technical standards for maintaining quality and consistency to enhance the acceptance of Poly Vinyl Chloride and related products and multiply its application in all spheres of life.

## IVC Objectives

- To promote and advocate all round development of the entire Vinyl industry comprising of all elements of the Vinyl value chain
- To build a positive image of Vinyl products in eyes of the end-users as well as society at large.
- To assist and collaborate with the government and non-government bodies and statutory authorities for formulating industry related policies including codes and standards and seek representations from such bodies.
- To promote and support standardisation and quality assurance programmes to encourage regulatory compliances.
- To create awareness and educate the end users of the value proposition of PVC products including energy conservation, eco-friendliness and sustainability.
- To support and encourage innovation, training and skill development within the Vinyl value chain and thereby raise the level of industry to global standards.
- To institute and/or fund scientific and economic research in the industry connected with PVC and its products.
- To provide a forum for member associations to collaborate for broadening the market for PVC products.

# The Evolution and Future of CPVC: The Rising Polymer in India Shaping Modern Infrastructure

**Manish Jain,**
Head Business Development - CPVC
Reliance Industries Limited

When it comes to building materials, there are a lot of options to choose from. But sometimes, the most reliable ones get overlooked. In this article, we are highlighting one such champion – Chlorinated Polyvinyl Chloride, or CPVC.

Plumbing and fire piping are the lifelines of the building industry, functioning much like the veins that carry blood throughout the human body. For decades, the engineering fraternity in India relied heavily on traditional metal piping, such as Galvanized Iron (G.I.), which inherently suffered from corrosion, leakages, and unhygienic scaling. The search for a robust alternative led to the emergence of various materials around the year 2000, but over the last two decades, Chlorinated Polyvinyl Chloride (CPVC) has decisively proven its worth, becoming the most preferred piping material in the nation.

### The History and Evolution of CPVC

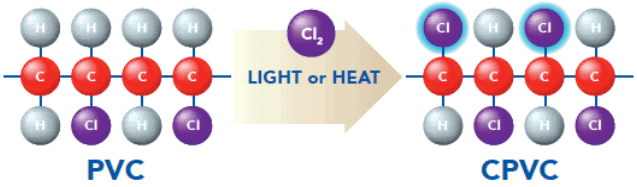
While CPVC feels like a modern marvel, it is an established material with a rich history. It was first produced commercially in the mid-1930s in Germany through the chlorination of PVC polymer in a solution at elevated temperatures. Early iterations of this material were primarily utilized in solution-applied surface coatings, adhesives, and even spun fibers.

A major evolutionary leap occurred around 1960 when the dispersion chlorination process was introduced. This allowed PVC polymer in an aqueous dispersion to be treated with a large excess of chlorine at relatively low temperatures under UV light, resulting in polymers with much better thermal stability. The technology gained significant traction in North America through the 1960s and 1980s, eventually spreading to the Middle East and arriving in India in 1998. Since its introduction to the Indian market, it has rapidly become the undisputed choice for hot and cold water distribution.

### The Chemistry: How PVC Becomes CPVC

Standard PVC consists of roughly 53-57% chlorine, derived from common salt, and the balance is petroleum-based hydrocarbons. CPVC takes this a step further. Through a free radical chlorination reaction initiated by thermal, UV, or chemical energy, chlorine gas decomposes into free radicals that replace a portion of the hydrogen on the PVC backbone.

This process elevates the chlorine content to 63-67%. Because chlorine atoms are significantly larger and bulkier than hydrogen atoms, they create a protective barrier around the carbon chain. This structural upgrade dramatically reduces the polymer's oxidization potential, protecting it from UV radiation, heat, and environmental degradation.




### Manufacturing Processes: Slurry vs. Dry Methods

The commercial production of CPVC involves reacting PVC with chlorine, but the methodologies vary significantly based on the reaction medium.

The Water-Slurry Process (Wet Method) This is the most commonly practiced commercial process today.

- The Process: PVC is suspended in water, the slurry is degassed to remove oxygen, and then heated. Chlorine is introduced under pressure, and the reaction is initiated (often via UV light). The resulting hydrogen chloride dissolves in the water, creating an acidic aqueous solution that is later neutralized, washed, and dried.
- Advantage: It eliminates the need for expensive, volatile organic solvents (swelling agents) and reduces raw material recovery costs.
- Limitations: Because the reaction is diffusion-controlled from the water into the PVC particle, the reaction must be closely monitored to ensure the right level of chlorination occurs.

The Fluid-Bed Process (Dry Method) Representing a more direct approach, this "dry" process fluidizes PVC particles in a reactor using chlorine gas, usually diluted with an inert gas.

- The Process: The chlorination is initiated by heat or light, and the hydrogen chloride gas byproduct is continuously scrubbed away. Once the target chlorine content is achieved, residual gases are removed, and the dry polymer is recovered directly.
- Advantage: It is potentially the most cost-effective method because it bypasses the extensive drying and water-treatment stages required by the slurry method.
- Drawback: Heat transfer from the solid phase to the gas phase is inefficient. The heat of the reaction can cause localized overheating, risking thermal degradation or chain scission of the polymer. Like the slurry method, it is diffusion-controlled, leading to heavier surface chlorination.

Other methods include the Solution Process (the oldest, highly uniform, but solvent-heavy) and the Liquid Chlorine Process (using liquid chlorine as the medium, offering excellent thermal stability but requiring highly specialized equipment).

The majority of the Global companies have adopted the wet process & have optimized the chlorination process via thermal, UV, chemical reactions.

### Critical Technical Properties

CPVC's dominance in crucial applications is rooted in its quantifiable engineering properties.

1. Glass Transition Temperature (Tg) Tg is the critical point where a rigid plastic transitions into a softer, rubbery state. Standard PVC has a Tg of approximately 80°C. Depending on the exact chlorine content, CPVC boasts an exceptionally high Tg ranging between 115°C and 135°C. This ensures the material maintains its structural integrity and handles high pressure even in demanding hot water or industrial applications.

2. Heat Distortion Temperature (HDT) This marks the temperature at which a polymer deforms under a specific load. CPVC features an HDT generally between 100°C and 110°C (at 264 psi). This allows CPVC pipes and profiles to withstand hot, ambient environments without sagging, warping, or losing shape. Overall, CPVC comfortably handles continuous fluid temperatures up to 93°C (200°F), whereas standard PVC peaks at 60°C (140°F).

3. Dielectric Properties CPVC is an outstanding electrical insulator.

   - Dielectric Constant: ~3.70 (at 60 Hz)
   - Dielectric Strength: ~1250V/mil These metrics mean it does not conduct electricity well, making it an exceptionally safe material for use around electrical installations and in industrial facilities where preventing stray current flow is critical.

4. Chemical Resistance Matrix

   CPVC's chemical inertness is one of its most valuable attributes, resisting attacks from a wide array of highly corrosive substances. It does not support corrosion, ensuring full bore flow (maintaining a Hazen-Williams C Factor of 150) throughout its lifespan.

| Chemical Category | Representative Substances | CPVC Resistance Level |
|---|---|---|
| **Acids (Inorganic)** | Sulfuric Acid, Hydrochloric Acid, Nitric Acid | **Excellent** |
| **Bases (Alkalis)** | Sodium Hydroxide, Potassium Hydroxide | **Excellent** |
| **Salts** | Sodium Chloride, Calcium Chloride | **Excellent** |
| **Aliphatic Hydrocarbons** | Hexane, Heptane | **Good to Excellent** |
| **Aromatic Hydrocarbons** | Benzene, Toluene | **Poor** (Not Recommended) |
| **Ketones & Esters** | Acetone, Ethyl Acetate | **Poor** (Not Recommended) |
| **Halogenated Solvents** | Chloroform, Carbon Tetrachloride | **Poor** (Not Recommended) |

(Note: Always consult the specific manufacturer's chemical resistance charts for industrial piping systems.)

5. Safe for use in Potable water:

   Since the inception of CPVC, numerous studies have been conducted which all prove that CPVC has no adverse effects on human health. These studies have reinforced the confidence of use of CPVC in potable water distribution around the world and today most of the countries have created standards / codes for CPVC use in potable water distribution.

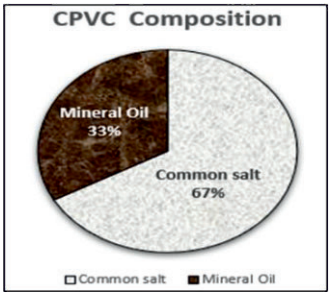
   The studies revealed that due to its inertness & smoothness of CPVC surfaces they have the lowest bacterial growth compared to stainless steel, copper, and other material used for water distribution and is corrosion resistant.

6. Sustainability: A True Green Building Material

   CPVC aligns strongly with sustainable development and circular economy principles.

   - Favourable Raw Material Footprint:

     Unlike traditional plastics that rely entirely on fossil fuels, CPVC is composed of approximately 67% common salt (chlorine) and only 33% mineral oil. This drastically minimizes the depletion of non-renewable hydrocarbon resources.




   - Fire Safety: With a remarkably high Limiting Oxygen Index (LOI) of 60, CPVC will not sustain a flame on its own. Since Earth's atmosphere is only 21% oxygen, CPVC self-extinguishes the moment a direct flame source is removed.
   - Longevity and Hygiene: CPVC systems do not leach harmful chemicals, outperforming copper and other plastics in resisting bacterial growth and biofilm formation. Designed for a 50+ year service life, the lower replacement rate makes it inherently sustainable.
   - 100% Recyclable: At the end of its exceptionally long lifecycle, CPVC pipes and fittings can be ground down and upcycled into secondary applications like window profiles or PVC pipes.

     CPVC resin by itself cannot me made into end products (pipe, fittings, sheets etc). Depending up the end-product application additives are added to enhance properties and aid in processing. Some of the additives used are Heat stabilizers, impact modifiers, processing aids, lubricants & pigments. A lot of research is going on with Nano material for enhancement of the properties. CPVC is a heat sensitive polymer & needs the right set of additives, equipment, process conditions and expertise in manufacturing to deliver high quality end products.

**The Indian Market Landscape and Unprecedented Growth**

The real estate sector in India is projected to surge from US$ 200 billion in 2021 to a staggering US$ 1 trillion by 2030, eventually contributing 13% to the national GDP by 2040. This rapid infrastructure development—bolstered by initiatives like "Housing for All" and the "Jal Jeevan Mission"—guarantees a massive, sustained demand for high-quality building materials.

To meet this projected 12-15% CAGR, local manufacturing capacity is scaling aggressively. Domestic / Global companies are making immense strategic investments to secure raw material availability within the country:

Today, more than 50+ BIS-certified CPVC pipes and fitting manufacturers—including industry giants like Supreme, Astral,

Ashirvad, Finolex & Prince —are driving the distribution of CPVC piping system across the subcontinent.

Expanding Applications: From Piping (Plumbing / Fire Sprinkler/ Industrial) to FutureTech

While traditionally dominating hot/cold plumbing, fire sprinklers, and industrial fluid transport, CPVC's unique properties are driving its adoption in next-generation sectors:

- Architectural Profiles: Specialty CPVC compounds are ideal for manufacturing high-quality building components such as windows, doors, ceilings, fences, and siding substrates. Because these compounds are inherently heat-resistant and flame-retardant, the architectural profiles maintain their structural shape and color without deformation, even when exposed to elevated temperatures, ensuring long-term cost efficiency.
- Chemical Storage Sheets & Tank Liners: Thanks to its exceptional resistance to a broad spectrum of harsh acids and bases, CPVC is a critical material in chemical processing facilities. It is widely fabricated into durable sheets to serve as protective liners within chemical storage tanks and handling equipment, ensuring the safe, long-term containment of highly corrosive liquids.
- Data Centres: The backbone of the digital age requires flawless cooling. CPVC is increasingly used for chilled water-cooling networks. Its installation requires no "hot works" (welding), and it entirely eliminates the risk of internal scaling or corrosion that could clog sensitive cooling systems.
- EV Lithium Batteries: As the electric vehicle market surges, CPVC is being utilized in battery casings and internal structural components. Its high dielectric strength ensures electrical isolation, while its chemical resistance protects against highly corrosive battery electrolytes.
- Hydrogen Transportation: Green hydrogen is the fuel of the future. CPVC is emerging as a candidate for low-pressure hydrogen distribution networks due to its low gas permeability, chemical inertness, and resistance to hydrogen embrittlement (a common failure point in metal pipes).

**New & Cutting-Edge Innovations in CPVC:**

The vinyl industry is continuously innovating to improve performance and sustainability:

- Next-Generation LED Light Chlorination Traditionally, the free radical chlorination reaction of PVC was initiated using thermal energy, ultraviolet (UV) light, or chemical catalysts. However, visible light and LED reactor technologies are now rapidly gaining ground. Adopted by global leaders in the vinyl industry, this LED chlorination system marks a significant shift in how CPVC resin is produced. Moving away from conventional UV methods, this cutting-edge technology delivers substantially better thermal stability, stronger processing efficiency, and measurable sustainability gains during manufacturing.
- VESDA Smoke Detection: CPVC is becoming the material of choice for Very Early Smoke Detection Apparatus (VESDA) systems. Today VESDA systems are installed at Airports, Railways station and all important buildings. CPVC's perfectly smooth bore ensures rapid, uninterrupted air sampling, while its LOI of 60 guarantees safety in mission-critical environments.
- Carbon Fiber Precursors: Researchers are utilizing CPVC as a highly cost-effective precursor for carbon fibre manufacturing. Bypassing the expensive oxidation stabilization step, CPVC-derived carbon fibre achieves a tensile strength of 1.83 Gpa, meeting strict automotive industry standards.

**Conclusion**

From its humble origins in 1930s laboratories to its current status as the backbone of modern plumbing, fire safety, and industrial fluid transport, CPVC has proven itself to be much more than a commodity plastic. Supported by immense domestic capacity expansions, unparalleled thermal and chemical properties, and a fundamentally sustainable composition, CPVC is not just keeping pace with India's infrastructure boom—it is actively enabling it.

# PVC – A Reliable Partner in Hydroponic Applications

**Dr. Abhijit Patil,**
Secretary General,
Indian Vinyl Council

## Vertical farming – No Longer A Futuristic Concept

Conventional agriculture has long been dependent on the use of farmland, natural sunlight, water, and favorable weather conditions. However, as climate change continues to disrupt weather patterns and reduce viable farmland, innovative solutions like vertical farming are emerging as potential alternatives.

Vertical farming is a relatively new method of growing crops in vertically stacked layers, often within heavily controlled indoor environments. This approach can use hydroponics, aeroponics, or aquaponics - methods that all use nutrient-rich water, instead of soil, to grow plants. With hydroponic systems, plant roots are submersed in nutrient-rich liquid. With aeroponic systems, the roots are suspended in the air. Aquaponic systems involve raising fish.

Vertical farming offers many benefits that traditional farming cannot. For example, while crops produced by traditional farming are limited by geographic region and seasonal changes, vertical farming enables growers to cultivate regional or seasonal crops indoors year-round. They can grow crops anywhere a greenhouse or controlled environment can be established. As a result, consumers (especially those in urban areas typically far from traditional farmlands) can also have easier access to fresher produce.

Vertical farming is the practice of growing crops in stacked layers, typically indoors, using controlled-environment agriculture (CEA) technology to optimise plant growth and eliminate the need for pesticides. By utilising hydroponic or aeroponic systems, it reduces water usage by up to 90–98% and requires significantly less land, enabling high-yield, year-round production.

### Key Aspects of Vertical Farming:

- Growing Techniques: Instead of soil, plants are grown in nutrient-rich solutions (hydroponics) or misted environments (aeroponics).
- Controlled Environment: Artificial light (LEDs), temperature, humidity, and CO2 levels are managed to create ideal growing conditions.
- Space & Location: Crops are stacked in vertical layers, allowing them to be placed in urban warehouses, shipping containers, or rooftops, reducing transportation costs and "food miles".
- Benefits: High productivity per square meter, year-round, pesticide-free, and consistent production.
- Challenges: High initial setup costs, high energy consumption for lighting/HVAC, and reliance on technology.

## Hydroponic farming – A Sustainable Food Supply Chain of Future

Hydroponic farming is a soil-free, water-efficient agricultural method that grows plants in nutrient-rich water solutions, often in controlled environments like greenhouses. By maximizing space and reducing water usage by up to 90% compared to traditional farming, this technique enables faster growth, higher yields, and year-round production.

### Key Advantages of Hydroponics

- Water Efficiency: Uses up to 90% less water than conventional farming, making it ideal for arid regions.
- Higher Yields & Speed: Crops can grow up to 10 times faster and in higher density than traditional farming due to optimized nutrition directly to the roots.
- Controlled Environment: Allows control over temperature, humidity, and nutrients, reducing the need for pesticides.
- Space Optimization: Vertical farming techniques allow for high production in small or urban spaces

### Common Hydroponic Systems

- Nutrient Film Technique (NFT): A continuous flow of nutrient solution runs over roots in channels.
- Deep Water Culture (DWC): Plant roots are suspended in an oxygenated nutrient solution.
- Aeroponics: A sophisticated method that mists roots with nutrient solution.
- Wick System: A simple, passive system that uses a wick to deliver nutrients.
- Drip Systems: Used for larger plants, delivering nutrients directly to the plant base.

### The Global Hydroponics Market

The global hydroponics market has witnessed remarkable growth over the past decade and shows no signs of slowing down. As the demand for sustainable agriculture rises, hydroponics has emerged as a revolutionary solution, enabling high-yield farming with minimal resources. From urban centres to rural landscapes, this innovative method is reshaping the agricultural industry and addressing critical challenges such as land scarcity, water conservation, and food security.

The global hydroponics market size is estimated at USD 6.23 billion in 2025 and is projected to increase from USD 7.01 billion in 2026 to approximately USD 20.00 billion by 2035, growing at a CAGR of 12.37% from 2026 to 2035.

The Indian hydroponic farming market is experiencing rapid growth, with a market size estimated as USD 500 million in 2024-2025, and projections suggesting it could reach over $3 billion by 2031-2033. Driven by rising demand for pesticide-free produce, urbanisation, and water scarcity, the sector is growing at a compound annual growth rate (CAGR) of over 15-17%.

### Hydroponics Market Growth: Key Drivers

1. Increasing Demand for Sustainable Farming

With rising awareness of climate change and environmental degradation, hydroponics has become synonymous with sustainable farming. Its water-saving capabilities and soil-less nature are attracting global attention.

- Hydroponics uses up to 90% less water compared to traditional farming.
- It eliminates soil erosion and reduces dependency on harmful pesticides.

2. Urbanisation and Vertical Farming

As urban areas expand, traditional farmland is shrinking. Hydroponics offers a solution through vertical farming, in which crops are grown in stacked layers or in compact spaces.

- Urban areas like Singapore, Tokyo, and New York are investing heavily in vertical hydroponic farms.
- This trend supports local food production and reduces transportation costs and carbon emissions.

3. Technological Advancements in Agriculture

The integration of IoT, AI, and automation has made hydroponics more efficient and scalable. Farmers now monitor crop health, nutrient levels, and environmental factors in real time, enhancing productivity.

**Opportunities in the Hydroponics Market**

While the hydroponics market is thriving, it also opens doors to new opportunities for businesses, governments, and individuals.

1. Commercial Farming and Export Potential

Hydroponics is gaining popularity in commercial farming, especially for high-value crops such as leafy greens, herbs, and fruits. The demand for organic and pesticide-free produce is rising globally, creating lucrative export opportunities.

2. Urban Farming Solutions

The market for home and community-based hydroponic systems is growing. Affordable DIY kits and smart, compact designs allow individuals to grow their own food, even in limited spaces.

3. Employment and Skill Development

The expansion of hydroponic farms is creating jobs in areas such as farm management, research, equipment manufacturing, and system design. Training programs and certifications are preparing a workforce for the future of agriculture.

4. Food Security in Developing Regions

Governments and NGOs are adopting hydroponics to combat food insecurity in resource-limited regions. Its low water and space requirements make it a viable option for drought-prone areas.

**Future Outlook for the Hydroponics Market**

The global hydroponics market is poised for sustained growth, with innovations and investments shaping its trajectory. Key trends to watch include:

- Increased adoption of renewable energy to power farms.
- Advancements in automated systems for precision farming.
- Expansion into rural and resource-limited regions to enhance food security.

By addressing existing challenges and leveraging opportunities, hydroponics has the potential to revolutionize agriculture, making it more sustainable, resilient, and efficient.

**PVC – A True Partner for Hydroponic Systems**

PVC is preferred material for hydroponic cultivation due to techno-commercial advantages.

1) Durable and Resistant to Corrosion

One of PVC's standout features is its durability. It doesn't rust or corrode, even when exposed to water for long periods. This makes it perfect for hydroponic systems, where water is constantly flowing.

2) Longer life

Do not require replacement of parts frequently, which saves time and money in the long run. With proper care, PVC setup can last for years.

3) Versatile for Custom Hydroponic Designs

PVC's versatility is another reason it's so popular. There are different designs possible with PVC through pipes, profiles, half gutters etc. One can cut it into different lengths, connect it with various fittings, and shape it to fit specific needs. Whether a vertical garden or a horizontal system- PVC makes it possible. Its adaptability allows to design a system that works best for the available space and choice of plants. Thus, PVC provides endless possibilities for hydroponic cultivation.

4) Affordable and Widely Available

When it comes to cost, PVC is hard to beat. One can find it at almost any hardware store, and it's usually priced much lower than other materials. This makes it a great choice if anyone is setting up your hydroponic system on a budget. Whether building a small system or a large one, PVC offers an affordable way to get started with hydroponics.

5) Lightweight and Easy to Work With

PVC is lightweight, which makes it easy to handle. It can be cut, drilled, or glued without much effort. This feature lowers the installation cost. One can move or modify the setup without any difficulty. This flexibility is a big plus for anyone experimenting with PVC hydroponics systems.

6) High strength to weight ratio

Due to higher strength and stiffness of PVC products, hydroponic systems do not require extensive support structures.

7) Good chemical resistance

PVC performs best towards the nutrient solutions used in the hydroponic systems maintaining pH between 5.5 to 6.5.

8) Exceptional resistance towards biofilm formation

PVC products for hydroponic requirements can be formulated with additives like antimicrobials or UV absorbing additive which restricts growth of biofilm forming algae.

9) Thermal Insulation

Thanks to the excellent thermal insulation provided by PVC, it will be easier to maintain a stable temperature in the hydroponic system.

## PVC Profile-based hydroponic structures



## PVC Gutter System for Hydroponics



## Hydroponic Tower


## PVC Pipe based Systems


## Designed for household usage

**PVC Hydroponic Fodder tray System**

## A Successful Case Study - PVC pipes help make the world's largest urban garden come true.

Nature Urbaine is using PVC pipes to implement vertical structures for urban gardening that save space and resources and provide fresh, locally grown produce. The garden occupies more than 14,000 square meters on the roofs of the Versailles Exhibition Park in Paris, France.

### Nature Urbaine - A Revolution in Urban Agriculture, Equivalent to Two Football Fields

Nature Urbaine occupies the rooftop of Pavilion 6 of the Paris Expo Porte de Versailles, ultimately spanning 14,000 square meters (equivalent to two football fields). The farm boasts over 4,500 square meters of operational production area, housing 696 columns and 1,428 cultivation gutters. The market gardeners employ pioneering techniques in vertical farming using aeroponics and hydroponics. These systems circulate water and nutrients in a completely closed loop, avoiding urban pollution and reducing water consumption by an impressive 90%. Vertical farming multiplies the available production area by a factor of five.

In its pursuit of innovation, Nature Urbaine introduced new elements in 2021, including the launch of new varieties such as microgreens, green beans, and raspberries. These additions complement the existing array of crops, which include eggplants, basil, lettuces, kale, chives, heirloom tomatoes, cucumbers, watercress, spinach, and more.

The farm's daily harvest is promptly distributed to nearby restaurants and hotels, ensuring freshness and supporting local businesses.

## PVC – a chosen material for urban agriculture

In Nature Urbaine the plants grow upwards, supported by vertical columns of PVC pipes and bamboo, and not spread in rows on the ground, as in traditional farms. In this way, a square meter becomes five times more productive than usual.

For years, both the do-it-yourself crowd and professional urban farms have favoured PVC, as it is safe, durable, light weight, recyclable and affordable.

And it is not only virgin PVC that enables plants to grow. In many places in the world, creative minds have found a myriad of ways to reuse discarded PVC building products such as pipes and gutters for urban gardening.

In Aarhus, Denmark and Rwanda, the VinylPlus-supported urban garden project Garden to Connect has gathered local enthusiasts, non-profit organisations, community centres, architects, authorities, waste owners and PVC converters. In the project the life of discarded PVC construction products is prolonged before they are sent to recycling. The construction products are given a new function as plant boxes.

Urban agriculture using PVC pipes contributes to a better trade-off between the two SDGs. Hydroponics, aeroponics, vertical farming and the other urban growth systems make cities more resilient and sustainable and can support development of green spaces. At the same it enables local food production that supports nutrition security and income generation.

# Industry Updates

### Lubrizol introduces LED reactor technology for CPVC manufacturing

Lubrizol Corporation has unveiled a major breakthrough in CPVC manufacturing, installing next-generation LED reactor technology at its Louisville, Kentucky plant. The LED chlorination system marks a significant shift in how CPVC resin is produced, delivering sharper thermal stability, stronger processing efficiency and measurable sustainability gains.

The new process significantly improves thermal stability and energy efficiency, driving more sustainable production while unlocking operational advantages for customers. Among the benefits: longer production runs with less downtime, greater formulation flexibility and improved color performance — key factors in high-specification applications.

"LED chlorination allows us to deliver meaningful performance improvements-greater thermal stability, faster customer process times, and improved sustainability, while enabling new levels of operational flexibility

### Sikora Centrewave 6000 system for making PVC-O manufacturing more precise:

Suzhou Bechton Plastic Machinery, a Chinese manufacturer of PVC-O plastic pipe extrusion equipment, has incorporated a Centrewave 6000 system from Sikora into its latest model. Bechton's PVC-O pipe production line is for pipes with diameters of 90-400mm.

It is claimed that the Centrewave system addresses three production challenges in large-diameter pipe production: comprehensive monitoring, ease of operation, and increased automation. The system uses millimetre-wave technology to achieve 100% coverage of the pipe circumference during measurement, enabling precise monitoring of wall thickness. This overcomes measurement challenges encountered with traditional methods, ensuring homogeneity of the pipe wall thickness – and the pipe's pressure rating and durability.

It is easy to operate and provides precise control over wall thickness, preventing the production of overly thin or thick pipes. Through intelligent control, it cuts reliance on operator experience and provides real-time data records and trend diagrams.

The initiative was well appreciated by the students and faculty of the university and requested more and frequent interactions in future. Prof. Gite proposed on job training (1-3 months) for the students of final year.


### AIUPMA Calls for Urgent Government Action as Chinese uPVC Imports Overtake Indian Manufacturing

The All India uPVC Profile Manufacturers Association (AIUPMA) has sounded a serious alarm over the rapid rise of imported uPVC window profiles into India, warning that the domestic manufacturing ecosystem is facing severe pressure due to unfairly priced imports, predominantly from China.

Imported profiles from China are being sold in the Indian market at prices lower than the cost of raw materials required for domestic production, severely impacting local manufacturers. Over the past three years, imports from China have steadily increased year after year.

As a result, the market share of Indian manufacturers has dropped below 50%. If this trend continues, the sustainability of the domestic industry will be at serious risk.

A key reason for this situation is the high anti-dumping duty imposed on raw materials when imported into India. However, when these same raw materials are processed into finished products in China and exported to India, they attract significantly lower duties, giving Chinese products a major pricing advantage in the Indian market.

Furthermore, many imported products are of inferior quality and tend to deteriorate within two to three years. This has led to a loss of customer trust and a decline in demand for high-quality products manufactured domestically.

If this situation persists, manufacturing in India may become unviable. The association strongly urged the government to provide the industry with the necessary recognition and a protective environment, emphasising the need to ensure that only quality products enter the Indian market.

### IVC interaction with Somaiya University

Indian Vinyl Council (IVC) had undertaken an initiative of educational interaction with Somaiya University, Vidyavihar, Mumbai. A half-day symposium on "Poly Vinyl Chloride (PVC) a Trailblazer of Innovation and Sustainability" was organised at the School of Science, Commerce and Arts, Somaiya University, Jalgaon on 17th March, 2026.

The symposium highlighted the role and activities of IVC in the promotion of PVC and PVC Products, the PVC industry scenario in India, Applications of PVC in different end-use sectors, the importance of various additives in the processing of PVC, PVC recycling possibilities and products made from recycled PVC, and the PVC recycling scenario – Global and India.

The purpose of the symposium was to create positive image of PVC under the light of various case studies, inculcate interest about PVC among the young students who would be industry representatives in future, generate interest within students to work on innovation/product development/research in the area of PVC and PVC Products as well as allied industry.

The symposium was attended by about 85-90 students from M.Sc. (Polymer) and B.Sc. (Chemistry) courses. The symposium

was chaired by Prof. Dr. Pradnya Prabhu, Principal (Science College) and co-ordinated by Prof. Dr. Vandana Jamdar from Dept. of Polymer Science, Somaiya University.

From IVC side, Ms. Arunakumari (Reliance Ind. Ltd.), Mr. Manoj Vermani, (Reliance Ind. Ltd.), Mr. Himalaya Vardikar (Reagens India Polymer Additives Pvt. Ltd.) and Dr. Abhijit Patil (Secretary General, IVC) delivered presentations on IVC Introduction, PVC Industry Scenario, , Importance of additives and Applications of PVC respectively.

The initiative was well appreciated by the students and faculty of the university and requested more and frequent interactions in future. Prof. Jamdar proposed on job training (1-3 months) and industrial visits for the students of final year.





INDIAN VINYL COUNCIL

**INDIAN VINYL COUNCIL**
Admin. Office : 101/102, Terminal - 9 Building,
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Mumbai - 400 099, Maharashtra. INDIA
Tel.: +91 22 67489899
Email ID : membership@indianvinylcouncil.com
Website: indianvinylcouncil.com

Reg. No. : GUJ/21190/Ahmedabad (Registrar of Societies)

# MEMBERSHIP APPLICATION

Date of application:

Name of the organization : _____

Business Address : _____

_____

City : _____ Pin : _____ State : _____

Tel. : _____ Email: _____ Website: _____

Factory Address (if applicable) : _____

_____

City : _____ Pin : _____ State : _____

Tel. : _____ Email: _____ Website: _____

Date of Establishment _____ GST No. _____

Category of Business (Please tick mark wherever applicable) (see page 3 and 4 for criteria of type of membership)

☐ Manufacturer of PVC resin ☐ Additives manufacturer ☐ Processor of PVC ☐ Equipment manufacturer

☐ Trader/Distributor ☐ Institution/Association ☐ Consulting firm ☐ Others

Annual Turnover of last financial year Rs. _____

Nature of business: _____

| Name of Authorized Representatives | Designation | Specimen Signature | Mobile No | Email ID |
|---|---|---|---|---|
| _____ | _____ | _____ | _____ | _____ |
| (Principle Member) | | | | |
| _____ | _____ | _____ | _____ | _____ |
| (Alternate Member) | | | | |

Category of Membership Applied for (Please tick mark wherever applicable):

☐ Privilege ☐ Associate ☐ Donor

Name of the authorized Person:

SIGNATURE

**FOR OFFICIAL USE**

Received on: _____

Accepted at the Managing Committee Meeting held on _____

Sign of Hon. Secretary / Auth. Signatory

Send the filled form along with the cheque to :
Indian Vinyl Council, 101/102 terminal -9, Nehru Road, neat Hotel Sahara Star, Vile Parle (E) , Mumbai 400099 .India

INDIAN VINYL COUNCIL
Admin. Office : 101/102, Terminal - 9 Building,
Nehru Road, Near Hotel Sahara Star,Vile Parle (East),
Mumbai - 400 099, Maharashtra. INDIA
Tel.: +91 22 67489899
Email ID : membership@indianvinylcouncil.com
Website: indianvinylcouncil.com
Reg. No. : GUJ/21190/Ahmedabad (Registrar of Societies)

## FEE STRUCTURE

A) Privilege Members : Individuals in the Business of PVC, Corporate in PVC business, PVC compounders, PVC converters, PVC end product fabricators and any other company engaged in the field of PVC value chain or furthering the object of the Society, may be admitted as Privilege Member

Figures in Rupees

| Please tick as applicable category | | | | | |
|---|---|---|---|---|---|
| CATEGORY (COMPANY TURN OVER) | 0-100 Cr | 100-250cr | 250-500Cr | 500-1000Cr | 1000+Cr |
| ADMISSION CHARGE | 5000 | 5000 | 5000 | 5000 | 5000 |
| ANNUAL MEMBERSHIP FEE | 10000 | 25000 | 50000 | 75000 | 100000 |
| TOTAL | 15000 | 30000 | 55000 | 80000 | 105000 |
| ADD GST (18%) | 2700 | 5400 | 9900 | 14400 | 18900 |
| TOTAL | 17700 | 35400 | 64900 | 94400 | 123900 |
| LESS TDS(10%) | 1500 | 3000 | 5500 | 8000 | 10500 |
| TOTAL PAYABLE | 16200 | 32400 | 59400 | 86400 | 113400 |

## MEMBERSHIP RENEWAL CHARGE

Figures in Rupees

| Please tick as applicable category | | | | | |
|---|---|---|---|---|---|
| CATEGORY (COMPANY TURN OVER) | 0-100 Cr | 100-250cr | 250-500Cr | 500-1000Cr | 1000+Cr |
| ANNUAL MEMBERSHIP FEE | 10000 | 25000 | 50000 | 75000 | 100000 |
| TOTAL | 10000 | 25000 | 50000 | 75000 | 100000 |
| ADD GST (18%) | 1800 | 4500 | 9000 | 13500 | 18000 |
| TOTAL | 11800 | 29500 | 59000 | 88500 | 118000 |
| LESS TDS(10%) | 1000 | 2500 | 5000 | 7500 | 10000 |
| TOTAL PAYABLE | 10800 | 27000 | 54000 | 81000 | 108000 |

B) Associate Member: Any society, association, chamber of commerce or other not-for-profit organization, trust, foundation etc. registered as per the applicable law and representing manufacturing industries, service providers, suppliers, end users, dealer etc. belonging to the Vinyl chain from the India, may be admitted as Associate Member of the Society

Figures in Rupees

| | |
|---|---|
| Membership Fee | 10,000 |
| One Time Enrolment Fee | 5,000 |
| Total | 15,000 |
| Add GST 18% | 2700 |
| Total | 17700 |
| Less TDS @ 10% (for F/Y 21-22) | 1500 |
| Total Payable | 16200 |

Above mentioned are Annual fees and become due in April every year.

C) Donor Member: Individuals, firms, trusts, foundations, institutions, bodies corporate or associations supporting or desirous of supporting, or furthering the objects of the Society, may, on payment of the lump sum donations, as is fixed by the Society from time to time.

Donation will be accepted in multiples of Rs 1.0 Lakh and minimum of Rs 5.0 lakhs

# Privilege Members of IVC

1 Reliance Industries Limited
2 Baerlocher India Additives Pvt. Ltd.
3 Goldstab Organics Pvt. Ltd.
4 Reagens India Polymer Additives Pvt Ltd
5 Bihani Manufacturing Company Pvt. Ltd.
6 Ori-Plast Limited
7 The Supreme Industries Ltd
8 Theysohn Extrusion Technik India Pvt Ltd.
9 Platinum Industries Limited
10 Veka Private Limited
11 Manish Packaging Pvt Ltd.
12 Finolex Indistries Ltd
13 Deceuninck Profiles India Pvt Ltd
14 Silvin Additives Pvt. Ltd.
15 Amisha Vinyls Pvt Ltd
16 Asia Pacific Vinyl Network
17 PVC Converters (India) Private Limited
18 Pioneer Flex Pvt. Ltd.
19 Sun Ace Chemical India (Pvt.) Ltd.
20 Encraft India Pvt. Ltd.
21 Robin Banerjee
22 Lubrizol Advanced Materials India Pvt. Ltd.
23 Bharat Milling Industries
24 Prabhu Poly Pipes Ltd
25 Cooldeck Industries Pvt .Ltd
26 Duroplast India Pvt Ltd
27 Manish Jain
28 Mobel Chem Speciality Pvt. Ltd
29 Shand Pipe Industry Pvt.Ltd
30 Benchmark Polytechnik Pvt. Ltd.
31 Kemron Wood Plast Pvt. Ltd.
32 Nishan Multi Trade Pvt. Ltd.
33 Payal Poly Plast Pvt. Ltd.
34 Indowud NFC Pvt. Ltd.
35 J B Plastochem Pvt. Ltd.
36 Jain Solar Company
37 Gauri Plastochem Pvt. Ltd.
38 Galata Chemicals Pvt. Ltd.
39 R P Plastics Industries Pvt. Ltd.
40 Maxran Corporation
41 Ganges Jute Pvt. Ltd.
42 Hardy Smith Designs Pvt. Ltd.
43 Epigral Ltd.
44 Fine Organic Industries Ltd.
45 TRA Plast Industries Pvt. Ltd.
46 Vplus Chemical
47 Billion Plastics Pvt. Ltd.
48 Prasad Pneucon Automation LLP
49 Prakash Chemicals Pvt. Ltd.
50 Neoplast Engg. Pvt. Ltd.
51 Stabplast Chemo Industries Pvt. Ltd.
52 Chemvera Specialty Chemicals Pvt. Ltd.
53 SICA Plastic Machinery Pvt. Ltd.
54 NSF Safety and Certifications India P Ltd
55 Sintex BAPL Ltd.
56 DCW Ltd.
57 RA Chemicals Ltd.
58 Mittal Enterprises
59. Wonder Polymers Privilege Member

# INDIAN VINYL COUNCIL


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