



News Letter

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Vinyl is an integral part
of our day to day life

A Tribute to Sh. G K Srinivasan



(23-04-1937 – 24-09-2025)

Shri. G. K. Srinivasan (fondly known as GKS) was highly qualified, erudite, and dynamic and was one of the most respected Plastic technologists in India. He had to his credit a B.Sc. from the University of Madras, B.Sc. (Tech.) a gold medalist and M. Sc. Tech in Plastics Technology from the University Institute of Chemical Technology (formerly UDCT).

He worked in Calico, Wavin, Caprihans, and Reliance Industries Ltd. and served continuously for more than 40 years. He acquired expertise in various disciplines of the industry covering various aspects of PVC starting from PVC Resin Manufacturing, QC, R&D, Calendaring, Rigid Pipe Manufacturing, and Marketing. His entrepreneur spirit led to ventures like Tubore PVC Pipes, Vinplex India Private Limited and Polytrusions Private Limited which set new benchmarks in quality and innovation in PVC Piping.

He also pioneered the marketing of specialty chemical products manufactured by International and Indian Companies & has extensively travelled across the world for business.

He was holding the post as a convener of the Plastic Pipe Sub Committee, Bureau of Indian Standards (BIS), Government of India for a long time and his contribution to the industry have been well recognized.

Beyond his professional achievements, Shri. Srinivasan was a man of multifarious interests and talent. He was a great supporter of Social Activities, such as Education and Training and contributed both time and resources in this field, ever willing and ready to guide, assist & mentoring. With this vast contribution, he was regarded as a fatherly figure in the plastic fraternity & he had been hailed as a man with a vision.

His support and encouragement during formation of Indian Vinyl Council (IVC) will always be remembered. We at IVC are deeply saddened by the loss of a guide & mentor.



From the desk of Editor

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Many times, when people see plastics being littered around, they often say, 'Plastics should not have been thrown away in the open.' They also say that 'plastics should not have been made at all'. While the first remark about throwing plastics irresponsibly is accurate, not making plastics is entirely incorrect and defies logic. It overlooks the numerous benefits that plastics and the industries that produce them have provided to both humans and the environment.

While the problems arising from the world's reliance on plastics are rather apparent, the benefits they provide, in the form of reduced waste and costs, are often overlooked. Plastics have enabled the development of a wide range of new materials that replicate the properties of existing ones and perform tasks that these materials cannot. Plastics are lighter, more durable, cheaper and easier to manufacture. These materials have become vital in everything from building a home to manufacturing cars to creating consumer electronics.

Let us take 'food' as a case study. Plastic packaging prevents perishable foodstuffs from spoiling, making it possible for global trade in meat, fish, fruits, and vegetables. It enables essentials like corn, lentils, sugar, milk and oil to be stored and distributed securely and inexpensively. More importantly, a one-litre plastic bottle weighs 90 per cent less than a glass one. Plastic packaging thus reduces shipping costs and emissions. Just imagine the 'plastic advantage'!

Plastics have also reduced the world's reliance on older materials and on the living beings from which many of them are made. Think of your combs. There are millions of them in use. If it had been from ivory, do you think even one elephant with tusks would have remained on this earth?

Just as the benefits of plastics are often overlooked, there are also numerous potential harms that we must address responsibly.

The horrible sight of discarded plastic waste strewn across the earth, to the detriment of wildlife, is indeed reckless. Additionally, there are concerns that it may break up into microscopic fragments invisible to the naked eye. Its impact on animals consuming such substances and entering food chains is definitely concerning.

To address the issue of plastic pollution, the approach cannot involve banning plastics, but rather managing them responsibly. Better recycling technologies, which are developing fast, are one of the answers. The proportion of plastics that's getting recycled has doubled in the last two decades, but is still at around 10 per cent. This is not because people are uncaring, but rather because recycling is more challenging and costly.

Some responsible action plans would include the following: First, a greater use of waste plastics for landfills. If executed and monitored effectively, this is far superior to poorly executed recycling. It helps to avoid shipping plastic waste across the globe and ultimately end up being dumped or burned. Secondly, the use of Incinerators, which can both produce energy and allow the resulting carbon to be captured, is a useful option. There are companies which have already found a way to turn the hydrocarbons released from waste incineration into plastic feedstock. Such innovations are game-changing.

The benefits of plastics far outweigh what many of us think, but we need to handle them responsibly, with potential costs being kept in mind. There is no way that mankind can avoid 'plastics' – we need to handle them with care and caution!

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.

Quality Management in the PVC Pipe Industry



Mr. Anup Mandal,
The Supreme Industries Ltd.

PVC pipes are vital to India's infrastructure due to their cost-effectiveness, durability, and versatility in applications such as plumbing, water supply, agriculture, and drainage. The PVC Pipe segment currently holds about a 60% share of the total pipes consumed in India. It is widely used in all applications of water management, including Irrigation, water supply, plumbing, sewerage, column & casing in borewells and tube wells, and

other flexible pipes. With such high consumption and a diverse range of applications, quality management becomes crucial for the PVC Pipe industry to ensure continuous and sustainable growth.

Quality management in the PVC pipe industry is crucial for ensuring product safety, durability, and compliance, which prevents costly failures, protects end-users, and builds customer trust. Implementing robust quality measures from raw material selection to final product testing reduces defects, improves performance, and provides a competitive advantage by enhancing brand reputation and fostering long-term business growth.

Key Aspects & Benefits of Quality Management

Ensures Product Safety and Reliability:

- **Meets Standards:** Quality management ensures pipes meet industry standards and certifications, guaranteeing safety and performance for intended applications.
- **Prevention of Failures:** Rigorous control prevents catastrophic failures, leaks, or contamination, which can have severe consequences for health, infrastructure performance and the environment.

Enhances Durability and Performance:

- **High-Quality Materials:** Quality management starts with selecting and testing high-grade raw materials, ensuring strength, flexibility, and resistance to corrosion, UV radiation, and pressure.
- **Consistent Manufacturing:** It maintains consistent wall thickness, uniformity, and proper compounding of materials, leading to more durable pipes that resist wear and tear.

Cost Reduction and Higher Efficiency:

- **Minimizes Defects:** Reducing defects like cracks and leaks prevents the need for costly rework, scrap, and warranty claims.
- **Long-Term Cost Savings:** Durable, high-quality pipes require fewer replacements, saving money on maintenance and repairs for both manufacturers and end-users.

Builds Trust and Reputation:

- **Customer Satisfaction:** Consistent, reliable products lead to higher customer satisfaction and brand loyalty.
- **Market Reputation:** A strong commitment to quality enhances a company's reputation, investors' trust, attracts new customers and provides a significant competitive edge.

Promotes Sustainability:

- **Reduced Waste:** Investing in durable pipes reduces waste from frequent replacements, making the industry more environmentally sustainable.

Facilitates Compliance and Continuous Improvement:

- **Regulatory Compliance:** Quality management helps manufacturers adhere to safety and environmental regulations, avoiding potential legal issues.
- **Proactive Approach:** Implementing a Quality Management System (QMS) transforms quality from a reactive task into a strategic advantage, enabling continuous improvement through the latest technology, data analysis and information systems.



Quality Assurance (QA) in the PVC Pipes and Fittings Industry – General Awareness:

Quality Assurance (QA) plays a critical role in the PVC pipes and fittings industry, ensuring that the products manufactured are safe, durable, and meet regulatory and customer expectations. PVC pipes and fittings are widely used in plumbing, irrigation, water supply, and industrial applications, so consistent quality is essential to prevent leaks, failures, and long-term damage.

Key Aspects of QA Function:

1. **Raw Material Verification:** QA begins with inspecting incoming raw materials such as PVC resin, stabilisers, and additives. Ensuring that these materials meet specified standards is crucial for producing high-quality pipes and fittings. Substandard raw materials can lead to weak, brittle, or defective products.
2. **Process Monitoring:** The production process involves extrusion for pipes and injection/moulding for fittings. QA ensures that process parameters temperature, pressure, speed, and cooling are maintained within the correct range. This guarantees consistent wall thickness, diameter, and mechanical properties.
3. **Product Testing:** QA conducts rigorous testing, including:
 - o **Dimensional checks:** Ensuring pipes and fittings match specified sizes.
 - o **Mechanical tests:** Assessing tensile strength, impact resistance, and flexibility.
 - o **Hydrostatic pressure tests:** Verifying pipes can handle rated pressures without leakage.

- o Chemical resistance tests: Ensuring compatibility with water, chemicals, and environmental conditions.
- 4. Documentation & Traceability: QA maintains detailed records of batches, test results, and production processes. This ensures traceability in case of defects and is essential for compliance with standards like BIS (Bureau of Indian Standards), ISO, or international standards such as ASTM.
- 5. Compliance & Certification: QA ensures that products comply with national and international standards. Certifications assure customers of product reliability and safety.
- 6. Continuous Improvement: QA identifies deviations, investigates root causes, and implements corrective actions. By analysing production data and customer feedback, QA contributes to process optimisation, reduction of waste, and enhanced product performance.

Importance for Industry and Customers:

- Prevents failures like pipe bursting, leaks, or chemical degradation.
- Enhances customer trust and brand reputation.
- Supports sustainable manufacturing by reducing defective products and wastage.
- Aligns the organization with legal and environmental standards.

Conclusion:

In the PVC pipes and fittings industry, QA is not just a technical function it is a strategic process that ensures reliability, safety, and long-term satisfaction for end-users while promoting operational excellence for the manufacturer.

With growing usage of PVC pipes in the country, quality management in PVC Pipe manufacturing is not only essential to ensure a long-term performance of the product but also to make the PVC pipe business more sustainable with improvement in brand image and investors' trust.



Vinyl is an integral part of our day to day life

Become a Member,
to enjoy the
IVC Benefits

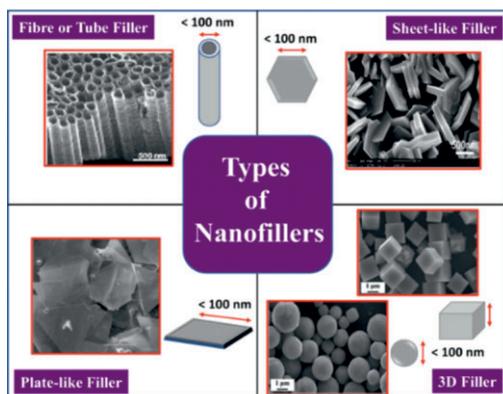
Nano fillers for PVC Nanocomposites



Dr. Yogesh Chimankar,
Platinum Industries Ltd.

Nanofillers are microscopic particles with at least one dimension between 1 and 100 nanometers used to enhance the properties of materials through increased surface area and strong interfacial interactions. These fillers can be inorganic (such as metal oxides or clays) or organic (like nanocellulose) and are used in low concentrations to significantly enhance mechanical, thermal, electrical, and optical properties, finding applications in

diverse fields, including packaging, medicine, and electronics.



How Do They Work?

- **High Surface Area:** The nanoscale dimensions give nanofillers a very large surface area relative to their volume, allowing for greater interaction with the surrounding material.
- **Interfacial Interaction:** This large surface area promotes strong interfacial (interface) interactions and crosslinking with the host matrix, such as a polymer.
- **Reinforcement:** Even at very low concentrations (e.g. less than 5% by weight), the improved interaction provides significant reinforcement and property enhancement to the composite material.

How are nanofillers made?

Nanofillers are manufactured using either top-down methods, which reduce larger particles to the nanoscale, or bottom-up methods, which build nanoparticles from atoms and molecules. The choice of method depends on the specific type of nanofiller (e.g., inorganic oxides, carbon-based materials) and the desired properties for the final composite material.

Top-Down Approaches

These methods start with bulk material and reduce it to the nanoscale.

- **Ball Milling:** Large powders are placed in a vial with grinding media (like balls) and subjected to high-energy impacts and friction through vial rotation. This process fractures and refines the powders into smaller particles.
- **Lithography:** Processes that use masks or beams (like electron beams) to etch or pattern materials at the nanoscale.

- **Arc Discharge:** An electrical discharge is used to vaporise and then recondense material into nanoscale particles.
- **Inert Gas Condensation:** Material is vaporised and then condenses into nanoparticles within an inert gas atmosphere.

Bottom-Up Approaches

These methods involve building nanoparticles from individual atoms or molecules.

- **Sol-Gel:** Precursor materials are mixed in a solution to form a gel, which then solidifies and is processed to create nanoparticles.
- **Chemical Vapor Deposition (CVD):** Gaseous precursors react in a controlled atmosphere to form solid nanoparticles on a substrate.
- **Hydrothermal Synthesis:** Chemical reactions occur in a hot, pressurized aqueous solution, leading to the formation of nanoparticles.
- **In-Situ Polymerization:** Nanofillers are dispersed within a liquid monomer, which is then polymerized to create a nanocomposite material.

Key Considerations in Nanofiller Manufacturing

- **Purity and Surface Properties:** The purity of starting materials and the surface characteristics of the final nanofillers are crucial for performance.
- **Control of Parameters:** Factors like temperature, pressure, reaction time, and the use of coating agents can be adjusted to influence the size, morphology, and properties of the resulting nanoparticles.
- **Scale and Cost:** Some methods are more suitable for laboratory-scale production, while others like conventional mixed oxide methods can be adapted for large-scale commercial use.

Applications

- **Polymers:** Nanofillers are a key component in polymer nanocomposites, improving mechanical strength, thermal stability, and barrier properties.
- **Food Packaging:** They enhance barrier properties and antimicrobial activity in biopolymer-based food packaging systems.
- **Medicine:** Nanofillers are used in drug delivery systems for controlled release and in biocompatible materials.
- **Optoelectronics:** They improve the performance of displays and sensors by enhancing conductivity, light emission, and mechanical flexibility.
- **Energy:** Nanofillers are employed in batteries and solar cells to improve efficiency and performance.



Nano-fillers for PVC Composites:

Common nanofillers used in PVC composites include clays, silica, calcium carbonate, talc, carbon nanotubes, graphene, and titanium dioxide, which enhance the thermal stability, mechanical properties, and fire resistance of the composites. The effectiveness of these nanofillers depends on their even distribution within the PVC matrix, which can be improved through surface modification to ensure better adhesion between the filler and the polymer.

Types of Nanofillers for PVC Composites-

- **Clay-based fillers:** This category includes materials like bentonite, kaolinite, and mica, which can improve the thermal and mechanical properties of PVC.
- **Carbon-based fillers:** Carbon nanotubes (CNTs), graphene, and graphene oxides are effective in enhancing the mechanical strength and thermal conductivity of PVC nanocomposites.
- **Oxide-based fillers:** Nanoparticles of silica (SiO₂), titanium dioxide (TiO₂), and zinc oxide (ZnO) are used to improve mechanical properties, thermal stability, and even add photocatalytic or UV-absorbing functionalities to PVC.
- **Other inorganic fillers:** Calcium carbonate, talc, and layered double hydroxides (LDHs) are other options to create PVC nanocomposites.
- **Natural organic fillers:** Nanocellulose derived from plant or animal sources can also reinforce PVC, providing excellent mechanical properties.

Why Use Nanofillers in PVC?

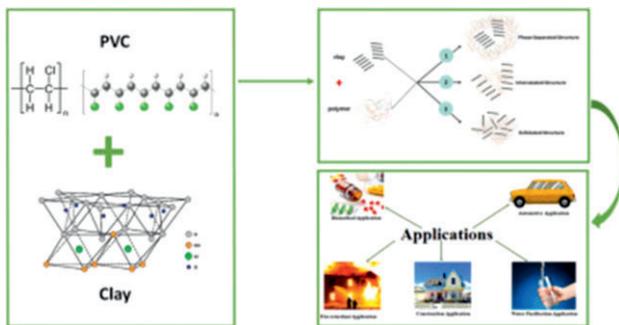
Nanofillers offer a high surface area, enabling greater interaction with PVC chains, which enhances properties such as tensile strength and elongation. Additionally, they offer advantages such as lighter weight, enhanced electrical and thermal conductivity, and improved dimensional stability, making them crucial for advancing the material's capabilities in various applications.

Key Considerations

- **Dispersion:** The key to realizing the benefits of nanofillers is to ensure their uniform dispersion within the PVC matrix. Poor dispersion can lead to poor mechanical properties.
- **Interfacial Adhesion:** Proper surface modification of nanofillers is crucial for enhancing their adhesion to the PVC polymer, resulting in a more robust composite.

Key Benefits of Nanofillers in PVC Composites:

- **Enhanced Mechanical Strength:** Nanofillers increase tensile strength, toughness, and elongation at break, providing better reinforcement compared to traditional fillers.
- **Improved Thermal Stability:** They can delay the thermal decomposition of PVC and enhance its overall thermal stability and char yield, which is crucial for mitigating its inherent instability.
- **Better Functional Properties:** Electrical and Thermal Conductivity: Uniform dispersion of nanofillers like carbon nanotubes and graphene can lead to higher electrical and thermal conductivity.
- **Antimicrobial and Antioxidant Properties:** Some nanofillers, like nano-silica, can imbue the PVC with antimicrobial or antioxidant properties, expanding its use in applications requiring these features.
- **High Surface Area:** Nanoparticles' nanoscale dimensions result in a large specific surface area, creating a larger interfacial area for interaction with the PVC matrix, leading to superior property improvements.
- **Lightweight and Dimensional Stability:** Nanofillers are typically lightweight, and their incorporation can mitigate shrinkage during processing, improving the dimensional stability of the final PVC product.
- **Improved material compatibility:** Nanofillers can influence the morphology of the composite, improving compatibility and dispersion between immiscible phases, and promoting more desirable structural formations like a co-continuous structure.
- **Better Fire Resistance:** Nanocomposites often exhibit improved fire resistance compared to pure PVC.
- **Novel Functionalities:** Nanofillers can introduce new properties to PVC, such as enhanced UV absorption, photocatalytic activity, or dielectric properties.
- **Electroactive polymers (EAPs)** such as plasticised polyvinyl chloride (PVC) reinforced with nanofillers have emerged as a promising approach for developing soft composite materials or gels with stimuli-responsive properties. These composites are utilised in advanced applications, including wearable artificial muscles, soft robotics, flexible actuators, adaptive lenses, and biomedical devices.



PVC Windows – Modern Power Plants for Sustainable Economic Growth



Dr. Abhijit Patil
Secretary, General, IVC



Ms. Arunakumari GS
Reliance Ind. Ltd.

Introduction

Power is a vital input for economic development and the sustenance of the modern economy. It is also important for the eradication of poverty. However, providing adequate and clean power to face the ever-growing environmental degradation has been a great challenge of the current century.

The inevitable increase in the use of fossil fuels to keep pace with economic growth has associated side effects, including a threat to the country's energy security and environmental degradation through climate change. The growing world population and economic development are putting pressure on the existing resources.

As early as 1896, the Swedish scientist Svante Arrhenius had predicted that human activities would interfere with the way the sun interacts with the Earth, resulting in global warming and climate change. The prediction is becoming more or less true mainly due to the indiscriminate use of fossil fuel.

Conservation of energy and environment is the call of the day. Every human being is aware of the alarming rate at which natural resources are being depleted and is well aware of the difficulties in replenishing them, let alone replenishing them at the same rate. The demand-supply gap in electricity is resulting in load shedding not only in residential areas but also in the industrial sector. On the other hand, serious efforts are being made to augment forest cover by adding to the 'artificial forest' through tree plantation drives across the country. Scarce natural resources, such as wood and energy-dependent metals, which are significant components of the construction sector, need to be replaced with alternatives that are more environmentally friendly and energy-efficient.

Energy Scenario in India:

India has world's 3rd largest power generation capacity as 467 GW and is fourth largest consumer of the electricity. Indian Power sector has generated about 1949 TWh in 2023-24. The country has been facing growing shortages since last many years. In 2011-12, shortage between peak demand (127,724 MW) and supply (114,233 MW) was observed to be about 14,000 MW.

In 2024-25, a shortage between peak demand (250 GW) and supply (240 GW) was observed to be about 10,000 MW. Peak demand is expected to grow to 272 GW by 2026-27. The peak demand and energy demand would be 363 GW and 2,459 billion kWh (excluding

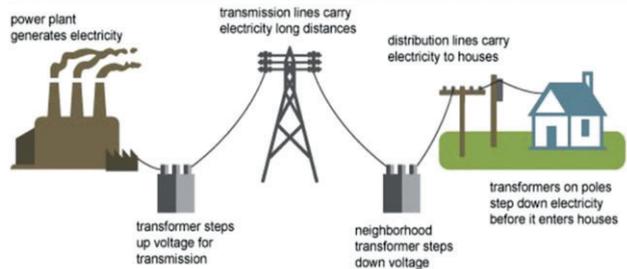
For instance, in 2024, the EU's Emissions Trading System (EU ETS) priced carbon between €80–€100 per ton of CO₂. Meanwhile, China's National ETS traded credits for as low as \$6–\$10. The disparity creates financial asymmetry, benefiting economies that are further along in decarbonization.

Carbon Markets and the Global Supply Chain

Decarbonization is reshaping the global supply chain. Logistics firms are facing surging costs due to carbon taxes and emission reporting requirements. The EU ETS now includes maritime shipping, making long-distance freight more expensive. Airlines must comply with CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation), adding carbon costs to air cargo.

As companies face growing pressure to map Scope 1, 2, and 3 emissions—direct, indirect, and value chain-related emissions respectively—supply chain compliance becomes a bottleneck. Firms unable to certify low-emission manufacturing or logistics, risk losing access to carbon-sensitive markets, particularly in Europe and USA. Suppliers from countries with lenient climate policies will either face border taxes, like the EU's Carbon Border Adjustment Mechanism (CBAM), or invest in costly certifications and offsets. In the near future, carbon efficiency will rival labor costs as a driver of supply chain decisions.

Electricity generation, transmission, and distribution



Forest Cover Situation and Fuelwood Consumption in India:

According to the India State of Forest Report, 2025, released by the Forest Survey of India (FSI), the total forest cover in the country is now at 8,27,357 sq. km. This accounts for 25.17 per cent of the total geographical area of India.

In India, in year 2023, out of 1.2 billion population, 0.9 billion people (over 70%) were dependent on fuelwood for cooking or heating purposes. In rural areas, the percentage of households depending on fuelwood is 67.3% while in urban areas, dependence on fuelwood is 14% as most of the households (68.4%) used LPG as the primary source of energy for cooking all over India. The cooking gas (LPG) is mainly utilised in the vicinity of the road. The number of LPG users in remote locations is negligible. Fuelwood is generally being extracted from the forest areas, but in recent years this trend has decreased. In 2011, only 27% of the total fuelwood was extracted from the forest. Other sources of fuelwood collection are roadside plantations, social forestry, private farms, and community lands. Fuelwood is not only consumed by the household sector but also at a commercial level, like in manufacturing, cottage, and construction industries, and in other sectors like hotels and cremations, etc.

India's dependence on fuelwood and forestry products as a primary energy source is not only environmentally unsustainable, but it is also claimed to be the primary cause of India's near-permanent haze and air pollution.

Unless India makes major, rapid and sustained effort to expand electricity generation and power plants, the rural and urban poor in India will continue to meet their energy needs through unsustainable destruction of forests and fuel wood consumption.

Construction Scenario in India:

Today, India is the second fastest-growing economy in the world. The Indian construction industry is an integral part of the economy and a conduit for a substantial part of its development investment, and is poised for growth on account of industrialisation, urbanisation, economic development and people's rising expectations for improved quality of living.

In India, construction is the second-largest economic activity after agriculture. It contributes about 9% of the country's GDP. By 2030, the sector is expected to account for 15% of the country's GDP. The construction industry in India has undergone a radical transformation over the past decade. As per a report by KPMG, by end of 2025 the Indian construction market is likely to be the 3rd largest in the world, valued at \$1.4 Trillion fueled by urbanization, rising incomes, and government investments. The market is predicted to reach \$2,134.43 billion by 2030, at a compound annual growth rate (CAGR) of 12.6% from 2024 to 2030. With the present emphasis on creating physical infrastructure, massive investment is planned in this sector.

The Knight Frank Report, "India Real Estate: A Decade from Now," indicates that India's urbanization rate of 36.5% (79 million households) is expected to rise to 42.5% (164 million households) over the next decade, with the number of cities with over one million people increasing from 64 to 70 by 2034.

The current housing shortage in urban areas is estimated to be ~10 million units. An additional 25 million units of affordable housing are needed by 2030 to meet the country's growing urban population. Similarly hotel industry is geared up to fill up the gap of 1 lakh hotel rooms by next five years at the rate of 20000 units per year.

Energy Saving in Buildings – Need of the hour:

Traditional buildings consume or are responsible for:

- 45% of the world's total energy use;
- 50% of all materials and resources;
- 50% of wood use;
- 35% of the world's CO2 emissions;
- 80% of potable water use;
- 25% of freshwater withdrawal (including power plants)
- 40% of municipal solid waste

Energy consumption in buildings is a matter of great concern for two main reasons:

- 1) Reflects the concern of the end users about the bills they are required to pay
- 2) Energy security of the country

The energy consumption in Indian buildings, particularly in the air-conditioned buildings, is much higher than that in other countries. [7]

PVC – An Infrastructure Plastic:

PVC – well established in the Western Hemisphere and finding increasing acceptance in the developing countries as well - is one such excellent alternative to many of the conventional materials in the building and construction sector. This has resulted in this material getting designated as "Construction Polymer" – very rightly so!

Owing to its excellent inherent resin characteristics and adaptability to numerous compounding ingredients, PVC can be formulated in various ways to meet different end use requirements. Furthermore, technological advancements in processing have also enabled this commodity polymer to meet the 'engineering' requirements.

Polyvinyl chloride, or PVC, finds applications suitable for building and construction, as well as infrastructure. PVC is used for manufacturing pipes, windows, doors, floorings, roofing sheets & membranes, electrical wiring & conduits, fencing, decking, siding, railings etc.

During their entire life cycle, PVC products not only save energy but also contribute a lot in saving environment by reducing the requirement of scarce resources like wood and oil. PVC as it contains 57% of chlorine in their structural backbone put very little pressure on oil resources for its manufacturing.

A polymer which consumes much lesser energy and creates much lesser environmental impact compared to many of the traditional construction materials and even some of the major polymers during its entire life cycle, PVC has established itself in significant end use applications in the construction sector. PVC Window is one such product!



PVC Windows: Energy and Environment Saving Windows

The consumption of electricity in buildings is dominated by the lighting energy demand and energy demand for air conditioning. In buildings, windows play a crucial role in determining electricity consumption with respect to both aspects.

Life cycle studies by Universitat Politecnica De Catalunya, Barcelona [8] on PVC windows in comparison with Wood and Aluminium windows explained that the usage phase in the window life cycle contributes the highest energy consumption. The studies revealed that PVC windows with double glazing save energy between 12 to 35% depending on the window system, with and without breaks, as shown in Graph 1.

PVC Windows not only save energy but also reduce carbon dioxide emission as shown in Graph 2. The above-mentioned study shows that PVC windows have the potential to reduce carbon dioxide emissions by about 60% over the life cycle and about 35% during the usage phase.

PVC windows also provide intangible benefits, including noise reduction, zero maintenance, and no water ingress.



PVC Windows – Relevancy for India

PVC Windows play a vital role in energy conservation in buildings- residential as well as commercial.

In India average residential unit size is observed as 800 square feet,

which includes 2 Bed rooms, 1 Kitchen and 1 Hall. Air conditioning is preferred in bed rooms rather than in the whole unit. In Indian climatic conditions, average usage of Air conditioning in residential area is about 2 hours per day. This results into usage of approximately 1083 kWh of power annually for air conditioning in one room. [11] It was analyzed through survey of electricity bills from various end users that PVC windows save at least 10% i.e. 108 kWh annually per room compared to conventional metal/wood windows.

PVC windows are used in about 10% of existing houses which comes to 7.9 million houses. [12] It can be concluded that these PVC windows have resulted in saving about 1484 MW of power, as shown in Table 1.

Assuming that PVC windows will continue to have 10% of share in new constructions to be built (10% of 35 million houses), it will contribute in energy saving of about 657 MW in additional residential buildings in future. Table 2 shows the energy saving through usage of one PVC window in 3.5 million houses to be built.

PVC windows have a share of more than 50% in US. [13] The PVC window sector is growing at a double-digit rate in India. If PVC window usage in India matches the US average, it would result in energy saving to the tune of 3380 MW as presented in Table 3. This is equivalent to 5 projects of 650 MW, which is the minimum economically viable size of a power plant in the country [3].

Similarly, usage of PVC window in hotel industry has great potential to save energy and environment. The study on usage of PVC windows by replacing Aluminium windows was carried out by a leading window manufacturer who installed PVC windows in a 5 Star hotel in Pune, India. It was observed that PVC windows saved about 3000 kWh/unit annually – a saving of ~ 23% of electricity.

The potential for energy saving using of PVC windows in all new hotel rooms (1 lakh rooms to be built) is calculated and given in Table 4. Total energy saving in hotel units would be about 55MW.



Conclusions

During their total life cycle, PVC Windows are known to conserve energy as compared to traditional material windows. From the current share of 10% PVC window usage in India, PVC Windows saved about 1500 MW of electricity. If the PVC windows usage rate reaches the US average of ~ 50%, it will result in a saving of ~ 3400 MW of electricity. This is equivalent to 25% of the current deficit in electricity availability and also equivalent to 5 average sized power plants. At a rate of ~ 0.9 million USD investment per MW generation [3], this would result in saving ~ 3000 million USD.

Table 1. Energy Saved through PVC Windows in Urban Residential Area in India

Total housing stock in India (million)	79
Housing units using PVC windows (10% of Total) in Million	7.9
Average power consumption due to one Air Conditioner (kWh/year)	1,083
Energy saving due to PVC Windows @ 10% (kWh/year)	108
Energy saving in total housing units with PVC windows (MWh)	8,53,200
Total usage of Air conditioner in India (hrs)	575
Energy saving due to PVC Windows (MW)	1484

Table 2. Energy saving potential of PVC Windows in new constructions

Housing shortage in Urban Area in India (Units in million)	35
Housing units using PVC windows (10% of total houses to be built) in Million	3.5
Average power consumption due to one Air Conditioner (kWh/year)	1,083
Energy saving due to PVC Windows @ 10% (kWh/year)	108
Energy saving in total housing units with PVC windows (MWh)	3,78,000
Total usage of Air conditioner in India (hrs)	575
Energy saving due to PVC Windows (MW)	657

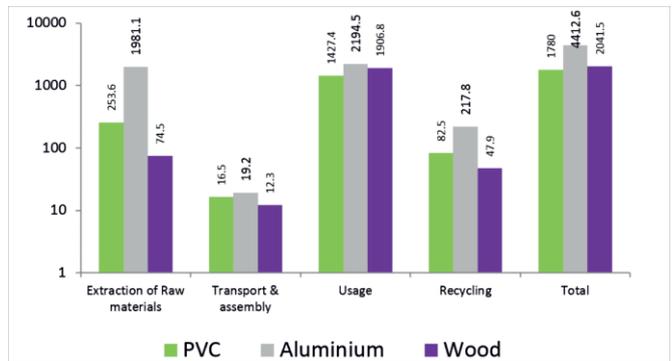
Table 3. Energy saving potential of PVC windows with US average

Housing shortage in Urban Area in India (Units in million)	35
Housing units using PVC windows (50% of total houses to be built) in million	18
Average power consumption due to one Air Conditioner (kWh/year)	1,083
Energy saving due to PVC Windows @ 10% (kWh/year)	108
Energy saving in total housing units with PVC windows (MWh)	19,44,000
Total usage of Air conditioner in India (hrs)	575
Energy saving due to PVC Windows (MW)	3380

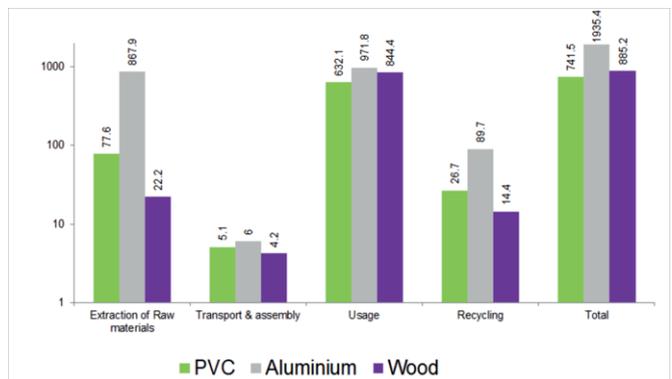
Table 4. Energy Saving Potential through usage of PVC Windows in Hotel Industry in India

Hotel room shortage in hospitality industry	1,00,000
Use of Air Conditioning per day (Hours)	15
Use of Air Conditioning per year (Hours)	5,475
Energy saving in one room annually on usage of PVC window vis-à-vis Aluminium Window (kWh)	3000
Total Energy saving that can be achieved through use of PVC windows in all hotel rooms to be built (kWh)	300000000
Total Energy saving in MWh	300000
Total Energy saving in MW	55

Graph 1. Energy Saving Proposition of PVC Windows vis-à-vis Aluminium and Wood (in kWh)



Graph 2. Reduction in CO2 emission due to usage of PVC Windows vis-à-vis Aluminium and Wood (in Kilograms)



Industry Updates

IVC Seminar

Venue- Hotel The Deltin, Daman

Date: 16-05-2025

Indian Vinyl Council organised a seminar at Plastic Processing Hub – Daman, where the audience had an opportunity to interact with technical experts from the PVC and allied industry, Industry associations like Daman Industry Association and Machinery manufacturers, etc.

This seminar was held on 16th May, 2025, at Daman, at Hotel The Deltin.

The purpose of the seminar was to provide a platform to Industry leaders, machine/additive manufacturers, end users, PVC converters to enrich the knowledge through interactions with industry stakeholders.

The seminar with a title ‘PVC- Plastic that stands the test of time’, was attended by more than 200 participants from industry stakeholders of PVC, Additives & Machinery value chain. The audience included CEO, Head of Departments, owners & founders of the businesses, representatives from PVC product manufacturing, technocrats etc.

The seminar was inaugurated with lighting of lamp and Ganesh Vandana. The welcome address by Dr. Shreekant Diwan, President, IVC highlighted the contribution of Daman in PVC Pipe industry as leaders in plasticizer mfg. (KLJ), Cable and Compound mfrs (Polycab India and Ddev Group) and many PVC compounders are located in Daman making it ‘Compounding hub’ of the country.

Mr. Vivek Sane – Past President, Indian Vinyl Council, had appraised about IVC & its activities. Chief Guest – Sh. Satyendra Kumar, President – Daman Industry Association, highlighted the importance of PVC in various end-use segments in general and in the Medical sector specifically. He also appealed industry participants to use platform of IVC to improve the performance and contribution of PVC value chain.

Mr. Janam Shah from Goldstab Organics Pvt. Ltd. delivered presentation ‘PVC Problems solved at the Root: Smart Stabilization for Superior Performance’ covering benefits of selection of correct stabilization system by knowing the root cause. He also highlighted importance of right compounding mechanism to avoid problems like improper fusion, brittleness, plate-out, etc.

Mr. I Parmar from KLJ Plasticizers showcased ‘Next Generation Plasticizers’ including non-phthalate plasticizers for medical disposables, range of KLJ plasticizers for Wire & cables, Automotive applications, etc.

1st Technical session covered presentations from Reliance Ind. Ltd (by Manoj Virmani) covering PVC consumption scenario-global & India, Prasad Pneucon Automation LLP (by Sh. Mahesh Thaker) covering automation systems for PVC processing and Polycan India Ltd. (by Sh. Netaji Jamdade) covering types and trends in flame retardants for PVC wires & cables, importance of various flame retards like, metal oxides, nanoclays & zeolites, halogen and phosphate-based retardants etc.

2nd Technical Session included presentation on Wood PVC Composites (by Hardik Panchal, Hardy Smith Pvt. Ltd.), MSME – Yesterday, Today and Tomorrow (by Sh. Robin Banerjee, Nucleon Research Pvt. Ltd.) and PVC Recycling – Myth to Reality (by Sh. Sourabh Mittal, RP Plast Industries).

IVC Members were felicitated by awarding Membership Certificates and acknowledged for their contribution in IVC.

Mr. Pranay Bhargava delivered vote of thanks.

The Seminar was well received by the audience and highly appreciated for the technical contents, time management and hospitality. The audience provided the feedback with requesting frequent organization of such events for upgrading the knowledge of participants through latest industry updates, technical innovations, product developments etc.



Industry Updates

IPI-IVC JOINT SEMINAR

Venue- Hotel Eros, New Delhi

Date: 23-07-25

Indian Plastics Institute- Mumbai Chapter & IPI HO had jointly organised a 7th technical seminar with Indian Vinyl Council (IVC). This seminar was held on 23rd July, 2025 at New Delhi.

The seminar with a title – PVC 360 – Innovations, Applications and Future Trends, was attended by approx. 200 no of participants.

The seminar was inaugurated with welcome address by Shri Vineet Gupta, Chairman, IPI Delhi Chapter. Mr. Sameer Joshi, Chairman, Governing Council IPI had appraised the audience about the IPI activities.

Mr. Rajeev Mehendale, Honorary Secretary, Indian Vinyl Council, had appraised about IVC & its activities. Keynote address on Advancing Sustainability & Circularity from Thought to Deed was delivered by Mr. Rajesh Deshpande, Vice President, DCM Shriram Ltd.. The chief guest covered the consumption trends in PVC and the potential available in India. Pulin Rajyagor from Reliance Ind. Ltd.

1st Technical session chaired by Sh. Sanjay Nawander (Reagens India Additives P. Ltd.) covered presentations from Benchmark Polytechnik and Sai Machine Tools. In 2nd technical session, 20 Microns Ltd., KLJ Plasticizers, Neoplast Engg. and Platinum Industries representatives delivered presentations on diverse

topics covering innovations in PVC Processing, Next generation plasticizers, Material Handling Automations, Modern Additives Package systems etc.

Technical session 2 chaired by Sh. Rajesh Srivastava (Reliance Ind. Ltd.) covered various topics on CPVC Resin Mfg, PVC and CPVC processing machineries, Sustainability through Stabilizers and innovative specialty additives presented by representatives from Epigral Ltd., Prasad Group, Theysohn Extrusiontechnik, Reagens India Additives and Mobelchem Specialty.

Panel discussion on 'PVC 360 – Innovations, Applications and Future Trends' was chaired by Ms. Vineeta Gupta (Reliance Ind.) and participated by Sh. Sharad Aggarwal (MD, Padmavati Pipes), Sh. PV Ravikumar (APL Apollo Doors & Windows), Sh. Arvind Goenka (RMG Polyvinyls), Mr. Mukesh Asija (Indian Plumbing Association), Sh. Sourabh Mittal (R P Plast Industries). Trends in end use sectors viz. PVC Pipes, Windows, Floorings, Plumbing systems etc were discussed in light of challenges and approach of PVC Pipe manufacturers for continuous improvement. The importance of quality management for sustainable business growth, the development of new products, and the role of BIS in improving the performance and economics of recycled PVC pipes were discussed at length by the panellists. Additionally, the challenges in processing mixed PCR were also addressed.

Mr. Manish Jain, Management Committee Member (IVC) delivered vote of thanks.





INDIAN VINYL COUNCIL

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)

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

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

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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

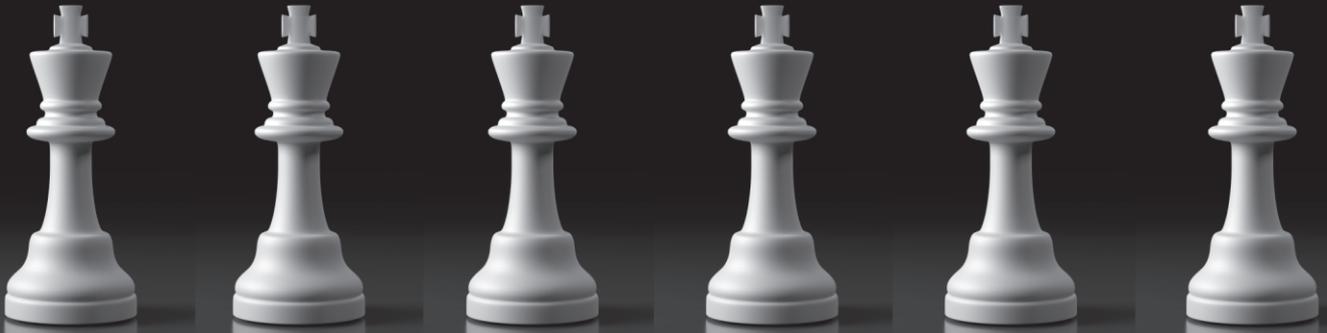
Membership Fee	10,000
One Time Enrolment Fee	5,000
Total	15,000
Add GST 18%	2700
Total	17700
Less TDS @ 10% (for F/Y 21-22)	1500
Total Payable	16200

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

HAPPY
Diwali



Celebrate Light, Celebrate Sustainability

*Indian Vinyl Council believes that progress and planet can go hand in hand.
Let's build a brighter, greener tomorrow with PVC - a smart and
safe choice for sustainable innovation.*

Wishing you a prosperous, safe, and eco-friendly Diwali!



INDIAN VINYL COUNCIL

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