

T.A.O. NEWSLETTER

Quarterly Company Newsletter



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Highlight

Film insert Molding (FIM) Technology & Market Trend



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Film Insert Molding (FIM) Decoration technology is a process for decorating plastic materials which later will be using a high pressure forming machine. It consists of 4 steps. Firstly, an image is printed onto a plastic sheet and then undergoes a high pressure forming process to get the required shape, then the formed plastic sheet is trimmed or cut to get the desired shape. The final step is the injection molding where plastic resin is injected and adhered to the plastic film to increase strength and functionality for assembly. Finished products include automotive parts, such as the automotive console [which include the automotive dashboard, car audio frame, air-conditioner frames, and controls], gear shift, door trim, and car emblem. For electrical appliances FIM technology is used for the control panel for washing machine and microwave and for medical appliances, it is often used for the frame of medical equipment such as heart rate meter frame. This process is used in the automotive, electrical appliances, and medical devices industries.

For forming process (2nd step), we recommend High Pressure Forming, which is more precise than regular thermoforming process, mainly used for forming of plastic materials or laminates for IME (In-Mold Electronics) or FIM (Film Insert Molding) processes. The main benefits of high pressure forming are high accuracy in positioning of graphics, symbols and printed electronics as well as high repeatability in forming shape.

Development of Film Insert Molding (FIM)










Film Insert Molding (FIM) is trend technology that is becoming increasingly popular in many industries, especially Automotive. Automotive designers discovered that FIM is enabling designers to be more adventurous.^[1] With the advancement in designing automotive interior as well as the development of specialty films using in FIM technology, FIM technology can now deliver any color and variety of effects, even circuit printing, creating more than just a case of producing colored plastic shapes, its capability is also being used to create and enhance brand value.

Global Automotive Interior Materials Market

According to the Global Automotive Interior materials market, it is expected to generate revenue of around USD 59.97 billion by 2024, growing at a CAGR of around 4.2% between 2018 and 2024.^[2] Automotive interior materials are a significant part of an automotive with the rising demand for premium interiors in mid-sized and eco cars. Apart from enhancing the ambience of the vehicle, they offer driving pleasure and maximize the comfort to drivers as well as passengers. It is considered an innovative technology that is likely to grow with the automotive market for both fuel and electric cars.

Advantages of FIM/IMD becoming a trend for many industrial products

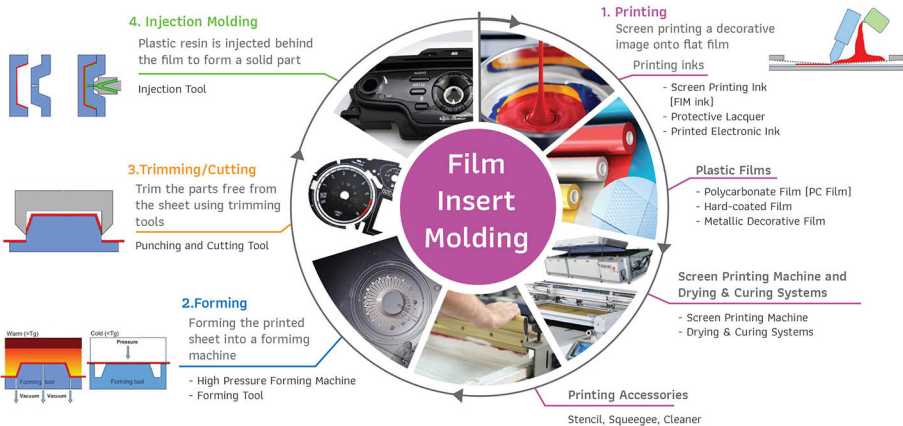
Due to the current environmental concerns, the use of eco-friendly materials is essential. Many manufacturers are looking for better materials, methods, and processes by which to manufacture their products. One alternative for decorating plastic products that is becoming more in demand includes film insert molding (FIM) as a way to avoid painting parts and chrome plating. It is safe for users and the environment. This offers manufacturers extensive flexibility in design and manufacturing as well as considerable savings in costs, time and machine investment.^[3]

-  Eliminates secondary decorating operations (e.g. coating and painting) and costs since injection molding and decorating occur within the same process. Circuits can also be printed and embedded rather than insertion of wires. The elimination of wires also allows for a thinner control panel.
-  Decoration can be changed by simply inserting different printed films from shot to shot.
-  Environmentally friendly, with the reduction of raw material such as metals, circuit wires, etc. resulting in decreased danger in case of a car accident.
-  High-precision parts can be made with unique appearances that could not be made any other way.
-  High durability and scratch resistance due to second surface graphics printing. That means the graphics are printed on the back or inside surface of the film, where it is permanently protected from the environment after the part is molded.
-  Unique and sophisticated appearances
-  The decorated film used in FIM can create a huge variety of visual effects by being monochromatic, multicolored, or metallic. The process also allows for integrated symbols, transmitted light design, surface impression (glossy, textured, or matte) and high gloss, which can be set selectively

Film Insert Molding (FIM) the total solutions

T.A.O. Bangkok Corporation Limited, is a specialist in providing products and services for clients who wish to use the Film Insert Molding (FIM) process. With over 25 years of experience in decorative printing, our engineering team are ready to provide consultation regarding FIM technology to support customers, in the automotive, electrical appliances and medical equipment industry as well as customers in other industries as well. The products that we provide are materials and machines used to make automotive emblem, illustrative emblem, car audio frame, and other products through the use of Film Insert Molding (FIM) technology.

Processes and Materials of FIM

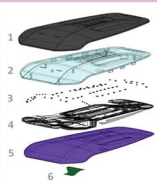


The products that we support for FIM production covers the whole process, from screen printing ink for FIM/IMD, Polycarbonate film (PC film), Metallic Decorative Films, Screen Printing Machines, Drying & Curing Systems, as well as High Pressure Forming Machine and Tooling for forming, cutting, and injection molding, along with the printing accessories, e.g. squeegee, stencil and Cleaner from the world's leading manufacturers. Our products are used by many of the major worldwide automotive and electrical appliance manufacturers as well as reputable medical equipment suppliers.



Credit Photo : Proell GmbH, Niebling GmbH

FIM Configuration



1. A-surface: Hard coated polycarbonate film, 0.375mm.
2. Molding resin: Polycarbonate
3. Electronic components: LEDs, top emitting and side emitting
4. Printed electronics: Conductive inks, dielectrics
5. B-surface (substrate for electronics): Polycarbonate film, 0.25mm.
6. External connection: Flat cable

World-class brands to serve FIM solutions :

covestro

Film

Matgraph

niebling

Proell

RKS

THIEME

Proell GmbH

T.A.O. INSIDE



Mechanism of Volatile Organic Compounds (VOCs) Emissions in the organization

T.A.O. Bangkok Corporation Limited has committed to good governance in both environment and safety. We pay attention to entire process in order to control and reduce the emission of volatile organic compounds (VOCs) which are pollutants that harm people, animals, communities, and environment. For example,



Water management: Our organization has inspection and monitoring of waste water from washing equipment in the production process before being released into the waste water treatment system of the Industrial Estate. After passing through the treatment process of the Industrial Estate, the water will be released into natural water sources.



Chemical vapors and air quality managements: Ventilation systems are installed in production rooms to reduce accumulation in this area. In addition, wet scrubbers are installed to treat the vapor generated from plate production before being released outside.



Waste sorting and hazardous waste management: The organization clearly classifies all wastes into general waste, recyclable waste, hazardous waste. Each type of waste has its proper disposal process. For instance, the container of hazardous waste and contaminants are safely disposed of to prevent chemical spillage.

Furthermore, all products distributed to the customers have been carefully selected to support the customer's requirements. They must be an environmentally friendly and meet International Standards such as:

- Products with low evaporation of VOCs.
- Products that are free from Aromatic Hydrocarbons, e.g. Toluene, Xylene, Benzene, Naphthalene, which are all volatile organic compounds.

With commitment and attention to the products and services delivered to our valued customers, highest awareness of social responsibility with regards to environmental aspects, the company was awarded the Environmental Governance Award 2019 (Green Star Award) under Smart Eco Industrial Town from the Industrial Estate Authority of Thailand. We are very proud of our commitment in taking care and protecting the environment for the good quality of our employee's lives as well as the community. We are ready to provide services and deliver quality products to our customers sustainably.



Regulation Standards that our products are in compliance with



Product Groups that are in compliance with the standards



Understanding Volatile Organic Compounds (VOCs) & Toxicity

What is VOCs?

Volatile Organic Compounds (VOCs) are pollutants with strong odor that are dangerous to human health or cause harm to the environment. It is the organic chemical that is one of the carcinogens. VOCs are carbon-based compounds and with hydrogen, oxygen, fluoride, chloride, bromide, sulfur, or nitrogen altogether to form Aliphatic or Aromatic, including Carbonyl (Aldehyde Ketones) and alcohol groups that have a high vapor pressure at ordinary room temperature.

Source of Volatile Organic Compounds (VOCs) in the atmosphere

The contamination of volatile organic compounds is caused by the production process in an industrial factory. Operations that require solvents, including the contamination in the product that people daily use and is difficult to avoid.

Health effects caused by VOCs



Immune System
Disturbing the immune system or reduce the capability of disease prevention



Other adverse health effects
Lung tissue will be permanently destroyed if in taking for a long time. It affects other body systems such as genetic systems, hormonal systems, cancer, and such reproductive systems as sterility and may cause birth defects in pregnant women.



Nervous System
Causing depressive symptoms such as drowsiness, dizziness, depression or loss of consciousness

Activities and Locations that cause VOCs



Industrial plants



Construction site



Car



Waste disposal site



Combustion of oil, coal, natural gas



Products with coatings, adhesives, thinner, and etc.

*Data source : BUREAU OF ENVIRONMENTAL HEALTH, DEPARTMENT OF HEALTH, MINISTRY OF PUBLIC HEALTH

Credit Photo : Designed by macrovector / Freepik

Ceremony of Environmental Governance Award 2019 with Smart Eco Industrial Town and Certificate of Honor (White Flag, Green Star Award)



The Industrial Estate Authority of Thailand has established an environmental governance project (White Flag, Green Star Award). The objectives are to promote and support factories in Industrial Estates to operate in accordance with environmental and safety governance. This encourages social responsibility by allowing the people in the area to participate in the inspection and supervision, as well as creating confidence from all sectors of factory management. This project started in 2008.

The ceremony of Environmental Governance Award and Certificate of Honor (White Flag, Green Star Award) 2019 was presided over by the honorable Ms. Somjin Piluek, Governor of the Industrial Estate Authority of Thailand, for factories in Industrial Estates in the Bangkok Metropolitan and the central regions. There were 64 factories in 15 industrial estates participating in the event.

T.A.O. Bangkok Corporation Limited participated in this project and passed the selection, receiving the Outstanding Factory Award of the year 2019 as an award-winning company at Chatrium Riverside Bangkok on 22nd January 2020. The award was accepted by Mr. Pakorn Angspatt, Safety Management Representative and Ms. Supawan Thongsee, Safety Officer in professional level of T.A.O. Bangkok Corporation.

T.A.O.'s New Year Party Celebration 2020



T.A.O. Bangkok Corporation Limited held a New Year party 2020 along with activities to strengthen unity within the organization. Employees participated in activities and all had fun. Morning activities led by executives and employees participating in sports games. Apart from having fun from the activities, employees also had a chance to plan and work together as a team to help one another. Afternoon activities were to exchange gifts between executives and employees, as well as lucky draw for special awards from executives. Special awards included Digital TV, microwave, toaster set with shabu pot, electric hot pot, and etc.

A New Year's Eve party was held in the evening. This was to give happiness to employees who have worked hard throughout the year. The theme of the party is Fancy Party, aka "Party tung tee-Fancy wai korn". TAO staff fully dressed up in fancy themes and join for a chance to win an excellent dress award. In addition, there were 6 awards for outstanding 5S activity. The departments who won the awards were Product Management, Supply Chain & Marketing Operation, Accounting & Finance, Warehouse, Quality Control, and Color Matching departments, respectively. The event was full of fun and smiles from executives and staff at Friendship Restaurant on 10th January 2020.

T.A.O. Bangkok Corporation Limited in cooperation with Deco Enterprise Company Limited organized educational media about VOCs in the booth for 60th anniversary of KMUTT



Deco Enterprise Co., Ltd., a client of T.A.O. Bangkok, invited to participate in the booth for the 60th anniversary of KMUTT. T.A.O. provided educational media about Volatile Organic Compounds (VOCs) to create understanding in the selection of products that help reduce emissions of VOCs, which is toxic to users, the environment, and can linger in the atmosphere at an industrial level. It can also impact health, immunity, nervous system and even cause death.

The campaign helped people recognize the dangers of VOCs to human, animals, and the environment in a critical level, with brochures, banners, and a presentation providing information. The 60th anniversary of King Mongkut's University of Technology Thonburi and the 190th anniversary of King Mongkut was held at the King Mongkut memorial building, Khun Worapan Pattarumpornsak, General Manager and Khun Punyapat Pattarumpornsak, Business Development Manager of Deco Enterprise Co., Ltd. provided information to visitors with the marketing communications team from T.A.O. Bangkok also participating in the booth on 3-5 February 2020.



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GET IN TOUCH WITH US

Please advise us your interested topics or any comments to:



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