

Digital printing technology, allowing for high-quality, customizable designs.

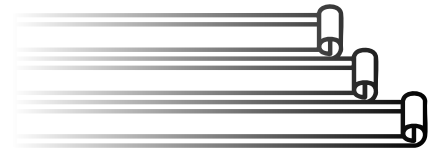
Issue 22 :
January -March 2025
Quarterly Company
Newsletter

T.A.O. NEWSLETTER



Elevate Your product design with 3D Inkjet Printing

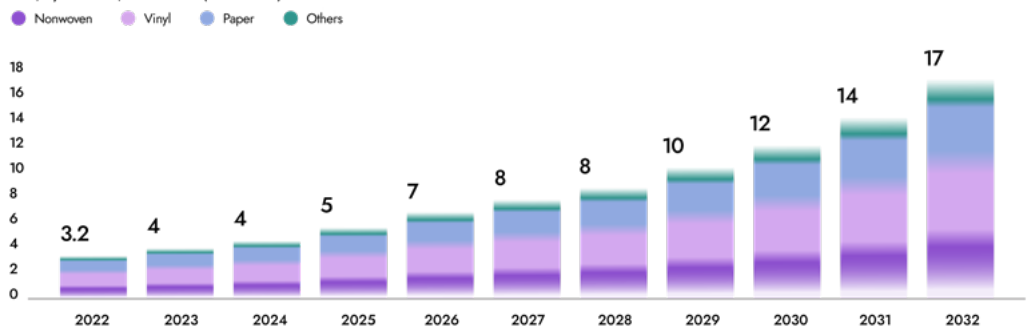
Global Digitally Printed Wallpaper Market



Digitally printed wallpaper

refers to wallpaper that is produced using digital printing technology, allowing for high-quality, customizable designs. The digitally printed wallpaper market has been growing steadily in recent years due to factors such as increased demand for customized home decor solutions, advancements in digital printing technology, and the availability of a wide range of designs and patterns.

Size, by substrate, 2022-2032 (USD Billion)



THE MARKET WILL GROW AT THE CARG OF 18.4%

THE FORECASTED MARKET SIZE FOR 2032 IN USD \$17B

Source : market.us

Top key trends make digitally printed wallpaper market growth



Customization



Eco-friendly Solutions

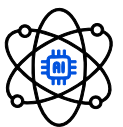


Innovative Designs



Online Sales Channels

Technological Advancements (Advancements in digital printing technology, including high-resolution printing, 3D printing, and UV-curable inks)



Source : LinkedIn



Highlight of digital inkjet printing in wallpaper market.

Feature	Inkjet Technology
Process	Non- contact
Design flexibility	Virtually unlimited
Setup time	Low
Investment	Lower than traditional
Environmental impact	Lower (water-based inks)
Durability	Can be comparable with proper inks and coatings
3D print/texture	Suit for Small & mass volume, lower cost
Cost	Lower cost both in volume and small batches



Dimense your print (Dimense digital inkjet printing solution)

Add customer depth by
embossing and printing.
Both at the same time

What is Dimense?

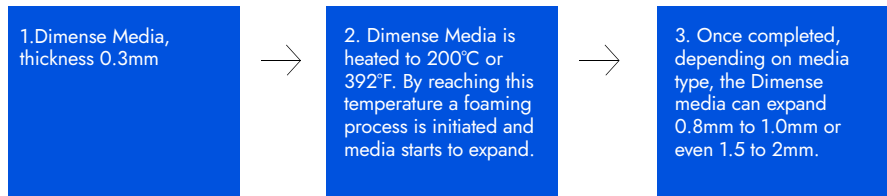
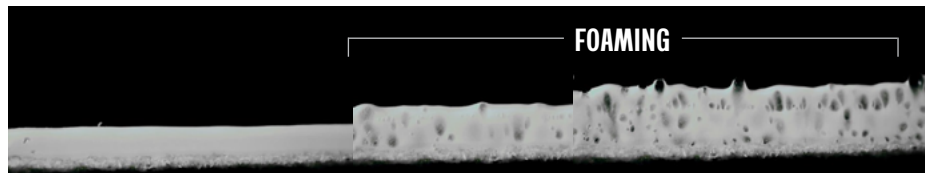
Dimense is a unique and patented complete system of an inkjet printer, combined with media and inks to create dimensional (3D textures) prints in one production step on a diversity of media with different finishes.

Key Benefits Dimense



- The media are unique, odorless, eco-friendly, PVC and plasticizer free.
- The inks are water-based in combination with a structural ink.

Dimense Technology Basics



DIMENSOR S



Dimense Ink Types

Dimensor S uses two types of inks + Cleaning Fluid.

1. Water-based inks for CMYK printing
2. Structural ink (S-ink)
3. Cleaning Fluid



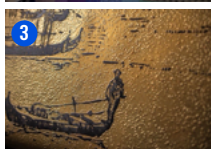
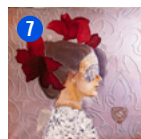
Safety & Certificate:

- PVC-free
- Plasticizer-free
- Phthalates-free
- AgBB certificate
- A+ certificate
- Media Fire-safety certificate
- CE certificate
- UL Approval

DIMENSE Applications

Transforming Spaces
with Artistic Flair

- 1 Commercial 3D Wall Covering
- 2 Paintable Dimense Décor
- 3 Mattallic Finish Cavases
- 4 Silicone Edge Graphic
- 5 Roll Up Banner
- 6 Digital Concrete Designs
- 7 Innovative Frame Art



Dimense Media Type	Parameters
Non-Woven materials	Various finish surface, Thickness after foaming: 0.8-1.0 mm
MATT	
PEARLESCENT	
CHAMELEON	
SUEDE	
SILVER	
GOLD	Printable, Thickness after foaming: 1.0-1.5 mm
PLUS	
Textile based materials	Thickness after foaming: 0.8-1.0 mm
SUEDE TEXTILE	
PEARLESCENT TEXTILE	

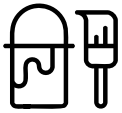
Source : [rolanddga](http://rolanddga.com)

Printing ink is a main element in the printing industry that appears an image on the products to communicate information and decoration. Therefore, the color shades are important in representing the image for product and brand recognition.

For T.A.O., we have a standard color match production process for mixing ink colors to achieve the customer requirement for color shades of screen and pad printing.

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Standards and Quality in T.A.O.'s Color Mixing Process.



Ink Mixing Ability

We have an experience more than 20 years for color mixing service according to support customer requirements.

Color Guide Systems Reference

Utilizing established standard color guide systems such as Pantone and RAL to support the printing industry's wide range of color shades.

Color Reference From Customer

Mixing colors according to the color reference sample from customer obtain accurate color shades on the customer substrate.

TAO's Color Matching Focus Point

Ink Mixing Ability

To support a variety of color shades according to customer requirements, we have a color match team ready to provide efficient ink mixing services.

Ink Sample and Service Support

To ensure that customers get the desired color shades, we support color match ink samples for customers to approve the color shades before production.

Good Quality Control

We are serious for production and quality control process to get accurate color shade and good quality.

We can mix colors on multi-layered printing.

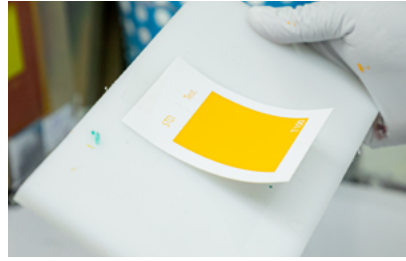
Because the color shade of the printed ink on another layer of ink will effect in different color shades appearance. And the color matching process is more complicated than usual. Therefore, it is necessary to use techniques and expertise in mixing colors.

As mentioned, it is often seen in the electrical and automotive industries, such as printing on glass panels of electrical appliances, control panels, car dashboards, etc.



TAO Production *capacity and lead time*

We have a color match production team in Thailand and Vietnam that can support the production capacity and lead time as follows:



Capacity		Lead Time
Thailand	1,800 kg/month	3 days for production
Vietnam	300 kg/month	

The color shade is inspected before sending the product to customer.

- ① Visual inspection under the light box.
- ② Delta E check the color of product with approved color before delivery (if agreed with customer)
- ③ Check the ink viscosity (if agreed with customer)
- ④ Issue a COA document in reference to production standards, when customer requests, which includes:

Visual check with the Color Light Box

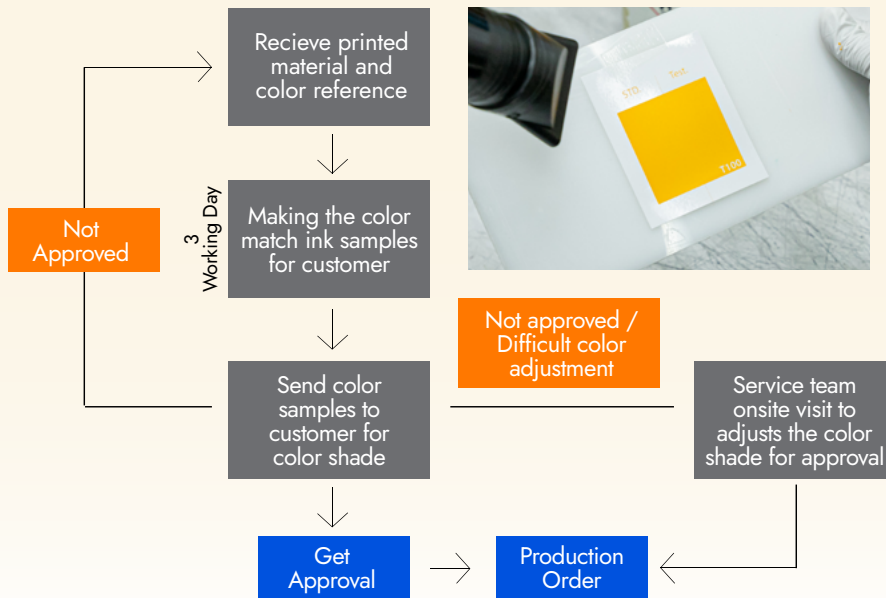
Ink sample and service support

We provide color samples to customers for test printing and approving color shades before the production order. Including color adjustment onsite services if the mixed colors are not correct according to the desired goals.

The process of color match ink sample to approve the color shade.



Inspect the color shade by delta E value



Good Quality Control

We take quality control seriously, and it is incorporated into our daily operations. In addition, there is continuous quality control training of personnel. All this is to ensure our goal of utmost customer satisfaction. Before we deliver the color match ink products to customers, there must be a seriously inspection process to ensure that the color shades are correct and accurate.

Interested in more information please contact K. Kittraj Sonso
Email: kittrajs@taobangkok.co.th



FIMPE: Forming the Future



On September 11-13, 2024, T.A.O. Bangkok Corporation Co., Ltd. hosted the event **FIMPE: Forming the Future to launch the FIMPE Innovation Center**. The event was held in collaboration with renowned partner companies specializing in the development of Film Insert Molding (FIM) technology, including Covestro, Niebling, and Proell.

Covestro is a leading manufacturer and distributor of plastic films. The company introduced various film types suitable for FIM products, highlighting special properties such as chemical and environmental resistance, making them ideal for outdoor applications exposed to sunlight, humidity, and direct heat. Additionally, Covestro offers specialty films that allow LiDAR waves to pass through and films compatible with In-Mold Electronics (IME).

Niebling, an expert in high-pressure plastic forming technology, highlighted the growing trend of using FIM and IME technologies in automotive components for both interior

and exterior applications, such as car grilles and logos. This trend is particularly evident in electric vehicles (EVs), where components manufactured using FIM/IME technologies are increasingly adopted. Furthermore, the development and design of additional parts utilizing these technologies are expected to expand in the future. To enhance the event experience, Mr. Drexler presented a sample automotive grille developed in collaboration with leading automotive component manufacturers, fully utilizing high-pressure forming (HPF) machines. This allowed attendees to witness firsthand the quality and capabilities of this technology.

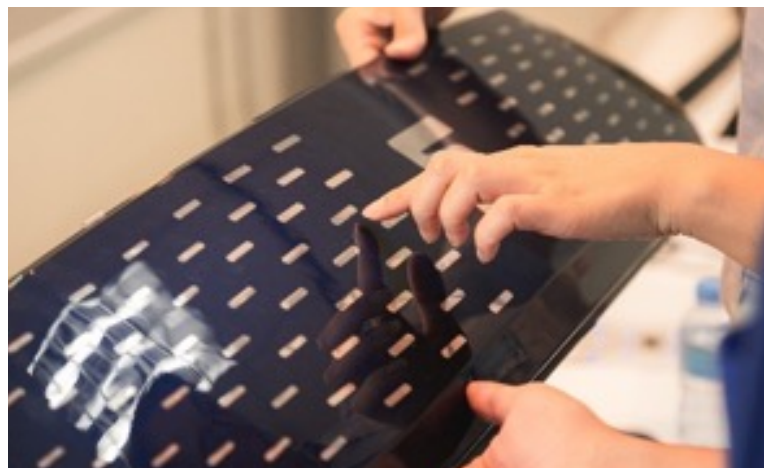
In addition, he showcased the newly sized Niebling SAMK 1000 machine, accompanied by a demonstration video of large-scale part production using the HPF 1400 high-pressure forming machine and the NST 300 cutting machine. This integration demonstrated a complete production line for the full FIM process, starting from printing, forming, and cutting, leading to the final plastic injection step to produce finished components.



Proell, a leading manufacturer of printing inks

For industries such as automotive components and electronics, Proell shared valuable insights into printing techniques and the selection of suitable inks for decoration and high-pressure forming technology. The company introduced screen printing inks specifically developed for FIM/IME technologies. These inks are designed with the following key properties:

- **High flexibility** to allow forming without cracking.
- **Heat resistance** to endure the high temperatures during the plastic injection process without melting or distortion.
- **Excellent adhesion** to ensure strong bonding between the film and plastic resin.



These advanced inks enable superior performance and durability, supporting innovative applications in automotive and electronic component production.

In addition to decorative printing inks, Proell has developed non-conductive inks to complement conductive inks used in printed electronics. They also introduced specialty inks designed for scratch resistance, chemical durability, and surface protection. These inks can enhance the appearance and functionality of parts by creating unique textures, making them more attractive and distinctive.

Examples include:

- **Norilux DC** : Ideal for FIM applications, offering formability and high durability.
- **NoriCure ORL and NoriProtect XCP** : Designed for exterior use, providing robust protection against environmental factors.
- **Norilux DCAL** : Specifically for metal surfaces, offering enhanced aesthetic and resistance properties.

As mentioned, these products have been developed in compliance with various industry standards to ensure they are well-suited for the specific applications of each component.



T.A.O. offers comprehensive FIM/IME solutions by integrating machinery, raw materials, and equipment related to printing and molding processes. This integration supports customers in developing FIM products more efficiently. T.A.O. provides full-service solutions or allows customers to select specific solutions tailored to their needs.

For example, some customers may already be working with FIM technology, while others may be new to the field but have experience in printing or plastic injection molding. T.A.O. adapts its offerings to meet the unique requirements of each customer, ensuring optimal results for various stages of product development.

T.A.O. offers additional guidance to help customers produce FIM products through the complete process. This includes

collaborating on the development of FIM prototypes to ensure a thorough understanding of the technology and its benefits. The aim is to provide accurate insights into how FIM can be applied, especially for presenting to automotive component manufacturers.

T.A.O. provides both pre-sales and post-sales services, ensuring customers have continuous support throughout their journey in adopting and implementing FIM technology effectively.

We are excited about the opportunity to apply FIM technology across various industries to enhance the potential for designing and producing components that traditional manufacturing technologies may struggle with. By utilizing FIM, we can develop enhanced product functionalities, improve production

efficiency, accelerate manufacturing processes, and reduce production waste. This innovative approach promises to drive better outcomes in terms of quality, cost-effectiveness, and overall performance.

On behalf of T.A.O. Company, we would like to extend our sincere gratitude to all the distinguished guests who attended the **FIMPE: Forming the Future** event. Your presence made the event truly special, and we appreciate your support and participation.