

White Paper on Thermal

Cyrel[®] FAST Flexographic Thermal Processor

Since developing the first thermal flexographic processor over 20 years ago, DuPont has continued to improve the Cyrel[®] FAST system in each subsequent generation to provide printer/converters and tradeshops the best performance, reliability, and sustainability available in plate making.

Cyrel[®] FAST has continuously improved, and we would like to highlight some of the key features of thermal plate making systems.

Reliability

The superior reliability of DuPont Cyrel® FAST thermal processors is well known in plate-making. We know because of a large installed base, exhaustive field experience, and detailed customer feedback. Our systems are designed to work in challenging industrial environments.

Thermal Processing Requires Thermal Management

A sophisticated thermal management system is at the heart of our Cyrel® FAST processors. Heat input can come from various sources but is most often comprised of an infrared

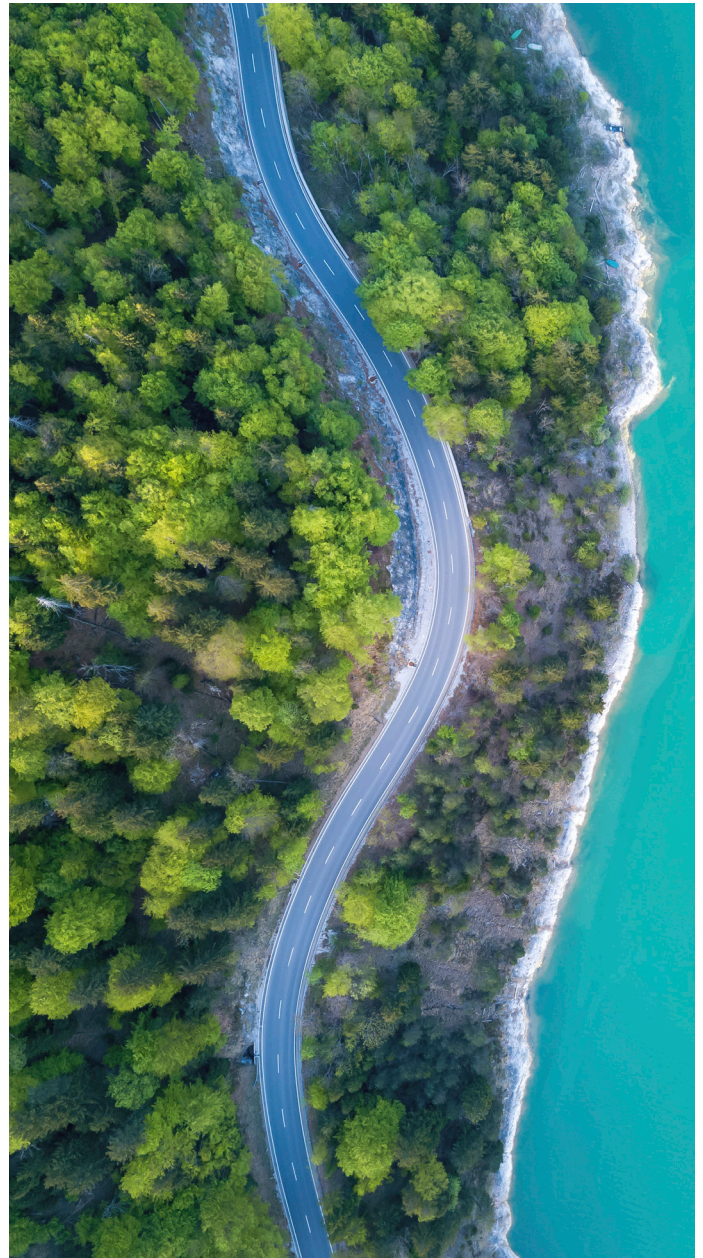
Having water-cooled systems manages heat better and helps ensure consistent plate-to-plate performance.

(IR) heater and a heated roller. IR heating has the benefit of easily adaptable energy control, but more significant

than the source of the heat is its impact on the plate being processed. Our experience has shown that the management of heat is most important for maintaining quality and high throughput, especially in 24/7 operations.

DuPont has been using IR heating in our thermal systems for over 20 years

The DuPont cooling system uses a chiller to remove the heat quickly from the processor in the exact locations that yield the optimal plate performance. Our heating and water-cooled systems are well-engineered and efficient to ensure consistent plate-to-plate performance.



Throughput

Throughput as measured by plates per hour is imperative in any platemaking organization, but in 24/7 operations high throughput turns critical. Without the downtime to “catch up”, platemaking operations can quickly become the bottleneck on production.

The DuPont™ Cyrel® thermal processor is named FAST because of how quickly it can provide your first plate. Another reason is the speed at which it can process per shift. Our Cyrel® FAST units are able to perform under pressure to produce more thermal plates per shift in comparison to solvent plate-making systems for faster access time. One of the reasons our machines operate faster, and more reliably – especially under demanding environments - is our ability to manage heat.

*Reliable system
with 99.9% uptime*

Experience

DuPont developed the first photopolymer flexographic processing system in 1974 to provide a higher quality, more productive, and less expensive alternative to existing printing methods. Then in 2000, DuPont introduced the first thermal processor system to provide printer/converters and tradeshops an even faster and cleaner way to make plates without solvent

With over 1,500 thermal installations worldwide, DuPont has developed an enormous catalog of experience that is reflected in our next generation systems and allows us to continue developing what's next.

Having so many thermal installs allows for constant customer feedback, whether it is in flexible packaging, tag and label, beverage carton, envelope, paper, or specialized coatings. From food to pharmaceutical, labels to wrapping paper, DuPont has superior experience and insight to help your company create the highest quality plates for your customers' needs.

Sustainability

Our platemaking customers are always seeking sustainable approaches in packaging and equipment. The DuPont™ FAST thermal processor has achieved, with its catalytic oxidizer (CatOx) less than 0.3% volatile organic materials (VOCs) released through the exhaust during plate production. And by eliminating the solvent still and dryer unit, customers free up space in their plate room along with eliminating the emissions and electrical demands of those systems.

When the first generation of Cyrel® FAST processors was launched 20 years ago, they did not include a CatOx as our third-generation systems do now.

Most of the heat generated from this catalytic reaction is recovered and used to preheat the incoming exhaust, significantly reducing the electrical heating demand. Our third-generation systems show a 99.7% elimination of VOCs in the exhaust – over

Technical Service Capability

The service capability of a company providing thermal processors is essential for the ongoing operations of a printer or tradeshop. Whether for scheduled preventive maintenance or for unexpected service calls, having enough experienced technicians available quickly is critical for our customers. Our systems have remote access capability for quick trouble-shooting.

DuPont's large staff of service technicians in North America, currently have a combined 380 years of experience with thermal flexographic systems. This wide coverage and deep product knowledge helps assure customers their systems will continue to run with incredible uptime and award-winning output quality.

In North America, DuPont's service technicians currently have a combined 380 years of experience with thermal flexographic systems.

75% cleaner than our thermal processors without a CatOx system. DuPont is the only company that has produced systems both with and without catalytic oxidizers so we can scientifically measure the exhaust composition for both systems in our labs.

Having cleaner exhaust matters, since packaging is facing increased sustainability requirements from both government environmental regulations and Consumer Packaged Goods (CPG) companies.

Results based on data collected by DuPont show during continual platemaking the cost of electricity using the CatOx is less than \$1 per 8-hour shift. That is a small cost to reduce VOCs an additional 75% over non-CatOx equipped thermal systems. And that ultra-clean operation is something sustainability-focused CPGs are looking for in a printer/converter partner and tradeshops.

DuPont has
over **1,500**
thermal
installations
worldwide



DuPont™ Cyrel® FAST 2000 TD

Quality and Value

DuPont systems have won the overwhelming majority of the Flexographic Technical Association's (FTA) quality awards for over 20 years. And in 2019, nearly 100% of the TLMI winners are FAST users and DuPont has more than 75% of the FTA quality awards given to printers using DuPont™ Cyrel® plates. The systems are not only clean and reliable, but they produce award-winning plates.

The value of a thermal processor includes its output quality, throughput per shift/day, consistent performance and uptime, sustainability score, along with the included technical service. DuPont™ FAST systems excel in each of these areas.

In 2019, over 75% of the FTA awards for quality were given to printers using DuPont Cyrel® plates

Summary

DuPont Cyrel® FAST technology reliably delivers faster and cleaner quality plates to printer/converters and tradeshops. We turn complicated operations into solutions and we work to help make your business more efficient, robust and sustainable. Smaller runs, faster turnarounds, minimizing environmental footprints and printing on various substrates are all possible with DuPont Cyrel® FAST.

About the Authors

Mark Hackler, PhD.

Mark Hackler has worked with DuPont Imaging Solutions (DuPont) for over 30 years and is part of a team recognized in 2019 with the prestigious American Chemical Society's (ACS) Heroes of Chemistry Award for their contribution to the discovery and development of DuPont™ Cyrel® EASY. Heroes of Chemistry is an annual award sponsored by the American Chemical Society that recognizes the role industrial chemical scientists and companies play in improving human welfare through commercial innovations and products.

Brad Taylor, PhD.

Brad Taylor is a technical fellow for DuPont Imaging Solutions in Wilmington, DE. He has worked for DuPont for over 30 years in various assignments in electronic imaging and imaging technology. He got his start in flexography as the technical team leader for the Cyrel® digital photopolymer plate development in 1995 and has continued to focus on new digital photopolymer product development and project management. Brad has a Ph.D. in electrical and computer engineering from Carnegie Mellon University. Brad is a recipient of the 2020 Pedersen Award which recognizes and promotes technical and scientific excellence across DuPont.

No freedom from infringement of any patent or trademark owned by DuPont or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. DuPont assumes no obligation or liability for the information in this document. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.



DuPont™, the DuPont Oval Logo, and all trademarks and service marks denoted with ™, sm or © are owned by affiliates of DuPont de Nemours, Inc. All rights reserved.

Form No. XXXX-XXXXXX-EN
November 2020