# APPVION DIRECT THERMAL CATALOG



PRIORITY MAIL 2198-2000 Washington DC 20020 SUNDAY OR HOLIDAY DELIVERY \* OF SIGNATURE REQUESTED

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# APPVION



WE DEVELOP INNOVATIVE, AQUEOUS-BASED, AND ENVIRONMENTALLY RESPONSIBLE COATING SOLUTIONS FOR CONSUMERS' EVERYDAY LIFE

At Appvion, we are inspired by what you do. We use our chemistry, innovative designs, and technology to bring ideas to life. Our company heritage is built on creating value. We utilize proprietary processes combined with technical knowhow in coating formulations to solve your specific needs. Our success comes from rolling up our sleeves as an extension of your team to ensure everyday business runs smooth and efficient.

As a leading manufacturer of direct thermal solutions, you can count on Appvion to tackle your customers' biggest challenges.



WE PROACTIVELY WORK WITH ENVIRONMENTALLY AND SOCIALLY RESPONSIBLE SUPPLIERS



WE CONTINUOUSLY IMPROVE OUR MANUFACTURING PROCESSES AND NATURAL RESOURCE USE TO REDUCE OUR ENVIRONMENTAL FOOTPRINT



WE PRODUCE SUSTAINABLE, QUALITY SOLUTIONS AS A MARKET LEADER IN INNOVATION

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### Key to Thermal Product Names





### **Responsible Coating Solutions**

Appvion provides you with innovative direct thermal solutions that continually improve safety and sustainability. Our solutions-based approach to sustainability supports the increase in end-user requests for products made with more natural components.

As market leaders in innovation, Appvion understands that sustainability is essential for long-term prosperity. We strive to balance economic growth, social responsibility, and environmental stewardship to meet the needs of today while ensuring future generations can thrive. Appvion is committed to improving efficiency, maintaining the well-being of employees and communities, and protecting our natural resources and environment.

Appvion has a formal Product Stewardship review process that involves assessing products during each developmental and commercialization stage. Our team proactively tracks and anticipates changing global, market, and consumer trends to ensure that product offerings will continue to meet product stewardship expectations.

As a non-integrated operation, we source wood-fiber material from certified chain of custody and non-controversial sources. We have held the Forest Stewardship Council (FSC) Chain of Custody certification for the past decade. We believe that responsible forest management is critical to the future of our planet, and in 2020, nearly 75 percent of our purchased fiber was 100% FSC certified.









### Label Products

Appvion direct thermal label products are ideal for barcode applications requiring a variety of environmental, chemical, and resistance properties. High printing speed, excellent barcode contrast, resistance, and versatility have contributed to the undeniable success of Appvion's label grades. Appvion's label portfolio is designed to meet your specific labeling needs and equipment for virtually any label application and environment.





# Résiste®

Topcoated label facestocks that are best suited for applications where extended image life is required in normal environments, or where resistance to oils and grease is needed.

	Caliner	laliper Basis Weight 17x22-500 lbs (μm) α/m² coated coated	Image	Print Speed	End-Use		Recor Printing	nmended g Processe	s		
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coated	Sensitivity	ips	Applications*	Offs	set	Fle	exo
		5/				mm/s		Front	Back	Front	Back
Résiste® 185-3.2	79	<u>18.6</u> 70.1	•		Medium	<u>2-8</u> 51-203	🥮 👅 📛 📥	UV	•	UV	UV & WB
Résiste <sup>®</sup> B550-3.1	79	<u>19.0</u> 71.4	•	-	High	<u>2-10</u> 51-203		UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 900-3.0	76	<u>20.8</u> 78.1	•		Ultra-High	<u>2-12</u> 51-305	🚺 ک	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> B900-3.2	81	<u>20.8</u> 78.4	•		Medium	<u>2-12</u> 51-305	(0) 🔐 🧔				
Résiste <sup>®</sup> PDLA	78.7	<u>18.3</u> 69	•		High	<u>2-10</u> 51-203	R .	UV		UV & WB	
Résiste <sup>®</sup> Rx	81.3	<u>19.0</u> 71.4	•		Medium	<u>2-8</u> 51-203	R <sub>x</sub>	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 15% PCW	77.21	<u>18.8</u> 69.5	•		Medium	<u>8</u> 51-203	8 🚔 🊔 🛞	UV	•	UV	UV & WB
Résiste <sup>®</sup> SR	71	<u>15.8</u> 59	•	•	Medium	2-8	Δ 💮 🄇		•		UV & WB
Résiste <sup>®</sup> SR	81	<u>19.1</u> 72			Medium	2-8	Δ 💮 🄇		•		UV & WB

• Compatible with printing method. Always validate ink for compatibility with thermal chemistry and OEM device.

WB = Water-Based UV = Ultraviolet

### Wavex®

Topcoated label facestocks best suited for applications that use near infrared or full infrared scanners to decode the ID symbology. Appvion's Wavex® PD grade is designed specifically to meet the requirements and qualifications of various package delivery needs.

	Caliper	Basis Weight	Top-	Back-	Image	Print Speed	End-Use		Recom Printing	mended Processe	s
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coat- ed	coated	Sensitivity	ips	Applications*	Off	set	Fle	exo
		6/				mm/s		Front	Back	Front	Back
Wavex <sup>®</sup> PD	86	<u>19.1</u> 71.8	•		Medium	<u>2-10</u> 51-254		UV	٠	UV & WB	UV & WB

## ThermArt®

Topcoated and brightly colored label facestock for applications requiring high visibility.

	Caliper	Basis Weight	Ton-	Back-	Image	Print Speed	End-Use		Recom Printing	nmended Processe	es
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coated	Sensitivity	<u>ips</u>	Applications*	Off	set	Fl	exo
		5/				mm/s		Front	Back	Front	Back
ThermArt <sup>®</sup> Orange 600-3.2	79	<u>20.6</u> 77.4	•		High	<u>2-6</u> 51-152		UV	٠	UV & WB	UV & WB

# Alpha®

Non-topcoated label facestocks for use in economy applications where either the label life expectation is short, or the environment is clean and controlled.

		Basis Weight		p- Back- Image		k- Image Print Speed		Recommended Printing Processes				
	Caliper (um)	<u>17x22-500 lbs</u>	Top- coated	Back- coated	Image <u>ips</u>		End-Use Applications*	Off	Offset		Flexo	
	(μ)	g/m²	couteu	coulcu	Scholary	mm/s	Applications	Front	Back	Front	Back	
Alpha <sup>®</sup> 185-3.2	81	<u>19.4</u> 72.8			Medium	<u>2-10</u> 51-254	▰≍⊄≛Ⴃ		•	UV*& WB	UV & WB	
Alpha <sup>®</sup> 180-3.3	81	<u>20.2</u> 75.9			Low							
Alpha <sup>®</sup> 820-3.4	81	<u>19.6</u> 73.7			High		📲 i ' j 🖴 💰 🧭	•	•	UV & WB	UV & WB	

\*Non-topcoat grades generally work with UV flexo inks, but not with UV overprint varnish

### Alpha<sup>®</sup> Free

Non-topcoated direct thermal stock formulated without chemical developers (BPA, BPS, and other phenols).

	Caliner	Basis Weight	Ton-	Back-	Image	Print Speed	End-Use		Recorr Printing	imended Processe	s
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coated	Sensitivity	ips	Applications*	Off	set	Fl	exo
		8/				mm/s		Front	Back	Front	Back
Alpha® Free	61	<u>13.2</u> 49.6				<u>2-6</u> 51-152					

\*Non-topcoat grades generally work with UV flexo inks, but not with UV overprint varnish



**Dispersible** Non-topcoated label facestock perfect for short-term identification. The label fully disperses at any temperature and completely washes away, leaving no paper residue behind.

	Caliner	Basis Weight	Ton-	Back-	Image	Print Speed	End-Use		Recorr Printing	mended Processe	es
	(μm)	$\frac{17x22-500 \text{ lbs}}{g/m^2}$	coated	coated	Sensitivity	<u>ips</u> mm/s	Applications*	Offset		Flexo	
		8/				mm/s		Front	Back	Front	Back
Dispersible	84	<u>18.5</u> 69.5			Medium	<u>2-8</u> 51-203	* -	UV		UV & WB	





### Film Products

Appvion's PolyTherm<sup>®</sup> film product line is the perfect solution when paper products are not providing the resistance needed. Our PolyTherm<sup>®</sup> filmbased grades provide the extra durability, resistance and sharp imaging required for a variety of applications where high water resistance or sheet strength may be needed. For unique applications where high plasticizer content adhesives could migrate through the paper sheet, our film solutions provide an excellent barrier.



## CleanSlate™

Topcoated film product that enhances traditional direct thermal performance by delivering expanded environmental resistance for long-term indoor and outdoor applications. It is made with a nonreactive chemistry, free from BPA and BPS.

		Basis Weight					Recom	mended I	Printing Pr	ocesses
	Caliper (um)	<u>17x22-500 lbs</u>	Top- coated	Back- coated	Image Sensitivity	End-Use Applications*	Offset		Fle	xo
	()=)	g/m²	couted	couted	e eniorentity	rippiloadionio	Front	Back	Front	Back
CleanSlate™ Film	78.7	<u>15.8</u> 59.5	•		Medium	<b>*</b>			UV & WB	UV & WB

# PolyTherm®

Topcoated film facestocks for use in applications where high resistance or sheet strength is needed.

	Calinar	Basis Weight	<b>T</b>	Deal	lucara	Print	Find the	F	Recomn Printing P	nended Processes	
	(μm)	<u>17x22-500</u> lbs	coated	coated	Sensitivity	ips	Applications*	Offs	set	Flex	ю
		g/m²				mm/s		Front	Back	Front	Back
PolyTherm <sup>®</sup> 300-10.0	254	<u>74.8</u> 281.0	-		High	<u>2-10</u> 51-254		UV		UV & WB	
PolyTherm <sup>®</sup> 600-6.0	160	<u>45.5</u> 171.0	•		High	<u>2-10</u> 51-254	🥪 🚹 💣		UV	UV & WB	
PolyTherm <sup>®</sup> 300-4.1	104	<u>21.9</u> 82.1	•		Medium	<u>2-10</u> 51-254	₽	UV		UV & WB	
PolyTherm® 190-4.1	104	<u>21.8</u> 82.0	•		Low	<u>2-10</u> 51-254	\$⊘	UV		UV & WB	
PolyTherm <sup>®</sup> 200-3.8	99	<u>21.1</u> 79.3	•		Medium	<u>2-10</u> 51-254		UV	UV	UV & WB	UV & WB
PolyTherm <sup>®</sup> 300-3.4 D	86	<u>16.2</u> 60.0	•		Medium	<u>2-10</u> 51-254		UV		UV & WB	
PolyTherm <sup>®</sup> 200-3.2	84	<u>18.0</u> 67.8	•		Medium	<u>2-10</u> 51-254		UV	UV	UV & WB	UV & WB
PolyTherm <sup>®</sup> 300-3.0 D	76	<u>14.3</u> 53.7	•		Medium	<u>2-10</u> 51-254	🛟 🕑 🏝 🚺	UV		UV & WB	

• Please note for best print-press performance, it is recommended that a water-based primer be applied prior to application of UV-cured inks.

WB = Water-Based UV = Ultraviolet



## PolyTherm<sup>®</sup> Clear

Topcoated film facestock that is translucent and has exceptional clarity and resistance.

	Caliper	Basis Weight	Top-	Back-	Image	Print Speed	End-Use	Р	Recomr rinting F	nended Processe	S
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coated	Sensitivity	ips	Applications*	Off	set	Fle	exo
		8/***				mm/s		Front	Back	Front	Back
PolyTherm <sup>®</sup> Clear 300-3.0	75	<u>18.7</u> 70.1	•		Medium	<u>2-10</u> 51-254				UV & WB	UV & WB

• Please note for best print-press performance, it is recommended that a water-based primer be applied prior to application of UV-cured inks.

## PolyTherm<sup>®</sup> Hotmelt

Topcoated film facestocks with back-barrier coating that have exceptional strength, smoothness and resistance. For use in applications with hotmelt adhesive.

	Caliner	Basis Weight	Ton-	Back-	Image	Print Speed	End-Use	Р	Recom rinting	mended Processe	es
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coated	Sensitivity	<u>ips</u>	Applications*	Off	set	Fle	exo
		8,				mm/s		Front	Back	Front	Back
PolyTherm® Hotmelt 300-4.1	104	<u>21.8</u> 85.0	•	•	Medium	<u>2-10</u> 51-254		UV		UV & WB	
PolyTherm <sup>®</sup> Hotmelt 300-3.0 D	76	<u>14.3</u> 53.6	•	•	Medium	<u>2-10</u> 51-254	<mark>^ }} ∲</mark> *	UV		UV & WB	





### **OPTIMA<sup>®</sup>**

Topcoated, film products with exceptional resistance performance and tear strength.

		Basis Weight					Recomr	nended I	Printing Pr	ocesses
	Caliper (um)	<u>17x22-500 lbs</u>	Top- Ba coated coa	Back- coated	ed Sensitivity	End-Use Applications*	Offs	set	Fle	хо
	([=)	g/m²			e eniorantej	rippiloutiono	Front	Back	Front	Back
OPTIMA <sup>®</sup> Wristband 6.0	155	<u>32.4</u> 121.8	•		High	+	UV		UV & WB	

• Please note for best print-press performance, it is recommended that a water-based primer be applied prior to application of UV-cured inks.



### **Gaming Products**

In the gaming industry, customers expect the best. Appvion direct thermal grades provide the perfect solution with product durability that lasts. Our direct thermal gaming products are ideal for pre-printing fine detail and have exceptional resistance properties. Many grades are also backcoated for compatibility with high definition graphics.

# Alpha®

Non-topcoated direct thermal grades are best suited for general purpose applications where extended image life is not a requirement.

		Basis Weight					Recommended Printing Processes				
	Caliper (µm)	<u>17x22-500 lbs</u>	Top- coated	Back- coated	Image Sensitivity	Image End-Use Offset		Flexo			
		g/m²					Front	Back	Front	Back	
Alpha <sup>®</sup> 800-3.8	97	<u>23.3</u> 87.6			High	<b>(3)</b>		•	WB	WB	

• Compatible with printing method. Always validate ink for compatibility with thermal chemistry and OEM device.





## Alpha<sup>®</sup> Plus

Topcoated direct thermal product for use in applications where moderate resistance to handling is required.

		Basis Weight					Recommended Printing Processes				
	Caliper (um)	<u>17x22-500 lbs</u>	Top- coated	Printable Backcoat	Image Sensitivity	End-Use Applications*	Offset		Flexo		
		g/m²			,		Front	Back	Front	Back	
Alpha <sup>®</sup> Plus 600-3.2	80	<u>19.4</u> 73.1	•		High	<b>S</b>	UV	•	UV & WB	UV & WB	
Alpha <sup>®</sup> Plus 600-3.2 Canary	83	<u>21.7</u> 81.6	•	-	High	<b>S</b>	UV	•	UV & WB	UV & WB	

WB = Water-Based UV = Ultraviolet

# Royale®

Topcoated direct thermal product for use in specific coinless slot machine applications requiring a high definition image and image life (TITO applications: ticket-in-ticket-out).

	Caliper (um)	per Basis Weight Top- Printable Image n) <u>17x22-500 lbs</u> coated Backcoat Sensitivity g/m <sup>2</sup>	Top-	Printable Backcoat	Image Sensitivity	End-Use Applications*	Recommended Printing Processes				
							Offset		Flexo		
	([)			Front	Back	Front	Back				
Royale <sup>®</sup> 800-4.5	110	<u>26.2</u> 98.5			High		UV	•	UV & WB	UV & WB	

# Résiste®

Topcoated direct thermal grade for use in applications where long image life and exceptional resistance properties are needed.

		Basis Weight					Recommended Printing Processes				
Caliper (µm)	<u>17x22-500 lbs</u>	Top- coated	Printable Backcoat	Image Sensitivity	End-Use Applications*	Offset		Flexo			
		g/m²			Schaltwrey		Front	Back	Front	Back	
Résiste® 600-3.1	83	<u>21.8</u> 80.3		•	High	<b>S</b>	UV	•	UV & WB	UV & WB	

\* Please refer to page 22 for the End-Use Application Key.



### **Ticket & Tag Products**

Dependable and versatile, Appvion provides solutions for a wide variety of entertainment and transportation ticketing needs. Crisp imaging ensures reliable barcode scannability and consistent image quality, while excellent press printing characteristics allow for compatibility with high quality image graphics. Additionally, Appvion's materials provide outstanding converting characteristics such as perforating, fan-folding, die cutting, and foil stamping.





# Résiste®

Topcoated direct thermal grades that are best suited for tag and/or ticket applications where extended image life is required in normal environments, or where resistance to oils and grease is needed.

	Caliner	Basis Weight	Ton-	Back-	Resolution	Image	End-Use	Recommended Printing Processes			S
	(μm)	<u>17x22-500 lbs</u> g/m <sup>2</sup>	coated	coat	(dpi)	Sensitivity	Applications*	Offset		Flexo	
		8/						Front	Back	Front	Back
Résiste <sup>®</sup> 500-7.6	191	<u>46.9</u> 176.3	•		200	Medium	🧼 🍋 🎡	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 600-7.5	191	<u>48.3</u> 181.6	•		300	High	🧼 🍋 🎡	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 400-7.0	178	<u>44.5</u> 167.3	•	•	200	Medium	🧆 🥶 🙀 🟛 T	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 800-5.3	135	<u>34.8</u> 130.8	•		300	High	1	UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 400-5.3	135	<u>33.9</u> 127.6	•		200	Medium		UV	•	UV & WB	UV & WB
Résiste <sup>®</sup> 800-4.5	112	<u>25.2</u> 94.7	•	•	300	High	== 🙀 🏡	UV	•	UV & WB	UV & WB

\* Please refer to page 22 for the End-Use Application Key.



### PressPro®

Topcoated direct thermal products that have exceptional press printing capabilities to give rich four-color graphics and long-life images that are resistant to handling.

	Caliper Basis Weight		Top- coated	Printable Backcoat	Resolution (dpi)	Image Sensitivity	End-Use Applications*	Recommended Printing Processes			
(μm) <u>1</u>	<u>17x22-500 lbs</u> g/m <sup>2</sup>	Offset						Flexo			
		8,						Front	Back	Front	Back
PressPro <sup>®</sup> 500-7.7	196	<u>50.7</u> 190.6		•	200	Medium		UV	•	UV & WB	UV & WB





# End-Use Application Key







# Direct Thermal Solutions By End-Uses



Appvion effectively manages health, safety, and environmental risks during the discovery, development, manufacture, use, and disposal of our products.

Appvion has a formal Product Stewardship review process that involves assessing products during each developmental and commercialization stage.

Appvion is currently developing formal sustainability review criteria to better understand and benchmark our existing solutions with newly developed solutions. The objective is to compare the sustainability attributes throughout their life cycle, and the criteria will be adopted into the current Product Stewardship review framework.

#### The review process includes the following:

- Using well-established risk assessment methods to responsibly manage health, safety, and environmental aspects of raw materials, intermediate, and finished products throughout their life cycle.
- Ensuring all products meet current regulatory requirements and applicable public safety standards
- Implementing principles of "safe product design" to integrate lower hazard alternative substances into products while still meeting end-user functionality requirements
- Promoting collaboration throughout the value chain to develop safe, quality products
- Improving products to provide environmental and social benefits.

Our team proactively tracks and anticipates changing global, market, and consumer trends to ensure that product offerings continue to meet product stewardship expectations. We also participate with our cutomers in the development journey to support their stated company sustainability goals by providing product stewardship and sustainability information.



### LABEL PRODUCTS

Bakery Labels		
Alpha® 185-3.2	Résiste® 185-3.2	Résiste® 15% PCW
<b>Compliance Labels</b> Résiste <sup>®</sup> 900-3.0		
Cold Storage/Freezer Labels Résiste® B550-3.1	Dispersible	
Counter Labels Dispersible		
Deli Labels Résiste® B550-3.1	Résiste® 185-3.2	Résiste® 15% PCW
Distribution Labels Résiste® B550-3.1	Résiste® 185-3.2	Alpha® 185-3.2
Food Rotation Labels Dispersible		
Industrial Labels Résiste® 900-3.0 Résiste® B550-3.1	PolyTherm <sup>®</sup> 300-3.0 D	PolyTherm <sup>®</sup> 200-3.2
Near Infrared Readable Wavex <sup>®</sup> PD		
Package Delivery Labels Wavex <sup>®</sup> PD	Résiste® 185-3.2	Résiste <sup>®</sup> SR

### LABEL PRODUCTS

Pharmaceutical Labels		
PolyTherm® 300-3.4 D Résiste® PDLA	Résiste® Rx Phenol-Free	PolyTherm <sup>®</sup> 300-3.0 D
Pre-Pack		
Résiste® B550-3.1		
Retail Labels		
ThermArt <sup>®</sup> Orange 600-3.2 Résiste <sup>®</sup> 400-7.0	Résiste® B550-3.1 Résiste® 15% PCW	Résiste® 185-3.2
Reusable Containers		
Dispersible		
RFID Labels		
Résiste® B550-3.1	PolyTherm <sup>®</sup> 300-4.1	Résiste® 900-3.0
Shelf Marking Labels		
PolyTherm <sup>®</sup> 300-4.1	Résiste® 900-3.0	PolyTherm <sup>®</sup> 300-3.4 D
PolyTherm <sup>®</sup> Clear 300-3.0	PolyTherm <sup>®</sup> 200-3.8 PolyTherm <sup>®</sup> 200-3.8	Resiste <sup>®</sup> 400-7.0
Shipping Invoices/Packing Slips		
Résiste® 900-3.0	Résiste® 185-3.2	Alpha® 185-3.2
Résiste <sup>®</sup> B550-3.1		
Warehouse Labels		
Résiste <sup>®</sup> B900-3.2	Résiste® B550-3.1	Alpha® 185-3.2
Resiste® 900-3.0	Resiste® 185-3.2	Resiste <sup>®</sup> PDLA
Weigh Scale Labels		
Résiste <sup>®</sup> B550-3.1	Résiste® 185-3.2	Alpha® 185-3.2
Resiste™ 15% PCW	Kesiste™ SK	



### FILM PRODUCTS

#### Address Labels

PolyTherm<sup>®</sup> Clear 300-3.0

#### Baggage Tags

PolyTherm<sup>®</sup> 300-4.1 PolyTherm<sup>®</sup> 300-3.4 D PolyTherm<sup>®</sup> Hotmelt 300-4.1 PolyTherm<sup>®</sup> Hotmelt 300-3.0 D

#### Car Rentals & Auto Auctions

CleanSlate<sup>™</sup> Film

#### Fishing & Hunting License

PolyTherm<sup>®</sup> 600-6.0

#### Horticulture

CleanSlate<sup>™</sup> Film

#### Industrial Labels

PolyTherm<sup>®</sup> 600-6.0 PolyTherm<sup>®</sup> Hotmelt 300-4.1

#### **Parking Violations**

PolyTherm® 300-4.1 PolyTherm® 300-3.4 D PolyTherm® 300-3.0 D PolyTherm<sup>®</sup> 200-3.8 PolyTherm<sup>®</sup> 200-3.2

PolyTherm<sup>®</sup> 200-3.8

PolyTherm<sup>®</sup> Hotmelt 300-3.4

PolyTherm® 190-4.1

PolyTherm<sup>®</sup> 200-3.2

PolyTherm<sup>®</sup> Hotmelt 300-3.4

PolyTherm<sup>®</sup> 200-3.8 PolyTherm<sup>®</sup> 300-3.0 D

PolyTherm<sup>®</sup> 200-3.2 PolyTherm<sup>®</sup> Hotmelt 300-3.0 D

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Gran Hinor

### FILM PRODUCTS

#### **Pharmaceutical Labels**

PolyTherm<sup>®</sup> 200-3.8 PolyTherm<sup>®</sup> 300-3.0 D PolyTherm<sup>®</sup> Hotmelt 300-3.4

Pre-Pack

PolyTherm<sup>®</sup> Hotmelt 300-4.1 PolyTherm<sup>®</sup> Hotmelt 300-3.0 D PolyTherm<sup>®</sup> 300-3.4 D PolyTherm<sup>®</sup> Hotmelt 300-4.1 PolyTherm<sup>®</sup> Hotmelt 300-3.0 D

PolyTherm<sup>®</sup> Hotmelt 300-3.4

PolyTherm<sup>®</sup> 200-3.2

#### **Product Labeling**

PolyTherm<sup>®</sup> Clear 300-3.0

#### Medical Wristbands

OPTIMA® Wristband 6.0

#### **Retail Shelf Marking Labels**

PolyTherm <sup>®</sup> 600-6.0	PolyTherm <sup>®</sup> 300-4.1	PolyTherm <sup>®</sup> 200-
PolyTherm <sup>®</sup> 300-3.4 D	PolyTherm <sup>®</sup> 200-3.2	PolyTherm® 300-
PolyTherm <sup>®</sup> Clear 300-3.0	PolyTherm <sup>®</sup> Holtmelt 300-4.1	
PolyTherm <sup>®</sup> Hotmelt 300-3.4	PolyTherm <sup>®</sup> Holtmelt 300-3.0 D	

#### Ski Lift Tickets

PolyTherm<sup>®</sup> 300-10.0

PolyTherm<sup>®</sup> 300-3.4 D

#### **Translucent Labels**

PolyTherm<sup>®</sup> Clear 300-3.0

#### Ultrasound

OPTIMA<sup>®</sup> S Ultrasound

#### Wristbands

PolyTherm<sup>®</sup> 190-4.1 PolyTherm<sup>®</sup> 300-4.1 PolyTherm<sup>®</sup> 200-3.2

3.8 -3.0 D

PolyTherm<sup>®</sup> 200-3.8



### GAMING PRODUCTS

#### **Coinless Slot Tickets**

Royale<sup>®</sup> 800-4.5

#### Keno

Alpha® Plus 600-3.2

Alpha® Plus 600-3.2 Canary

#### Lottery Tickets

Résiste® 600-3.1

Alpha® Plus 600-3.2

#### Alpha® Plus 600-3.2 Canary

#### Sports Book

Alpha<sup>®</sup> 800-3.8

Royale<sup>®</sup> 800-4.5

#### Tote/Wagering

Alpha<sup>®</sup> 800-3.8

Royale<sup>®</sup> 800-4.5



### TICKET & TAG PRODUCTS

#### Airline Check-In Kiosks

Alpha<sup>®</sup> 800-3.8

Résiste® 400-5.3

#### Amusement Park Tickets

Résiste® 800-5.3	Résiste® 800-4.5	Résiste® 600-7.5
PressPro <sup>®</sup> 500-7.7	Résiste® 400-7.0	

#### Baggage Tags

PolyTherm® 300-4.1	PolyTherm <sup>®</sup> 300-3.0 D	PolyTherm <sup>®</sup> 200-3.2
PolyTherm <sup>®</sup> 300-3.4 D	PolyTherm <sup>®</sup> 200-3.8	PolyTherm® 190-4.1

#### **Bin Tags**

Résiste® 600-7.5

Résiste® 400-7.0

#### Cinema Tickets

Résiste <sup>®</sup> 800-5.3	Résiste <sup>®</sup> 500-7.6	PressPro <sup>®</sup> 500-7.7
Résiste <sup>®</sup> 800-4.5	Résiste <sup>®</sup> 400-7.0	Résiste® 600-7.5
Résiste <sup>®</sup> 400-5.3		

#### Lightweight Tickets

Résiste® 800-5.3	Résiste® 600-3.1
Résiste® 800-4.5	Résiste® 400-5.3

RIVE ROME NOW

Alpha<sup>®</sup> 800-3.8



### TICKET & TAG PRODUCTS

Mass Transit Tickets		
Résiste® 800-5.3 Résiste® 800-4.5 Résiste® 600-7.5	Résiste® 500-7.6 PressPro® 500-7.7 Résiste® 400-7.0 Résiste® 400-5.3	
Ski Lift Tickets		
PolyTherm <sup>®</sup> 600-6.0	PolyTherm <sup>®</sup> 300-10.0	
Sports Event Tickets		
Résiste <sup>®</sup> 800-5.3 Résiste <sup>®</sup> 500-7.6	PressPro <sup>®</sup> 500-7.7 Résiste <sup>®</sup> 400-7.0	Résiste <sup>®</sup> 600-7.5
Parking Receipts		
Résiste <sup>®</sup> 600-3.1	Résiste <sup>®</sup> 400-7.0	Résiste <sup>®</sup> 400-5.3
Parking Spitter Tickets		
Résiste® 400-7.0		
Parking Violations		
PolyTherm® 300-4.1 PolyTherm® 300-3.4 D PolyTherm® 200-3.2	Alpha® 820-3.4 Résiste® 600-3.1	Résiste® 900-3.0 PolyTherm® 300-3.0 D
Performing Arts/Museum		
Résiste <sup>®</sup> 800-5.3 Résiste <sup>®</sup> 800-4.5	Résiste <sup>®</sup> 400-7.0 Résiste <sup>®</sup> 600-7.5	PressPro® 500-7.7 Résiste® 500-7.6



# Best Practices for Flexographic Printing

Appvion recognizes that Flexography is the most widely used print process for pre-printing direct thermal paper and film substrates. Our direct thermal products are designed to facilitate good performance in pre-printed Flexo applications from the time of printing to imaging. For ultimate success, the thermal media must retain variable image function through quality thermal image performance and retain the communication function of the pre-printed graphics.

Direct thermal products have specialty coatings applied to the substrate surface that enable variable image function in the presence of heat. The heat applied by the thermal printer during imaging often exceeds 300<sup>o</sup> F while in the presence of nip pressure and shear from motion across the static print head. These dynamics present challenges to the printed substrate that printers/converters need to be aware of.

Appvion has its own internal print-lab and has tested dozens of inks on a variety of direct thermal substrates. From this testing, we are happy to provide the following considerations for Flexographic printing on our direct thermal papers and films. We also have a document that lists compatible Flexographic printing inks available upon request from your sales or technical services representative.

#### FLEXOGRAPHIC PRINTING CONSIDERATIONS

Across most basis weights, Appvion offers two main coating design platforms:

- 1. Résiste® topcoated grades: non-absorptive surface, requires high pigment and good wetting ink for dark colors
- 2. Alpha® non-topcoated grades: very absorptive surface, watch out for solvent interaction with certain inks. Not compatible with most UV overprint varnishes.
- Most applications use water-based and UV Flexographic inks. The amount of solvent present in water-based inks should be kept at a minimum.
- Typically for narrow-web printing, less than 5% is fine. Wide web printing will allow for higher solvent content due to the higher web speeds associated with that process. Since most solvents will attack thermal coatings and compromise thermal image performance, make sure the solvent content is appropriate for drying conditions given your desired line speed. In general, problems will come in when solvent is still present within the ink coming out of the dryer. Additionally, NTC substrates may tolerate less solvent content than TC's as the Flexo ink is coming in direct contact with the thermal chemistry on a NTC.
- UV inks tend to create high drag under the print head, especially during imaging. Such drag can prove problematic, resulting in poor label tracking through the printer. To counter this, choose an ink that has good slip properties (like a gloss-coat overprint varnish) or use a UV curable overprint varnish.
- UV-Cured inks tend to show lesser adhesion than water-based inks. Use of a water-based primer can substatially improve UV ink adhesion.
- Water-based inks also tend to create excess drag under the printhead during imaging. Therefore, water inks should have good heat resistant properties AND good slip properties when exposed to elevate temperatures.
- Most major ink suppliers have an existing ink series suited for direct thermal applications. Start with your current ink supplier, always trial the ink and substrate in the end-user printer before launch, and modify if quality issues are encountered.

As always, contact your Appvion sales or technical service representative with any specific questions.

## Storage and Shelf Life Recommendations

#### SHELF LIFE

Storage of Appvion thermal products in a dark place at a relative humidity between 45% and 65% and at a temperature below 77°F (25°C) will assure satisfactory performance for at least three years from the date of manufacture.

#### IMAGE LIFE

Once Appvion thermal products have been imaged on the recommended equipment, Appvion expects the image will remain legible for at least seven years, assuming the documents are properly stored with compatible materials and at a temperature below 77°F (25°C). Review the following pages for image life by specific grade.

#### FADE RESISTANCE

Appvion thermal products use dye and coreactant technology to form an image. The combination is slightly sensitive to ultraviolet (UV) light and may exhibit some image decline with extended exposure to office light or shorter exposure to intense UV light. The stability of the image will depend upon the degree to which the image was originally developed, the individual product design, the intensity of the UV light, and the character of UV (percent of UV range in a light source). Sheet discoloration may also occur with the prolonged exposure to UV light.

#### CONTACT STORAGE

We recommend that Appvion thermal grades not be exposed for long periods to certain vinyls, plastics, shrink wraps, adhesives, wet-toner copies or certain carbon papers. An exception to these general guidelines would be our specially topcoated tag, ticket and label grades. A list of specific materials to avoid can be found to the right.

Topcoated grades are more resistant to these incompatible materials, but images can still be affected with prolonged exposure.

Most thermal papers, regardless of the manufacturer, are susceptible to many of the same items shown on this page. These incompatible substances are not unique to Appvion thermal products.

#### SPECIFIC MATERIALS TO AVOID

- 1. Organic solvents, including:
  - Alcohol (short chain)
  - Ketones (short chain)
  - Esters (short chain)
  - Ethers (short chain)
- 2. Cleaning Fluids (from above list)
- 3. Plasticizers
  - Alcohol-type (cellophane tape)
  - Ester-type (PVC film)
  - Polyethylene glycol-type
  - Dioctyl phthalate
  - Dioctyl adipate
- 4. Petroleum solvents
  - Gasoline
  - Toluene
  - Benzene
- 5. Wet-type diazo copy paper
- 6. Carbon papers (certain types)
- 7. Cast-coated papers
- 8. Papers containing tributyl phosphate
- 9. Dissimilar thermal systems
- 10. Carbonless paper solvents
- 11. Ammonia
- 12. Certain oils
- 13. Water (prolonged exposure)



## Storage and Shelf Life Recommendations

GRADE NAME	IMAGE LIFE*
Alpha® 185-3.2	10 years
Alpha <sup>®</sup> 800-3.8	10 years
Alpha® 820-3.4	10 years
Alpha® Plus 600-3.2	20 years
Alpha® Plus 600-3.2 Canary	10 years
CleanSlate™ Film	25 years
Dispersible	ТВА
OPTIMA® Wristband 6.0	20 years
OPTIMA® S Ultrasound	20 years
PolyTherm® 190-4.1	20 years
PolyTherm <sup>®</sup> 200-3.2	20 years
PolyTherm® 200-3.8	20 years
PolyTherm® 300-4.1	20 years
PolyTherm® 300-3.0 D	20 years
PolyTherm® 300-3.4 D	20 years
PolyTherm® 300-10.0	20 years
PolyTherm <sup>®</sup> 600-6.0	20 years
PolyTherm <sup>®</sup> Clear 300-3.0	20 years
PolyTherm <sup>®</sup> Hotmelt 300-3.0 D	20 years

\*The thermal image will remain legible for entire shelf life provided the image is fully developed on the recommended direct thermal printer and the document is stored with compatible materials under normal filing conditions. Normal conditions include maintaining a relative humidity between 45 and 65 percent and a temperature below 77°F (25°C). See page 34.

## Storage and Shelf Life Recommendations

GRADE NAME	IMAGE LIFE*
PolyTherm <sup>®</sup> Hotmelt 300-3.4	20 years
PolyTherm® Hotmelt 300-4.1	20 years
PressPro <sup>®</sup> 500-7.7	20 years
Résiste® 185-3.2	20 years
Résiste® 400-5.3	20 years
Résiste® 400-7.0	20 years
Résiste® 500-7.6	20 years
Résiste® 600-3.1	20 years
Résiste® 600-7.5	20 years
Résiste® 800-4.5	20 years
Résiste® 800-5.3	20 years
Résiste® 900-3.0	25 years
Resiste® B550-3.1	20 years
Resiste® PDLA	20 years
Résiste® Rx Phenol-Free	ТВА
Résiste® 15% PCW	20 years
Résiste® SR	20 years
Royale® 800-4.5	20 years
ThermArt <sup>®</sup> Orange 600-3.2	20 years
Wavex <sup>®</sup> PD	20 years

\*The thermal image will remain legible for entire shelf life provided the image is fully developed on the recommended direct thermal printer and the document is stored with compatible materials under normal filing conditions. Normal conditions include maintaining a relative humidity between 45 and 65 percent and a temperature below 77°F (25°C). See page 34.





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