UNDERWRITERS LABORATORIES

YOUR GUIDE TO UNDERSTANDING UL

A trusted resource across the globe for product safety certification and compliance solutions.

From Mactac®

mactac®
technology that sticks

UNDERWRITERS LABORATORIES

You see Underwriters Laboratories (UL) Marks everywhere — on billions of products each year. From the first light you turn on in the morning, the coffee pot that starts your day, the computer you are staring at, the drinking fountain at break time, the roof over your head and more, UL Marks are everywhere.

There is no certification program more widely accepted or recognized by regulatory agencies, insurance companies and consumers than UL.

A QUICK GLIMPSE

- 22 billion UL Marks appeared on products last year
- 72,000 manufacturers produce UL-certified products
- 20,000 types of products evaluated by UL
- 11,615 employees at UL

UNDERSTANDING AND MANAGING UL LABELS

What is UL?

Established in 1903, UL is an independent organization that writes standards and tests against these standards.

What are UL labels?

Printed nameplates, tags and labels with warnings, cautions, instructions and/or product classifications.

Where do you find them?

On electrical appliances, electronic devices, safety equipment, things that hold or convey flammable liquids, and on certain components inside devices.

Why are they there?

They acknowledge that the labeled product is "Recognized" as complying with an industry performance standard and deem it safe to use.

UL labels themselves must meet performance requirements designed to keep safety information permanently affixed to products.

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COMMON UL TERMS

Standards
- Collections of methods used to evaluate products within categories
- **UL 969** is the most common standard related to labels

Label Categories
- PGGU2 and PGGU8: labeling materials for the United States and Canada
- PGJI2 and PGJI8: labels or materials that are electronically printed

Files
- Collections of company listings within a category

Listings
- Products of similar construction within a file that are all Recognized under the same conditions

File Adoption
- Recognized label materials can be passed along to the label converter to reduce cost and time to market of the Recognized label

UL 969 MARKING AND LABELING SYSTEMS

- Labels and label materials Recognized under category codes PGDQ2, PGJI2, and PGGU2 are tested in accordance with the test methods in ANSI/UL 969, "Marking and Labeling Systems."
- The evaluation for Marking and Labeling Systems includes a construction examination and testing for permanency.
- Environmental conditioning of labels typically includes testing for exposure to high humidity or occasional exposure to water, elevated temperatures, sunlight resistance, or exposure to chemical agents.
- After the environmental conditioning, the labels are visually examined for curling, wrinkling, shrinkage or loss of adhesion around the perimeter.
- Testing also typically includes evaluation of legibility, resistance to defacement and adhesion.

Testing for Indoor use:

1. Standard atmosphere (72 hours at 23+2°C, 50+5%RH)
2. Water immersion (48 hours at 23°C)
3. Air oven (10 days, test temperature 20 to 30°C higher than rating temperature)

Testing for Outdoor use:

1. 7 hour low temperature (cold box) test at a temperature of -23°C or lower
2. 750 hour UV and Water exposure in Xenon
3. Immersions – various

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UL CUSTOMER BASE

CATEGORY	NUMBER OF CUSTOMERS	LABEL TYPE
PGGU2/8	133 / 10	Materials to be used by printers to create finished labels ** Category for Mactac (manufacturer of label materials)
PGDQ2/8	1228 / 235	Covers finished printed labels
PGJI2/8	371 / 111	Covers products intended to receive additional printing (thermal transfer, laser or hot stamp)
PGAA	1713	Labels with UL Mark

LABEL SUPPLY CHAIN

Marking and Labeling Categories →

PGGU2/8
PGJI2/8

PGDQ2
PGJI2/8

Label Material Manufacturers → Label Converters/ Printers → End Product Manufacturers
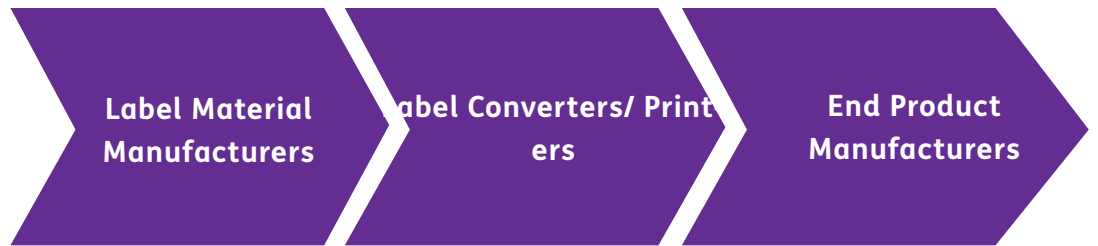
Products Sold →

Blank Label Stocks Overlaminates

Printed Labels Blank Die-Cut Labels

Finish Products (with applied labels)

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COMMON UL MARKS

UL Recognized Component

UL Listed

UL Classified

UL RECOGNIZED COMPONENT

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Some products certified by UL are components that are intended to be used in the manufacture of a complete, Listed product. These components cannot bear the UL symbol, but they may use a special [Recognized Component Mark](#).

- These are marks consumers rarely see because they are specifically used on component parts that are part of a larger product or system.

- A UL Recognized component is linked to the finished product therefore the label itself must be a Recognized component.

- Requires a certain combination of UL Recognized label with corresponding UL Recognized Ink (already tested by UL).

- Because safety information should be permanently available, UL Recognized Labels must demonstrate significant characteristics such as legibility retention, resistance to defacement and adhesion to the surface of the product.

- A UL Recognized label component is not a UL Recognized product. You **MUST** obtain UL recognition for your specific product to use the UL certified Marks.

- UL Recognized labels can be printed by using a printer or using a thermal transfer printer.

Examples: The Component Recognition marking is found on a wide range of products, including some switches, power supplies, and printed wiring boards.

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UL LISTED OR UL CLASSIFIED

- A **UL listed** product means that UL has tested a product according to nationally recognized Safety Standards and found it to be free from reasonably foreseeable risk of fire, electric shock and related hazards.

  Examples: Appliances and computer equipment, furnaces, heaters, fuses, electrical panel boards, smoke and carbon monoxide detectors.

- A **UL Classified** product indicates that representative sampling of a product has been tested as to specific properties, within a limited range of hazards, or suitability for use under limited or special conditions. UL Classified products fall into the categories of building materials and industrial equipment.

  Examples: Immersion suits, fire doors, and protective gear for fire fighters.

The UL Mark on a product means that UL has tested and evaluated representative samples of that product and determined that they meet UL's requirements. Products are periodically checked by UL at the manufacturing facility to make sure they continue to meet UL requirements.

There are several types of UL Marks. Each has its own specific meaning and significance. The only way to determine if a product has been certified by UL is to look for the UL Mark on the product itself.

- There are two types of UL Service: Type R and Type L.

UL will make the decision regarding the appropriate service and type of Mark to be used based upon the nature of the product, the history of product performance, and the method for producing the product.

PRINTING LABELS WITH THE UL MARK

Type R

- Manufacturer is required to submit a layout of the proposed Mark to UL for review and authorization.
- If the design layout is found acceptable, UL will authorize the drawing by applying its authorization stamp.
- Manufacturer (Customer) provides stamped UL Mark layout to the supplier for printing of the UL Mark (Supplier or customer can print the UL Type R Mark).

The Type R Mark normally consists of the following four elements:
- Appropriate UL symbol
- Word LISTED or CLASSIFIED
- Product name
- A four character alphanumeric Control Number assigned by UL

Note: Future orders may be printed as long as the composition of the UL Mark does not change from the UL authorized stamped drawing.

Type L

UL Marks for products under Type L Follow-Up Service are strictly controlled. All orders for these type labels must be processed through a UL Label Center (PGAA).

- Each order of Type L Marks requires specific written authorization from UL.
- The written authorization will specify the name of the supplier, the Serial or Issue numbers that are to appear on the Marks, the type of UL symbol, the appropriate wording, and the specific quantity of Marks that are to be produced.
- The labels may only be produced as authorized and only in the quantities specified by UL on the order authorization.
- Must be UL authorized in order to print – PGAA.
- Customer CANNOT print these on his/her own.

The Type L Mark normally consists of the following elements:
- Appropriate UL symbol
- Word LISTED or CLASSIFIED
- Product name
- The words "ISSUE NO." or "SERIAL NO." followed by the numbers appearing on the authorization order from UL
- Company name or UL File Number

Note: Due to the changing issue/serial numbers that are controlled by UL, each and every order for Type L Marks must be authorized by UL.

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NAVIGATING THE UL
ONLINE DATABASE

UL has an Online Certifications Directory where you can search for files and see what Recognitions are available from your suppliers:

- Go to www.ul.com.
- Click on the "Certifications" link to launch the UL Online Certifications Directory.
- Type in search criteria and click the "search" button.
- Click the link to open file.

NAVIGATING THE UL ONLINE DATABASE

Here is an example of our file:

Note the header that states "unprinted label stocks."

Pressure-sensitive unprinted label stocks:

MODEL NO.	APPLICATION SURFACE	MAX TEMP (°C)	MIN TEMP (°C)	INDOOR USE	OUTDOOR USE	ADDITIONAL CONDITIONS
BDE6914 2.6M WH UV BOPP TC/MP690						
	Acrylic paint (AC PT)	100	-40	X	X	C, F1, K, O
	Acrylic powder paint (AC PDR PT)	100	-40	X	X	C, O
	Alkyd paint (AK PT)	100	-40	X	X	C
	Aluminum (AL)	100	-40	X	X	C, F1, O
	Epoxy paint (EP PT)	100	-40	X	X	C, F1, K, O
	Epoxy powder paint (EP PDR PT)	100	-40	X	X	C, F1, O
	Galvanized steel (GS)	100	-40	X	X	C, F1, O
	Melamine (ME)	100	-40	X	X	C, F1, K, O
	Nylon - polyamide (PA)	100	-40	X	X	C, F1, O
	Phenolic - Phenol Formaldehyde (PH)	100	-40	X	X	C, F1, O
	Polycarbonate (PC)	100	-40	X	X	C, O

- Model No. shows the product line
- Application surface are the substrates that the labels are applied to
- Temperature range Recognized
- Indoor/outdoor use

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NAVIGATING THE UL ONLINE DATABASE

MODEL NO.	APPLICATION SURFACE	MAX TEMP (°C)	MIN TEMP (°C)	INDOOR USE	OUTDOOR USE	ADDITIONAL CONDITIONS
FAD6914 2M CL PET TC/MP690, FCD6914 2M WH PET TC/MP690, FED6914 2M BRT SIL PET TC/MP690, FFD6914 2M MAP SIL PET TC/MP690, FGD6914 2M BRSH SIL PET TC/MP690						
	Acrylic paint (AC PT)	150	-40	X	X	C, F1, G, K, O
	Alkyd paint (AK PT)	150	-40	X	X	C, F1, G, K, O
	Aluminum (AL)	150	-40	X	X	C, F1, G, K, O
	Epoxy paint (EP PT)	150	-40	X	X	C, F1, G, K, O
	Galvanized steel (GS)	150	-40	X	X	C, F1, G, K, O
	Polyester paint (PER PT)	150	-23	X	X	
	Polyester powder paint (PER PDR PT)	150	-23	X	X	C, F1, G, K, O

- Additional conditions column shows other conditions recognized:

  "C" – Occasional exposure to cooking oil

  "F1" – Occasional exposure to fuel oil No. 1

  "G" – Occasional exposure to gasoline splashing

  "K" – Occasional exposure to kerosene

  "O" – Occasional exposure to lubricating oil

  *These are referenced at the bottom of our file.

SUBMITTING LABELS FOR UL RECOGNITION

Step 1: Determine the end user's UL label requirements.

- Which UL Standard? (ex. UL969)
- What substrate will the label be applied to?
- What are the conditions that need to be met? (ex. min/max temperature, indoor/outdoor)
- How will the label be printed?

Step 2: Select the label material.

- Decide which label constructions meet the end user and UL requirements.

Step 3: Apply for UL recognition

- www.ul.com/imdquote or 1-877-UL HELPS.

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FILE ADOPTION

Label converters and printers who use Recognized label materials can receive the benefit of the recognition established for the label material when establishing recognition for their printed labels.

The Conditions of Acceptability of the materials used as indicated on the Online Certifications Directory are passed along to the label converter.

This reduces the cost and time to market the Recognized label by eliminating redundant testing and reduces follow-up service costs.

This process is known as "Label Adoption."

File Adoption Steps

- Fill out the UL project form to quote for Label Adoption, which includes print testing if they desire.
- Go to http://www.ul.com/global/eng/pages/corporate/contactus/rfq.
- Select "Yes" to Label Adoption Process option on the online quote form under "New Products."
- Customer will enter company information, product information and printing information.
- Under the program, no new testing is required - only a paper transfer

Getting the most value for your money.

- When adopting a specific Mactac product, include all the flexo inks, digital inks and thermal transfer ribbon already preapproved.

For additional information or to submit a label adoption request with Mactac® go to the UL website, www.UL.com. Mactac's file numbers are provided below.

Listings	Category	Mactac Fil Number
Marking and Labeling System Materials - US	PGGU2	MH12627
Marking and Labeling System Materials - Canada	PGGU8	MH12627
Printing Materials - US	PGJI2	MH26726
Printing Materials - Canada	PGJI8	MH26726

RIBBON RECOGNITION

Mactac has the following thermal transfer ribbons Recognized
with its product line, saving your customer the 7- to 12-week wait.

- DATAMAX SDR Resin Ribbon
- DATAMAX IQRES+ Resin Ribbon
- DATAMAX PGR Wax-Resin Ribbon
- DNP R300 Resin Ribbon
- DNP TR4070 Resin Ribbon
- DNP TR6075 Resin Ribbon
- DNP Signature Series Resin
- ITW B324 Resin Ribbon
- Zebra 5100 Resin Ribbon
- iimak SP330 Resin Ribbon
- Fuji Copian FTX308 Resin Ribbon
- EFI Jetrion Series UV Ink Jet

- DATAMAX SDR-D Resin Ribbon
- DATAMAX IQMID+ Wax-Resin Ribbon

- DNP R510 Resin Ribbon
- DNP TRX-55 Wax-Resin Ribbon
- DNP TR6070 Resin Ribbon

- ITW B128/M95 Wax-Resin Ribbon
- Zebra 5095 Resin Ribbon

INK RECOGNITION

[Mactac]® also has secured recognition for flexo inks used with its durable film product line. Upfront UL recognition with flexo inks reduces converters' cost and time spent qualifying substrates. Converters using UL-recognized Mactac products now have pre-approval with the following flexo inks. Pre-approval means no new testing is required — only a paper transfer that can be submitted through an Internet portal, via email or phone.

UL Recognized Flexo Inks
- ACTEGA (Water Ink Technology)
  - Versifilm Plus Series (water-based)
  - Optafilm Series (water-based)
  - Phamaflex ULF (UV ink system)
- Enviromental Inks
  - Film III Series (water-based)
- Flint Group Narrow Web
  - Flexocure FORCE (UV ink system)
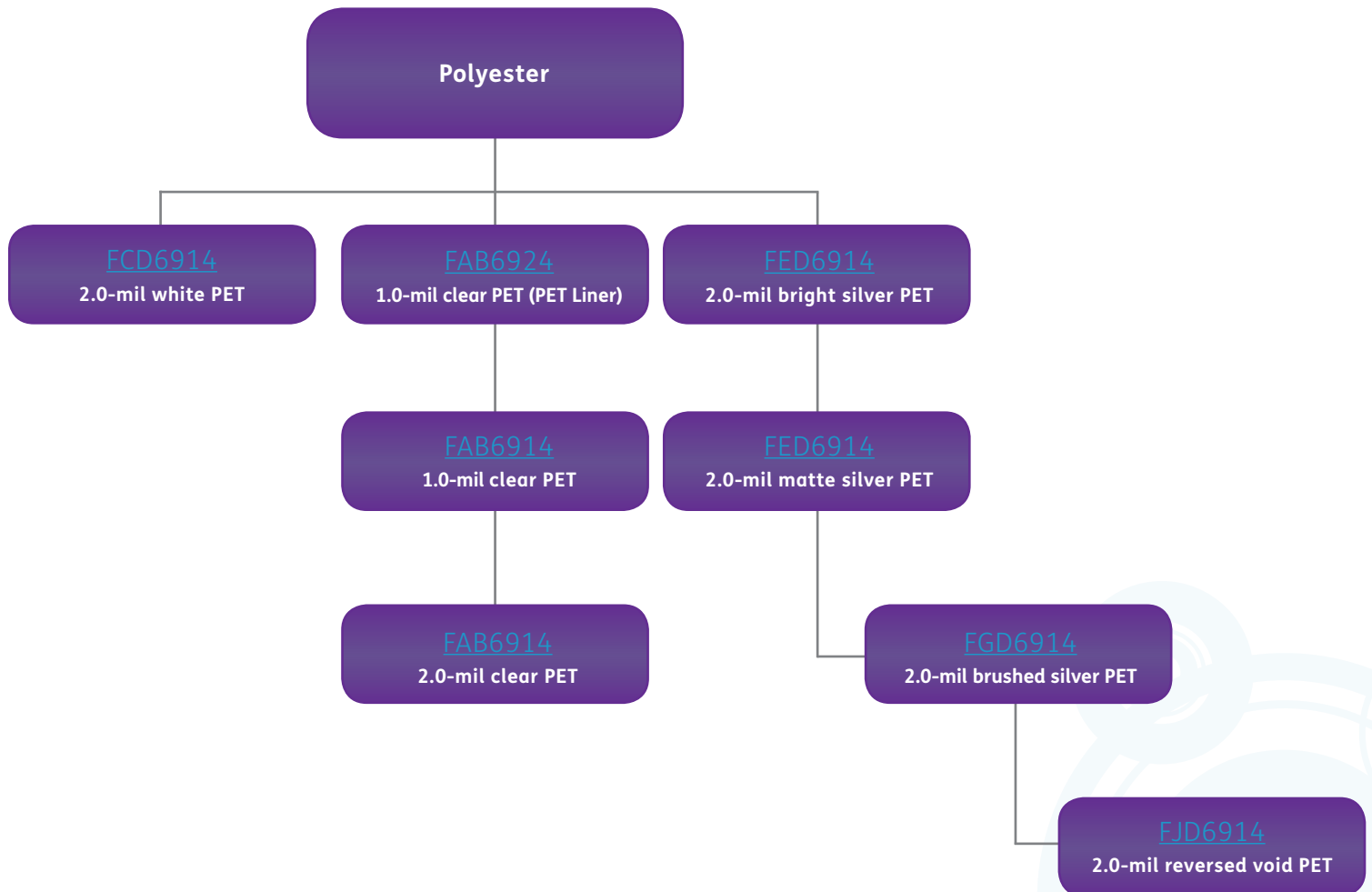 - Hydrofilm ACE (water-based)

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DURABLE FILMS

Designed to address the extreme application needs of several initial markets, including lawn and garden, chemical drums, appliance and nameplate, and wet-cell batteries, Mactac's durable film solutions are tested and recognized by industry standards, such as Underwriters Laboratories 969 or British Standard 5609, for superior performance despite long-term exposure to a variety of environmental elements.

Roll Label pressure-sensitive adhesive constructions are designed to last the life of the application.

These products provide protection from solvents, temperature extremes, UV (light degradation), moisture, chemicals, abrasion and other harsh environments.

- Tested and recognized to meet UL, cUL (CSA C22.2 No. 0.15), British Standard 5609, RoHS (Restriction of Hazardous Substances Directive) and WEEE (Waste Electrical and Electronic Equipment Directive).
- Offered through Mactac's Precise Program to accommodate smaller orders.
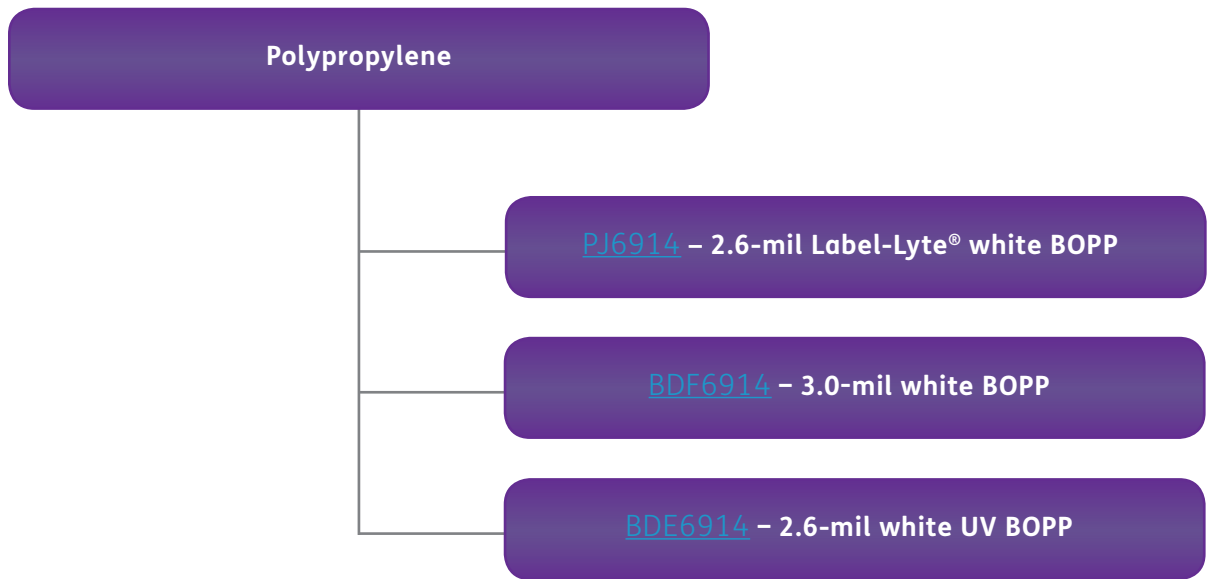- Entry level product line – future generations include UV, high temperature label material, evolving customer needs.

DURABLE LABELS
PET PRODUCT LINE

Polyester

FCD6914
2.0-mil white PET

FAB6924
1.0-mil clear PET (PET Liner)

FED6914
2.0-mil bright silver PET

FAB6914
1.0-mil clear PET

FED6914
2.0-mil matte silver PET

FAB6914
2.0-mil clear PET

FGD6914
2.0-mil brushed silver PET

FJD6914
2.0-mil reversed void PET

Polyester is a relatively stiff film. This stiffness will help with dispensability but will be a weakness when conformability is required. Clear polyester has good clarity for use as an overlaminate. PET films have good temperature and chemical resistance. Polyester is not affected by most solvents and chemicals and will resist heat up to 302° F. Two shortcomings: relatively high cost (especially compared to BOPP) and can tend to scratch easily. We will initially offer eight polyester products as part of the durable line – clear, white, bright silver, matte silver, brushed silver and reverse void.
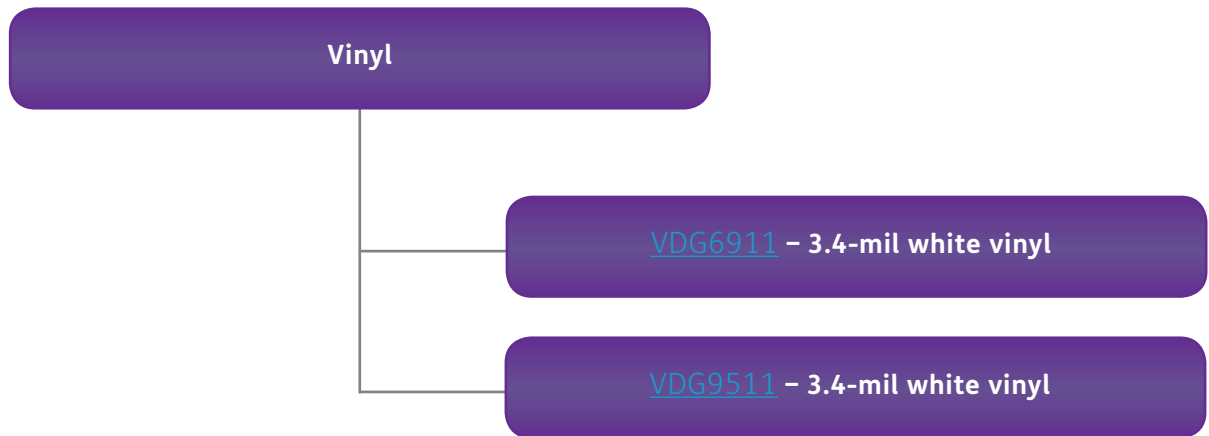
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DURABLE LABELS
BOPP PRODUCT LINE

Polypropylene

PJ6914 **– 2.6-mil Label-Lyte® white BOPP**

BDF6914 **– 3.0-mil white BOPP**

BDE6914 **– 2.6-mil white UV BOPP**

Polypropylene is a low-cost film that, based on BOPP's strength and performance, makes it an outstanding value. Polypropylene has good chemical and fair solvent resistance, but also has some weaknesses; it is not very temperature resistant, and it will soften around 200° F. It also has poor UV light resistance, which is why the UV BOPP has been modified with additives to give 2+ years of outdoor light resistance.

DURABLE LABELS
VINYL PRODUCT LINE

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┌─────────────────────────────────────┐
│                Vinyl                 │
└─────────────────────────────────────┘
         │
         │        ┌──────────────────────────────────┐
         ├────────│ VDG6911 – 3.4-mil white vinyl    │
         │        └──────────────────────────────────┘
         │        ┌──────────────────────────────────┐
         └────────│ VDG9511 – 3.4-mil white vinyl    │
                  └──────────────────────────────────┘
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Vinyl is an extremely conformable film that has moderate UV resistance. Some of vinyl's shortcomings are its tendency to stretch, which can be a problem on press or for the end-user; vinyl has a very unique odor – just think about the smell of a shower curtain. Vinyl is difficult to print without being topcoated. The plasticizers used to make the film conformable bloom to the surface and make printing a challenge. Vinyl is very soft – most start to soften around 120° F, which is very low. Ours have been tested and approved up to 176° F.

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ABOUT MACTAC

For more information on Mactac's line of durable film solutions, or other high-quality products available from Mactac Printing Products, call 800.255.9733, e-mail Mactac.Americas@mactac.com or visit www.Mactac.com/RollLabel.

About Mactac

Mactac is a leading supplier of pressure-sensitive adhesives. Founded on personal service, technical support, quality assurance, custom capabilities and supply chain efficiency, Mactac is dedicated to providing superior quality to its customers. For more information, please visit www.mactac.com.

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