Heat Transfer Labels for Garments

How To Print

Using the HP Indigo 7K Digital Press

How-to Guide

January 2021

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The HP Indigo press' counter feature records the number of impressions you make using your press. The counter does not reflect any previous use of the press or its age.

This English version of this document must be used as the original instructions.

The HP Indigo press is a Class 1 Laser Product containing high voltage power supplies and laser light sources. There is no danger to persons or equipment when the system is operated in accordance with the directions provided by HP in this and other publications. All high voltage power supplies and laser sources are located behind protective covers. Warning labels are attached to each protective cover. Do not remove covers.

In the event of a conflict between the English version and this language version, the English version will prevail.

Part Number: CA494-12700

Revision 01: January 2021

Table of contents

1 Introduction 4

What is the Heat Transfer application? 4

Who can benefit from reading this document? 4

Examples of Transfer application 5

Why print digitally? 5

Why print with HP Indigo technology? 6

2 Print Process 7

General 7

Site preparation 7

Activating the Heat Transfer special blanket scanning SW feature 8

Design and Pre-press 9

Thermal transfer media 10

Printing 11

Preconditioning process 11

Unique transfer profile for the Heat transfer feature 11

Job definition 12

Finishing and converting 14

Product Case Study - Production of Hoodies 15

Step 1 – Printing 15

Step 2 – Screen inks with Adhesive 15

3 Quality Assurance & Best Practices 17

Troubleshooting Tips 17

4 Regulation 18

Regulatory Aspects 18

Conformance to OEKO-TEX® 18

Appendix - A Obtaining Customer Support 19

Materials Application Team (MAT) 19

Partners & Suppliers List 19

Appendix - B Service and Support 21

Revision History 22

Printing Instructions 22

1 Introduction

What is the Heat Transfer application?

The heat transfer application utilizes heat and pressure to transfer a printed image from a *thermal transfer substrate* to a desired surface such as a garment, for example - sports T - shirts. These surfaces vary in nature because the textile materials from which they are made vary from cotton to polyester, as does the required durability (for example, wash cycles, sweat resistance) of the transfer.

Production of the transfer label begins with printing a mirrored image onto the transfer substrate. The image then transferred to the final surface using special transfer equipment.

In order to produce high-end, highly durable transfer products, several finishing steps are required to imbue the label with the required resistances.

IMPORTANT NOTE:	The finishing aspects that normally follow the printing step are not addressed by this document; they can be found in partner information supplied by our media partners such as ITEX.

IMPORTANT NOTE:	There a variety of additional transfer media that you can use to produce the general requirements labels for memrobilia and T-shirts. This will be discussed in a future How-To Guide.

Who can benefit from reading this document?

- Owners and operators of the HP Indigo 7K Digital Press or an upgraded HP Indigo 7900 Digital Press.
- HP Indigo customer support, marketing and sales organizations.

Examples of Transfer application

Several applications are commonly produced in the heat transfer arena. Some of them include:

- Garments – Shirts, hats, product tags, care & neck labels (for example: shirts and shoes).

- Plastic containers – Such as buckets, or other round containers
- Cosmetics – Rounded items like pencils, perfumes etc.
- Miscellaneous items – Such as skateboards, guitars or flat surfaces

Why print digitally?

When comparing the digital heat transfer process to conventual screen printing, many advantages apply:

- Extremely cost effective in small quantities orders
- Designs with multiple colors can be executed easily
- Garments can be easily customized
- Complicated designed can be easily transferred
- Fast turnaround time, reduced inventory

Why print with HP Indigo technology?

Heat transfers can be also produced using other digital technologies such as toner and Ink-jet, yet:

- HP Indigo transfers show higher resistance to wash cycles and high temperatures than other digital technologies
- HP Indigo provides better image quality
- HP Indigo presses are compatible with PET substrates which are popular in the Heat Transfer industry.

2 Print Process

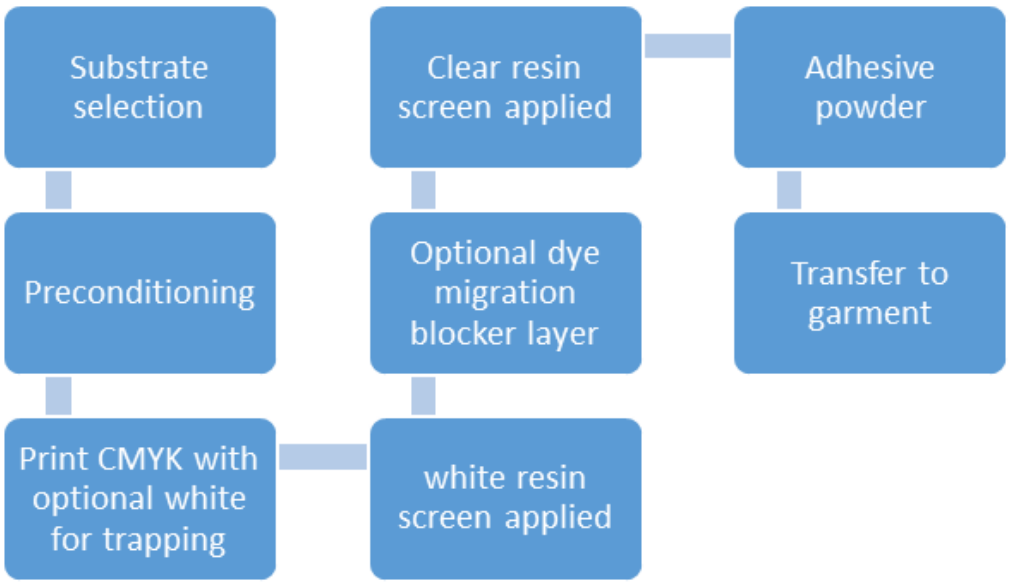
General

The printing step will in most cases be the first step for Heat transfer label production. Printing is done on an HP Indigo 7K Digital Press or an upgraded HP Indigo 7900 Digital Press using a special heat transfer blanket.

This chapter provides step by step instructions on how to print onto the transfer media using ITEX Transfer Film S1 which was certified by HP Indigo.

The process work flow of producing a heat transfer label is shown in the following scheme:

Figure 1: Heat Transfer for garments flow



Site preparation

In order to successfully produce this application, the following steps should be performed:

- Press should be well maintained and calibrated
- Operator should be aware on all substrate related definitions
- Required consumables:
  - Heat transfer blanket P/N Q4640B - W6x00 blanket
  - Thick impression paper P/N Q4636A - Digital mold media
  - Premium white ink, if applicable

Activating the Heat Transfer special blanket scanning SW feature

NOTE: This activation requires a CE code. To get the code, open a case call at the Care Center.

1. Touch: **Print Care Center > Maintenance > Upgrades > Software Configuration > Functionality Update > Functionality**.
2. Search for code 458059 (Iris plus) and approve.
3. Perform restart upon request.

Design and Pre-press

When designing a job for heat transfer there are various things to consider, such as eye marks for consecutive finishing steps, which are known to those who have the specific finishing equipment.

Reverse printed image

Print the image onto the transfer substrate in *reverse printing mode* (mirrored) so that the image that is transferred onto the final substrate prints properly.

White trapping

To help with positioning and to reduce registration issues with the consecutive steps, we recommend adding 1 - 3 white layers of image contour. The contour should be approximately 0.1 - 0.2 mm shorter than the CMYK graphic, so that there is no white ink around the border.

White inks

White inks are available according to the following table.

Availability of White inks	Presses
Premium white	HP Indigo 7K Digital Press, HP Indigo 7900 Digital Press HP Indigo 7600 Digital Press and HP Indigo 7800 Digital Press upgraded to the level of the HP Indigo 7900 Digital Press
Standard white	HP Indigo 7600 Digital Press, HP Indigo 7800 Digital Press, HP Indigo 7000 Digital Press, HP Indigo 7r Digital Press, HP Indigo 7eco Digital Press

White inks can be added by using one separation layer in the design which can repeated by using the press software at the job properties. The second option is to add 2 - 3 different white separations in the design.

Alternatively, some customers may elect to apply the white layers by screen inks if they have the relevant hardware. In that case, white trapping can reduce registration issues.

Thermal transfer media

Transfer media is based on special release coatings which are applied to a variety of substrates such as paper and synthetic media. This special release coating enables the release of the printed image after heat and pressure are applied on the media.

The correct choice of coating is critical to a successful transfer application.

As of now, several substrates have been tested and certified for the garment application; these are detailed in the "Partners & Suppliers List " on page 19.

These substrates were certified by HP Indigo; they passed all requirements for printing adhesion and transfer behavior for successful printing.

These optimized substrates are based on a BOPET sheet with proprietary release and print receptive coating specially produced to work with Indigo LEP technology. The sheet is ready to print on "as-is".

IMPORTANT NOTE:	In some cases, the sheets should be preconditioned by heat treatment to avoid the sheets being deformed during the production process post-print. Please ask your media supplier for best practices with your substrate.

Printing

The required printing method is multi-shot mode. For the transfer application, print using reverse (mirror) mode.

Preconditioning process

For a successful thermal print, we recommend following these steps to prepare the press for heat transfer printing:

1. Use the functionality code that you received when ordering the heat transfer blanket to install it.
2. Perform 2nd transfer calibration with the regular installed impression paper.
3. Replace the impression paper to thick impression paper (digital mold media).
4. Perform 2nd transfer calibration again with the thick impression paper.
5. Make sure to use Multi-shot mode.

Unique transfer profile for the Heat transfer feature

Due to the many film types, variations in thicknesses, densities and other mechanical properties – the following values should be seen only as a recommended starting point. Before starting production with a new material, it is recommend conducting a short test to find the best working parameters.

Press parameters

Recommended transfer profile on the HP Indigo 7K digital press using the ITEX S1 sheets are as follows:

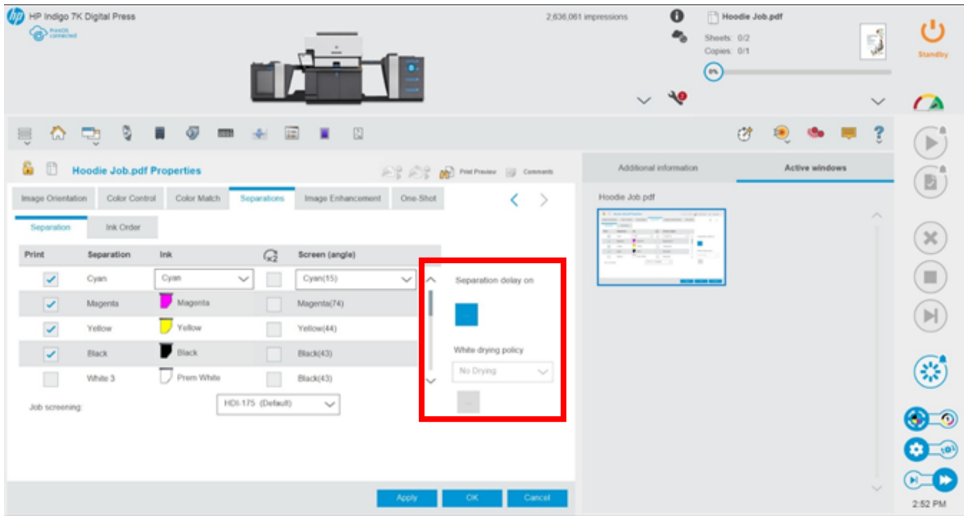
- Blanket temperature of 110 ℃
- T2 force of 240 - 300 Kg

Job definition

If white ink is used in the job it is required to work according to the drying policy of the premium white.

For successful transfer application, the following setup points are required:

1. On the job properties page, go to Separations tab. If you don't see the tab, use the arrow keys to scroll right until you see the Separations tab.



There are 2 important settings on this page: White Drying Policy and Separation Delay (see above).

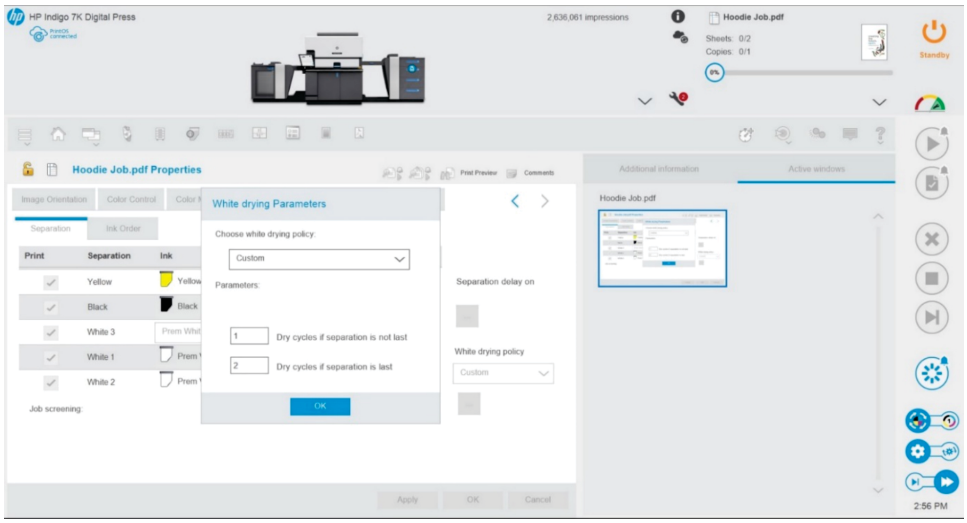
Drying policy is important when printing with **Premium white**. It is important to apply the correct drying policy. Use the table "When changing Drying policy setting" below for the correct drying policy.

NOTE: The finishing aspsects that normally follow the printing step are not addressed by this document; they can be found in partner information supplied by ITEX.

To change the Drying policy setting: choose **Custom** and work according to the table below.

Table 1: When changing Drying policy setting

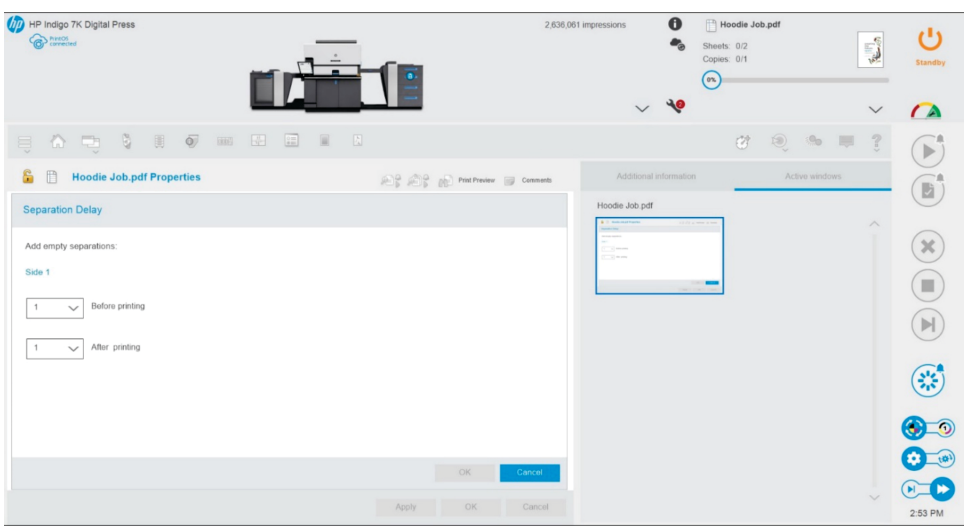
Number of white separations	Drying policy
No white	N/A
One separation	Medium drying policy
Two or more separations	Custom drying policy: One, if not last; two, if last



2. **Separation delay:** Use according to the table "Number of separations / Separation delay" below per the separations applied on the job.

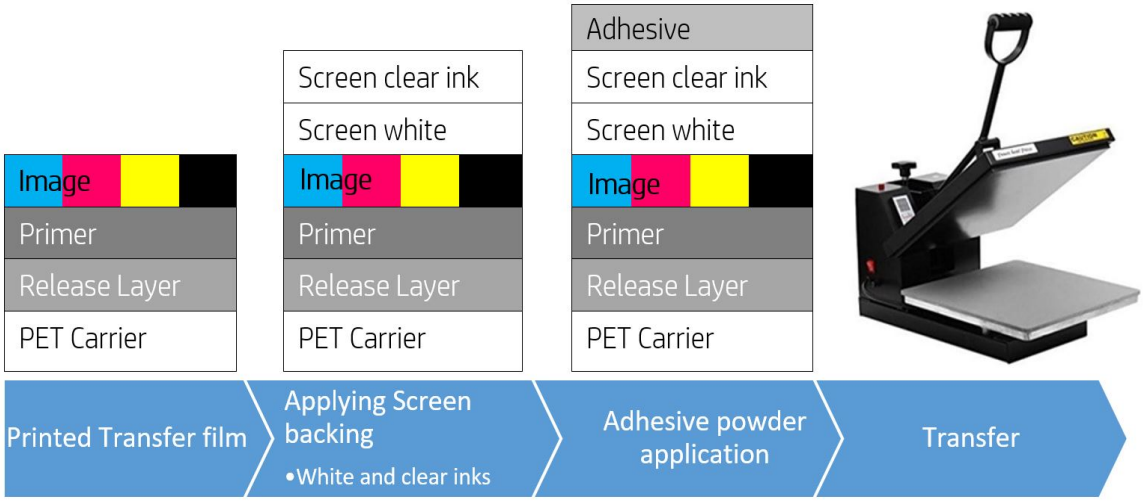
Table 2: Number of separations / Separation delay

Number of separations	Separation delay
CMYK	-
CMYK + W	One before printing and 1 after printing.
CMYK + 2W or CMYK + 3W	One before printing and 2 after printing.



Finishing and converting

The post-print process of the heat transfer application for garments is mainly based on the following scheme:



Once the film is printed on the Indigo press, we can continue with the finishing steps. Normally the subsequent layers would be based on applying a backing white layer followed by a clear ink layer. These layers are required to **increase opacity and durability** of the final label.

It is important to note that different garment (fabric) materials and label requirements require using different inks/adhesive combinations.

Screen application equipment is used to apply the screen inks with different types of mesh sizes and to cure the different layers using heat conveyors. There are several screen machine suppliers available to choose from, including the following which were tested with HP Indigo technology as shown below. These suppliers may have several options of tiers of machines, the machines shown here are examples only:

Sakurai MS - 102ª II (Japan)	**INO Print VS (Slovenia)**
ULTRA - HIGH PRECISION STOP CYLINDER PRESS Cylinder system & video camera	Optical sensor system, flat design
	

Product Case Study - Production of Hoodies

This information was provided by the company iTEX based on their in- house experience.

Equipment:

- Auto - register screen print machinery from Sakurai Japan, INO Slovenia, or similar
- iTEX Powdering Machine ZSCT - III or similar
- Convection heat conveyor dryer (gas or electric) of 4 - 6 meters of heating module.

Step 1 – Printing

- Preconditioning iTEX Transfer Film S1 thru convection heat conveyor dryer @140 ºC / 1 - 2 min

NOTE: Incorrect use of IR heating may cause the substrate to deform.

- Printing of HP Indigo CMYKK (+optional White)

Step 2 – Screen inks with Adhesive

Normally Step 2 is done on one finishing machine with several screen stations that will apply several ink layers and powdered hot-melt adhesive.

Screen white ink

Two layers of screen white are applied on the printed image with drying between the layers. The screen white layer is printed trapped in the printed image (0.15 - 0.2 mm)

Ink + Catalyst	iTEX AQ White with addition of catalyst
Mesh size	77 - 48 or 90 - 48
Squeegee type	Triple 75/90/75
Drying Temperature and duration on conveyor dryer	105 - 115 ºC / 1 - 2 min depending on conveyor dryer

Optional Screen Anti-sublimation layer

This coating is used for sublimation dyed fabrics. 2 layers are required for desired coat weight with drying between the layers.

Ink + Catalyst	iTEX AQ Block with addition of catalyst
Mesh size	43 - 80 or 48 - 80
Squeegee type	Triple 75/90/75
Drying Temperature and duration on conveyor dryer	105ºC - 115ºC/1min - 2min depending on conveyor dryer

Clear Screen ink layer + hot-melt adhesive

One layer of clear screen ink is required prior to adhesive application. This layer is printed over and will trap the printed image (0.15 - 0.2 mm larger). When the clear layer is still wet the adhesive is applied in powder form and dried right after

Ink + Catalyst	iTEX AQ Base with addition of catalyst
Mesh size	77 - 48 *or* 90 - 48
Squeegee type	Triple 75/90/75
Drying Temperature and duration on conveyor dryer	-
Adhesive	iTEX Powder Adhesive PU75 / 80 - 200
Drying Temperature and duration on conveyor dryers	150 ºC / 1 - 2 min

NOTE: The choice of hot-melt adhesive is critical for the desired application and durability required.

NOTE: There are various recipes known in the industry which are tailored to the specific type of garment/fabric and requirements.

Following image preparation, the transfer process can be done. There are a variety of transfer machines where a release paper is normally used in order to remove the PET film from the garment after the thermal transfer is complete.

3 Quality Assurance & Best Practices

Troubleshooting Tips

Transfer issues

In some printing conditions, the image transfer may have issues as seen in the following figure. When this happens, tweak the following parameters:

- **Blanket temperatures:** Increase blanket temperature; the printed image will be dryer when collecting on the blanket.
- **Transfer force:** Increase the secondTransfer force to 300 Kg.
- **Substrate freshness:** The transfer media may be not fresh or had issues during shipment. Test a batch that worked well in the past or compare the behavior with a different box/crate of media. In some cases, heating the substrate to remove residual moisture can help. Consult with your film supplier.

Registration

For registration issues between white layers on the CMYK layers, **run CPR correction** for the relevant number of layers printed, for example, run a 7-layer CPR correction. If this solves the issue, use the Registration Correction Tool available on the press.

4 Regulation

Regulatory Aspects

The status of HP Indigo ElectroInk for printing food packaging applications can be found in the white paper *HP Indigo for Food Packaging Printing Regulatory Overview* (4AA4 - 8153ENW, February 2015). Contact customer care for this document. This document provides details on the status of HP Indigo ElectroInk under key worldwide regulations for food contact materials, and well-defined conditions of use. HP Indigo ElectroInk is not intended for direct food contact.

HP Indigo Ltd. will provide information on HP Indigo ElectroInk to the customer and customer's laboratory to allow a proper risk assessment to be performed. All regulatory information about other materials, such as the primer, varnish, and label film, should be provided by each manufacturer / supplier. HP Indigo Ltd. is not responsible for materials and processes that are beyond its control. HP Indigo Ltd. recommends that its customers perform their own risk assessment and regulatory compliance determination of their product.

Conformance to OEKO-TEX®

HP Indigo Ltd., does not have an OEKO-TEX certificate; however, **We confirm that HP Indigo ElectroInk and Imaging Oil do not contain substances in excess of the limits listed in Standard 100 by OEKO - TEX.**

Appendix - A Obtaining Customer Support

Materials Application Team (MAT)

The Materials Application Team (MAT) provides customer support in matters related to flexible packaging materials, applications development and troubleshooting.

The MAT is always available to address your questions via email:

Region	First Name	Last Name	Email Address
WW	Meni	Shimel	Meni.shimel@hp.com
EMEA	Usue	Palomares	usue@hp.com
APJ	Alvin	Zhou	wenxiu.zhou@hp.com
NA	Pasha	Solel	pasha@hp.com

Partners & Suppliers List

The following tables list the contact details for our suppliers of films, primers, varnishes and converting equipment vendors.

Substrate suppliers:

Supplier	Substrate	Address	Country	Tel.	Website
ITEX Imaging Products SLU	Itex Transfer Film S1	Avinguda del Progrés, 7 Vilassar de Mar, 08340 Vilassar de Mar/Barcelona, Spain	Spain	+34 607988935	www.iteximaging.com For more information you can contact Jan Iversen at jan@iteximaging.com

Converting Equipment Suppliers

Supplier	Address	Country	Tel	Website
Sakurai	2 - 9, Fukuzumi 2-Chome, Koto - Ku, Tokyo 135-0032	Japan	81-(0)3-3643-0490	www.sakurai - gs.co.jp
	1700 North Basswood Road, Schaumburg, IL 60173, USA	USA	1-847-490-9400	www.sakurai.com
	Tamian Way, Hounslow, Middlesex TW4 6BL, United Kingdom	UK	44-208-577-5672	www.sakurai - gs.co.uk
INO Print	Industrijska ulica 14 4226 Žiri, Slovenia	Solvenia	+386 4 505 11 00	www.ino-ziri.si/screen-printing-machines/

Appendix - B Service and Support

To obtain service, please contact the customer care center within your country/region:

Europe:	
Belgium:	+32 (0)2 626 4803
France:	+33 (0)1 57 32 41 07
Germany:	+49 (0)69 38 07 89 193
Ireland:	+353 (0)1 656 9760
Italy:	+39 02 69430637
Luxembourg:	+352 (0)24 87 13 98
Netherlands:	+31 (0)20 547 6870
Spain:	+34 9 12757781
UK:	+44 (0)84 5604 7435
APJ:	
Japan:	+81 (0)1 2085 5536
Singapore:	+65 9891 1753
Distribution Channels (DC):	+31 (0)20 654 5543
North America:	1-800-204-6344
Israel:	+972 (0)8 938 1818

North America and Latin America	International	Israel	APJ
HP	HP	HP	HP
Indigo Division	Indigo Division	Indigo Division	Asia Pacific Pte Ltd
5555 Windward Parkway	Krijgsman 75	Kiryat Weizmann	No.3 Tuas Link 4 #02-01
Alpharetta, GA 30004	1186 DR Amstelveen	P.O. Box 150	Singapore 637016
USA	The Netherlands	Rehovot 76101	
		Israel	

Revision History

Revision	Date	Revision description
CA494-12700	1 December 2020	Initial document
CA494-12700 Rev01	January 2021	Image on p.14 changed. Small updates to: White trapping, Supplier, QA.

Printing Instructions

NOTE: To ensure a high quality print, use the CA494-12700_PRINT.pdf version of this document.

COVER	
Paper weight	250 g
Page size	8.27 x 11.00 in (21 x 27.94 cm)
Printing HP Indigo digital press	8.27 x 11.00 in (21 x 27.94 cm)
Simplex/duplex	Front cover - duplex Rear cover - simplex
Color	Full color - high resolution
Coating	Lamination - shiny front and rear covers
INSIDE PAGES	
Paper weight	80 g
Page size	8.27 x 11.00 in (21 x 27.94 cm)
Printing	HP Indigo digital press
Simplex/duplex	Duplex
Color	Full color - high resolution
Coating	None
FINISHING	
Stitch	2 saddle stitch on left side

This is an HP Indigo digital print.

www.hp.com/go/indigo

PN: CA494-12700