



A COLBERT WHITE PAPER

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ONE CLEAN CARTON® PASSES THE TEST

Colbert Packaging put its One Clean Carton through scientific testing and passed!

For decades, consumers and manufacturers alike have become more aware of the role of packaging in sustainability and safety. One Clean Carton® has been introduced to provide access to packaging that meets the highest standards for sustainable, pharmaceutical and food-safe secondary packaging.

One Clean Carton® is printed on Clearwater Paper®, Solid Bleached Sulphate (SBS) paperboard. SBS uses only chemically processed virgin fiber and contains no mechanical pulp in a middle ply. SBS is a strong sheet that performs well, with no jamming or tearing in the production run. Fewer production slowdowns means less paperboard and ink waste. This reduces production waste and use of raw materials. Our most recent independent laboratory testing involved carton samples printed on Clearwater's Candescence® SBS and on the company's ReImagine® paperboard consisting of 30% post-consumer recycled (PCR) fiber. The ReImagine® paperboard including PCR content was included to analyze its ability to pass rigorous testing confirming it meets low migration, low odor, and low V.O.C. standards.



The samples of One Clean Carton® were printed with agri-based inks, provided by Huber. The inks are printed in compliance with the standards outlined in both Part A and Part B by the Swiss Ordinance for food packaging inks and with the Nestle Guidance Note on Packaging Inks. The inks we use have been reviewed to meet the Swiss Ordinance and Nestle Guidance standards. In addition, we use a clean pH additive to avoid any retained solvents/amines.

Part A of the Swiss Ordinance lists chemical substances that have been toxicologically evaluated and a Specific Migration Limit (SML) that has been set for each substance. Part B lists chemical substances that have not been toxicologically evaluated and are used in ink formulations with the default migration limit set at 0.01 mg/kg (10ppb). No substances not listed in the Swiss Ordinance are used in any part of a pharma or food packaging ink formulation used in our One Clean Carton.



OVERVIEW OF ANALYTICAL METHODOLOGY AND TESTING STRATEGY

The printed paperboard packaging samples were subjected to a battery of analytical tests in order to qualify them for food/ pharmaceutical packaging application.

- 01. Headspace-GC-MS** analysis to determine volatile out-gas products from the packaging upon heating to 100°C for 30 minutes to measure potential products that might out-gas and permeate foods/drugs during storage. This technique was used to monitor retained solvents and compounds with boiling points below toluene.
- 02. Purge & Trap-Thermal Desorption-GC-MS (P&T-TD-GC-MS)** analysis to determine semi-volatile out-gas products from the packaging upon heating to 100°C for 30 minutes to measure potential semi-volatile migrants that might out-gas and permeate foods/drugs during storage. This technique was used to monitor slow ink/varnish/adhesive solvents and semi-volatile compounds with boiling points above toluene.
- 03. Sensory evaluation** (odor) of the samples by jar testing after heating to 50°C in closed glass mason jars.
- 04. Food-side (unprinted-side) FDA migration testing** of the packaging in custom-design extraction cells using both 10% ETOH (FDA aqueous-acidic food simulant) and 95% ETOH (FDA fatty food simulant) and FDA Condition of Use E extraction conditions (room temperature filling and storage).

The Nestle Guidance Note on Packaging Inks allows limited exceptions for ink chemicals used outside of Europe, provided these are specifically permitted by local food packaging ink regulations that include a toxicological evaluation.

The water based coating used on our One Clean Carton® is supplied by Cork Industries, Inc., an ISO 9001 compliant manufacturer. The aqueous coating meets or exceeds all U.S. federal and state guidelines, including Consumer Product Safety Improvement Act of 2008, 16CFR 1303, and TPCH guidelines. This coating is high gloss, scuff resistant, and low V.O.C. None of the ingredients in this Cork Industries coating contain any heavy metals above the acceptable levels in the TPCH guidelines.



In addition, the aqueous coatings do not contain any of the substances that are on the REACH candidate list of substances of very high concern as of the June 27, 2018 ECHA candidate list. Further, this coating does not contain any chemicals known to the state of California to cause cancer or reproductive toxicity within the provisions of Proposition 65.

Cork Industries has provided documentation that their coating may be used for indirect food contact applications when used in compliance with FDA regulation: 21CFR175.105.

All of the coatings originate in the United States of America and all formulary ingredients originate in the U.S.A.



One Clean Carton® uses water based adhesives supplied by Capital Adhesives, an ISO 9001 registered organization. Our supplier provides adhesive products that meet or exceed low V.O.C. emission requirements and are approved for use under the food and safety regulation, FDA 21CFR 175.105 for indirect food contact applications. The Clean Carton adhesive also meets the regulatory protocols for the Coalition Northeastern Governors Model Toxics Legislation (CONEG, ASTM F963, EN 71-3) and the Consumer Products Safety Improvement Act of 2008 (CPSIA).

IN SUMMARY, ONE CLEAN CARTON® MEETS STANDARDS FOR LOW MIGRATION, LOW ODOR, AND LOW V.O.C FOR INDIRECT FOOD CONTACT. THIS COMBINATION AGRI- AND WATER-BASED PACKAGING SOLUTION WILL PASS THE TEST FOR SUSTAINABILITY AND SAFETY.

Learn more about Colbert Packaging at
www.colbertpkg.com

