
PHARMAFLEX *AVALANCHE* (RPL900704) MULTI-PURPOSE UV CURABLE WHITE PRINTING INK

A Single High Opacity White Ink With Superior Adhesion Properties And Smooth Laydown For Most Applications

Product Overview

PharmaFlex *Avalanche* UV Curable Printing White can be used for either flexographic printing or rotary screen printing. Labels, shrink sleeves, pouches, plastic cartons, tags, displays, and squeeze tubes are just a few of the application areas for this high end, work-horse product. *Avalanche* consistently exhibits a pleasing blue-shade white color, strong opacity, outstanding adhesion, and very good overprinting properties. Exceptional flexibility and a sophisticated formulation allow the printer to employ a wide range of substrates, second down inks and other in-line or off-line converting options.

The surface of *Avalanche* is eminently receptive to overprinting with either UV curable products or water-based inks and coatings. ***Avalanche* contains no silicone in any quantity at all!** This feature makes it ideal as an opacifying base for bar codes, security features, or process and line printing with pigmented inks.

Adhesion and reduced curl of UV curable inks and coatings is directly related to low shrinkage features. Low shrinkage and cross-linking speed are directly related; adequate cure speed can be easily accelerated by sufficient UV energy. Therefore, a high intensity, strong dose UV exposure sets the stage for *Avalanche* to perform in an optimum manner.

Safety of our customers is of paramount concern, so for this reason, *Avalanche* does not contain aggressive skin sensitizers, like HDODA or TMPTA. Virtually all other UV curable whites sold today contain aggressive skin sensitizers, which in many cases have been proven to migrate across and through packaging barriers including PETE, PETG and HDPE.

In addition, *Avalanche* has been formulated to be free of amines, plasticizers (phthalates), Bis-Phenol A, ITX, benzophenone (or any similar or related compounds), all common materials found in the vast majority of UV curable products from other suppliers.

Surface Characteristics

Avalanche has been developed specifically for adhesion on a wide range of films and metalized substrates also providing superior trapping features. The smooth surface combined with the receptive chemistry makes *Avalanche* easy to overprint or re-coat without pinholes or jagged edges in the overprint products.

This product is ideal for applications where the printer requires a truly opaque white base, yet must print on the surface for additional graphic impact. UV curable or water-based colors trap cleanly with great edge definition and solid centers. For applications like “see through” labels, cartons, displays or tags *Avalanche* serves as a great “sandwich” layer.

Although not specifically developed to be imaged, *Avalanche* has performed well in this regard for many printers. Prior to full production use, *Avalanche* should be thoroughly evaluated using the same printers, imagers, foils or dies that will be used in the actual production environment should this product be used for any variable information marking or down-line decoration. Any tapes, films, toners, foils, inks and ribbons used in combination with *Avalanche* should also be evaluated prior to full production use to ensure conformance to customers' durability and graphic quality expectations.

The surface of cured *Avalanche* may become less receptive with multiple exposures to high dose UV energy or extended storage at elevated temperatures. Material overprinted with *Avalanche* should be properly stored and inventory rotated to ensure satisfactory results.

To further improve surface receptivity and smoothness of *Avalanche* the printer should compliment this fine chemistry with an optimized printing environment. Doctor blade type, plate type, mounting tape, anilox roll, screen mesh, squeegee material, impression pressure and substrate all play critical roles in attaining ideal surface smoothness.

Flexographic Printing:

Avalanche is inherently easy to blade. Compared to most other white UV inks it does not require precise tuning and adjustment of the doctor blade to experience a fine, bladed coating on the anilox roll without backside blade spitting. In general, stainless steel doctor blades .008 " thick are best. Single bevel, self-seating rounded tip, or stepped blades with .003"- .004" tips all yield trouble free blading without chatter or spitting.

The marriage between graphic design, plate type and mounting tape is proven over time and well documented. When printing *Avalanche* as high coverage solids and line copy, one should utilize a hard density (not general purpose or medium density) mounting tape and a *soft* plate. Plates best for process printing or fine copy will not provide good results, when printing UV flexo opaque whites. With respect to UV flexo opaque whites there is no such thing as a general purpose plate.

***Avalanche* does not require a custom anilox roll, unlike white inks from other ink manufacturers.** Still, the anilox roll is extremely important to achieving optimum opacity with *Avalanche*. Line count for optimum opacity should be between 100 - 150 lpi with volume ranging from 14-22 bcm; specify ceramic, laser engraved, 30°. Although these types of anilox rolls maximize opacity, surface smoothness may be compromised. 200 – 300 line anilox rolls with 7-10 bcm volumes still produce excellent results and may be all that is required. It is best to not have the manufacturer put a high polished surface on these rolls; request a standard surface finish.

Rotary Screen Printing:

Avalanche performs equally well with either Stork[®] or Screeny[®] printing mesh. When utilizing a Stork[®] screen, additional squeegee pressure may be necessary to obtain the smoothest surface. Technicians from Stork[®] recommend squeegee pressure set at 4-6 rather than the standard pressure. When utilizing a Screeny[®] style screen, use of the "yellow" or softer squeegee provides best results. With both types of screens keep the squeegee on the crown of the impression cylinder or slightly above the crown. For screen applications a coat weight of 7-12 microns is ideal.

Contamination Precautions

Avalanche has been formulated to be resistant to silicone, wax or other forms of surface contamination. Still, contamination can come from press- side print aids used with most other rotary screen products. The goal for all printers is to establish a silicone and contaminant free environment. Do not use defoamers or silicone based flow aids in *Avalanche*! These materials will dramatically impair surface smoothness and the ability of this product to accept any form of overprinting, marking, imaging or decoration.

Clean application areas thoroughly after using other varnishes, inks or coatings, including the pumps, and replacing any hoses with completely flushed or preferably new hoses. *Avalanche* can become contaminated by the silicones generally present in other manufacturers' "silicone free" (actually reduced or modified silicones) products. Do not use spray lubricants at any time in the areas where *Avalanche* is being utilized.

Clean and ream squeegee holder very well leaving no residual products *regardless of color compatibility*. Thoroughly clean any syringe injectors with a fast evaporating cleaning solvent to remove silicone from the seal area. All screen parts and accessories (squeegee holder, squeegees, hoses, screens, rings, wiper blades, etc.) must be completely dry and free of wet cleaning compounds. Residual wet solvent or water-based cleaners will contaminate *Avalanche*.

Stir *Avalanche* very well with a clean mixing blade or paddle for a minimum of 60 seconds prior to use to optimize wet out and lay of this product. Vigorous shaking will suffice if the container can be lifted and shaken for the 60 second minimum.

If silicone containing products are used intermittently on the press, designate one squeegee holder and set of pump hoses for use solely with silicone containing products. *Clearly mark these accessories*.

Again, most rotary screen inks that claim to be silicone free actually use modified silicone products or reduced quantities of silicone. These inks will still contaminate true, silicone free products. The agents that promote great flow and leveling in silicone free products are completely incompatible with silicone or modified silicone additives.

Once a silicone free environment has been established the risk of silicone contamination is greatly reduced.

Beware: In addition to utilizing modified silicone, many rotary screen inks claiming to be silicone free add solvent(s) or evaporative products into the rotary screen inks in order to reduce surface tension and promote better flow and leveling. These materials will cause plugging of fine detail in screens during extended runs, and these materials will cause damage to UV lamps and reflectors. Lamp and reflector damage will inhibit cure over time and create curing failures.

Curing Properties

For simulated screen using flexography or with actual screenprinting a heavy deposit of ink is required. At coating weights approaching 10 microns (0.40 mils) the *Avalanche* will still cure with one lamp. Although a 500-600 Wpi lamp is strongly recommended, a 400 Wpi lamp may be used if web speed is significantly reduced. Please test for sufficient depth of cure prior to any production run.

A focused curing systems and/or higher output is always preferred with heavy deposits of UV curable products. These curing systems greatly expand the printers' processing window by having more available power. High deposit printing places additional responsibility on the printer to closely monitor the "health" of the UV curing units by routine bulb and reflector maintenance.

Degree of cure and coating properties are inter-related. Make certain that the coating is cured well before evaluating adhesion, resistance properties and hardness.

Although *Avalanche* cures well and exhibits good adhesion to the substrate, maximum chemical resistance, hardness, adhesion and overall coating strength will be attained after a 24 hour post-cure. Substantial improvement in hardness and post-cure can be seen in as little as 30 minutes.

NOTE: *Each UV curing unit should be manually set or programmed to operate at maximum power output, when web speed is 90 fpm or greater, regardless of settings for other inks or coatings. If a curing unit cannot operate at high levels without affecting web stability, contact the curing unit manufacturer. Power levels < 75% are not sufficient to cure heavy ink deposits.*

Adhesion Properties

Avalanche adheres to a wide range of materials. This product can be used on most film, metallized paper and metallized board substrates. Acetate, styrene or raw polyester materials in particular should be thoroughly tested for compatibility with *Avalanche* or any UV curable product before production use.

Avalanche performs well when overprinting many high wax content water-based inks. Again, prior to utilizing *Avalanche*, test for compatibility with the substrate, inks, adhesives and glues that may be overprinted by this product or overprinted atop this product. In rare cases UV inks interact with printing inks or other materials to produce a faded/altered color or other unacceptable results.

Properties and Technical Specifications

Avalanche forms a tough, flexible ink film resistant to most household cleaning products and petroleum based products including those used for automotive purposes.

Use *Avalanche* for applications where extreme flexibility is demanded and where no edge lift or label curl is tolerated. Although this product is fast curing, it is resilient and will die-cut on even the tightest radius, fold, score or perf without chipping, cracking, or crazing when thoroughly cured.

Centipoise Viscosity
(Brookfield DV-2, #4 spindle, 50 rpm): 900

Weight per Gallon (lbs.): 13

Effective: 13 April 2009

All reported results have been obtained in controlled production environments, therefore, ACTEGA WIT, Inc. recommends thorough testing at the actual printing facility prior to any production run. The specific printing and curing conditions are provided merely as reference information; variations in ink deposit and/or curing power will affect results. Inks recommended by ACTEGA WIT, Inc., when properly cured, must conform to all performance requirements of the finished product in the end-use environment to ensure customer satisfaction. The preceding recommendations are presented for a specific application after careful review of the available information. Due to the inability of ACTEGA WIT, Inc., Inc. to anticipate or control conditions whereby products (and information relating thereto) will be employed, ACTEGA WIT, Inc. cannot guarantee desired results will always be obtained with ACTEGA WIT, Inc.' products. Ink and coating products should be tested, as stated above, by our customers to determine fitness-for-use, as defined by their internal criteria. Each substrate and application for which the ACTEGA WIT, Inc. products are targeted should be evaluated. ACTEGA WIT, Inc., Inc. hereby disclaims responsibility for