Avery Dennison® - Nazdar UVLX Screen Clear Processing Specifications

Instructional Bulletin #3.40 (Revision 0)
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1.0 Substrates

Avery Dennison – Nazdar UVLX Screen Clear is designed for use with select Avery Dennison MPI films printed on Hewlett Packard Latex Printers. Refer to the ICS Performance Guarantee or ICS Platinum Warranty documentation for specific printer/ink/media compatibility and durability. Always test your substrate prior to production.

2.0 Performance

Avery Dennison – Nazdar UVLX Screen Clear has been formulated specifically for outdoor applications on pressure sensitive vinyl printed on latex printers. The Avery Dennison – Nazdar UVLX Screen Clear exhibits exceptional flexibility, exterior durability, chemical resistance, and may be used on decals that will be die-cut, or premasked.

The Avery Dennison – Nazdar UVLX Screen Clear is a one-part, 100% solids ultraviolet-curable screen clear that exhibits high gloss and moderate cure speeds. This ink is intended to work well straight from the container on a wide range of printing equipment.

Decals with Avery Dennison – Nazdar UVLX Screen Clear will exhibit increased resistance to chemicals such as gasoline and isopropyl alcohol. Test to ensure compliance with specific standards, protocols and performance requirements.

Any questions or concerns regarding ink should be directed to your Nazdar or Avery Dennison Technical Representative.

2.1 Variables affecting durability
Some color change and loss of gloss should be expected as prints normally age. Variables affecting a printed part's durability include:

- Ink film thickness and degree of drying
- Color:
    - Using digital latex ink colors not rated for 3 year durability.
    - Using digital latex ink colors below recommended color strength.
- Substrate type and age, the substrate should be rated for the required durability
- Mounting angle or directional orientation
- Geographical location
- Air pollution and exposure to excessive abrasion (for example, brush car washes)

3.0 Application Information

Mesh:	355-380 tpi (140-150 tpcm) with a mesh opening of 22-35 µm monofilament polyester mesh for most applications. Coarser mesh counts and/or twill weave result in heavier ink deposit requiring additional cure output. Other mesh sizes may be used after consultation with Avery Dennison or Nazdar Technical Support
Stencil:	Use direct emulsions and capillary films which are solvent resistant and UV compatible.
Squeegee:	70-90 durometer polyurethane squeegee.
Coverage:	Estimated 3,200 – 4,200 square feet (295 - 390 square meters) per gallon depending upon ink deposit. Reference www.nazdar.com for examples of coverage calculations.
Viscosity Selection	UVLX V2 - higher viscosity ideal for clamshell screen presses UVLX V3 - lower viscosity for 4 post screen presses
Clear coat Thickness:	The clear coat should be applied on digital graphics to provide a coating of 8 - 12 micron.
Thinner:	Avery Dennison – Nazdar UVLX Screen Clear is formulated to be press ready. Thoroughly mix the ink prior to printing. Improper mixing can lead to inconsistent ink performance. .
Reducer:	Use RE315 UV Reducer to reduce the viscosity of these inks. Add up to 5% by weight. Over reduction can reduce print definition, film thickness and adversely affect cure.
Clean-Up:	Screen Wash (Prior to Reclaim): Use IMS201 Premium Graphic Screen Wash, IMS203 Economy Graphic Screen Wash, or IMS206 Graphic Auto Screen Wash. Press Wash (On Press): Use IMS301 Premium Graphic Press Wash.
Packaging:	Available in gallon containers.
Storage / Shelf Life:	These inks are reactive to light and temperature extremes. Store closed containers at temperatures between 65°-78°F (18°-25°C). Storing product outside of these recommendations may shorten its shelf life. Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink. Avery Dennison – Nazdar UVLX Screen Clear supplied in 1 gallon (4/5 kilo) containers or smaller are useable for a period of at least 24 months from the date of manufacture. Ink packaged in 5 gallon or greater (20 kilo or greater) containers may have a significantly reduced shelf life. To obtain the official shelf life letter, Contact your Avery Dennison or Nazdar Technical Service Representative.
Ink Handling:	Direct contact with the skin is the primary route of exposure and irritation with UV inks. Therefore, it is recommended that all personnel mixing and handling these products wear gloves and barrier cream to prevent direct skin contact. Safety glasses are suggested in areas where ink may be splashed. If ink does come in contact with skin, wipe ink off with a clean, dry absorbent cloth or rag (do not use

	solvent or reducer). Proceed to wash and rinse the affected area with soap and water. Consult the applicable Safety Data Sheet (SDS / MSDS) for further instructions and warnings. Avery Dennison – Nazdar UVLX Screen Clear is a one-part UV Screen OP Clear, 100% solids UV-curable screen printing ink and does not contain N-vinyl-2-pyrrolidone (trade name V-Pyrol®).

4.0 Processing

Cure Parameters:	Avery Dennison – Nazdar UVLX Screen Clear cures when exposed to a single medium pressure mercury vapor lamp emitting output millijoules (mJ) and milliwatts (mW) of: 100-180 mJ/cm² @ 600+ mW/cm². Additional output may be required when printing over a dark or colored background. These guidelines are intended only as a starting point for determining cure parameters, which must be determined under actual production conditions. "Undercuring" the ink may result in poor adhesion, lower block resistance, reduced durability, and higher residual odor. "Overcuring" the ink may reduce the flexibility of the printed part. To increase mJ levels, slow down the belt speed or scan speed. To increase mW levels, increase the wattage setting of the UV reactor. To optimize mJ and mW output, maintain the bulb and reflector, and ensure proper focus to the substrate. These guidelines are representative of measurements taken using an EIT® UVICURE® Plus radiometer measuring the UVA bandwidth (320-390 nm). To obtain accurate mW readings with the UVICURE® Plus, reduce the belt speed to less than 40 ft/min. UV Inks can be affected by stray UV light in and around a printing facility resulting in the appearance of ink drying in the screen during the course of a long run. Be aware of skylights, windows, and overhead lights possibly curing the ink in the screen. Precautions include the use of light filters that block out the damaging wavelengths.
Adhesion Testing:	Refer to Instructional Bulletin #3.05 for more detailed instructions on performing the "cross hatch tape test". Even when recommended UV energy output levels are achieved, it is imperative to check the degree of cure on a **cooled down** print: 1. Thumb twist – the ink surface should not mar or smudge. 2. Scratch surface – the ink surface should resist scratching. 3. Cross hatch tape test – per the ASTM D-3359 method, use a cross hatch tool or a sharp knife to cut through ink film only; then apply 3M #600 clear tape on cut

	area, rub down, and rip off at a 180 degree angle. Ink should only come off in actual cut areas. Reference IB 3.05 for complete cross hatch instructions.
Post Finishing:	To assure optimum performance, with relation to die cutting, pre-masking or chemical resistance, allow 4-8 hours for the ink and substrate to stabilize after curing.
Pre-Masking:	To assure optimum performance with pre-mask tapes on the Avery Dennison – Nazdar UVLX Screen Clear, it is important to evaluate specific pre-masks as well as application methods used in production. Recommended: R-Tape 4760, 4760 RLA and American Biltrite 6882.

5.0 Troubleshooting

If The Ink Is Not Curing:	● Check for proper use of mesh. ● Check squeegee pressure, angle and sharpness. Too much pressure or a dull squeegee will significantly affect film thickness and cure. ● Check UV unit for adequate UV output. ● Color too opaque for UV light to penetrate, usually noted when a color match requires the use of opaque white or black. Reduce the opaque color with the addition of mixing clear until effective cure is obtained.
Poor Adhesion:	● Excess ink deposit resulting in inadequate cure. ● Surface contamination on substrate. Wipe a section of the substrate with Isopropyl Alcohol prior to printing. ● Try another type or batch of substrate.

6.0 Quality Control in Processing

Nazdar and Avery Dennison require using these guidelines for the proper application of the protective clear coat to achieve maximum durability and end use performance of the graphics. It is the ultimate responsibility of the graphics manufacturer to verify proper adhesion, clear coat thickness and aesthetic qualities that are suitable for end use applications.

NOTE: The Avery Dennison – Nazdar UVLX Screen Clear has been formulated to render exceptional performance on selected Avery Dennison materials. However, due to possible batch-to-batch variability, a thorough test relative to all performance characteristics should be conducted prior to every production run.

Revisions have been italicized.