

NZE24 Electronic Black and NZE25 Electronic White Screen Inks have been formulated specifically for glass electronics and industrial print applications with the following performance criteria: high optical density, thin dry ink deposit, excellent adhesion, excellent boiling water resistance, excellent MEK resistance, and high temperature resistance. NZE24 and NZE25 can be tinted with a range of Halogen-Free (HF) colors for white and black color matching. NZE24 and NZE25 are two-part inks and must be initiated/catalyzed with a catalyst.

Substrates

- Various glass materials for electronic and industrial applications

Substrate recommendations are based on commonly available materials intended for the ink's specific market when the inks are processed according to this technical data. While technical information and advice on the use of this product is provided in good faith, the User bears sole responsibility for selecting the appropriate product for their end-use requirements. Reference the 'Quality Statement' at the end of this document.

User Information

Mesh

380-420 tpi (150-165 tpcm) with a mesh opening of 22-38 um monofilament polyester mesh.

Stencil

Use direct emulsions and capillary films which are solvent resistant.

Squeegee

70-90 durometer polyurethane squeegee.

Ink Preparation

NZE24 Black: Add 1 part NZE684 Black Catalyst to 10 parts NZE24 Black ink by weight.

NZE25 White: Add 1 part NZE685 White Catalyst to 10 parts NZE25 White ink by weight.

The amount of catalyst should only be based on the weight of the ink and not include the weight of any other additives. Thoroughly mix the inks prior to printing.

Pot life of the catalyzed inks is approximately 5 to 7 hours.

Tinting

NZE24 Black: tint up to 45% with NZE200 to NZE219 and NZE310 colors by weight. Add 1 part NZE684 Black Catalyst to 10 parts of the total ink amount.

NZE25 White: tint up to 45% with NZE200 to NZE219 colors, NZE310, and NZE24 Black.

NZE25 White tinted up to 15%: add 1 part NZE685 White Catalyst to 10 parts of the total ink amount.

NZE25 White tinted 16% to 30%: add 1 part NZE685 White Catalyst to 7 parts of the total ink amount.

NZE25 White tinted 31% to 45%: add 1 part NZE685 White Catalyst to 6 parts of the total ink amount.

Example for calculating the amount of catalyst for a tinted white ink: 125g of total ink containing a 20% tint with a catalyst ratio of 1:7 is calculated as:

$$100\text{g white} + 25\text{g tint} = 125\text{g total ink}$$

$$125\text{g total ink} \div 7 = 18\text{g catalyst}$$

NZE200 to NZE219 and NZE310 tinting colors are not recommended to be used as stand alone items.

Printing

Add only enough ink to the screen to be able to print for 5-10 minutes. Add additional ink in small increments throughout the print run to maintain screen stability.

Maintain ink temperature at 65°-90°F (18°-32°C) for optimum print and cure performance. Lower temperatures increase the ink viscosity, impairing flow and increasing film thickness. Elevated temperatures lower the ink viscosity, reducing print definition and film thickness.

Pretest to determine optimum printing parameters for a particular set of ink, substrate, screen, press, and drying / curing conditions.

Nazdar does not recommend inter-mixing of NZE Solvent-Based inks with other inks besides the NZE Solvent-Based inks.

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Cure Parameters

Good air circulation is necessary to remove the vaporized solvents.

NZE24 Black: Bake the catalyzed NZE24 Black ink at a maximum of 180°C (356°F) for 30 minutes.

NZE25 White: Bake the catalyzed NZE25 White ink at a maximum of 120°C (250°F) for 30 minutes.

Note: See 'Tinting Colors' section for reference to heat stability for the range of tinting colors.

Common Performance Additives

The market specific performance properties of the NZE Solvent-Based inks should be acceptable for most applications without the need for additives. When required, any additives should be thoroughly mixed before each use. Prior to production, test any additive adjustment to the ink. Inks containing additives should not be mixed with other inks.

Reducer: Use RE183 Retarder to reduce the viscosity of these inks. Add up to 8% by weight. Over reduction can reduce print definition, film thickness and adversely affect cure.

Example for additives: 100g Ink + 10g Catalyst with 8% Reducer is calculated as:

$$100\text{g ink} + 10\text{g catalyst} + 8.8\text{g reducer} = 118.8\text{g total}$$

Cleanup

Screen Wash (Prior to Reclaim): Use IMS201 Premium Graphic Screen Wash, IMS203 Economy Graphic Screen Wash, or IMS206 Graphic Auto Wash.

Press Wash (On Press): Use IMS301 Premium Graphic Press Wash.

Storage / Shelf Life

Store closed containers at temperatures between 65°-78°F (18°-25°C). Storing products outside of these recommendations may shorten their shelf life. Ink taken from the press should not be returned to the original container; store separately to avoid contaminating unused ink.

To obtain the official shelf life letter, Contact Nazdar Technical Service at InkAnswers@nazdar.com or see contact listing at the end of this document.

General Information

Ink Handling

All personnel mixing and handling these products must wear gloves and eye protection. Clean up spills immediately. If ink does come in contact with skin, wipe ink off with a clean, dry, absorbent cloth (do not use solvent or thinner). Wash the affected area with soap and water. Consult the applicable [Safety Data Sheet](#) (SDS / MSDS) for further instructions and warnings.

For assistance on a wide range of important regulatory issues, consult the following Regulatory Compliance Department link at <http://www.nazdar.com> or contact Nazdar Ink Technologies - World Headquarters (see contact listing at the end of this document).

Adhesion Testing

Even when recommended drying and curing levels are achieved, it is imperative to check the degree of cure on a **cooled down** print:

1. Touch of ink surface – the ink surface should be smooth.
2. Thumb twist – the ink surface should not mar or smudge.
3. Scratch surface – the ink surface should resist scratching.
4. 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.

Physical Properties Test Results

These results were obtained by testing of catalyzed NZE24 and NZE25 inks at full strength on electronic glass. This information is provided as a general indication of the ink performance, not as a specification or a guarantee.

Adhesion

Test: Cross-hatch tape (ASTM D3359)

Result: Pass

Gloss

Test: 60° meter <85

Result: Pass

Heat Resistance

NZE24 Black Test: 30 minutes at 350°C (660°F)

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NZE25 White Test: 30 minutes at 200°C (390°F)
Results: Pass, no visible change to the printed ink surface.

Chemical Resistance

Test: MEK (methyl ethyl ketone) soak for 1 hour
Result: Pass, no visible change to the printed ink surface.

Boiling Water Resistance

Test: 30 minutes at 100°C (212°F)
Result: Pass, no visible change to the printed ink surface.

Manufacturer's Product Offering

Based on information from our raw material suppliers, these ink products are formulated to contain less than 0.06% lead. If exact heavy metal content is required, independent lab analysis is recommended.

The NZE Solvent-Based inks are free of the halogens chlorine and bromine based on supplier information and in compliance with the electronics industry standard, IEC 61249-2-21 (<http://www.iec.ch/>).

Standard Printing Colors

NZE24 Black and NZE25 White with their appropriate catalyst are intended to work as supplied or can be tinted up to 45% with NZE200 to NZE219 and NZE310 Tints.

Halogen-Free (HF) Tinting Colors

NZE200 to NZE219 and NZE310 are intended to be used only as tinting colors up to 45% addition into NZE24 and NZE25. These tinting colors are not recommended to be used as stand alone items.

High additional levels of NZE200 to NZE219 and NZE310 into the white and black can result in a higher gloss level and reduced opacity of the printed part.

NZE200 to NZE219 have high heat resistance, except for the NZE210 HF Yellow Tint and NZE219 HF Green Tint. When very high heat resistance is required, use the NZE310 HF Yellow HS Tint as:

- The replacement for NZE210 HF Yellow Tint.
- Combined with NZE218 HF Blue GS Tint in any color match using NZE219 HF Green Tint.

Packaging / Availability

Contact your Nazdar distributor for product availability and offering.

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Standard Ink Items

Standard ink items listed below are inventoried in 1 kilogram containers.

Printing Colors

Item Number	Color
NZE24	Electronic Black
NZE25	Electronic White

Halogen-Free (HF) Tinting Colors

Item Number	Color
NZE200	HF Clear Tint
NZE210*	HF Yellow Tint
NZE211	HF Orange Tint
NZE212	HF Red Tint
NZE213	HF Carmine Tint
NZE214	HF Magenta Tint
NZE215	HF Maroon Tint
NZE216	HF Violet Tint
NZE217	HF Blue RS Tint
NZE218	HF Blue GS Tint
NZE219*	HF Green Tint
NZE310	HF Yellow HS Tint

* These colors not recommended where high heat resistance is required. Use recommended alternative item.

Additives / Reducers

Item Number	Color
NZE684	Electronic Black Catalyst
NZE685	Electronic White Catalyst
RE183	Retarder

Cleaners / Clean Up

Item Number	Color
IMS201	Premium Graphic Screen Wash
IMS203	Economy Graphic Screen Wash
IMS206	Graphic Auto Screen Wash
IMS301	Premium Graphic Press Wash

Nazdar Quality Statement

Nazdar® stands behind the quality of this product. Nazdar® cannot, however, guarantee the finished results because Nazdar® exercises no control over individual operating conditions and production procedures. While technical information and advice on the use of this product is provided in good faith, the User bears sole responsibility for selecting the appropriate product for their end-use requirements. Users are also responsible for testing to determine that our product will

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perform as expected during the printed item's entire life-cycle from printing, post-print processing, and shipment to end-use. This product has been specially formulated for screen printing, and it has not been tested for application by any other method. Any liability associated with the use of this product is limited to the value of the product purchased from Nazdar®.

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