

**K-2 (T.G)**

**[Table grade printing products: ZAP (Zydex Alternative to Plastisols)]**

**Product attributes & range:**

**Zydex** offers a complete range of RSL compliant products\* (test certificates available on website), for textile screen-printing on Tables. (see Table 1). The textile print using these products will meet Oekotex 100 standards for baby wear category (if printed according to procedure given below)

- (i) White pastes (2):**  
 K2000 (T.G.) (high opacity for dark grounds)  
 K 2 White (T.G) (medium opacity for light & medium grounds)

- (ii) Specialities: K2 Glitter (T.G)**

- (iii) 9 coloured pastes K2 (T.G) series :**

These allow the printer to work with the same color management platform as our inks for knits & wovens viz K 2 Opaque (48 – 62T) / K 2 W (48 – 62T) inks. Printing of these colours on dark grounds is possible by minor opacity adjustment. (see table 2)

**Table 1: Salient features of products are summarized below:-**

<b>Products</b>	<b>K2 (T.G.)</b>	<b>K 2000 (T.G.)</b>	<b>K2 white (T.G.)</b>	<b>K 2 Clear (T.G.)</b>	<b>K-2 Glitter (T.G.)</b>
Type of product	9 colours (Black, Marine, Blue (G), Blue (R), Scarlet, Red, Yellow, Green, Violet)	White paste	White paste	Base polymer For color printing	Base Polymer For glitter printing
Opacity	Nil	High	Medium	N.A	N.A
Background	N.A	Dark	Light & medium	N.A	N.A

Stretch	High				
No. of ptg rounds reqd. for coverage	Minimum	Minimum	Higher	N.A	N.A
Print Finish	Matt	Gloss	Matt*	Can be added to improve gloss*	N.A
Feel	soft				
Texture	Smooth				
Solid Content (%)	Vary from colour to colour	69 ± 2	62 ± 2**	54 ± 2	52 ± 2
Mesh	48 to 62T				10 to 20T
Tackiness	Non-tacky* (use finer meshes in case of Tack)				
Crock Fastness	Wet: 3 to 4, Dry: 4 to 5 (Even in dark colors using Zycron pigments)				
Wash durability	5 wash cycles (As per std test method)				

\*\* vs 55 to 57% for others

\*Test: Print 2 coats on knitted fabric. Dry at 110°C for 5 min & cure at 150°C for 3 min. Keep paper on printed portion with approximately 1 kg weight over the same for 24 hrs. After 24 hrs, remove the weight and release the paper. The paper should be easily removed.

### Quality Assurance to Retailers:

- Cheaper water based pastes, after 5 washes show loss of stretchability, softness & smoothness. For a customer, durability of the print quality, viz. minimum deterioration after repeated washes is of primary importance.



- Zydex products show almost 90% performances in terms of stretch, smoothness & softness like the original print even after 5 standard wash cycles.
- Testing the printed portion after 5 washes for stretchability, softness & smoothness will help in differentiating the quality of the prints.
- During the field tests, our products have shown excellent performance upto 200 home launderings.

**Making colored pastes from Zydex system:** Traditionally printers mix pigment emulsions to white pastes to prepare color pastes. This method is not recommended as the printer will end up making a large quantity of colored print paste. To avoid this Zydex offers 9 ready to use Color Inks K 2 (T.G.), which can be mixed with each other to achieve desired Pantone shades.

**Opacity adjustment for medium & dark grounds\*:**

K2 (TG) Ink pastes are suitable for printing on pastel ground. To print on Dark/Medium ground, it is advisable to make the color paste more opaque by mixing it with White Paste as per guideline given in the table below.

Sr. No.	Table Grade Color Inks requiring opacity adjustment	By addition of K2 White (T.G) (% of Color Ink)	
		Medium Ground	Dark Ground
1	K2 Marine (T.G.)	3	6
2	K2 Blue (G) (T.G.)	3	6
3	K2 Blue (R) (T.G.)	3	6
4	K2 Scarlet (T.G.)	3	6
5	K2 Red (T.G.)	3	6
6	K2 Yellow (T.G.)	3	6
7	K2 Green (T.G.)	3	6
8	K2 Violet (T.G.)	3	6

**{Note - K2 Black (T.G) will not require addition of K2 White (T.G.)}**

**N.B:** Never add pigments to white pastes directly as this will result in higher consumption of colors, poor fastness, stretch & feel. Our white pastes are designed for direct use as white color & not designed for color addition.

**Accessories:**

- For Brightness : Fluorescent Inks (9 colors) (see Table 3)
- for Other properties & requirements : Inks modification (4 products) (see Table 3)  
: Print modification (3 products) (see Table 3)

**Table 3:**

Sr. No.	K 2 FLSC Inks with Formaldehyde content (ppm)	Accessories
1	K 2 Blue FLSC (N.D)	<b>Ink modifiers: (4)</b>
2	K2 Magenta FLSC (120)	Opacity & Color strength redn , stretchability : K 2 Clear(T.G) / Zytrol 600 (Binder)
3	K2 Orange FLSC (120)	
4	K 2 Pink FLSC (100)	Shade boosters : Zycron pigment emulsion (10 colors)
5	K 2 Red FLSC (84)	Viscosity enhancer : Zase 5100 (Thickener)
6	K2 Lemon FLSC (110)	Viscosity reducer : K 2 Ink Reducer
7	K2 Yellow FLSC (100)	<b>Print modifiers (3)</b>
8	K2 Green FLSC (75)	Fastness Improvement: Fixer(Catalyst-MX*)
9	K2 Violet FLSC (75)	Feel Improvement : Softener (R 55)
		Gloss Reduction : K 2 Matt
		<b>* Non RSL compliant</b>

Fixer: Catalyst MX : formaldehyde level:  
(4 to 4.5% or 45,000 ppm)

For RSL compliance with fluorescent inks addition should be done keeping in mind formaldehyde contribution from them. For safety purpose, assume 10ppm formaldehyde levels in white pastes/K2 Clear (T.G), then by addition of 1 to 2% fluorescent colours to them, the total formaldehyde increase will be 2 to 3 ppm (approx), which will make the total formaldehyde level upto 12 to 13 ppm.

Mixing K2 (T.G) pastes (nine colours) & Fluorescent colors one can achieve practically all shades in Pantone book.

## Printing Technique:

- **Screen**

Mesh (48-62T): The screens used for printing should be preferably made of heat set polyester, as they have longer life with water base inks compared to Nylon screens.

**Note:** Lower mesh count than optimum will lead to thicker film deposition, poor drying, poor curing & residual tack. So it is very important that critical attention must be paid to mesh selection for every job.

- **Photo emulsions: Water resistant photo emulsion.**

**Test:** Rub ink / water on dried photo emulsion surface, it should resist scrubbing action. Do not use hardener with polyester meshes as this will not allow their recovery. Always coat emulsions with proper equipments (automatic coaters) to reduce deposition.

- **Frames:** Should be of Aluminum to avoid chances of contamination due to rust

- **Tension:** The tension of screen should be in range of 15 – 25 N/cm. [lower than 10 N/cm is not recommended] for this screens should be stretched pneumatically.

- **Off contact:** It is desirable to have off contact of min 2 mm (between fabric & screen).
- **Squeegee:** Square & sandwich squeegee with shore hardness no. 60/90/60 or 70/90/70 is preferred. In case of heavy deposition and blotch design it is recommended to use rounded squeegee.
- **Flash:** Where available, flashes can be used to reduce drying time on tables.
- **Curing:** The dryer temperature setting should be or 160-175°C for 75-80 seconds (longer driers are recommended). Exact time and temperature should be optimized based on dryer & type of print.
- **Fusing:** 170 – 190°C at 5-10 kg/cm<sup>2</sup> pressure. Fusing paper should be checked for its eco friendliness as this can also lead to contamination with compounds like tin, etc.
- **Release of prints from screens:**  
Velvetrol/R-55 is recommended for applying on the back side of the Screen for easy release of fabric during printing.

## Troubleshooting:

- **Seasonal changes:**  
Summer (Hot and Dry): Spray water intermittently  
Winter (Cold and Dry): Spray water intermittently  
Rainy (Hot and Humid): Make sure fabric is dry. Additional flash may be used (airflow through flash will help).
- **Day / Night:**  
During the day the drying would be faster as compared to night. The drying profile of the product may be adjusted as follows:  
  
For faster drying/Tack: Change mesh to finer  
For slower drying : mix with K2 (62-120T) series of colors.

- **Adjustment of viscosity:**
- Before printing: Higher viscosity may be required for improved ground coverage, whereas, lower viscosity will give smoother print. Viscosity can be increased by adding Zase 5100 thickener (Do not use regular thickeners for this).
- During printing: Water is lost from pastes due to Atmospheric heat in tropical countries

This leads to viscosity build up which can be adjusted by intermittent spray of water. Alternately the highly viscous inks may be removed, add thinner (**K2 Ink Reducer**) inside & soak for 24 hrs. Then mix & use

- Prolonged storage on screen during work intervals (lunch break, etc)  
4-5 strokes after an extended break of more than 15 min will clear the screens to allow regular printing production

- **Fabric related issues:**

**Hairiness:**

This should be eliminated as far as possible in pretreatment. Otherwise hot pressing may be done to suppress the protruding fibers. This is basically a spinning problem for which proper Quality standards for yarn are essential.

**Dyeing:**

- a) While printing on synthetics / P/C blends, thermo migration can occur if low sublimation disperse dyes are used. Hence printing on dark background (dyed) should be done only after checking quality of dyes used etc. (high sublimation dyes above 190°C are recommended)
- b) While printing on cotton, fixation of reactive dyes can be a

problem particularly with cheaper mono-valent dyes. Poor fixation and washing can lead to loose reactive dye on the surface, which can give the reactive dye migration in the film.

The printer is expected to check (before printing) bleeding of reactive dyed fabric in hot water at 60 °C.

(For discharge prints, check use of Ramazol dyes during dyeing, otherwise discharging of colour will not be complete.)

### **Variables:**

- **Curing:** For a given print design it is recommended that every time after curing is done, it should be checked by immediately subjecting it to 2 home launderings (at 55 deg C in the laundrometer [40 rpm] for 30 **min with 5 gpl.** surf excel). In case washing fastness is poor, you may increase drying time or temperature depending on equipment settings.

### **Techno – Economic Evaluation of Table Printing Products:**

Normally printing products are selected by printers as cost/kg basis. This is incorrect method of selection as it gives a wrong picture misses out on the overall printing cost as explained below:

- **Cost/Kg:** This method doesn't take into account the  
(a) % solids (b) opacity (which reduces the labour cost)  
(c) printability of the products through fine meshes.
- **% Solids:** Normally for getting 1 gm solid, the solid content is very important. e.g, K 2000 white paste as  $69 \pm 2\%$  solids whereas a normal white paste will have  $55 \pm 2\%$  solids. This will also lead to faster drying & hence quicker turns. Thus based on the cost/kg solids, the cost difference will come down by  $(69-55)/55 \times 100 = 25\%$  as was evident in cost/kg basis.
- **Opacity:** In table printing "labor cost" is approx. 40% of the printing cost & is higher than the "chemical cost" which is approx. 30%. Thus a high opacity paste like K 2000 will arrest dark (black) ground in say 2 rounds of 2 strokes as compared to

say 3 rounds of 2 strokes for low opacity white paste which will lead to a saving of 33% in printing cost or 40% of the print chemical cost.

		<b>K 2000</b>	<b>K2 white</b>	<b>Local products</b>	<b>Remarks</b>
1	Cost/kg	1.5X	X	X	50% higher
2	Solid content ( $\pm$ 2%) on solids basis	69%*	60%	55%	15%* higher than K2 white (Net impact 35 %**)
		1.35X**	X	.9X	
3	Chemical cost as a % of print cost (X = 30%)	(1.35 x 30%) 0.4X	0.3X	.33X	10% higher
4	Labor cost 40% of printing cost	0.27X	0.4X (50% higher)	0.4X	3% lower
	Total cost (chem.+labour)	0.67	.7x	0.73X	
<b>Overall Cost of K2000*</b>					<b>3 to6% lower</b>

### Tips for RSL Compliance

- The spatulas, screens, stirrers, containers, squeezes etc. that are used for plastisol inks need to be avoided to prevent contamination and rejection of garments on eco issues.
- Printing sections for water based & plastisols should be segregated completely.
- All other chemicals & accessories used in print shop like beads, emulsions, thinners, degreasing chemicals, adhesives, etc should be RSL compliant.



## Complementary Products:

### Automatic / Semi Automatic Printing:

1. **K 2 (62T – 120T):** Inks for printing on automatic machines.
2. **K 2 Opaque (48T – 62T)/ (62T – 120T):** Inks for printing on semi-automatic machines
3. **Zase-5100:** Thickener for Inks
4. **K 2 Clear/K 2 Opaque Clear/K 2 W Clear:** For dilution of inks without losing solid & printability.
5. **K 2 Glitter:** For glitter/pearl/gold/ Black printing.

### Other Products:

1. **K 2 Transfer Adhesive:** Adhesive for transfer printing.
2. **K 2 Puff Base:** For puff (3D) effect.
3. **K 2 Matt:** For Matt effect
4. **Zycron Pigment:** 10 Shades (Booster)

### Rotary and flat screen-printing:

1. **Zycoprint:** Thickener for pigment printing
2. **Zytrol-600:** Binder for pigment printing.
3. **R 55:** Softener for pigment printing.
4. **R 66:** Pigment printing additive for brilliancy & leveling blotches
5. **R 5000 TSP:** Ready to use pigment-printing paste. (Binder + Thickener + Softener)

### Storage:

- Do not store in direct sun or at a temperature higher than 45°C.
- Always keep the lid closed after withdrawal of material from the can.
- Minimum shelf life of the product is 18-24 months.
- For extended storage, once the can is opened, pour 50 gms of water on the top surface and then close the lid tightly.



***Disclaimer:***

*The information & data contained herein are given in good faith but without warranty. We recommend that before using our products, the customer should make his/her own tests to determine the suitability of the products for his/her own purpose under his/her operating conditions. As the circumstances under which our products are stored, handled and used are beyond our control, we cannot assume any responsibility for their use by the customers.*

---

**Zydex Industries**

25/A, Gandhi Oil Mill Compound,  
Gorwa, Vadodara-390016,  
India.

TEL. : +91 265 2280865/2283386/2280120

FAX : +91 265 2280872

Email : [info@zydexonline.com](mailto:info@zydexonline.com)

Web : [www.zydexindustries.com](http://www.zydexindustries.com)