

B461

FREEZING LABEL (-196°C)

Description

Laboratory identification such as vials, centrifuge tubes, test tubes, straws, and slides.

B461 can be offered in a self-laminating format which has a white thermal printable zone and a clear overlaminating area or completely flood coated for flat label applications. B461 has good print smudge resistance, solvent resistance, good high and low temperature performance. B461 performs well in common laboratory environments such as liquid nitrogen and autoclave applications

Print technology	Thermal transfer
Material type	Polyester
Finish	Clear film with matte white printable zone coated ink
Adhesive	Permanent acrylic

Physical data

Physical properties

	Test methods	Average results
Thickness	ASTM D1000 - Substrate - Adhesive - Total (excluding liner)	0,0229 mm (0,0009 inch) 0,0254 mm (0,0010 inch) 0,0483 mm (0,0019 inch)
Adhesion to:	ASTM D 1000	
- Stainless steel	20 minute dwell 24 hour dwell	32 oz/inch (35 N/100 mm) 39 oz/inch (43 N/100 mm)
- Polypropylene	20 minute dwell 24 hour dwell	10 oz/inch (11 N/100 mm) 10 oz/inch (11 N/100 mm)
- Glass	20 minute dwell 24 hour dwell	37 oz/inch (40 N/100 mm) 39 oz/inch (43 N/100 mm)

Environmental properties

Printed samples were laminated to glass test tubes (1.1 cm outer diameter) and polypropylene centrifuge tubes (1.1 cm inner diameter, 1.5 ml capacity) and allowed to dwell 24 hours before exposure to the indicated environments.

	Test methods	Average results
High service temperature**	30 days at various temperatures	Slight discoloration at 230°F (110°C), no visible effect to print. Material discolored but functional up to 266°F (130°C)
Pressure cooker (simulate autoclave)	3 cycles of 1 hour in 250°F (121°C)/15psi pressure cooker and 23 hours at room temperature	Very slight discoloration and very slight print bleed after 3 cycles
Liquid Nitrogen***	3 cycles of 4 hours at -320°F (-196°C) and 20 hours at room temperature	No visible effect after 3 cycles

Freezer	3 cycles of 16 hours at -94°F (-70°C) and 8 hours at room temperature	No visible effect after 3 cycles
Liquid Nitrogen to boiling water***	1 hour at -320°F (-196°C) then placed in boiling water 212°F (100°C) for 10 minutes	Very slight discoloration
Freezer to boiling water	1 hour at -94°F (-70°C) then placed in boiling water 212°F (100°C) for 10 minutes	Very slight discoloration

**samples for this testing were placed only on glass panels and glass test tubes

***also tested labels on aluminum foil

Chemical properties

Printed samples were laminated to test tubes and allowed to dwell 24 hours prior to testing. Test conducted at room temperature. Samples were immersed in the test solvent for 15 minutes. The samples were removed and rubbed 10 times with a cotton swab saturated with the test fluid. The rating scale below shows the effect to the quality of the print for each sample.

Chemical reagent	Effect to label		Effects to printed image*	
	Flat	Wrapped	Without rub	With rub
Ethanol	No visible effect	No visible effect	1	1
Toluene	Slight adhesive ooze	Slight adhesive ooze	1	1
Isopropanol	No visible effect	No visible effect	1	1
Xylene	No visible effect	No visible effect	1	1
Dimethylsulfoxide (DMSO)	No visible effect	Slight adhesive ooze	1	1
Methylene chloride	Adhesive ooze	Slight adhesive ooze and label unwrap	1	1
50% Acetic acid	No visible effect	No visible effect	1	1
10% Hydrochloric acid	No visible effect	No visible effect	1	1
10% Sodium hydroxide	No visible effect	No visible effect	1	1
10% Clorox solution	No visible effect	No visible effect	1	1

Rating scale	1 = no visible effect
	2 = slight smear or print removal, detectable but minimal smear
	3 = moderate smear or print removal (print still legible)
	4 = severe smear or print removal (print illegible or just barely legible)
	5 = complete print and/or topcoat removal

Shelf life

Shelf life is two years from the date of receipt for this product as long as this product is stored in its original packaging in an environment below 80° F (27° C) and 60% RH. It remains the responsibility of the user to assess the risk of using this product. We encourage customers to develop testing protocols that will qualify a product's fitness for use in their actual application.

Disclaimer

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