

Bepop PET Label White/Silver Technical Data Rev. 5

Product name	SL-S153N PET Label White SL-S154N PET Label Silver
Product overview	This is a film for creating labels that uses PET (polyethylene terephthalate) as the material. It is suitable for creating labels for output using the CPM-100H Series and CPM-100 Series. It differs from the usual Bepop sheets by being a material that does not include polyvinyl chloride.
Subject machine types	CPM-100H Series (Including CPM-100SH)/CPM-100 Series

[Materials and External Appearance]

Testing items		Units	PET Label White	PET Label Silver	Remarks
Material	Surface film		PET (With white mixed in)	PET	
	Printing			Silver color, white color	
	Adhesive		Acrylic	Acrylic	Strong adhesive type
	Release paper		Double-sided polylamination	Double-sided polylamination	
Thickness	Surface film	μm	50 ± 3	38 ± 2	The adhesives of both the PET Label White and Silver have been made 5μm thicker. White: Portion manufactured after September 15, 2005 Silver: Portion manufactured after March 15, 2005
	Adhesive	μm	20 ± 3	20 ± 3	

[Performance]

A. Adhesive strength

Testing items	Units	PET Label White	PET Label Silver	Testing method/ Supplementary information
Adhesive strength	N/25mm (gf/25mm)	13 ± 4 (1326 ± 400)	13 ± 4 (1326 ± 400)	Complies with JIS Z0237

B. Adhesive strength according to different adherend materials

Product name	Adherend material	Adhesive strength [N/25mm]	Remarks
PET Label White	SUS304	12.7	To make the PET Label White/Silver difficult to peel off even when affixed to rough surfaces, the thickness of the adhesive was increased by 5μm. Even for surfaces that are quite rough,
	Leather satin coated steel plate	3.2	
	Leather coating	6.9	

	(Black)		such as leather satin coated steel plate and leather coatings (pear skin-like condition), there is an adhesive strength of 2.8N or greater, and the label cannot be peeled off easily.
PET Label Silver	SUS304	12.4	
	Leather satin coated steel plate	2.8	
	Leather coating (Black)	5.7	

[2/4]

C. Adhesive properties under high and low temperatures

Testing method	<p>25mm width strips of each sheet (PET Label White/Silver only, and PET Label White/Silver with three types of lamination attached) were affixed to stainless steel plates, glass plates, and coated metal pipes at room temperature. Then, after exposing the sheets to each high and low temperature environment for the stipulated time, the changes in each sheet (lifting, peeling, and color change) and the conditions when peeling off the sheets were confirmed.</p> <p>* When affixing the sheets, the areas of the adherend where the sheets are to be affixed are degreased using alcohol.</p>
Remarks	<p>[Stainless steel plate] When exposed under extremely high temperatures (50°C or higher), it was confirmed that some adhesive remained after peeling off the PET Label White. Under extremely high temperatures (150°C), deformation (shrinkage) of the lamination base material of the laminate kit attached to the PET Label White/Silver was confirmed. Usage at extremely high temperatures (100°C or greater) is not recommended as it causes adverse effects on the sheet.</p> <p>[Glass plate] Under extremely high temperatures (150°C), deformation (shrinkage) of the lamination base material of the laminate kit attached to the PET Label White/Silver was confirmed. Usage at extremely high temperatures (100°C or greater) is not recommended as it causes adverse effects on the sheet.</p> <p>[Coated metal pipe] When exposed under low and high temperatures, changes such as sheet lifting and surface color changes were not confirmed. However, the use in extremely high temperature environments (50°C or greater), or use by directly affixing to piping that is subject to high temperatures is not recommended as it may cause adverse effects on the sheet.</p> <p>* In all of the cases, there was no lifting or peeling of the sheet from the adherend.</p> <p>* When exposed in extremely high temperature environments, it was confirmed that the lamination surfaces change color at temperatures of 100°C or greater for the laminating film, and at 150°C or greater for the laminating kit.</p> <p>* From the results described above, it can be judged that the range has no problems when using indoors (in environments where the temperature is 50°C or less).</p>

Data	Adherend	Exposure Temperature	-20°C	0°C	50°C	100°C	150°C
		Exposure time	2 hours	10 days	10 days	10 days	2 hours
Stainless steel plate	PET Label White	○	○	○	○ Note 3	○ Note 3	○ Note 3
	PET Label Silver	○	○	○	○	○	○
	PET Label White + laminating film	○	○	○ Note 3	△ Notes 1, 3	△ Notes 1, 3	
	PET Label Silver + laminating film	○	○	○	△ Note 1	△ Note 1	
	PET Label White + laminating ribbon	○	○	○ Note 3	○ Note 3	○ Note 3	
	PET Label Silver + laminating ribbon	○	○	○	○	○	
	PET Label White + laminating kit	○	○	○ Note 3	○ Note 3	×Notes 1, 2, 3	
	PET Label Silver + laminating kit	○	○	○	○	×Notes 1, 2	
	Glass plate	PET Label White	○	○	○	○	○
		PET Label Silver	○	○	○	○	○
		PET Label White + laminating film	○	○	○	△ Notes 1, 3	△ Note 1
		PET Label Silver + laminating film	○	○	○	△ Note 1	△ Note 1
		PET Label White + laminating ribbon	○	○	○	○	○
		PET Label Silver + laminating ribbon	○	○	○	○	○
		PET Label White + laminating kit	○	○	○	○	×Notes 1, 2
PET Label Silver + laminating kit		○	○	○	○	×Notes 1, 2	
Coated metal pipe		Label PET White	○	○	○	-	○
	Label PET Silver	○	○	○	-	○	

*○: No changes are apparent. The product can be used without problem.
 △: There is no sheet lifting or peeling, and the label descriptions are also legible. (This should be confirmed under the actual usage environment.)
 ×: There is considerable degradation, and the product cannot be used.

* Note 1: Changes occur in the lamination surface color (The color changes to a slightly pale yellow color)
 Note 2: Deformation (shrinkage) of the lamination
 Note 3: Some adhesive remained after peeling off the sheet

* The lamination is for affixing to the Bepop sheet to improve the abrasion

	<p>resistance and weather resistance to maintain the legibility of the characters displayed on the sheet. In the testing, the laminations described below were used.</p> <ul style="list-style-type: none"> ■ Laminating film: SL-L100 Laminating film (Product No.: IL99297) * This is laminating film requiring direct application by hand. ■ Laminating ribbon: SL-R150T Lamination (Product No.: IL99342) * This is ribbon cassette-type lamination for thermal transfer to the sheet using the CPM-100 Series/100H Series. ■ Laminating kit: LC-X510 (Product No.: IL90022) * This is laminating film that is affixed to the sheet using the manual laminator (SL-X510) after printing the sheet using the CPM-100H Series and the CPM-100_3. <p>* For the technical data relating to the laminations, refer to the separate technical data materials for each lamination.</p>
--	--

[3/4]

D. Adhesion under conditions subject to moisture

Testing method	<p>25mm width strips of each sheet (PET Label White/Silver only, and PET Label White/Silver with three types of lamination attached) were affixed to glass plates at room temperature. Then, after exposing the sheets to the moisture environments for the stipulated time, the changes in each sheet (lifting, peeling, and color change) were confirmed.</p> <p>Assuming the worst environment for the testing, neutral salt water spray testing was implemented according to JIS Z 2371.</p> <p>* When affixing the sheets, the areas of the adherend where the sheets are to be affixed are degreased using alcohol.</p>																							
Remarks	In all cases, changes such as sheet lifting, peeling, or color changes were not observed.																							
Data	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 30%;">Exposure conditions</th> <th style="width: 40%;">35°C, salt water spray (5% saline water)</th> </tr> <tr> <td></td> <td style="text-align: center;">Exposure time</td> <td style="text-align: center;">24 hours</td> </tr> </thead> <tbody> <tr> <td rowspan="9" style="text-align: center; vertical-align: middle;">Sheet conditions</td> <td>PET Label White</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label Silver</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label White + Laminating film</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label Silver + Laminating film</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label White + Laminating ribbon</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label Silver + Laminating ribbon</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label White + Laminating kit</td> <td style="text-align: center;">○</td> </tr> <tr> <td>PET Label Silver + Laminating kit</td> <td style="text-align: center;">○</td> </tr> </tbody> </table> <p>* ○ No changes are apparent. The product can be used without problem.</p>		Exposure conditions	35°C, salt water spray (5% saline water)		Exposure time	24 hours	Sheet conditions	PET Label White	○	PET Label Silver	○	PET Label White + Laminating film	○	PET Label Silver + Laminating film	○	PET Label White + Laminating ribbon	○	PET Label Silver + Laminating ribbon	○	PET Label White + Laminating kit	○	PET Label Silver + Laminating kit	○
	Exposure conditions	35°C, salt water spray (5% saline water)																						
	Exposure time	24 hours																						
Sheet conditions	PET Label White	○																						
	PET Label Silver	○																						
	PET Label White + Laminating film	○																						
	PET Label Silver + Laminating film	○																						
	PET Label White + Laminating ribbon	○																						
	PET Label Silver + Laminating ribbon	○																						
	PET Label White + Laminating kit	○																						
	PET Label Silver + Laminating kit	○																						

E. Adhesion depending on the material and surface conditions of the adherend

Testing method	<p>After affixing 25mm width strips of the sheet to various types of plastic plates under room temperatures, the plates are left for a long period at room temperatures, and then changes in the sheet conditions (lifting or peeling) are confirmed.</p> <p>* When affixing the sheets, the areas of the adherend where the sheets are to be affixed are degreased using alcohol.</p>							
Remarks	<p>In all cases, changes such as sheet lifting or peeling were not observed. Even for adherend materials such as PE (olefin series materials) from which adhesive sheets generally peel off easily, no lifting of the sheet occurred. For the PMMA (acryl) plate with Note 1 attached, the results showed that some adhesive remained when the sheet was peeled off.</p>							
Data	Adherend		PE	POM	PC	PET	PVC	PMMA
			Polyethylene	Polyacetal	Polycarbonate	Polyethylene terephthalate	Polyvinyl chloride	Acryl
	Exposure time		1 week	1 week	1 week	1 week	1 week	1 week
	Sheet condition	PET Label White	○	○	○	○	○	○
PET Label Silver		○	○	○	○	○	○ Note 1	
<p>* ○: No changes are apparent. The product can be used without problem.</p> <p>* Note 1: Some adhesive remains after peeling off the sheet.</p>								

[4/4]

F. Chemical resistance and solvent resistance

Testing method	<p>After affixing the sheets to glass plates, the plates are immersed in various types of chemicals and solvents for two hours under room temperatures, and then changes in the sheet conditions (lifting or peeling) are confirmed.</p> <p>* When affixing the sheets, the areas of the adherend where the sheets are to be affixed are degreased using alcohol.</p>						
Remarks	<p>For the PET Label White, protrusion of the sheet adhesive from the adherend occurred after immersion in toluene, ethyl acetate, acetone, and MEK. Changes including sheet lifting and peeling were not observed.</p> <p>For the PET Label Silver, lifting of the sheet from the adherend occurred after immersion in ethyl acetate, but no changes such as sheet lifting or peeling were observed in the other chemicals and solvents. Additionally, exposure to toluene, acetone and MEK had the effect of dissolving the silver-colored printed part of the sheet, so that the sheets should not be used in environments where these solvents are present.</p>						
Data	Chemical or solvent		Toluene	Hexane	Ethanol	Ethyl acetate	Acetone
	Immersion (2 hour)	PET Label White	△Note 2	○	○	△Note 2	△Note 2

	PET Label Silver	xNote 3	○	○	△Note 1	xNote 3
Chemical or solvent		IPA	MEK	Distilled water	0.1N hydrochloric acid	0.1N sodium hydroxide
Immersion (2 hours)	PET Label White	○	△Note 2	○	○	○
	PET Label Silver	○	xNote 3	○	○	○
<p>* ○: There is no lifting or peeling. Can be used without problem. △: There is no peeling, and the characters are also readable. (* Should be confirmed under the actual usage environment.) x: There are considerable changes in the sheet. Cannot be used.</p> <p>* Note 1: Lifting Note 2: The adhesive protrudes from the adherend. Note 3: The silver colored printed part dissolves. * IPA: Isopropyl alcohol MEK: Methyl ethyl ketone</p>						

G. ESD evaluation (Electrostatic discharge resistance testing)

Because the SL-S154N PET Label Silver uses a resin film that has not been subjected to antistatic processing, there will be almost no self-discharge after the product has become charged. It is therefore judged that the product is unsuitable for use in applications involving direct attachment to semiconductors.

[Precautions when handling products]

- These products are not to be used in the PM-100, LC-100KP, LC-100CP, or LC-100P machines, since blurred printing may occur.
- When printing, be certain to set the sheet type to "PET Label White (or Silver)" in the printer driver properties.
- Avoid directly touching the sheet surface with your fingers. If oil from your fingers becomes attached to the sheet, it will become difficult for the printing to attach to the surface, causing gaps in printing and blurring.
- When affixing the sheet, attach it carefully taking care not to capture air bubbles, and use a squeegee to ensure that the sheet is stuck firmly to the surface.
- The adhesive used in these sheets is a strongly adhesive type. Once it has been affixed, it is extremely difficult to remove.
- Due to the properties of the sheet adhesive, sheets cannot be affixed in extremely low temperatures (5°C or less).
- The adhesive performance of sheets will be influenced by the adherend materials, surface conditions, whether there is grease or dust (soiling), surface irregularities, surface curvature, and the environmental conditions.
- Do not directly affix sheets to the human body, since there is a chance that it may cause skin rashes.
- Do not affix the sheets to clothing, since the clothing may change color.
- With regard to solvents, in the case where the sheets become immersed, or even when the

sheets come into temporary contact, it is possible that the adhesive will expand and the adhesive performance will be reduced. Use of these products in environments where solvents are present is not recommended.

- With regard to chemicals, there may be an effect depending on the concentration. Use of these products in environments where chemicals are present is not recommended.

- When storing the products, avoid locations that are subject to high temperatures, high humidity, direct sunlight, or large amounts of dust.

◇ The details in the above descriptions are based on actual measured values and other information, and are not guaranteed values. This data represents an accurate assessment of the material characteristics, but does not constitute a manufacturers guarantee.

◇ The performance after affixing the products is based on a precondition that the products must have been correctly affixed.