

High heat resistant non-silicone adhesive tape

(Manufactured by Korea Taconic, AGC Group, P-KT:6323)

1. Introduction

The performance required of masking tapes is higher than ever before due to the higher integration of electronic circuit boards caused by the recent trend toward smaller and larger capacity information terminals and the adoption of lead-free solder alloy to reduce substances of environmental concern. Generally, silicone adhesives are used for high-temperature adhesive tapes, but since silicone adhesives are usually not recommended for temperatures above 200°C and silicone volatile components are noted as a cause of contamination of semiconductor chips, there is a need for masking tapes with non-silicone adhesives and improved heat resistance.

Our company has been selling masking tapes using non-silicone adhesives, and we have started handling a grade with further improved heat resistance, which is introduced in this report.

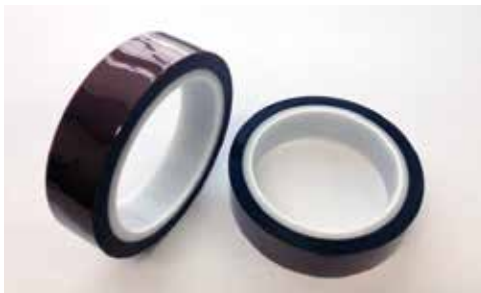


Figure1 Product photo of high heat-resistant non-silicone adhesive tape

2. Background

Due to the increased adoption of lead-free solder alloy in recent years, the temperature of the mounting process is said to be 230°C, and masking tape that can withstand this temperature is essential. Generally, polyimide tape coated with silicone adhesive is used for masking tape (confirmation required), but the normal grade is 200°C, and even the heat-resistant grade is 260°C. However, since a silicone adhesive (polysiloxane) is used, low-molecular-weight siloxane decomposes when used at high temperatures, and this causes problems such as contamination of the wafer surface and contact failure in electronic circuits.

Non-silicone masking tapes have traditionally had problems such as low heat resistance of the adhesive, residue after use, and foaming due to decomposition gas, but since they do not generate siloxane, they are expected to contribute to ensuring reliability in the mounting process (SMT; Surface Mount Technology) of circuit boards, which will become increasingly dense in the future.

3. Product specifications

The adhesive tapes introduced here are all made of a polyimide base material that is coated with a non-silicone adhesive (Table1).

Table1 Types of heat-resistant adhesive tapes

			Type A	Type B	Type C	conventional product
Thickness	Substrate (polyimide)	μm	25	25	25	25
	Adhesive	μm	38	38	38	39
Peel Strength (SUS)		gf / 25mm	Min 200	Min 300	Min 200	Min 350
Max. working temperature		°C	200	200	260	160





※ This is a product under development and specifications are subject to change.

4. Features

In the following, we will examine the heat resistance of Type C, which has the highest heat resistance.

After standing in an oven at 260°C for 2 hours, as shown in Table2, residue due to deterioration of the adhesive can be seen in the conventional product, but no residue can be seen in "Type C" with improved heat resistance (Table2).

Table2 Residue check of heat-resistant adhesive tape after heat test at 260°C for 2 hours

	After heating	Enlarged pictures
conventional product		
Type C		

In addition, no residue was observed in the actual test in a solder bath (285°C, 10 minutes) (Table3, Figure2).

Table3 Residue check of heat-resistant adhesive tape after solder bath test

After heating	Enlarged pictures
	

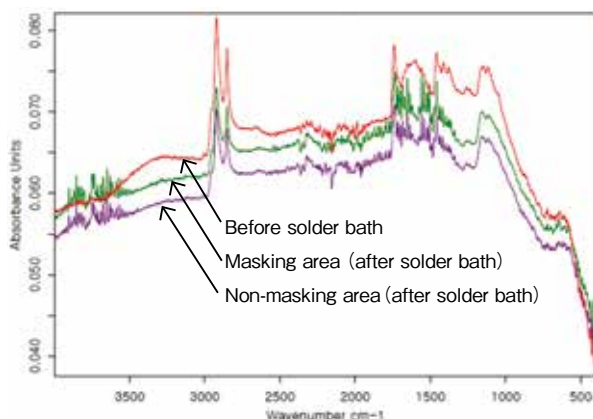


Figure2 IR absorption spectroscopy before and after solder bath test

5. Conclusions

This product was designed as a masking tape for the solder reflow process of surface mounting (SMT) of rigid and flexible boards, but as stated, no residue was observed under 260°C, and the product has sufficient capability for masking applications.

By all means, it has been confirmed that since a non-silicone adhesive is used, no siloxane is detected in the decomposition gas and we believe that this product will be useful in other applications where contamination by siloxane is a problem. In addition to the solder reflow process described in this article, we can also expect to see the product used in wire bonding, thermosetting mounting processes, dicing, and packaging processes. Furthermore, the adhesive tape is introduced as a masking tape made of polyimide in this article, but it could also be coated for other base materials such as fluoroplastic tape, therefore it is possible to consider non-silicone release tapes for the heat-sealing process.

※ All data and values in this document are representative values under a certain environment. It is necessary to confirm the suitability of the product when using it.



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