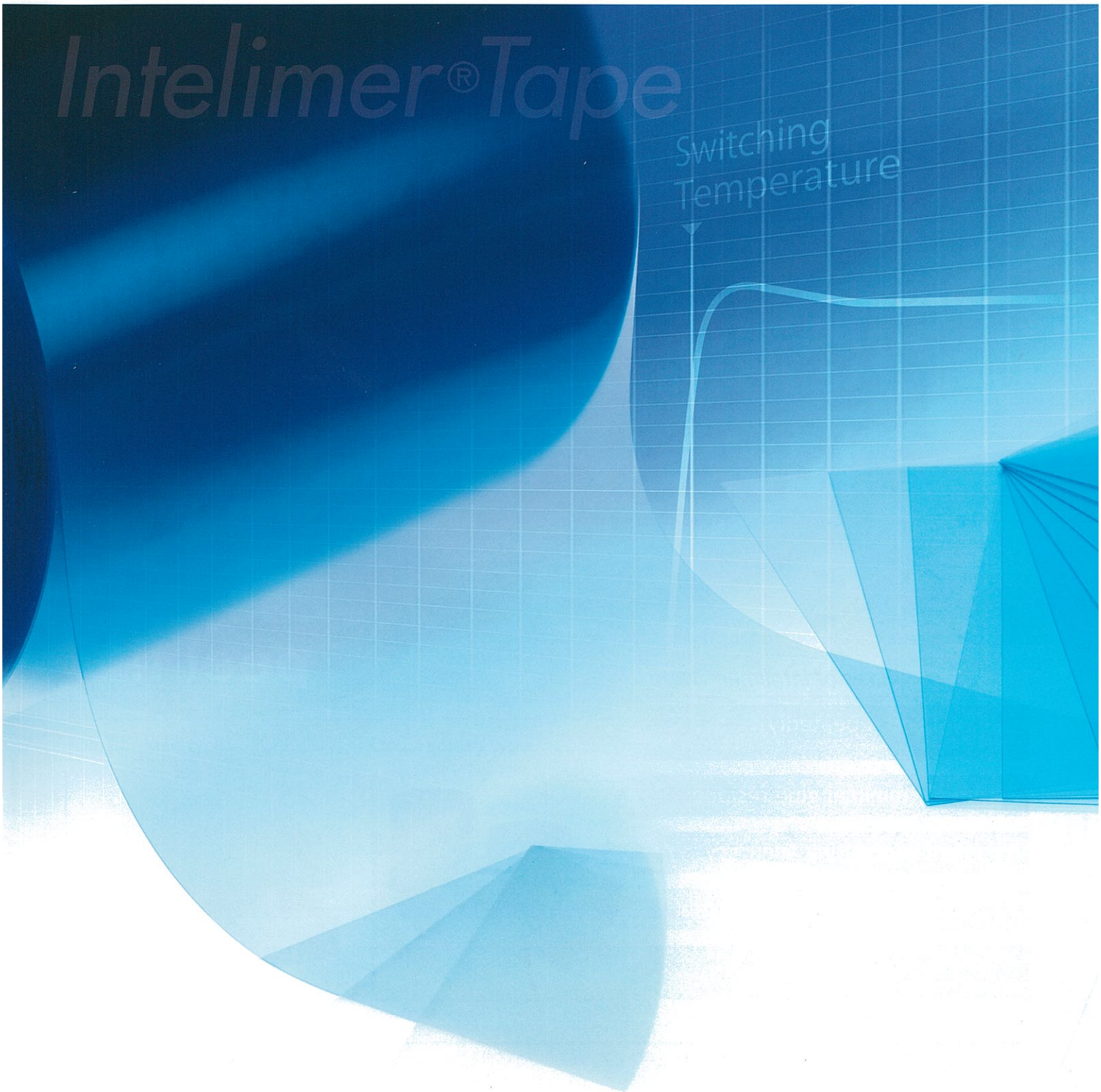
Functional tape that reversibly sticks and releases
in response to temperature changes

Intelimer® Tape

NITTA



What is Intelimer® tape?

It is a new type of functional adhesive tape whose tacky ↔ non-tacky can be controlled by changing the temperature.

Securely fixing !!

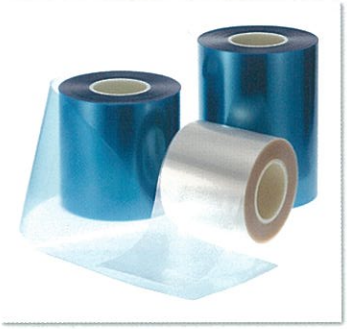
If you change the temperature,

Tacky↔Non-tacky

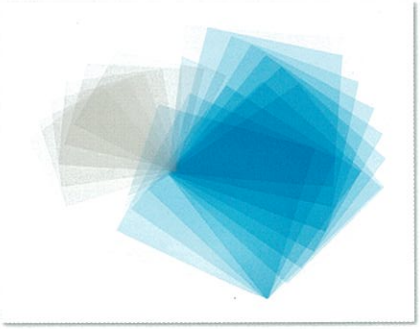
Easy to peel !!

Features of Intelimer® Tape

- Can be used repeatedly
  ※Depends on the use environment.
- Extremely minimal glue residue
- Excellent processing accuracy
- Variable thicknesses of glue and base material
- RoHS-compliant
  ※Contains no hazardous substances.



▲Roll type



▲Sheet type

3 Types Available to Meet the Different Device or Process Requirements

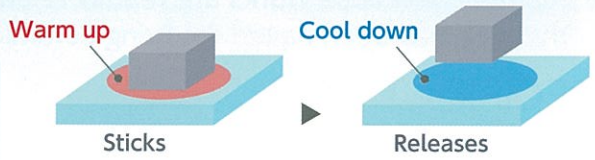
Intelimer® tape can be selected from three types. Choose one based on the ambient temperature at which the tape will be affixed to secure or process workpieces, or removed.

Release when cold **CO**

COOL-OFF TYPE

Switching temperature* can be set freely between 20 and 60°C.

When used to secure works for high temperature processing, the tape readily releases when heat is radiated and the tape cools off. Suitable for knife cutting or laminating process.

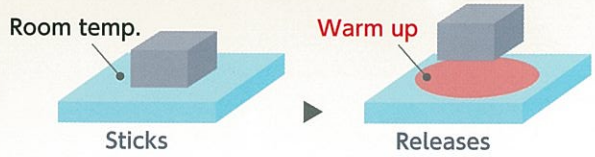


Release when warm **WO**

WARM-OFF TYPE

Switching temperature* can be set freely between 30 and 50°C.

Because it can be affixed at room temperature, the tape is suited for dicing electronic components.

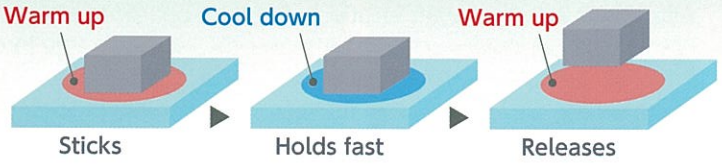


Easier to Use than Wax **SO**

WAX-SUBSTITUTE TYPE

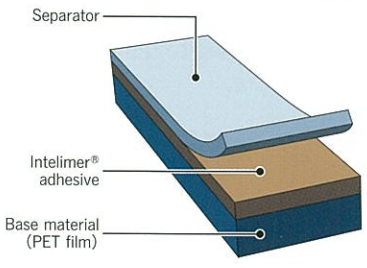
The tape improves processing accuracy owing to its strong adhesion and sound dimensional stability.

Because the tape holds fast, it is suited for grinding and polishing wafers as they undergo microfabrication.

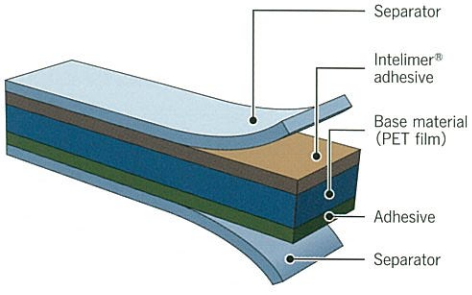


Construction of Tape

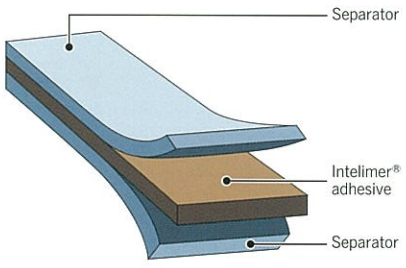
Single-sided type



Double-sided type



Baseless type

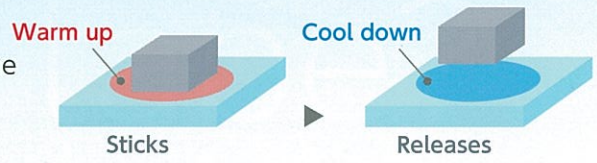


*The switching temperature is the point where the tape changes from a tacky adhesive to a non-adhesive state.

Release when cold **CO**

COOL-OFF TYPE

- Can be sticky by warming up to above the switching temperature.
- Can be peeled by cooling down to below the switching temperature.
- Switching temperature can be set freely between 20 and 60°C.



**The cool-off type is suitable for fixing workpiece during hot working.
Because works are readily released when cooled down by heat radiation,
the tape has been hailed for fixing ceramic devices for lamination and knife cutting processes.**

SPECIFICATION

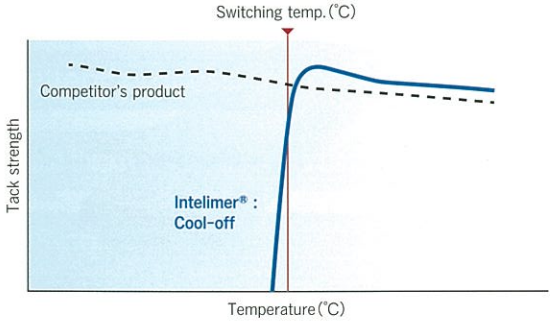
CO Cool-off 55°C type	Product code	Switching temp.	Tack strength*2 (for stainless steel) N/25mm	Tack strength decreasing rate	Tape thickness (No separators)	Base (PET) thickness	Remarks
	CS5040C02	55℃	5.9	≥ 90% at ≤ 40°C	140μm	100μm	Single-sided type*1
	CS5040C05	↑	1.2	↑	↑	↑	↑
	CS5040C08	↑	0.4	↑	↑	↑	↑
	CS5025C05	↑	1.2	↑	125μm	↑	↑
	CS5010C25	↑	0.1	↑	110μm	↑	↑
	CS5010C80	↑	<0.05	↑	↑	↑	↑

HOW TO USE

- Peel the blue separator from the tape. Since the tape is not adhesive at room temperature, heat it to 55~60˚C with a hot plate or other heat source to trigger its adhesion.
  Affix the tape to the target location using a rubber roller, etc.
  Pass the rubber roller back and forth over the tape with little force applied 2 or 3 times.
  Pressing hard with the roller will keep the tape from peeling or may leave glue on the target surface.
- Use this tape for application in the temperature range of 55 to 90°C.
- After the work is finished, wait until the workpiece and tape are cooled down to below 43°C before peeling the tape.
  Leaving at room temperature for several minutes makes it easy to peel the tape.
  Do not use air-conditioner for rapid cooling.
  Doing so can cause the adhesive to denature, making it hard to peel the tape.

DATA

Tack strength vs. temperature



PRECAUTIONS FOR USE

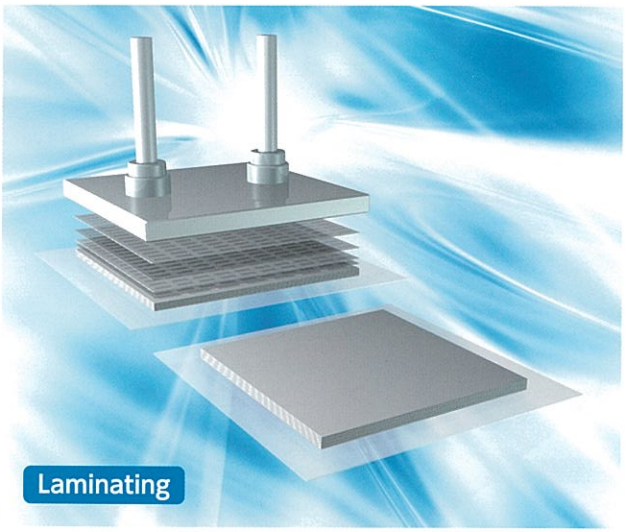
- Affixing the tape
  This tape becomes tacky when heated to 55˚C and above, but its adhesive force changes according to temperature, pressure and other factors. Therefore, test the tape before actual use.
- Peeling the tape
  This tape loses its tackiness at 43°C and lower temperatures, but its release depends on bonding conditions.
  Also, note that peeling the tape above 43°C can damage the target surface or leave glue residue on it.

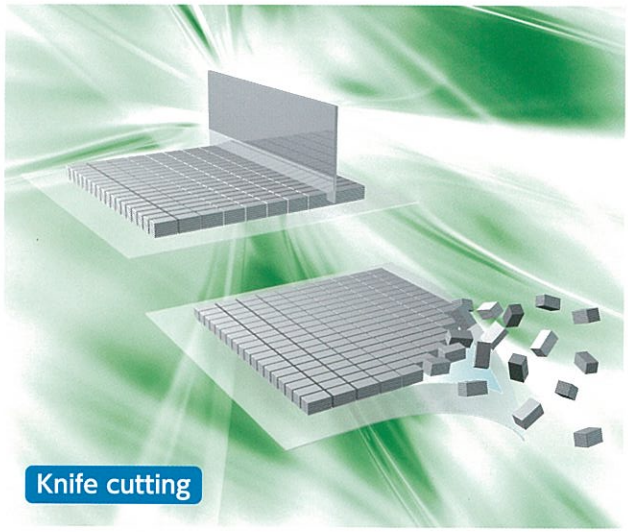
*1 : Double-sided type also available. *2 : Compliant with JIS Z0237

Advantages of Using Intelimer® Tape in Electronic Device Manufacturing Processes

Fixing green sheet (multilayer capacitors)

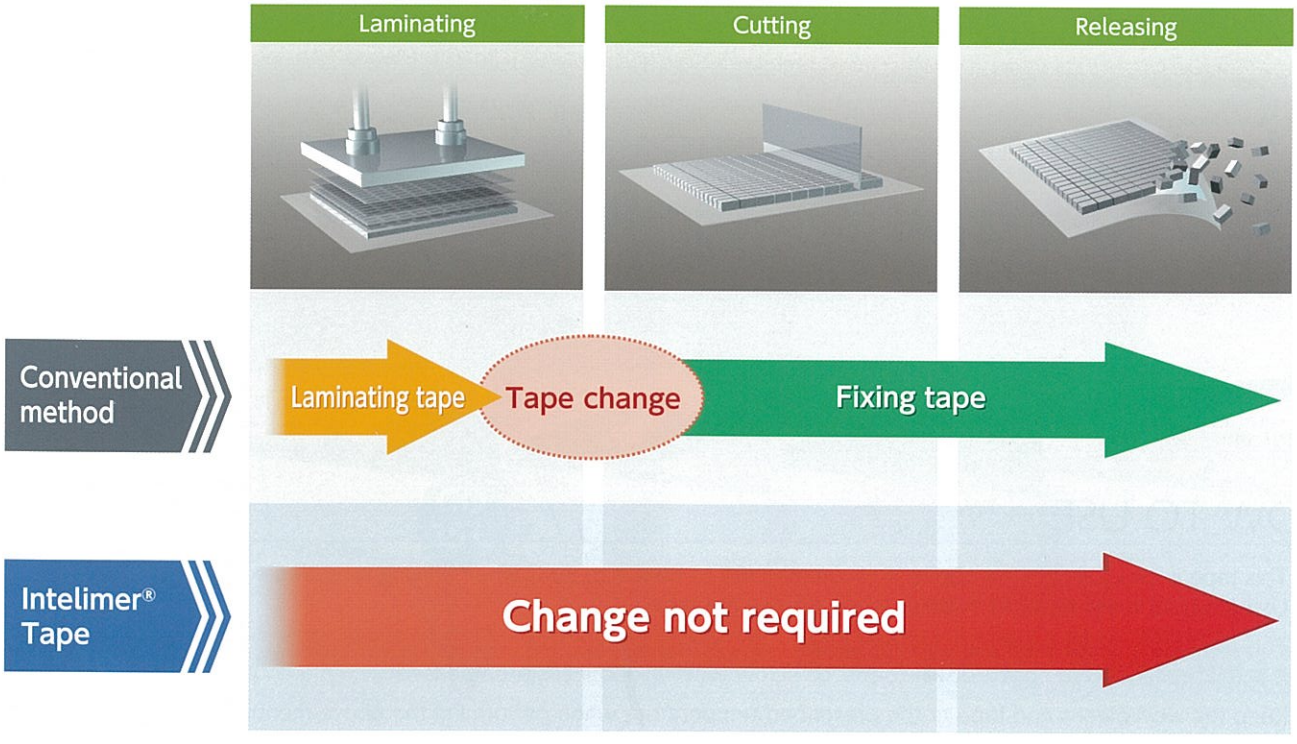
Intelimer® tape is effective also for fixing workpieces in the green sheet laminating, knife cutting and dicing processes where heat is applied when workpieces are processed. In case the knife cutting process comes immediately after the laminating process, change of the carrier tape is no longer required as before.
As a result, both man-hour and costs can be reduced. In addition, the good dimensional stability will contribute to improved yield, without affecting the processing accuracy.





A single tape supports processes from laminating up to cutting and separation.

Do you use two different tapes separately for laminating and cutting?
A single Intelimer® Tape can be used from laminating up to cutting.
This not only reduces the use of tape and tape changing man-hour, but also improves processing accuracy, thus enabling significant cost reduction.

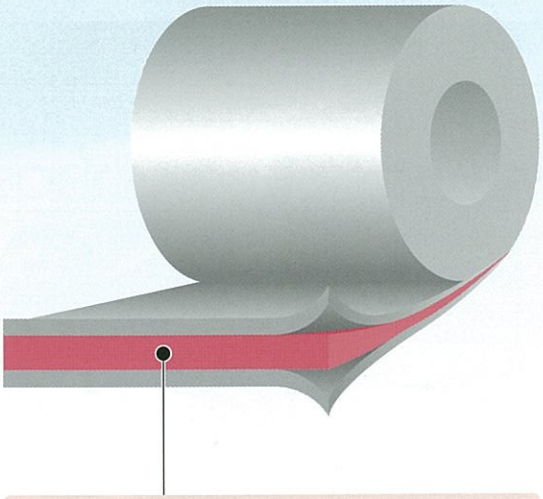


NEW Intelimer®Tape

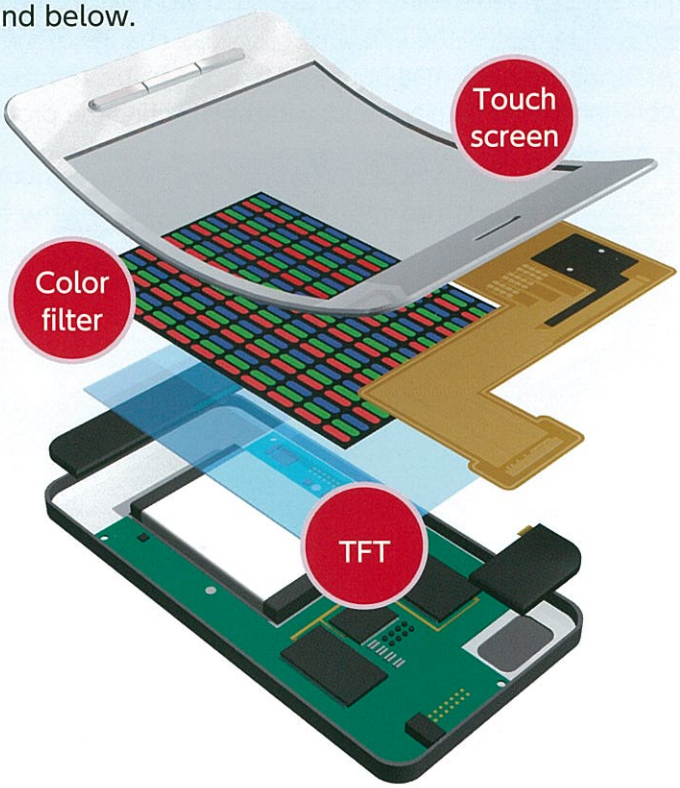
Plafix™

Cool-off 25°C Baseless Type

While holding fast between room temperature and 200˚C, the tape can be easily peeled off at 10˚C and below.



Baseless type consists of separators with adhesive in between.



SPECIFICATION

CO

Plafix™ Product code	Tack temperature	Tack strength at 50°C (For polyimide) N/25mm	Tack strength decreasing rate	Glue thickness
CS2325NA3	≥25℃ (50°C recommended)	3.5	≥90% at ≤10℃ (5°C recommended)	25μm
CS2325NA4	↑	1.4	↑	↑
CS2325NA2	↑	0.4	↑	↑

※Tack strength with PI film when peeled off at 180°

HOW TO USE

- This tape is tacky at 25°C or above. It recommended to heat it to 50˚C when affixing to workpieces. Use a rubber roller to avoid bubbles when affixing the tape.
- This tape loses its tackiness at 10°C or below. It is recommended to cool it down to 5°C or below when workpieces are released.
- Keep the workpieces and tape at the prescribed temperature when performing the above-mentioned operation.

Recommended usage — Temporary fixing for a flexible device manufacturing process

From glass substrate to FPC! From rigid to flexible!!

Flexible displays that could not be produced on existing lines can now be manufactured on the same equipment by temporarily fixing the film to the glass base using Intelimer® Tape.
Plafix™ is tolerant to all processes including TFT, TP and CF, and can be peeled off without damaging the film-formed substrates after the process is finished.

Current film formation process

	Transfer by existing equipment	Film formation process
Grass substrate process	Glass substrate; Conveyance roller; Transferable because panel is hard	Solid and warp-free Film can form owing to low thermal expansion
FPC process	FPC	
If grass substrate is changed to FPC	Plastic is weak and **cannot function as a carrier**	**Film cannot form** due to thermal expansion

Plafix™ used

Easier to peel than cool-off type, plus it can withstand film forming processes.
(Super easy peelability, heat-resistance, dimensional stability, chemical-resistance)

Film substrate / Plafix™ / and glass base are used for temporary fixing

Nitta's proposal

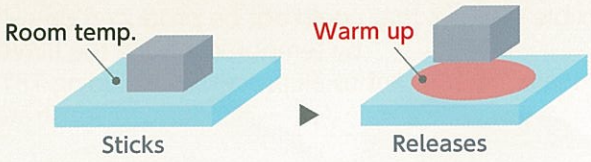
Make next-generation devices by using Intelimer® Tape!!

Glass base setting	Plafix™ affixed	FPC attachment	Film formation	FPC release
Transfer by existing equipment	Plafix™ affixed	Attach workpiece before film formation	No lift, shift or warp Good tolerance to solvent, resist, and etchant	FPC can be released without being damaged
Glass substrate; Conveyance roller	Rolled laminate; Intelimer® tape; CO 25℃	Rolled laminate; FPC		
Process temp. : RT	RT~50℃	(50°C recommended)	RT~200℃	5℃~10℃ (5°C recommended)

Release when warm **WO**

WARM-OFF TYPE

- Becomes sticky when cooled down to below the switching temperature.
- Adhesion releases when warmed up to above the switching temperature.
- Switching temperature can be set freely between 30 and 50°C.



Warm-off type is suitable for applications where workpieces are fixed and processed at room temperature.
Because the adhesion releases by warming and the tape does not damage works,
the tape is suited for dicing electronic components and more.

SPECIFICATION

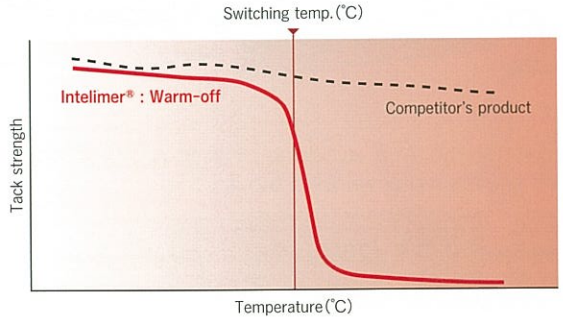
WO Warm-off type	Product code	Switching temp.	Tack strength*2 (for stainless steel) N/25mm	Tack strength decreasing rate	Tape thickness (No separators)	Base (PET) thickness	Remarks
	WS5130C02	50℃	6.0	≥90% at 60°C	130μm	100μm	Single-sided type*1 Highly condensed type
	WS5130C10	↑	1.5	↑	↑	↑	↑
	WS5130C20	↑	0.7	↑	↑	↑	↑
	WS5030C15	↑	0.3	↑	↑	↑	Single-sided type*1 Highly tacky type

HOW TO USE

- Peel the transparent PET separator from the tape. Since the tape is tacky at room temperature, affix it to the target location using a rubber roller, etc.
  Pass the rubber roller back and forth over the tape with little force 2 or 3 times.
  Pressing hard with the roller will keep the tape from peeling or may leave glue on the target surface.
- Use this tape for application at temperature below 50°C.
- To peel the tape after the work, heat up the workpiece and tape to above 60°C.
  Peel the tape off at 60°C or higher temperature. If attempted below 60°C, the adhesive force is still active, making it harder to peel the tape off.

DATA

Tack strength vs. temperature



PRECAUTIONS FOR USE

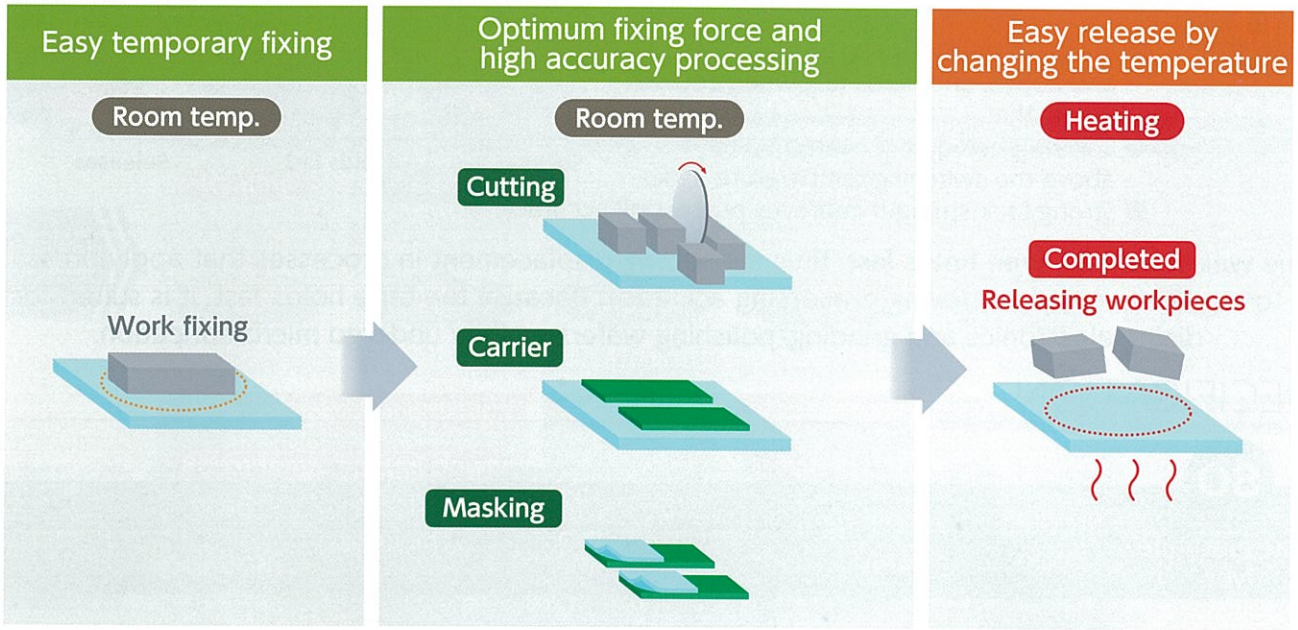
- Affixing the tape
  This tape is tacky at room temperature, but its adhesive force changes according to temperature, pressure and other factors. Therefore, test the tape before actual use.
- Peeling the tape
  This tape loses its tackiness at 60°C and higher temperatures, but its release depends on bonding conditions, etc.
  Also note that peeling the tape below 60°C can damage the target surface.

*1 : Double-sided type also available. *2 : Compliant with JIS Z0237

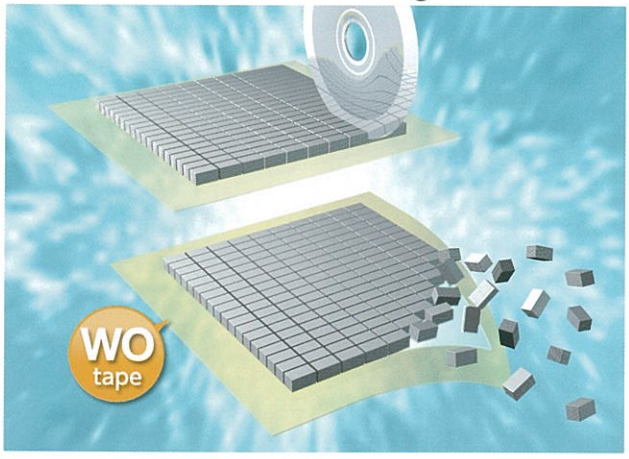
APPLICATION

Warm-off tape applicable to various purposes

Eco-friendly tape that can be peeled by just changing the temperature.

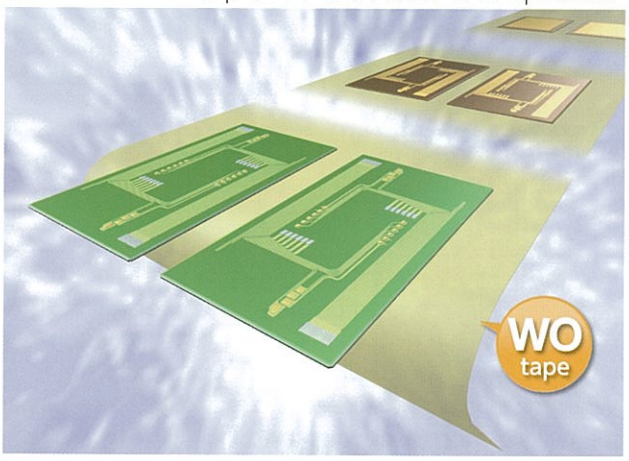


For wafer or device dicing



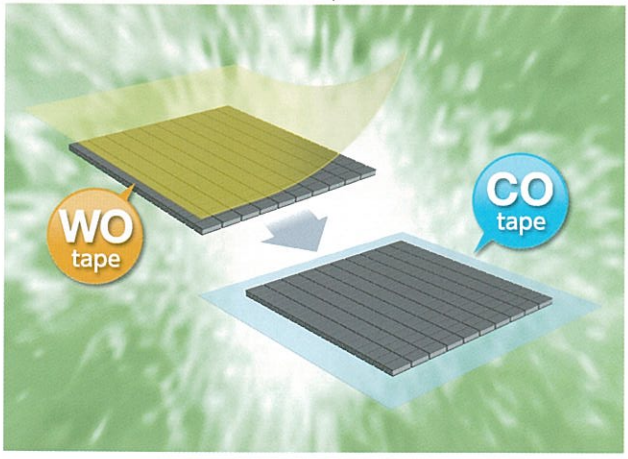
Workpieces can be freely released by heating the tape
Proposal for dicing application

As carrier tape for thin-film workpieces



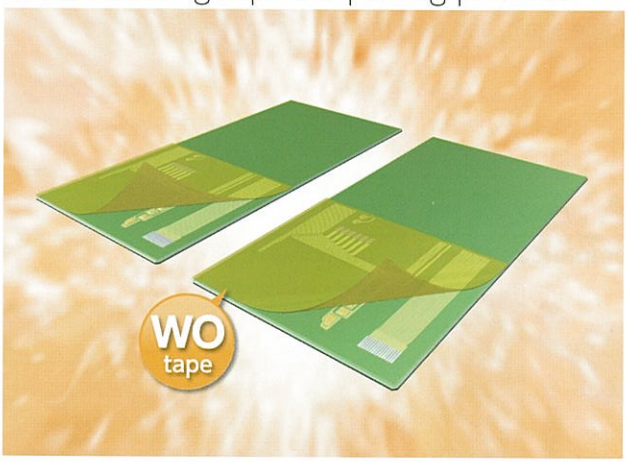
Workpieces can be freely released by heating the tape
Proposal for carrier application

For device transfer process



Workpieces can be easily transferred to other tape by heating the tape
Proposal for transfer application

As masking tape for plating process

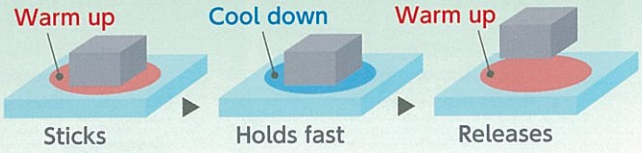


Using the WO Tape for plating operations protects workpieces against plating liquid infiltration. Once plating is complete, the tape can be easily peeled by heating it
Proposal for masking application

Easier to Use than Wax **SO**

WAX-SUBSTITUTE TYPE

- Bonds at the switching temperature and above, and holds fast when cooled below that.
- Can be peeled off if heated up to above the switching temperature again.
- Strong tack strength improves processing accuracy.



The wax-substitute type holds fast, thus minimizing displacement in processes that apply pressure to workpieces and improving processing accuracy. Because the tape holds fast, it is suited for dicing electronics and grinding/polishing wafers as they undergo microfabrication.

SPECIFICATION

SO Wax-substitute type

Product code	Switching temp.	Surface delamination strength*1 (Intelimer® adhesive) N/25mm	Bottom delamination strength*1 (General-purpose adhesive) N/25mm	Tape thickness (No separators)	Base (PET) thickness	Remarks
SC4210CA3	45℃	9.0	5.0	120μm	100μm	Double-sided type
SC4210CA8	↑	6.0	↑	↑	↑	↑
SC4210CA4	↑	1.5	↑	↑	↑	↑
SS4440N10	80~130℃	6.0	—	40μm	—	Baseless type

HOW TO USE

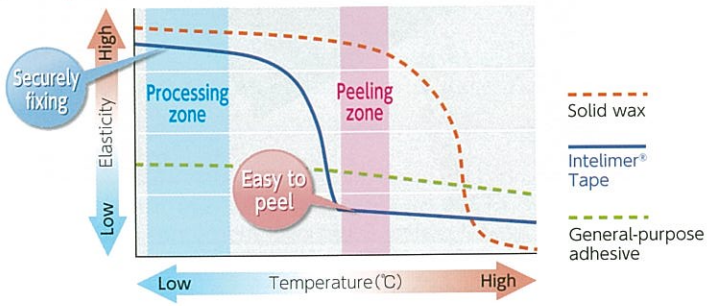
- Peel the separator from one side of the tape. Since the tape is not adhesive at room temperature, heat it to around 50°C with a hot plate or other heat source to trigger its adhesion. Process the workpiece while bonded to the tape.
- When the tape and workpiece are restored to room temperature, the tackiness increases whereby bonding the two.
- Process the workpiece while bonded to the tape. Use for application in the range of room temperature to 60°C. (Heat resistance varies with the product type.)
- To peel the tape after the work, heat up the workpiece and tape again, and peel the tape from the workpiece. Peel off the tape at above th switching temperature. If restored to room temperature at this point, tackiness increases whereby making the tape harder to peel off. (Peel the SS44 type at 100°C or above.)

PRECAUTIONS FOR USE

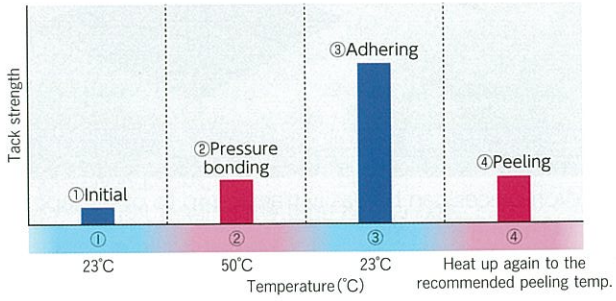
- Affixing the tape
  This tape becomes tacky when heated up to 50°C or above, but tackiness varies with temperature or pressure. Therefore, test the tape before actual use.
- Peeling the tape
  This tape readily releases when reheated, but its release depends on bonding conditions. Also, stripping the tape off forcefully can damage the target surface or leave glue residue on it.

DATA

Comparison of elastic modulus



Tack strength vs. temperature

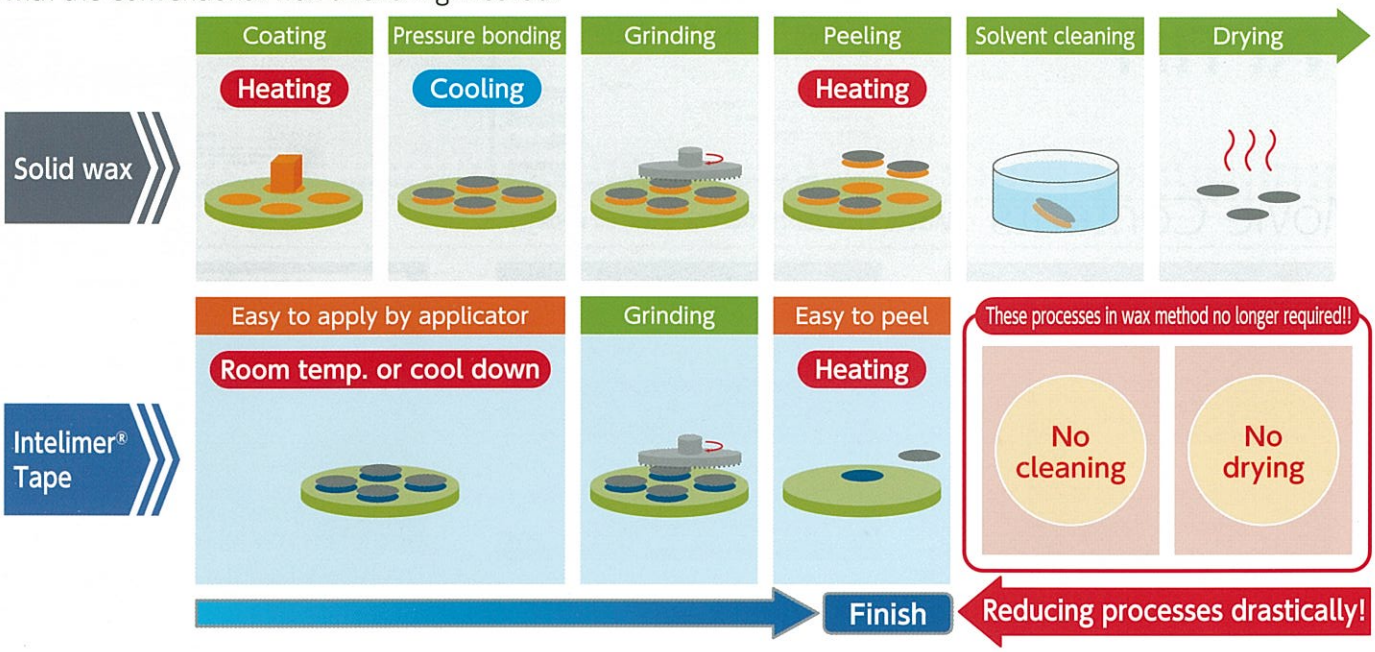


*1 : Compliant with JIS Z0237

Advantages of Changing from Wax to Intelimer® Tape

Reducing processes

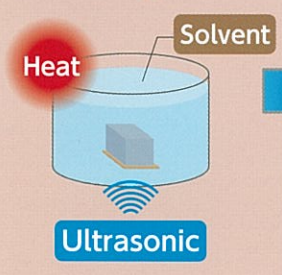
Using Intelimer® Tape lets manufacturers omit solvent washing and drying processes required with the conventional wax anchoring method.



Reducing environmental load

■ Fixing by wax

Wax remains and solvent cleaning is required

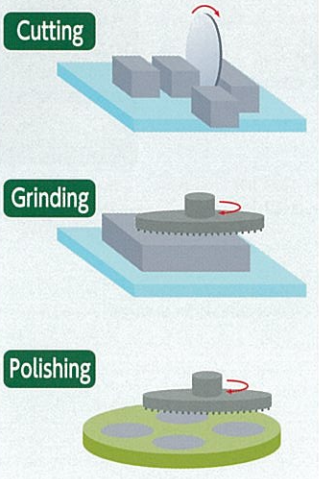


High environmental load

Intelimer® Tape requires no solvent cleaning, thus reducing environmental load drastically.

To wash off the wax requires solvent, therefore effluent treatment impacts the environment. Using Intelimer® Tape greatly reduces environmental load because wax washing is unnecessary, and, for that same reason, it reduces costs and is harmless to people.

Main applications



- Strong adhesion at room temperature
- Enables high accuracy processing
- Can be peeled easily by heating up
- Almost free of adhesive residue

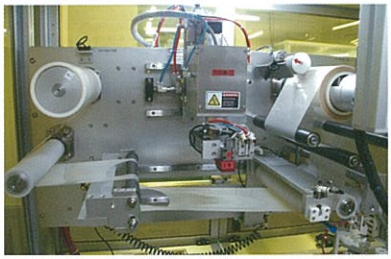
The wax-substitute type of Intelimer® Tape securely holds workpieces with a strong adhesive force, therefore it is suited dicing, grinding and polishing wafers that require processing accuracy.

Intelimer® Tape Applicator TCM-460

Applicator proposal

This device automatically applies Intelimer® Tape to sapphire and other material wafers. It can be added to existing production lines in place of conventional wax coating machines with minimal changes to other equipment. And, it eliminates costs associated with washing.

●Appearance of tape applicator



●Automatic application by roller

●Reducing tact time by parallel processing

Web Site

Introducing the Intelimer® Website

www.nitta.co.jp/product/intelimer/top.html

You can find more information on Intelimer® Tape in our product page.
It offers detailed description of products by application, including the following movie contents.

Movie Contents

Movie Contents (Can be found on website)

Intelimer® Tape Applicator (in Japanese)
March 2012

Intelimer® Tape Applicator (in English)
March 2012

Intelimer® Tape Technical Guide (in Japanese)
Replace Wax-fixing with Intelimer® Tape
December 2011

Example of Intelimer® tape used for Sapphire wafers (in Japanese/Chinese)
January 2011

Example of Intelimer® tape used for nanoimprint lithography (in Japanese)
April 2010

Precautions in Handling

- Safety Precautions: Do not apply this tape directly to the skin or food.
- Precautions for Storage: Avoid direct sunlight and sore store at room temperature. Store in a place where temperature is always between 10 and 40°C, and relative humidity is less than 60%. Avoid hot and humid conditions.

Patent Labeling

- Patent Rights

Nitta Corporation owns the patents not only on Intelimer® Tape itself, but also on the manufacturing process of ceramic electronic and panel components made with this tape, in the following Asian countries:

- Japanese patents 3485412 / 3565411 / 4391623 / 4869468 etc.
- Taiwanese patents 104114 / 147476 / I265189
- Korean patents 334418 / 446948 / 457652
- Chinese patents ZL00808718.0 / ZL00808721.0

- Intelimer® is a registered trademark of Landec Corporation in the United States.

Export Trade Control Ordinance / Foreign Exchange Control Order (Enforced on August 1, 2012)

- This product has been deemed "not subject to" Items Nos. 1 - 15 of Appended Table 1 of the Export Trade Control Ordinance.
- This product has been deemed "not subject to" Items Nos. 1 - 15 of Appended Table of the Foreign Exchange Control Order.

※The contents of this catalog are as of May 2013.
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