



APPLICATION PROCEDURE FOR PTM7000 (PAD FORMAT)

THERMAL INTERFACE MATERIALS

Initial Application, Rework and Troubleshooting

Introduction



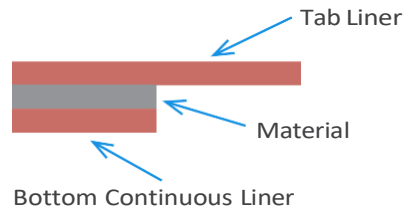
Honeywell's thermal interface approach is based on phase change materials (PCMs). Our PCM design is driven by an innovative polymer technology and advanced filler systems that can be customized to fit diverse product applications and end uses.

This publication provides detailed procedures for applying our pad format TIM products to electronic devices. Most Honeywell TIMs are also available in paste/printable format, and a separate procedures document should be followed for those products.

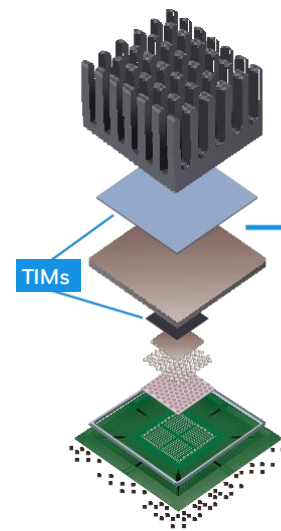


Pad Format Structure

Product Lateral View



Product Top View



PCM Key Attributes

- Optimal surface wetting
- Low contact resistance
- Low thermal impedance

Stable TI across accelerated aging tests: HTB, thermal cycling, HAST

No bleed-out, pump-out or flow-out

- Easy assembly
- Broader process windows
- Higher yield with zero material waste

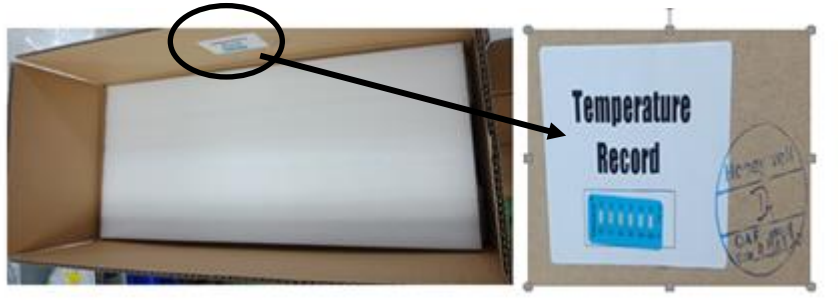
For complete specifications and performance of all Honeywell TIMs, visit our website and download technical data sheets.

Storage & Handling Method

- Recommended Storage Temperature: 19-24°C
 - For short term handling (less than 10 days) and transportation, it is acceptable to have temperature above the recommended range. The material disposition is described below based on temperature indicator when receiving the product.
 - Storing product for a long period (e.g. over 10 days) at higher temperature than the above recommended range would not impact thermal performance of the product but would increase the risks of PCM material bleeding out of the liner.
- <65% RH
- Shelf Life: 12 months
- Storage Orientation: Reel orientation must be with clear release tab on top, as shown in the figure on the right
- Keep away from incompatible materials – refer to ASIS.
- Do not handle, store or open the package near an open flame, source of heat or sources of ignition



- Temperature indicators can be found inside the box (see figure below). One is red and the other is blue. Either is packed in the box for PTM7000.



- Multiple temperature indication points (29°C, 33°C, 34°C, 37°C, 40°C, 42°C) are listed on it.
- Figure below shows the condition of the temperature records at different temperatures.
- In case temperature < 40°C, no action is required. PCM can be used AS-IS.
- In case temperature $\geq 40^{\circ}\text{C}$, customer needs to store PCM in controlled environment at temperature 19-24°C and humidity < 65% RH for 24 hours

Temperature indicator



When temperature is <29°C



When temperature is $\geq 29^{\circ}\text{C}$



When temperature is $\geq 33^{\circ}\text{C}$



When temperature is $\geq 37^{\circ}\text{C}$



When temperature is $\geq 37^{\circ}\text{C}$



When temperature is $\geq 40^{\circ}\text{C}$



When temperature is $\geq 42^{\circ}\text{C}$

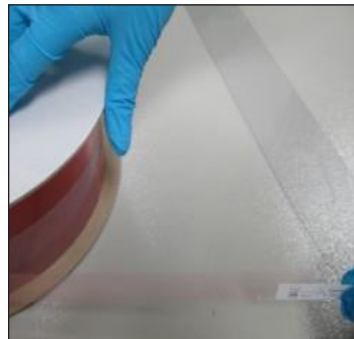
Application Methods & Procedures

There are two application methods to remove the pad from the liner:

1. Manual
2. Semi-Automatic Dispenser

Manual Removal Method

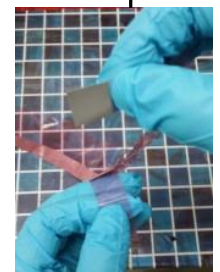
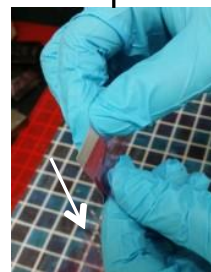
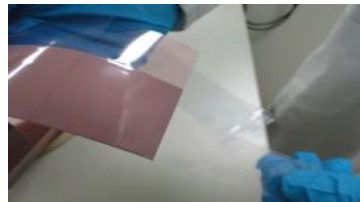
1. Open roll, remove plastic cover
2. Roll out blank continuous liner
3. Stop when first pad comes out



4. Start to remove the pad from liner one by one

5. Hold the tab liner with one hand and the continuous liner with the other hand

6. Pad successfully removed from liner



Peel continuous liner away from pad

Hold the tab liner and pull the continuous liner side. Peel quickly, taking care not to damage the pad.

For protection of both devices and operators' hands, we recommend the wearing of clean disposable gloves during all handling of thermal interface materials.

Semi-Automatic Dispenser Removal Method

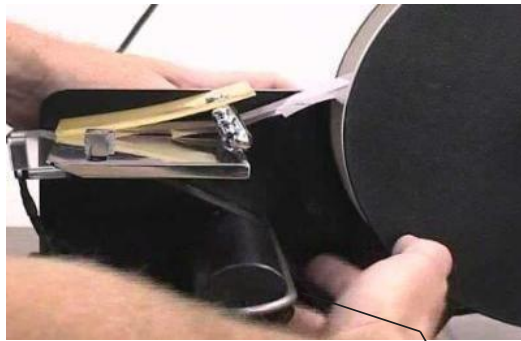


Figure 1

Figure 1:

- Semi-Automatic Dispenser yielding on average 99% release.



Figure 2:

- Individual pad for release.

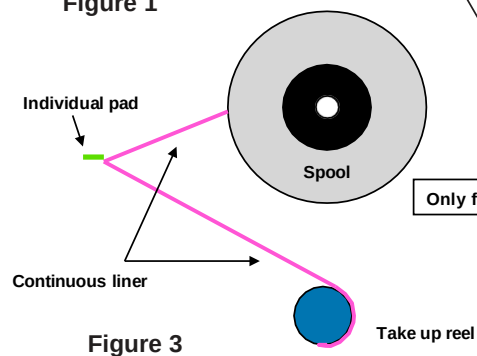
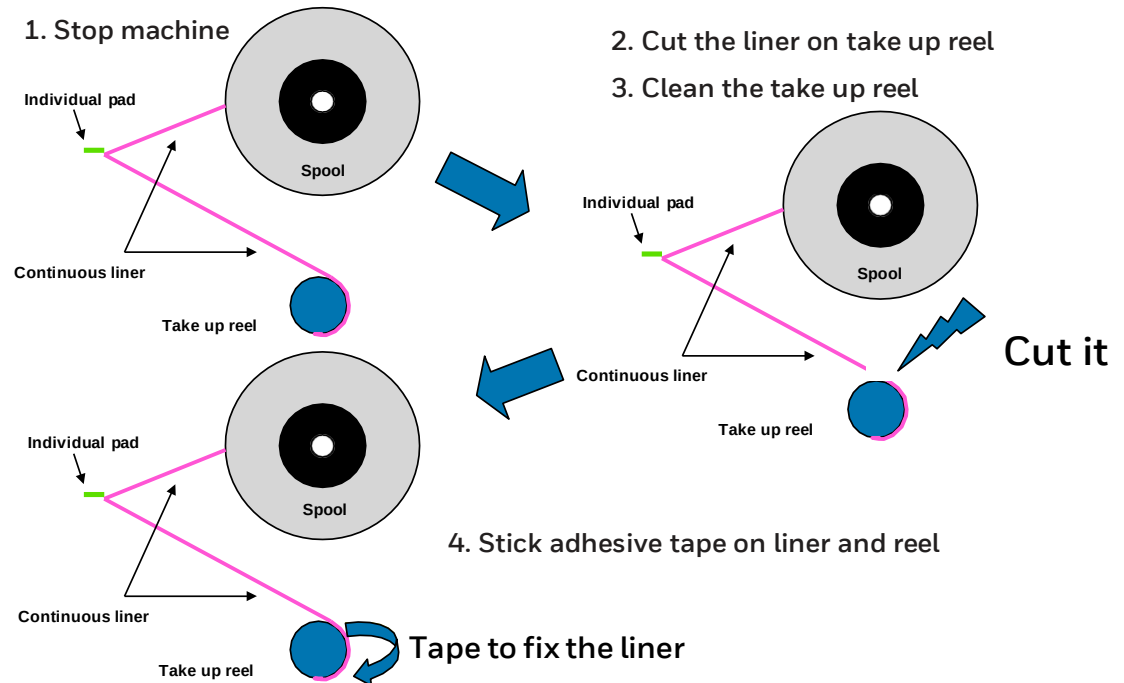


Figure 3:

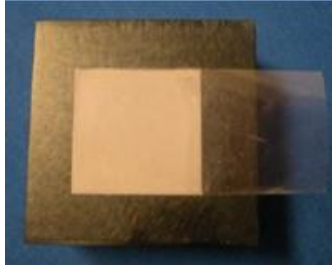
- Block diagram for easy release:
- Spool to have resistance.
- Angle to be 140-170 degrees
- Take up reel speed steady for individual pad width.
- Carefully remove individual pad and apply to heat sink.

As dispenser models may vary, always consult your equipment manual in addition to these procedures.

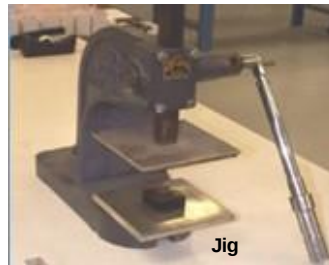
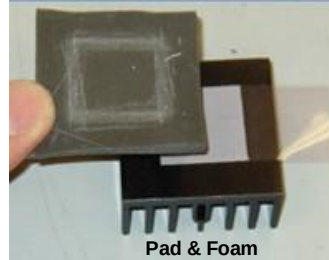


Attachment and Tab Liner Removal Method

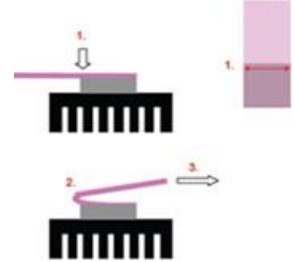
1. Attach the pad onto application surface, place and align to correct position



2. Put additional pressure on the pad material with jig or hold manually with pressure for 3-5 seconds



3. Tab liner release after attachment



Critical to tab liner release

- Ensure pad is tacked down at tab interface
- 140-180° angle for tab release
- Quick pull (use same force as when removing Band-Aid® or duct tape)

Rework Method

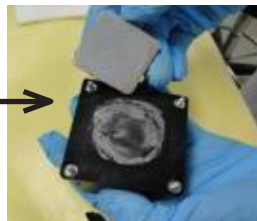
Easy rework process for troubleshooting.

1. Detach the interface, using a gentle twisting and lifting motion.

Take care not to mechanically damage the silicon during this step. Review the device architecture to assure the silicon is not bumped.

2. Once removed, use a lint-free towel to wipe off residue on both interfaces.

To further clean the interface, acetone, IPA or toluene may be used. To protect the operator, wear disposable gloves during this step.



3. Ensure interfaces are clean and free of contaminants. Repeat the attachment process shown above.

If dirty, repeat Step 2 in removal procedure to clean the surfaces, allowing 5 minutes for solvent to dry before next step.

Basic Troubleshooting – CRF Collapse

Keeping the roll in correct position at all times is of critical importance. To prevent waste of material, be sure all operators understand this clearly.

Defect:

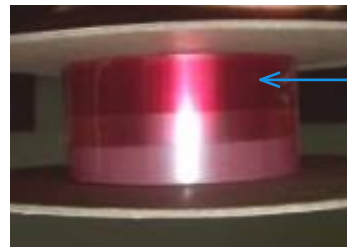
Raw material collapses to one side during transportation or storage.

Failure Mechanism:

Storage orientation of roll is improper.

Solution:

Follow correct orientation instruction on roll label and application notes. Roll must be stored with clear release tab side up.

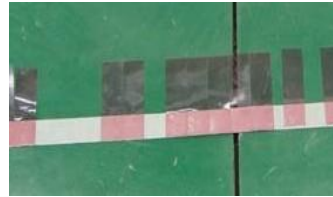


CLEAR RELEASE
TAB ON TOP

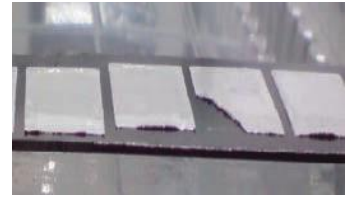
Basic Troubleshooting – Release & Attachment Problems

Defect:

Difficult to release pad from continuous liner or pad broken after attachment.



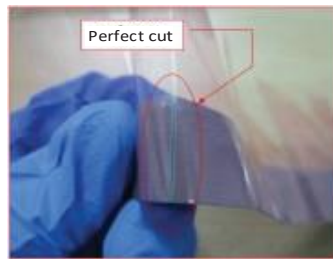
PAD NOT COMING OFF THE CONTINUOUS LINER



LEFT WITH BROKEN PADS AFTER ATTACHMENT

Failure Mechanism:

- Improper handling method for release or attach
- Overly high storage temperatures may cause the pad to melt and excessively stick to liner



BEFORE STORAGE TEST



AFTER STORAGE @ 40 °C/10 MIN

Solution:

- Follow HEM recommended transportation and storage temperature, release and attach procedure/tool in application note.
- Use non-reversible temperature label to monitor transportation/ storage temperature.



NON-REVERSIBLE TEMPERATURE LABEL

Invoice#	HEM	Golden World	Customer
91689167		34	
91697171		34	
91697169		34	
91693396		34	42
91693398		34	34
91693395		34	40
91691907		34	34
91693399		34	42

Samples of high temperature exposure of certain shipments

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