

VTS void terminator system



- Void Free Results regardless of dimensions, fine pitch or gap
- Increase Dispenser UPH
- Improve Yield
- Minimize process stress
- Bleeding and Creep Control
- Capable of non-Clean/Bake/Plasma Process

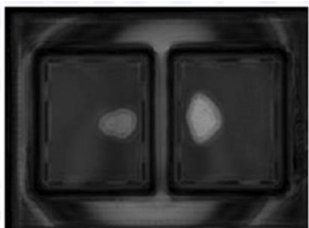
C2W, C2C, C2S
CUF, NCP, NCF, EUF
WP, PLP, 2D, 3DIC

Ableprint's VTS, Void Terminator System, offers the best cost saving solution for flip chip packages with Void Free results. Using APT's Void Dissolution, Diffusion and Replacement techniques, a void is increased then shrunk, dissolved and diffused into the material thus eliminating the void. Depending upon the material you are using, and the product you are working with, the VTS can be combined with a variety of options to produce the results you desire. The VTS can be used to eliminate voids in shallow bump/pillar arrays and within tight pitches. Die can be placed closer together because you no longer have to design for underfill dispensing. UPH can be increased because there are simpler dispensing patterns and material can be saved.

Applications

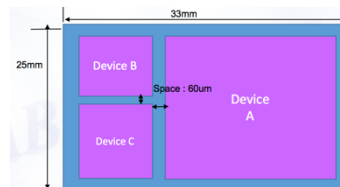
Flip Chip Underfill – Chip Size 10x12mm

Cu Pillar Bump - 60 μ m Bump Pitch
Underfill – Namics u8410-219
U-Pattern – 2 Pass OR
MCL Pattern – 2 Pass
UPH increased 9.5x



TCCUF – Chip on Si Interposer

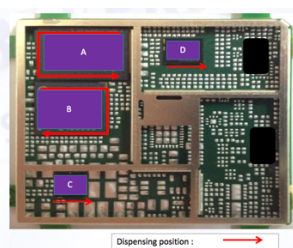
Chip Sizes: A – 22x22mm, B – 8.5x9mm, C – 13x9mm
Cu Pillar Bump - 150 μ m Bump Pitch
Underfill – Hitachi or Namics
 Pattern for All Devices
UPH increased 10x



Package on PCB – SiP

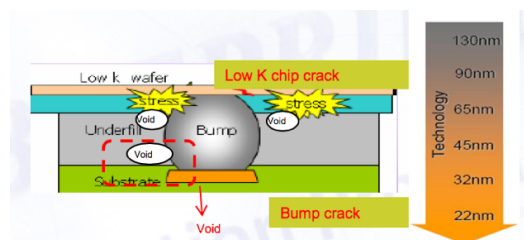
Underfill – Namics u8410-99
U-Pattern and I-Pattern

Material saved ~25%, Bleeding & Creeping Control



Minimizing Stress on Low K wafer

Low K wafers are more brittle and bumps become fragile. Minimize stress impact, void size.



General Specification

Temperature & Pressure Control	Control System	Be individually controlled by PLC
	Temperature	<ul style="list-style-type: none"> - Temp. Range: Room Temp ~ Max. 200°C - Ramp Up: 6°C/min (w/o loading) - Cool Down: 150°C ~ 80°C: Approx. 40 mins - Control: PID Auto temp. controller. Accuracy: +/-3C @ 5~8kg/cm² - With 6 temp. monitoring points to ensure temp. uniformity inside of the chamber, and better material cured uniformity to acquire better reliability.
	Pressure	<ul style="list-style-type: none"> - Recommend: Max 8Kg/cm² - Pressure Control: +/-0.1kg/cm² - Average pressure ramp up rate at 1kg/cm² per minutes, air inlet at 5Kg/cm² is able to reach Max 8Kg/cm² within 10 mins - Option: Linear slope offering controllable pressure at 0.1kg~0.5kg/min
Structure & Component	Inner Material	SUS 304 stainless steel & surface treatment
	Outer Material	SUS 400 stainless steel & surface treatment & coating
	Pressure Stabilizer	1 set
	PM Calibration System	6 temp. PM reading ports
	Heater	12KW
	Temperature/Pressure Record	7+ 2 points Temp. / 1 point pressure record data
Operation Interface	PC Base/Windows Touch Panel	<ol style="list-style-type: none"> 1. 999 programs 2. Data tracking of process conditions above 1 year 3. Data tracking of alarm history above 1 year 4. Offer Ethernet protocol with user's IT/CIM 5. Remote program upgrade and software debug rapidly by PC base control system
Facilities Requirement	Air Inlet	¾" PT air inlet (CDA or N2)
	Air Outlet	6" exhaust outlet, can be with security valve & exhaust muffler
	Cooling Water Inlet	¾" PT water inlet, water temp <
	Cooling Water Outlet	¾" PT water outlet

Upgradeable Software & Hardware

Fast Heating Up / Fast Cooling Down	<ul style="list-style-type: none"> - Fast Heating Up 10C~/min @ 5~8kg/cm² - Fast Cooling Down 10C~/min @ 5kg/cm² <p>Compare others with 1~3C/min, APT de-void system with fast heating up and fast cooling down, which UPH is up to 1.5 times and shorten curing profile (Test curing condition by 150C/60min)</p>
O2 Concentration Control	<ul style="list-style-type: none"> - Products with metallic surface (Cu, Ag, Sn) - Product oxidation will impact process and reliability due to oxygen level at high temp. curing, it's severer in high pressure environment. Well control oxygen concentration is significant to keep stable high temp. & high pressure process. - Low oxygen concentration process is available on VFS/VTS
De-Outgas	<ul style="list-style-type: none"> - Minimize chamber maintain frequency and difficulty - Yield improvement by reducing device and chamber contamination
H/L Pressure Interaction Control	<ul style="list-style-type: none"> - Adhesive strength improvement - Improve devoid capability for High Modulus Die Attach Film
Future Upgrade to VTS	<ul style="list-style-type: none"> - VTS is designated for terminate bigger void while CUF with much narrower gap, furthermore with magnificent capability of cost reduction. VTS can meet requirements of de-void for any high-end products. - APT provides the future option for VFS being upgraded to VTS.
SECS/GEM Communication	<ul style="list-style-type: none"> - Online/remote control - Process flow control

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