Model HB series Advanced Hybrid Bonder

多功能混合製程先進黏晶機

Die bonding is the process of attaching the die either to its package or some substrate. A good die bonding process needs to be precisely aligned before place on the right pad. It also needs perfect contact between the die and the substrate without void. To achieve the perfect contact, the bonding head design must be able to aligned freely for the coplanarity. Because the die is weak and brittle, a fine tuning bonding force capability is mandatory to avoid destroying the die during bonding process.

黏晶是將晶片黏合在封裝材料或基板上的製程，良好的黏晶製程除在壓合前需要將晶片吸取及精準的對位，更需要確保晶片與基板的完美接觸以避免任何可能造成的空隙，要做到完美的晶片與基版的完美接觸黏晶頭需要能自由調整共面性的優越控制能力，同時由於晶片的脆弱性，黏晶的壓合力道需要具備能作微細調整的能力。

For solder bonding, the fluxing process is important. Proper amount of the flux has to be precisely dispensed on the substrate. For epoxy bonding, precision epoxy dispensing can avoid excess of die attach fillet, which could result in the die attach contamination of the die surface or the problem of die lifting or die cracking due to less amount of epoxy material used. On the other hand, a good eutectic bonding needs proper control of the bonding temperature, duration and bonding force.

在Solder bonding過程中助焊劑的塗佈製程是非常重要，適當的助焊劑需精確塗佈在基板上，對epoxy bonding中精密的膠水塗佈可以避免過量膠水造成的汙染或因膠量不足造成的傾斜或龜裂的問題，至於eutectic bonding共晶黏合上，壓合的溫度控制、力道及壓合時間都是決定黏晶效果的重要因素。

HYBRID BONDER

SSI HYBRID BONDER fulfills inline automatic multiple function process with integration with die bonding and SMT assembly and precision fluid control processes and laser fine machining process.

Furthermore, the SSI advanced hybrid packaging system can be combined with flip chip bonding, 3-D stack assembly, dispensing/inkjet printing or dipping/welding, thermal or UV curing, AOI, laser processing. With SSI own embedded control system, own vision algorithm and specific own driver and smart software of auto calibration with miniature sensor is indispensable for high precision process results. All process data can be collected and reported of the traceability data to SECES/ GEM , MES-system. Immediate monitoring of condition • Events, reports, alerts • Remote command (Remote command, RMCD) • Recipe Upload/Download • Mapping • Terminal message transmission

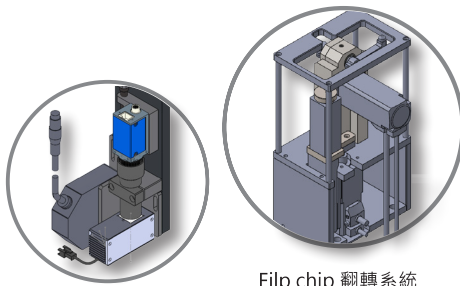
SSI is capable to provide advanced integrated process solutions by putting our core module solution to offer rapid response while customer is facing process challenges or special process system requirements.

HYBRID BONDER

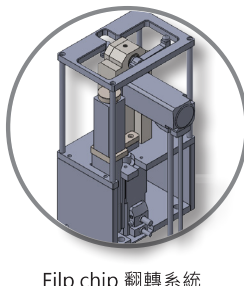
SSI HYBRID BONDER通過與芯片鍵合和SMT組裝以及精密的流體控製過程和激光精細加工過程相集成，實現了在線自動多功能製程。

此外，SSI先進的混合封裝系統可與倒裝芯片鍵合，3-D堆棧組裝，點膠/噴墨印刷或浸入/焊接，熱或UV固化，AOI，激光加工相結合。使用SSI自己的嵌入式控制系統，自己的視覺算法和特定的自己的驅動程序以及帶有微型傳感器的自動校準智能軟件對於實現高精度的過程結果是必不可少的。軟件部分可以收集所有過程數據，並將可追溯性數據報告給SECES / GEM和MES系統。立即監視狀態•事件，報告，警報•遠程命令（遠程命令，RMCD）•配方上載/下載•映射•終端消息傳輸

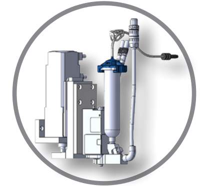
通過在客戶面臨過程挑戰或特殊過程系統要求時，我們的核心模塊解決方案可以提供快速響應，SSI能夠提供先進的集成過程解決方案。



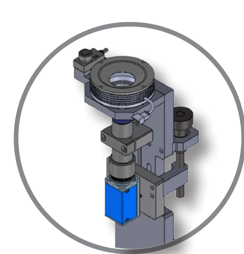
檢測系統



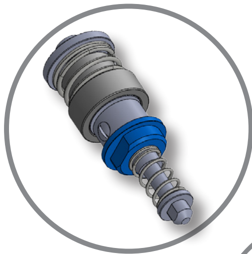
Filp chip 翻轉系統



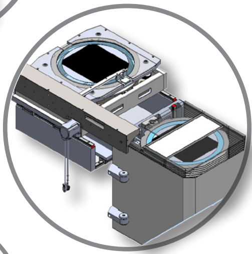
噴閥系統



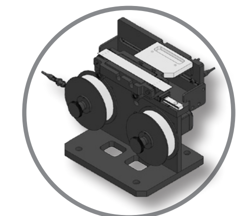
下照相機



吸盤治具



wafer table



清膠帶機構

Model HB series is an advanced semiconductor die bonding machine designed to handle mixed assembly process besides bonding including pick-place for different components, micro dispensing or laser welding. Model HB600 is using the most intelligent motion control and vision integrated software **V2K**, which enables the highest assembly efficiency with friendly intuitive teaching method. SSI hybrid binder control technology includes the following important features :

a. State of the art vision alignment technology for sub-micro bonding combing the special camera system design, vision algorithms, image process software and AI technology for sub-micron alignment to 0.2 micron bonding applications.

b. Sophisticated bonding head design to handle critical bonding applications. SSI bonding head is able to control the bonding force with the integration of load cell and voice coil motor for fine force tuning to create gentle force for weak or small dies. In addition, SSI bond head special coplanarity alignment capability can ensure complete surface bonding.

c. Advanced micro dispensing technology for fast and precision jetting of flux, epoxy and conductive paste. Typical bonding machines are still using time pressure technology for dispensing, which is not accurate and slow. When dies are becoming smaller and smaller, SSI has the best advanced dispensing capabilities for any critical micro dispensing in term of precision and speed.

d. Intelligent pick-place is able to pick and align the parts angle before position alignment and placement or flip before placement. Different and multiple pick-up heads design with software control for pick-up head auto change capability, Model HB series can run very high speed.

Model HB系列是一部適合混合製程的黏晶設備，其功能包括取放、精密塗膠、黏晶,甚至雷射熔接，能處裡的零件不局限於晶片，也能處裡其他各種零件。Model HB系列使用SSI開發的最先進運動控制與影像整合的智慧軟體，不但具備處裡高速複雜的組裝程序，更具備人性化直覺式的教導介面，學習及教導容易，SSI hybrid bonder的控制技術包括下列重要特點：

a. 最先進的次微米特殊設計的鏡組系統，影像演算法, 影像處裡軟體及AI的次微米影像對位技術。

b. 尖端複雜的bond head設計，具備處裡困難的黏晶製程. Bond head整合秤重傳感器及音圈馬達的微調控制技術，能對應敏感的壓合力道及壓合的共面性需要，以確保完美的黏晶要求。

c. 先進的壓電噴射微量塗膠技術提供高速精密塗膠的要求以解決使用傳統接觸式塗膠膠量不精確及沒效率的困擾，當晶片愈趨微小化，塗膠的精確性能確保黏晶的最佳效果，SSI 超過20年的塗膠技術及經驗可以協助客戶提高黏晶的品質。

d. 智慧抓取能將抓取的零件先做角度再進行對位，然後執行黏合的相關動作，同時機台也可以根據需要提供零件抓取後的翻轉動作，機台也能選擇性提供工多個吸頭的模組及控制更換吸頭的控制軟體。

Model HB series hybrid bonder can work with different parts feeder including wafer ring, Jedec tray bowl feeder or tape feeder. Model HB series also offes options for bond head heating , substrate preheat or any customized configuration to fit any bonding process need.

Model HB 系列作為一個先進功能的黏晶設備提供包括wafer ring, jedec tray及振動工料器等進料系統，Model HB 系列也能提供基板預熱或任何客製化的製程需求。

Specifications :

- Placement Accuracy (With Alignment Tolerance)：XY ±5um @3 Sigma
- Wafer Size：Up to 12吋
- Die Size：150um~30mm
- Die thickness：50um~1000um
- Substrate Length：Up to 380 mm(up to 12” Wafer frame)
- Substrate Width：Up to 380 mm(up to 12” Wafer frame)
- Substrate Thickness：Up to 1.1mm
- Substrate Type：Strips, Flex, FR4/FR5, Lead Frame, Wafer Frame
- Force Control：1~100N
- Temperature Control：Room Temperature 200°C (Allow Custom Temperature Requirement