

石無鉛® 載具製作說明

Stononlead® Carrier Manufacture Instructions

【工欲善其事，必先利其器】於石無鉛®使用過程中，若能掌握一些原則，並且加入您公司的設計規範，必定能讓您的載具品質更上一層樓，以下針對石無鉛®製作過程中容易發生的問題，加以說明。

The saying goes, “A workman must first sharpen his tools if he is to do his work well.” As you use Stononlead®, keep in mind some principles and add it with your company’s designing standards. We believe the quality of your carriers will upgrade to a higher level. Below (The next few pages) discusses/discuss some frequently encountered issues when using Stononlead® for manufacture

1. 材料選擇 Material selection

針對不同的製程，石無鉛®材料目前有LB-B、LB-L、LB-LG三種可供選擇使用，以下簡單說明此三種材質的特性，以及如何應用在製程中：

LB-B特性:

- 1.高結合力—適合做高難度的切削，如:0.4mm以上薄壁、深度加工、攻牙、細長檔牆、 ϕ 2mm定位pin(如圖1、2)。
- 2.推薦應用範圍—DIP、SMT(300*300mm以內)。
- 3.供應厚度—4、5、6、8、10mm。

LB-L特性:

- 1.亮面高質感—表面為深黑亮面，增加載具質感。
- 2.厚度2mm—降低成本，減輕重量及吸熱。
- 3.清潔度高—適用於對環境污染要求高的封裝製程及產品。
- 4.光滑的表面—利於膠帶黏貼及膠的塗佈。
- 5.推薦應用範圍—SMT製程(如圖3、4)。
- 6.供應厚度—2、3、4mm。

LB-LG特性:

1. SMT及DIP載具大尺寸及平整度要求較高適用。
- 2.此為LB-L研磨，供應厚度5、6mm。

2. 加工注意 Attention while processing

- 1.禁止於石無鉛®表面塗抹溶劑或機油，以免造成載具變形，如圖一。
- 2.加工時若使用切削液必須清洗乾淨，不可殘留機油以免影響壽命!
- 3.建議使用全合成切削液，以最低的比例(5%)與水混合，切削液的目的為防塵及防止設備生鏽，過多的油污會增加清洗載具的時間降低載具質感，如圖二，且容易經由高溫後破壞載具結構，造成分層現象，如圖三。
- 4.切削石無鉛®LB-L，因表面有一層亮膜，故需採用輕切削方式避免表面分層，需先以導角刀或 ϕ 3以下銑刀將圖形邊界切割1mm深→劃破亮面，如圖四、五；依各種加工設備調整切削速度。

圖1/Figure 1

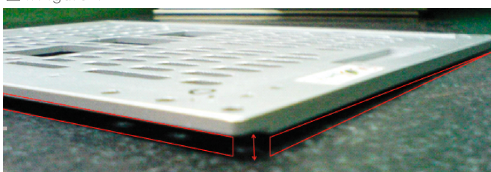


圖2/Figure 2



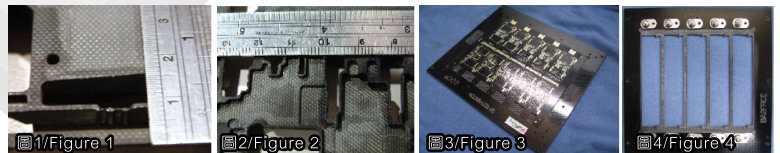
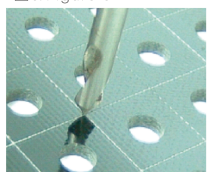
圖3/Figure 3



圖4/Figure 4



圖5/Figure 5



Depending on the manufacturing process, Stononlead® currently provides LB-B and LB-L for your options.

The following briefly explains the characteristics of these two materials, and how they are applied within manufacture:

Features of LB-B:

- 1.High binding -Suitable for high difficulty tooling, such for walls as thin as 0.4 mm, deep processing, tapping, thin stalling walls, and ϕ 2 mm positioning pins(Figure 1 & 2).
- 2.Recommended applications - DIP, SMT (within 300 * 300mm).
- 3.Administer thickness—4、5、6、8、10mm.

Features of LB-L:

- 1.High-surface texture - The glossy black surface color provides a better texture for the carrier.
- 2.An only 2 mm thickness provides lower costs, reduces weight and heat absorption.
- 3.High cleanliness - suitable for high environmental protection requirements with the packaging processand products.
- 4.Smooth surface - suitable for plastic coating and tape adhesion.
- 5.Recommended applications - SMT process.(Figure 3 & 4).
- 6.Administer thickness—2、3、4mm.

Features of LB-LG:

- 1.SMT and DIP carrier has the great size and smoothness request high is suitable.
- 2.Grinds for LB-L ,Administer thickness—5、6mm.

- 1.Wiping or smearing solvents or machine oils is prohibited.(Figure 1)
- 2.If tooling fluid is necessary during processing, complete removal and cleaning of the tooling fluid must be done to guarantee the life usage for Stononlead®.
- 3.The purpose for tooling fluid is to prevent dust and rust. It is recommended to use complete synthetic tooling fluid with the lowest proportion (5%) mixed with water. Not only will excessive oil increase the cleaning time and affect the texture (Figure 2), but also can easily cause damage Stononlead® and stratification at high temperatures. (Figure 3)
- 4.With regard to tooling of Stononlead® LB-L, because of its glossy surface one should use light tooling procedures to prevent surface stratifications. At first use a chamfer cutter or ϕ 3 tooling knife and cut a 1mm margin around the graph to scrape off the gloss(Figure 4 & 5). the tooling speed is adjusted based on the different processing equipment.

3. 設計要求 Design requirements

1. 若載具上方必須施壓，強化結構防止變形，建議使用強化檔條，參考第五點。
2. 檔條與載具的中心孔位必需一致 (如圖1)，否則容易導致載具變形及翹曲。
3. 無論使用何種材質，檔桿與檔桿間 (組裝時) 不可相互擠壓，需有0.1mm以上的間隙 (如圖2)；更不可相互重疊組裝 (如圖3)。
4. 禁用電木材質檔桿 (FR4、鋁、不鏽鋼允用)。
5. 避免使用下列方式設計製作，以免增加分層機率 (如圖4)，若需以此方式製作，建議預留量需超過1mm以上，並採取輕切削方式進行加工 (如圖5)。
6. 設計彈片時，必需避免集中於某處，施加壓力也不可過大 (如圖6)為正確，(圖7)為錯誤示範。

圖1/Figure 1

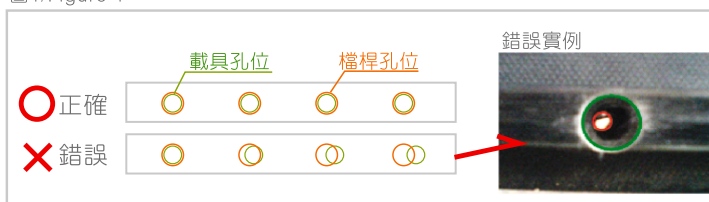


圖4/Figure 4

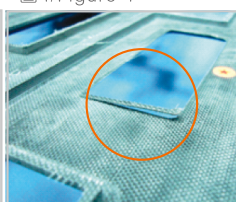


圖5/Figure 5

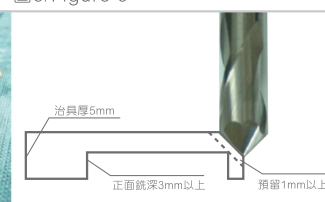


圖2/Figure 2

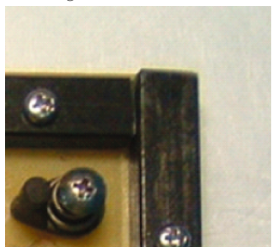


圖3/Figure 3

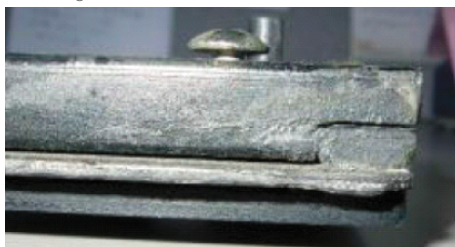


圖6/Figure 6

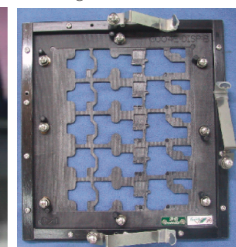


圖7/Figure 7



4. 使用維護 Using maintenance

1. 可使用清潔劑清洗Flux。
2. 避免過爐後在尚未冷卻之前施加過多外力，建議若必須加壓PCB板，請於過錫爐後先將壓點取下，以免長時間使用造成載具變形。

5. 應用範圍 Applications for the use of Stononlead®

