



程陽有限公司
Sunny Process Co.,Ltd.

石無鉛™ Stononlead™

RoHS  

www.stononlead.com



耐高溫280度C、高密度、隔熱、斷熱工程材料
280°C of high-temperature, high-density, thermal insulation
engineering materials

基於科技始於人性，為使材料性能兼顧功能並且符合『人性』為要求；本公司致力於載具的具材料與載具設計研發製造，多年來堅持創新開發的精神，對於載具生產及使用過程中所產生問題進行研發及改良以提昇使用壽命減少工業傷害。

In order to make sure materials are functional and environmental, we are committed to research and develop required engineering materials, and insist on the spirit of innovation and development over years, as well as R&D and improve the problems came up in the process of carrier production and use to increase service life and reduce industrial injuries!

七大特點

Seven characteristics

- | | |
|------------|---------------------|
| 1.降低對人體的傷害 | 1. Low Hazardous |
| 2.降低皮膚過敏 | 2. Low Irritation |
| 3.降低機台維護成本 | 3. Low Cost |
| 4.提高機構強度 | 4. High Strength |
| 5.提高使用壽命 | 5. High Cycle life |
| 6.提高乾淨度 | 6. High Cleaning |
| 7.提高工程技術 | 7. High engineering |

辨識正牌石無鉛™

Identification of Stononlead™

使用者可藉由石無鉛™標籤來辨別真假，每張標籤皆有一組編碼，可向本公司經銷處直接查詢，安全無虞。

All Stononlead™ sheets are with a ID label, and there is a code on this ID label, please check this code with us.



材料特性

Material properties



耐高溫

High-temperature resistance

280度C，耐高溫、高密度、隔熱、斷熱

280°C, high-temperature resistance, high-density, thermal insulation.

抵抗酸鹼增長壽命

Increase service life by resisting to acid

不需特殊處理，可抵抗Flux的噴塗及侵蝕

No special treatment, resistance to the spraying and erosion of Flux.

結合強度高

High combined strength

耐撞擊及磨擦，比國產合成石壽命更長

Impact-resistance and rubbing-resistance, longer life than other local brand.

清潔度高

High cleanliness

沒有粉塵，比合成石更潔淨，適合用在封裝製程及低落塵要求的環境

Low dust, cleaner than other brand. Suitable to be used in package process and low dust demanding environment.

低膨脹係數及低熱導性

Low expansion coefficient and low thermal conductivity

提高SMT工程的品質及生產良率

Improve the quality and production yield of SMT engineering.

剛性高

High rigidity

利於實施攻牙動作等細部加工

Beneficial to detail tooling such as tapping.

可降低不良率，增加生產效益

Can reduce defective rate, and increase production efficiency



優勢比較

Advantages comparison

0.4mm薄壁切削特性，提高焊接良率，材質韌性減少了加工使用過程中的損毀。

Cutting characteristics of 0.4mm thin-wall improves welding yield, and material's tenacity reduces usage damages in processing.



膨脹係數對 SMT製程的影響

Expansion coefficient to mention the impact on the SMT process

迴流焊製程中所使用的載具，由於必須承受高溫及高重複性的操作，在目前電子產品要求輕薄、高密度下，PCB的發展就朝輕薄、多層、高密度趨勢繼續發展。

過爐時高溫產生的膨脹現象，使得使用者因慣用的載具材料為鋁合金，因膨脹係數過大，在280度C的高溫中和PCB膨脹距離差異太大(300mm約0.8mm)，導致產品變形，良率無法提升的問題。

石無鉛™材質的膨脹係數與基板相同，貼合效果更好，低變形量讓PCB在高溫中維持平整，不需提高工作溫度，提升產品良率。

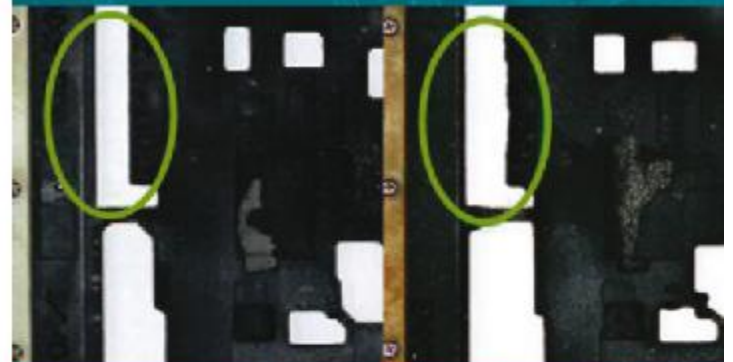
If expansion coefficient of stononlead™ material is same with substrate, then it will fit better; low deformation keeps PCB maintains smooth in high temperature and without raising temperature to improve product yield.

After through high-temperature furnace, swelling phenomenon shows up, and due to user is used to use aluminum carrier which the expansion coefficient is too much, big difference between 280°C high temperature and PCB expansion distance results in product deformation, and yield can not be improved.



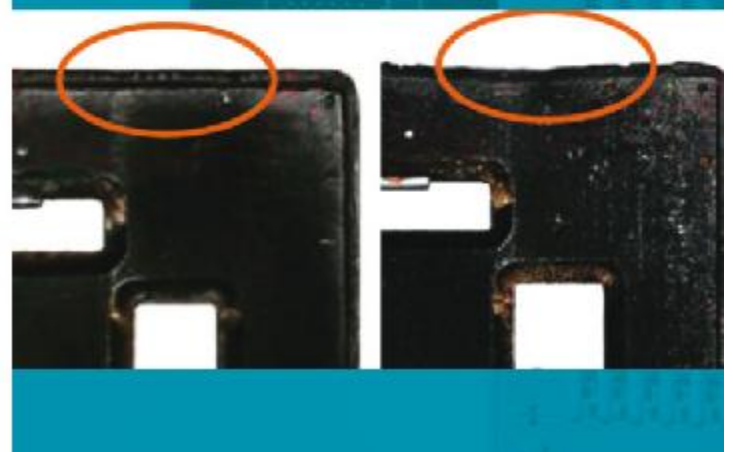
石無鉛™ 新載具
Stononlead™

傳統載具
Common composite materials
崩裂、導致溢錫
Crack, causes to solder over flow
in carrier.



石無鉛™ 新載具
Stononlead™

傳統載具
Common composite materials
易裂化，減少使用時間
Easy to crack, reduces the time.

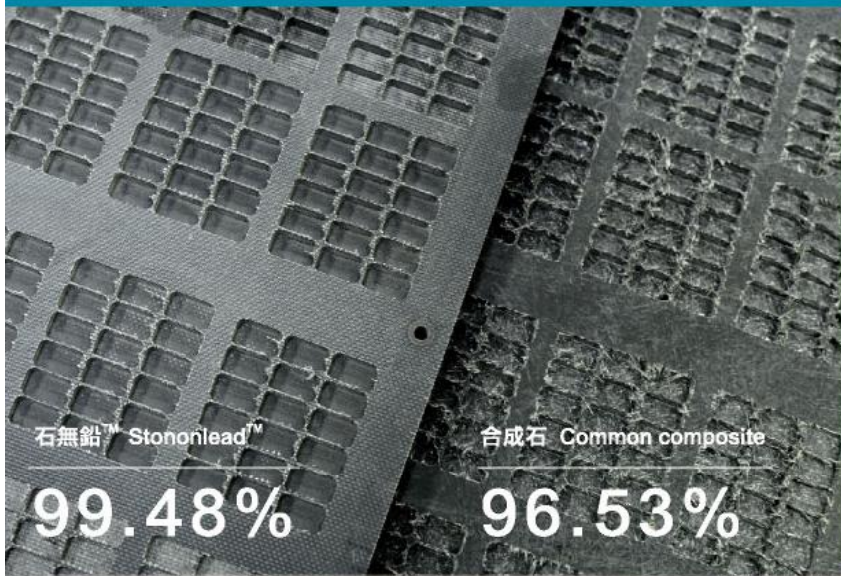


關鍵參數比較

Comparison of key parameters

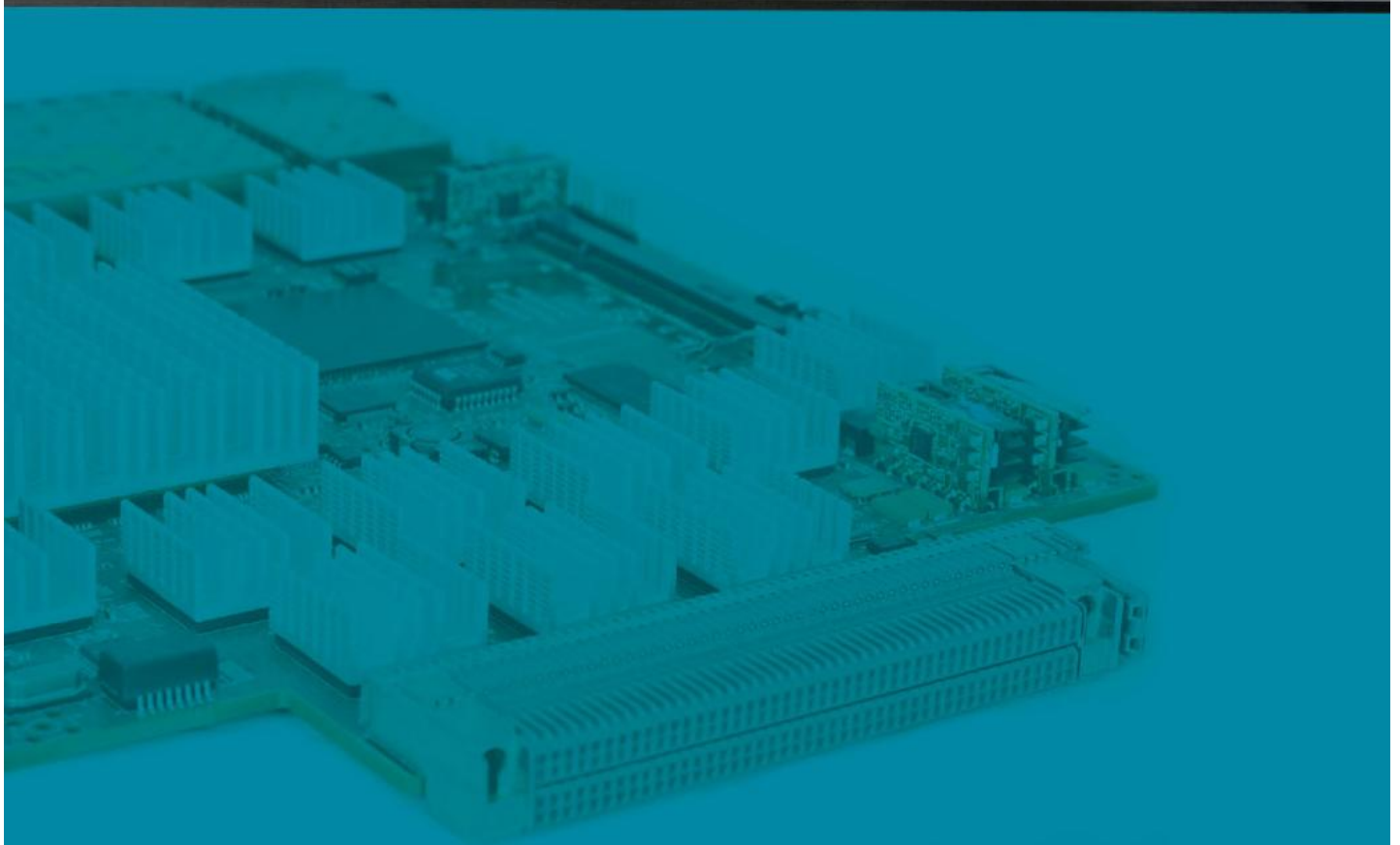
| 特性 Property | 材質 Material | GP樹脂基板 GP resin substrate | 石無鉛 Stononlead | 鋁 Aluminum |
|---|-------------|------------------------------|-------------------|---------------|
| 線性膨脹係數 (ppm/°C) Linear expansion coefficient (ppm/°C) | | 10 | 11 | 25 |
| 熱傳導率 (w/m*k) Thermal conductivity (w/m*k) | | 1 | 0.7 | 200 |
| 彎曲強度 (Mpa) Bending strength (Mpa) | | 450 | 450 | 260 |

以上資料為測試數據僅供參考



切削過程中，薄壁的良率會影響到載具生產良率以及產線使用的壽命，因此石無鉛™可以表現出更佳性能及更長的使用壽命。

During the tooling process, the thin wally yield rate will affect the carrier yied rate and production line life. Thus the use of Stononlead™ can provide a better performance and longer life.



SGS檢驗

SGS certificated

由於從原材料上得到根本的改善，石無鉛具備了耐高溫，抗酸蝕，高結合度的性能，除了符合RoHS、PFOS、Anti-Static等的要求，更能完全安全無虞的在無鉛制程的要求下進行DIP及SMT的加工。

不僅如此，在研發人員長期的關注之下，石無鉛無論在加工操作或是成本要求上都已經一併取得可觀的效益。採用石無鉛，就是您當下的正確決定！

Comply with the requirements of ROHS, PFOS and ANTISTATIC.

歡迎來電：(02)8993-1730或E-mail:BOBOL@sunny.twmail.net索取
更多應用資訊或至官方網站查詢

www.stononlead.com

Warmly Welcome to Inquire: +886-2-8993-1730 or E-mail:BOBOL@sunny.twmail.net
Multi-application markets, scope and examples.
Welcome to the official website or email questions to www.stononlead.com.



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