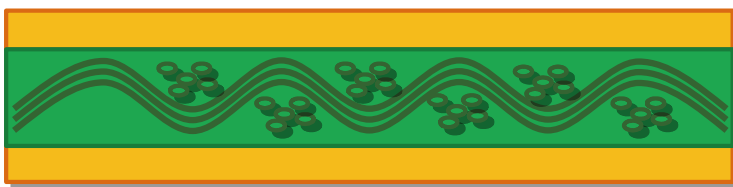


Producing Method of Printed Circuit Board

Both side Board (2layer) A: Via forming

This is a basic board with conductors on the front and back, using vias (drilled holes) to provide continuity between the front and back. The invention of the via connection has greatly improved the flexibility of wiring.

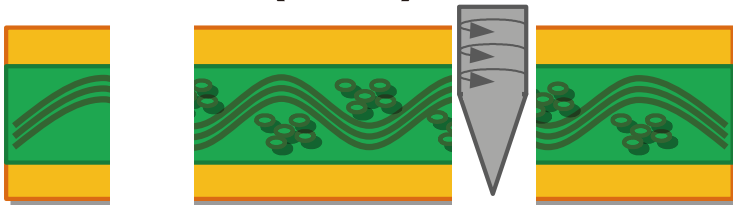
1. Prepare a copper clad laminate (material) with copper foil on both sides.



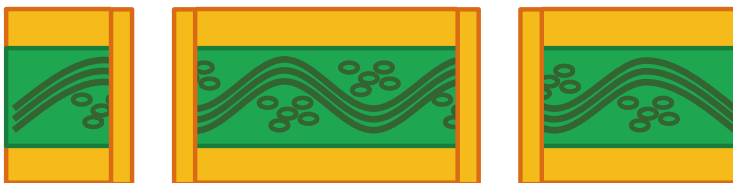
Cu Foil

Core

2. Holes (vias) are formed by drilling.

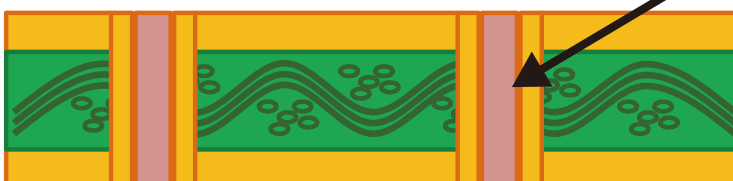


3. Copper plating is formed on the inner wall of the via to provide continuity between the front and back.



Copper paste is used as a hole-filling material, and it also has the purpose of improving the conductivity of the via.

4. Fill the via with hole filling material.



Producing Method of Printed Circuit Board

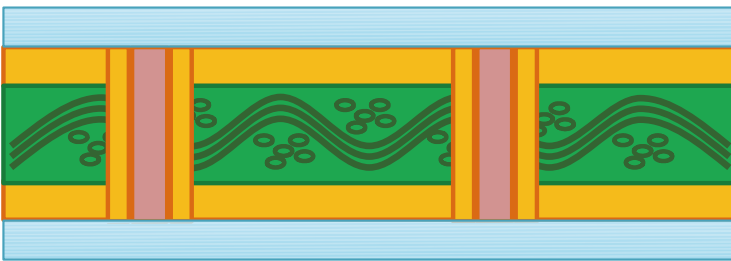
Both side Board (2layer) B: Patterning

Cu Foil

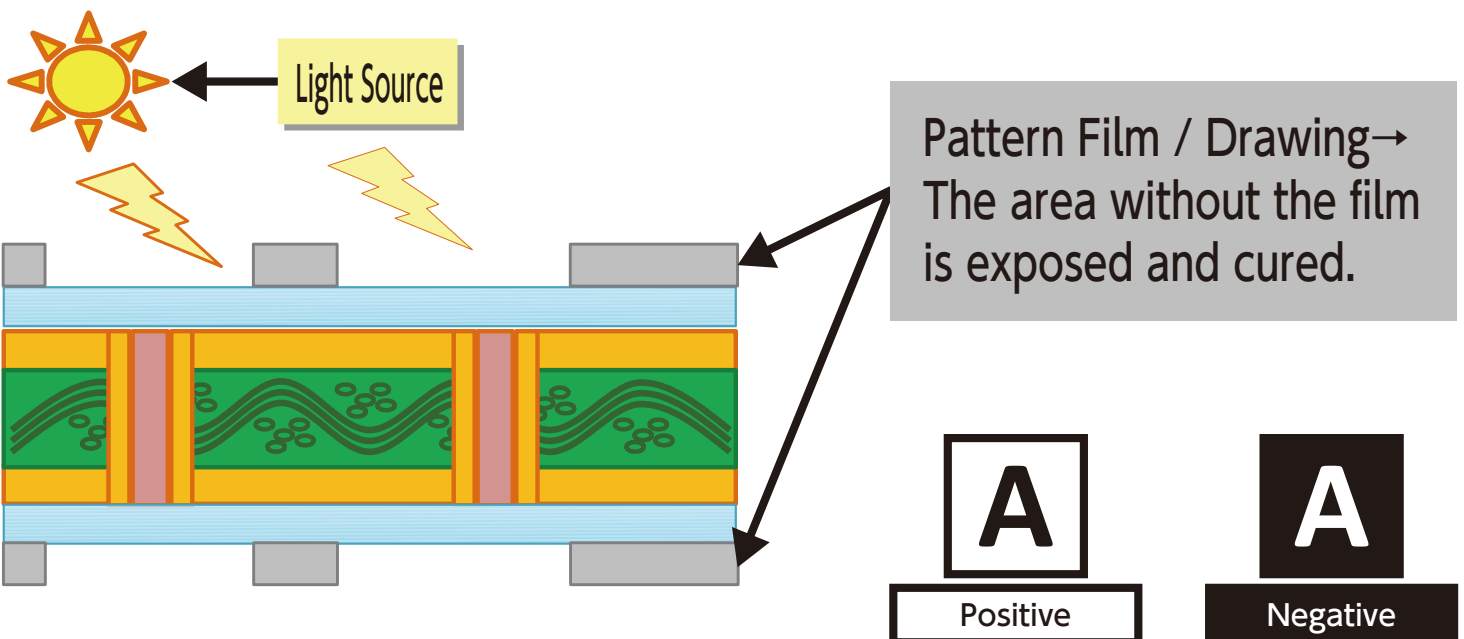
Core

Cover Film

5. Etching resist (Cover Film) for **“patterning”** is applied to both sides.



6. Expose at the opposite side of the pattern (negative pattern) according to the drawing, and expose and cure only the resist area to be left.



Producing Method of Printed Circuit Board

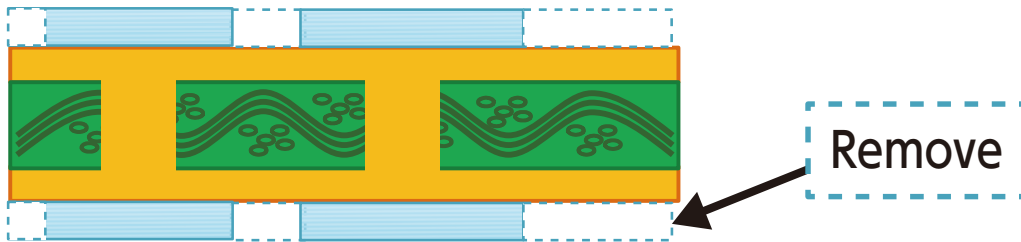
Both side Board (2layer) B: Patterning

Cu Foil

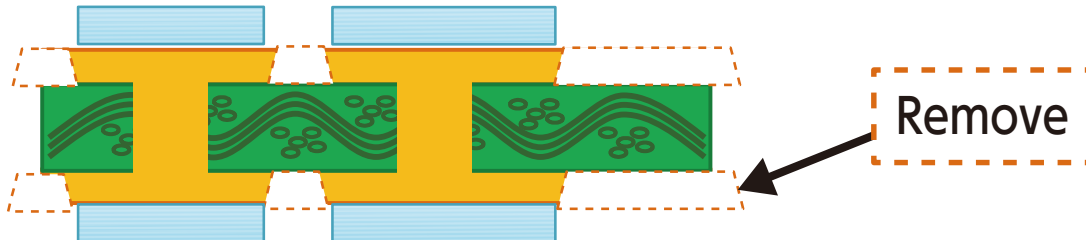
Core

Cover Film

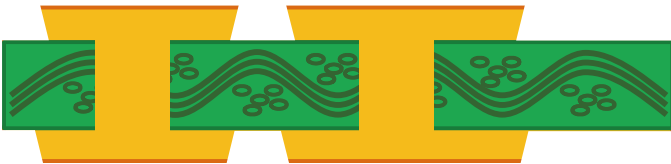
7. Remove the uncured etching resist with chemical solution.



8. The remaining resist is etched to form a pattern.



9. All etching resists are removed and the patterning is complete.



AOI (Auto Optical Inspection) is performed in the next process to check if the pattern is formed without any problems. In this inspection, the pattern on the drawing is compared with the pattern on the actual product, and if there is any difference in shading, etc., an alarm is raised.



Producing Method of Printed Circuit Board

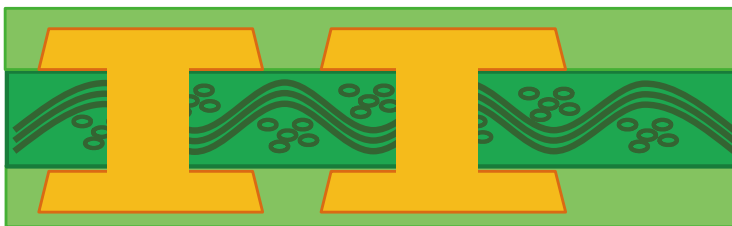
Both side Board (2layer) C: Solder Resist

Cu Foil

Core

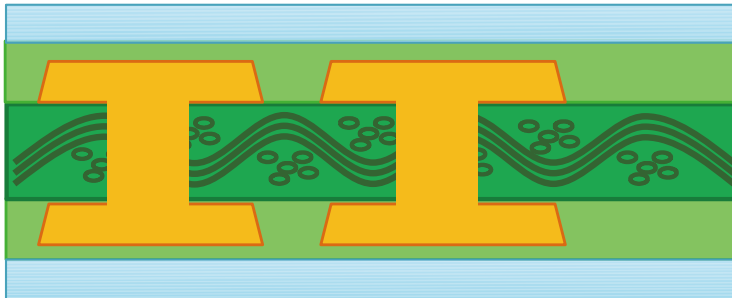
SR

10. Solder resist (SR) is stretched / coated over the pattern.

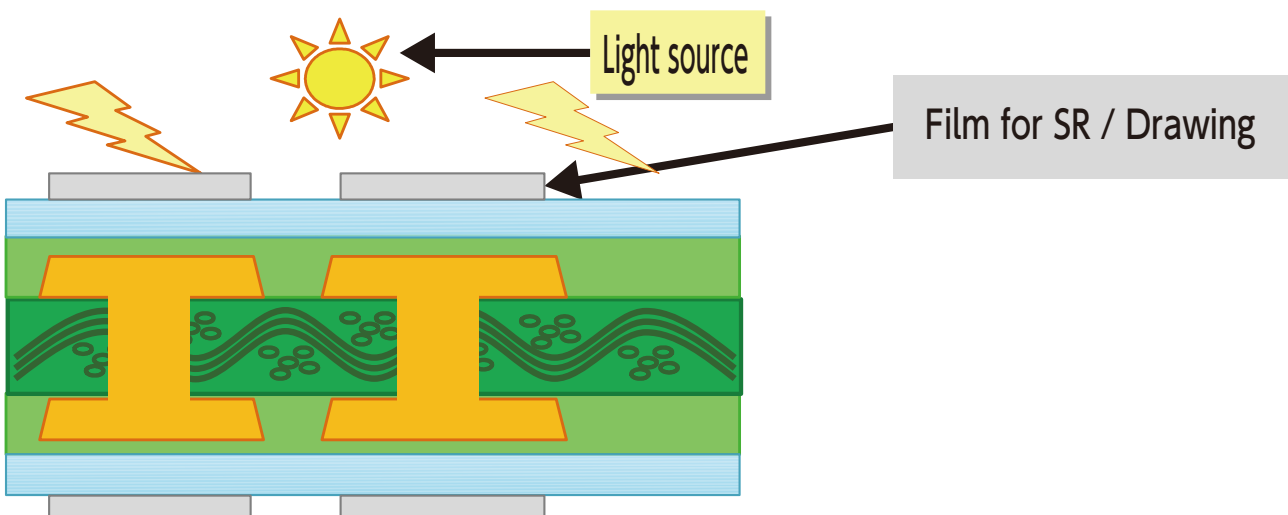


SR: There are liquid and film types.

11. Resist for SR formation is attached on the SR.



12. UV exposure (curing) of the resist for SR formation.



Producing Method of Printed Circuit Board

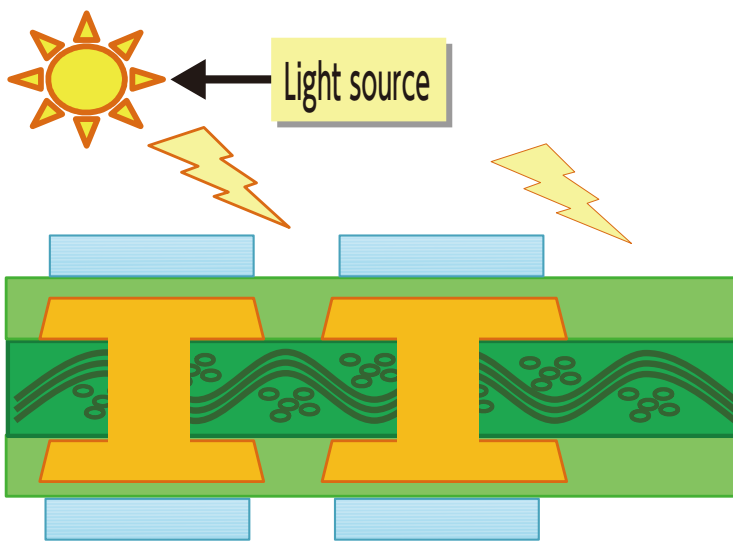
Both side Board (2layer) C: Solder Resist

Cu Foil

Core

SR

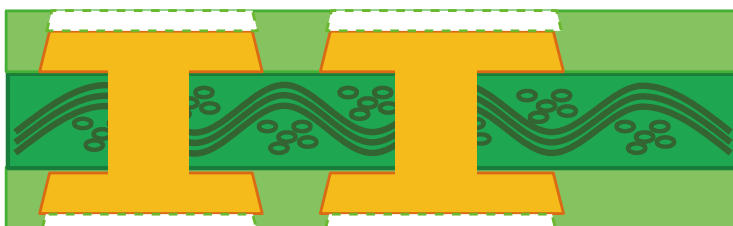
13. Semi-cure the SR based on the remaining resist for SR formation.



The part that is exposed to light (UV light) will cure and remain as SR.



14. Remove the resist for SR formation, remove the uncured SR, and finally cure the entire SR.



15. SR formation is complete.



Producing Method of Printed Circuit Board

Both side Board (2layer) D: Surface Treatment

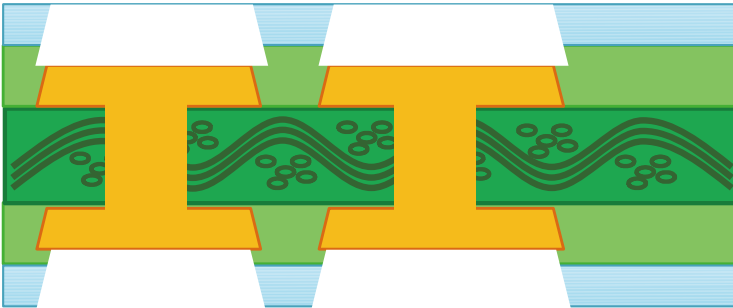
Cu Foil

Core

SR

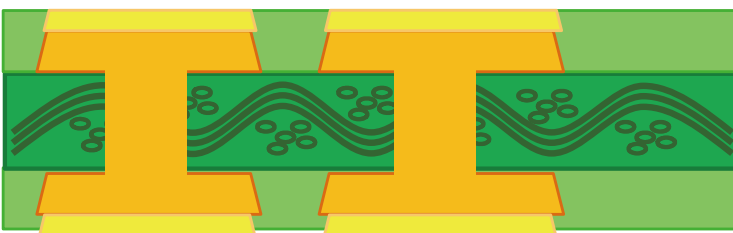
Au Plating

- 16. A resist (gold mask) is applied to form the surface treatment (Au plating).**
 (Formation method is the same as for pattern and SR.)

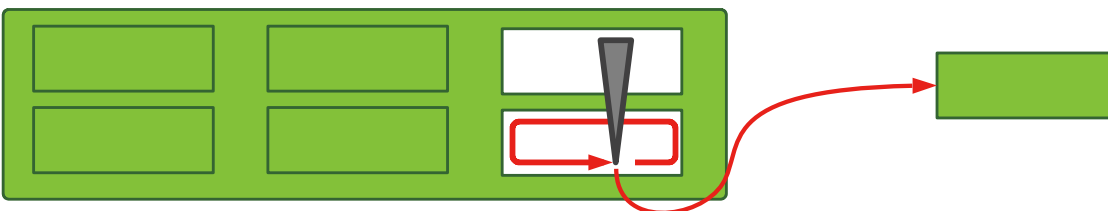


The formation method can be selected from electrolysis or electroless depending on the application and thickness specification.

- 17. Forming the Surface treatment: Au Plating.**



- 18. Cut out the substrate into a sheet outline using a router.**



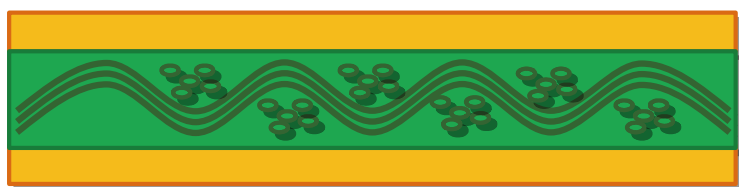
- 19. Post-processing (inspection, cleaning, packaging, etc.) and then shipping...**

基板のつくりかた

両面基板(2層板) A: ビア形成

ビア(ドリル穴)を用いて表裏の導通を図る、表裏に導体を持った基本的な基板です。ビア接続の発明により配線の自由度が格段に向上しました。

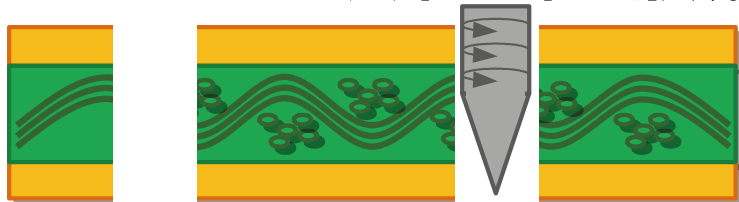
1. 両面に銅箔が張られた銅張積層板(材料)を用意。



銅箔

コア材

2. ドリルにて穴(ビア)を形成。

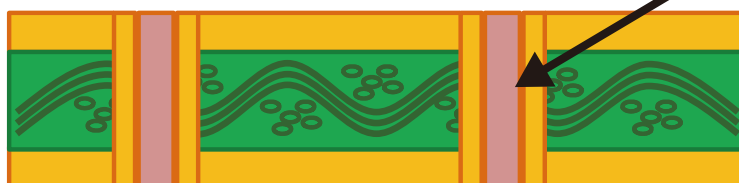


3. ビアの内壁に銅めっきを形成、表裏の導通を取る。



穴埋め材には銅ペーストなどが使用され、ビアの導電性を向上させる目的もあります。

4. ビアに穴埋め材を充填。



基板のつくりかた

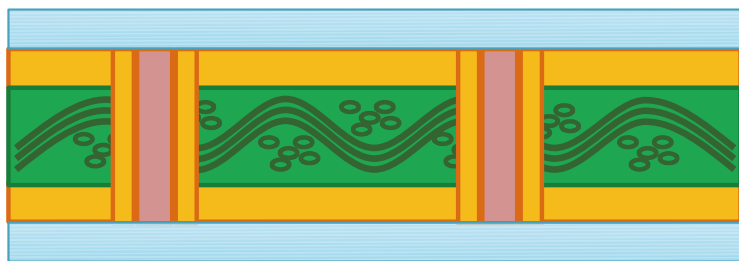
両面基板(2層板)B:パターン形成

銅箔

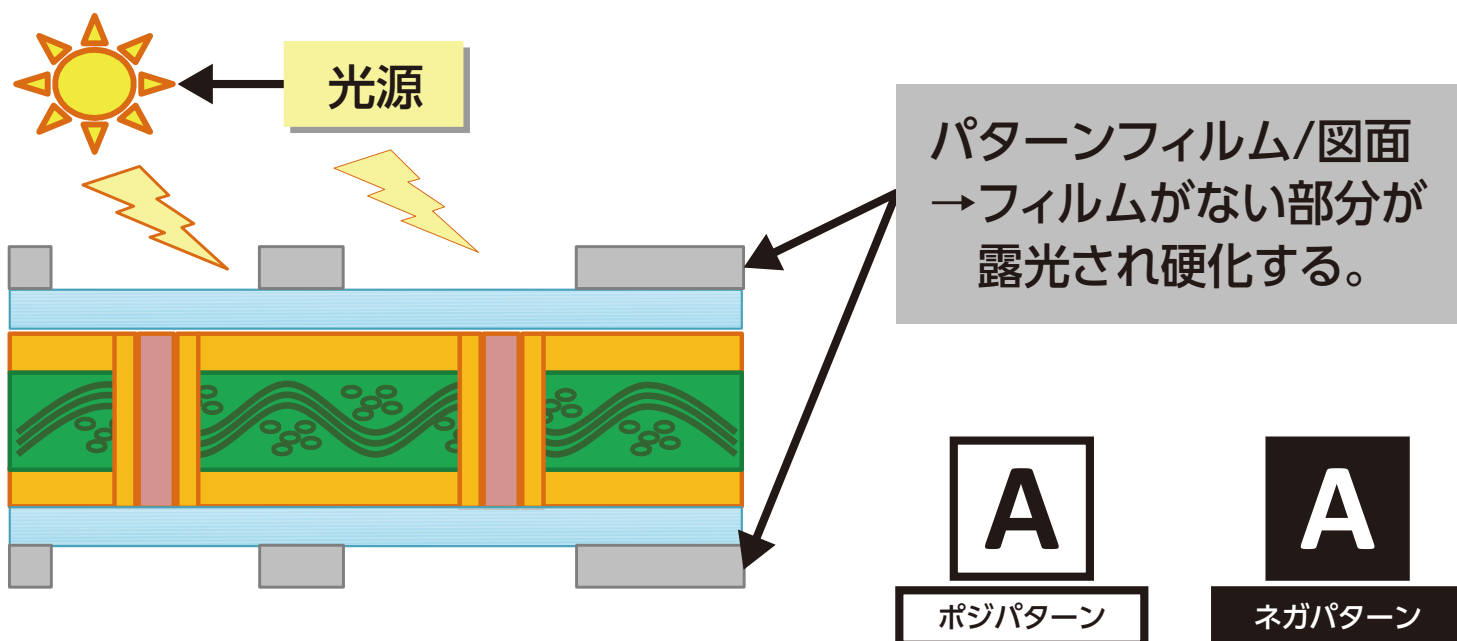
コア材

保護フィルム

5. 両面に「**パターン形成**」用の
エッチングレジスト=保護フィルムを張り付け。



6. 図面に沿ってパターンと逆の場所(ネガパターン)にて
露光し、残したいレジスト部分のみを露光し硬化。



基板のつくりかた

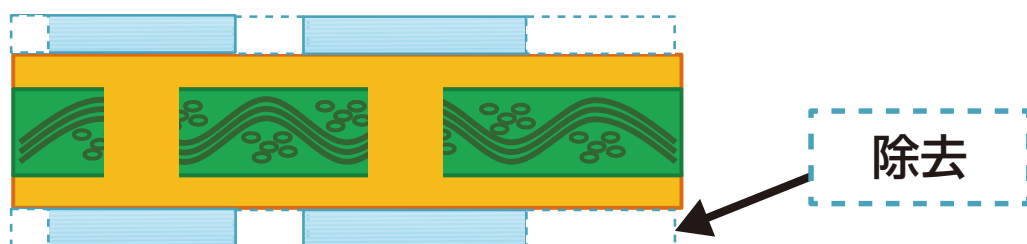
両面基板(2層板)B:パターン形成

銅箔

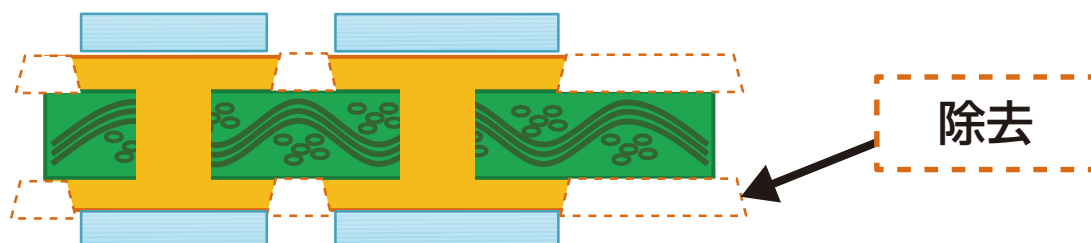
コア材

保護フィルム

7. 硬化していないエッチングレジストを薬液にて除去。



8. 残ったレジストを元にエッチングにてパターン形成。



9. 全てのエッチングレジストを除去し、パターン工程は完了。



パターンが問題なく形成されているかどうかを確認するため、次工程にて「AOI」(Auto Optical Inspection=自動光学検査)をかけます。この検査は、図面上のパターンと実製品上のパターンを比較し陰影などに相違点があればアラームを挙げる方式です。



基板のつくりかた

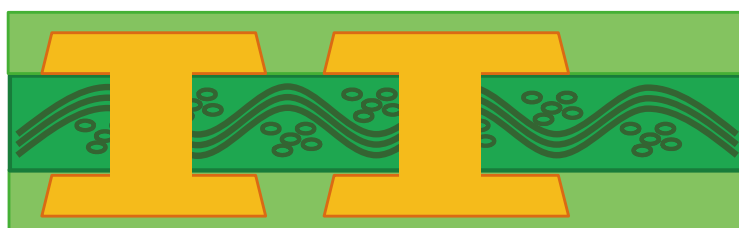
両面基板(2層板) C:SR形成

銅箔

コア材

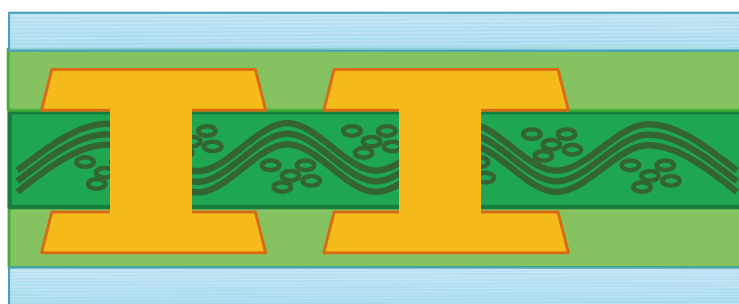
SR

10. パターン上にソルダーレジスト(SR)を張り付け/塗布。

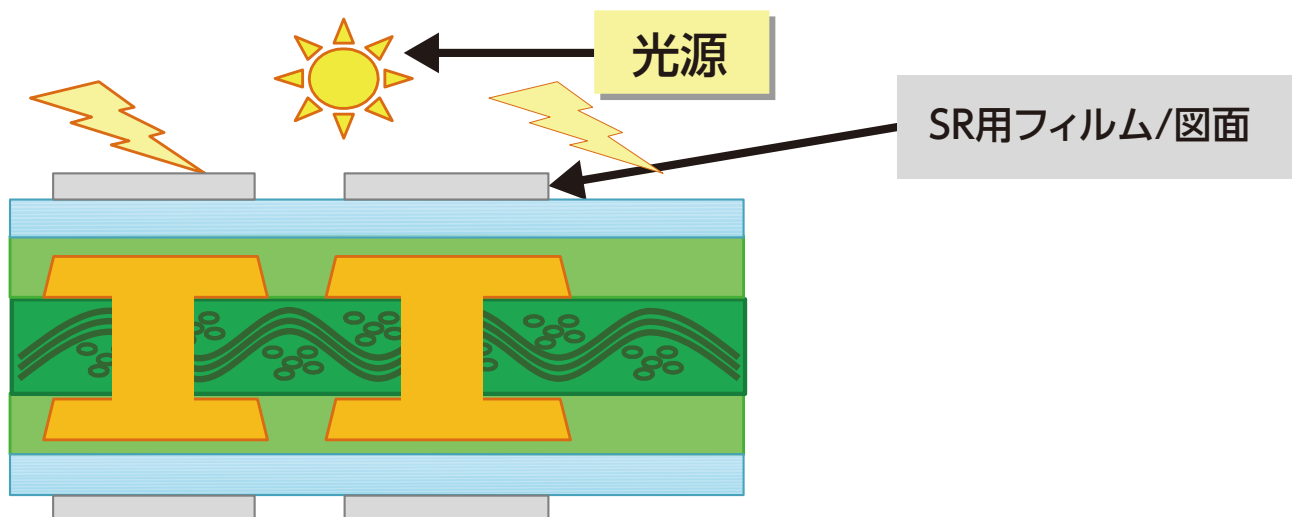


SR: 液体タイプや
フィルムタイプがあります。

11. SR上にSR形成用のレジストを張り付け。



12. SR形成用レジストをUV露光(硬化)。



基板のつくりかた

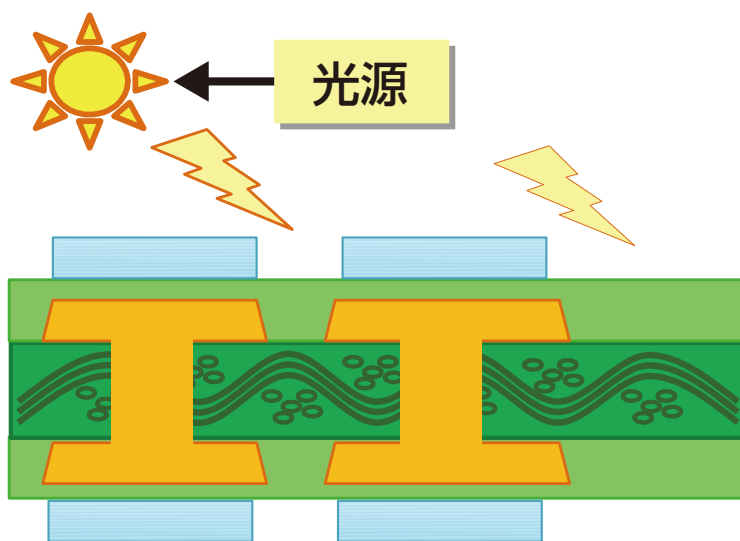
両面基板(2層板) C:SR形成

銅箔

コア材

SR

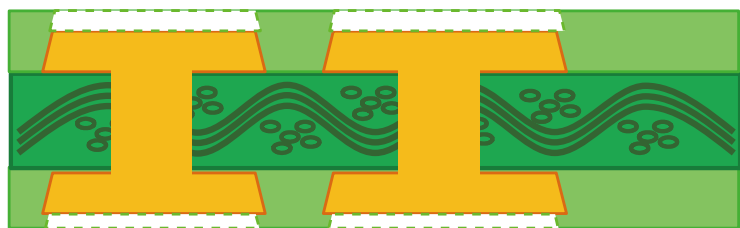
13. 残ったSR形成用レジストを元にSRを半硬化。



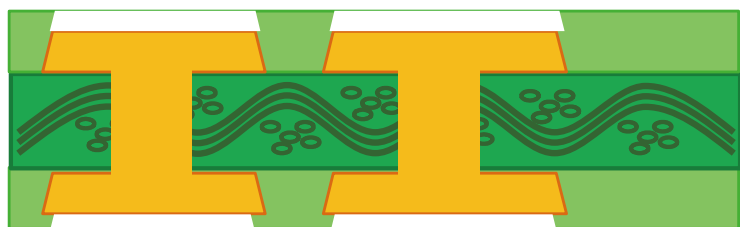
光(UV光)が
当たっている箇所が硬化し、
SRとして残ります。



14. SR形成用レジストを除去し、
更に硬化していないSRを除去、最後にSR全体を硬化。



15. SRの形成が完了。



基板のつくりかた

両面基板(2層板)D: 表面処理形成

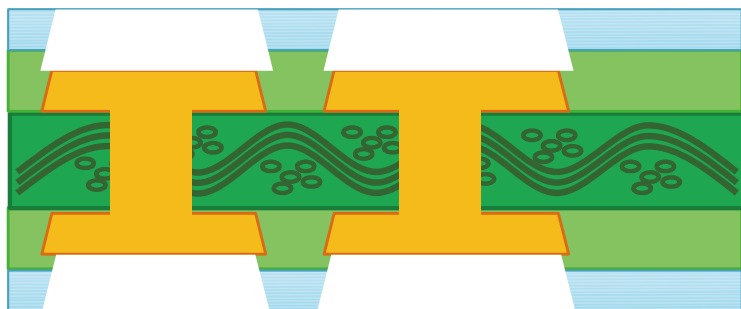
銅箔

コア材

SR

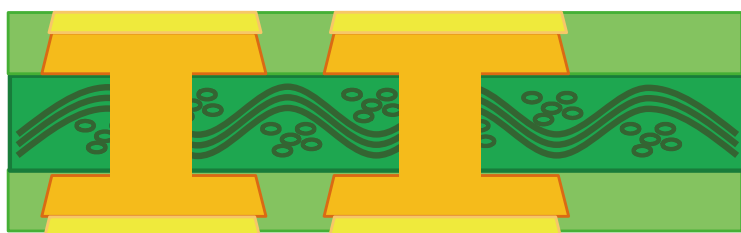
金めっき

16. **表面処理: 金めっき**を
形成するためのレジスト: 金マスクを張り付け。
(形成方法はパターンやSRと同様。)

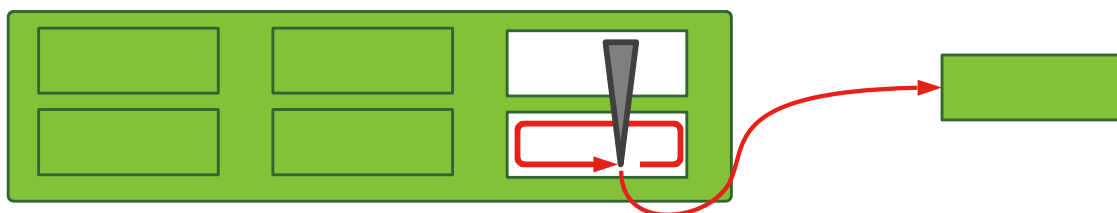


金めっきの形成方法は電解や、無電解などがあり用途や厚み指定により選択します。

17. **表面処理: 金めっき**を形成。



18. 基板をルーターにてシート外形に切り出し。



19. 後工程(検査、洗浄、梱包など)を経て出荷へ…。