DESIGN FOR MANUFACTURING 2008

“NO DESIGN FOR MANUFACTURING”

April 28, 2008

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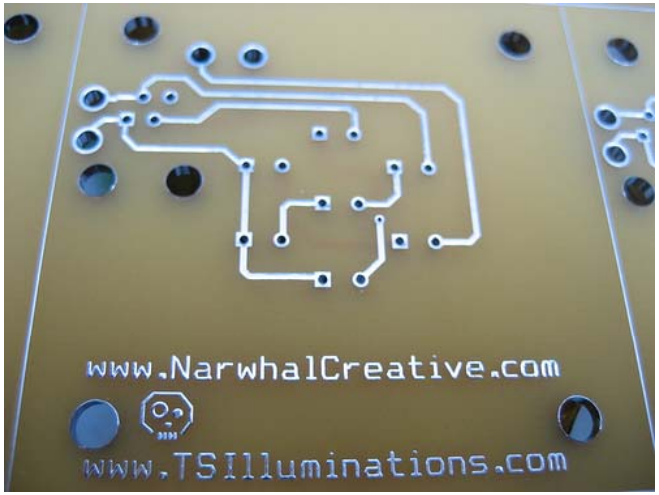
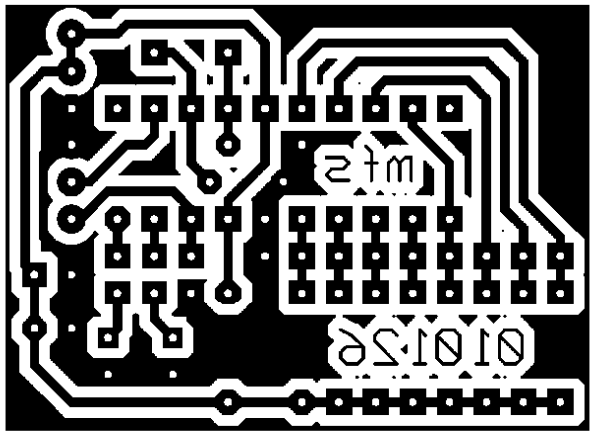
Contents

- **Introduction**
  - Concept
  - Objectives
  - Preliminary research
- **Analysis**
  - Material
  - Problems
  - Characteristics
  - Video
- **Detail Design**
  - Comparing
- **Future Work**

Introduction

- **Concept**



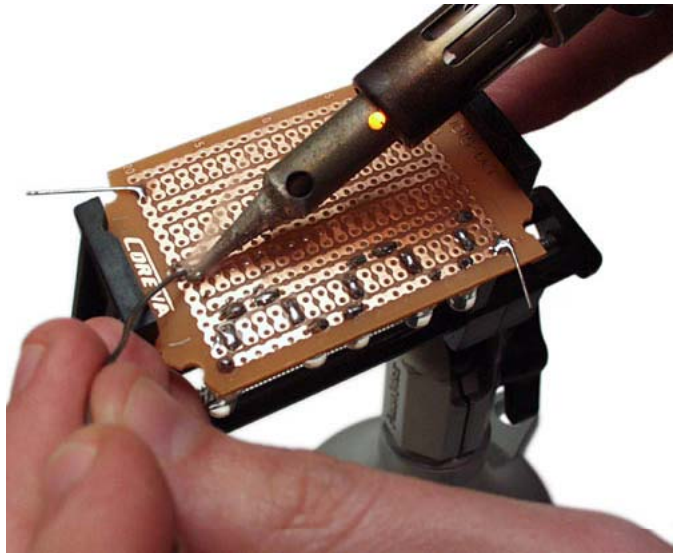


- **Electronic goods have an electrical circuit.**
- **Interconnection of resistors, inductors, capacitors, and etc.**
- **The normal circuit doesn't cross lines.**
- **Insulator on a cross point**

Introduction (cont.)

- **Objectives**
  - **Each part will be connected directly**
  - **It is not necessary to make a complex design.**
  - **New technique for an easy & fast way to make an electrical circuit.**

- **Preliminary research**
  - Solder & soldering
  - Useful in electronics and plumbing



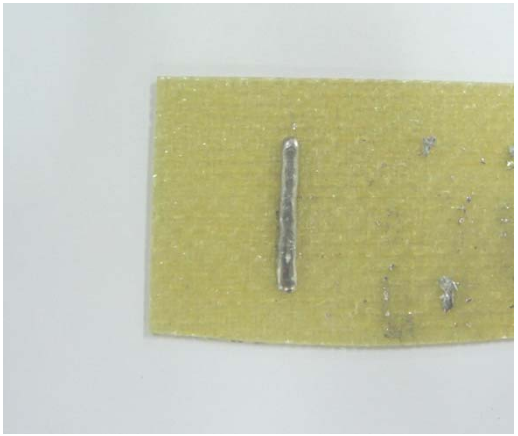
Soldering

Analysis

- **Material**

Low Temp. Lead

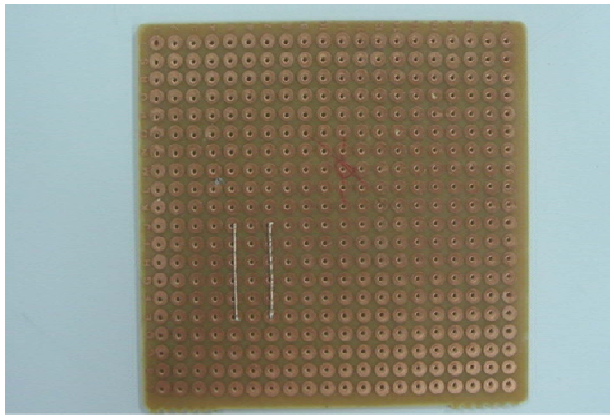
No.	Speed (mm/s)	Temp. (℃)	Pressure (Pa)	Height (mm)	Results (Bonding)
1	5	170	10	Not measured	Bad
2	6.5	160	5	Not measured	Good
3	8	160	5	Not measured	Good
4	10	170	10	Not measured	Balloon
5	15	150	22	Not measured	Bad
6	5	178	15	59	Best



Analysis

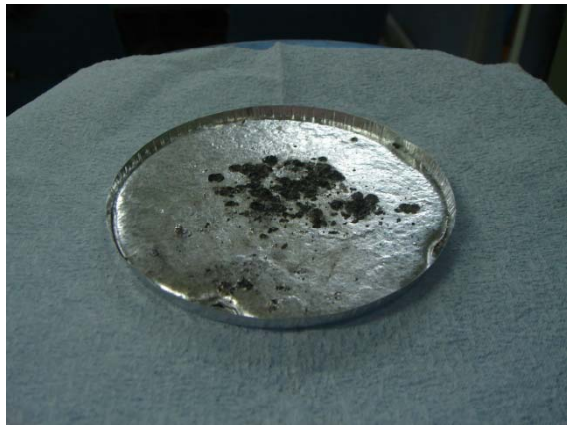
Bi 57, Sn 43

No.	Speed (mm/s)	Temp. (℃)	Pressure (Pa)	Height (mm)	Results (Flow / Shape / Bonding)
1	5	165	4	Not measured	Over flow /- / Bad
2	20	164	3	3	Flow / Balloon/ Bad
3	17	164	60	1	Flow / Thin line / Bad
4	17	164	48	1	Flow / Line / Bad



Analysis

- **Problems**



Analysis

- **Material Selection**

Solder

Materials	Melting temp.	Operation temp.	Reference
Low temp. lead	105	164	Good flow & Bonding
Soldering lead	168	220	Operation temp. is too high.
Sn, Ag lead	225	235	Operation temp. is too high.
Bi 57 , Sn 43	160	165	Good flow
Bi 70, Sn 30	164	175	Over flow or No flow

Material selection

- **Material**

•Low melting point lead

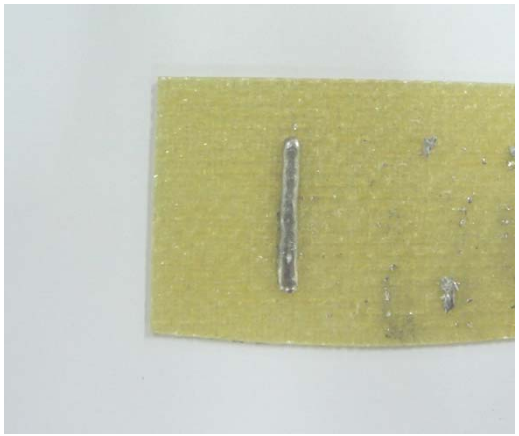
•Melting temp. : 105℃

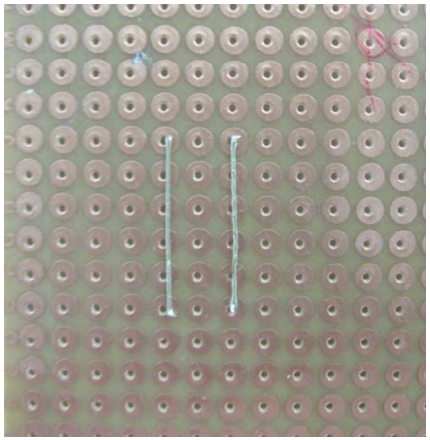
Characteristics of this material:

•Melting temperature is not high.

•Good bonding

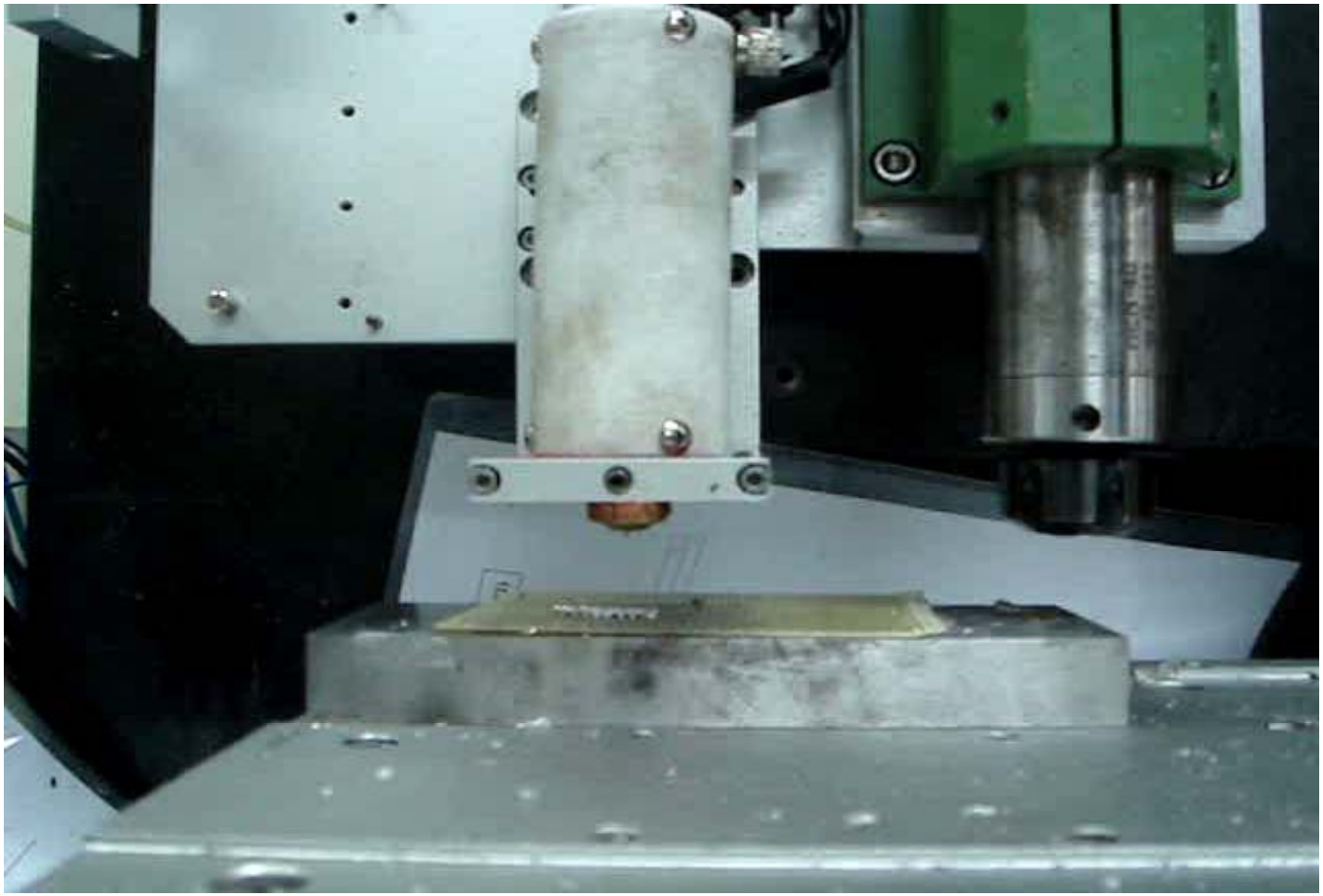
• Making lines with good thickness.





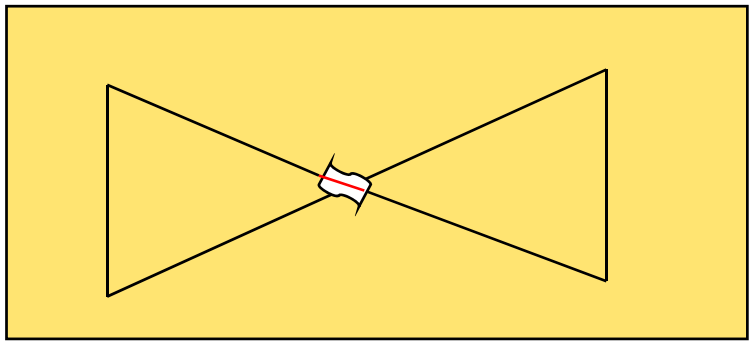
Analysis

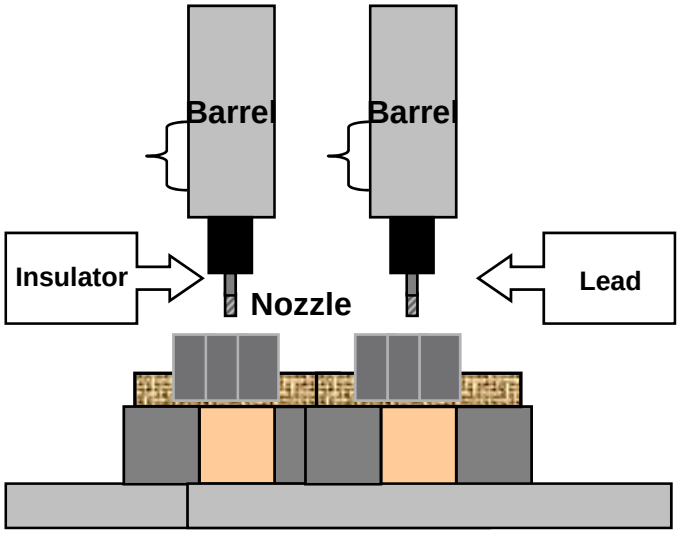
- **Video**



Future work

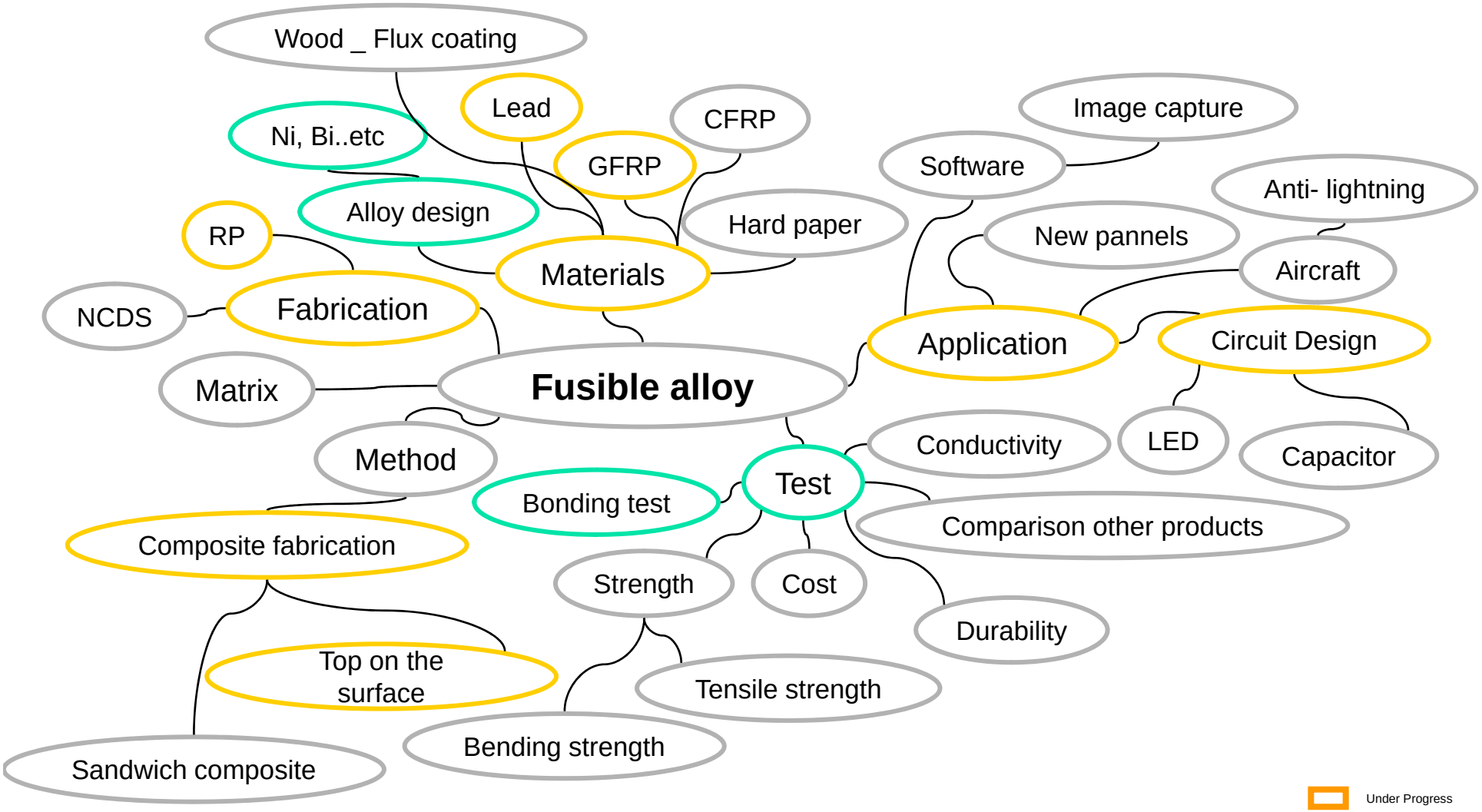
- Check the bonding on the PCB.
- Start to connect lines.
- Check the conductivity.
- Make a simple circuit and using insulator.





- **Comparing**
  - Time, Cost, and etc.

Brainstorming



Thank you