electronica

A Report on the Visit to Electronica 13/11/2024

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Leiton

- Very good reception and will to collaborate
- The project manager is also associated with a University
- Interest in technical development in general

Leiton

We received a few questions that may help moving forward:

- Wire bonding: are we using gold or aluminium for it?
- Channels for air leaking may help with avoiding bubbles on the kapton surface: can we afford them or they will spoil the flatness?
  - Note: air bubbles are quite rarely observed
- What is the nominal value of the exposed gold *semi-circle*? And what is the tolerance?
- Some of the adhesive material may come out of the coverlay and cover the *semi-circle* → provide minimum gold exposure and tolerance
  - Have we received any complaints from MACs about the semi-circle, particularly regarding wire bonding?
  - Note: we have delivered the first large batch of plates and we will know soon
- We should provide all measurements and tolerances
  - The company standard resolution of 150-200 microns
  - They can do better if needed

Bernd's Recommendations

Company	Summary of the interaction	Remark
Proto-Electronics (provider is SAFE-PCB)	not a standard product for them "use different material for polymide"	seems sound, but probably not the product we are looking for
Glück Industrie-Elektronik GmbH	switched from "not possible" to "yeah we can do it" in 2 minutes	veto
IBR Leiterplatten GmbH	Know their stuff well. "design is basic" "go with cheap production method, throw away bad ones" "wire bonding method important" "full gold (ENIG) coating cheaper than regional thin ENIG coating"	Highly recommend for further discussion
Kubatronik Leiterplatten GmbH (representative is Gatema)	"I have to talk to my engineer" but seems our design a familiar product to them	can discuss further
P.M.C. Leiterplatten Technology GmbH (together with QDOS and Suiwa as a team)	Know their stuff. Suggested laser cutting. Our design is quite usual to them.	recommend for further discussion

Other Companies We Contacted

Company	Summary of the interaction	Remark
FlexOn	Did not say much about the techniques. “how can your university pay us?”	veto
Yan Tat Group	Knows about the technical stuff. Mentioned “full gold coating is cheaper than custom local coating” Also “how can your university pay us?”	recommend for further discussion
Alba PCB	“need to talk to engineers”, “we like challenge”, “vegetable optical fiber”	veto
Elgoline	“CERN supplier” always suggesting fancy but expensive solutions. “wire bonding with soldering vs ultrasonic”, “palladium coating instead of gold coating”, or “low-power laser to only remove coverlayer and adhesive, not hurting copper”	recommend for further discussion

Summary of common feedback

- Technical discussions
  - Need information on wired bonding method (Au vs Al vs Cu wire, and soldering vs ultrasonic) to understand the material to use and the best way to treat it (LeitOn, IBR, Yan Tat, and Elgoline)
  - Laser cutting is good for small batch production. Nominal tolerance from laser 150 - 200 microns (LeitOn, Yan Tat, and P.M.C.)
  - The choice of kapton material. Some companies are more used to different polymide material (SAFE PCB, Glück, Elgoline)
  - Carbonization of material from laser cut. (LeitOn said the edge of kapton could carbonize. Elgoline said only the adhesive carbonizes, not the kapton)
- Business-related
  - Many representatives were not technical experts.
  - Some concerned about payment through university (probably slow?)
  - Instead of saying “we do not know how to do this”, they usually say “I think it can be done. Please send details to our engineer.”

Information on Kapton and baseplate measurement

How LeitOn does it

- A microscope with tick marks in the field of view plus a platform with precise motion control
- Move the platform and record the distance moved
- Good precision, but very slow

From Keyence

- IM-8000, exactly the machine to do the optical measurement we have in mind
- Very expensive, 40K-75K

BACK-UP

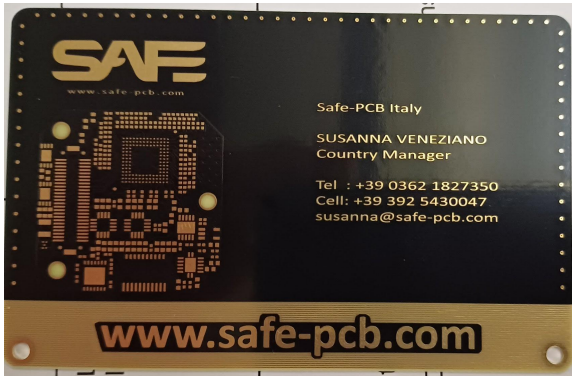
BERND'S RECOMMENDATIONS

Proto-Electronics

They re-directed us to SAFE-PCB

“We use non-standard material for kapton”

The kapton foil design did not seem a product they have really under control



Glück Industrie-Elektronik GmbH

“We have no idea what you are asking for”
“We will need ten thousand pieces”
“We can do it”

Not really the best impression

IBR Leiterplatten GmbH

“Tolerances are not a problem: we produce more and throw away the bad ones”

They seem competent and happy to collaborate on a research project:

- They say the design we propose is not complicated or highly unusual
- They wanted to know more about the wire bonding
    - Good sign :)
- They suggest that full gold (ENIG) coating is cheaper than regional thin ENIG coating

Kubatronik Leiterplatten GmbH

“I have to talk to my engineer”

It seems like the design we propose is something they can do

P.M.C. Leiterplatten Technology GmbH

“You will pay by the number of kapton foils”

They seem competent and say the design can be produced

- They suggested using laser cutting, at least for the first pieces
- They said that the polymide and coverlay we presented in the design is their standard

SOME ADDITIONAL COMPANIES WE TALKED TO

Yan Tat

“How will the University pay us?”

They looked competent and asked some questions and gave suggestions about the wire bonding. E.g., full gold coating is cheaper than custom local coating

Flexon

“How will the University pay us?” (Bis)

Not much more than that

Elgoline

“We are a CERN supplier”

Eager to collaborate and show off, but seem competent

- They had a very large piece (~0.5 m) of kapton used in the ATLAS pixel detector
- They suggested solutions which are probably overkill
  - E.g., to expose the copper semi-circles, they plan to cover everything and then remove the excess of kapton with laser pulses
- They gave us chocolate with a big CERN logo on top

Alba PCB

“We use vegetable fiber optics”

The representative was not an expert, but found our design unusual

- He wanted to talk with the company engineer
- Claimed they like challenges