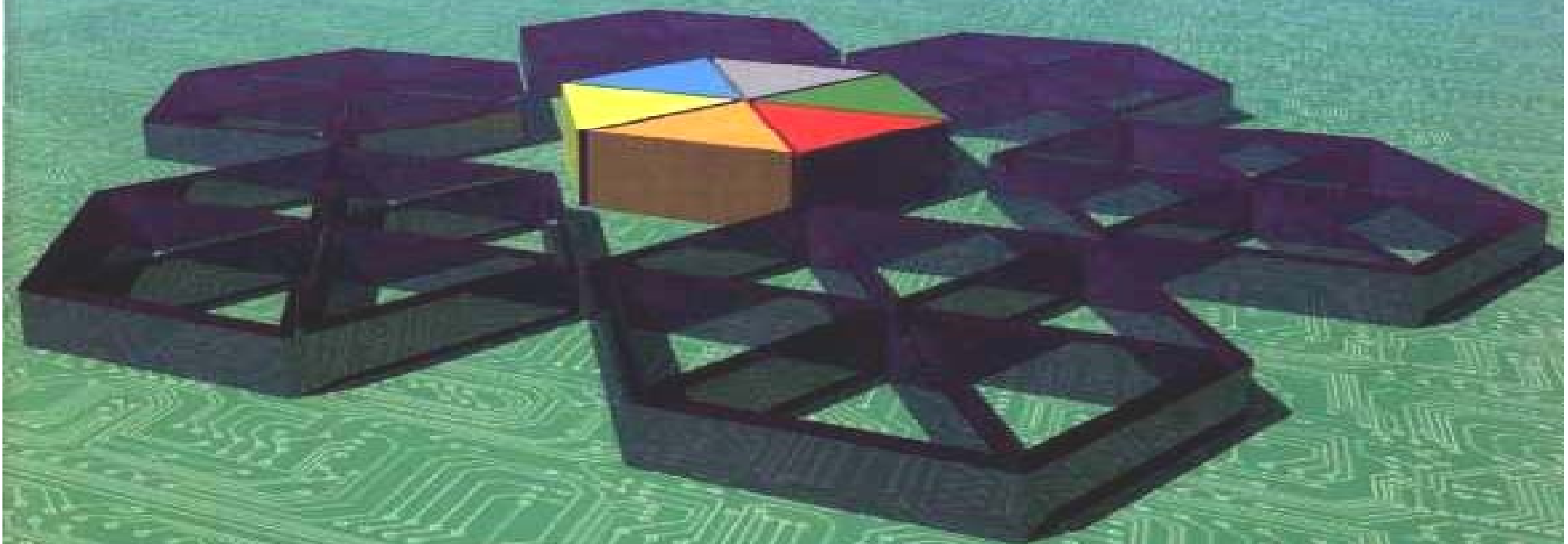


2nd RD51 Collaboration meeting

13 –15 october 2008

Groupe CIRE



History

Thanks to a active politic of external growth and investment in R&D equipments, CIRE became one of the European leaders in PCB production, offering the wildest range of product and technologies on the market.

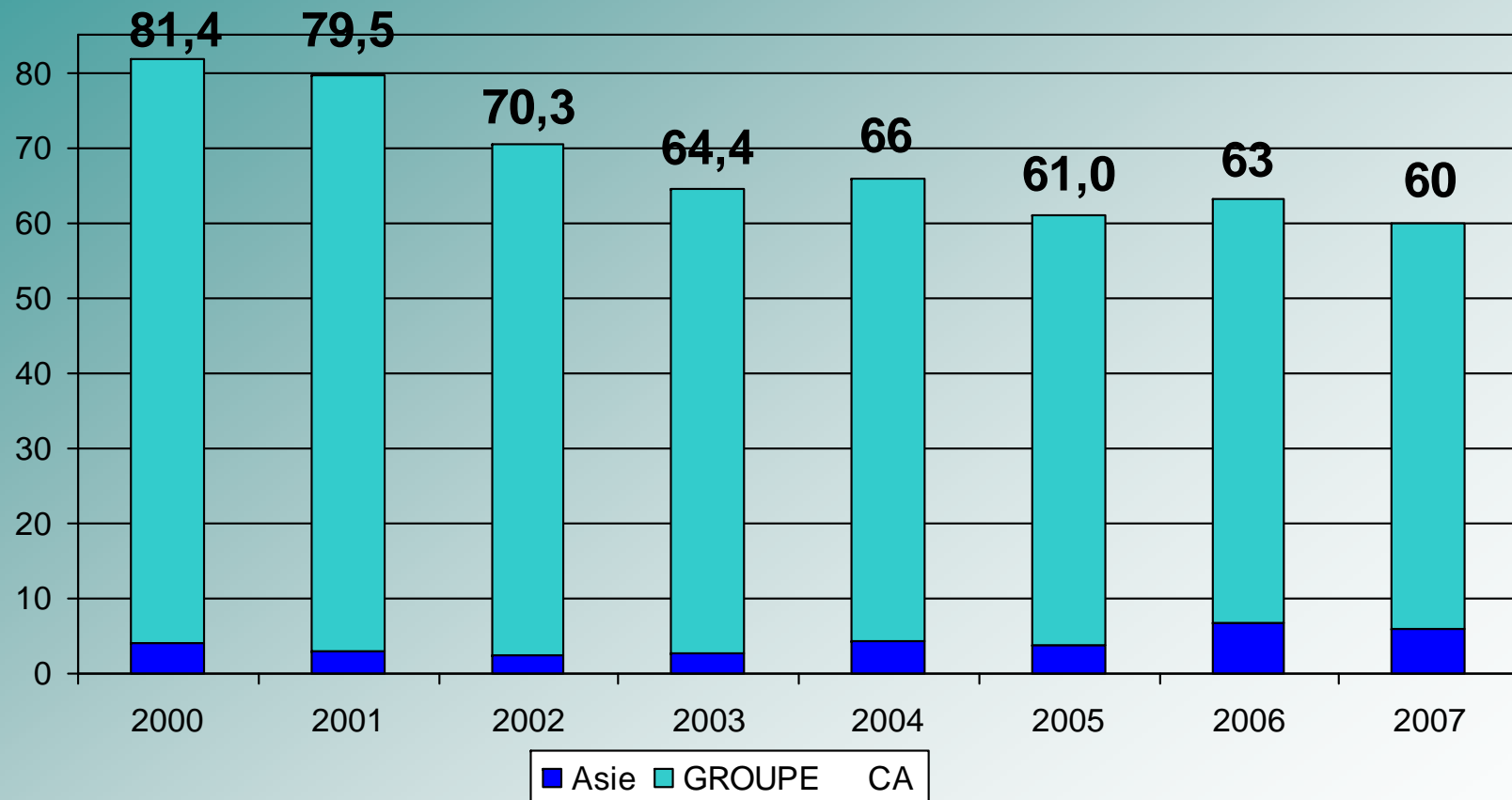
N°1 in French market, CIRE is actually N°7 in Europe .

- 1970 Creation of SGCI in Bellegarde
- 1979 Creation of SPCI in Paris
- 1984 Creation of BREE in Pithiviers
- 1986 Creation of CIRETEC in Orléans
- 1989 Bought of CIREA to THOMSON Group in Cholet
- 1991 Creation of BREE INDUSTRIE in Puiseaux
- 1996 Bought of PLANTIN in St Benoît (Chambéry)
- 1997 Bought of SIFELMET in Chalon S/Saône
- 1999 Bought of CIREP to THOMSON Group in Toulouse
- 2002 Creation of CIRE GmbH in Francfort
- 2002 Creation of sales department in Italie
- 2005 Creation of sales department in UK

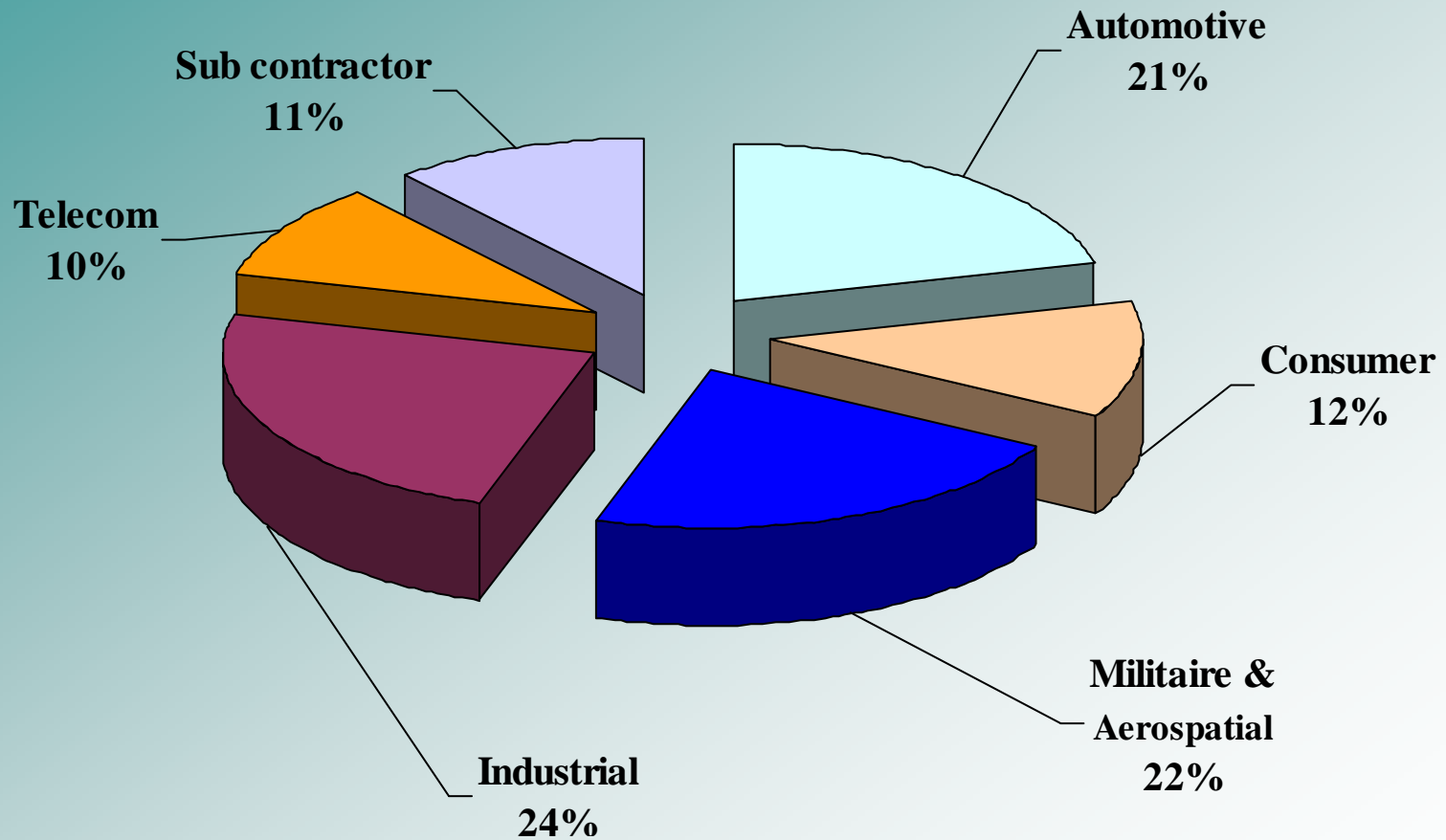
Key numbers

- 1st PCB French manufacturer - 7th European
- Turnover : 60 M€
- 540 employees
- 8 production plants
- Production : 80.000 m²/mois
- Investments : Average 7 %
- Export : # 30 % (1st Pcb exporting company of French market)
- Member of « Pôles de compétitivité » : Aérospace Valley & Sciences et Systèmes de l'énergie électrique

CA (M€)



Market turnover



Customer Top 20

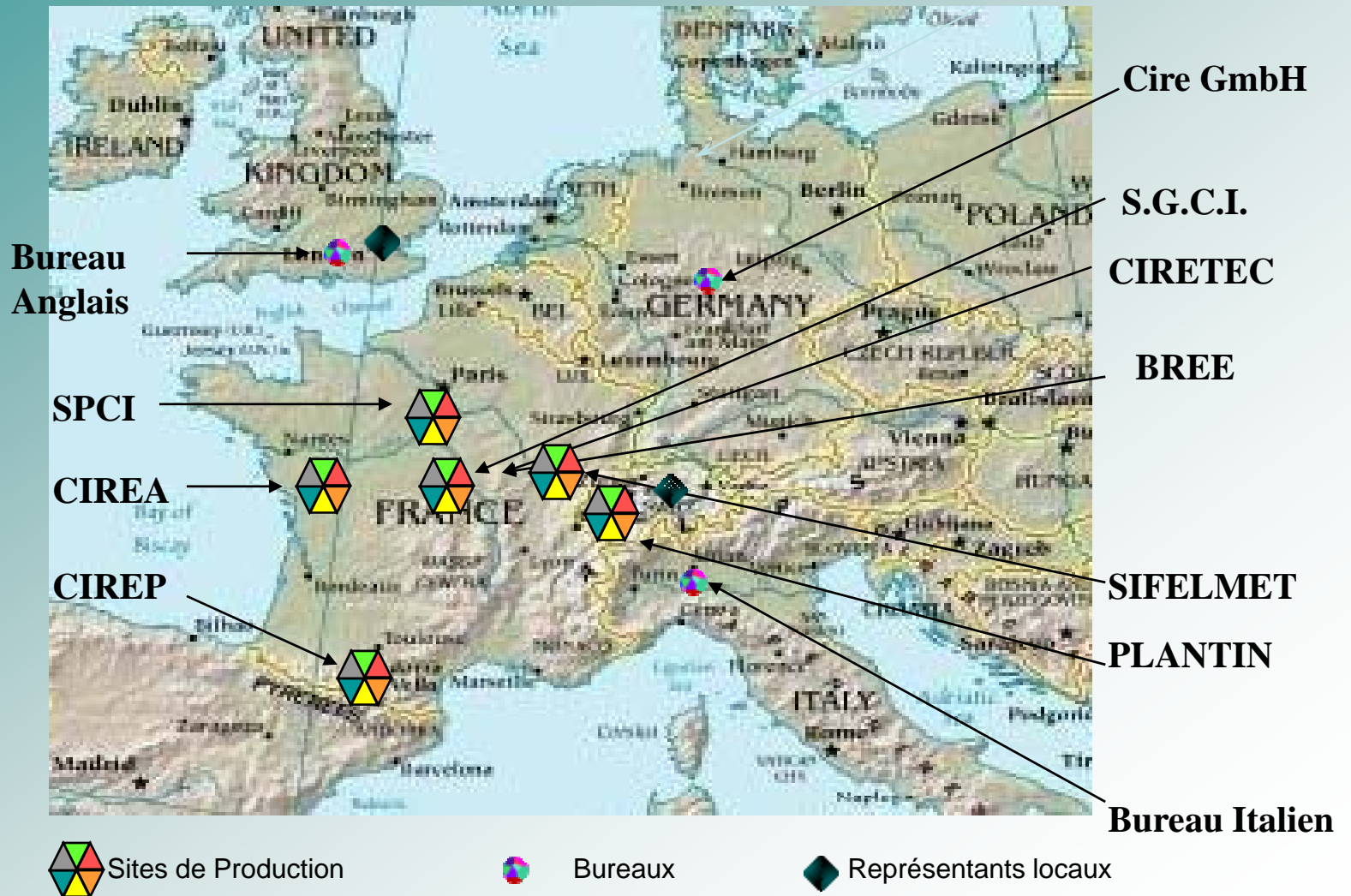
1. THALES
2. JOHNSON CONTROL
3. MAGNETI-MARELLI (Italie)
4. SCHNEIDER
5. ASTEEL
6. EPIQ
7. NCF
8. FORD-VISTEON (UK)
9. EADS
10. CADMIC OY (Finlande)
11. TRONICO
12. SELHA FABELOR ACE
13. EOLANE
14. SOLECTRON
15. INTERTECHNIQUE (Zodiac)
16. Groupe SAGEM
17. INVENSYS
18. MAT EQUIPEMENT
19. LEROY SOMER
20. DELTA DORE

Qualifications

- ESA
- CNES
- NADCAP
- ISO 9001 v 2000
- UL
- TS16949

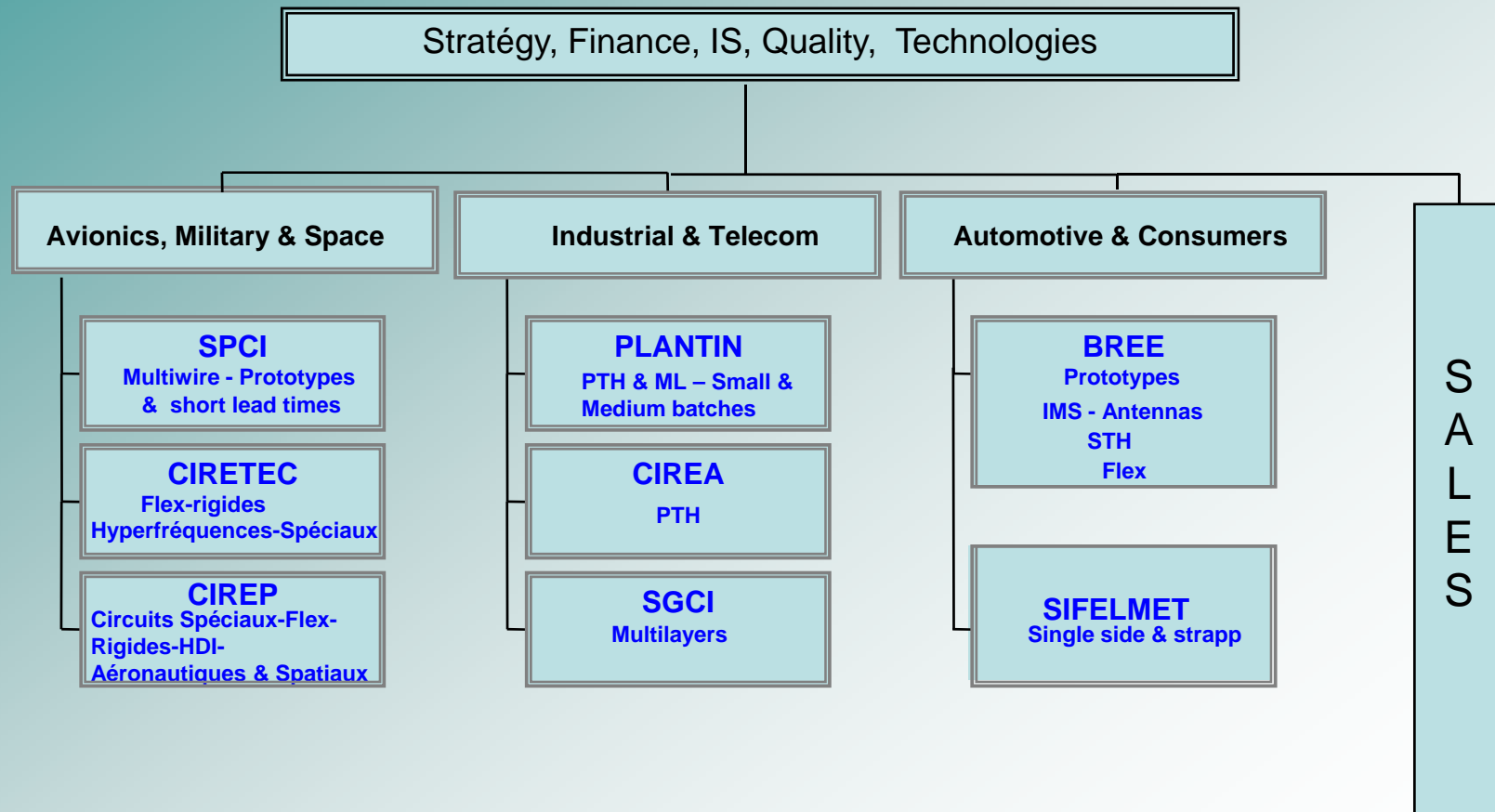


CIRE Group



Organization

An adapted organization to the flexibility and responsiveness of electronic European market



To summarize

- CIRE is a network of 8 facilities specialized in technologies and dedicated to part of the market or type of service.
- Each company has his own strategy and his .
- Le Groupe assure le financement et la coordination des stratégies marketing et industrielles, les investissements, les achats, la relation clients, la gestion des connaissances et la fertilisation croisée.
- Le service Commercial intervient comme une société de commercialisation interne, opérant pour les 8 sociétés et offrant une interface unique pour les clients.

Stratégie d'entreprise

VISION : « Être Le Fournisseur de Référence de l'Industrie Européenne »

OBJECTIFS :

- Consolider le Leadership Européen « Multi-Technologies »
- Croissance annuelle : > 10%
- Capacité d'autofinancement : > 10%

AXES DE DEVELOPPEMENT :

- Les niches « européennes » à forte croissance (Mil-Aero-Space, Automobile « fiabilisée », Électronique Industrielle, Médical, Sécurité ...)
- L'excellence opérationnelle dans le positionnement « high mix, low/medium volume, high tech, service-client »
- L'innovation technologique
- Le développement du potentiel humain du Groupe
- L'accroissement du portefeuille-clients Export
- Le développement « opportuniste » de partenariat « low cost »

En résumé :

- Une gamme complète de technologies pour accroître votre créativité
- Une capacité d'assurer un appui technique à votre département d'études :
 - Conception de nouveaux circuits
 - Solution alternative pour une réduction de coûts
- Réactivité, flexibilité et fiabilité pour garantir votre chaîne logistique
 - Avec des produits de haute qualité
- Coûts maîtrisés grâce à la performance et à la qualité
 - Des maquettes, prototypes, petites et moyennes aux grandes séries

Projets R&D

« **Buried power supply boards** » (CIRETEC)

« **EMC-PACK** » (CIREP)

« **LED Lighting** » (BREE)

« **PCB 2** » Buried passive components
Pôle Aerospace Valley – Chef de projet : CIREP

« **HDI 'spatial'** » (CIREP) - partners : Esa, Cnes

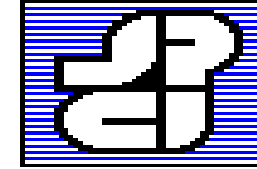
« **HDI 'A 350'** » (CIREP) - partner : Airbus

« **Optical fiber boards** » (SPCI) – partners : Astrium –Thales

« **Micromegas Bulk** » (SPCI) – partner : CEA

Printed Circuit Board

Protoype & Multiwire



S.P.C.I.

Employees = 50

Production area: 2200 m²

Activity: - PTH (prototype – less than 1m²)
- ML (prototype – less than 1m²)
- Multiwire

Expertise: - 100 μ line & space
- ML up to 20 layers
- carbon contact
- pressfit
- Blind & buried holes
- Controlled Impedance

Production capacity: 600 m² / month
15 new files / day

Lead time: 5-10days (PTH & ML) standart
2-3 days (PTH) 3-5 days (ML) short

Quality: UL 94V0
CNET
ISO 9001 v2000



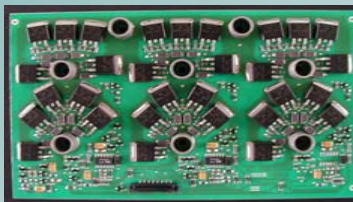
Industrial Medical



Market applications

- Rail transportation
- Energy
- Automation
- Medical intensive care
- Professional camera

Products



Customers

- ALSTOM
- SCHNEIDER ELECTRIC
- LEGRAND
- CSEE
- CROUZET
- LEROY SOMER
- GE HEALTHCARE
- GRASS VALLEY

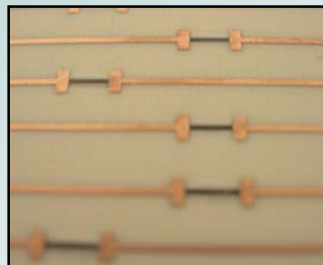
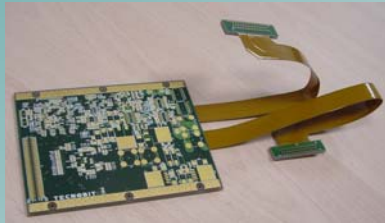
Military



Market applications

- EUROFIGHTER flight control
- RAFALE
- NH90, TIGRE
- Radar, Active Array
- Missiles, tank
- Equipment for advanced soldier

Products



Customers

- GALILEO AVIONICA
- INDRA
- THALES
- MBDA
- HISPANO SUIZA
- ZODIAC
- SAFRAN
- EADS
- BARCO

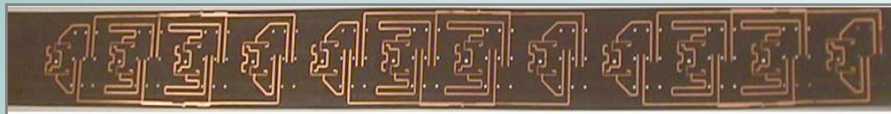
Avionic



Market applications

- Flight control units (Long Range)
- Warnings
- Air Traffic Management
- Aircraft anti collision (TCAS)
- Engine control
- Cockpit display

Products



Customers

- AIRBUS
- VIBROMETER
- LATECOERE
- EUROCOPTER
- THALES AVIONICS
- TEAM

Printed Circuit Board

ML & DSPTH low volume



PLANTIN Employees = 60
Production area: 2500m²

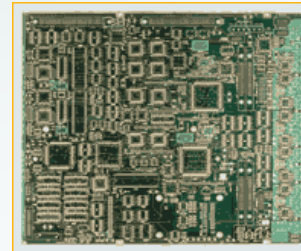
Activity: - DSPTH
- ML

Expertise: - 170 μ line & space
- ML up to 10 layers

Production capacity: 2 000 m² / month
20 new files / day

Lead time: 3 weeks standard
2 weeks short

Quality: UL 94V0
Cnet
ISO 9001 v2000





CIREA	Employees = 68
Production area: 3000m ²	

Activity: - DSPTH
- DSPTH on Aluminium

Expertise: - High density 150µm
- Drilling 300µm
- Thickness 0.2mm
- Carbon keys
- Peelable

Production capacity: 3 000 m² / month
10 new files / day

Lead time:	3 weeks standard 1 to 2 weeks short
-------------------	--

Quality: UL 94V0
Cnet
ISO 9001 v2000



S.G.C.I.

Employees = 95

Production area: 4500m²

Activity:

- ML up to 20 layers
- 10 days for MC8+ from 1 to 5 sqm

Expertise:

- High Density (100µm)
- Microvia (100µm)
- Carbon Keys
- Peelable mask
- Press-fit back plane
- Controlled impedance
- Buried and Blind holes

Production capacity: 3 000 m² / month
 20 new files / day

Lead time: 2-5 weeks standard

Quality: UL 94V0

Cnet

ISO 9001 v2000



CIRETEC

Employees = 60

Production area: 2250 m²

Activity: - ML

- Flex
- Flex-Ridig
- HF PCB (40% Production FR & HF)
- All types of internal and external heat sink

Expertise:

- 80 μ line & space
- micro vias 100μ
- Blind and buried holes
- Controled impedance
- Pressfit
- Plasma

Production capacity:

800 m² / month
8 new files / day

Materials: Polyimide, FR4 HTG, Teflon, Kapton, Aramid, Cyanate Ester, BT.

Lead time:

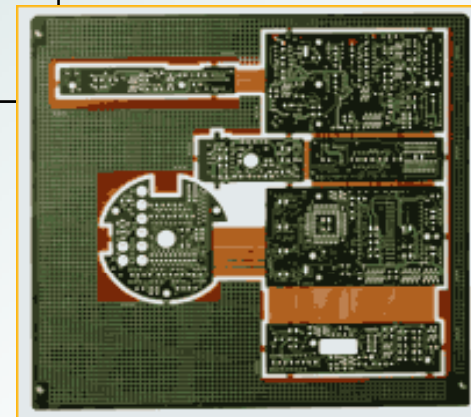
3-4 weeks standard
2 weeks short

Quality: UL 94V0

Qualifas

Cnet

ISO 9001 v2000



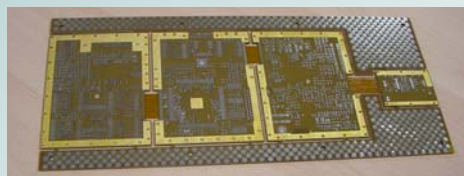
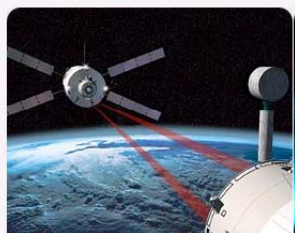
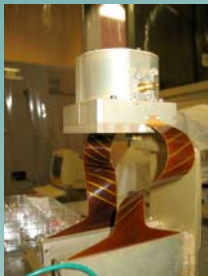
Space



Market applications

- Satellites
- Launcher
- Scientific experience
- Earth observation

Products



Customers

- EADS ASTRIUM
- SODERN
- CEA
- ALCATEL ALENIA SPACE
- CESR

Printed Circuit Board

Rigid-Flex for Space & Avionic



CIREP

Employees = 54

Production area: 4000m²

- Activity:**
- ML
 - Flex
 - Rigid-Flex
 - All types of internal and external heat sink
 - Big panels (>2.5 meters)


- Expertise:**
- 100 μ line & space
 - laser micro vias 100 μ
 - Blind and buried holes
 - Controlled impedance

- Materials:**
- FR4, Kapton, HTG Polyimide, Cyanate ester, BT Epoxy, Thermount, PTFE ...

Production capacity: 800 m² / month
8 new files / day

Lead time: 4 weeks (Flex-Rigid) 3 weeks (ML) standard
2-3 weeks (Flex-Rigid) 1-2 weeks (ML) short



- Quality:** UL 94V0
ISO 9001 v2000
 CNES
NADCAP
ESA (in qualification)
EN/AS/JISQ/9100:2003

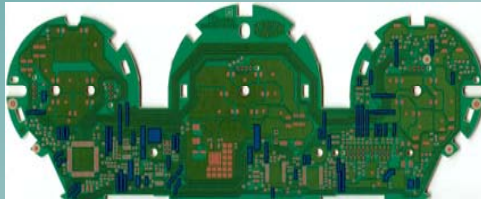
Automotive



Market applications

- Fuel injection controller
- Lighting (IMS technology)
- Cluster
- Air conditioning
- Multimedia

Products



Customers

- ACTIA
- BOSCH
- DEMO
- DELPHI
- EATON
- GRUNDING
- HELLA
- JCAE
- L'ELECTRIFIL
- MAGNETI MARELLI
- NIPPON SEIKI
- SIEMENS VDO
- TRW
- VALEO
- VISTEON
- WHERLE



B.R.E.E. Industrie

Employees = 75

Production area: 3300m²

Activity:

- STH (Small & Medium & High Volume)
- SS & DS, nonplated
- Printed Silver RFID Antenna
- Flexible Material
- Polymere vias Ag
- IMS

Expertise:

- 200 /180µ line & space
- carbon, copper shielding
- silver links, carbon & copper
- silver & copper via
- silver antenna
- High pot test

Production capacity: 18 000 m² / month
5 new files / day

Lead time: 4 weeks standard



Quality: UL 94V0

TS16949

ISO 9001 v2000

VALEO1000



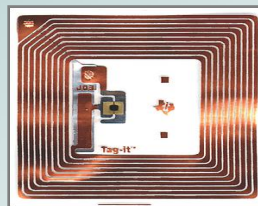
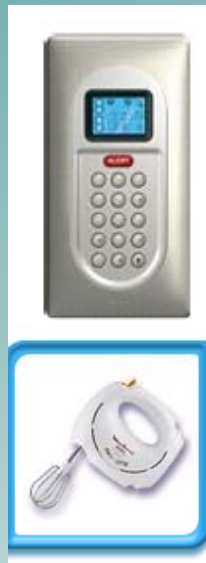
Consumer



Market applications

- Home automation
- White/brown products
- Safety systems credit cards
- RFID

Products



Customers

- DELTA DORE
- INVENSYS
- MOULINEX SEB
- SAGEM
- ELECTROLUX
- GE PROCOND
- ELCO BRANDT



SIFELMET

Employees = 68

Production area: 3000 m²

Activity: - SS

- SS Cross-over
- Medium & High batches

Expertise:

- 200 μ line & space
- carbon, copper shielding
- carbon resistiv
- carbon contact
- copper & silver links
- Leadfree HAL

Production capacity:

25 000 m² / month
5 new files / day

Lead time:

3 weeks standard
2 weeks short
(E.I. 5 working days)

Quality: UL 94V0

ISO 9001 v2000

valeo 1000



LOW COST PCB MANUFACTURING PARTNERSHIP

Automotive and Consumer Partner (China)

Activity: -SS and STH
- Medium & High batches

Industrial Partner (Taiwan)

Activity: - DS and ML
- Medium & High batches

Projet
Qualité Totale CIRE
et FILIALES

Principes

ISO 9000 v 2000 ⇒

~~Systeme de Management
de la Qualite~~



CIRE+Filiales ⇒

Qualite du Systeme de



Management



Strategie & Processus

Plans d'actions & travail
d'equipe

Reportings

Pilotage filiales

- Par objectifs déclinés de la stratégie CIRE (travail d'équipe)
- Connus et partagés par tout le personnel
- Simplification et adaptation de l'organisation à la stratégie

- Supports :

	revue	recommandée	minimum
✓ Plan stratégique		1/mois	1/2mois
✓ Revue de processus		1/mois	1/mois
✓ Revue de direction		1/mois	1/2mois
✓ Revues de chantiers		1/semaine	1/mois

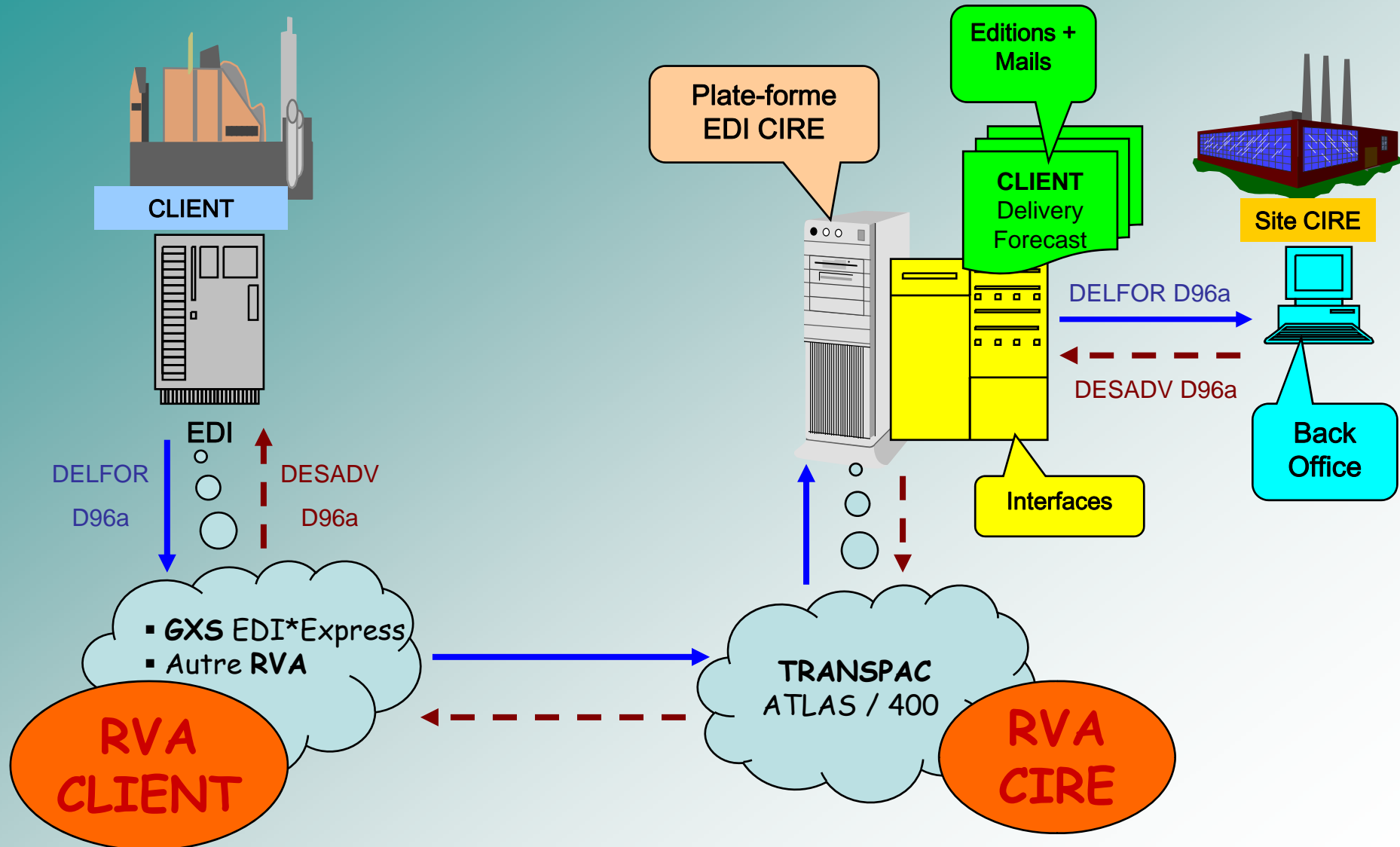
Chantiers / QOS

Objectifs ⇒ Chantier ⇒ Résultats et pérennisation



Sté	Secteur	Objet	fin	%	commentaires
SGCI	Détourage	Réduction NQ De 1,2% à 0,4 %	avril	70	36 points identifiés– mesures faites – déjà une réduction de 60% des rebuts (0,4% atteint). Solutions en cours Gains prévisible : 100 k€/an
SGCI	Perçage	Amélioration perf : de 100 m ² / j à 150 m ² /j	mars	50	30 points identifiés – mesures faites – déjà 10 heure de travail gagnées par semaine – solutions en cours Résultats stabilisé à 145 m ² / j en mai
SGCI	FAO/final	5S	mars	70	Grilles réalisées – Audits en cours
SGCI	Commercial	Amélioration perf	mars	80	15 points identifiés - solutions en cours
SGCI	Direction	Pilotage par processus	juin	60	MAQ réalisé, Revues démarrées, 1ere revue de direction faite. 2ème en juin.

Architecture EDI CIRE- CLIENT



La GPAO du Groupe CIRE

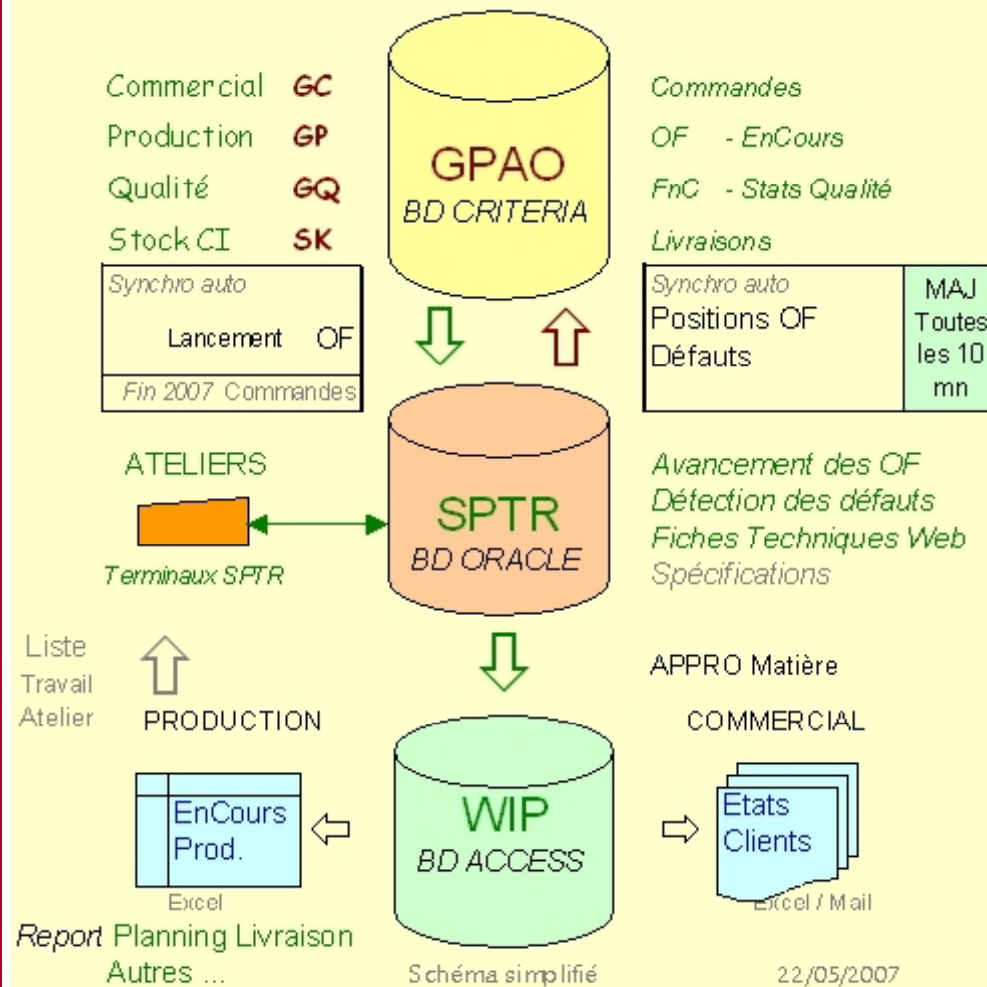
GPAO

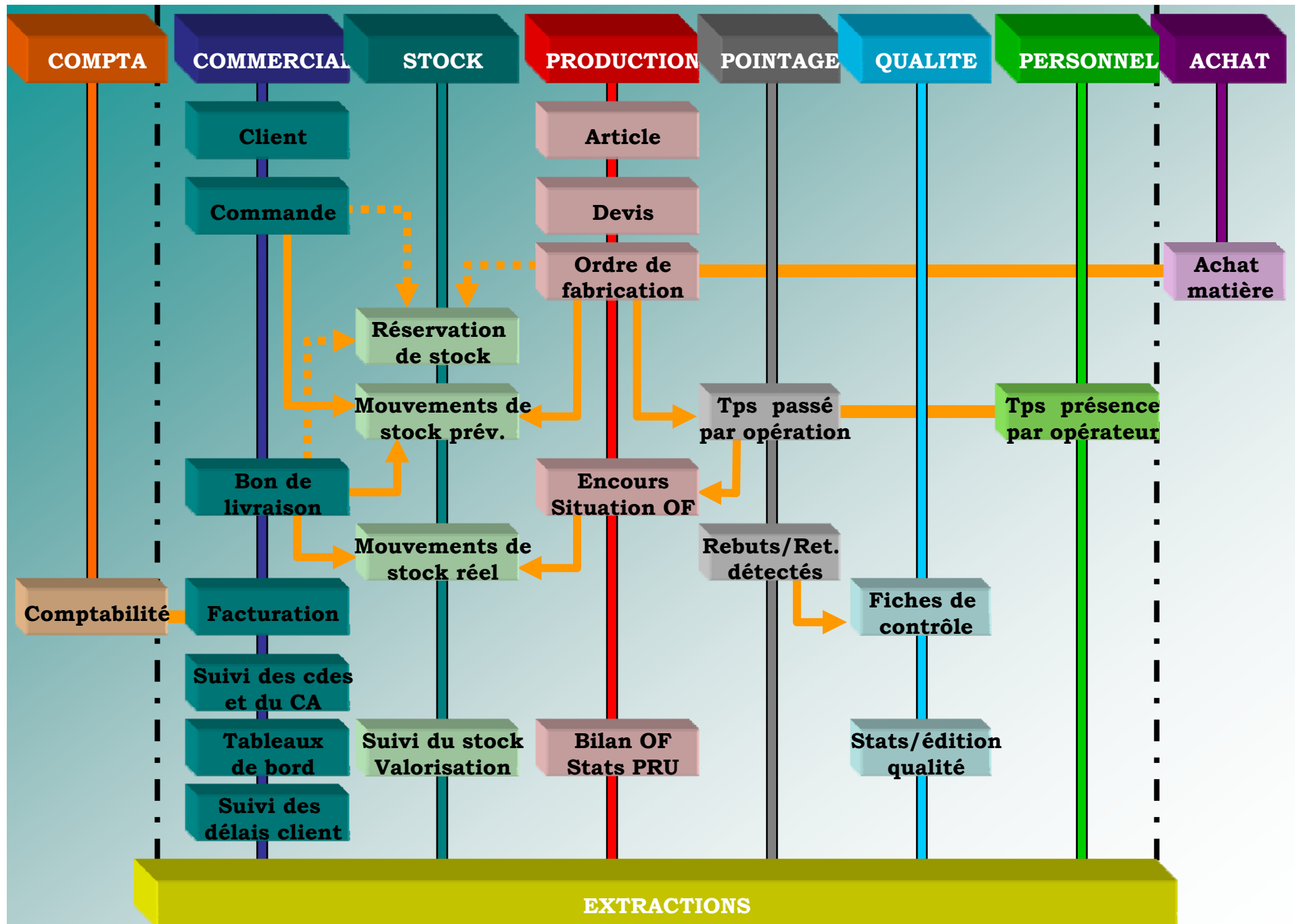
- Ventes
- Production
- Qualité

Les Atouts du SI CIRE

- Temps Réel
- Performance

Modèle SI CIRE : GPAO + SPTR + WIP





Avionic



Military



Space



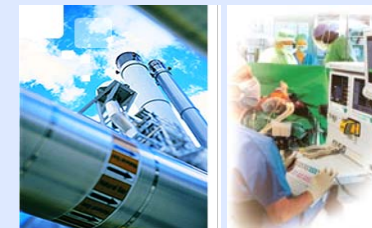
Consumer



Automotive



Industrial Medical



Advanced Technologies for high density PCB application

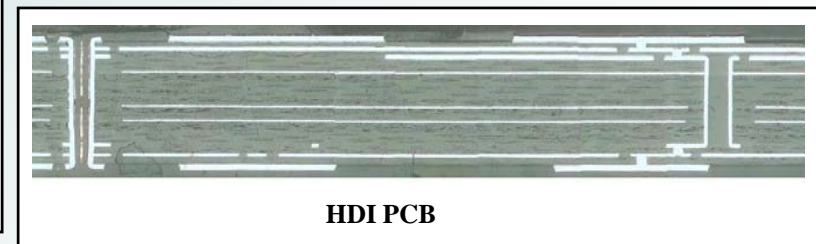
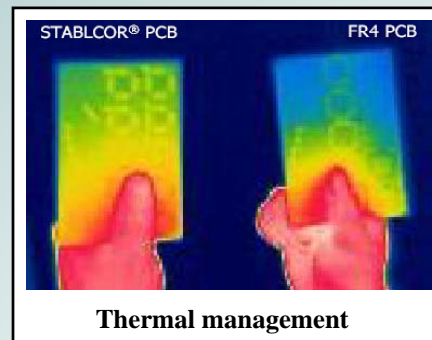
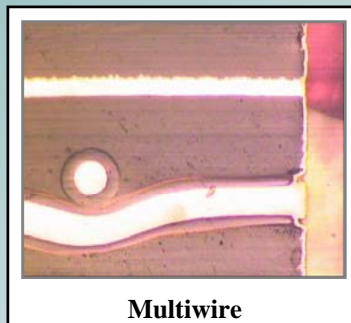
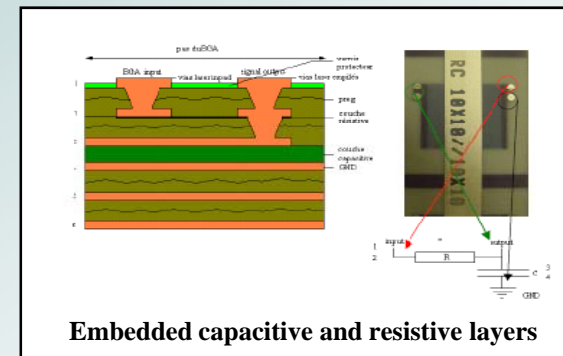
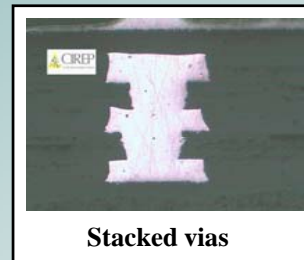
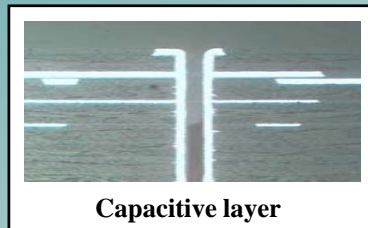
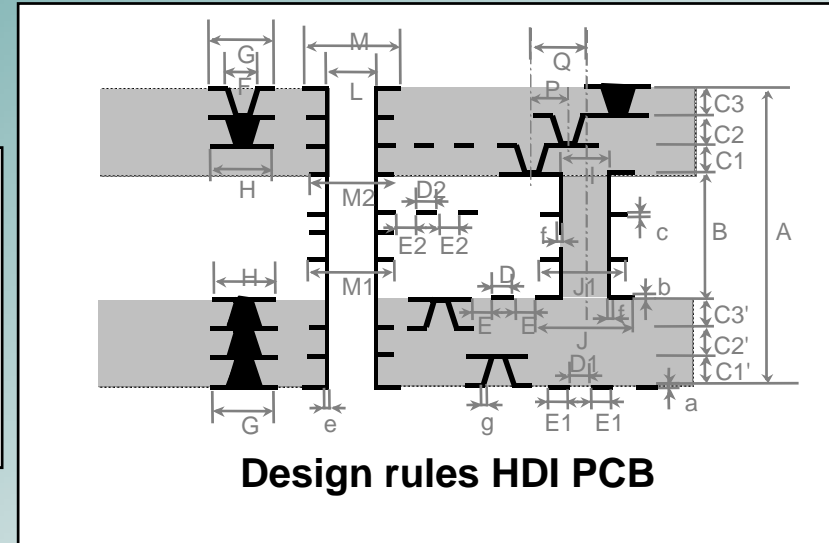
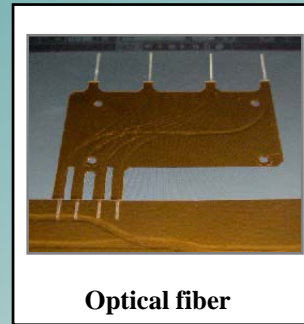
EMC Compliant Heterogeneous Systems

Interference with portable devices Interference with mobiles

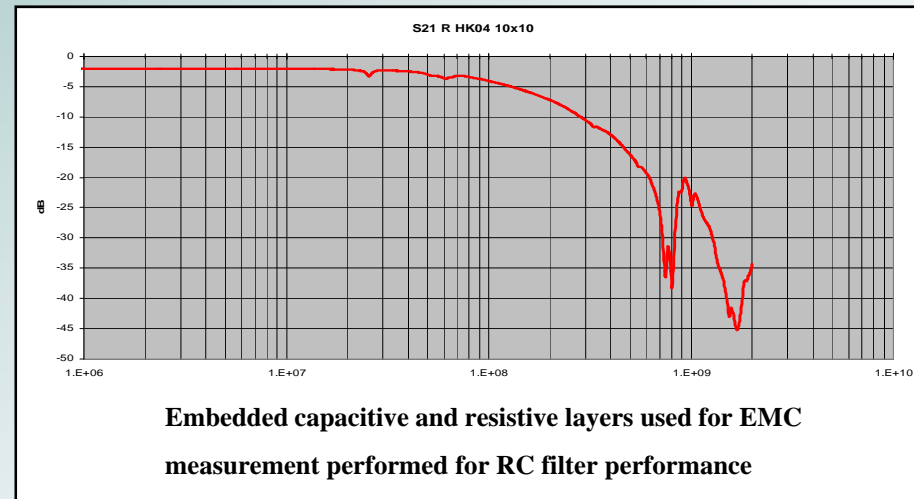
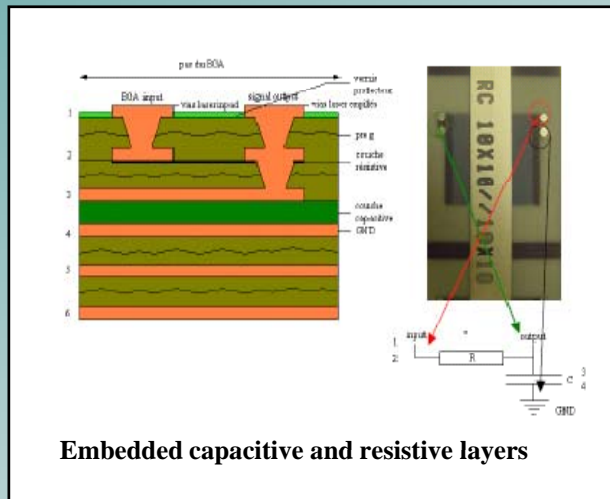
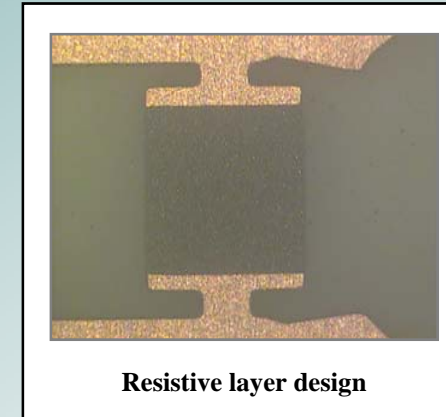
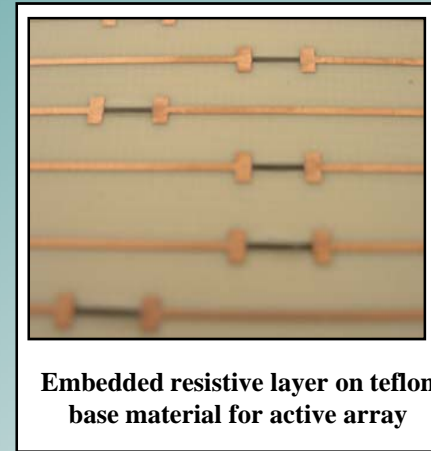
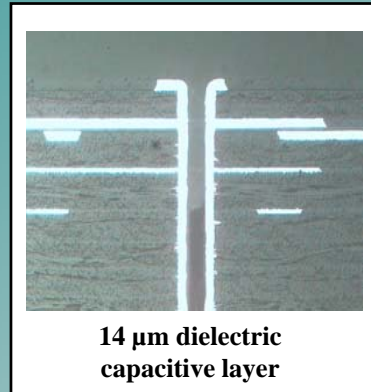
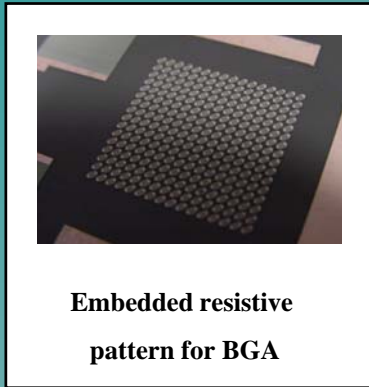
Interference Radar AntiCollision bag, ABS,.....

Similar EMC problems in aerospace

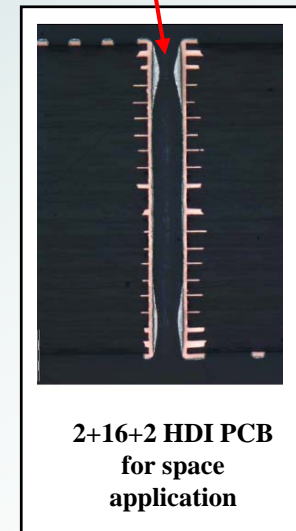
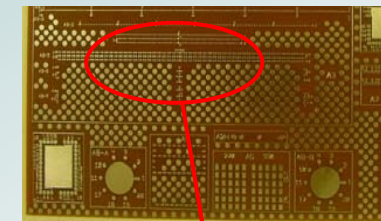
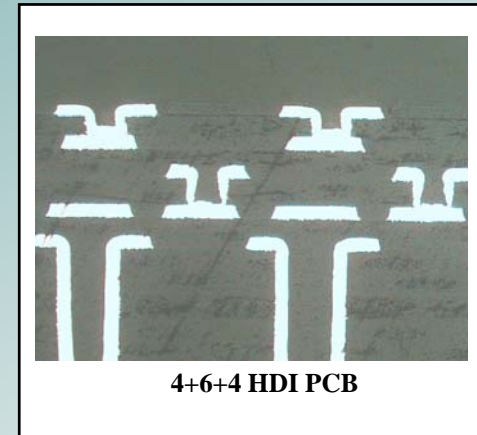
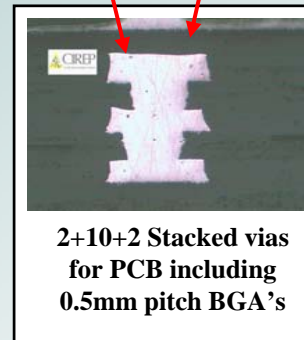
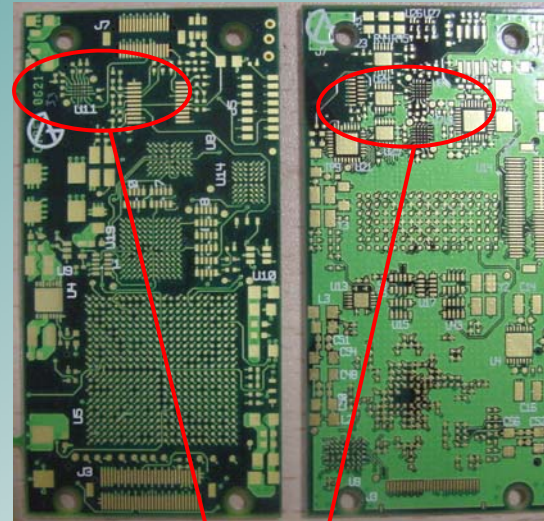
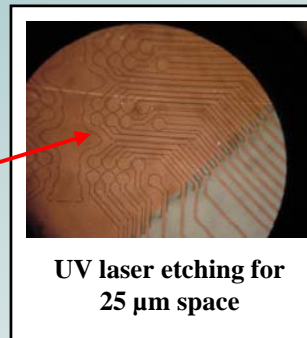
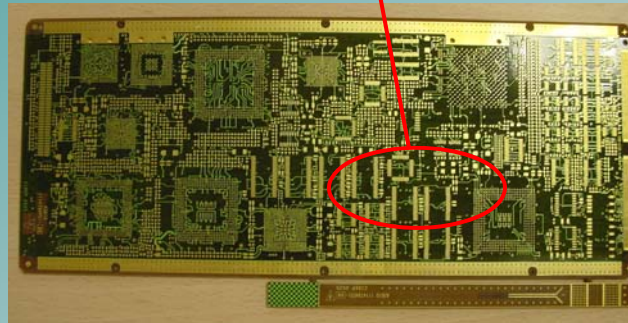
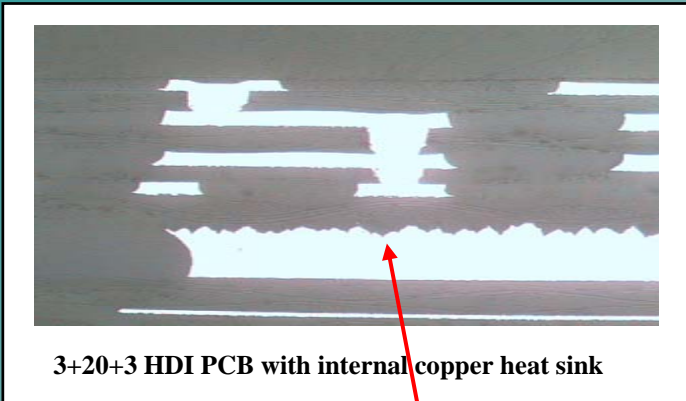
PIDEA European project for EMC compliance



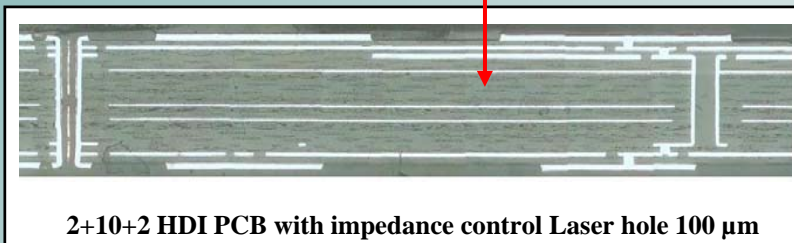
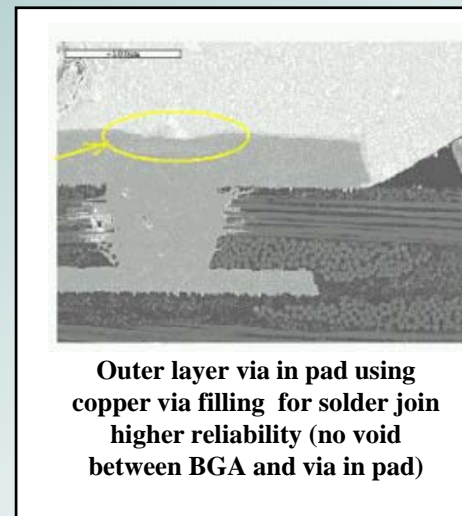
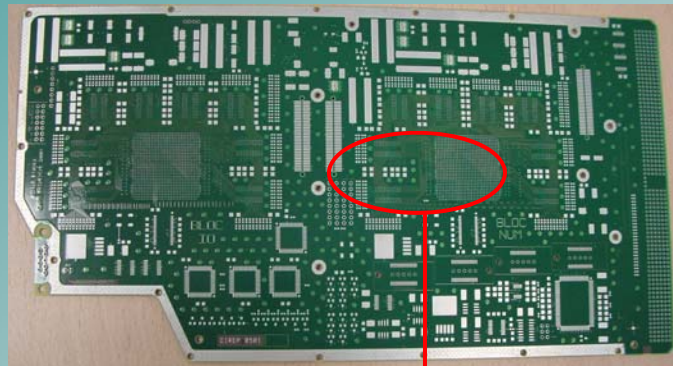
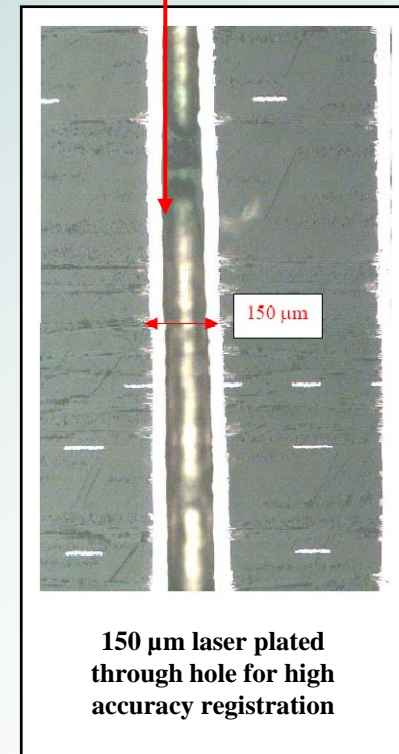
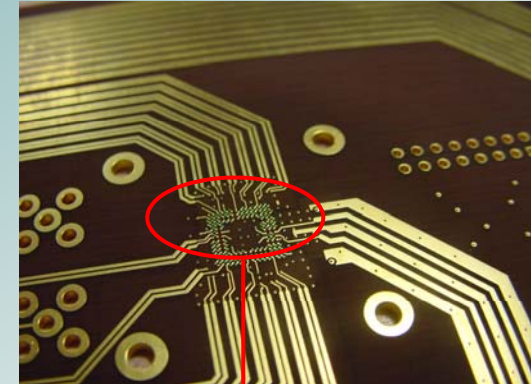
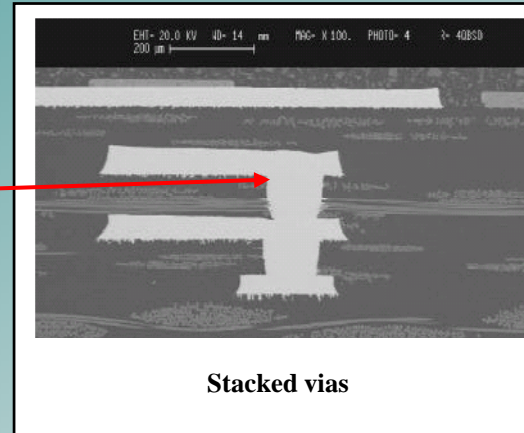
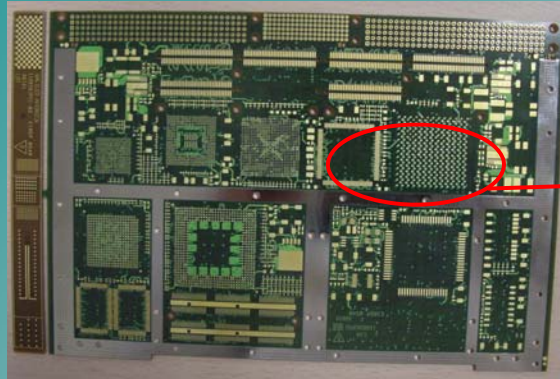
Embedded passives



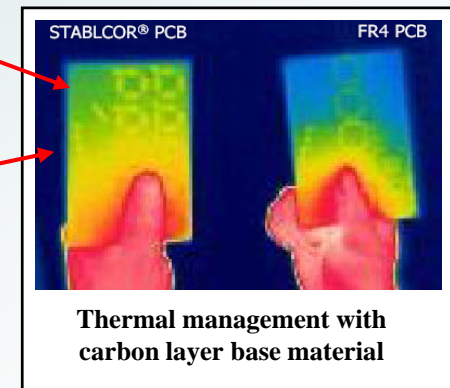
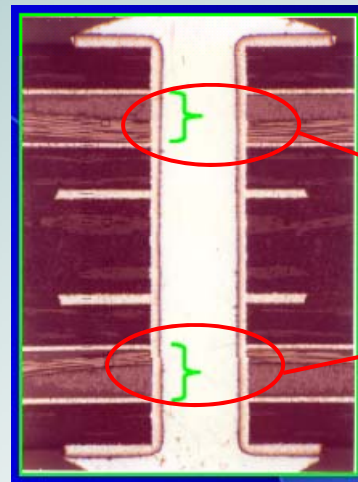
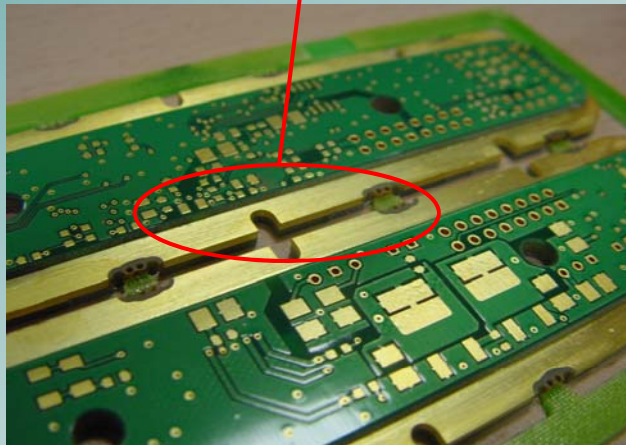
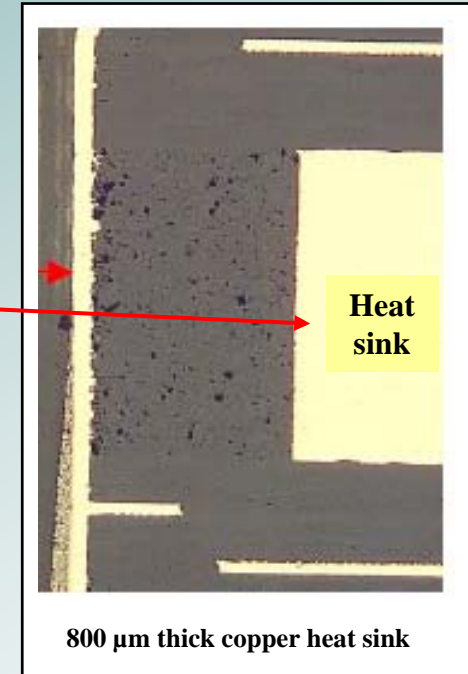
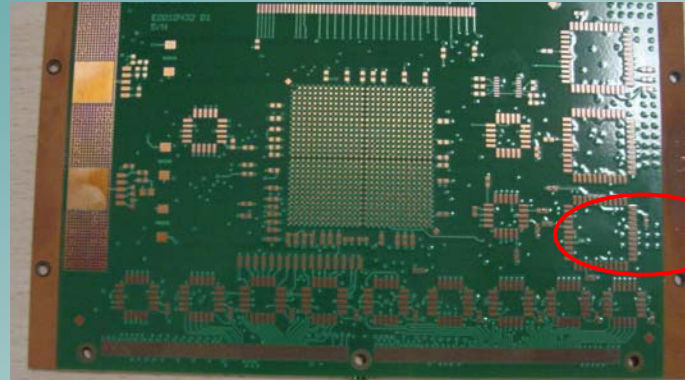
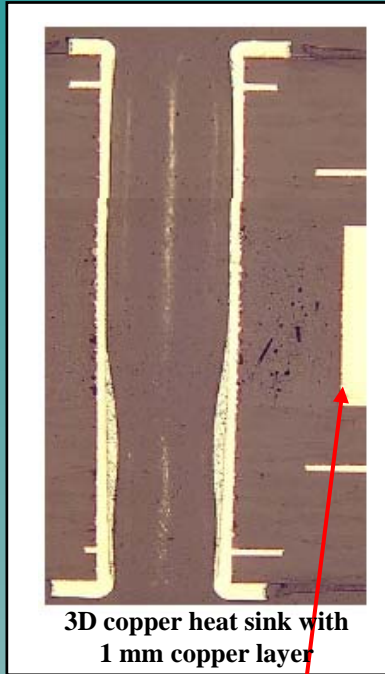
HDI PCB's



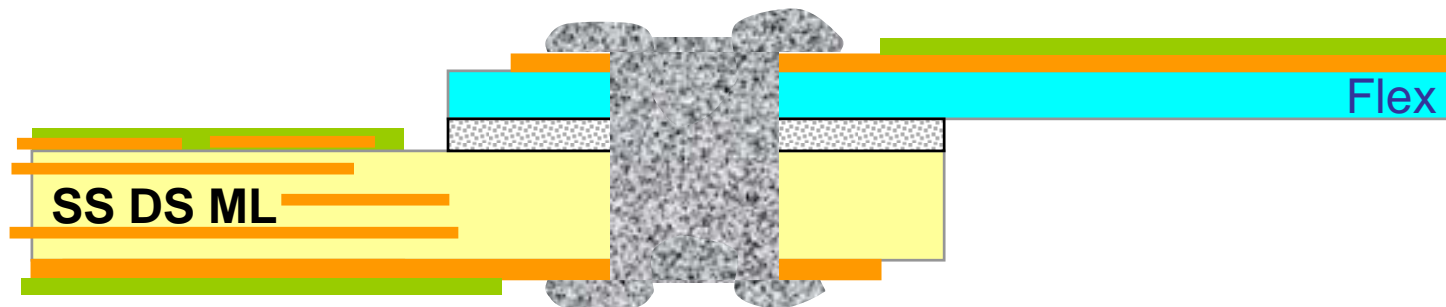
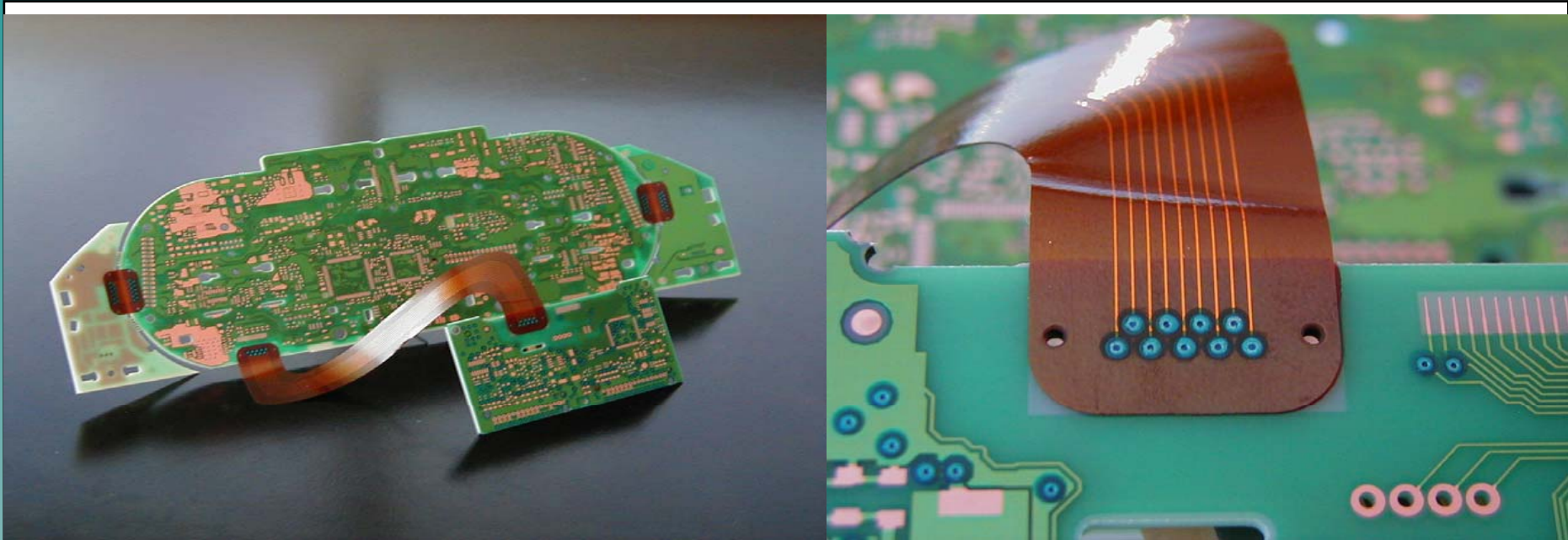
HDI PCB's



Thermal management

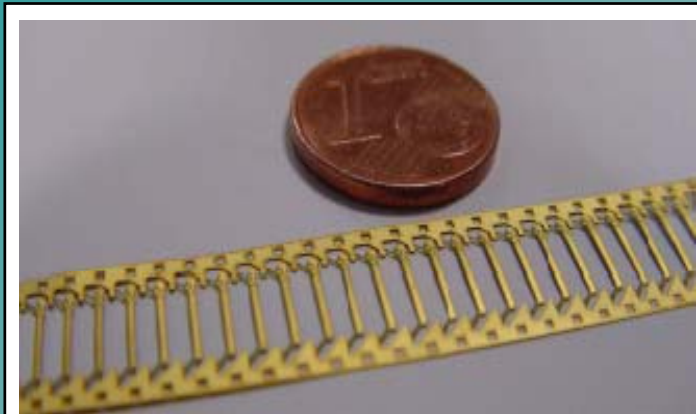


Flexible & rigid flex PCB's

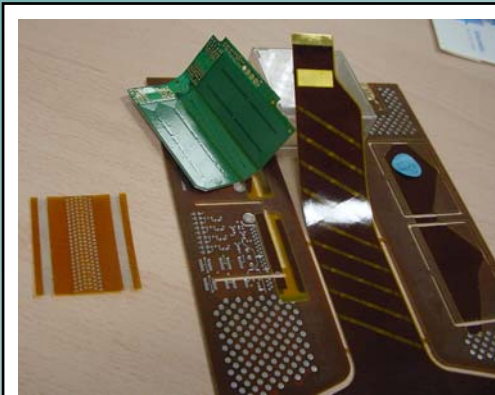


Local flexible layer with electrical connection for low cost application

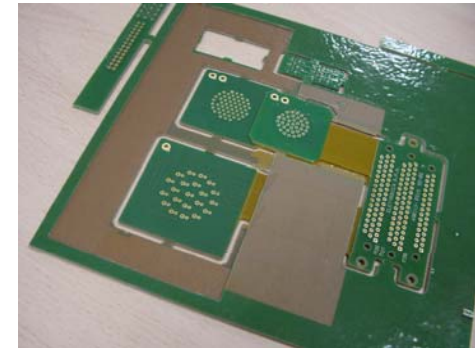
Flexible & rigid flex PCB's



25 μ m kapton layer UV laser routing



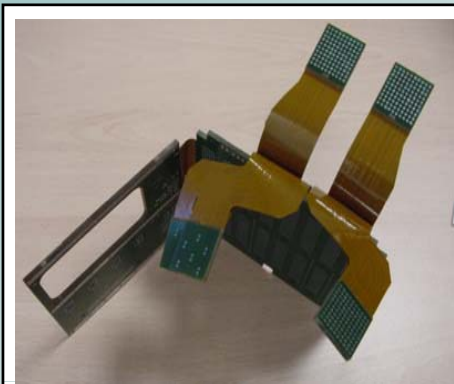
Flex & rigid flex application for connectors, captors, measurement



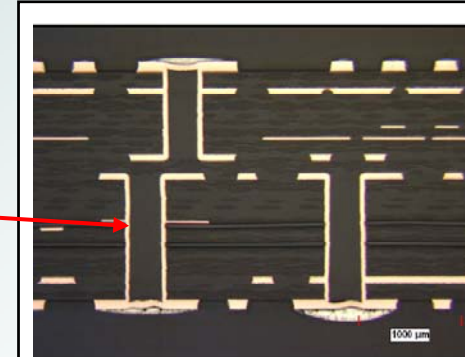
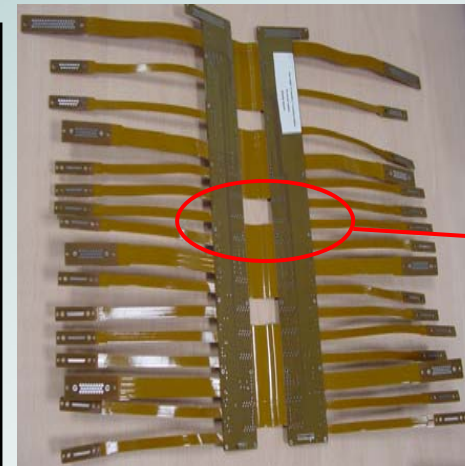
Rigid flex technology with different thickness for each rigid part



25 μ m kapton with resistive layer for cryogenic application



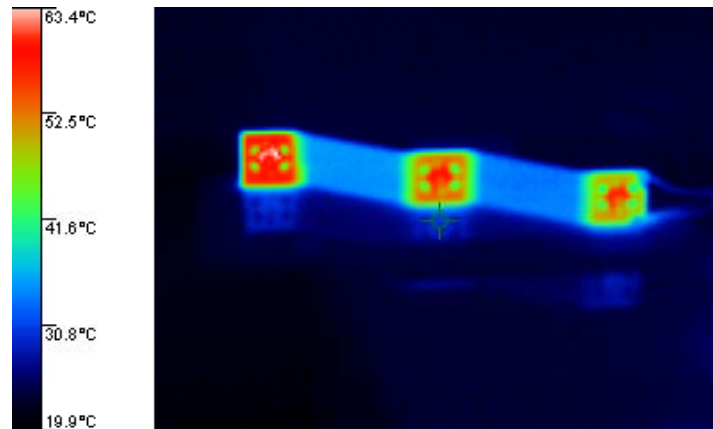
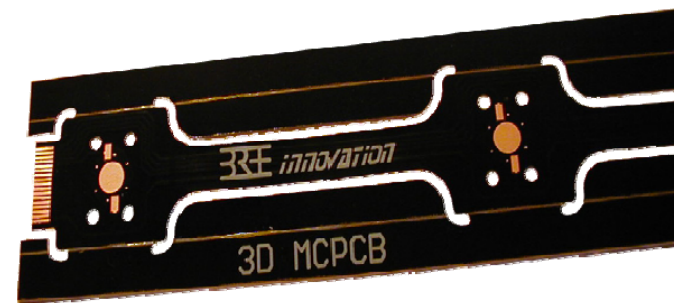
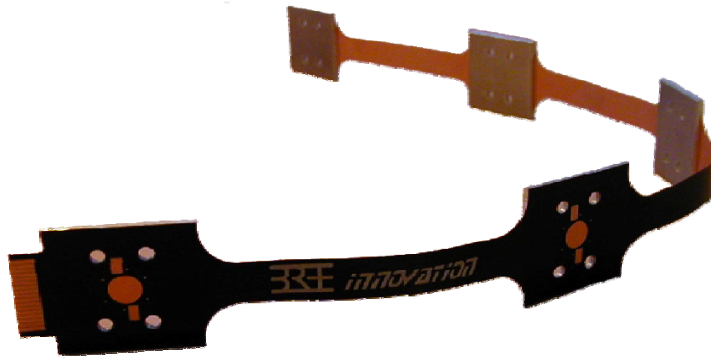
3D application with rigid flex technology



Flex rigid technology for space application

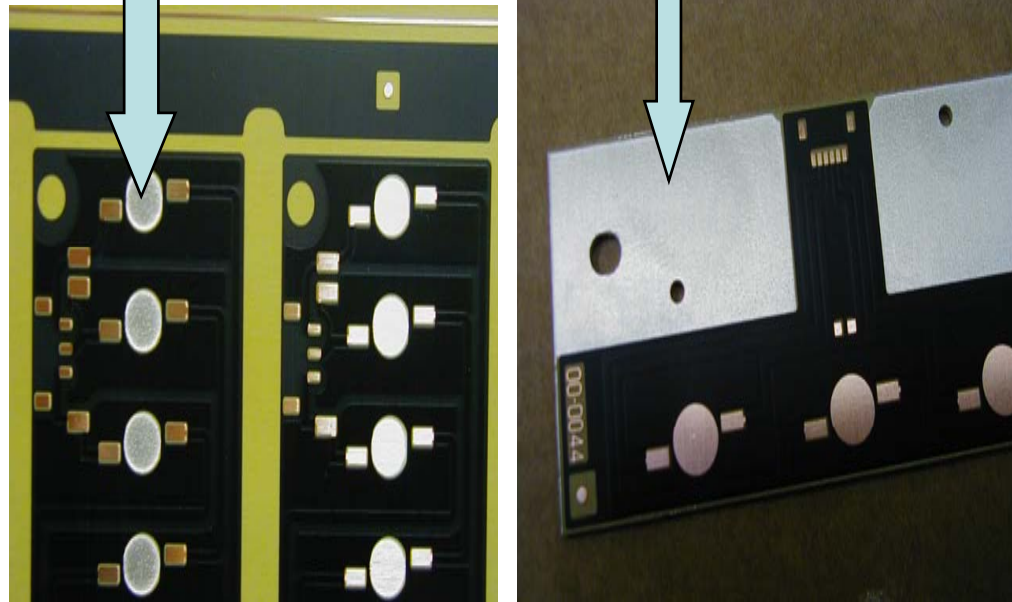
IMS PCB's

IMS Rigid Flex including thermal management and 3D electrical connection

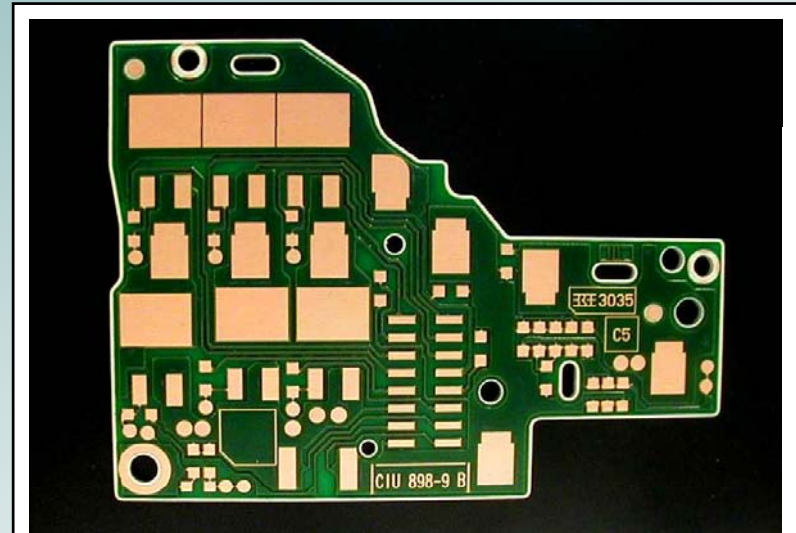


IMS PCB's

LAND WITHOUT
INSULATED LAYER



Selective Insulated Layer



IMS PCB

AMELIE

AMELIE



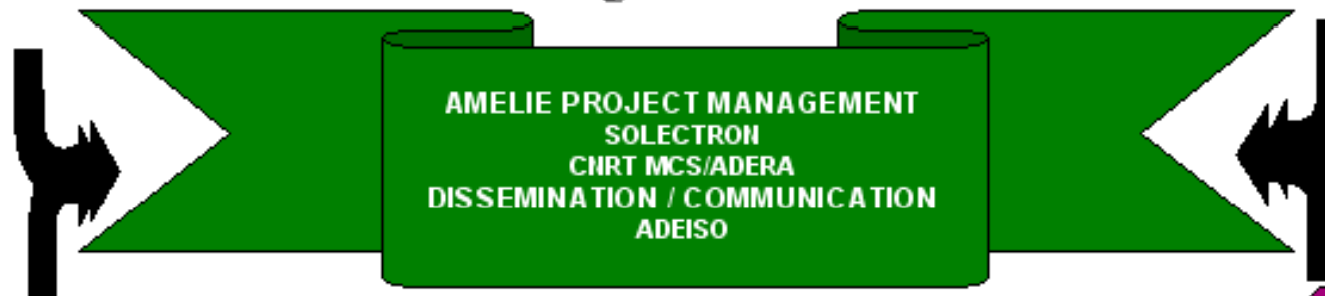
PARTNERS

COMPONENT MANUFACTURERS :

ALENCON PLASTIC (Plastic for connectors)
PHILIPS FRANCE (IC Packaging)
SGCI / CIRE (Printed Circuit Board)
TEMEX (Passive components)

END USERS :

GAIA CONVERTER (Aeronautic, Military, Niche markets)
THALES AIRBORNES SYSTEMES (Aeronautic, Military)



LABORATORIES :

CHRT BN (Plastic materials)
ISPA (Plastic materials)
IXL (Expertise and FEM)

ELECTRONIC MANUFACTURING SERVICES :

SOLECTRON FRANCE (Assembly)

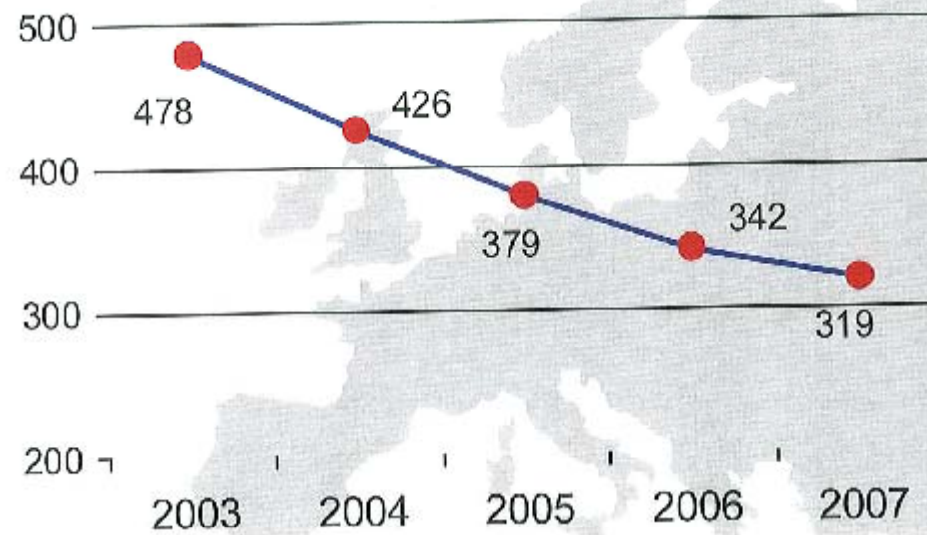
ADEME



ZVEI: European PCB Production 2007



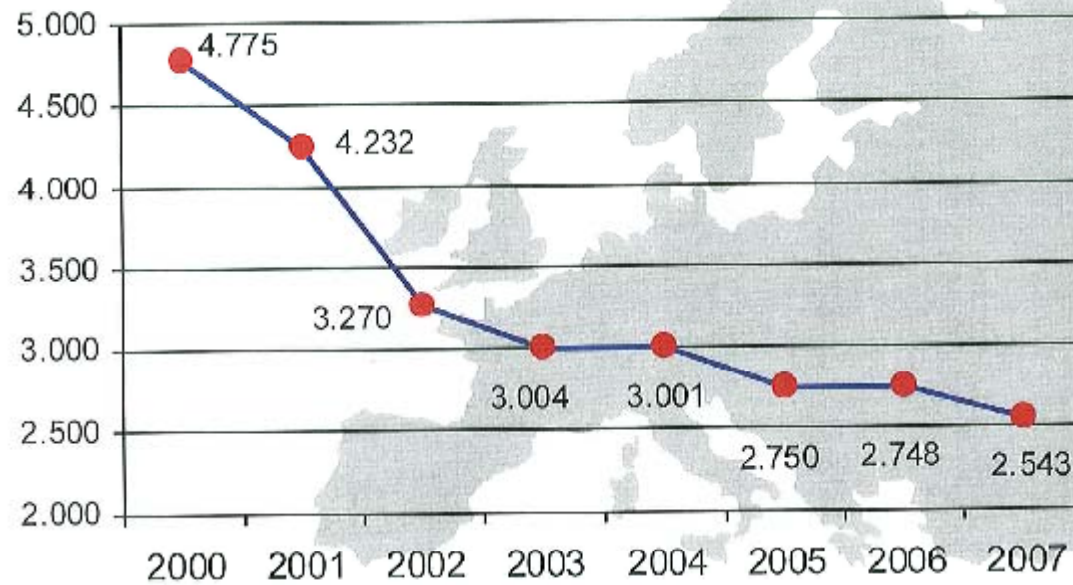
Number of manufacturers in Europe



ZVEI: European PCB Production 2007



PCB production in Europe in million EUR



Evolution de la production européenne en M€ / C.A.

CIRE 1998 -2007



Research References

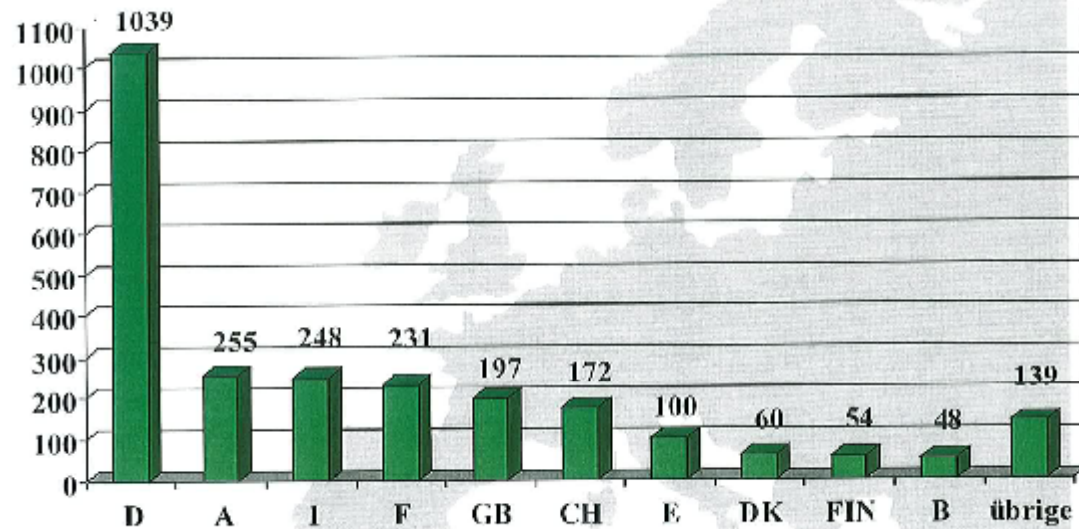
- CEA : Detectors, Flex-rigid, Bulk studies
- CNRS : Electronic multilayer boards
- INFN: Multiwire detectors
- CNR: Radioastronomic Multiwire application
- GANIL: Electronic multilayer boards
- Max Plank Institute: Multiwire
- LAL: Calice project



ZVEI: European PCB Production 2007



turnover 2007 per country (in million EUR)



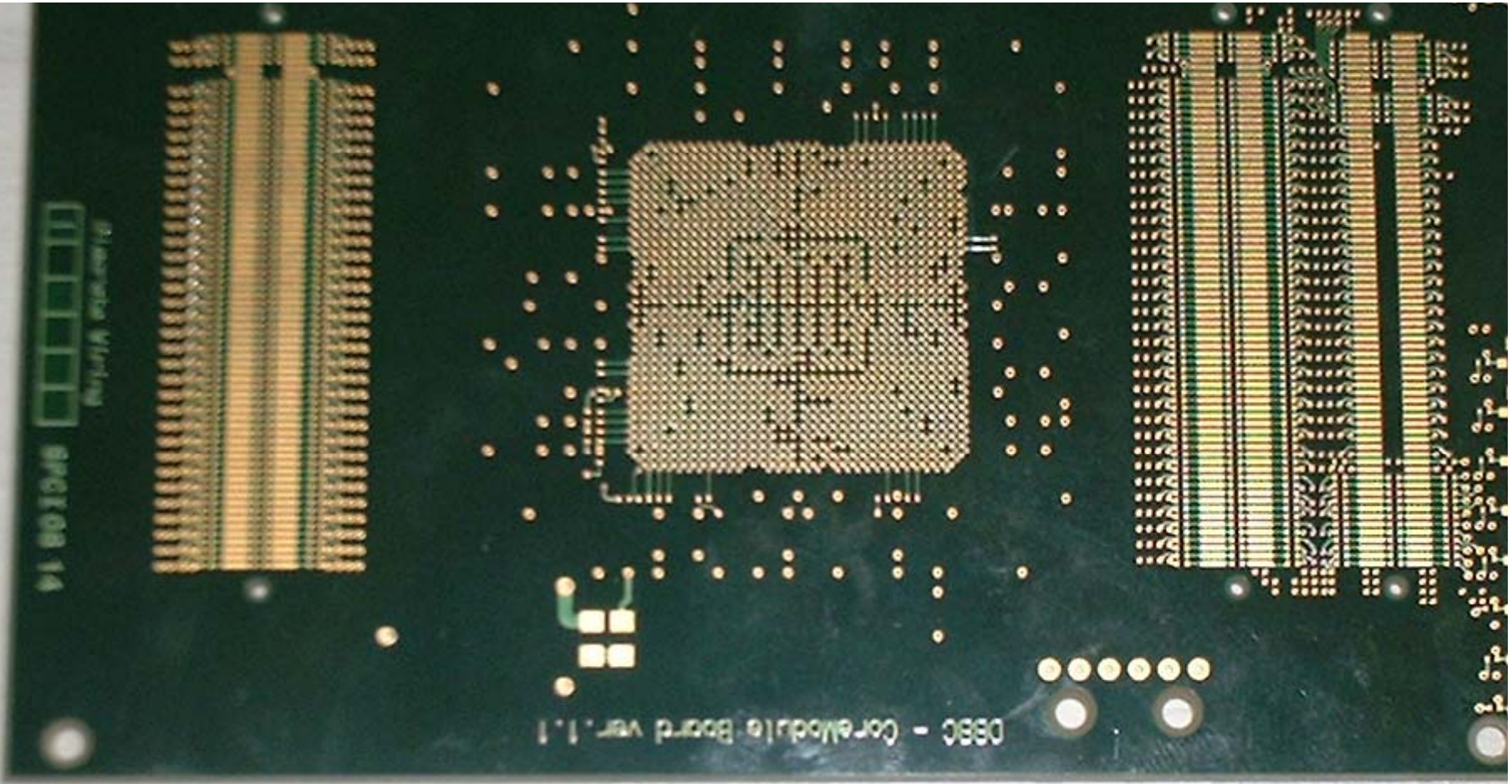
ZVEI: European PCB Production 2007



Top companies in Europe *)

1. AT & S	A	11. Invotec	GB
2. Ruwel	D	12. Aspocomp	FIN
3. Würth	D	13. Fr.- Mechatronik	D
4. Schweizer	D	14. hmp-Heidenheim	D
5. Fuba	D	15. PPC	CH
6. Multek	D	16. SoMaCis	I
7. Cire-Gruppe	F	17. GPV-Gruppe	DK
8. Elvia-Gruppe	F	18. ACB-Gruppe	B
9. Fr.- Mektec	D	19. Exception	GB
10. KSG	D	20. CST	I

*) sequence of order per production value in Europe



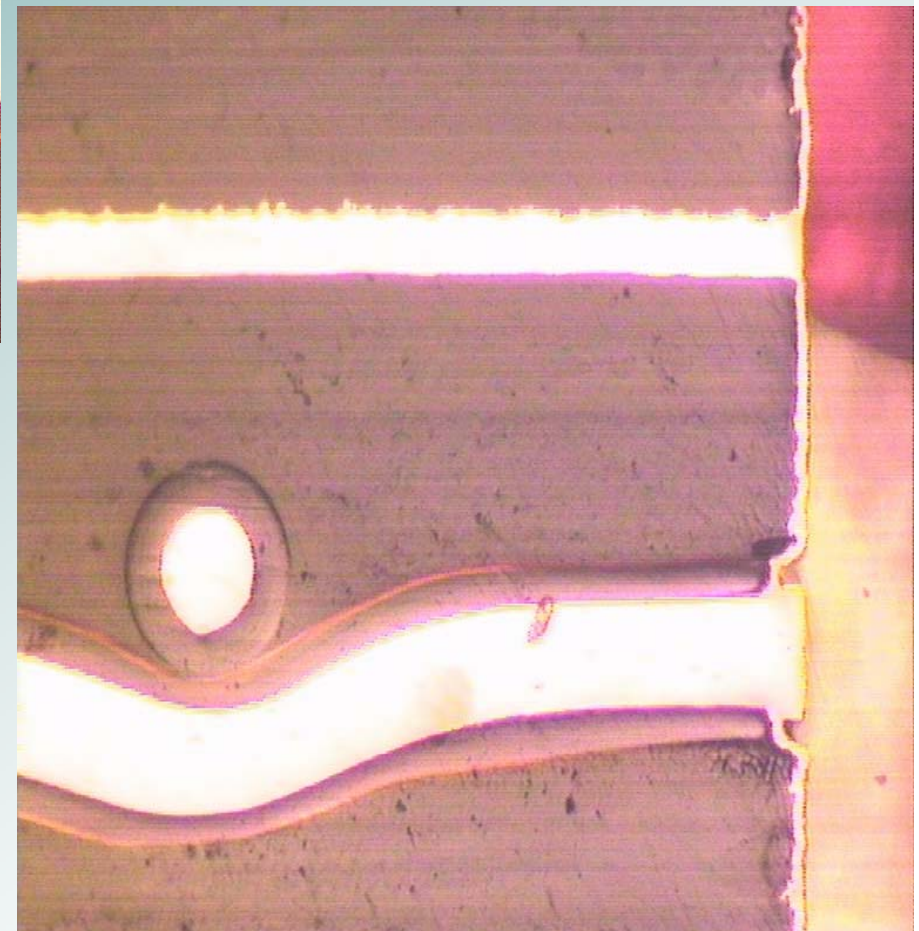
BeagleBone Black

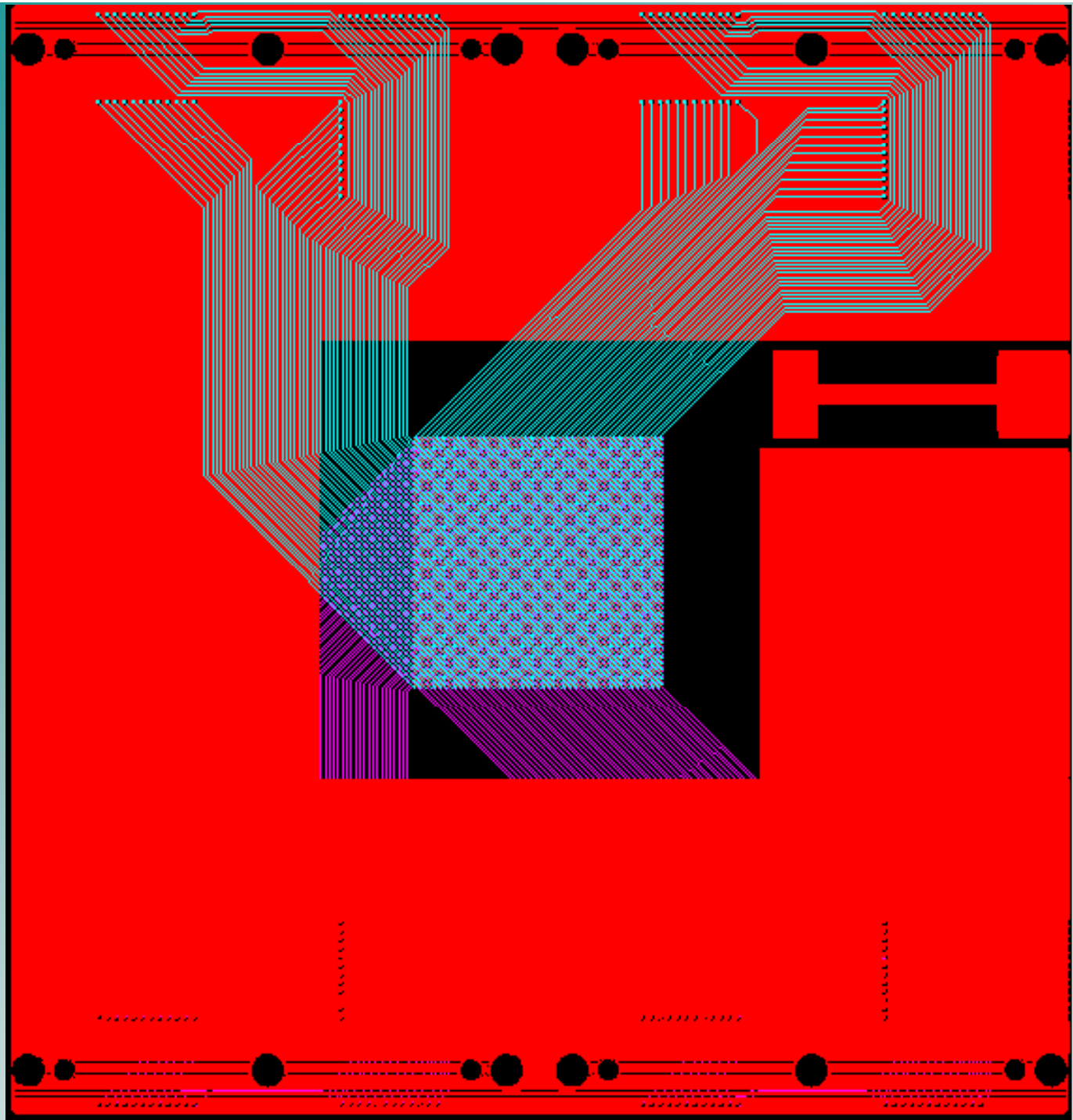
BBB-0814

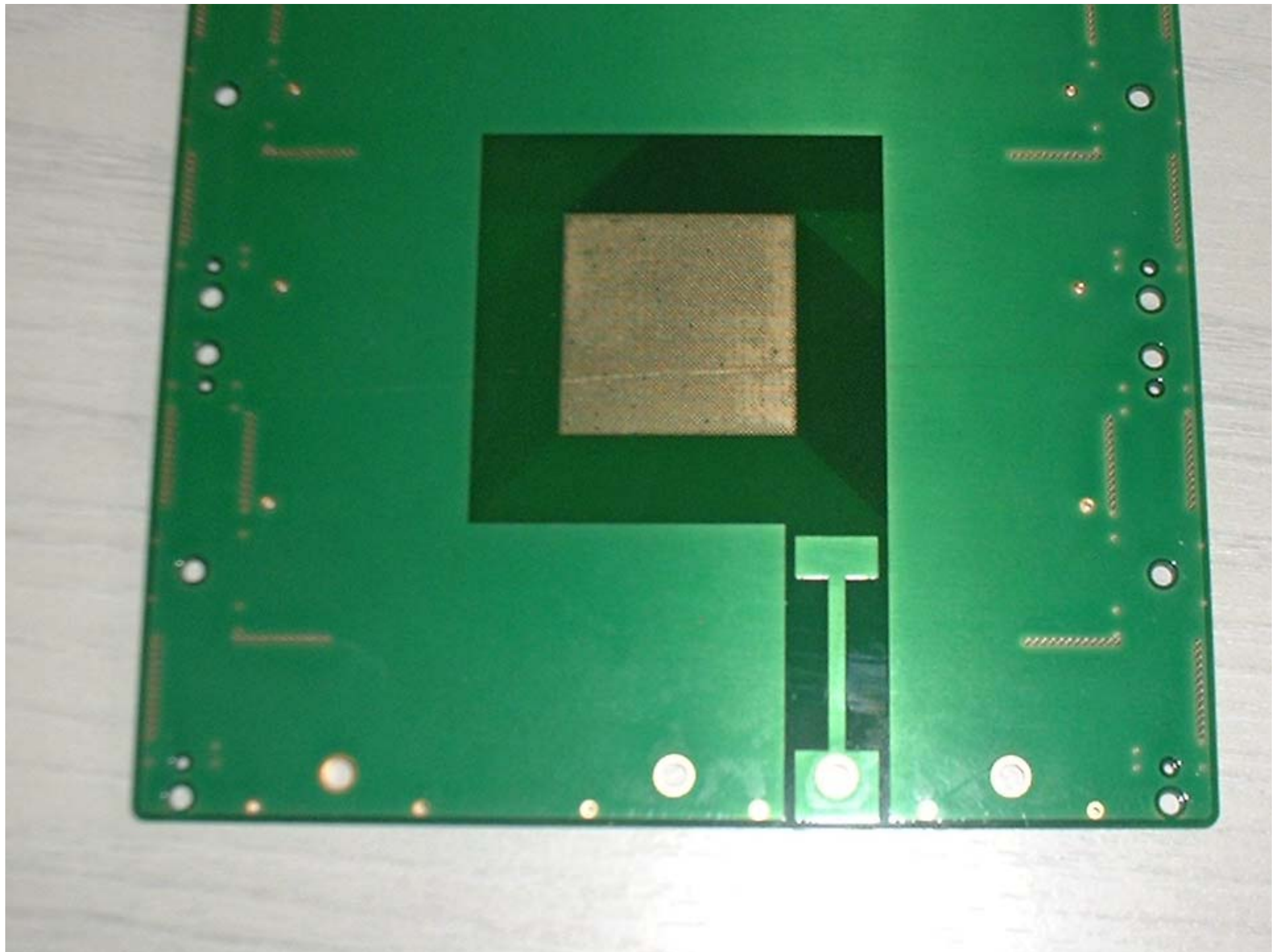
BBB - CoreModule Board ver. 1.1

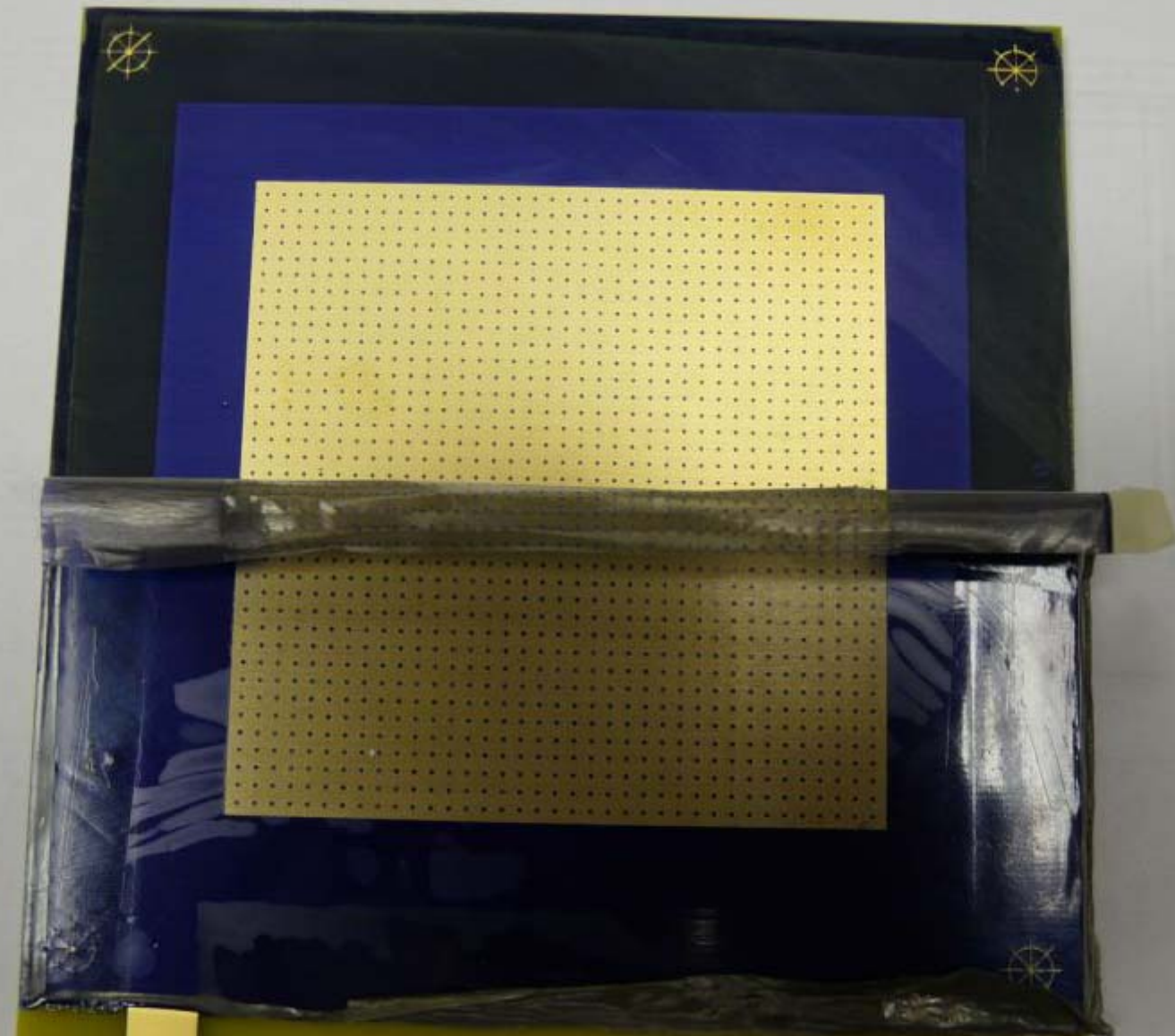
coupe apres metal

fil 2.5 mils

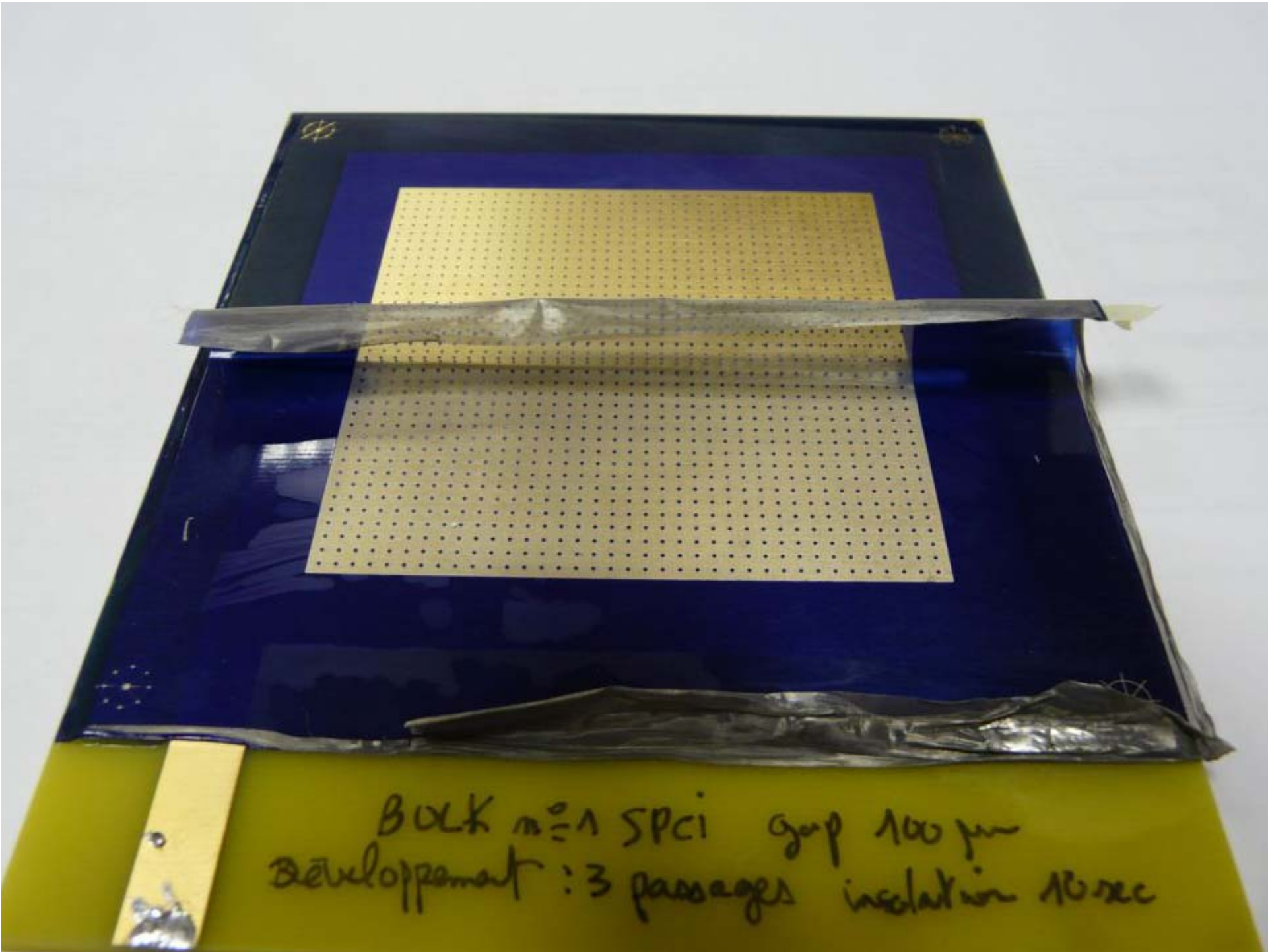








BULK $n=1$ SPCI gap 100 μ m
developpement : 3 passages isolation 10 sec



BULK n°1 SPCI gap 100 µm
Développement : 3 passages isolation 10 sec

Our support

- R&D support for Pcb design with IRFU
- R&D and design of multiwire board for INFN
- Technical consultant for LAL (Calice project)
- Test on SPCI Bulk for validation with IRFU
- Design of Multiwire for CNR

Our Wish

- Increase our collaboration with CEA/Irfu!
- and RD51?
- By setting up a contract of partnership between R&D and industrial application
- Sharing our expertise and help physician to solve any kind of electronic or Pcb issue

THANK YOU

ttomao@cire.fr