



Our experience in **SPACE & NEW SPACE**

Application for Space sector

Cistelaier delivered PCBs for several applications on Flight Units & for different sections i.e.:

- Mass Memories
- Computers
- Satellite Management Unit
- Deep Space Transponder or Frequency Translator
- Power sections (DC/DC Converter & Post Regulation)
- GNSS RF Receiver
- RF Filtering section
- High Speed Camera Compression Board for EML on IIS
- Backpanel

Materials for Space sector

More than 800 PCBs have been delivered in the last 7 years based on:

- Epoxy base materials
- Thermount / para-aramidic 85NT materials
- Polyimide

Flight Programs for Space sector

Here following the main Programs where PCBs manufactured by Cistelaier have been used :

- CERES
- CSG
- JUICE
- EUCLID
- SOLAR ORBITER
- EXOMARS 2018
- COPERTINICUS
- SENTINEL 1
- SARAH
- SES-17 (also HDI in polyimide)
- BB4A
- CNG (HDI in polyimide)
- COSMO
- KOREASAT
- MMX
- ISS EML Facility (rigid and rigid-flex)
- SAR-Lupe
- PLATINO
- IGSC

Adopted ESA Requirements

The projects have been produced and qualified according to:

- ECSS-Q-ST-70-10C, ECSS-Q-ST-70-11C and ECSS-Q-ST-70-60C
- ECSS QT/2014/148/SH and clause 7.7 from ECSS-Q-ST-70-60C
- ECSS QT/2014/030/SH and clause 9.5.5 from ECSS-Q-ST-70-60C

Technical Heritage in Space Sector

Cistelaier S.p.A. manufactured PCBs for Space sector with the following features:

- HDI
- Multilayers PCBs up to 18 layers, rigid and rigid-flex
- Epoxy & Polyimide resin base material, glass or para-aramidic fiber support
- Rigid Flex up to 10 Layer on flex material
- Standard ML, Sequential Lamination and HDI build up
- Microvia Laser drilled and copper filled vias
- Mechanically drilled Filled & Capped vias (specific resin with low CTE)
- Minimum vias of 0.15 mm
- Thickness up to 2.80 mm
- Aspect ratio up to 9.3:1
- Tin-Lead Reflow finishing
- Solder mask Nasa approved with low outgassing
- Enig
- Selective Electrolytic Nickel and/or Gold

Cistelaier ESA Qualification

On the 3rd of October 2024 the European Space Agency stated that Cistelaier S.p.A. has been qualified in accordance with ECSS-Q-ST-70-60C, for the manufacturing of:

- Rigid sequential polyimide PCBs as per PID_v05 until Oct 2025 – 12layer on Arlon 35N
- Rigid-flex polyimide PCBs as per PID_v05 until Oct 2025 – 12layer on Arlon 35N+Panasonic Felios Flexible laminate

This ESA qualification is in fact what we call “Phase A” of a more extended project where “Phase B” will be represented by the extension of our actual PID and where “Phase C” will allow us to “qualify state of the art HDI rigid polyimide-based PCBs for Space applications”:

Phase B:

- Delta qualification in several steps improving finishing type, pcb thickness, copper thickness, number of layer and number of flex layer

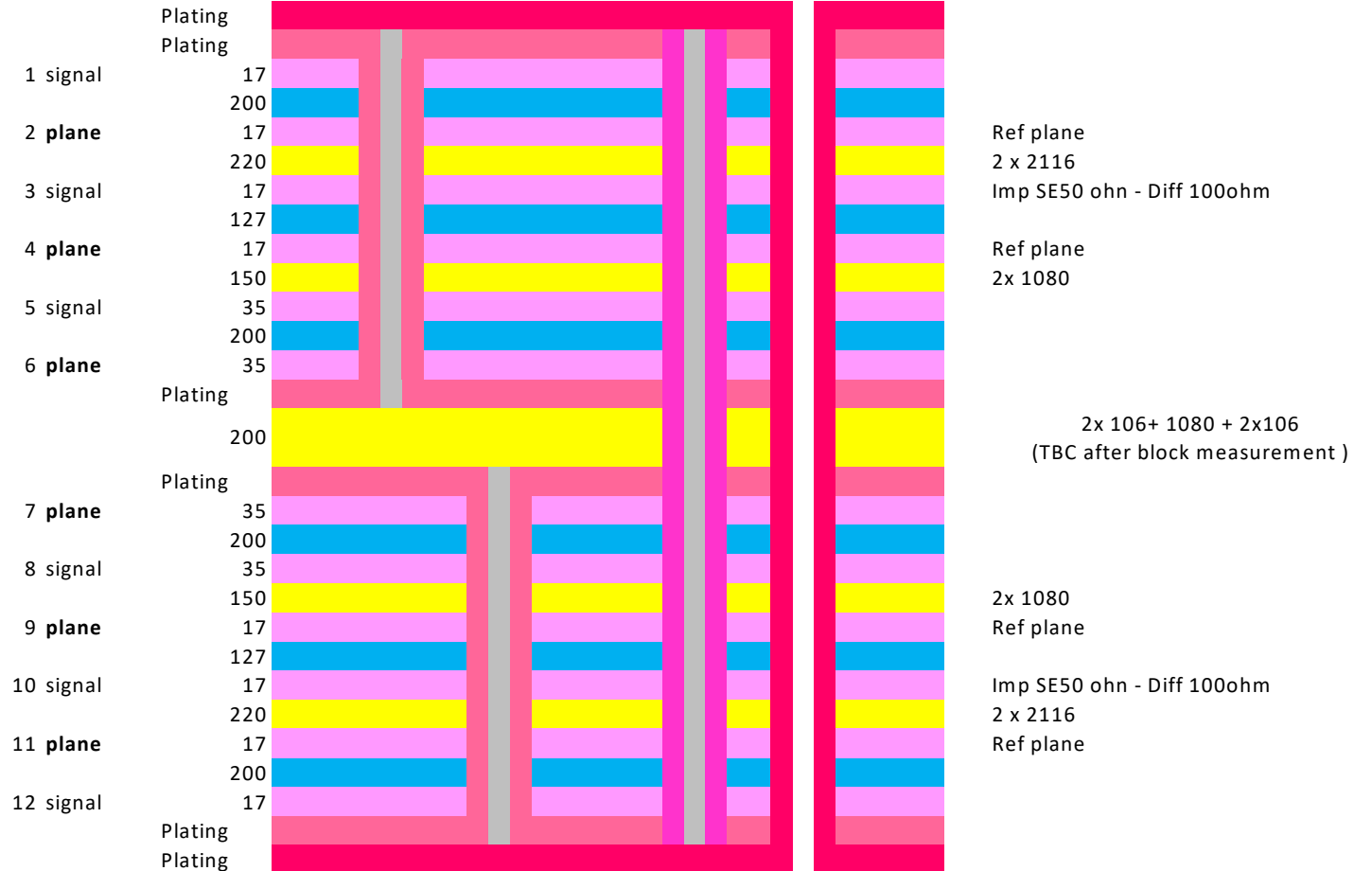
Phase C:

- MLB with HDI Technology (polyimide) based on this process, with ASI (Italian Space Agency) and TAS-I (Thales Alenia Space Italy) support:
 1. DE-RISK project
 2. GSTP project

Qualified rigid stack-up

Multilayer - Sequential Lamination

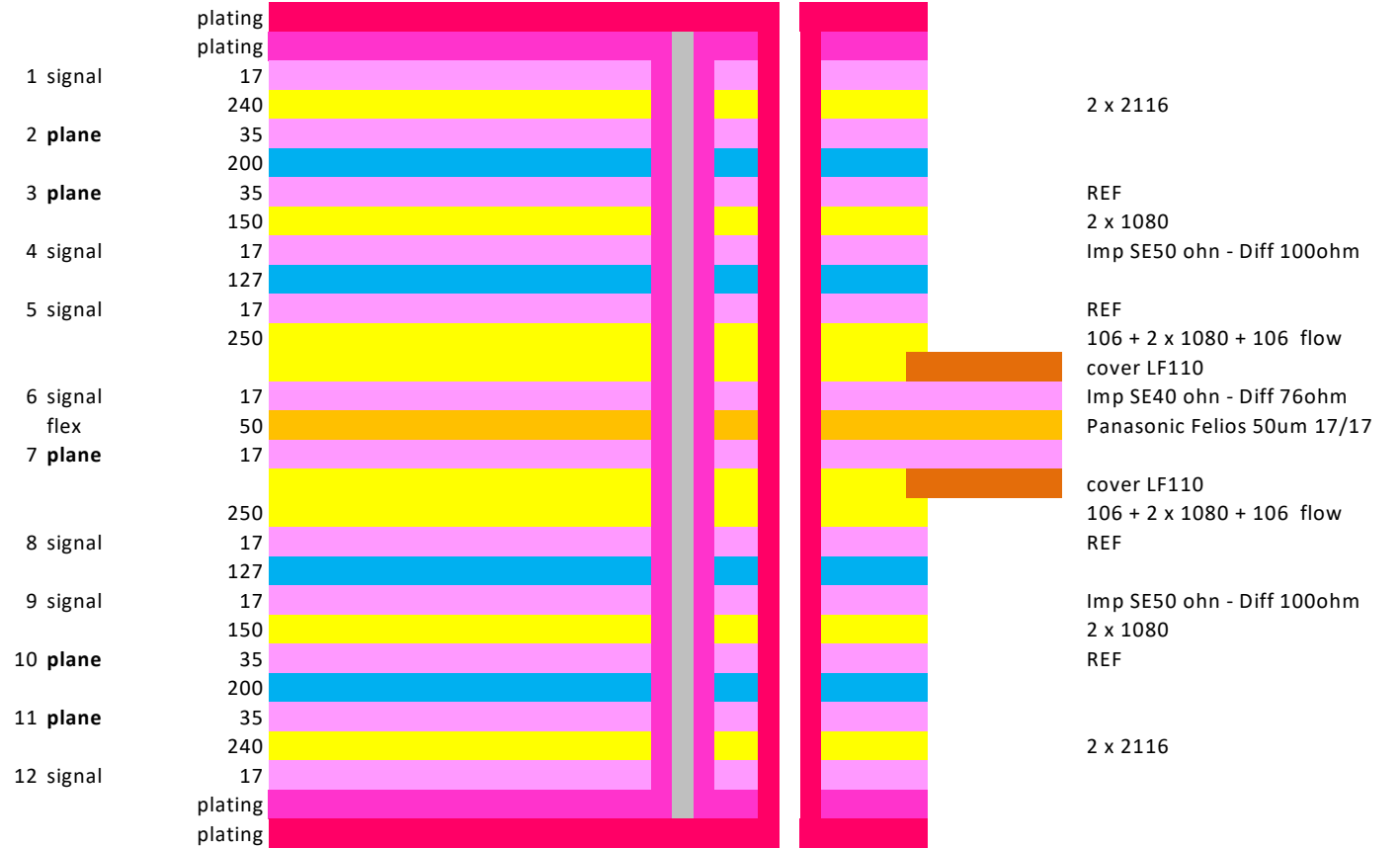
Technology	DS	
	ML	X
	Flex	
	Flex-rigid	
	HDI	
Number of layers	Total	12
Number of layers and sequence	Rigid	12
	Flex	
	Drilling sequence	4(1-6) (7-12) (1-12F&C) (1-12)
	Lamination sequence	2
Thickness/size	PCB size (mm)	
	PCB thickness (mm)	2.4
	Manufacturing panel size (mm)	457x610
	External min. Cu thickness (μm)	17 + 2xplating
	External max. Cu thickness (μm)	
	Internal min. Cu thickness (μm) non-plated	17 (min 11 μm)
	Internal max. Cu thickness (μm) non-plated	35
	Internal min. Cu thickness (μm) plated	35 + plating
	Internal max. Cu thickness (μm) plated	
Material	HTg FR4	
	Polyimide	Arlon 35N
	Noflow prepreg	
	Flexible	
	Mixed materials	
	Metal core	
Surface finish	SnPb reflow	X
	Ni/Au electroplated	X
	ENIG	
	Tin diffusion layer	
Design features	External track width (μm)	150um on 17Cu ± 20% 200um on 35Cu ± 20%
	External isolation (μm)	150um on 17Cu ± 20% 200um on 35Cu ± 20%
	Internal track width (μm)	130um on 17Cu ± 20% 150um on 35Cu ± 20%
	Internal isolation (μm)	130um on 17Cu ± 20% 150um on 35Cu ± 20%
Min. hole size	PTH (via)	0.35
	Blind	0.25
	Buried	
	Microvia	
Aspect ratio	PTH (via)	6.9
	Blind	4.0
	Buried	
	Microvia	
Interconnections innerlayers	Typical etch-back	Negative



Qualified rigid-flex stack-up

Rigidflex - 1 Flex Layer

Technology	DS				
	ML				
	Flex				
	Flex-rigid	X			
	HDI				
Number of layers	Total	12			
	Rigid	10			
Number of layers and sequence	Flex	1			
	Drilling sequence	2 1-2F&C) (1-12)			
	Lamination sequence	1			
Thickness/size	PCB size (mm)				
	PCB thickness (mm)	2.5			
	Manufacturing panel size (mm)	457 x 610			
	External min. Cu thickness (µm)	17 + 1 x plating			
	External max. Cu thickness (µm)				
	Internal min. Cu thickness (µm) non-plated	35 (min 25 µm)			
	Internal max. Cu thickness (µm) non-plated	35			
	Internal min. Cu thickness (µm) plated				
	Internal max. Cu thickness (µm) plated				
Material	HTg FR4				
	Polyimide	Arlon 35N			
	Noflow prepreg	X			
	Flexible	Panasonic Felios 50um			
	Mixed materials				
Surface finish	Metal core				
	SnPb reflow	X			
	Ni/Au electroplated	X			
	ENIG				
Design features	Tin diffusion layer				
	External track width (µm)	150um on 17Cu ± 20% 200um on 35Cu ± 20%			
	External isolation (µm)	150um on 17Cu ± 20% 200um on 35Cu ± 20%			
	Internal track width (µm)	130um on 17Cu ± 20% 150um on 35Cu ± 20%			
	Internal isolation (µm)	130um on 17Cu ± 20% 150um on 35Cu ± 20%			
Min. hole size	PTH (via)	0.55			
	Blind				
	Buried				
	Microvia				
Aspect ratio	PTH (via)	4.5			
	Blind				
	Buried				
	Microvia				
Interconnections innerlayers	Typical etch-back	Negative			



Endorsment Letters

- TAS, Italy, current customer
- LEONARDO, Italy current customer
- SITAEL, Italy, current customer
- Airbus- SPACE ENGINEERING, Italy, current customer
- OHB Italia, Italy, current customer
- MB Elettronica, Italy, current customer
- SKYLabs, Slovenia, current customer
- TDS, Italy, current customer
- KAISER, Italy, current customer
- TECNOBIT (OESIA Group), Spain, current customer

Thanks for your attention

Cistelaier S.p.A.

Via M. Finzi, 587

41122 – Modena – Italy

T: +39 059 269711

E: sales@cistelaier.com



Finmasi Group PCB Division



Italian PCB Manufacturer



French PCB Manufacturer



German PCB Manufacturer