

 <b>OMR</b> <small>PRINTED CIRCUIT BOARDS</small>		Emissione:	05/11/98
		Sezione:	CTF-ITA
ISO TS 16949		Foglio:	1 di 6
		Rev.:	11 del 06/11/14
<b>TITOLO: CTF: OMR TECHNICAL CAPABILITIES</b>			



# CTF

(capitolato tecnico di fornitura)

## OMR TECHNICAL CAPABILITIES

- REV. 11 -

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### 1) SCOPE

This document defines the main technical characteristics for professional PCBs' serial production.

### 2) APPLICATION

This document is applied if the customer does not specify the technical characteristics of the pcbs. Furthermore, it is used during the feasibility study for each new PCB.

### 3) RESPONSIBILITIES

The Engineering department has to keep this document updated and applies it as foreseen whilst the Quality Assurance approves this document.

### EXECUTION

The Engineering Department checks the customer documents in the following steps:

#### Feasibility analysis

In this step the Engineering Department evaluates the customer request using this document in order to analyse the feasibility of OMR Italia to produce the PCB.

Documents which are necessary to produce a PCB:

The required files depend on the number of layers of the PCB and on other requirements such as the presence or lacking of solder and the symbolism etc.

Example: for a double-faced PCB the following files are necessary:

"TOP" side: it is necessary to indicate which is the top or bottom side

"BOTTOM" side

solder mask "TOP" side

solder mask "BOTTOM" side

Silkscreen top or bottom side:

Other files TOP and Bottom if required (notations, peelable solder mask etc.)

Drilling/Routing: Gerber file 274x/excellon/sieb&meyer/list of drilling diameters in ascii format, mechanical drawing and PCB profile drawing

Files format: Gerber 274x/barco DPF/

#### Engineering

When the feasibility study is successfully completed and OMR ITALIA has obtained the order from the customer, the Engineering Department will prepare all documents necessary for the production and complete all missing aspects which have not been indicated by the customer. OMR ITALIA will ask a written confirmation from the customer before production. All eventual critical aspects will be evidenced in the production notes. If requested, a copy of this document will be sent to the customer.

The Engineering Department has to keep a registration of the technical capabilities sent to customers on the internal document 05.00.01. In this document the date, the client and the revised version of the technical capabilities are stated.

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CHAPTER	ITEM	REFERENCE VALUES		
<b>Base Material (FR4)</b>		Outer Layer	Inner Layer	Multilayer thickness 4/6/8 layers
	Base material thickness tolerances	Thickness (mm)	Thickness (mm)	Tolerance (mm)
		0,63	0,20	± 10%
		0,7	0,30	± 10%
		0,8	0,36	± 10%
		1,0	0,50	± 10%
		1,2	0,70	± 10%
		1,5	0,80	± 10%
		2,0	1,00	± 10%
		2,4	1,20	± 10%
		3,2		± 10%
		Tolerance on the finished PCB Double Side / Multilayer ± 10%		
		Minimum thickness Prepreg foil 0.051mm		
Copper foil thickness tolerance	Thickness (µm)	Thickness (µm)	Tolerance (%)	
	17	12	± 10	
	35	17		
	50	35		
	70	70		
	105	105		

<b>Multilayer press equipment</b>	Lauffer vacuum assisted
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<b>Base material with other characteristics</b>	Materials with other TG values: (glass transition temperature)	135° / 150° / 170° / 180° / over 190° C
	Materials with CTI values in class 1-3	≤ 250 / 400÷600
	Base Material FR4 standard	Isola: DE104 / KF Iteq: IT140 Ventec: VT42
	Base Material with High Tg	Isola: IS400 / IS420 / PCL370HR / FR408HR Iteq: IT158 / IT180 Ventec: VT481 Panasonic: R1755M
	Base Material Halogen Free	Panasonic: R1566W

<b>Drilling</b>	Tolerance for the actual position of the holes after drilling	± 50 µm
	Tolerance for the position of the holes on the end product. Requests below ± 100 micron will be considered on an individual bases according to the base material, panel size and the surface finishing.	± 100 µm
	Minimum final hole diameter	0,20 mm
	Tolerance diameter plated holes	+ 0,1 / - 0,05 mm
	Tolerance diameter not plated holes	≤ 6,3 mm ± 0,05 mm > 6,3 mm ± 0,1 mm
	Tolerance diameter final press-fit	+0,09/-0,06 mm
	Number of spindles	46 Posalux + 32 Pluritec

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Lay-out	Minimum Annular-ring	Outer (mm)	Inner (mm)	Cu thickness (µm)	
	Drilled hole/nominal pad referred to the maximum thickness of used base copper		0,1 ÷ 0,15	0,15 ÷ 0,20	17
		0,1 ÷ 0,15	0,18 ÷ 0,22	35	
		0,15	0,20 ÷ 0,30	70	
		0,20	0,25 ÷ 0,30	105	
Minimum Clearance ring on inner layers	0,25 ÷ 0,3 mm				
(Annular ring minimum residue)	IPC A600 class 2				
Lines/spaces tolerances	± 20 % of nominal value				
	Outer layer		Inner layer		
Nominal minimum line and space dimension	Line (µm)	Space (µm)	Line (µm)	Space (µm)	Cu Thickness (µm)
(Riferiti al massimo spess. di Cu utilizzabile)		100	100	100	17
		100	120	100	35
		150	150	150	50
		150	150	150	70
Spessore rame elettrolitico nei fori ≥ 20 µm		200	225	200	105
Lay out exposure equipments	Altix-Automatech automatic exposure units				

Liquid Photoimageable solder mask (curtain coating application)	Minimum solder dam	80 µm			
	Tolerance positioning solder mask	± 100 µm			
	Acceptance overlapping of solder mask	From plated through holes		On SMD pad	
		50 µm		No solder mask on pad	
	(Solder mask touch up allowed)				
	Minimum thickness solder mask on track edge	5 µm			
	Minimum clearance defined on copper or FR4	300 µm			
Solder mask type	Huntsman Probimer 77				

Liquid Photoimageable solder mask (screen printing application)	Solder mask White	Sun Chemical Coates xv501Series G			
	Solder mask black	Sun Chemical Coates xv501T4 Series A			
	Solder mask red	Sun Chemical Coates xv501TC			
	Solder mask blue	Sun Chemical Coates xv501T4 Series A			
	Solder mask green (curtain coating)	Sun Chemical Coates xv501TM			

Metal Finishing	Hot Air Solder Levelling Alloy supplier : Cofermetal				
	Alloy used: eutectic	Sn 63% / Pb 37%			
	SnPb thickness	1 to 30 µm			
	Hot Air Solder Levelling Lead Free Alloy supplier :Cofermetal				
	Alloy used	Sax 0307			
	Sn thickness	1 to 30 µm			
	Electroless Nichel : (ENIG) Supplier : Dow				
	Ni	3 ÷ 6 µm			
	Au	0,05 ÷ 0,15 µm			
	Immersion silver Supplier: Entone				
	Thickness	0.15 ÷ 0.45 µm			
	Immersion Tin Supplier : Atotech				
	Thickness	0,8 ÷ 1,2 µm			
OSP Supplier: Entone					
Thickness	0,15 ÷ 0,45 µm				

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<b>Notations</b>	Minimum dimension	0,18 mm
	Minimum distance from SMD pads	0,25 mm
	Minimum distance of hole pads	0,20 mm

<b>Hole plugging with solder mask</b>	Max. 30÷40% hole length on one side	Maximum hole diameter plugged 0,5 ÷ 0,6 mm
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<b>Via filling with solder mask</b>	In developing	Maximum hole diameter plugged 0,5 ÷ 0,6 mm
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<b>Carbon Ink</b>	Ink Supplier Peters	Type: SD2843
	Minimum space between pads	0,50 mm
	Minimum dimension	0,90 mm
	Average thickness	15 µm

<b>Peelable solder Mask</b>	Ink Supplier Peters	Type SD2955
	Maximum hole diameter coverable	3,0 mm (7mm with Kapton)
	Average thickness	350 µm

<b>Scoring</b>	Angle	30°
	PCB thickness (mm)	Scoring residual PCB thickness (mm)
	0,8÷1,0	0,30 (+0,1 /- 0,05)
	1,0÷2,5	0,40 (+0,1 /-0,05)
	Tolerance scoring position	± 0,10 mm
	Tolerance scoring parallel line position	± 0,10 mm
	Minimum distance between scoring line center and copper	
	from a ground area	0,3 mm
	from a line	0,4 mm
	PCB profile dimension with scoring	0,30 /- 0 mm
Equipments	4 Telmec machines	

<b>Routing</b>	Dimension tolerances UNI EN 22768-1	> 0.5 ÷ 6	> 6 ÷ 30	> 30 ÷ 120	>120 ÷ 400
		± 0,05	± 0,10	± 0,15	± 0,20
	Internal radius suggested	0.4 mm			
	Not plated slots dimensions tolerances	± 0,10			
	Not plated slots position tolerances	± 0,10			
	Minimum distance routing profile / Cu	0.20 mm			
Equipments	24 spindles Pluritec				

<b>Bow and Twist</b>	Maximum value	0,5% / 1%
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<b>Electrical Test</b>	% PCB tested	100%
	Allowed short circuit repair	IPC rules
	Luther & Maelzer equipments	2 Picomat LM100/11A   Megamat LM100/22A
	Max. test area	325x244mm   406x244mm
	Test parameters	open: 30Ω±10KΩ short: 100kΩ ÷100MΩ
	Test voltage	From 40 to 300 Vdc
	Minimum Pad dimension	Pad 0,4mm
	Test Voltage: 40 a 300V	

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<b>Packaging</b>	Packaging type	Shrinkage type with recyclable cardboard
		Pluriball and antistatic foil. 25 or 50 micron

<b>Nominal values product classes</b>	CLASS NUMBER	2	3	4	5	6
	Minimum drilled hole diameter [mm]	> 0,5	≥ 0,45 ≤ 0,5	0,40	0,35	<0,35
	Minimum line and space [µm]	≥ 250	≥ 180 < 250	≥ 150 < 180	≥ 120 < 150	≥ 100 < 120
	Annular ring on outer layer [µm]	> 200	> 150 ≤ 200	≥ 130 < 150	≥ 120 < 130	≥ 100 < 120
	Annular ring on inner layer [µm]	> 250	> 200 ≤ 250	> 150 ≤ 200	> 130 ≤ 150	> 100 ≤ 130
	Clearance Annular ring on inner layer [µm]	> 500	> 400 ≤ 500	> 300 ≤ 400	> 250 ≤ 300	> 200 ≤ 250

<b>Minimum copper thickness before and after plating</b>	Base copper thickness	18 µm	Inner	Min. copper thickness after plating	14 µm	Base copper thickness	50 µm	Outer	Min. copper thickness after plating	70 µm
		0,5 oz								
	18 µm	Outer	40 µm		70 µm	Inner	60 µm			
	0,5 oz				2 oz					
	35 µm	Inner	30 µm		70 µm	Outer	85 µm			
	1 oz				2 oz					
35 µm	Outer	55 µm	105 µm	Inner	90 µm					
1 oz			3 oz							
50 µm	Inner	45 µm	105 µm	Outer	120 µm					
1,5 oz			3 oz							

<b>Documents and reference specifications</b>	Customer original files for lay-out and drilling
	UL 94 and 796 test flammability of plastic materials UI file E79991
	Acceptability of printed boards IPC.A-600 class 2, IPC 6012 and IPC-SM-840,Perfag
	OMR Italia SPA internal operative instructions and procedures

<b>Metal finishing expiry date</b>	Finishing type	Expiry date from date of production (week code on PCB)	Spec reference
	Hot Air Levelling	12 months	(rif. Perfag)
	Chemical Ni.Au ENIG	12 months	(rif. Perfag)
	Chemical Tin	6 months	(rif. Perfag)
	Passivated copper OSP	6 months	(rif. Perfag)
	Immersion Silver	12 months	(rif. Perfag)
NB: Expiry starting from the date indicated on the PCB			

Rev	Date	Short description of revisions
0 - 5	Paper copy	Reference to paper copy
6	30/08/11	New complete edition
7	01/07/12	Editorial modifications
8	01/08/12	CTI symbol; Metal finishing expiry alignment with Perfag
9	04/02/13	Introduction tolerance for position of holes of the end product (Chapter drilling)
10	07/10/2013	Introduction characteristics of other materials
11	06/11/2014	Document update

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