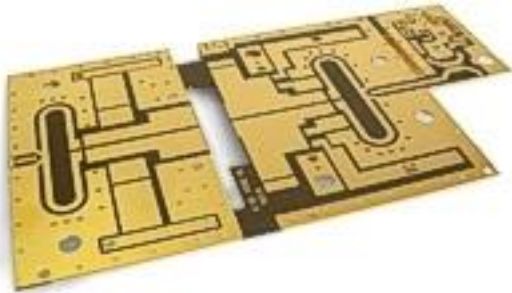


# FINE-LINE CIRCUITS LIMITED

( CORPORATE )

# WHO WE ARE ?

An independent publicly traded Printed Circuit Board(PCBs) manufacturer, located in Special Economic Zone of Mumbai, India with a sales office in USA, producing & exporting all types of PCBs in small volumes and delivering rapidly.

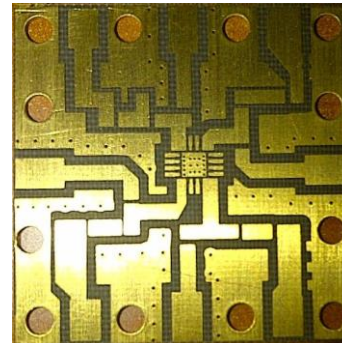


# Why us ?

## Our Specialization is :

### We specialize in the production of Space Grade RF Microwave PCBs

- We build PCBs using a variety of Low Loss/High Performance laminates especially from Rogers, Nelco, Taconic and including Rogers RT Duroid Series (5000 & 6000) and similar materials.
- These are with a special surface finish of 2-4 microns Electroplated Bondable Gold Direct on Copper. (no nickel barrier equals to no signal loss & excellent gold wire bond ability.)



**APPROVED  
BY ISRO**



ISRO has put over 75 satellites and India ranks 4<sup>th</sup> in the world on Satellite Launches and Space accomplishments.



RT Duroid  
PCBs  
( 5000 &  
6000 series)

- We are the only approved PCB Supplier for India's foremost Space Agency - ISRO (Indian Space Research Organization) for their RT Duroid PCBs which go into their Satellite Communication Systems.
- *We have made this 2-4 microns electroplated bondable Gold direct on Copper Finish AFFORDABLE.*
- *We Strongly Believe this will add Enormous value to your product offering as you will get the highest signal Performance.*



- Global experience and its best practices implemented for the customer gain.
- ISRO Certificate Number# (SAC/SRG/CERT/2016/02) & (SAC/SRG/CERT/2017/02).  
(Indian Space Research Org: Space Application Centre.)
- Medical ISO 13485:2012 + ISO 9001:2008  
URS/UKAS Certificate Number# 70330/A/0001/UK/En.
- TS 16949 & AS/EN 9100 & IPC Class III Compliant.
- UL # E146621 A
- A Lieferant Certifications / A-Supplier Certifications from many German & USA customers.
- Financially a net zero debt company with state of the art equipment and a vibrant operational team.






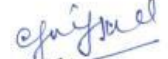

# CERTIFICATE & APPROVALS

## ISRO Space Application Centre Approval Certificate (Flight Hardware)

अंतरिक्ष उपयोग केंद्र अंतरिक्ष विभाग भारत सरकार अहमदाबाद - 380015 गुजरात, भारत		Space Applications Centre Department of Space Government of India Ahmedabad - 380015 Gujarat, India												
<b>अर्हता प्रमाणपत्र / Certificate of Qualification</b>														
जारी करने की तिथि: सितम्बर 09, 2016 प्रमाणपत्र सं.: एसएजी/सेक/सर्टिफिकेट/2016/02	ISSUE DATE : September 09, 2016 CERTIFICATE No. : SAC/SRG/CERT/2016/02													
This is to certify that <b>M/s. Fine Line Circuits Limited</b>														
145, SDF V, Seepz, Andheri (East), Mumbai - 400096, India has been Qualified by Space Applications Centre for the fabrication of gold Plated PTH PCB using Soft RF Substrates for Flight Hardware Realization. Details of Qualified Process are as under,														
<table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Laminate Type</th> <th>Capabilities</th> <th>Processing Type</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RT/D-6002 with and without Cu-Back</td> <td> <i>Line Width/Spacing</i> : 5mil  <i>PTH/Via</i> : 0.3mm, without Cu-Back &amp; 0.5mm, with Cu-back               </td> <td> <i>Pattern Formation</i> : Subtractive Processing  <i>PTH/Via</i> : Electroless Copper               </td> </tr> <tr> <td>2</td> <td>RT/D- 6010 with and without Cu-Back</td> <td> <i>Gold Finish</i> : 2 to 4 μm               </td> <td> <i>Gold Deposition</i> : Electrodeposited               </td> </tr> </tbody> </table>	Sr. No.	Laminate Type	Capabilities	Processing Type	1	RT/D-6002 with and without Cu-Back	<i>Line Width/Spacing</i> : 5mil <i>PTH/Via</i> : 0.3mm, without Cu-Back & 0.5mm, with Cu-back	<i>Pattern Formation</i> : Subtractive Processing <i>PTH/Via</i> : Electroless Copper	2	RT/D- 6010 with and without Cu-Back	<i>Gold Finish</i> : 2 to 4 μm	<i>Gold Deposition</i> : Electrodeposited		
Sr. No.	Laminate Type	Capabilities	Processing Type											
1	RT/D-6002 with and without Cu-Back	<i>Line Width/Spacing</i> : 5mil <i>PTH/Via</i> : 0.3mm, without Cu-Back & 0.5mm, with Cu-back	<i>Pattern Formation</i> : Subtractive Processing <i>PTH/Via</i> : Electroless Copper											
2	RT/D- 6010 with and without Cu-Back	<i>Gold Finish</i> : 2 to 4 μm	<i>Gold Deposition</i> : Electrodeposited											
यह प्रमाणपत्र अगस्त 31, 2018 तक वैध है   This Certificate is valid up to August 31, 2018.														
संदर्भ दस्तावेज / Reference Documents														
➤ परीक्षण रिपोर्ट सं. SAC/SRA/GEN/QTR/05, 2016 / Qualification Test Report No. SAC/SRA/GEN/QTR/05, 2016 ➤ प्रक्रिया पहचान दस्तावेज आइडी: Fineline/D/PID-02, संशोधन: 01/00, दिनांक 22 मार्च 2016 / Process Identification Document ID: Fineline/D/PID-02 Revision: 01/00 dated 22 March 2016.														
 (के. बी. व्यास) (K. B. Vyas) ग्रुप प्रधान, एसएजी/सेक Group Head, SRG/SAC	 (ए. क. लाल) (A. K. Lal) ग्रुप निदेशक, एसएजी/सेक Group Director, SRG/SAC	 (तपन मिश्रा) (Tapan Misra) निदेशक, सेक Director, SAC												

# CERTIFICATE & APPROVALS

## ISRO Space Application Centre Approval Certificate

अंतरिक्ष उपयोग केंद्र अंतरिक्ष विभाग भारत सरकार अहमदाबाद - 380015 गुजरात, भारत		Space Applications Centre Department of Space Government of India Ahmedabad - 380015 Gujarat, India
<b>अर्हता प्रमाणपत्र / Certificate of Qualification</b>		ISSUE DATE: February 16, 2017 CERTIFICATE No.: SAC/SGR/CERT/2017/02 ISSUED BY.: PMQD-E/SGR/SAC
जारी करने की तिथि: फरवरी 16, 2017 प्रमाणपत्र सं.: सेक/एसआरजी/सर्विफिकेट/2017/02 जारी कर्ता: पीएमक्यूडी-ई/एसआरजी/सेक		
<p align="center"><b>This is to certify that</b>  <b>M/s. Fine Line Circuits Limited</b></p>		
145, SDF V, Seepz, Andheri (East), Mumbai - 400096, India has been Qualified by Space Applications Centre for the fabrication of Rigid-Multilayer Board in accordance with ISRO-PAX-304, Issue-2, for Flight Hardware Realization. Details of Qualified Process are as under,		
Sr. No.	Process Type	Capabilities
1	14-layer, FR-4 (HR-370) laminate, HASL finish	Line/Gap: 6 mil, Basic Cu: 1/2-Oz on Outer layers & 1-Oz on other layers PTH/Via: 0.4mm, Max. Aspect Ratio (PCB Thickness/Drill Dia) of 5.3 PTH/Via Filling: Nil
यह प्रमाणपत्र फरवरी 16, 2020 तक वैध है   This Certificate is valid up to February 15, 2020.		
संदर्भ दस्तावेज / Reference Documents		
> परीक्षण रिपोर्ट सं.: SAC/SRA/GEN/QTR/18, 2015 / Qualification Test Report No. SAC/SRA/GEN/QTR/18, 2015. > प्रक्रिया पहचान दस्तावेज सं.: Fineline/D/PID-01, संशोधन: 01/00, दिनांक 25 नवम्बर 2015 / Process Identification Document ID: Fineline/D/PID-01 Revision: 01/00 dated 25 November 2015.		
 (र. क. हेगड़े) (R. K. Hegde) प्रधान, पीएमक्यूडी-ई/एसआरजी Head, PMQD-E/SGR	 (के. बी. व्यास) (K. B. Vyas) ग्रुप प्रधान, एसआरजी/सेक Group Head, SRG/SAC	 (ए. के. लाल) (A. K. Lal) ग्रुप निदेशक, एसआरजी/सेक Group Director, SRG/SAC
 (तपन मिश्रा) (Tapan Misra) निदेशक, सेक Director, SAC		

# *COMPANY OVERVIEW*



# ABOUT US

**Fine-Line Circuits Ltd** an **ISO 9001:2008** accredited publicly traded company is committed to manufacturing and delivering defect-free PCBs to manufacturing industries by continually upgrading its services, process capabilities and product range.

### **OUR VISION:**

Our vision for Fine-Line is to be a Reliable, Quality, Medium Volume Manufacturer, Exporter, “Pleasing Customers 100 %” in the Complex High Count Multilayer Printed Circuit Boards.

### **OUR MISSION:**

Our Mission for Fine -Line is to be a Performance Driven, Reliable, Continuously Improving, High Quality, Medium Volume independent manufacturer, exporter" Pleasing customer 100%" in the complex High Count Multilayer PCB.

To have a manufacturing base in each of the major market served by the company.

### **OUR GOAL:**

To complete in the world markets by continuously improving capability to handle higher PCB complexity (thinner lines & smaller holes) and gear up for smaller lot sizes and shorter lead times and border range of materials & finishes all at a continuously reducing selling price.

### **Quality Policy:**

Fine-Line Circuits Limited commits itself to manufacturing & deliver defect free PCB's to manufacturing industries by continually upgrading the services, process capability, product range & with a constant customer focus we will achieve customer satisfaction. Comply with requirements and continually improve the effectiveness of the Quality Management System.

### **Take on 'Make in India'**

The company believes that this is indeed a great initiative by the Indian government, since the economy can prosper only when there are sufficient manufacturing activities taking place. So far, the facilities set up by different companies in India have been very encouraging, and the company truly hopes that this momentum will continue to grow with a focus on capability rather than capacity.

# OUR MANAGEMENT



**Mr. Abhay Doshi**  
(Managing Director)



**Mr. Rajiv Doshi**  
(Executive Director)



**Mr. Joy Chacko**  
(Operations, Investments & Technology)



**Mr. Milan Trivedi**  
(Sales & QA)



**Mr. Prakash Morgaonkar**  
(Production & Deliveries)



**Mr. Nikhil Kumar**  
(Maintenance, Multi Layers & Environment)



**Mrs. Prema Radhakrishnan**  
(Finance & Compliances)

Supported by 150 team members.



# OUR TEAM



# OUR CONTACT

## HEADQUARTERS



## EU REPRESENTATION



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51105 Köln  
Germany

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Email: [fineline@vsnl.com](mailto:fineline@vsnl.com),  
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## U.S. A. OFFICE



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San Jose, CA 95129  
USA

Tel/Fax # +1 877 876 3660

Email: [finelineus@aol.com](mailto:finelineus@aol.com)

# WHAT WE ARE ?

# OUR CAPABILITIES

- 1 to 24 Layer Printed Circuit Boards Rigid, R/Flex, Backplanes, High Frequency Board.
- Controlled Impedance BGA Blind/Buried Via PCBs.
- All categories of Tg.
- Specials: Rogers PTFE, Metal Clad PCBs, Very High TG PCBs, LED PCBs PET, PEN, G10 PCBs.
- All finishes including LF HAL, HAL, ENIGold, ENI Palladium Gold, Carbon, Imm.Tin, Imm.Silver & Electroplated Direct Bondable Gold on Copper



- Line/Space-4mil/0.1mm,SMD Pads -10mil/0.25mm & Hole Size-8mil/0.20mm.
- Stringent intricacies covering tight SM dams, Aspect ratios of 12:1, Annular rings, Tight Isolations.
- Specials: of via hole filling, edge plating, thick copper, press fit holes, heat sinks, buried resistors.



Production  
Capability\_RF Board



Production  
Capability\_Rigid PCB



Production  
Capability\_Flex PCB



Production  
Capability\_Rigid Flex P

# OUR WORK CULTURE

- Always under promise & over deliver.
- Do all that is necessary for getting repeat business.
- Our average age of customers is 12 years & of equipment is 3 years.
- Above all with clear communication we will ensure you get a lower total cost of purchase.
- High part no. small volume capability with short lead-times.
- High reliability & consistency with competitive prices & great working flexibility & superior customer engagement.
- A safe hedge against China and with far superior communication, IP ethics & consistency.

# OUR MANUFACTURING COMPETENCY

## Ingrained Over 26 Years...

- All processes are in-house & no subcontracting of any process.
- All processes are compliant to Class III IPC Standards, AS9100 and TS16949.
- All employees are trained for “Intrinsic Safety” requirements of customers.
- No compromise in material sourcing (laminates from Nanya, Isola & Rogers).
- Intense & Collaborative DFM process enabling smooth fabrication.

# OUR MANUFACTURING COMPETENCY

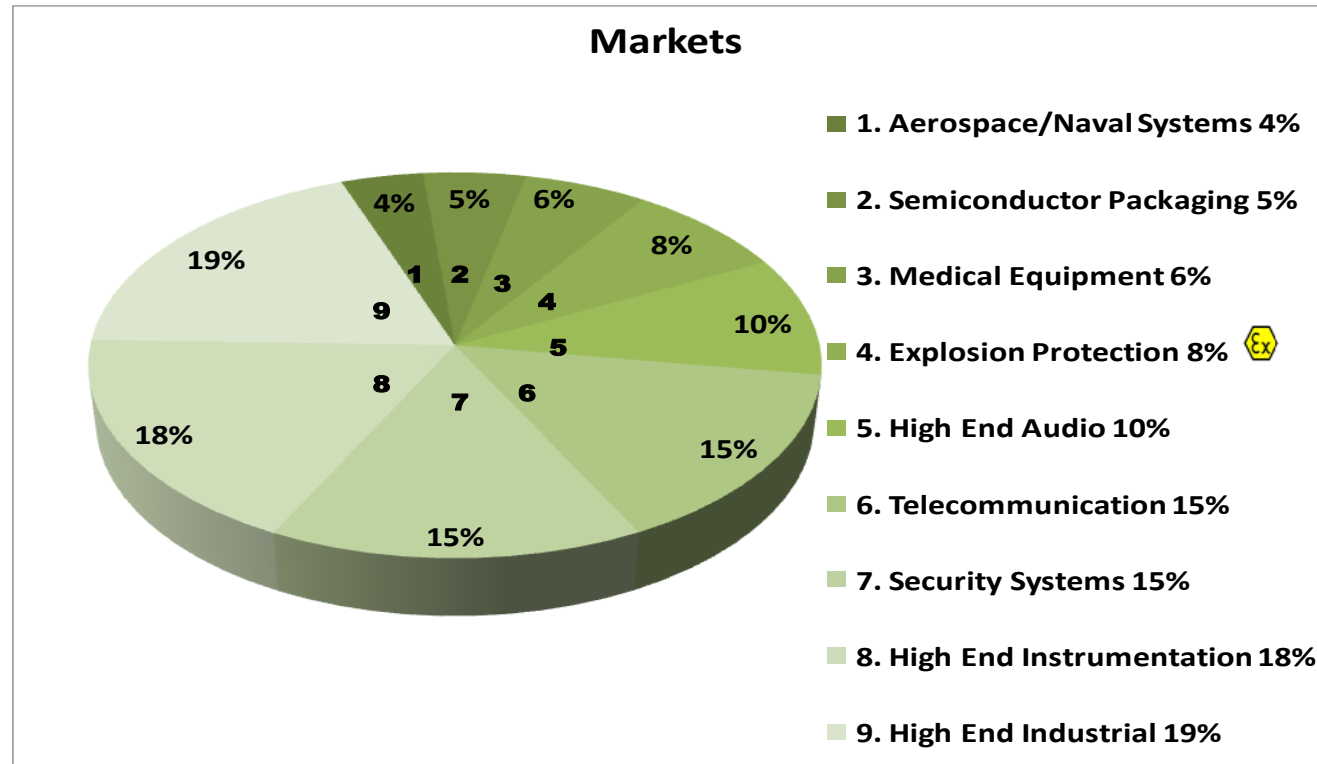
## Ingrained Over 26 Years...

- No deviation done to design without customer's written approval.
- Continuous technology upgradation with avg. equipment age < than 5 years.
- Continuous focus on "Flow" with Lean Manufacturing & 5S implementation.
- Continuous focus on Cycle Time Reduction.
- Continuous focus on Environment with high "Green" awareness & Zero Discharge.

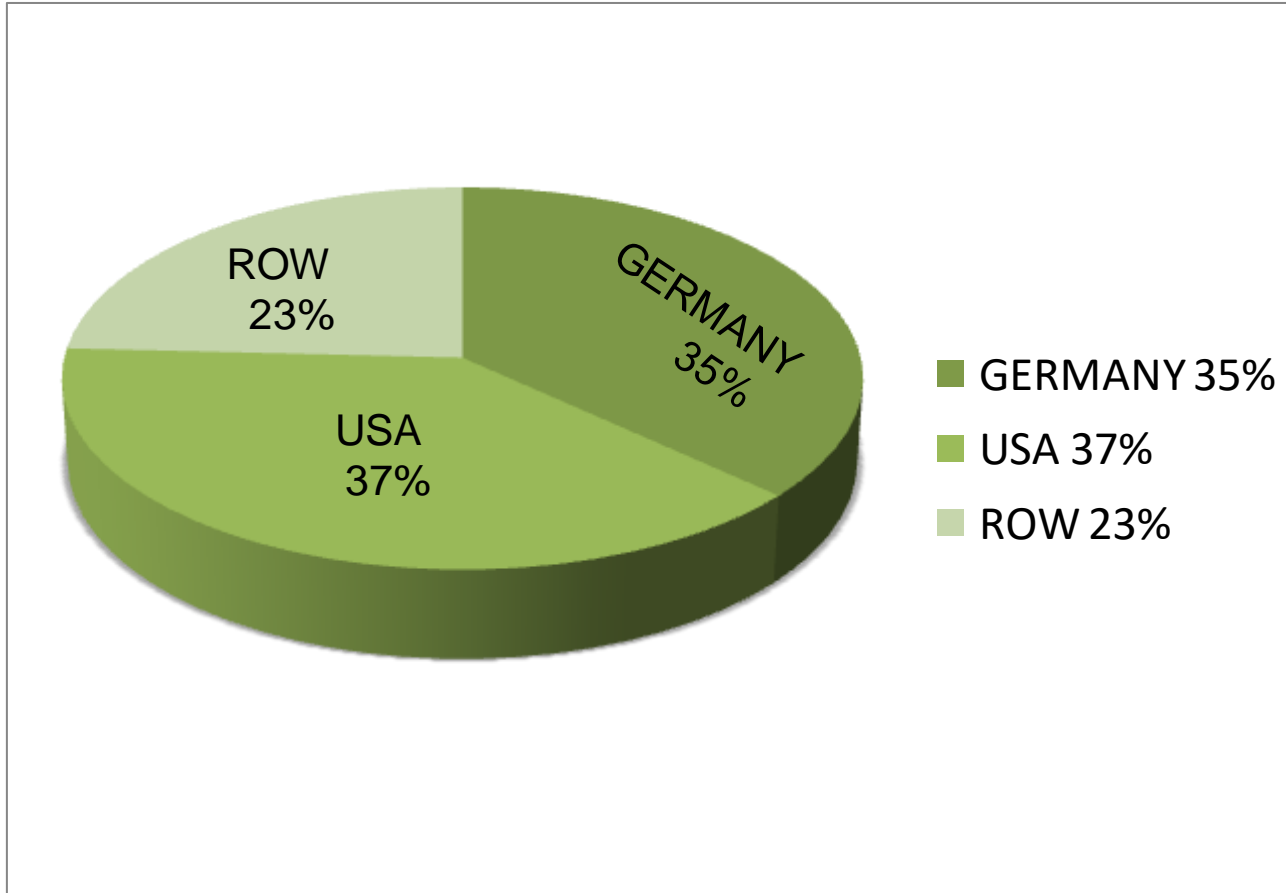


# OUR SERVICES & MARKET COVERAGE

- Production Volume of all types of 1 - 24 layers PCBs delivered in 10 - 20 days.
- Prototypes / Quick Turns docked at your door in 5-7 days



# OUR GLOBAL REACH.. 100% Exports to USA, EU & FAR EAST



# Key Manufacturing Equipment

- Posalux Ultra Speed Drilling.
- Hollmueller Inner Layer Acid Etching Machine.
- Automa -Tech Imaging.
- Automated Optimal Inspection Machine (AOI).
- OEM Vacuum Hot & Cold Press.
- IS Wet Processes Etcher.
- MEC Chemical Cleaning Machine for Solder Mask.
- Posalux Ultra Speed Routing Machine.
- ATG Testing.
- Europlasma Desmear Machine

# Posalux Ultra Speed Drilling, Switzerland.

- Micro Holes - Vias up to 8 mil.
- Higher RPM - hence better hole quality & better adhesion on hole wall.
- Depth Control - Possibilities of manufacturing blind and buried vias.
- Increased automation - eliminated man errors total real time broken bit detection by contact drill.
- Fast checking of the alignment between clamping system and the spindles.





# Hollmueller Inner Layer Acid Etching Machine, Germany.

- It can Etch 3 mils thick panel.
- Inner Layer conveyance transporter for 2 mil thick panel.
- 2 mil/ 2 mil line space/line.
- Very minimum under cut.



# Automa -Tech Imaging Machine, France.

- Fully Automatic CCD Alignment.
- Fully Automatic CCD Alignment.
- HDI compatible down to 25 um line and space.
- Automatic lighting adjustment system for CCD Cameras.



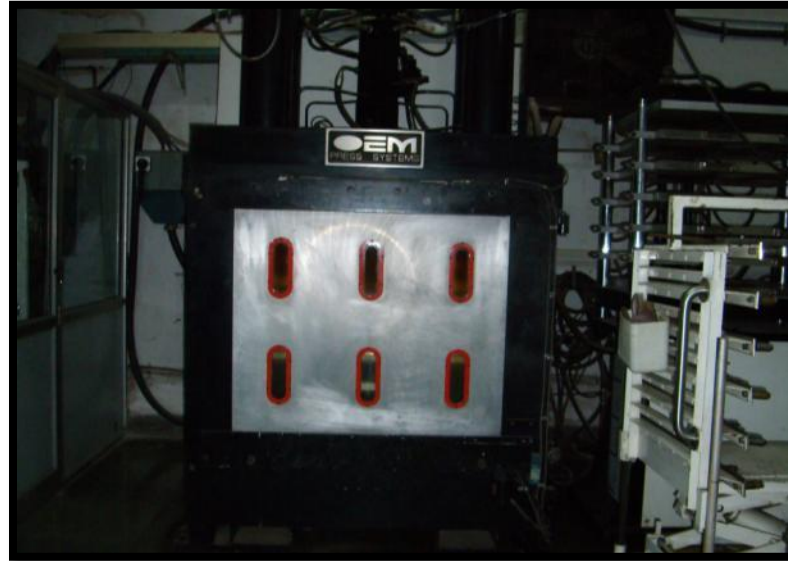
# Automated Optimal Inspection Machine (AOI), Israel.

- AOI inspection with reference to Gerber files.
- Can inspect Inner Layer, outer layer ,buried jobs and films.
- Separate verification R/W station.



# OEM Vacuum Hot & Cold Press, USA.

- 140 Ton vacuum lamination, OEM press with 6 openings
- Electric Heating.
- Ability to hold tighter tolerance on high layer count.
- Consistent thickness uniformity across your product.





# IS Wet Process Etcher, Italy

- Can handle thinner inner cores - hence can go up to higher counts MLBs Layers of 24 Layers.
- Being State of the art developer, 4 mil / 4 mil spacing in inner layers can be handled.





# MEC Chemical Cleaning Machine for Solder Mask, Taiwan.

- Surface preparation with chemical cleaning TTM M/L for PISM.
- Handling critical boards with width or space.
- Cleaning smaller holes prior to solder mask.
- It uses MEC chemistry.



# Posalux Ultra Speed Routing Machine, Switzerland.

- Can rout the PCBs to individual Arrays to the size shape as per the customers requirement within the required tolerance.



# ATG Testing, Germany.

- State of the art testing of 12 mil SMD.
- Inner layer testing capability.
- Higher reliability in testing.
- Simultaneous double side SMD testing.



# Europolasma Desmear Machine, Belgium.

- Used for back-Etch & desmear of Multilayer, Rigid, Flex, Teflon & R/F PCBs
- Various types of gases used for different types of materials such as Oxygen, Nitrogen, CF<sub>4</sub> & Helium.





# OUR COMMITMENT

- Ensure no repeat issues.
- Ensure lesser and lesser issues over time.
- Ensure lesser issues than your existing vendors.





# CERTIFICATE ISO Certificate



# OUR ACHIEVEMENT

## ZERTIFIKAT

*In appreciation of excellent performances  
as a supplier of company  
R. Stahl Schaltgeräte GmbH*

Assessment of the last six months of 2006 has been completed.  
Company Fine Line Circuits Limited has been classified as an

**A-SUPPLIER**

We are looking forward to having ongoing good business  
connections.

R. STAHL Schaltgeräte GmbH

  
i.V. Reinhold Stadtmüller

  
i. A. Carmen Peters



# OUR ACHIEVEMENT





# OUR ACHIEVEMENT



# OUR GREEN INITIATIVE





## Contact Details

Mr. Milan. J. Trivedi

Sr. General Manager-Sales & QA

Mobile No: +91-9820468308

E-mail: [mtrivedi@finelineindia.com](mailto:mtrivedi@finelineindia.com)

FINE-LINE CIRCUITS LIMITED

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Email: [fineline@vsnl.com](mailto:fineline@vsnl.com), Skype : [flclskype](https://www.skype.com/name/fineline)

Website: [www.finelineindia.com](http://www.finelineindia.com)

**THANK YOU**