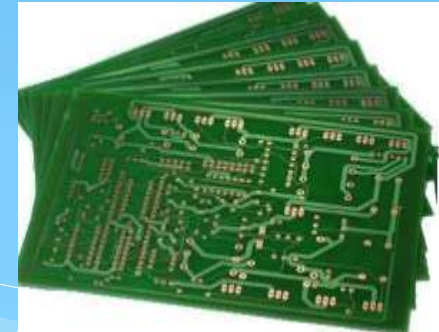




A LEADER IN LAMINATES & PCB'S





A LEADER IN LAMINATES & PCB'S

* COMPANY PROFILE

DhanLaminatesPvtLtd.isanindependentlegalentity.

The company was established in September 2007 with Trading of Copper Clad Laminates and Unclad Laminates.

- ❖ **The company is a privately owned high-new-tech enterprise composed of R&D, Production, Sales & Services.**
- ❖ **Our Main Products include NEMA FR-4/G10 and NEMA FR5/G-11 Laminate Sheets with a non-going expansion to manufacture Glass Epoxy tubes and Rods.**
- ❖ **After the Directors completed more than a decade experience in Imports of Fibre Glass Epoxy Laminated Sheets, In the year 2011– 2012 we started the production of Copper Clad Laminate and Un-Clads Laminates.**

Now in the Year 2018-2019

DhanLaminates entered in Bare PCB Manufacturing and established a State of the Art manufacturing facility in Kolkata (West Bengal) using most modern equipment's and technologies.

We are committed to achieve the same level which we achieved in Laminate manufacturing using our knowledge, dedication & focus towards Quality & Customer Service.



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Brief Introduction of Key Management

DIRECTORS

1. **Mr. ALOKE PACHISIA** : A Hardcore Technocommercial individual. Committed to compete abroad manufacturers of Laminates & PCBs by providing World Class Quality & Service to Indian Customers on competitive prices.
2. **Mrs. AARTI PACHISIA**: A Quality & System oriented Lady, Providing her services to the Organization for Human Resource, 5S & Structuring of the Organization.



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Brief Introduction of Key Management

KEY MANAGERIAL PERSONS

1. Mr. VARUN PACHISIA : Handling entire Commercial & Finance related activities of the Organization.

UNIT-I (LAMINATE DIVISION)

1. Mr. VISHESH PACHISIA : Handling Production & Quality related activities of Laminate Division.

UNIT-II (PCB DIVISION)

1. Mr. S.P. SINGH : Business Unit Head of PCB Division having Hardcore PCB manufacturing experience of over 29 Years in Various Top Indian PCB Manufacturers.

2. Mr. P.N. BARMAN : Handling entire Technical & Maintenance activities of PCB Division. Having more than 35 Years rich experience of working in various PCB Manufacturing Units in India.



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Our Vision & Principle

Since the establishment of Dhan Laminates Pvt. Ltd., We have abided by the philosophy of '**WORK IS WORSHIP**'. We have developed a highly qualified management and technical team. In addition, there is a constant endeavour in the pursuit of innovation of technology and product.



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Our Mission

Our mission is to be the leader in this line of business by providing maximum customer satisfaction through our commitment to quality, delivery and service. Our focus is on continuous Improvement, method refinement and complete customer satisfaction.



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QUALITY SYSTEM

The plant is incorporated with ISO 9001:2015 certified Quality Management System and using most stable and modern processes and process control techniques and reliable raw material. We are committed to provide the best **Electrical Insulation** and **Electronics Interconnection** to fulfill the customer requirements.



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Quality Objectives

- Employment of skilled manpower
- To maintain Zero defect tolerance level
- Implementation of Process Control and Documentation
- Enhancement of customer satisfaction level
- To give better technical support to customer to full satisfaction



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Unclad & Copper Clad Laminates (Laminate Division)

Our Laminate Division is well equipped with Modern Equipments required for making Speciality Laminates. Speciality FR4 & FR5 Unclad Laminates, we make are used for Electrical Insulations in various Electrical Equipments. Also it is used for other various applications. And the Copper Clad Laminates, we make is used as basic Raw Material for making Bare Printed Circuit Boards (PCBs)



LEADER IN LAMINATES & PCB'S

FACILITY

List of Machines & Equipment

- **Cutting Section:**
 1. Hydraulic Shearing Machines
 2. Paddle Shearing Machines
 3. Roller Cutting Machines
- **Assembling Section:**
 1. Automatic Conveyor Assembler.
 2. Manual Assembling Trays.
- **Press Section:**
 1. Hydraulic With Auto Loader Press Machine-2 Units
 2. Hydraulic With Manual Loading Press Machine-2 Units
- **Separation Sheets:**
 1. Three sets for each machine.



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Production Capacity & Technical Capabilities

| | |
|---------------------------------|-------------------------------|
| Copper Clad Laminates | : 20000 Sheets / Month |
| Unclad Glass Epoxy Sheet | : 100 MT. / Month |

Technical Specifications:

| | |
|-----------------------|---|
| Sheet Sizes | : 1220 x 1020 mm, 1220 x 915 mm, 1020 x 610 mm |
| Grade (CCL) | : CEM-3 & FR4 in Copper Clad (UV & Non UV) |
| Grade (Unclad) | : Class 'F' Insulation FR4 (UV) & FR4 (Natural) And Class 'H' Insulation FR5 (High Tg) |



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CopperClad Laminates

Colours Available

Grade CEM-3 (NONUV)

- * **THICKNESS** : 0.3~3.2MM (Standard thickness 0.8, 1.0, 1.2, 1.6, 2MM)
- * **COPPERFOIL** : 18 μ , 25 μ , 35 μ , 70 μ , 105 μ
- * **STANDARD SHEET SIZES** : 24"X40"/36"X48"/40"X48"
- * **COLOURS** : PINK, GREY



PINK



GREY



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GradeFR-4

COLOURS AVAILABLE

- * **UVBLOCKED** :YELLOWBASE
- * **NONUV** :NATURALBASE
- * **THICKNESS** :0.3~3.2MM
(Standardthickness
0.8,1.0,1.2,1.6,2MM)
- * **COPPERFOIL** :18 μ ,25 μ ,35 μ ,70 μ ,
105 μ
- * **STANDARD
SHEET SIZES** :24"X40"/36" X48"/
40"X 48"
- * **COLOURS** :YELLOW(UV)COLOUR,
NATURAL(NON-UV)
COLOUR



UV



UV



NON UV



NON UV



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Glass Fiber Epoxy Unclad Laminate Grade FR-4

- * **LENGTH AND WIDTH TOLERANCE** : ± 25 MM
- * **AVAILABLE THICKNESS** : 0.15 MM ~ 100 MM
- * **THICKNESS VARIATION** : Up to 5 MM ± 0.10 MM, Above 5 MM ± 0.50 MM
- * **SIZE** : 610 MM x 1020 MM, 1020 MM x 1020 MM, 1030 MM x 1230 MM
- * **COLOURS** : Lemon Yellow, Golden Yellow, Natural, Green
- * **INSULATION CLASS** : 'F'



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DIFFERENCE BETWEEN FR4 & G10

- * G10/FR4 has extremely high mechanical strength, good dielectric loss properties, and good electric strength properties, both wet and dry. The main difference between NEMA Grades G10 and FR4 is that FR4 is a fire retardant grade of G10. Therefore, FR4 can be safely substituted where G10 is called out, while G10 can never be substituted where FR4 is called for.



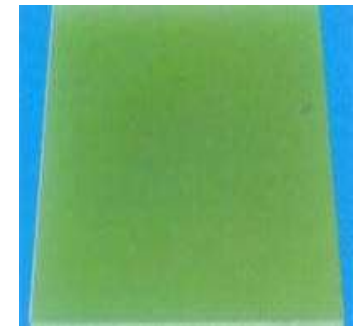
LEMONYELLOW



GOLFENYELLOW



FR4 NATURAL



G10 GREEN



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High TG Glass Fiber Epoxy Unclad Laminate

- ❖ **PRODUCT** : HIGH TG GLASS FIBER EPOXY UNCLAD LAMINATE
- ❖ **LENGTH AND WIDTH TOLERANCE** : ± 25 MM
- ❖ **AVAILABLE THICKNESS** : 0.15 MM ~ 100 MM
- ❖ **THICKNESS VARIATION** : Up to 5 MM ± 0.10 MM, Above 5 MM ± 0.50 MM
- ❖ **SIZE** : 610 MM x 1020 MM, 1020 MM x 1020 MM, 1030 MM x 1230 MM
- ❖ **COLORS** : Deep Yellow, Deep Green,
- ❖ **INSULATION CLASS** : 'H'



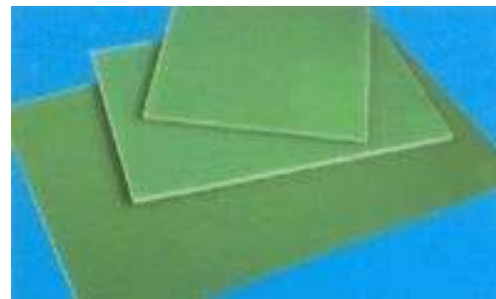
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DIFFERENCE BETWEEN FR5 & G11

NEMA grades G11/FR5 Glass-Cloth Reinforced Epoxy-natural color is typically yellow green to amber. This grade is similar to G10/FR4 with the addition of a higher operating temperatures and some improved mechanical strength at elevated temperatures. The main difference between NEMA Grades G11 and FR5 is a fire retardant grade of G11. Therefore, FR5 can be safely substituted when G11 is called for while G11 can never be substituted where FR5 is called for.



FR5 DEEP YELLOW



G11 DEEP GREEN



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Segments Whom We Cater To (Laminates Division)

- * Electrical Switchgear Industries
- * Transformer Industries
- * Electrical Component Manufacturers
- * PCB Manufacturers
- * Automobile Component Manufacturers
- * Electronics Kit Manufacturers



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Components



GASKET WASHERS



GLASS EPOXY WASHERS



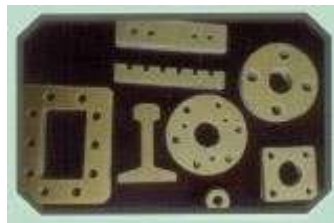
GLASS EPOXY SPACERS



GLASS EPOXY COMPONENTS



GLASS EPOXY WEDGES



GLASS EPOXY COMPONENTS



DOVETAIL RUNNER



DOUBLE SIDED RUNNER WITH SPACER



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PRINTED CIRCUIT BOARDS (PCB DIVISION)

A printed circuit board mechanically supports and electrically connects electronic components or electrical components using conductive tracks, pads and other features etched from one or more layers of copper laminated sheets, onto and/or between sheet layers of a non-conductive substrate.



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ListOfMachineryForSingleSided&MetalCore PCB's

Printing Area

- * FullyAutomaticPrintingMachines
- * SemiAutomaticPrinting Machines
- * ManualPrintingStations
- * SemiAutomaticOpticalGuideHoleDrilling Machines
- * UVCuringMachines
- * IRCuringMachines

ChemicalArea

- * FullyAutomaticEtching&StrippingLine
- * FullyAutomaticChemicalCleaning& ScrubbingLines

FinalFinish Area

- * CNCRoutingMachine4Spindle
- * CNCRoutingMachine2Spindle
- * PowerPressesforPunching&Different Outer Profile
- * CNCV-GroovingMachinewithJumpScore
- * FullyAutomaticV-GroovingMachinewith Jump Score

SurfaceFinishArea

- * AutomaticLacquerCoating Machine
- * HotAirSolderLevellingMachine
- * AutomaticOSPLine

FinalTesting&Inspection

- * HighVoltageBBTTester



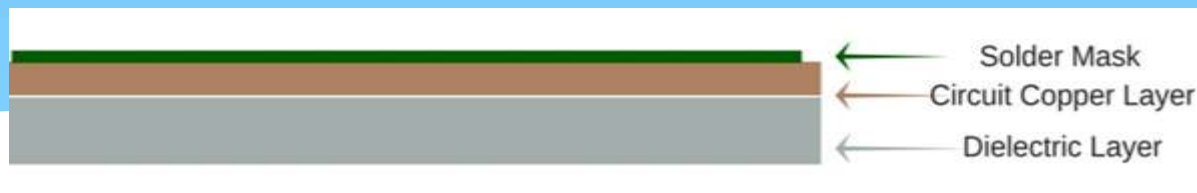
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SINGLE SIDED

Single Sided PCBs contain only one layer of conductive material and are best suited for low density designs. Single sided PCB's have been around since the late 1950s and still dominate the world market in sheer piece volume. Single-Sided printed circuit boards are easily designed and quickly manufactured. They serve as the most cost effective platform in the industry.

How Are Single Sided PCBs Made?

One thin layer of thermally conductive but electrically insulating dielectric is laminated with copper. Solder mask is usually applied on top of the copper.





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Benefits of Single Sided PCBs

Ideal for simple low-density designs

Lower cost, especially for high volume orders
Lower probability of manufacturing issues

Popular, common, and easily understood by most PCB manufacturers



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Although Single Sided PCBs are relatively simple, they can still be used in very complex devices:-

- * Powersupplies
- * Relays(automotiveandindustrial)
- * Timingcircuits
- * Sensorproducts
- * LEDlighting
- * Radioandstereoequipment
- * Packagingequipment
- * Surveillance
- * Calculators
- * Printers
- * Coffeemakers
- * Vendingmachines
- * Solidstatedrives
- * Camerasystems



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List of Machinery For Double Sided PCB's

CNC Area

- * Six Spindle CNC Drilling Machines
- * Four Spindle CNC Routing Machine
- * Two Spindle Long Format Routing/Drilling Machines

Imaging Area

- * Scrubbing Machine
- * Hot Roll Dry Film Laminator
- * Double Side Double Drawer Automatic Exposure for Dry Film
- * Double Side Double Drawer Automatic Exposure for Solder Mask
- * Developing Machines for Dry Film & PISMD Developing

Chemical Area

- * Electroless PTH Line
- * Electroplating Line
- * Conveyrised Etching & Stripping Line (SES Line)

Surface Finish Area

- * Hot Air Solder Levelling Machine
- * Automatic OSP Line

Final Finish Area

- * CNC Routing Machine 4 Spindle
- * CNC Routing Machine 2 Spindle
- * CNC V-Grooving Machine Jump Score
- * Fully Automatic V-Grooving Machine Jump Score

Final Testing & Inspection

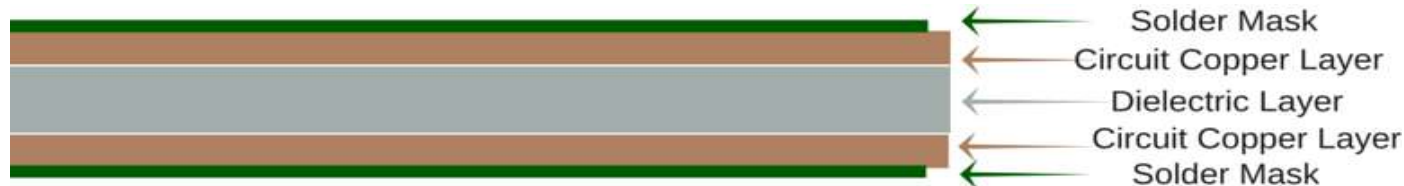
- * High Voltage BBT Tester
- * Micro Section Equipment



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Double Sided:-

Double Sided PCBs (also known as Double-Sided Plated Thru) circuits are the gateway to high technology applications. They allow for closer (and perhaps more) routing traces by alternating between a top and bottom layer using vias. Today, double sided printed circuit board technology is perhaps the most popular type of PCB in the industry.





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Benefits of Double Sided PCBs:

- * More flexibility for designers
- * Increased circuit density
- * Relatively lower costs
- * Intermediate level of circuit complexity
- * Reduced board size (which can reduce costs)

Applications of Double Sided PCBs:

- * There are nearly limitless applications for old and new designs. Fine line surface mount, ultra high copper build, high and low temperature, Solder coated, Silver, and Gold finishes are just a few examples of DSPTH applications.



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The following are applications in which Double Sided PCB can be used:-

- * Industrial controls
- * Power supplies
- * Converters
- * Control relays
- * Instrumentation
- * Regulators
- * UPS systems
- * Power conversion
- * HVAC
- * LED lighting
- * Hard drives
- * Printers
- * Phone systems
- * Power monitoring
- * Automotive dashboards
- * Line reactors
- * Test equipment
- * Amplifiers
- * Traffic systems
- * Vending machines



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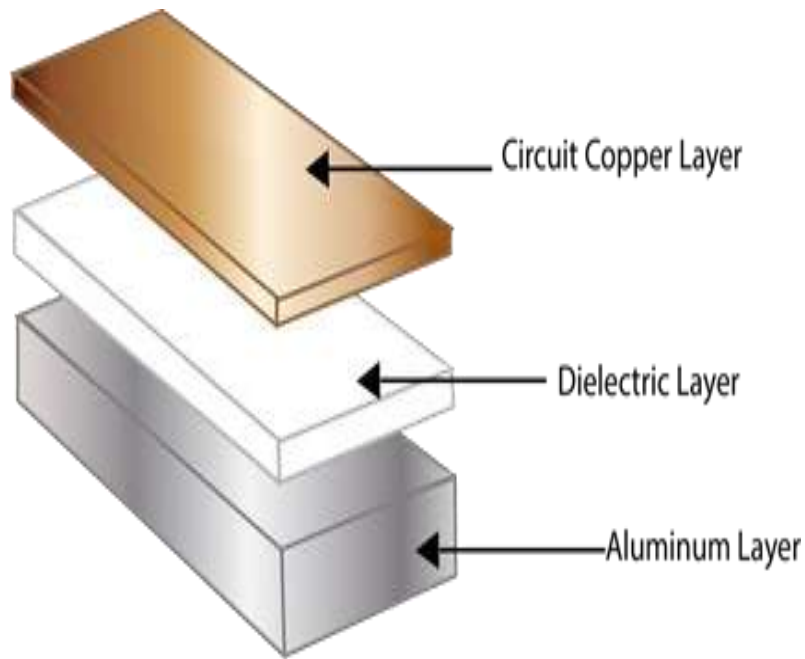
Metal Core:-

- * Aluminium Printed Circuit Boards contain a thin layer of thermally conductive dielectric material that transfers heat
- * There are many names for these products; Aluminum clad, Aluminium base, Metal clad Printed Circuit Board (MCPCB), Insulated Metal Substrate (IMS or IMPCB), Thermally conductive PCBs, etc... but they all mean the same thing and perform the same way.



ALADERIN LAMINATES & PCB'S

How Are Aluminum PCBs Made?



- * A thin layer of thermally conductive but electrically insulating dielectric is laminated between a metal base and a copper foil. The copper foil is etched into the desired circuit pattern and the metal base draws heat away from this circuit through the thin dielectric.



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Benefits of Aluminum PCBs

- * Heat dissipation is dramatically superior to standard FR-4 constructions.
- * The dielectrics used are typically 5 to 10 times as thermally conductive as conventional epoxy-glass and at a tenth of the thickness
- * Thermal transfer exponentially more efficient than a conventional rigid PCB.
- * Lower copper weights than suggested by the IPC heat-rise charts can be used.



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Applications of Aluminum PCBs

- * Although Power Converters and LEDs are the largest users of these products, Automotive and RF companies are also looking to take advantage of the benefits of these constructions. While a single layer construction is the simplest, other configuration options are also available on request.



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Multilayer PCB:-

- * **Multilayer PCB is a circuit board that has more than two layers.**
- * Unlike a Double-Sided PCB which only has two conductive layers of material, all multilayer PCBs must have *at least three* layers of conductive material which are buried in the centre of the material.



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How Are Multilayer PCBs Made?

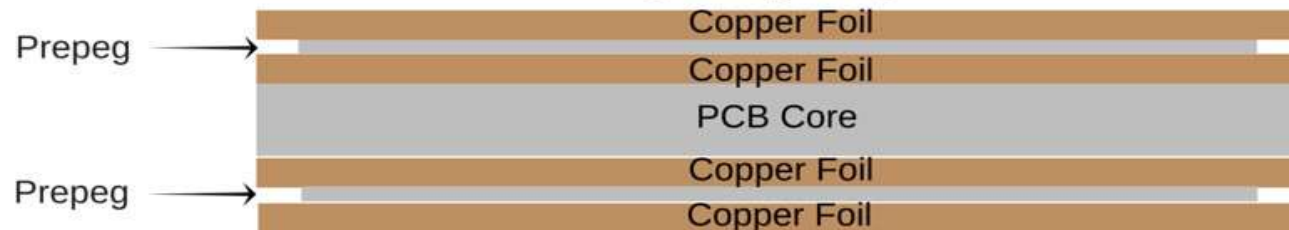
- * Alternating layers of prepreg and core materials are laminated together under high temperature and pressure to produce Multilayer PCBs. This process ensures that air isn't trapped between layers, conductors are completely encapsulated by resin, and the adhesive that holds the layers together are properly melted and cured. The range of material combinations is extensive from basic epoxy glass to exotic ceramic or Teflon materials.



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- ❖ The figure below will illustrate the stackup of a 4-Layer/Multilayer PCB. Prepreg and core are essentially the same material, but prepreg is not fully cured, making it more meltable than the core. The alternating layers are then placed into a lamination press. Extremely high temperatures and pressures are applied to the stack up, causing the prepreg to "melt" and join the layers together. After cooling off, the end result is a very hard and solid multilayer board.

Side-View of Multilayer Stackup (4 Layers)





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Benefits of Multilayer PCBs (compared to single or double-sided PCBs)

- * Higher assembly density
- * Smaller size (considerable savings on space)
- * Increased flexibility
- * Easier incorporation of controlled impedance features.
- * EMI shielding through careful placement of power and ground layers.
- * Reduces the need for interconnection wiring harnesses (reduces overall weight)



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Applications of Multilayer PCBs

While the weight and space benefits of multilayer PCBs are especially valuable, Multilayer PCBs are also beneficial to applications where "cross-talk" levels are critical.



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These are a few main applications using Multilayer Printed Circuit Boards

- * Computers
- * File servers
- * Data storage
- * Signal transmission
- * Cell phone transmission
- * Cell phone repeaters
- * GPS technology
- * Industrial controls
- * Satellite systems
- * Handheld devices
- * Test equipment
- * X-ray equipment
- * Heart monitors
- * CAT scan technology
- * Atomic accelerators
- * Central fire alarm systems
- * Fiberoptic receptors
- * Nuclear detection systems
- * Space probe equipment
- * Weather analysis



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Segments Whom We Cater To (PCB Division)

- * Telecommunications
- * Lighting
- * LED Applications
- * Consumer Electronics
- * Automation Industries
- * Automobile Industries
- * Computer Applications



ALEADER IN LAMINATES & PCB'S

Production Capacity & Technical Capabilities

| | | |
|---------------------------|---|--|
| * Production Capacity | : | Single Side-20000 Sq.Mt./Month Double Side-3000 Sq.Mt./Month Metal Core-10000 Sq.Mt./Month |
| * Type Of Laminates | : | FR1/CEM-1/CEM-3/FR4 & Metal Core |
| * Laminate Thickness | : | 0.4–3.20mm |
| * Copper Foil Thickness | : | 18micron–70 micron |
| * Minimum Track Width | : | 0.10mm(Double Side)&0.15mm(Single Side) |
| * Minimum Spacing | : | 0.10mm(Double Side)&0.15mm(Single Side) |
| * Min.Hole Size(CNC) | : | 0.30mm(Finish) |
| * Min.Hole Size(Punching) | : | 0.70mm |
| * Maximum PCB Size(D/S) | : | 610mmx500mm |
| * Maximum PCB Size(S/S) | : | 1180mmx500mm |
| * Maximum PCB Size(MC) | : | 1180mmx500mm |
| * Mechanical Tolerances | : | +/-0.10mm |
| * Surface Finishes | : | Lacquer/HAL/Carbon/OSP |
| * Acceptable Data Formats | : | Gerber274X/Protel Files/Coral Draw Files/Autocad Files |



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RESULT of FY 2018-2019

SALE TURNOVER (INR.)

Laminate Division:

- ❖ Sales Turnover FY 2018-2019 : 182 Million
- ❖ TARGET For FY 2019-2020 : 220 Million

PCB Division:

- ❖ TARGET FOR FY 2019-2020 : 180 Million



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Certifications





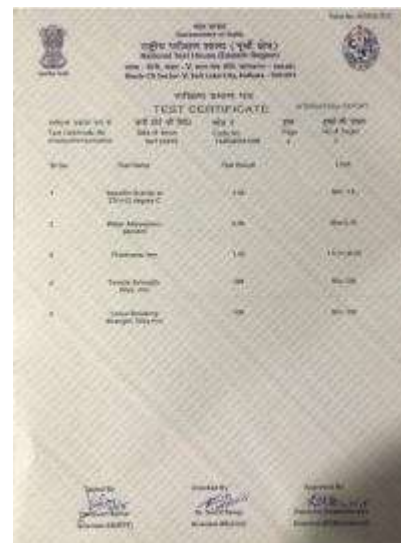
PRODUCT TEST REPORTS Continued...

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LEADER IN LAMINATES & PCB'S

PRODUCT TEST REPORTS





LEADER IN LAMINATES & PCB'S

CONTACT DETAILS



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