



DALEBA
Printed Circuits

Daleba Printed Circuits – supplying PCBs since 1963

- ✓ Single-sided and double-sided PCBs
- ✓ RF and microwave PCBs
- ✓ Embedded copper PCBs
- ✓ Copper coin PCBs
- ✓ Ceramic PCBs
- ✓ Multilayer PCBs (4-20 layers)
- ✓ Heavy copper boards (up to 85 oz)
- ✓ IMS boards (copper/aluminium base)
- ✓ Flex and flex-rigid PCBs
- ✓ Stencils

Daleba has supplied the global electronics industry since 1963. We now deliver about 50 million+ PCBs each year to customers worldwide..

Sourcing PCBs takes expertise. We match your technical and commercial requirements with the right manufacturing facility. Depending on your needs, production is carried out in our UK factory or one of our trusted plants in the Far East. When you choose Far East production, our UK team works with our engineering and logistics teams in Hong Kong and China. This ensures cost-effective, reliable supply. We arrange fast airfreight when lead time is critical or scheduled deliveries to fit your production plan.



Daleba Printed Circuits UK Headquarters, Orland House

Stock Management - our value-added service

Alongside manufacturing, we provide customised stock management. This service keeps your production lines moving and protects you from supply interruptions. Whether you operate from a single site or across multiple locations, we hold and deliver PCBs where and when you need them. This added flexibility reduces risk, saves storage costs and ensures continuity of supply.

Our experienced stock management team will work with you to build a programme tailored to your specific needs. Options include:

- ✓ Inventory buffering
- ✓ Kanban and re-order point systems
- ✓ Schedule sharing
- ✓ Consignment stock agreements

We take a strategic view of your inventory, considering everything from lead times and freight costs to forecasting, valuation and space planning.

Consignment Stock

Our consignment stock service gives you maximum flexibility with minimal risk. We manufacture PCBs in advance and deliver them either to your site or to our secure 75,000 sq ft UK warehouse. We currently hold over six million PCBs for customers, ready for immediate despatch. You only pay when you use the stock, freeing up working capital while keeping production uninterrupted.

Key benefits:

- ✓ Larger batch sizes reduce unit costs
- ✓ Build up to six months' stock to secure the best price
- ✓ Stock available at your premises or stored with us for next-day delivery
- ✓ Pay only when stock is consumed, improving cash flow
- ✓ Flexible payment terms, such as 30 days from end of month after use
- ✓ Guaranteed supply on hand — no delays, no shortages
- ✓ Fewer deliveries cut administration and reduce your environmental footprint

We also help lower freight costs and carbon emissions. When replenishing, we plan ahead and use sea freight from the Far East instead of airfreight. This reduces cost and supports your sustainability goals. Whether you need steady supply to your company or are planning for growth, consignment stock provides certainty, efficiency and environmental benefit.



FR4 PCBs – The Heart of Reliable Electronics



Daleba has been manufacturing printed circuit boards since 1963. Over the decades, PCB technology has advanced to include high layer counts, exotic materials, thermal management solutions, embedded components and fully flexible designs. Through all this progress, FR4 still remains at the core of electronics production. We continue to supply FR4 boards from simple single layer builds through to complex 20+ layer constructions, providing the reliability and performance our customers depend on.

FR4, short for “Flame Retardant 4,” is a glass-reinforced epoxy laminate that meets modern standards and balances excellent electrical insulation, flame-resistant properties and mechanical durability. Its typical glass transition temperature (Tg) spans from 115 °C to over 180 °C, depending on the grade—ensuring stability across diverse operating conditions. Low moisture uptake (less than 0.1%) also makes FR4 ideal for humid or marine environments.

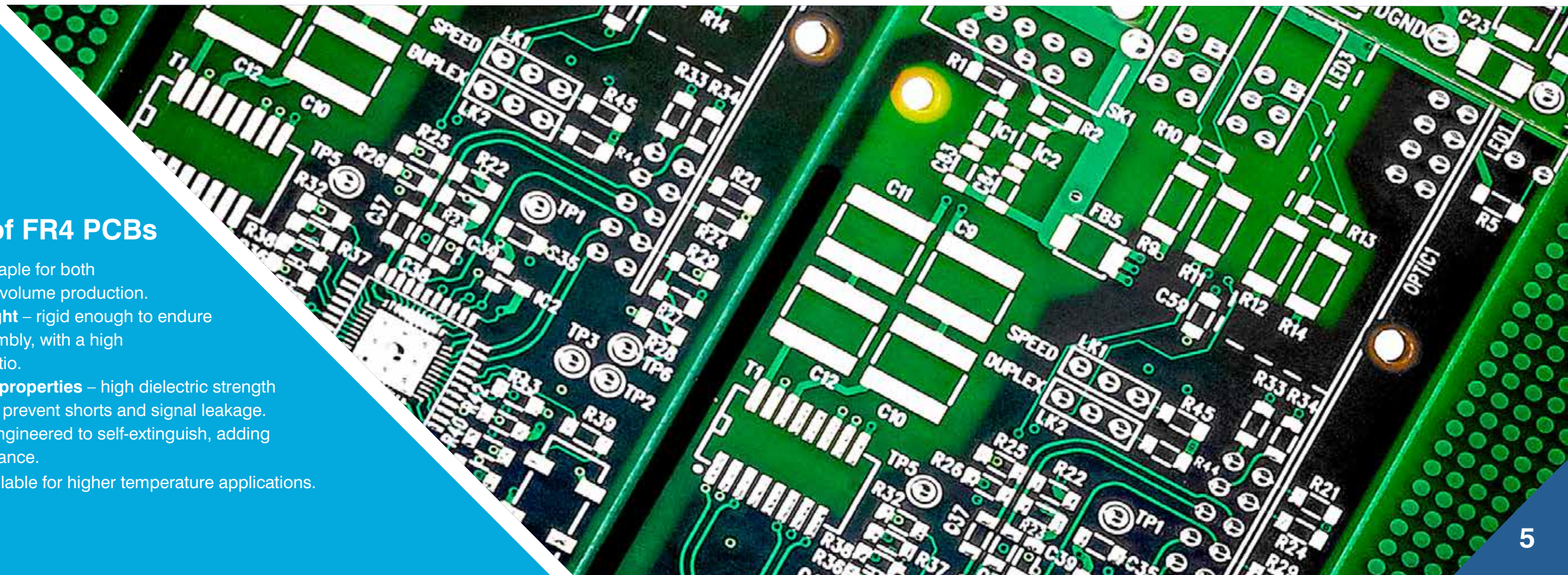
Standard FR4 typically has a Tg of 140–150 °C. We also stock high-Tg variants rated up to 190 °C (Tg190)—ideal for assemblies demanding enhanced thermal endurance. We manufacture FR4 PCBs in single-sided, double-sided and multilayer formats, with copper weights from ½ oz to heavy copper variants to offer flexibility for current carrying needs. As standard, we offer board thicknesses ranging from 0.2 mm to 3.2 mm.

FR4 remains the go to choice whether for telecoms, medical devices, automotive systems, or routine industrial gadgets thanks to its versatility, affordability and dependable performance.

Daleba’s heritage in FR4 manufacturing provides a foundation of assured quality and sustained innovation.

Key Benefits of FR4 PCBs

- ✓ **Cost-effective** – a staple for both prototypes and high-volume production.
- ✓ **Strong yet lightweight** – rigid enough to endure machining and assembly, with a high strength-to-weight ratio.
- ✓ **Excellent dielectric properties** – high dielectric strength and stable insulation prevent shorts and signal leakage.
- ✓ **Flame retardant** – engineered to self-extinguish, adding reliability and compliance.
- ✓ **High Tg** options available for higher temperature applications.



HDI and RF & Microwave

An HDI PCB (High-Density Interconnect PCB) stands out with significantly greater wiring density compared to traditional through-hole PCBs. As specified in IPC-6012, it is characterised by an average of at least 20 electrical connections per square centimetre on both sides of the board, enabling compact and complex designs.

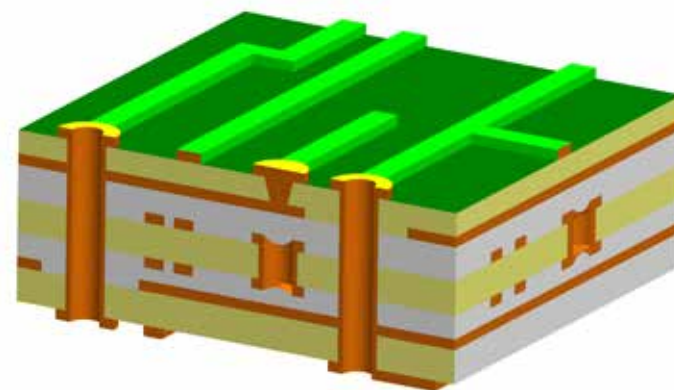
HDI boards are commonly used to achieve smaller, lighter, more powerful and reliable electronic devices by utilising multiple layers, fine tracks and gaps, microvias and blind and buried vias. With HDI a shorter signal path ensures power loss is less and therefore its overall electrical performance is better supporting high-speed signals and improved signal integrity which is essential for many cutting-edge technology products.

HDI PCBs (High-Density Interconnect Printed Circuit Boards) should follow IPC2226, the standard for design such PCBs including features such as:

- ✓ **Microvias:** Laser-drilled vias with a diameter typically less than 150 microns, enabling compact interconnections between layers.
- ✓ **Blind/Buried Vias:** Vias that connect specific layers without traversing the entire PCB, saving space and optimising design.
- ✓ **Thinner Lines and Spaces:** Enhanced density through fine conductor widths and spaces, often less than 100 microns.

Multiple Layers

Designs utilising stacked, staggered, or sequential layers to maximize component density.



RF & Microwave PCBs

PCBs used for RF (Radio Frequency) and microwave applications are specially designed to handle high-frequency signals, typically in the range of megahertz (MHz) to gigahertz (GHz). These PCBs must meet stringent requirements to ensure minimal signal loss, interference and distortion at such high frequencies.

Specialist materials need to be used in manufacturing. FR4 is not suitable for high-frequency applications above 1 GHz due to its higher loss and variation in dielectric constant. At Daleba, high-performance RF and microwave PCBs are one of our specialities.

Our expertise ensures that each board meets the stringent requirements for high-frequency applications, providing exceptional signal integrity and durability in even the most demanding environments.

With decades of experience, we are trusted by clients in aerospace, military and telecommunications sectors for delivering precise and reliable solutions.

IMS - Metal Clad Printed Circuit Boards

Daleba is a leading UK manufacturer of high-performance IMS (Insulated Metal Substrate) - Printed Circuit Boards, also referred to as MPCBs (Metal Clad Printed Circuit Boards).

Originally developed in the 1960s for high-power applications, this technology is now widely adopted for thermally demanding environments where efficient heat dissipation is critical. Unlike conventional FR4-based PCBs, IMS boards are engineered to transfer heat away from components far more effectively to enable tighter packaging. The dielectric layer used in these boards typically has a thermal conductivity ranging from 1W/mK to 9W/mK — vastly superior to that of standard FR4 materials. This makes IMS the go-to solution for applications requiring reduced junction temperatures and reliable thermal management.

At a recent review with one of our valued automotive customers, we discussed how we have produced and supplied them with 250+ million units of a single IMS PCB for a critical automotive safety application. The IMS technology was chosen by the customer for its outstanding performance in high-temperature environments which is crucial in the automotive industry where safety and durability are paramount. This long-term programme spans nearly 20 years, demonstrating the reliability, consistency and quality of our products over time.

An IMS consists of three key layers:

Copper Foil - Typically ranging from 1oz (35µm) to 4oz (140µm), although heavier copper is available on request. This layer forms the conductive circuit and is processed similarly to standard PCBs.

Dielectric Layer - This is the most crucial part of the construction. It electrically isolates the copper circuit from the metal base, while allowing rapid heat transfer. The performance of this layer defines the board's thermal efficiency. At Daleba, we use only premium dielectric materials to ensure optimal thermal conductivity and long-term reliability.

Metal Base Layer - Usually aluminium, although copper is used in specialist applications. The standard aluminium thickness ranges from 1.0mm to 3.2mm, with 1.6mm being the most common. Aluminium offers a good balance of thermal performance, mechanical stability and low weight.

With over 60 years of PCB manufacturing expertise, Daleba is trusted by OEMs and electronics manufacturers who require reliable thermal solutions.

Whether for LED lighting, automotive, power electronics or other high-power sectors, our IMS boards deliver consistent performance and quality.

“Daleba is a leading UK supplier of high-performance IMS Boards, also referred to as MPCBs.”

Flex & Rigid-Flex PCBs

Compact, lightweight solutions from Daleba

Daleba offers both Flex and Rigid-Flex PCBs for demanding applications where space, weight, and reliability are critical. These technologies provide mechanical flexibility without compromising electrical performance and are widely used in medical devices, aerospace, defence, and advanced consumer electronics.

What are Flex and Rigid-Flex PCBs?

Flex PCBs (also called FPCs, Flexible Circuits or Flex Circuits) are made from conductive copper layers laminated onto a flexible polyimide substrate. These circuits can be single-sided, double-sided or multilayered and can include rigid stiffeners to support component mounting.

Rigid-Flex PCBs combine one or more rigid PCB sections with flexible interconnects, creating a hybrid structure. These flex sections are often bent or folded into position during installation, allowing designers to reduce both board count and interconnect complexity.

Tailored to your application

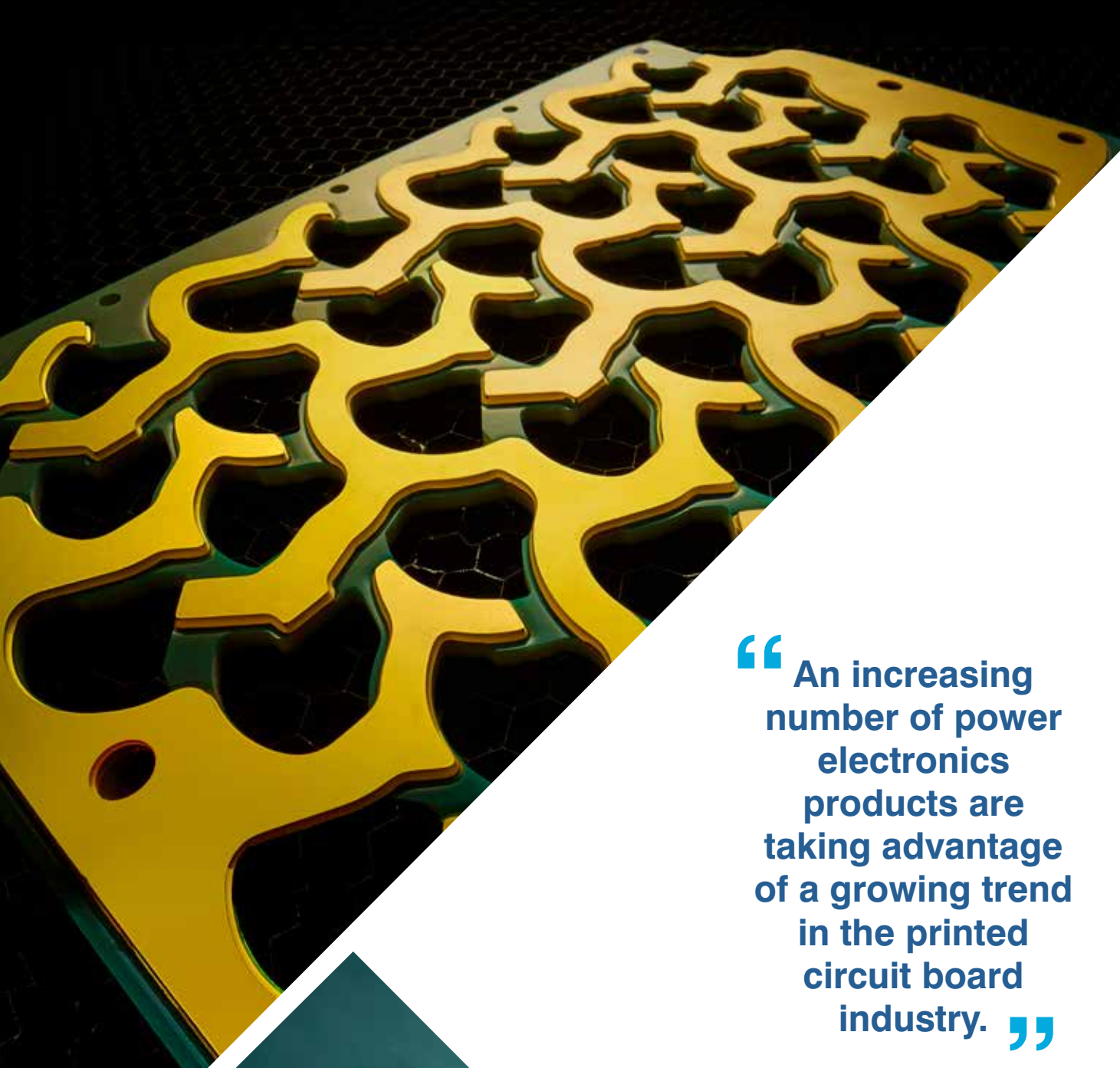
Whether your project requires a single flex layer or a complex multi-section rigid-flex design, Daleba has the experience and capability to deliver. We work closely with customers to provide optimal layout, stack-up, and material choices to ensure performance, reliability and manufacturability.

Why Choose Flex and Rigid-Flex Technology?

These technologies offer numerous advantages, including:

- ✓ **Efficient use of space** – Flex circuits can fold, twist or wrap into tight enclosures and 3D shapes, making them ideal when rigid boards simply won't fit.
- ✓ **Reduced weight** – Polyimide is substantially lighter than traditional substrates, and eliminating connectors further reduces the total weight.
- ✓ **Improved reliability** – By removing mechanical connectors and solder joints, failure points are reduced. Polyimide also enhances thermal and dimensional stability.
- ✓ **Lower assembly costs** – Fewer parts and simplified mechanical assembly can reduce manufacturing time and cost.
- ✓ **Dynamic Flex capability** – In applications like robotics, printers or folding screens, Flex circuits can endure repeated motion without fatigue.
- ✓ **Shock and vibration resistance** – Flex circuits absorb mechanical stress better than rigid PCBs, making them well-suited to high-vibration environments such as aerospace and automotive systems.

“Flex and Rigid-Flex technology is crafted for the most demanding applications.”



“An increasing number of power electronics products are taking advantage of a growing trend in the printed circuit board industry.”

HEAVY COPPER PCBs

PCBs with 3oz or more of finished copper in the inner and/or outer layers are defined as Heavy Copper. Our UK manufacturing facilities allow Heavy Copper boards to be produced up to 18 layers.

For Extreme Heavy Copper we have the capability for up to 85oz

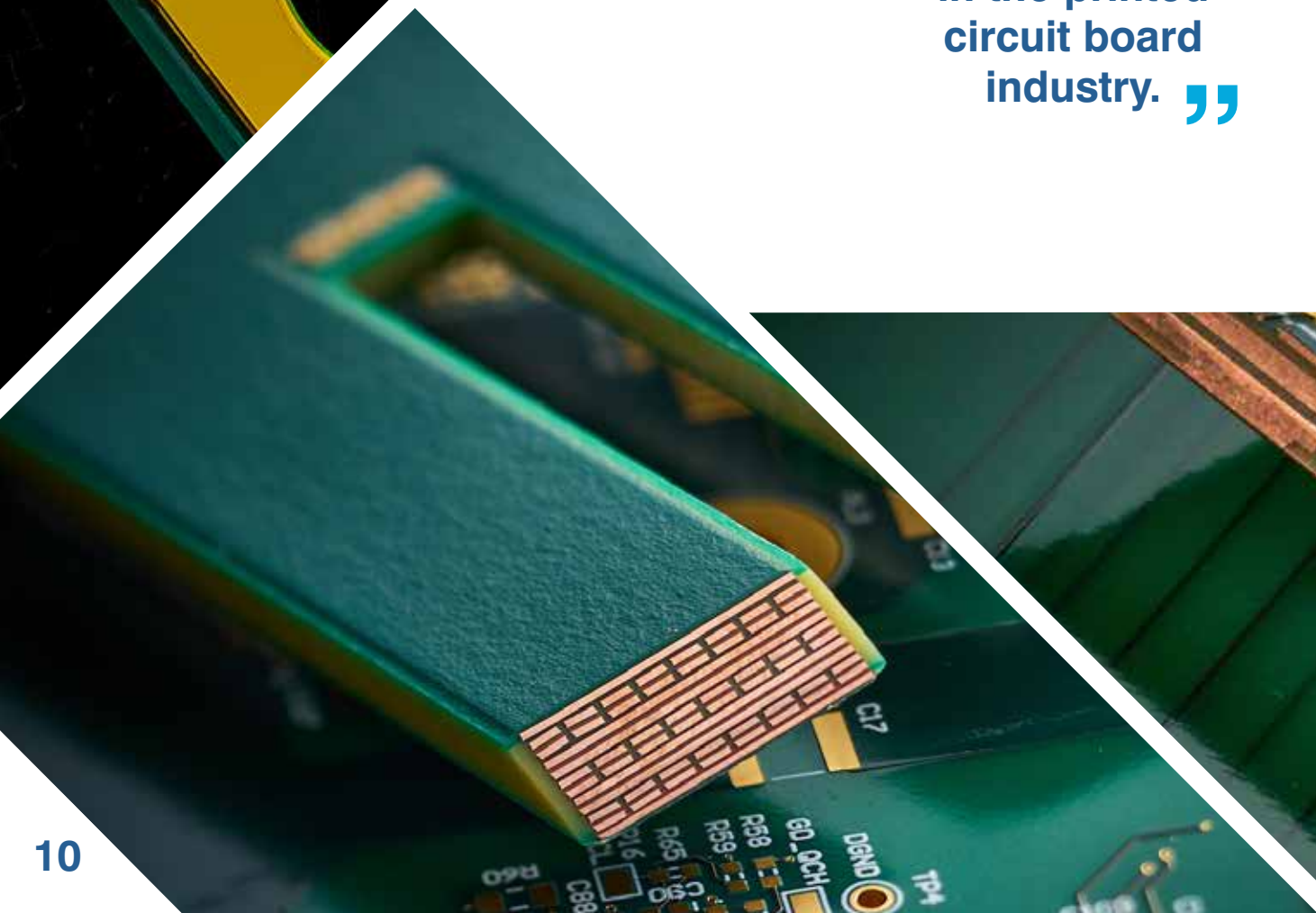
Heavy Copper and Extreme Heavy Copper PCBs offer benefits such as:

- ✓ Increased endurance to thermal strains.
- ✓ Higher current carrying capacity.
- ✓ Increased mechanical strength at connector sites and in PTH holes.
- ✓ Use of exotic materials to their full potential (i.e. high temperature) without circuit failure.
- ✓ Reduced product size by incorporating multiple copper weights on the same layer of circuitry.
- ✓ Heavy copper plated vias carry higher current through the board and help to transfer heat to an external heatsink.
- ✓ On-board heatsinks directly plated onto the board surface using up to 120-oz copper planes.
- ✓ The ability for on-board high-power density planar transformers.

A new development we have for Heavy Copper PCBs is to embed part of a copper layer within the PCB's core. This copper layer is often referred to as an “inner layer” or a “power plane” and it is used to provide power and ground connections for the components on the board.

Part of the copper tracks are hidden within the board, much like the majority of an iceberg is hidden beneath the surface of the water. Embedded copper PCBs are used in a variety of electronic devices, particularly those that require high-speed or high-frequency signal processing. By providing a dedicated inner layer for power and ground connections, these PCBs can reduce electromagnetic interference (EMI) and improve signal integrity. They can also help reduce the overall size and weight of a device, since fewer external components are needed to provide power and ground connections.

Embedded copper with different copper weights enables greater packaging opportunities and the ability to have the outer layers on one planar level which greatly aids assembly of components.



Ceramic PCBs have become a more viable option for PCB designers who need a substrate with an outstanding performance.

Advantages over other technologies:

- ✓ Superior values of thermal conductivity (up to 180W/mK).
- ✓ Higher substrate operating temperatures over 300°C.
- ✓ Low CTE (Coefficient of Thermal Expansion).
- ✓ Suitable for high-frequency applications due to low signal loss.
- ✓ Possibility for Hermetic packages with 0% water absorption
- ✓ Ideal for vacuum environments – no outgassing.

Direct Plated Copper (DPC)

The development of the DPC production method was a breakthrough. It allows Plated Through Holes (PTH) and tighter track and gap tolerances than earlier methods. DPC makes ceramic substrates far more practical for designers.

DPC involves vacuum sputtering under high temperature to deposit a very thin layer of copper to the substrate and in any pre-drilled holes. The addition of a thin titanium layer acts as a bonding interface between the copper and ceramic layers. Panels are then plated up to the required end copper thickness ranging from 10µm (≈ 1/3oz) to 1000µm (≈ 28oz). Normal PTH methods do not produce reliable results on ceramics and therefore DPC must be used if a double sided PTH board is required. With DPC it is also possible to produce a circuit with different thicknesses of copper in selected areas. You could, therefore, have a control section and a power section on the same layer.

Direct Bonded Copper (DBC)

For DBC Boards the copper is bonded to the Ceramic substrate on one or both sides using a high-temperature oxidation process. It offers options of heavy copper thickness - 140µm (4 oz)-350µm (10 oz). The copper and substrate are heated in an atmosphere of nitrogen containing about 30ppm of oxygen; under these conditions, a copper-oxygen eutectic forms which bonds successfully both to the copper and the oxides used as substrates. With DBC, the copper layers can then be etched using standard PCB technology to form the required circuit. Conventional PTH processing is not suitable for ceramics and therefore only DPC is used for through hole plating.

Active Metal Brazing (AMB)

Unlike DBC, Active Metal Brazing forms the substrates without metallisation. Under a high temperature vacuum the copper is joined (brazed) direct to the ceramic base. This offers a high reliability substrate with unique heat dissipation. The brazing technology also enables copper weights of up to 800µm on thin ceramic substrates. These Heavy Copper materials make AMB ideal for Power Electronics.

Ceramic Substrate Options

- ✓ **Al2O3 (Alumina Oxide)** - Most commonly 96%, this is the most standard and cost-effective option, with a Thermal Conductivity of around 24W/mK. A 99.6% option is also available.
- ✓ **AlN (Aluminium Nitride)** - Required when Thermal Conductivity is the driver. With a TC of around 170W/mK it is the best option for highly demanding systems.
- ✓ **SiN (Silicon Nitride)** - More resistant to shock than other substrate options, with a higher fracture toughness and bending strength. Well suited for automotive applications where structural reliability is key.

Property	Unit	Al ₂ O ₃ (96%)	Al ₂ O ₃ (96.6%)	AlN	SiN
Thermal Conductivity	W/mK	24	29	180	85
Coefficient of Thermal Expansion (CTE)	x 10 ⁻⁶ /K	6.7	6.8	4.6	2.6
Dielectric Constant	-	9.8	9.9	9	9
Signal Loss	x 10 ⁻³	0.2	0.2	0.2	0.2
Light Reflectivity	%	70/85	75	35	-
Dielectric Strength	KV/mm	≥15	≥15	≥15	≥15
Rupture Strength	Mpa	400	550	450	800
Peel Strength	N/mm	>1.44	>1.44	>1.44	>1.44

Copper Coins - Targeted Thermal Management

Daleba offers advanced Copper Coin technology for thermally demanding designs. This approach is ideal when a few components generate high heat that must be removed quickly and efficiently.

Copper has a thermal conductivity above 400 W/mK, making it one of the best materials for heat transfer. A copper coin is a solid insert embedded in the PCB under hot-running components. It creates a direct thermal path to a heatsink or chassis and delivers roughly twice the cooling of a via array.

We use C103 electrical-grade copper for its conductivity and durable properties. Coins can be machined in different shapes and placed on the top, bottom or through the PCB, with or without electrical connection.

Copper Coins suit single sided, double sided and multilayer boards. They integrate with other thermal features such as DTE pedestals, to deliver customised solutions for power, LED and RF applications.

“Advanced Copper Coin technology for thermally demanding designs.”

Laser Cut Stencils

SMT Stencils when you need them

- ✓ Clean contours with smooth, burr-free edges
- ✓ Excellent geometry, precision, reliability and productivity.
- ✓ 100% scan check inspection for all cutting apertures

Material

- ✓ **Stainless steel grade 304 Full hard**
Tensile: 1329 N/mm
Elongation: 5.0%
Hardness: 408 HV
- ✓ **Fine grain (substitute for Nickel alloy)**
Tensile: = 1000 N/mm²
Elongation: 5.0%
Hardness: 370 HV

Applications

- ✓ **OptiGuard stencils**
Dimensions: – 23” x 23”; – 23” x 29”; – 29” x 29”
Thicknesses (µm): 80, 100, 120, 130, 150, 180, 200, 250
- ✓ **Stencils glued in aluminium frame**
Dimensions: – 22” x 22” (555 x 555 mm); – 23” x 23” (584 x 584 mm); – 29” x 29” (736 x 736 mm); – 400 x 500 mm; – 550 x 650 mm; – 584 x 1200 mm
Thicknesses (µm): 80, 100, 120, 130, 150, 200
- ✓ **Stencils for self- tensioning frames**
All types and dimensions
Thicknesses (µm): 80, 100, 120, 130, 140, 150, 180, 200, 250, 300
- ✓ **Prototype stencils**
Max dimensions: 200 x 300 mm
- ✓ **Via fill stencils**

End Treatment

- ✓ **Classic mechanical polish**
- ✓ **Electro-chemical polish**
- ✓ **Nano-Pro Tek coating**

Technical Data	
Cutting range (X/Y)	600 x 800 mm (23.6” x 31.5”)
Maximum frame size (X/Y)	740 x 950 mm (29.1” x 37.4”)
Maximum loose sheet size (X/Y)	650 x 850 mm (25.6” x 33.5”)
Material thickness	Up to 600µm (23.6 mil)
Laser repetition rate	Up to 45 kHz

Thermal Interface Materials (TIM)

Daleba offers TIM under our brand EMI Thermal.

Modern electronic designs invariably result in components being worked harder, running at higher power which inevitably means operating temperatures are increased. Failure to carefully consider thermal management can quickly lead to overheating of components, poor performance, damage or even failure.

An essential part of managing thermal issues is to ensure there are no voids or gaps filled with air between the heat-generating components and the thermal device, such as a heatsink. If air remains between the mating surfaces, the ability to transfer heat away from the components will be greatly compromised.

To fill those air gaps EMI Thermal offer a dynamic range of Thermal Interface Materials that includes Natural Graphite, Void / Gap Fillers and Electrically Isolating TIM.

We stock raw material in the UK and convert to any profile required with the finest of tolerances. We use die cutting tools for high volume converting, and digital cutting machines for fine, low volume work.



PCB Engineering

Engineering

When data is received it needs to be 'Engineered' – getting it ready for production. We have our own team of UK based Engineers and our group is resourced with a total of 18 PCB Engineers. Their primary function is to ensure data integrity and find the best possible design solutions available for you.

- ✓ DRC (debugging)
- ✓ Gerber manipulation (customisation of data)
- ✓ CAD data validation
- ✓ APQP and PPAP document provision
- ✓ Design For Manufacture advisory service
- ✓ FAIR document provision to release to AS 9102

Surface finishes available

When producing a PCB, several factors are considered—layout, materials, laminates inner layers, and the board's layer stack. Yet, the surface finish is often overlooked. While most engineers know that exposed copper will oxidise and affect soldering, many are unsure which finish to specify. Key considerations include storage time, end-use, assembly method, PCB design, and of course, cost. Below is a brief overview. Contact us for guidance on choosing the right finish for your application.

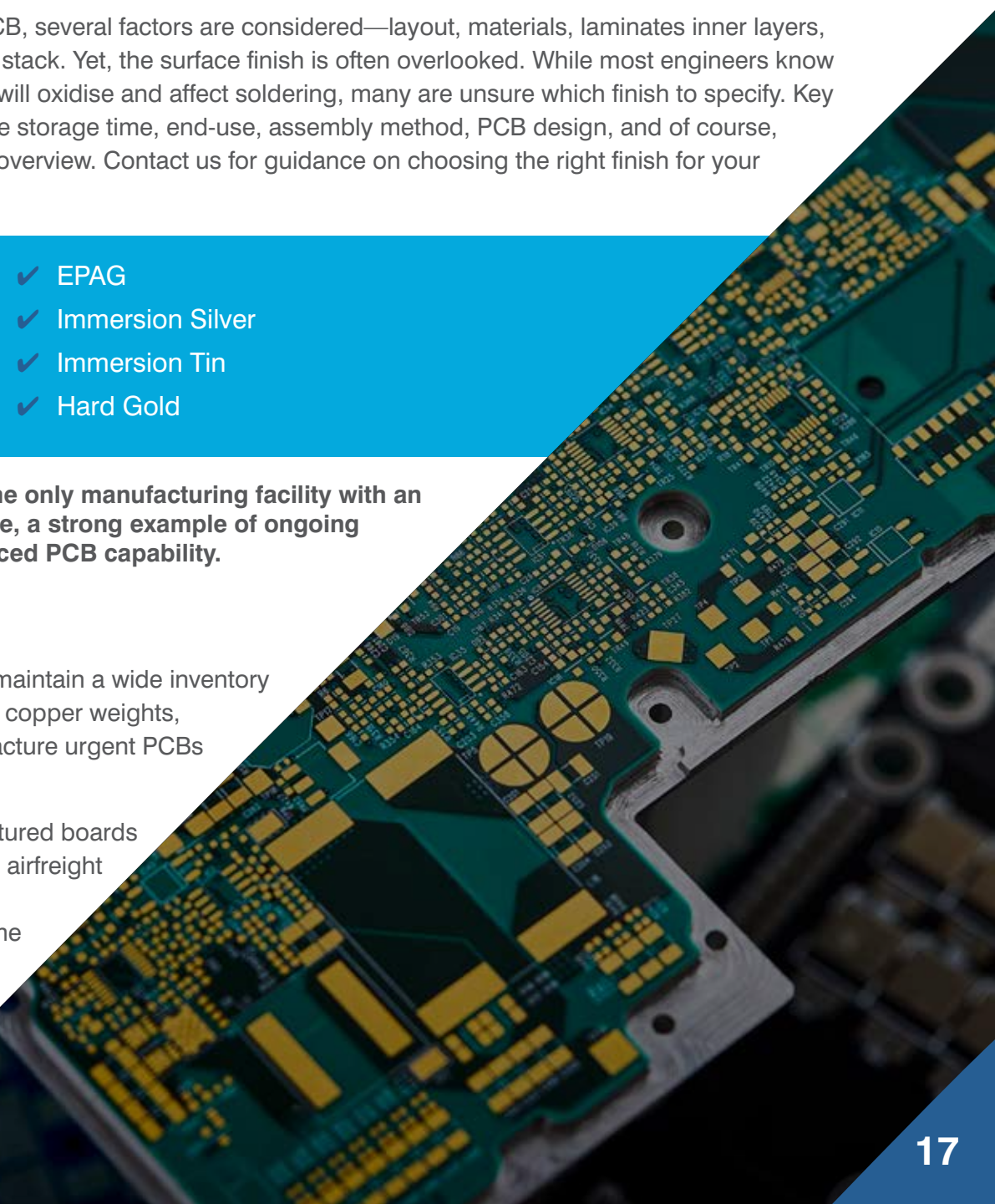
- ✓ OSP
- ✓ EPAG
- ✓ HASL
- ✓ Immersion Silver
- ✓ ENIG
- ✓ Immersion Tin
- ✓ ENEPIG*
- ✓ Hard Gold

*In the UK, we are the only manufacturing facility with an in-house ENEPIG line, a strong example of ongoing investment in advanced PCB capability.

Lead-times

In our UK factory we maintain a wide inventory of base materials and copper weights, allowing us to manufacture urgent PCBs quickly.

For Far East manufactured boards we can offer standard airfreight and a guaranteed air express service for time critical requirements.



Quality

At Daleba Printed Circuits, quality guides every decision and process. Our Business Management System ensures that every product meets customer requirements for quality, service and price. We deliver in line with our own strict quality standards or the exact specifications set by our customers.

Our Commitment:

- ✓ To deliver high-quality products, on time and in full, while supporting our customers in achieving greater efficiency.
- ✓ To maintain certification to key international standards, including EN 9120:2018 and ISO 9001:2015 by following the robust policies and procedures set out in our Business Management System.



ISO
9001:2015
REGISTERED



We are also Joscar accredited and Cyber Essentials Certified.

Sustainability

At Daleba, sustainability is built into how we operate. As a supplier of high-quality printed circuit boards, we recognise the environmental impact of our industry and are committed to reducing it wherever possible.

Our sustainability policy is regularly reviewed and communicated to all staff, stakeholders and supply chain partners. It reflects our commitment to continuous improvement and responsible practices across every level of our business.

We go beyond legal and regulatory requirements, expecting the same level of commitment from our suppliers and partners. From waste management to energy use and from materials sourcing to ethical working practices, sustainability is a shared responsibility – one we take seriously.

We have been trading since 1963 and understand that long-term success means operating in a way that respects both people and planet. At Daleba, we're not just supplying PCBs – we're helping to build a more sustainable future.

Capabilities

Our full capabilities are available on our web site. Here's a brief overview.

Board types	FR4 Single & Double Sided, Multi-Layer, Heavy Copper, IMS, Flex, Rigid-Flex, HDI, RF/Microwave, Ceramic, PCBs with DTE Pedestals and Copper Coins.
Maximum layer count	20+
Copper foils:	
Single Sided	1oz (35µm) - 2oz (70µm) - 30oz (1050µm)
PTH	1oz (35µm) - 30oz (1050µm)
Multilayer (Outer layers)	½oz (18µm) - 30oz (1050µm)
Multilayer (Inner Layers)	½oz (18µm) - 30oz (1050µm)
Metal Clad	1oz (35µm) - 15oz (525µm) (top copper layer)
Heavy Copper	Max. 85oz, embedded copper on outers for planar level.
Surface Finishes	Hot Air Solder Level, Immersion Gold (ENIG), ENEPIG, EPAG, Immersion Silver, Immersion Tin, Hard Gold & Gold Finger, OSP
Maximum board thickness	6.00mm
Maximum panel size	610mm x 1000mm
Minimum Track / Gap	±0.05mm
Hole Diameter (PTH)	±0.05mm
Hole Diameter (Non-PTH)	±0.1mm
Solder Mask colours	Various including Green, Blue, White, Black, Red
Drilling	Minimum 0.20mm (mechanical), 0.075mm (laser)
Approvals	ISO 9001:2015 EN 9120:2018 (technically equivalent to AS9100D & JISQ9100:2016) Joscar registered Cyber Essentials Certified



Daleba Printed Circuits
Orland House
Hertford
Hertfordshire
SG13 7AT
United Kingdom

 +44 (0) 1992 510 000
 sales@daleba.co.uk
 www.daleba.co.uk

