

SMT Stencil Specifications & Capabilities

Technical Specification Sheet

This document summarizes PCBELEC SMT stencil specifications for prototype, framed, frameless, electroformed, nano-coating, and step stencil options. Final manufacturability, lead time, and delivery arrangements are confirmed after review of complete production data and order requirements.

Stainless Steel & Nickel Options	Laser-Cut, Electroformed, Nano-Coated & Step Designs
For Prototype, NPI & Production Use	Engineering review available for critical aperture and step requirements

Prototype SMT Stencil Spec

Prototype SMT stencils are designed for quick-turn and NPI builds. Laser-cut from stainless steel, they support a range of sheet thicknesses and fine aperture requirements.

Technology	100% laser cut
Material	Stainless Steel
Sheet Thickness	0.06–0.30 mm
Min. Aperture	0.10 mm
Distance to Edge	7 mm
Overall Size	736 × 736 mm
Aperture Tolerance	±0.007 mm
Lead Time	1–2 days

Framed SMT Stencil Spec

Framed SMT stencils are mounted on aluminum frames for use with compatible stencil printers and production-line printing systems.

Technology	100% laser cut
Material	Stainless Steel
Sheet Thickness	0.10–0.30 mm
Frame Material	Aluminum
Frame Size	Standard and custom options
Min. Aperture	0.15 mm
Distance to Edge	7 mm
Overall Size	736 × 736 mm
Aperture Tolerance	±0.007 mm
Lead Time	1–2 days

Framed PCB Stencil Frame Size Guide

Select a frame size compatible with your stencil printer or tensioning system. The values below identify framed stencil area and the corresponding maximum squeegee area.

300 × 400 mm (11.81 × 15.75 in)	120 × 220 mm (4.72 × 8.66 in)
370 × 470 mm (14.57 × 18.50 in)	200 × 300 mm (7.87 × 11.81 in)
400 × 600 mm (15.75 × 23.62 in)	220 × 400 mm (8.66 × 15.75 in)
400 × 700 mm (15.75 × 27.56 in)	220 × 500 mm (8.66 × 19.69 in)
400 × 800 mm (15.75 × 31.50 in)	220 × 600 mm (8.66 × 23.62 in)
400 × 900 mm (15.75 × 35.43 in)	220 × 700 mm (8.66 × 27.56 in)
400 × 1000 mm (15.75 × 39.37 in)	220 × 800 mm (8.66 × 31.50 in)
400 × 1200 mm (15.75 × 47.24 in)	220 × 1000 mm (8.66 × 39.37 in)
400 × 1400 mm (15.75 × 55.12 in)	220 × 1200 mm (8.66 × 47.24 in)
420 × 520 mm (16.54 × 20.47 in)	240 × 340 mm (9.45 × 13.39 in)
450 × 550 mm (17.72 × 21.65 in)	270 × 370 mm (10.63 × 14.57 in)
500 × 800 mm (19.69 × 31.50 in)	320 × 600 mm (12.60 × 23.62 in)
500 × 1200 mm (19.69 × 47.24 in)	320 × 1000 mm (12.60 × 39.37 in)
550 × 650 mm (21.65 × 25.59 in)	340 × 440 mm (13.39 × 17.32 in)
584 × 584 mm (23 × 23 in)	380 × 380 mm (15 × 15 in)
736 × 736 mm (29 × 29 in)	480 × 480 mm (19 × 19 in)

Frameless SMT Stencil Spec

Frameless SMT stencils are laser-cut stainless-steel foils suitable for compatible tension frames, printers, and manual printing applications.

Technology	100% laser cut
Material	Stainless Steel
Sheet Thickness	0.06–0.30 mm
Min. Aperture	0.05 mm
Overall Size	280 × 380 mm
Fiducial Data	Yes
Panelized Data	Yes
Lead Time	1–2 days

Electroformed Stencil Spec

Electroformed stencils are manufactured using an electroforming process with nickel foil for fine-feature and high-precision applications.

Technology	Electroforming
Material	Nickel
Sheet Thickness	0.025, 0.04, 0.05, 0.06, 0.08, 0.10, 0.15, 0.20, 0.25, 0.30 mm
Min. Aperture	0.04 mm
Overall Size	510 × 800 mm
Aperture Tolerance	±0.008 mm
Lead Time	5–7 days

Step Stencil Spec

Step stencils combine laser cutting with etched steps for boards that mix fine-pitch components and large power pads.

Technology	Laser-Cut + Etched Step

Material	Stainless Steel
Base Sheet Thickness	0.10–0.30 mm
Step Depth	0.02–0.08 mm per step (max ±0.15 mm)
Min. Aperture	0.10 mm
Distance to Edge	7 mm
Overall Size	736 × 736 mm
Aperture Tolerance	±0.007 mm
Step Tolerance	±0.010 mm
Lead Time	3–5 days
Best For	Boards mixing fine-pitch & large power pads

Nano-Coating Stencil Spec

Nano-coated stencils use stainless steel with a nano coating for applications requiring the stated durability and aperture-position options.

Technology	Nano Coating
Material	Stainless Steel with Nano Coating
Coat Thickness	1.5 µm
Stencil Life	> 100,000 prints
Aperture Position	Various Aperture Positions Available
Application	LED backlighting
Aperture	1,000,000
Lead Time	1–2 days

SMT Stencil Design & Ordering Notes

To help manufacture your SMT stencil accurately and quote it without delay, please provide the required production files and order details. The notes below identify the information needed for standard and specialty stencil requests.

Required Production Files

- Provide the solder-paste Gerber layer for the required PCB side: top, bottom, or both.
- Include the board outline, panel outline, fiducial marks, and tooling features when applicable.
- Clearly identify the required stencil side when files are supplied for both PCB sides.
- Submit production-ready Gerber or ODB++ data; PDF drawings may be included as reference files.

Aperture & Thickness Requirements

- State the required stencil thickness, or request a recommendation based on the finest pitch, pad geometry, and component mix.
- Identify any required aperture reductions, home-plate designs, window-pane patterns, or other aperture modifications.
- Highlight the smallest apertures and critical packages, such as fine-pitch QFN, BGA, micro-BGA, or 01005 components, when applicable.
- Request an engineering review before production when aperture design or solder-paste release is critical.

Stencil Type-Specific Details

- Framed: Confirm the printer-compatible frame size and required usable stencil area.
- Frameless: Provide tension-frame or printer-holder requirements, including the compatible foil size.
- Electroformed: Identify critical fine-pitch, micro-aperture, or paste-release requirements for engineering review.
- Nano-coated: Identify the intended application and any durability or paste-release requirements.
- Step stencil: Provide a step map or mechanical drawing showing each step area, base thickness, final thickness, and required step depth.

Quotation & Delivery Details

- Provide the required quantity, destination country or region, and requested delivery date.
- State whether the stencil is intended for prototype, NPI, or production use.
- Include any packaging, shipping-account, or labeling requirements with your quote request.
- Final manufacturability, lead time, and delivery arrangements are confirmed after review of the complete order information.