

28-Jan-21

Mr. Eli Azulay  
Engineering Manager

# 2021

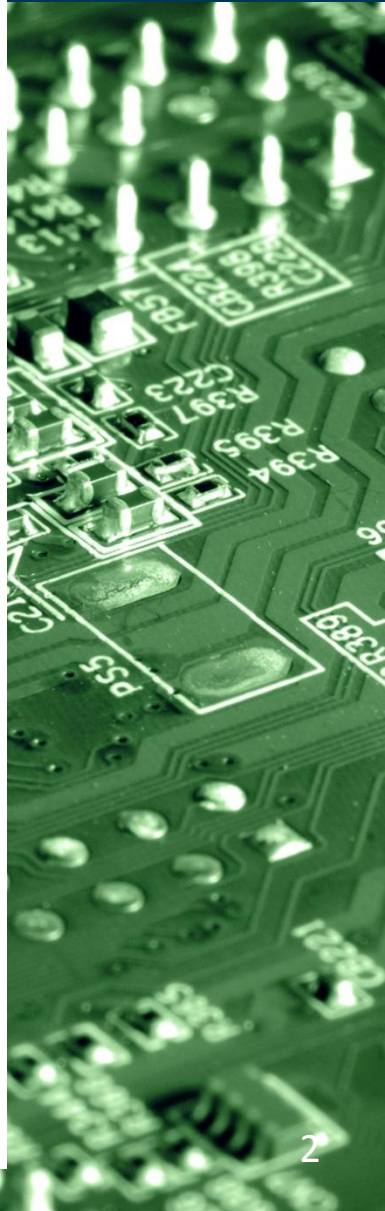
## PCB Cost Saving Recommendations

**eltek**

a  Nistec company

# Company Profile

- Leading manufacturer of complex flex rigid and high-density rigid PCBs for advanced high reliability applications.
- Markets Served:
  - Defense
  - Space
  - Aerospace
  - High Rel Medical
  - Oil & Gas / Industrial
  - Research
- Established in 1970
- Publicly traded on Nasdaq (ELTK)



# Company Profile

## Factory Information

### Location



Petah Tikva,  
Israel

### Size



**100,000** ft<sup>2</sup>

### Employees



**295**

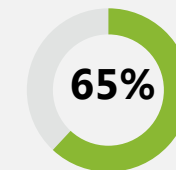
(12) Process Engineers  
(22) Product Engineers  
(12) Sales & Tech Support  
(20) QA  
(27) Leadership / Management  
(~205) Production

2 Shifts; 5 days a week

### Revenues 2019

**\$ 34.8 M**

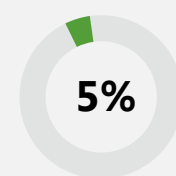
### Main Products



**Flex Rigid**



**Rigid**



**Multi-Flex /  
Flex**

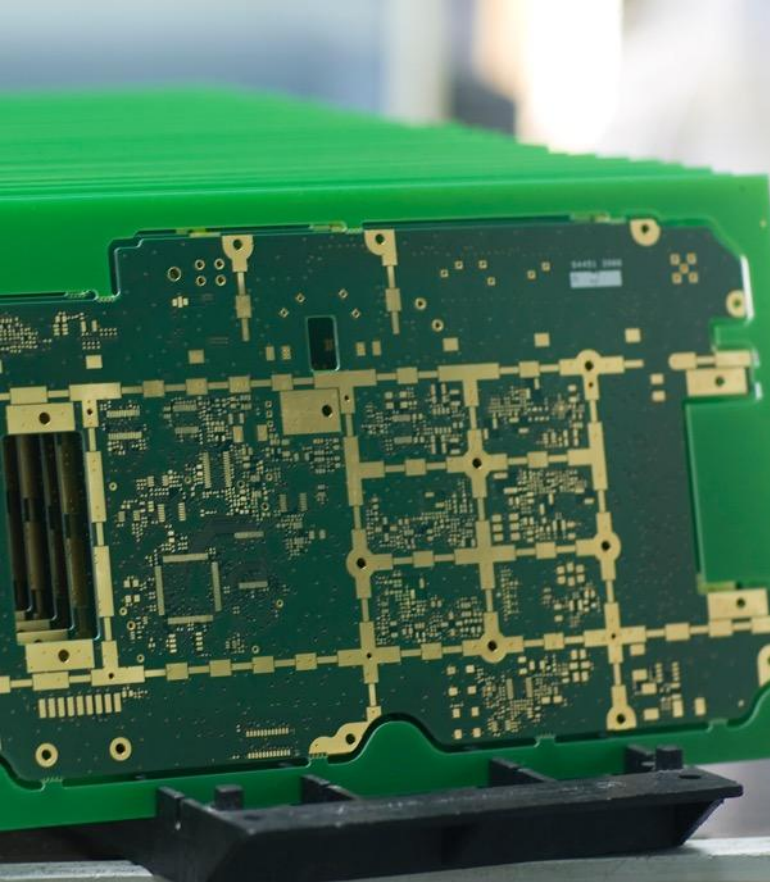
**<800,000 PCBs**

### Key Qualifications



NADCAP,  
AS9100D,  
ISO9001:2015,  
UL 94V-0

# Manufacturing Capabilities



## Main Product Types

Flex Rigid, Rigid, Multiflex and Flex



## Panel Sizes

12x18, 18x24, Backplane Panel  
(Max Board Size – 19" x 26")



## Max Layers

38 layers +; max thickness 0.252" (6.4mm)



## Copper Weights

- Base copper down to 5 microns
- Max Copper Thickness: 4 oz



## Materials

DuPont, Rogers, Iteq, Ventec, Panasonic, Arlon, Isola and others

- Long experience with processing and mixed material type constructions
- Duroid Experience: 6002, 6006, 6010, 6202, 5870, 5880
- Fusion Bonding of pure Teflon (PTFE)
- Teflon on Brass
- Flexible Silver Shielding

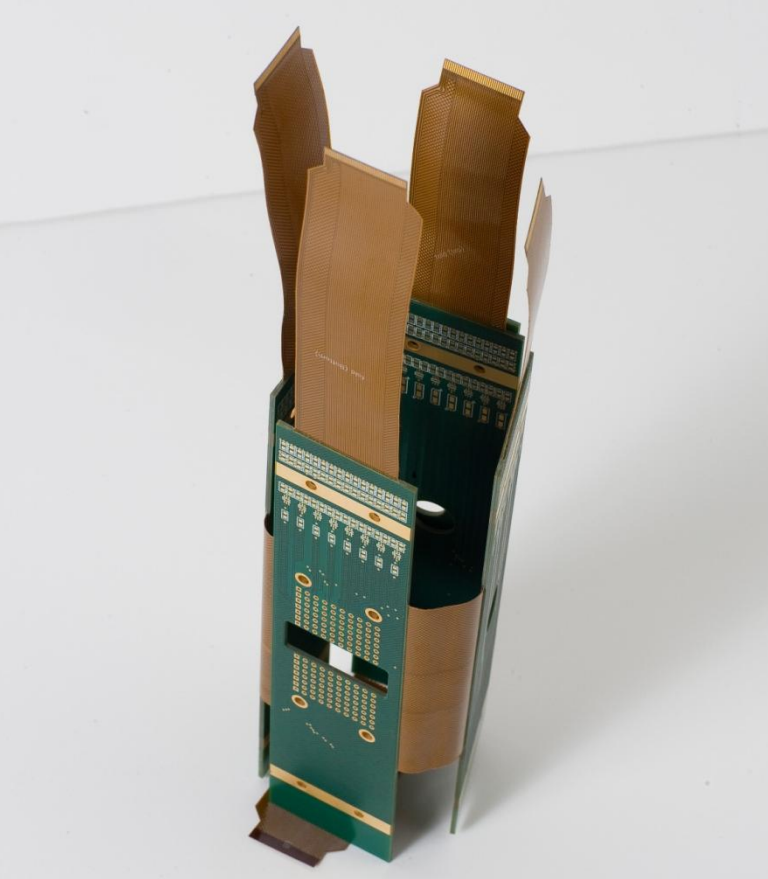


## HDI

- Stacked / Staggered Microvias
- Sequential Build up to: 5+N+5
- Via Filling: Via In Pad, Microvia Fill, Copper Fill



# Manufacturing Capabilities



## Laser Direct Imaging & Direct Image Solder Mask

Film free factory; all product is direct imaged



## Soldermask

Green, Blue, White, Red & Black



## AOI

All inner layers and outer layers 100% AOI Inspected



## Controlled Depth NC Processing

- Back Drilling, Cavity Formations, Edge Castellations, Controlled Depth Milling
- Embedded COIN technology



## Heatsinks & CTE Solutions:

- 3D wrap around, Internal, External
- Built in Ceramic Substrate



## Electrical Testing:

- 100% by flying probe

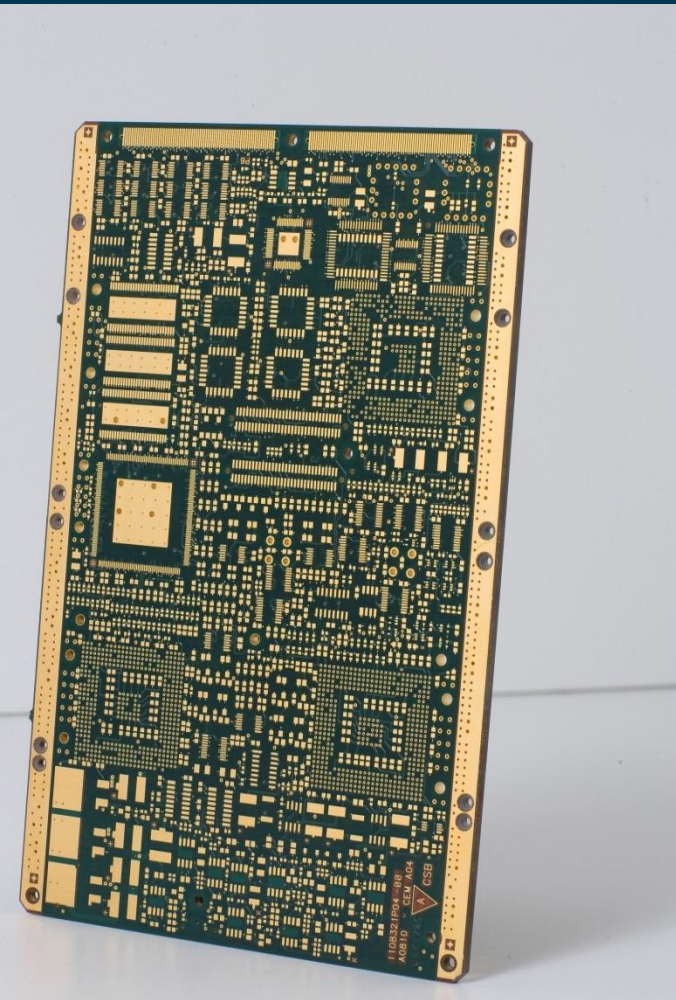


## Surface Finishes:

- HASL, ENIG, Immersion Ag, Hard Au / Soft Au – all processes in house
- Currently subcontract ENEPIG\* volume warrants in-house installation

*\*For export restricted product MLA amendment has been approved by DDTC and BIS to give us the ability to use our subcontractor for ENEPIG and other specialty finishes.*

# Manufacturing Capabilities



## Exact drilling capabilities

- DOP- drill on pad. Precise drilling using CCD camera
- X-Ray assisted registration & drilling for complex PCBs.
- Individual drilling file for PCB in production panel.

## Special mechanical drilling capabilities

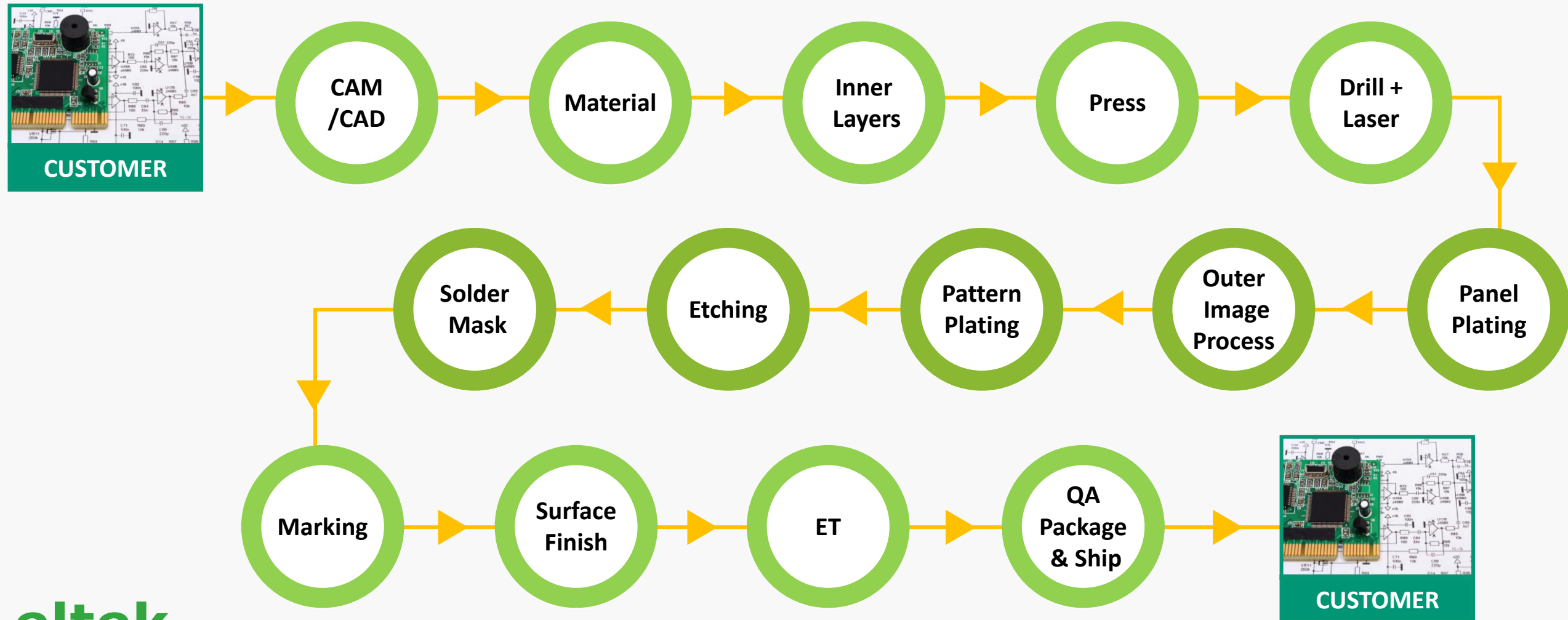
- 3&4 mil diameter TH



## Electrical Testing:

- 100% by flying probe
- 16 Test Heads "ATG A7-16 XW Flying Probe Test System"
- High Speed Direct Linear Drives for X and Z motion
- Light weight Carbon Z-Axis
- Test System for oversized panels up to 1000 mm
- Fast 300 mA Kelvin Testing
- Capacitor test up to 1000V

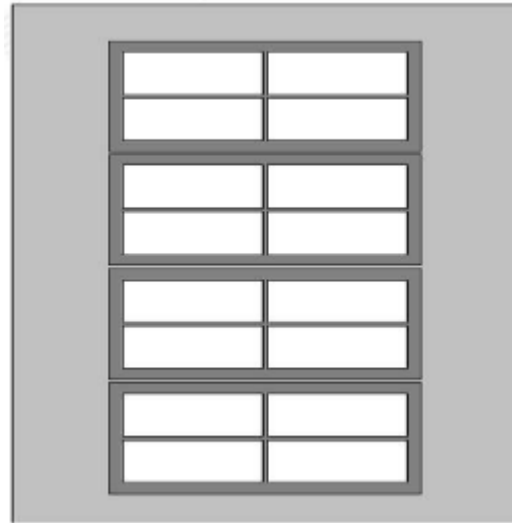
# Process Flow



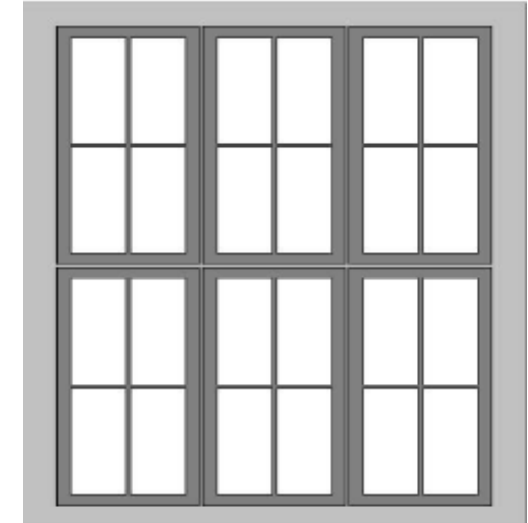
# BASIC COSTS OF PRINTED CIRCUITS BOARDS



## ➤ Production Panel Utilization Is An Important Cost Factor



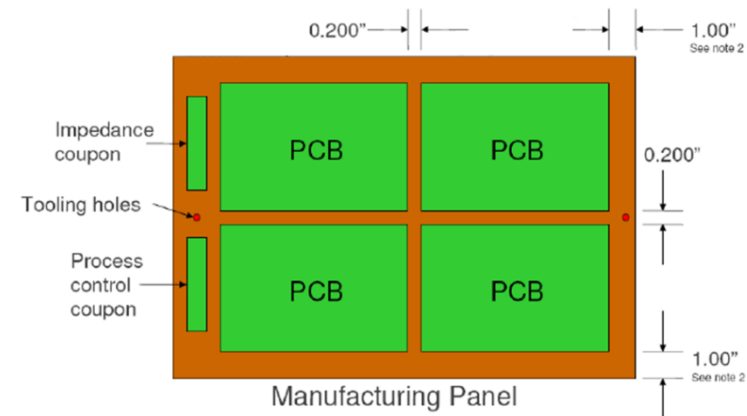
Poor utilization  
**58%**



Good utilization  
**77.8%**

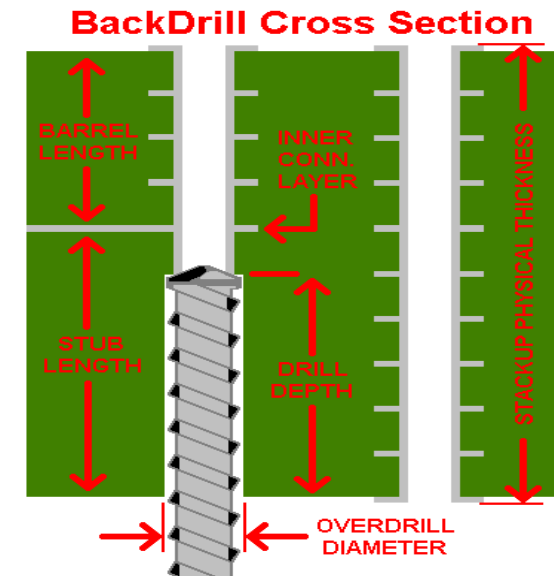
## ➤ Quality approvals and controlled impedance require extra coupons

- ✓ IPC Class 3 (Multiple industries)
- ✓ AS9100D (Aerospace & Avionics)
- ✓ Mil-P-55110 (Military)
- ✓ ISO 13485 (Medical)

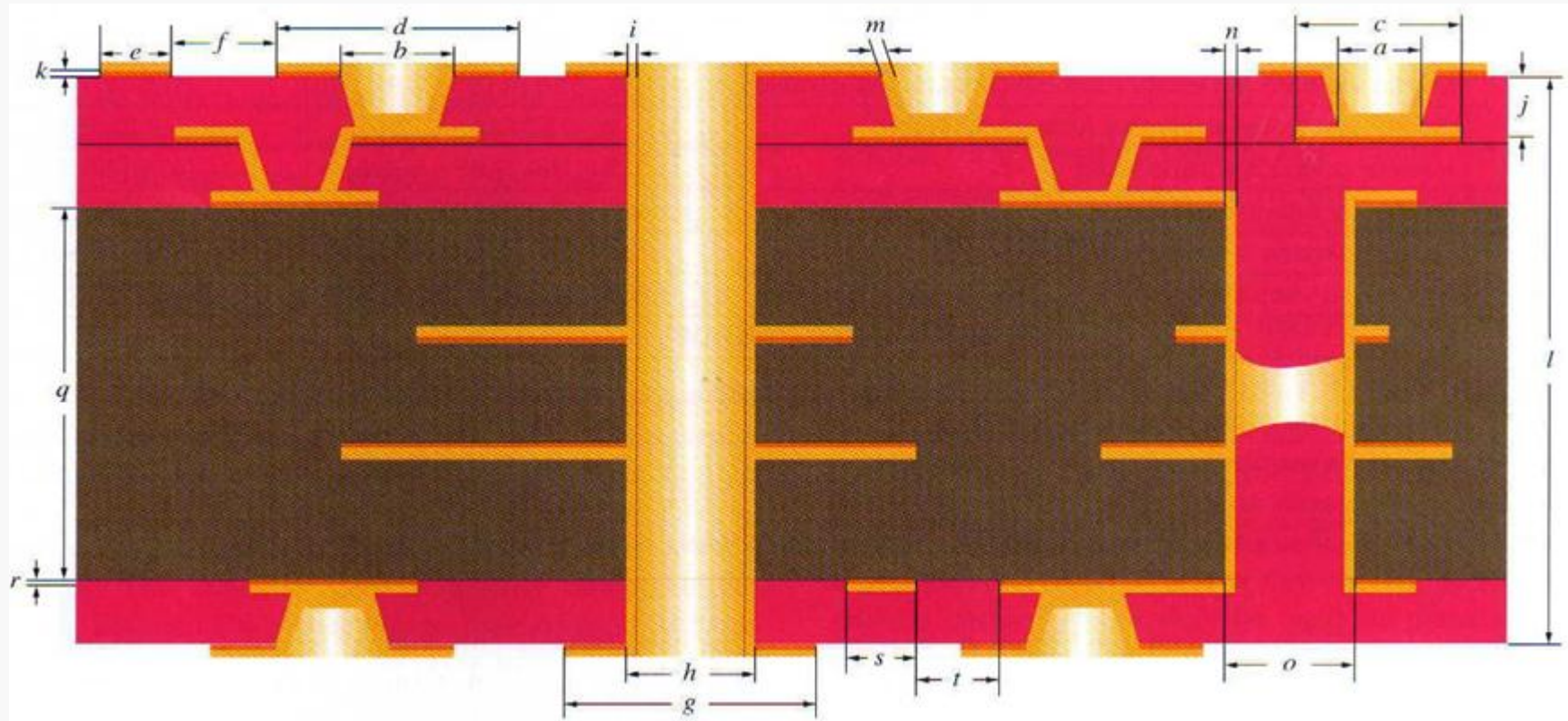


## ➤ Drilling Process

- ✓ Number of drilled holes
- ✓ Min. drilled diameter
- ✓ Number of diameters

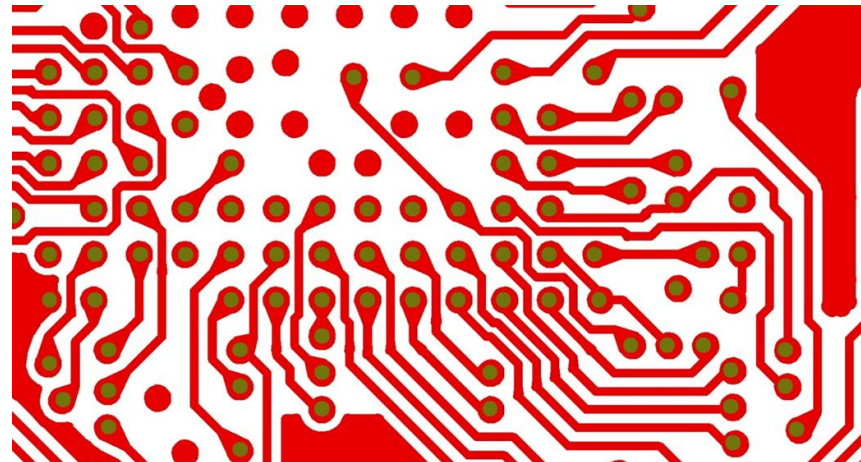


# HDI via between layer 1-2 and 2-3 with buried vias



## ➤ Yield

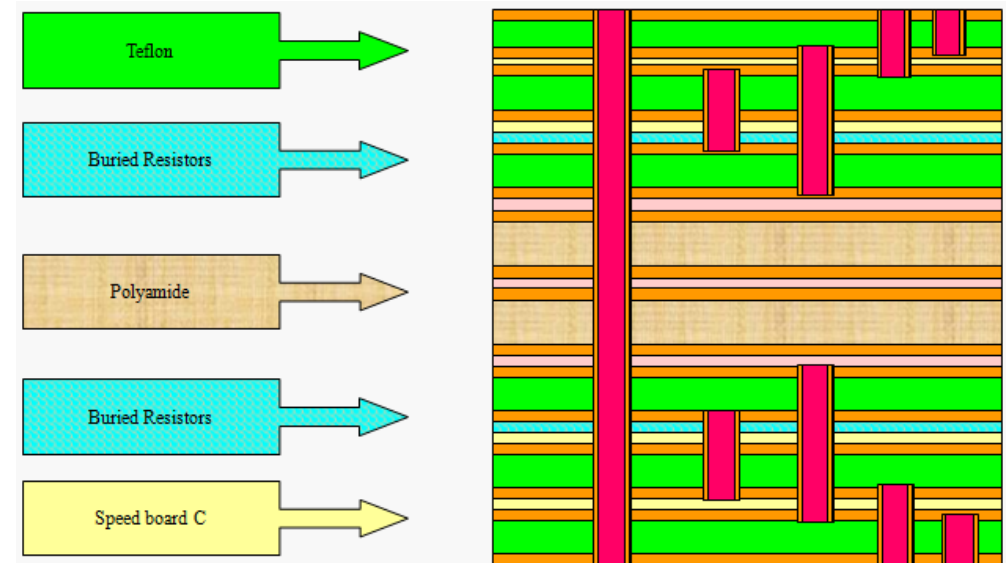
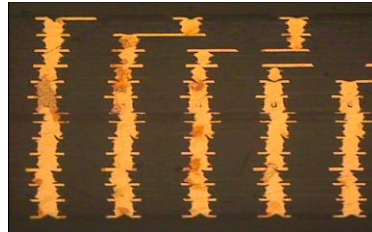
- ✓ Design features/complexity determine the yield thus costs.
- ✓ The predicted yield determines the number of production panels.



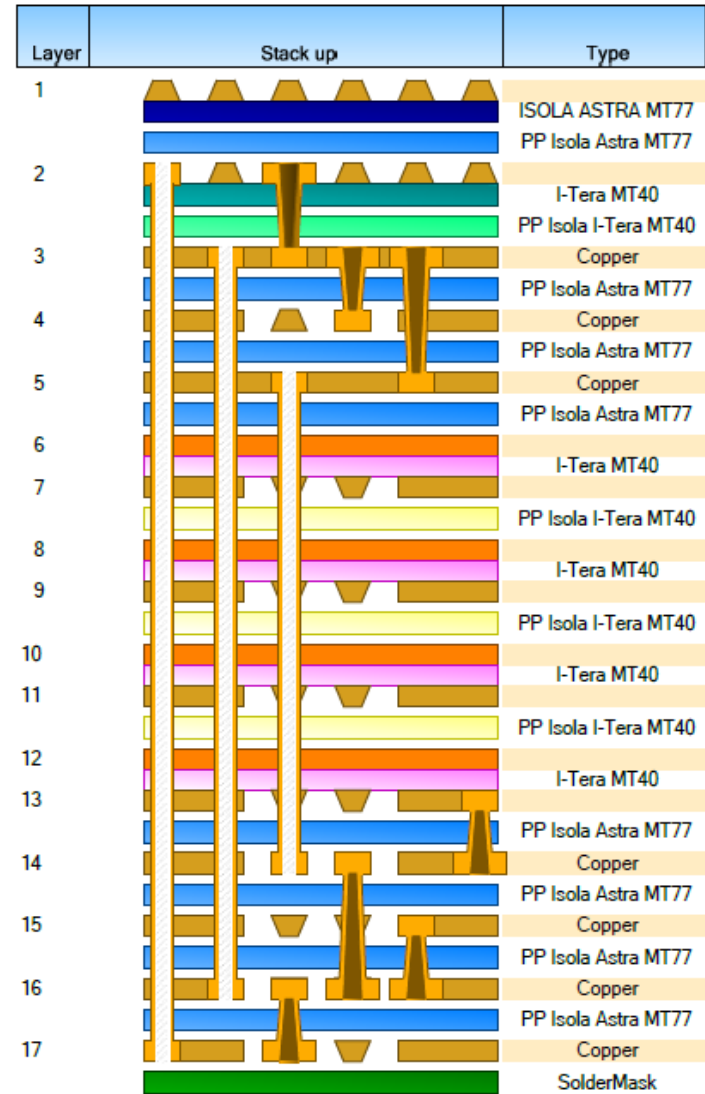


## ➤ Cost Increase Factors

- ✓ Non- standard design rules
- ✓ Blind Via's, buried Via's, stacked Via's
- ✓ Resin filling and capping Via's
- ✓ Back drill



## Cost Of Press Factors



## ➤ Summary

- ✓ Production panel utilization
- ✓ Drilling process
- ✓ Design rules
- ✓ Blind & Buried Via's
- ✓ Costs Press Factors



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Thank You For Your Participation.  
See You Soon In Our Next Webinar.