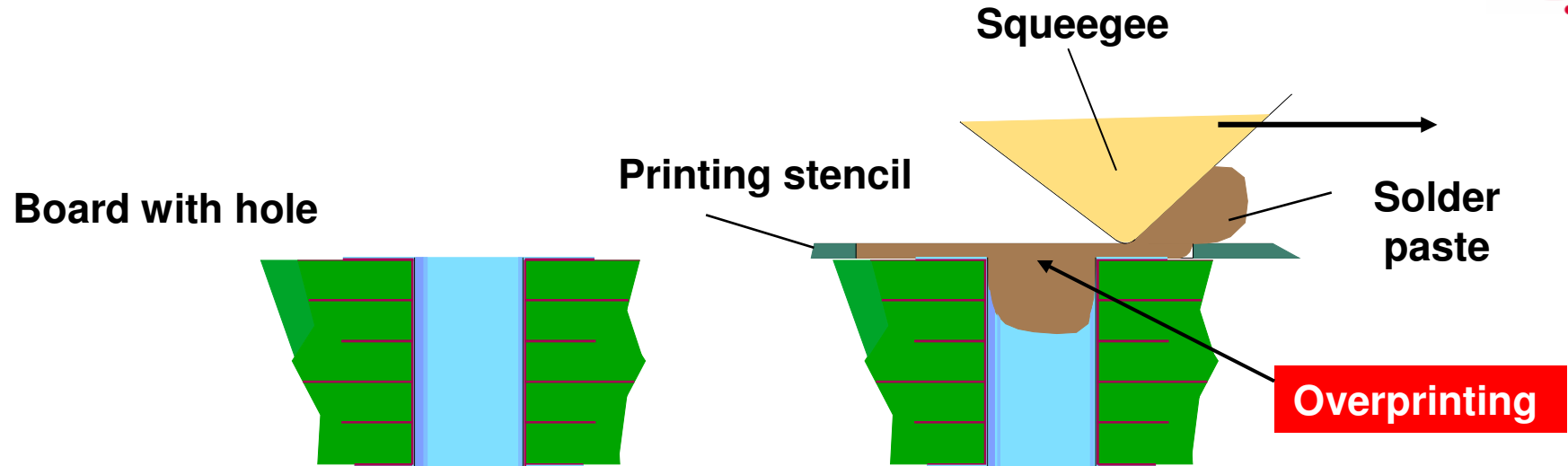


**A SMT-compatible technology to include
Through hole solder mounted components
into a typical SMT process**

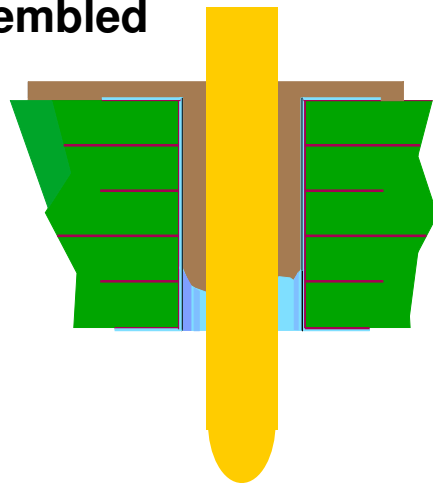
- Less through-hole mounted components on today's PCB Daughtercards
 - Connectors are often the only non SMT component.
 - Requires separate process to press fit or wave solder the connectors
 - If SMT Connectors were available, the quantity of other through-hole mounted components could probably also be reduced.
- Press-fit concerns
 - Tight dimensional requirements on plated through holes add complexity and cost to PCBs
 - High forces required to assemble boards, and requirement for supports puts constraints on PCB layout.
- SMT Concerns
 - Most SMT components have no forces applied to them during use.
 - Connectors have to resist mating & unmating forces, and sometimes residual forces.
 - Adds requirement for additional mechanical hold-downs, which can take up extra space
 - Particularly for large components, concerns about co-planarity / Board warpage
- Pin-in-paste addresses a number of these issues
 - Accepted for reliability and yield
 - Allows for fully automated handling and soldering.

Reduction of applied cost

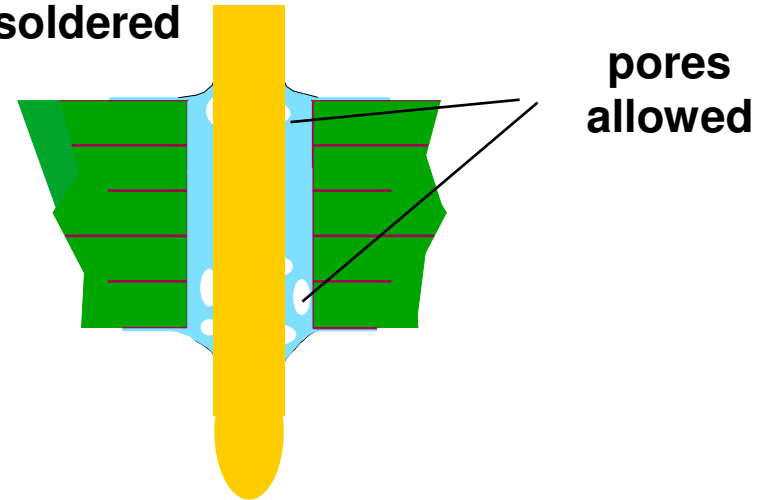
Pin-in-Paste principle



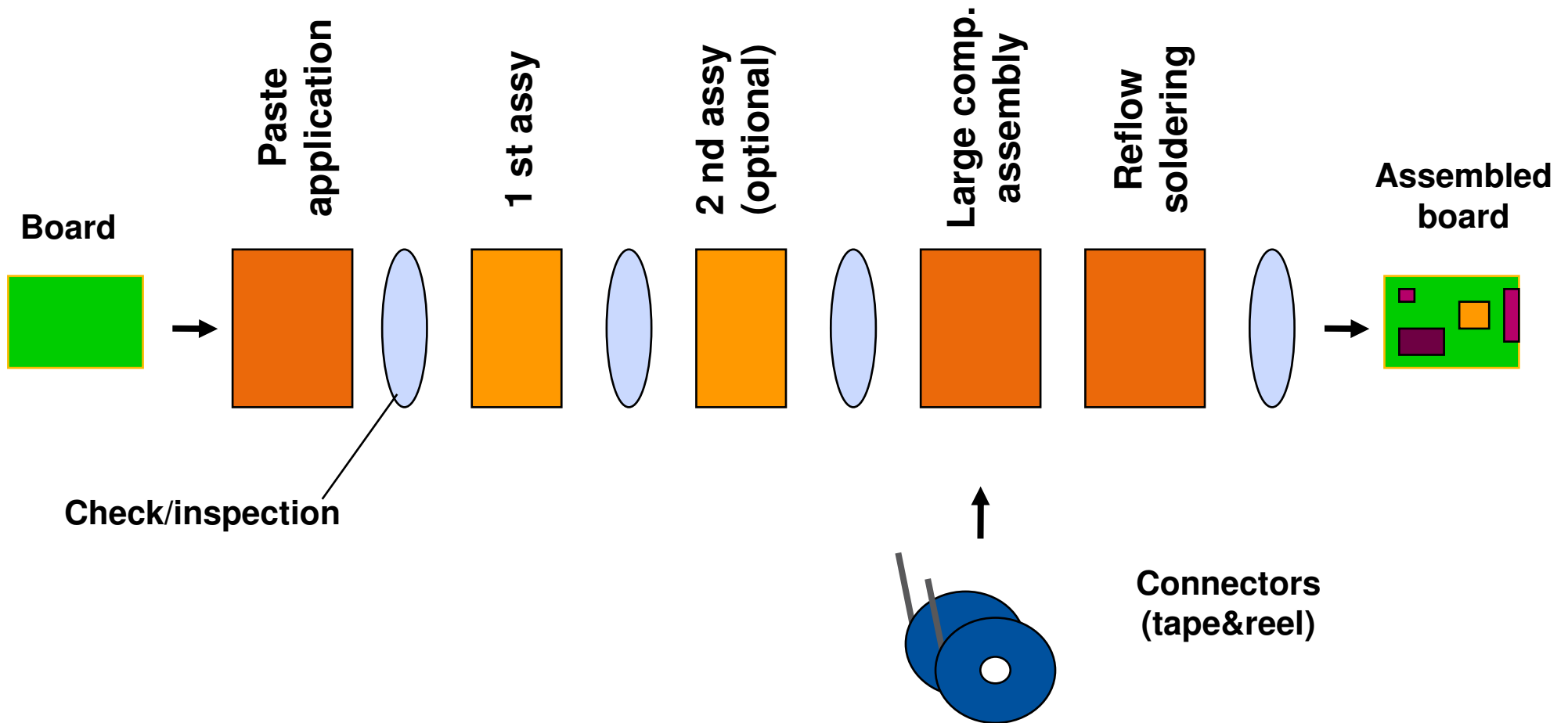
Component assembled



Reflow soldered



A typical SMT process



- size/weight
- high temperature resistant
- package
- handling/picking
- positioning
 - On solder tails only
 - solid pegs
 - Compliant pegs (metal or plastic)
- retention force feature
- solder paste printing considerations

- Housing material
- Marking
- Insert inside insulator (e.g. coax)

Requirement: Withstand 2 cycles of 10 seconds in 260°C

Normally solved with high temperature plastics

Packaging becomes “part of the product”

Tape and reel solution

Most accepted

No special tooling

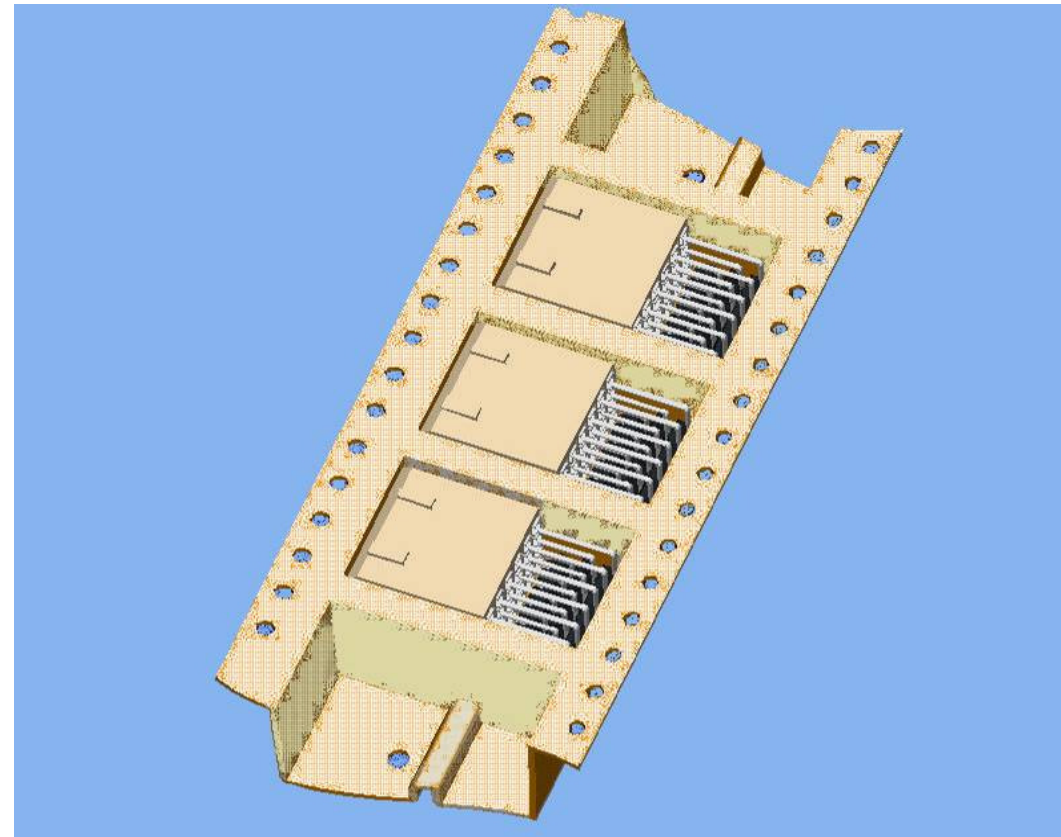
Standardized dimensions

ESD-treated

Some limitations on size

Trays

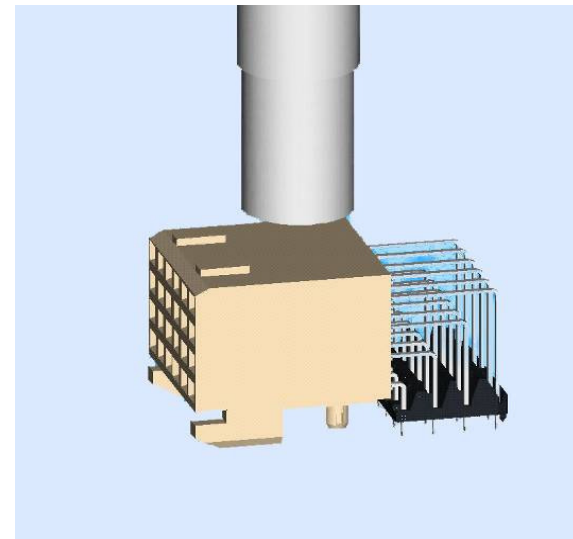
Tubes



Handling / Placement



- Vacuum nozzle surface most common solution
- Mechanical gripper as second choice
 - Special tooling may be required in placement machine
- Feeder limitations on tape
- Good leveling in package (parallel to horizontal plane)
- Heavy/large components may need reduced handling speed



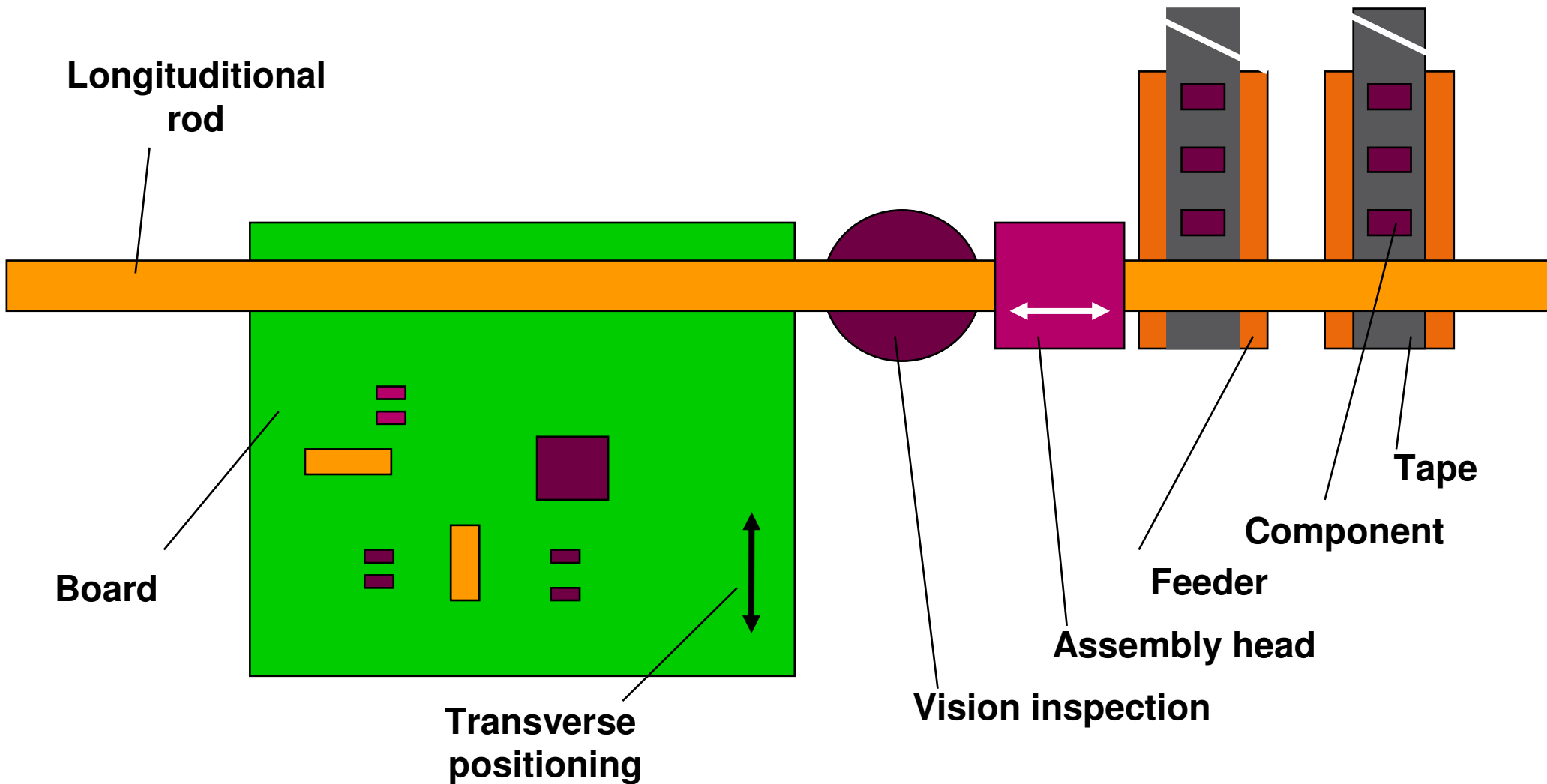
- Application dependant
 - External forces
 - Plug-in forces from e.g. backplane (Typical for Metral)
 - Forces from connected cables (Typical for D-sub)
- Assembly process dependent
 - Component shape (stability, high aspect ratio)
 - Placed over edge of PCB?
 - Final assembly position requirements?

**Typically no extra screws, rivets etc.
can be applied after soldering
as it will generate Residual stress in the solder joints**

Added requirements on the connector such as:

- Free space for hole overprinting
 - Free space for surface tension at solder during reflow
 - Solder tail shape and hole/tail ratio
- ***Careful control of paste printing parameters will guarantee high process yield.***

Large component assembly (principle)



- Solder result is the main point.
- Reduced filling degree accepted (50%-75%)
 - No Industry standard like wave soldering.
- Wetting better than in wave soldering

Process control focused

- D-sub - Available
- Metral - Available
- Densi-Shield - Available
- Quickie – Available
- Minitek (2mm) – In Development
- Bergstik – In Development
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