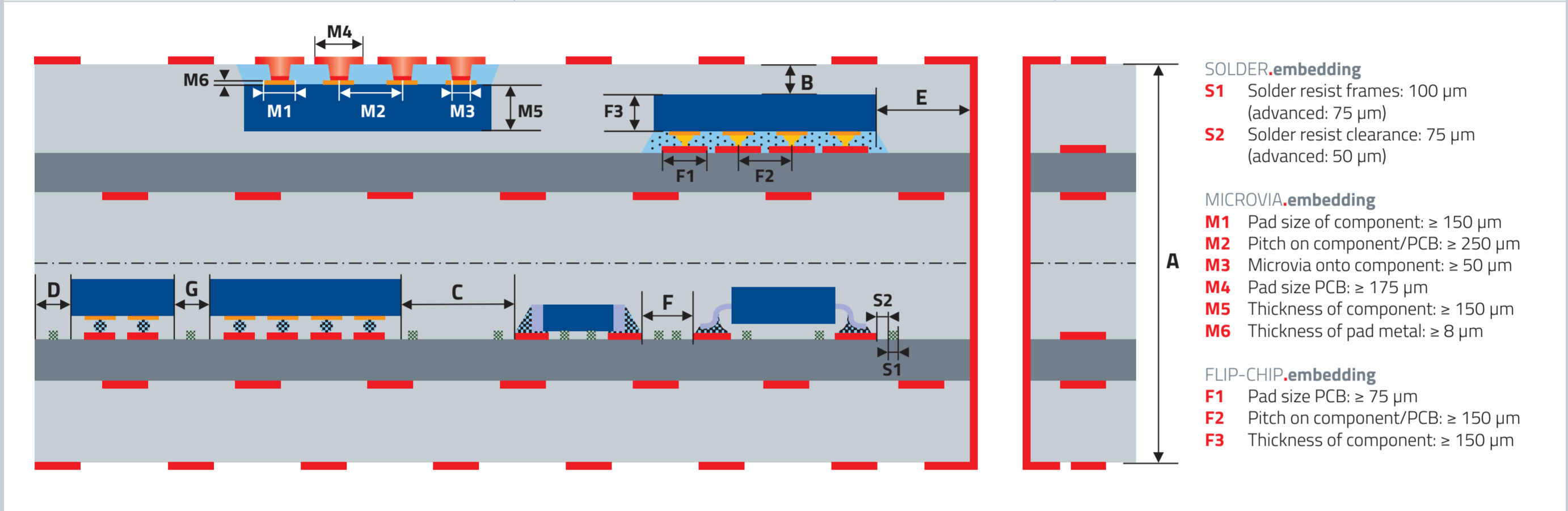
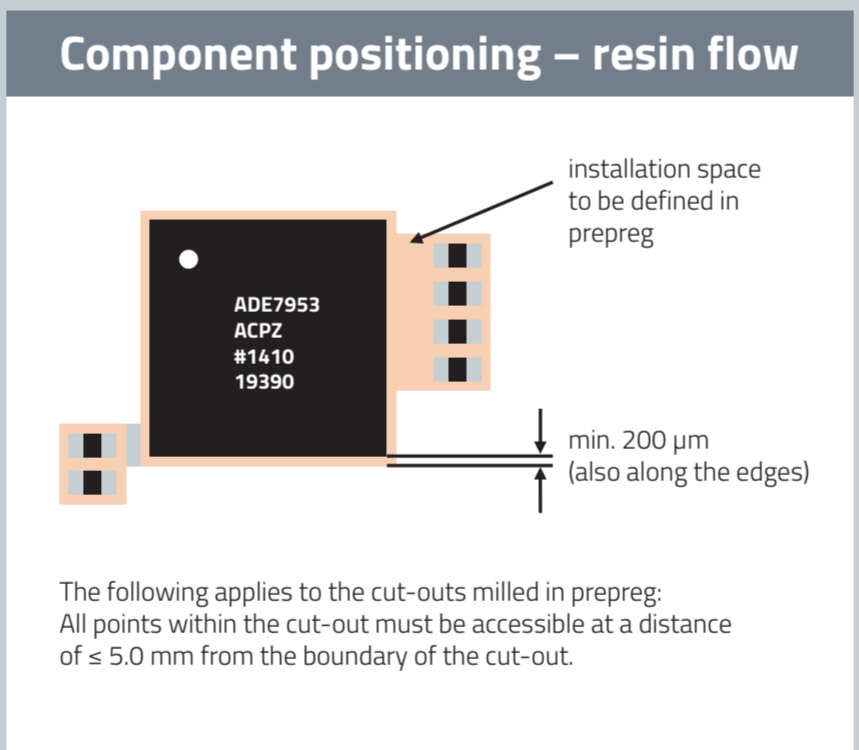


# EMBEDDING TECHNOLOGY

Indicators for technology use		
<p><b>SOLDER.embedding</b></p> <ul style="list-style-type: none"> <li>Active components that are not available as a bare die</li> <li>Active and passive components</li> <li>Range of the solid SMD components can be used (with restrictions)</li> </ul>	<p><b>MICROVIA.embedding</b></p> <ul style="list-style-type: none"> <li>Combination of active and passive components</li> <li>Highly reliable assembly and packaging technology</li> <li>Copper or nickel-palladium pad metallisation on the components</li> </ul>	<p><b>FLIP-CHIP.embedding</b></p> <ul style="list-style-type: none"> <li>Active components, which were previously wire-bonded</li> <li>Components need to be bumped (Nickel Gold or Gold stud bumps) or can be bumped at WE (Gold bumps)</li> <li>No passive components possible</li> <li>Active components with pitch &lt; 250 µm possible</li> </ul>



- Components in general**
- All components must fit into the actual layer stack-up
  - No component may protrude in the z-axis
  - Max. component size: 10 × 10 mm<sup>2</sup>
  - Components must not contain cavities (e.g. Quartz Crystal devices) or liquids (e.g. liquid electrolytes).
- Placement of components**
- Occupation of an inner layer with components
    - max. 40 % of the available area
    - Individual clarification necessary with > 40 % occupancy
  - Components should be grouped
  - Max. size of the group: each point in the group must be reachable from the group edge within 5 mm to ensure the resin flow into the cavity of each group



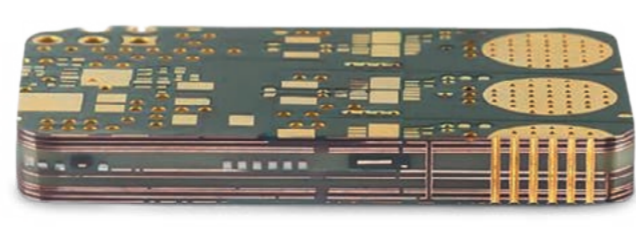
Unless otherwise agreed, IPC-7092 applies to all products with embedded components. The associated PCB production corresponds to IPC-A-600 Class II and the assembly to IPC-A-610 Class II.

Depending on the design and final build-up of the PCB with embedded components, the design rules/design guides currently valid at Würth Elektronik „Basic Design Guide“, „Flex-Rigid Design Guide“, „Heat Management Design Guide“ and the „HDI Design Guide“ apply. If you have different requirements, please contact us directly!

**Embedding Technology**

**EMERGING TECHNOLOGIES FOR INNOVATIVE SOLUTIONS**

<p><b>Miniaturisation</b></p> <ul style="list-style-type: none"> <li>Package replacement</li> <li>Space savings of assembly area on the outer layers</li> </ul>	<p><b>Performance/Function</b></p> <ul style="list-style-type: none"> <li>Integrated shielding</li> <li>Short signal paths</li> <li>Protection against plagiarism</li> </ul>	<p><b>Reliability</b></p> <ul style="list-style-type: none"> <li>Protection against environmental influences</li> <li>Secure and full-surface fixing</li> <li>Thermal management</li> </ul>
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- A PCB thickness – according to our general PCB specification.**
  - Standard: 2,4 mm
  - Upon request: 3,2 mm
  - In special cases: > 3,2 mm (needs to be evaluated for specific applications)
- B Layer stack-up**
  - At least one layer of prepreg should always be inserted between the component and the copper layer above, or it must be ≥ 100 µm (smaller on request).
  - Based on assembly technology and layer stack, the max. thickness of the components is calculated
  - The WE layer stack-up proposal specifies the maximum possible component height – or references the maximum component height.
- C Distance group to group or component to group:**
  - Min. 1.000 µm
  - 700 µm also possible upon request (700 µm ≈ 300 µm material + 2 × 200 µm clearance)
- D Distance component to PCB edge**
  - ≥ 500 µm (less possible upon request and after clarification)
- E Distance via to component edge**
  - ≥ 500 µm (less possible upon request and after clarification)
- F Distance component to component**
  - Condition: pad of the footprint extends beyond the component.
  - ≥ 300 µm between the pads
  - Smaller distances upon request and after clarification
- G Distance between component and component**
  - Condition: component extends beyond pads
  - ≥ 200 µm between component outlines
  - Smaller distances upon request and after clarification