

## Image: Micro-sections of circuit boards intended for space missions

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Embedded within these resin discs are vital clues to determine whether future space missions will fail or thrive.

These are microsections taken from [printed circuit boards](#) (PCBs), being considered for use by coming ESA projects. Such boards are key building blocks of [space missions](#).

As the electric, electronic and electromagnetic components hosted on PCBs are increasingly miniaturised, satellites are becoming much smarter and more capable – provided the boards function as intended.

ESA's Materials and Electrical Components Laboratory – based at the ESTEC technical centre in Noordwijk, the Netherlands – has the task of checking if the performance and workmanship of candidate boards and assemblies meet rigorous space-quality standards.

Any defect in the PCBs, or in the soldering process used to attach components to the boards, could impair satellites, or even lead to the total loss of a mission.

For its role as technical gatekeeper, the Lab is equipped with powerful diagnostic tools, including optical and scanning electron microscopes capable of hundred-thousand-scale magnification.

The microsections are cast inside resin to make them easier to prepare and inspect on a microscope, in some cases with dye added to help detect defects and reveal any materials and processes underperformance.

Provided by European Space Agency

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