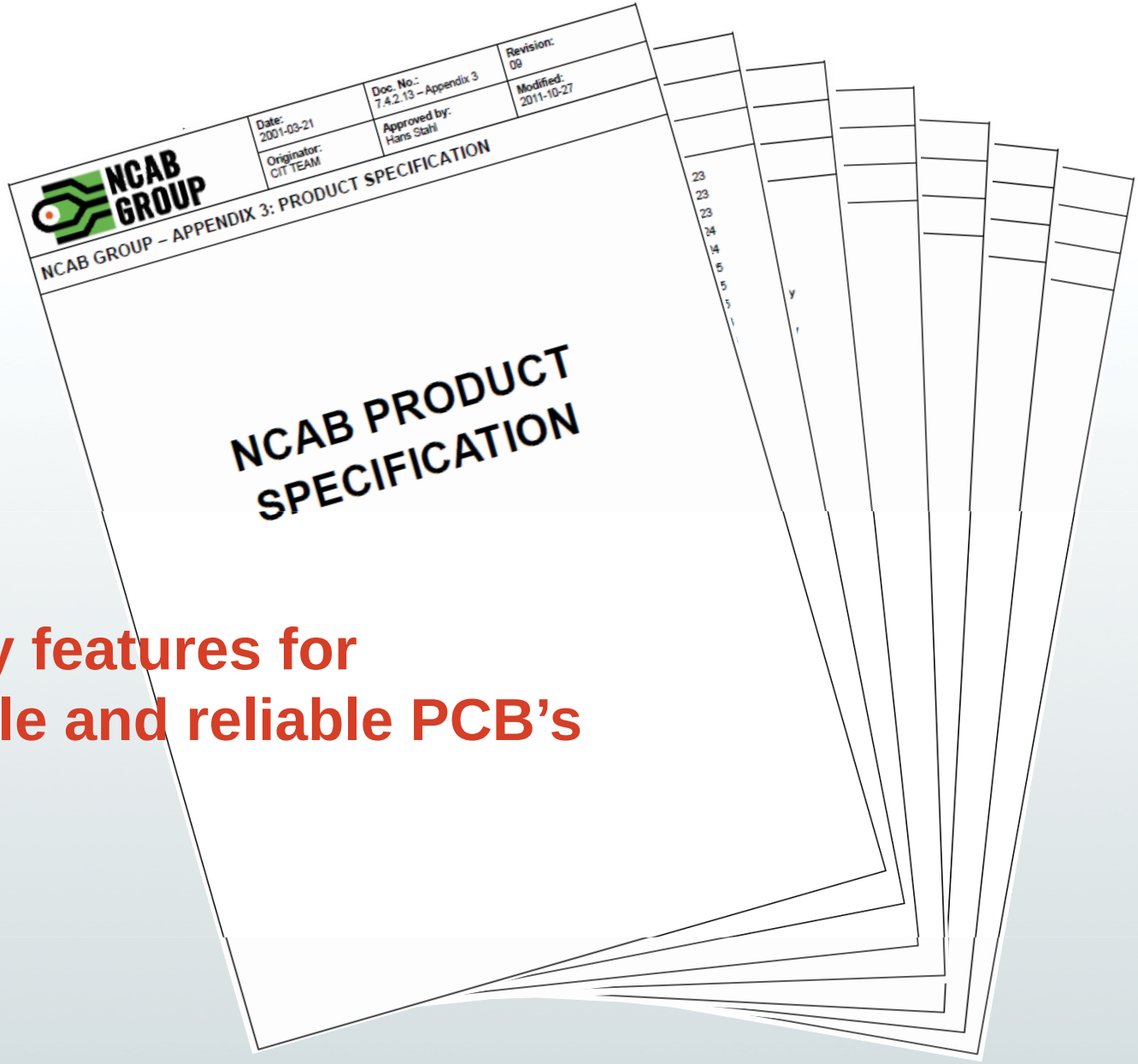
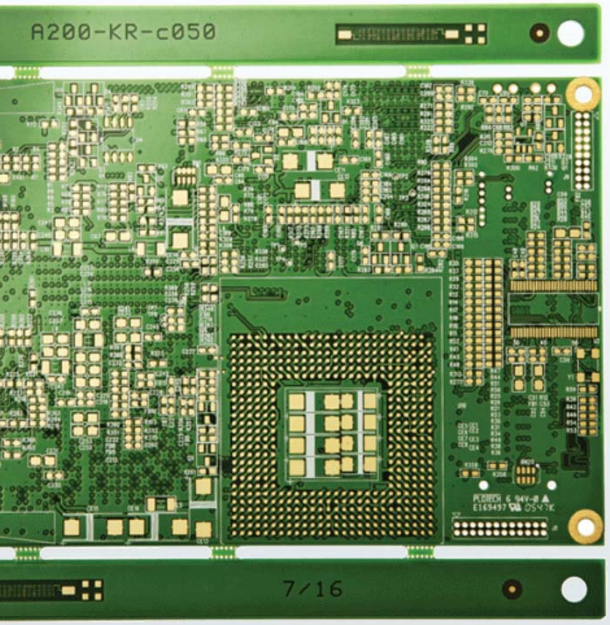
NCAB Group | Seminar no. 9

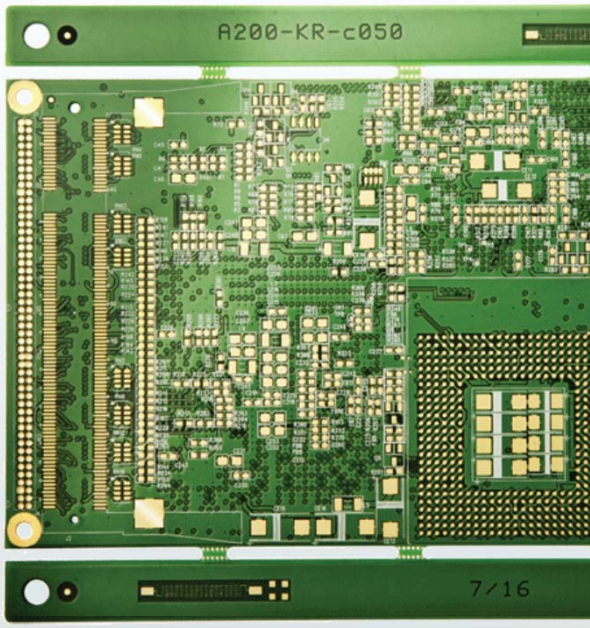
NCAB Group PCB Specification



14 key features for durable and reliable PCB's

Are all PCB's created equal?





Actually… No

All PCB's aren´t created equal

Everybody at NCAB knows…

…attention to details makes the difference

…the specification leads to quality being built in from the start

1 25um nominal hole plating as per IPC Class 3

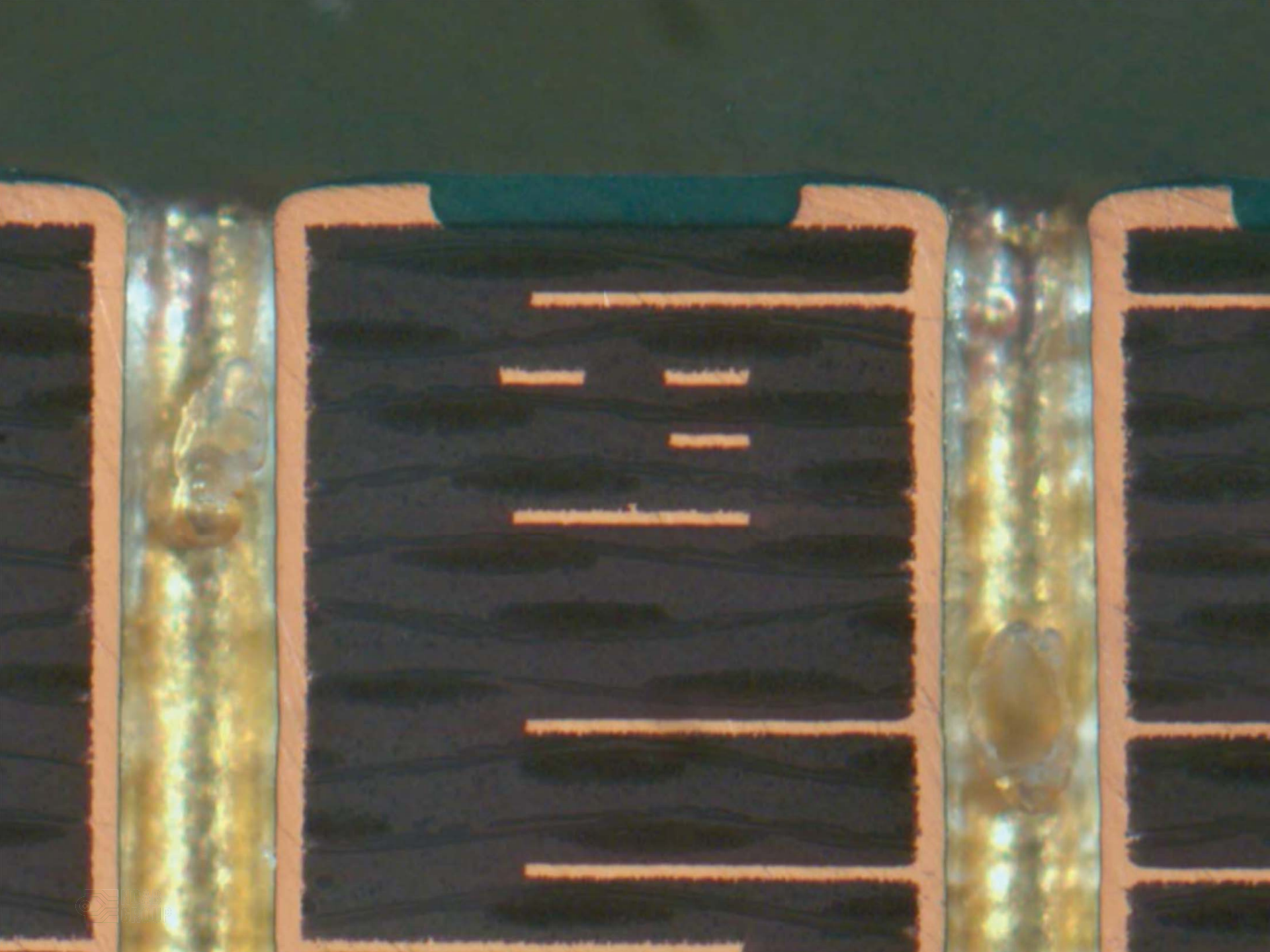
BENEFITS

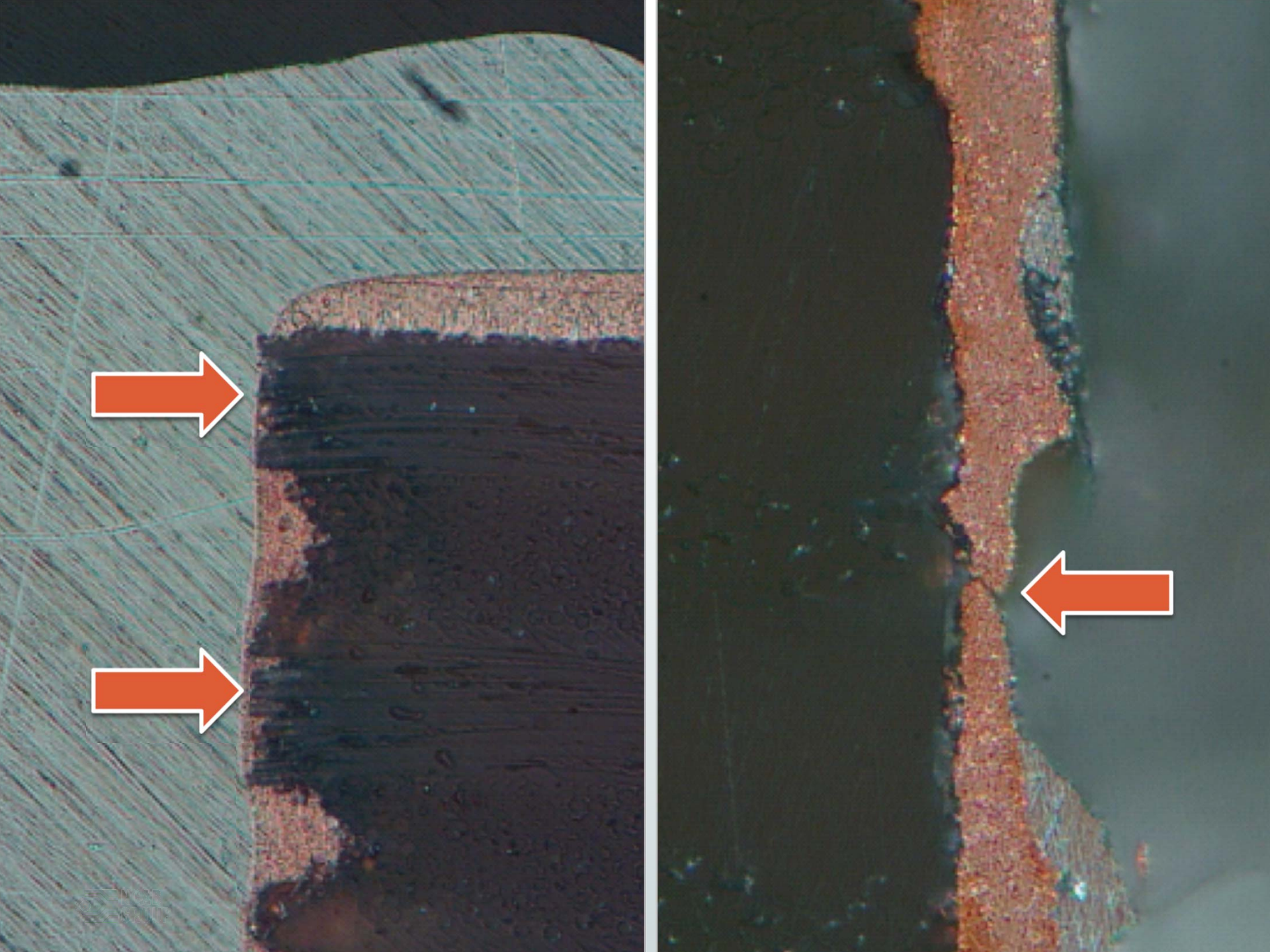
Greater reliability including improved z-axis expansion resistance.

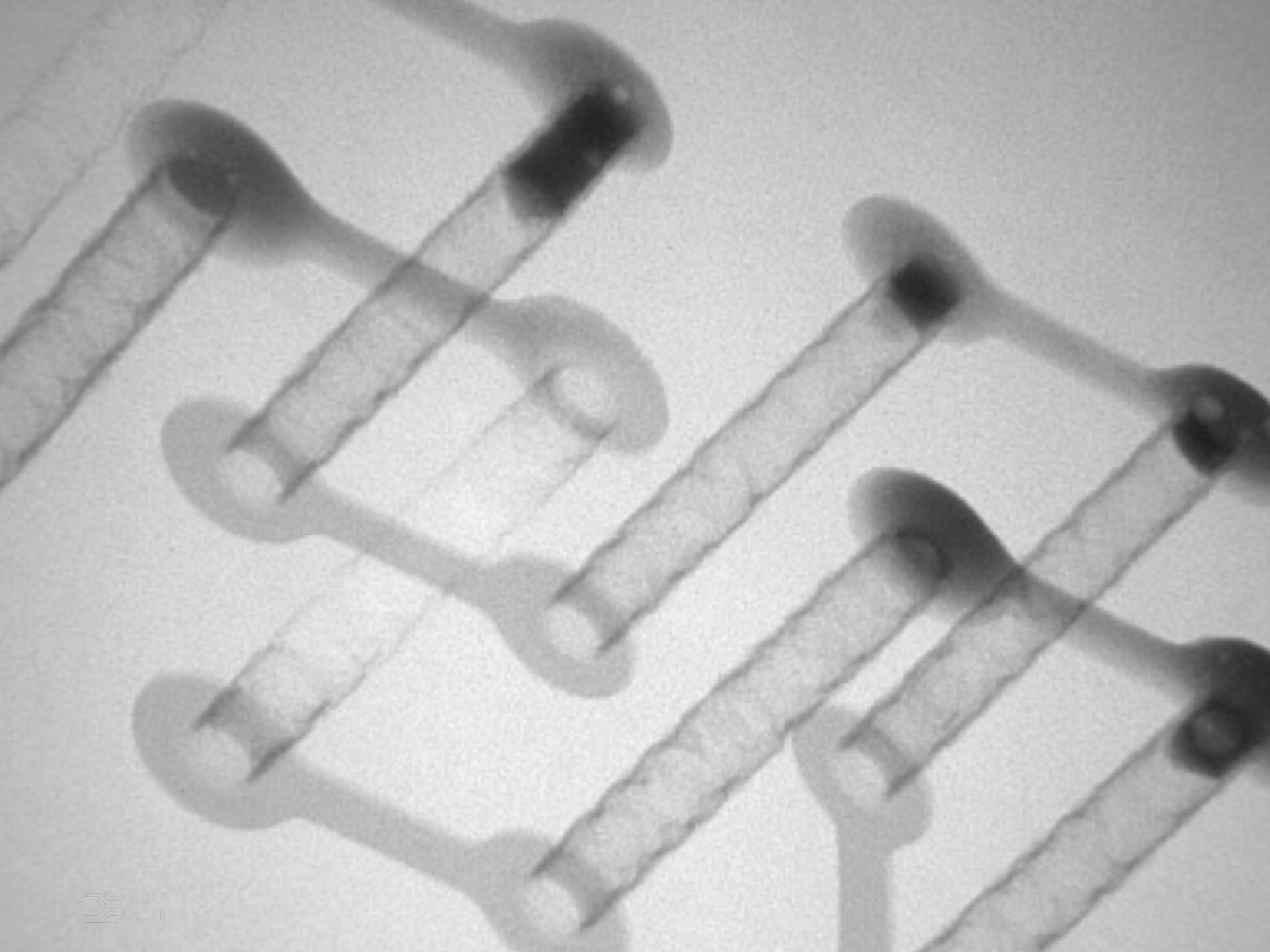
RISK OF NOT HAVING

Electrical continuity problems, risk of electrical or functional failure during load conditions.

IPC Class 2 provides 20% less copper with 20um nominal and 18um low spots.







2 No track welding or open circuit repairs

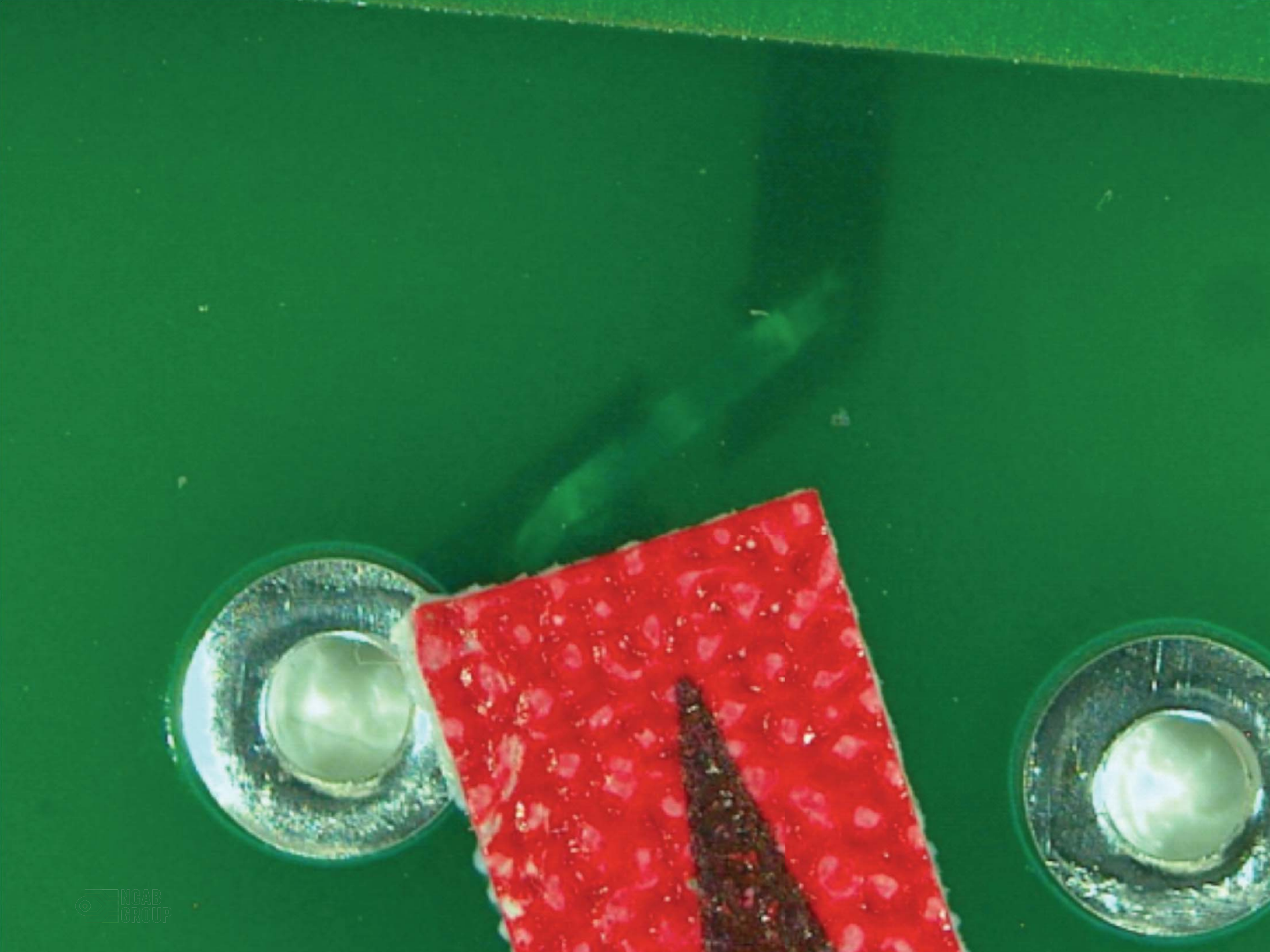
BENEFITS

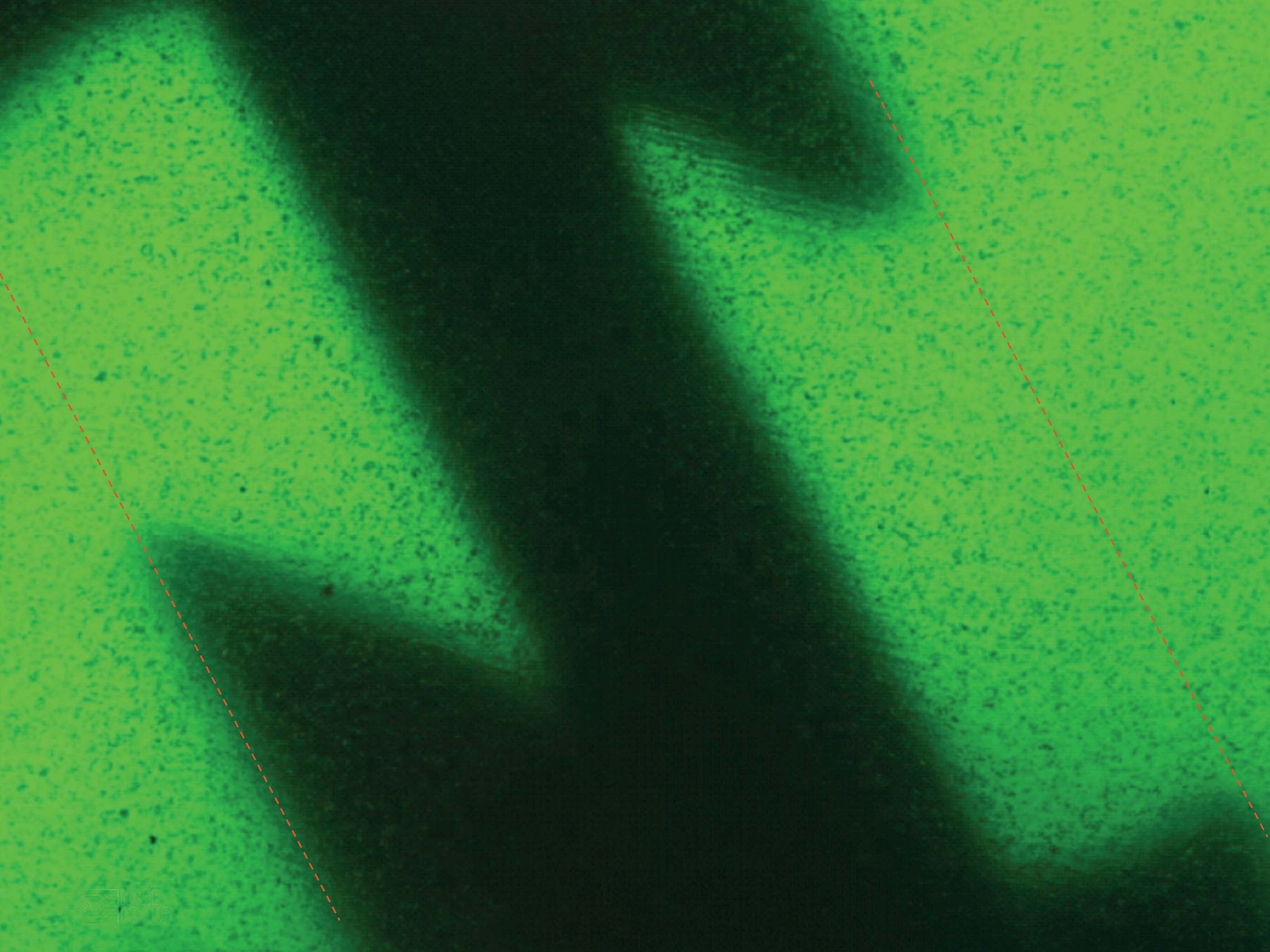
Reliability through perfect circuitry and security, as no repair = no risk of failure of repair.

RISK OF NOT HAVING

Poor repair can actually lead to open circuits being ‘supplied’ as even a ‘good’ repair has a risk of failure under load conditions (vibration etc.) leading to potential field failures.

This is a key characteristic for those products which are safety or life critical. For NCAB Group we consider this standard.





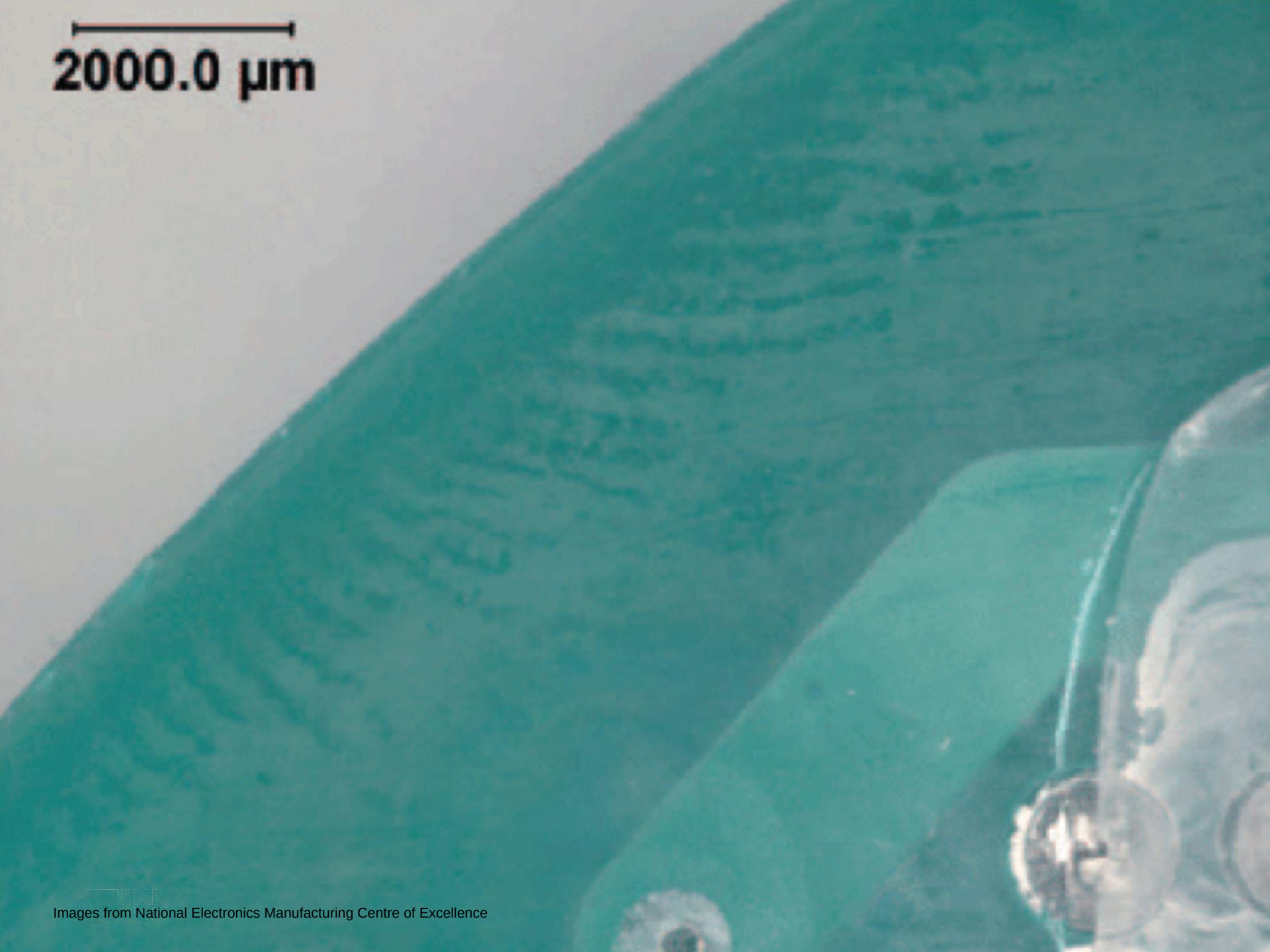
3 Cleanliness requirements beyond those of IPC

BENEFITS

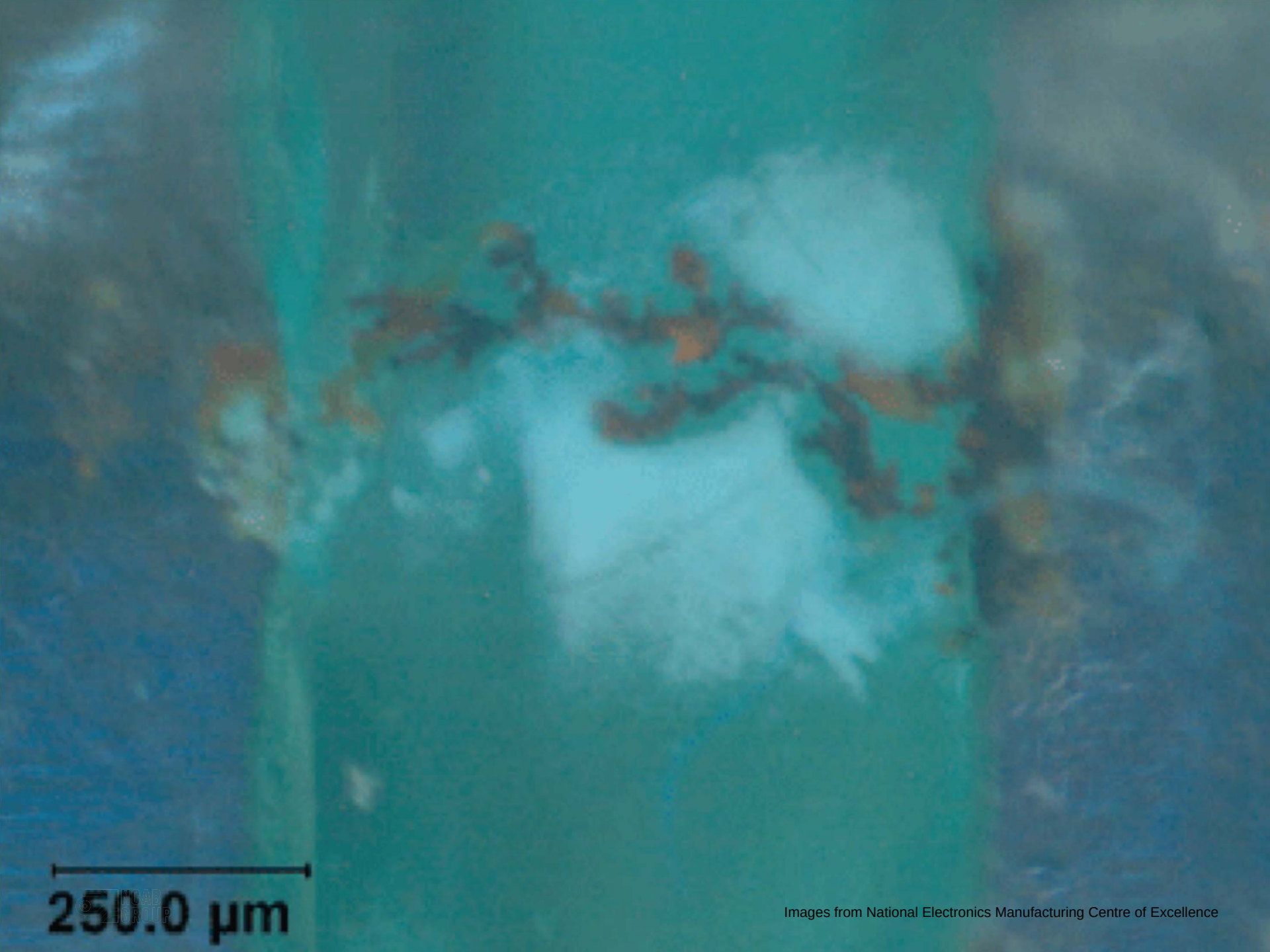
Improved cleanliness of the PCB influences and promotes increased reliability.

RISK OF NOT HAVING

Residues on the boards, solder pick up, conformal coating problems, ionic residues leading to risk of corrosion and contamination of the surfaces used for soldering – both potentially leading to reliability issues (poor solder joint / electrical failures) and ultimately increased potential for field failures.



Images from National Electronics Manufacturing Centre of Excellence



Images from National Electronics Manufacturing Centre of Excellence

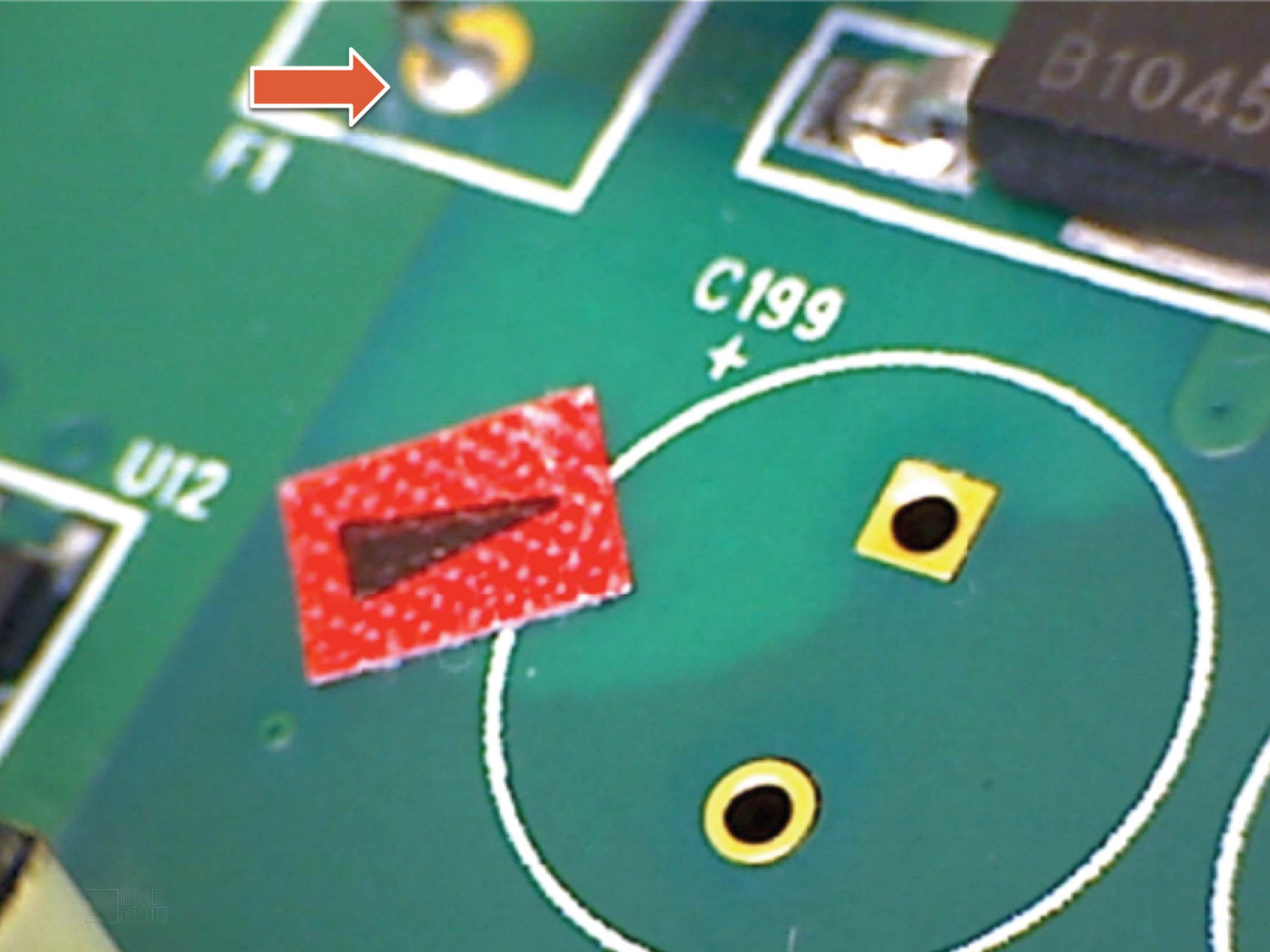
4 Tight control of age of specific finishes

BENEFITS

Good solderability, reliability and less risk of moisture ingression.

RISK OF NOT HAVING

Solderability problems can occur as a result of metallurgical changes within the finish of old boards, whilst moisture ingression can lead to delamination, inner layer separation (open circuits) during assembly and/or when in the field.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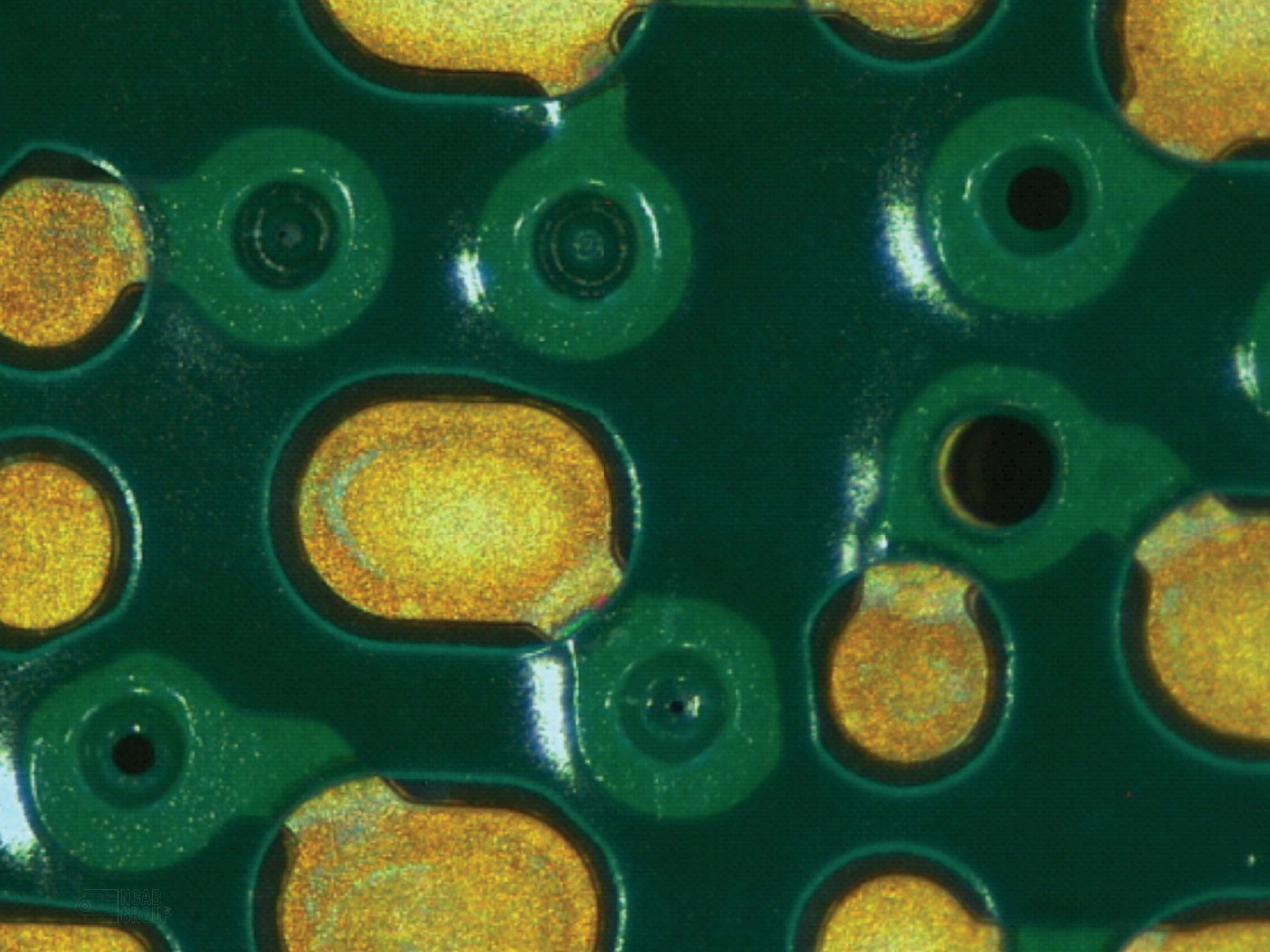
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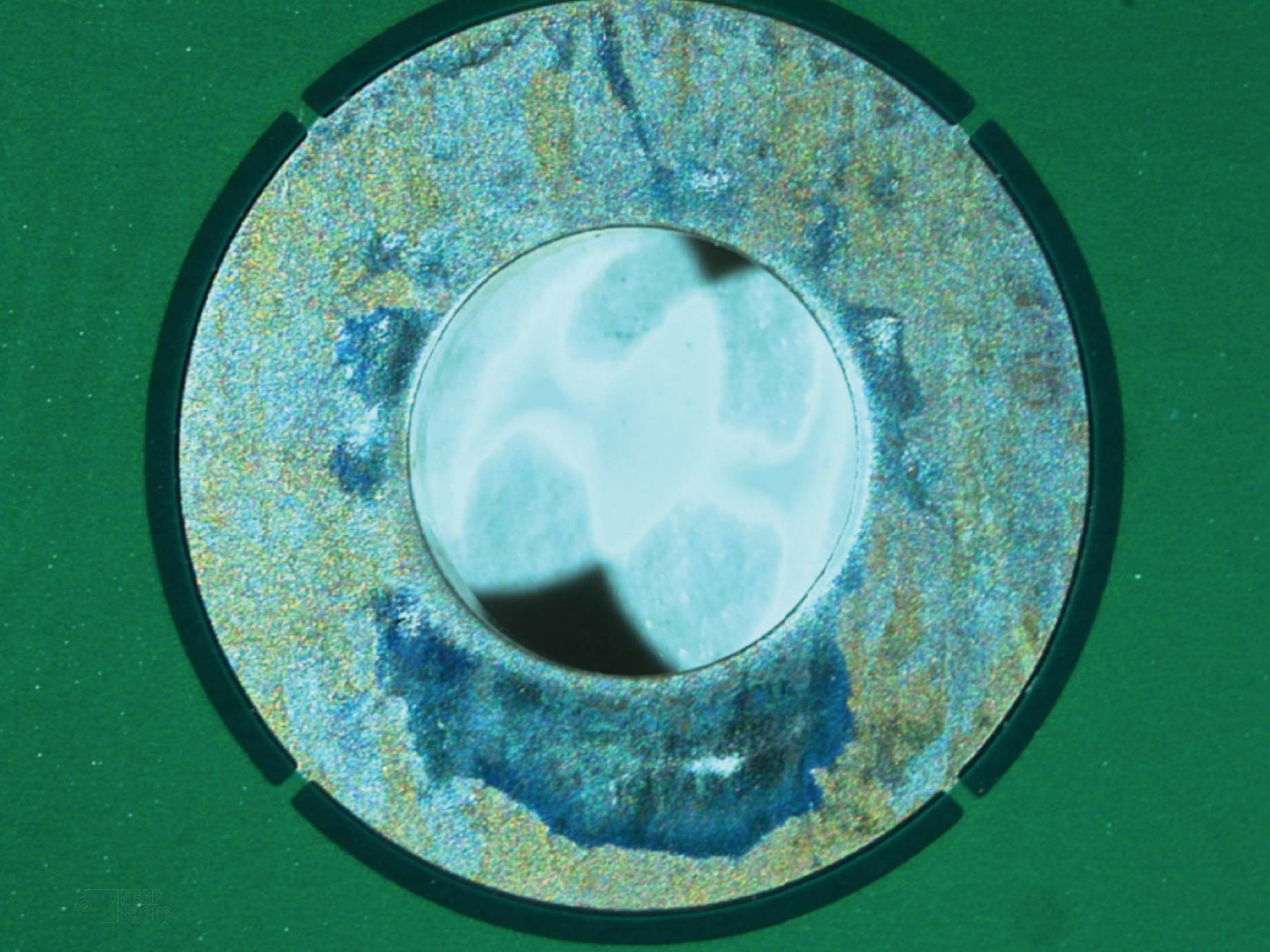
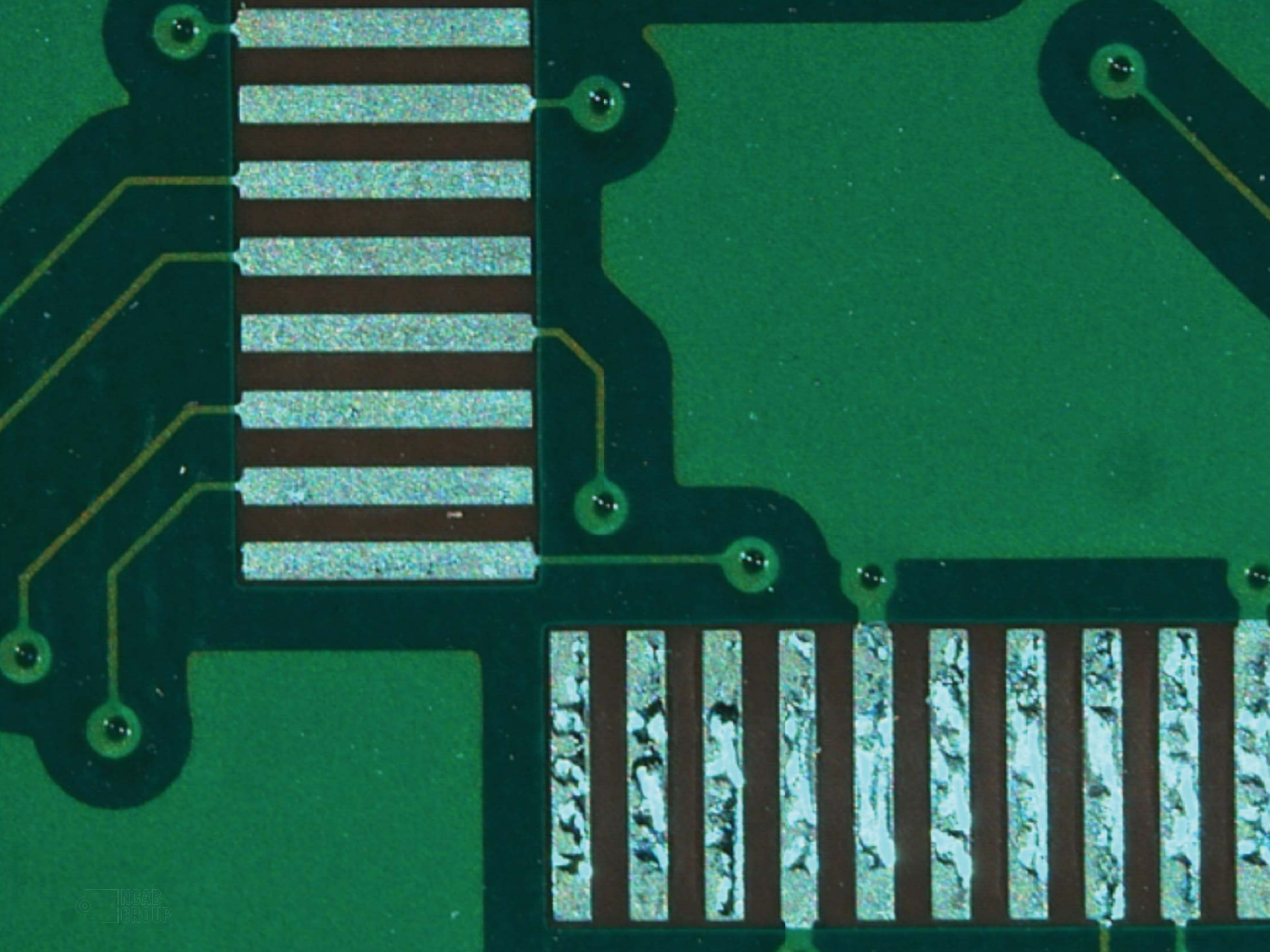




5 Internationally known base materials used – no ‘local’ or unknown brands allowed.

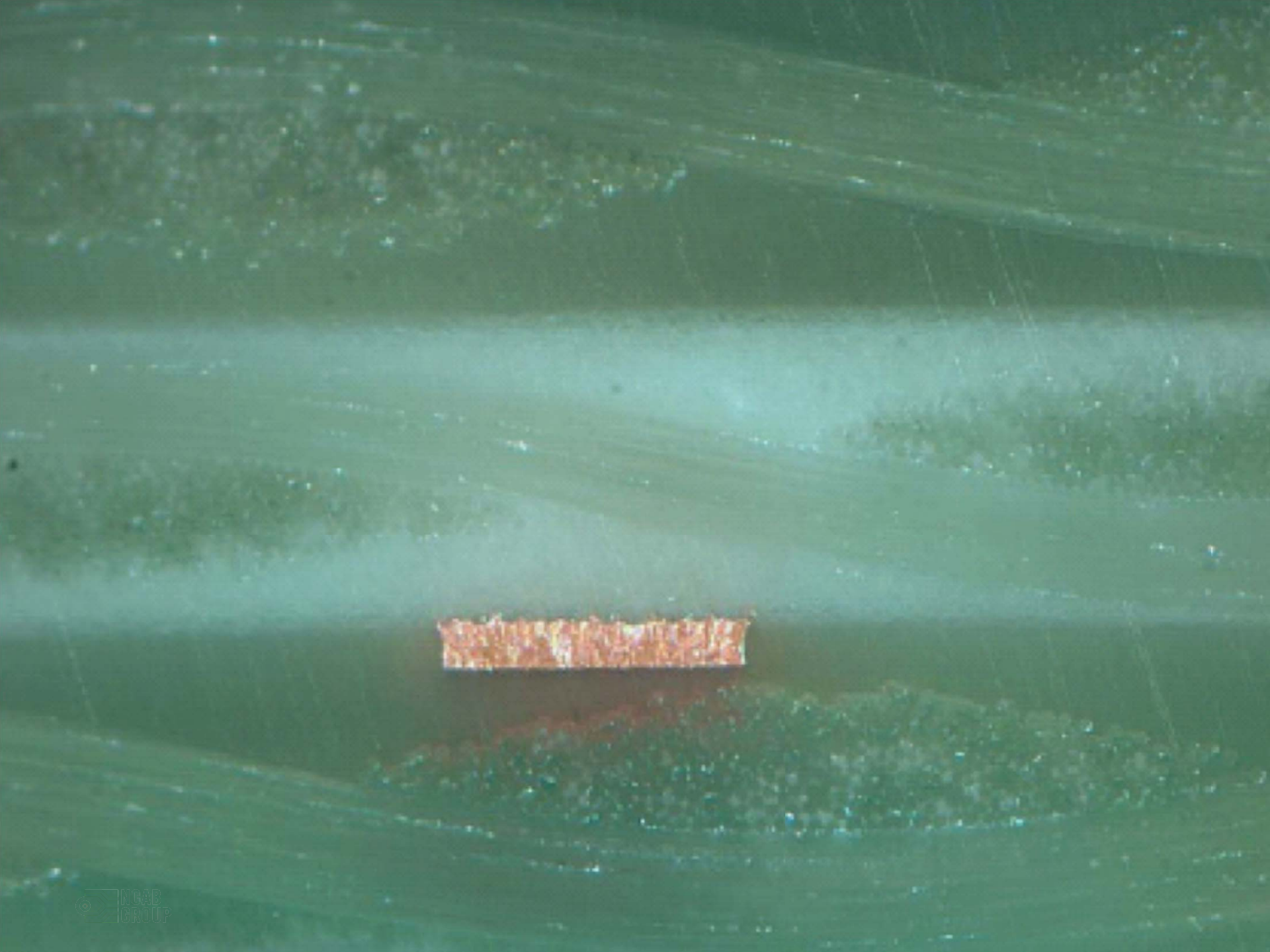
BENEFITS

Increased reliability and known performance.

RISK OF NOT HAVING

Poor mechanical properties mean the board doesn’t behave as expected during assembly conditions – for example: higher expansion properties leading to delamination / open circuits and also warpage problems.

Poor / reduced electrical characteristics can lead to poor performance (impedance for example).



6 Tolerance for copper clad laminate is IPC4101 class B/L

BENEFITS

Tighter control of dielectric spacing provides less deviation in electrical performance expectations.

RISK OF NOT HAVING

Electrical characteristics may not be exactly as planned and units within the same batch can demonstrate greater variation in output / performance.

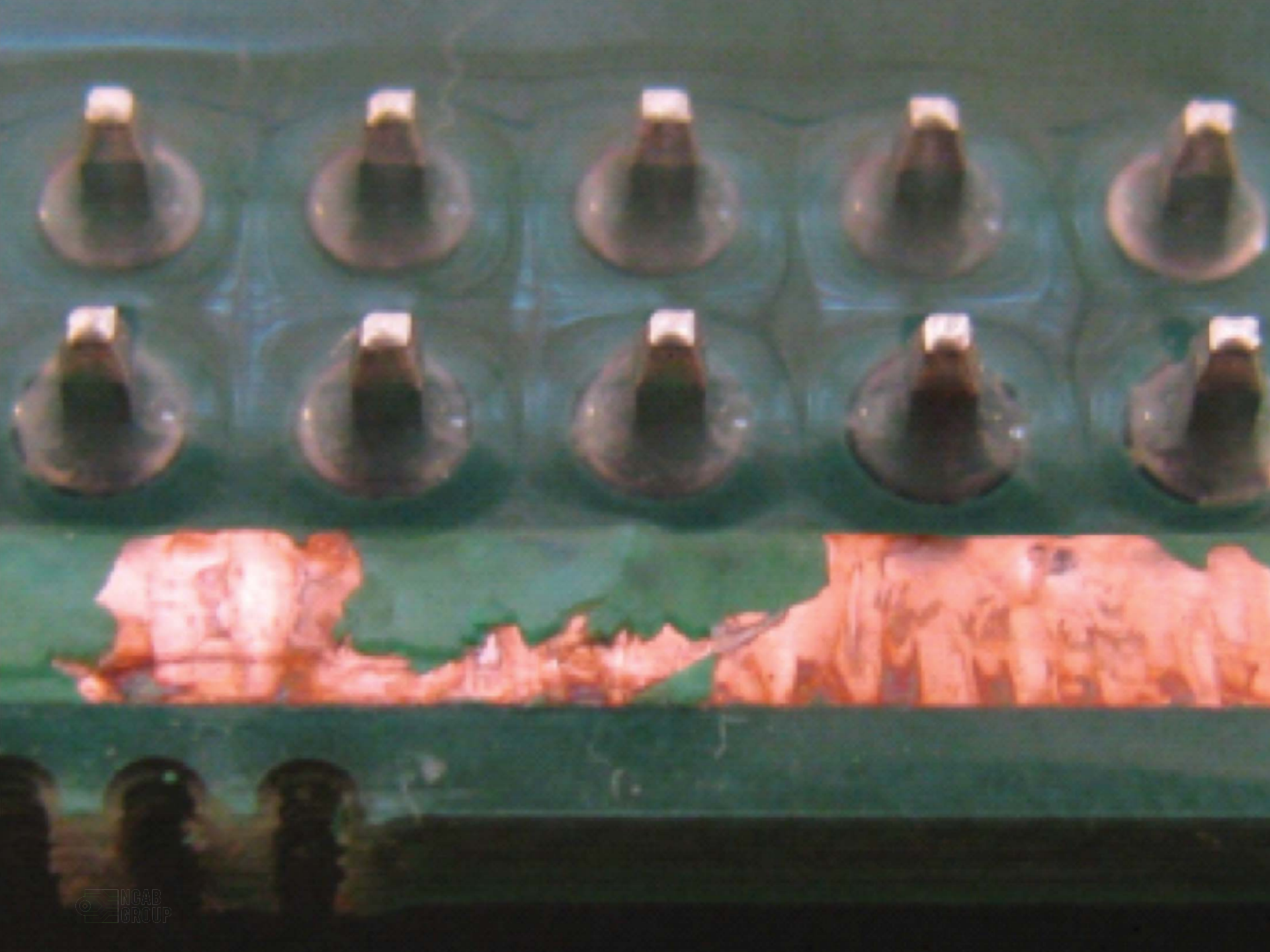
7 Defined soldermasks and ensuring accordance to IPC-SM-840 class T

BENEFITS

NCAB Group approves ‘good’ materials to provide security in the ink and in knowing the soldermasks are covered within factory UL approvals.

RISK OF NOT HAVING

Poor inks can lead to problems with adhesion, resistance to solvents and hardness – increased risk of soldermask coming away from the board ultimately leading to a risk corrosion of the copper circuitry.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8 Defined tolerances for profile, holes and other mechanical features

NCAB unique

BENEFITS

Tighter tolerances means improved dimensional quality of the product – better fit, form and function.

RISK OF NOT HAVING

Problems during assembly such as alignment / fit (press fit pin issues that are only found when the unit is fully assembled). Also problems with assembly into any housing due to increased deviation in dimensions

9 NCAB Group specifies soldermask thickness – IPC does not

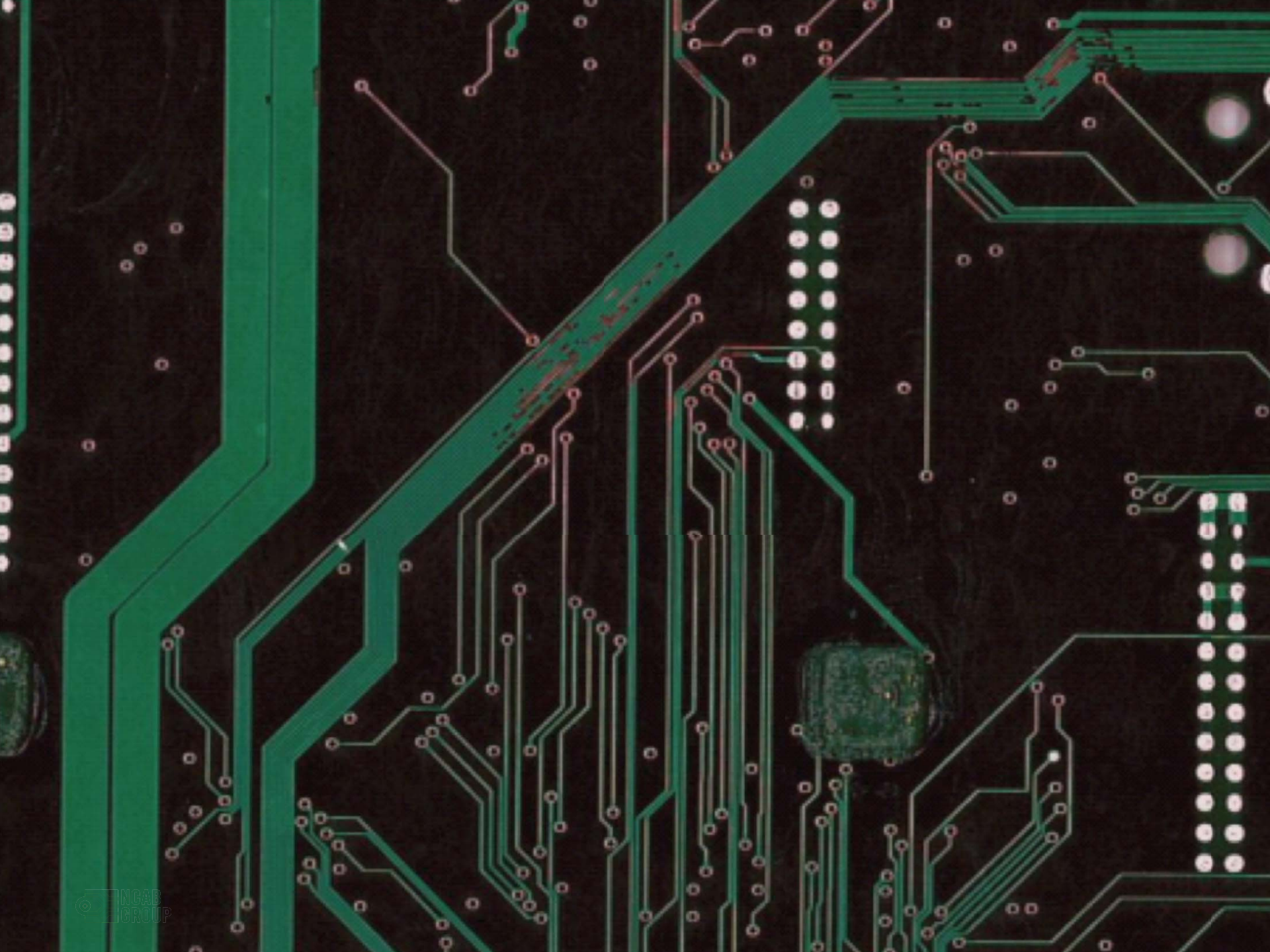
BENEFITS

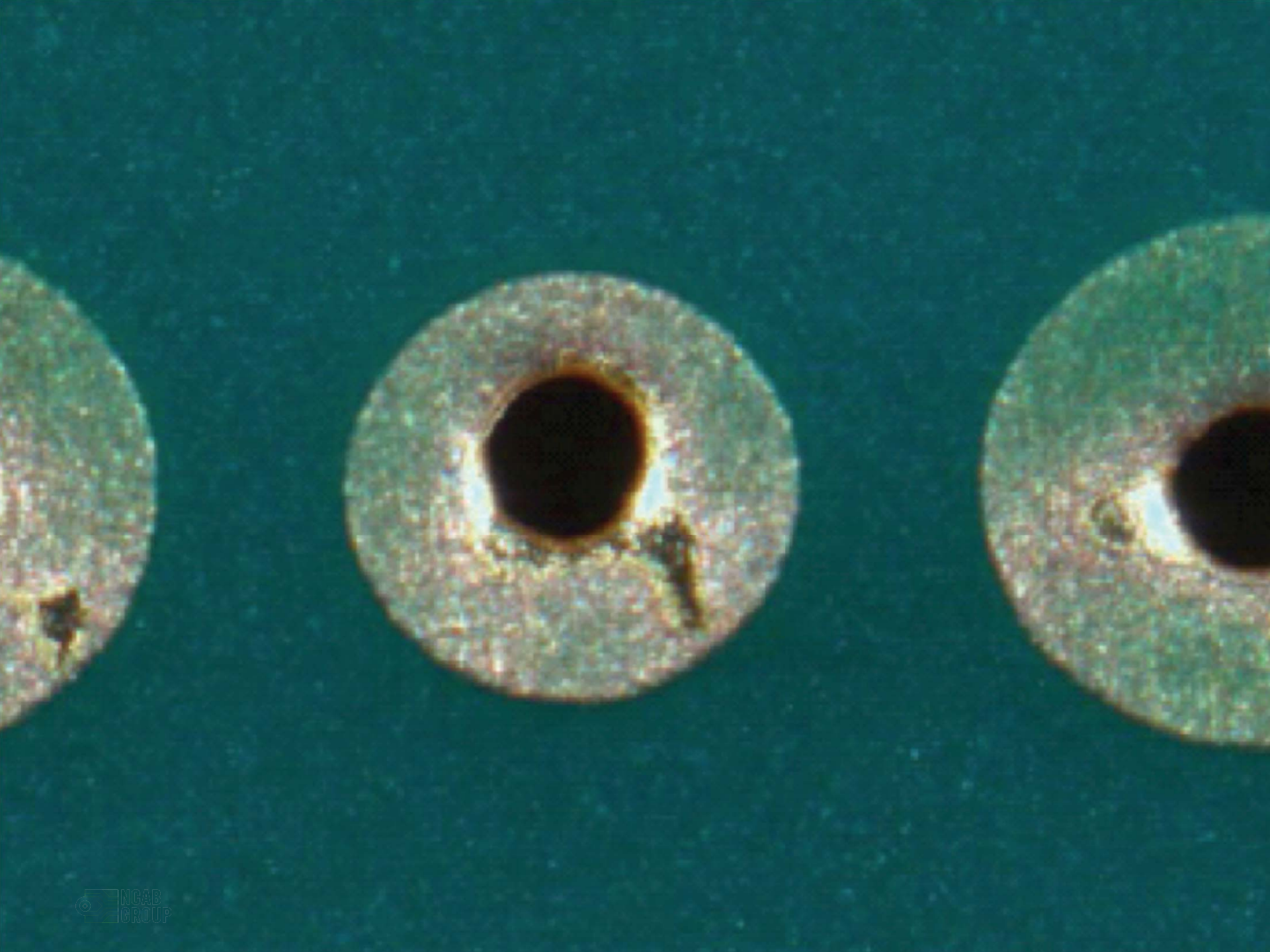
Better electrical insulation, less risk of flaking or loss adhesion and greater resilience to mechanical impact – wherever that may happen!

RISK OF NOT HAVING

Thin deposits of soldermask can lead to problems with adhesion, resistance to solvents and hardness – all of which can see soldermask coming away from the board; ultimately leading to corrosion of copper circuitry.

Poor insulation characteristics due to the thin deposit can lead to short circuits through unwanted electrical continuity / arcing





10 NCAB Group defines cosmetic and repair requirements – IPC does not

BENEFITS

Security as a result of love and care during the manufacturing process.

RISK OF NOT HAVING

Multiple scratches, minor damage, touch ups and repairs – a functional but perhaps unsightly board.

If concerned over what can be seen, then what risks are involved with what cannot be seen, and the potential impact on assembly or risk when in the field?

11 Specific requirements on depth of via fill (type VI)

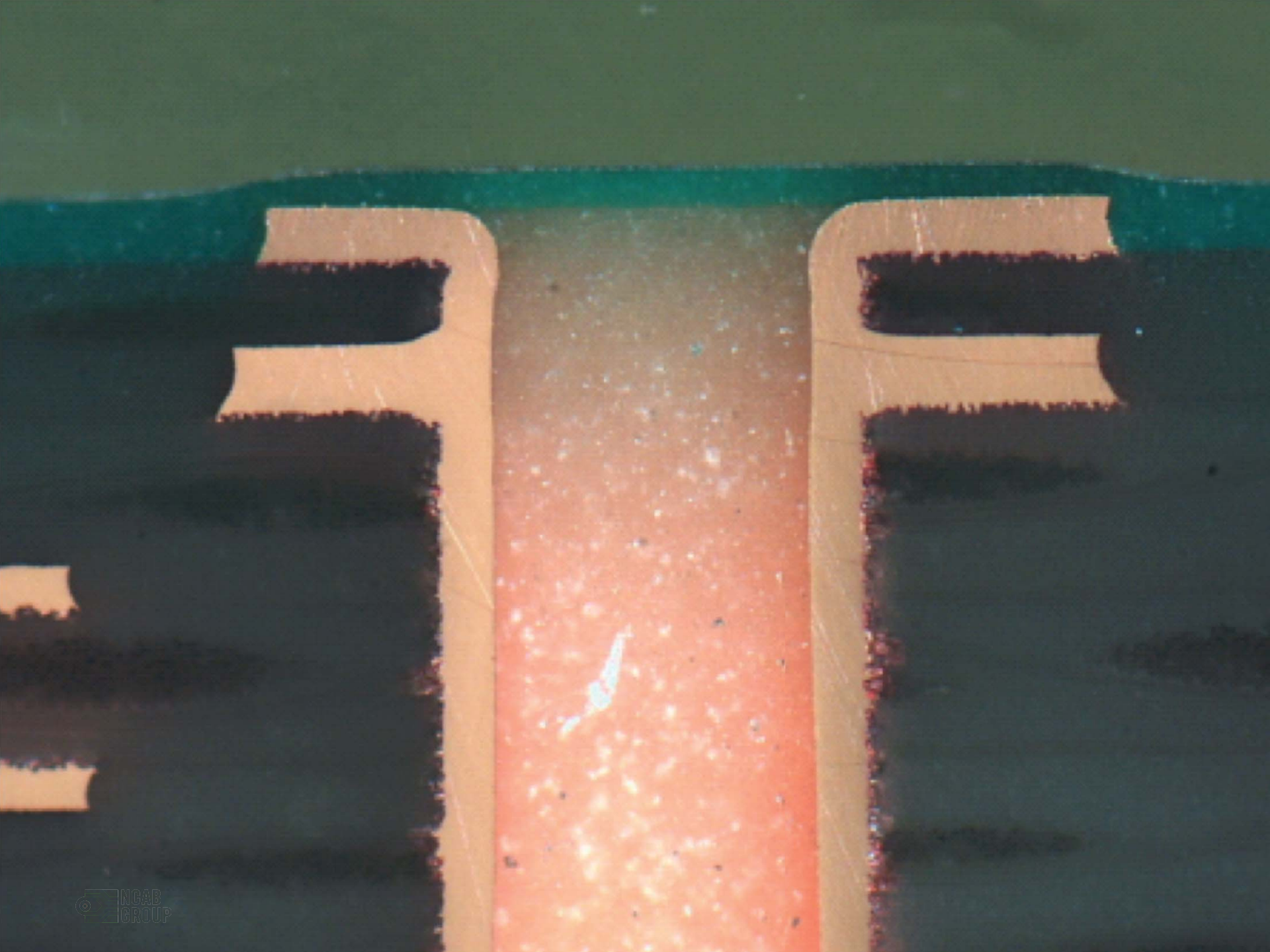
BENEFITS

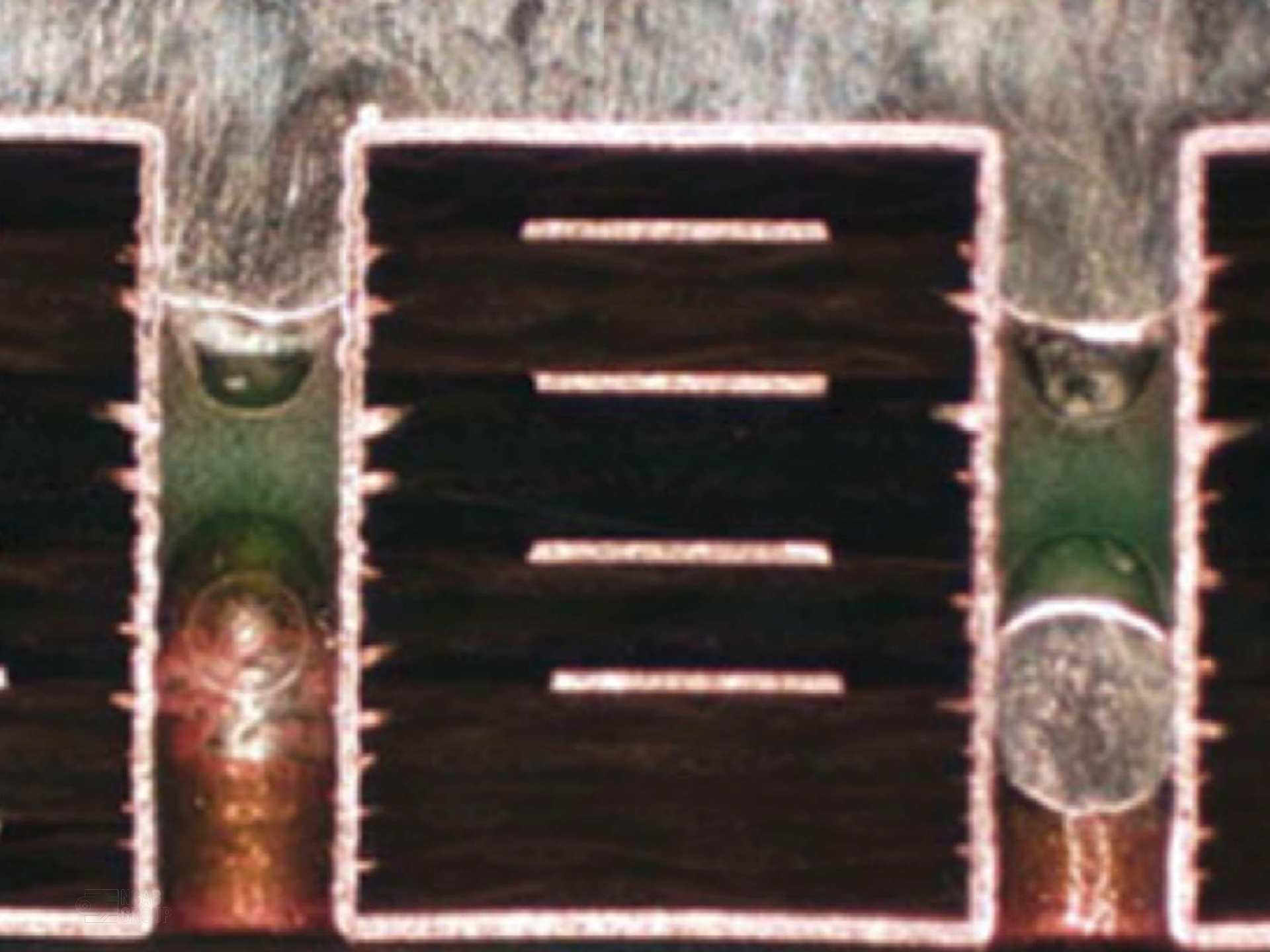
A good quality filled via hole will provide less risk of rejection during the assembly process.

RISK OF NOT HAVING

Half filled via holes may trap chemical residues from the ENIG process which can cause problems such as solderability.

Such via holes can also trap solderballs within the hole which can escape and cause short circuits either during assembly or in the field





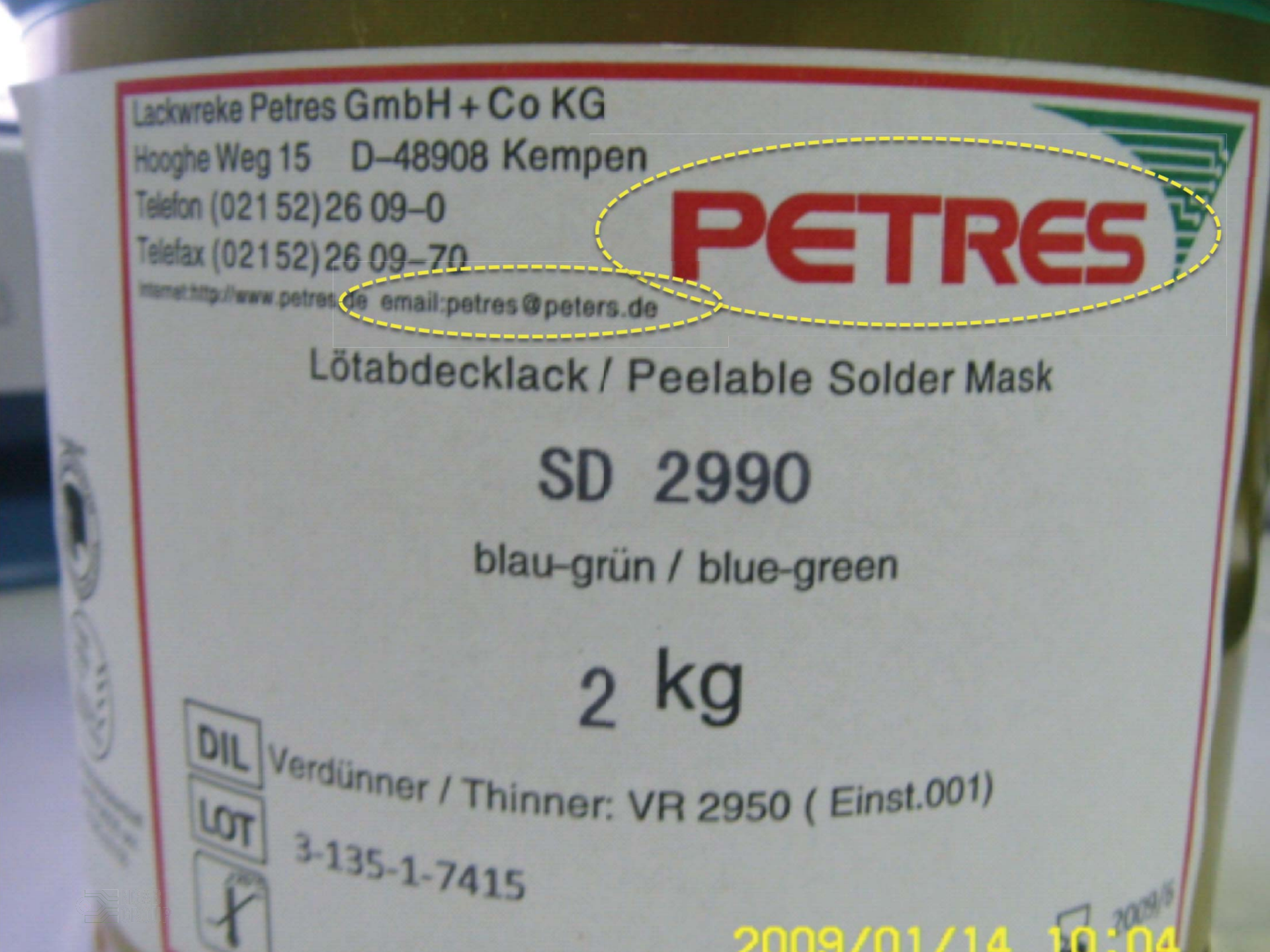
12 Peters SD2955 peelable as standard

BENEFITS

The benchmark for peelable mask – no ‘local’ or cheap brands.

RISK OF NOT HAVING

Poor or cheap peelable can blister, melt, tear or simply set like concrete during assembly so that the peelable does not work as it should!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13 NCAB Group specific qualification and release for every purchase order

BENEFITS

Security in knowing that through the release process, all of the specifications have been verified.

RISK OF NOT HAVING

Risk that the product received will not be validated adequately and that any deviations to specification may not be spotted until assembly or final box build…. when it is too late

14 No x-outs accepted

BENEFITS

No partial assembly means improved efficiency for the customer.

RISK OF NOT HAVING

Special set-ups are necessary for each panel with a defect, and if the x-outs are not clearly marked or not segregated from the main delivery, there is a risk of assembling a known bad board; waste of components and time

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- Rigid-flex
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- IPC vs. Perfag
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