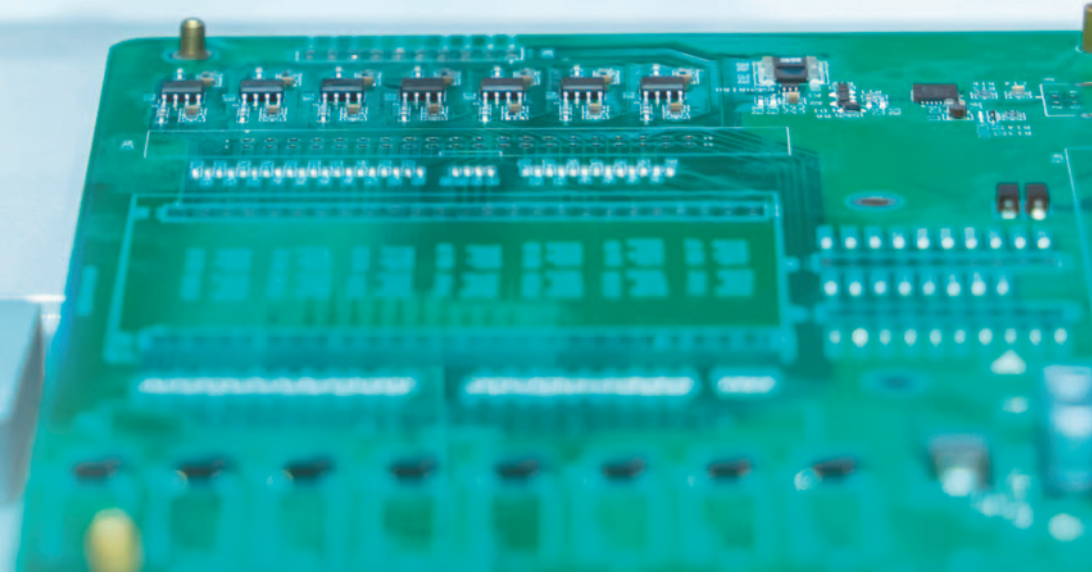
teknek

An ITW Company

Solutions for Mitigating Foreign Object Debris in the SMT and PCBA Sector

Integrating Contact Cleaning Technology



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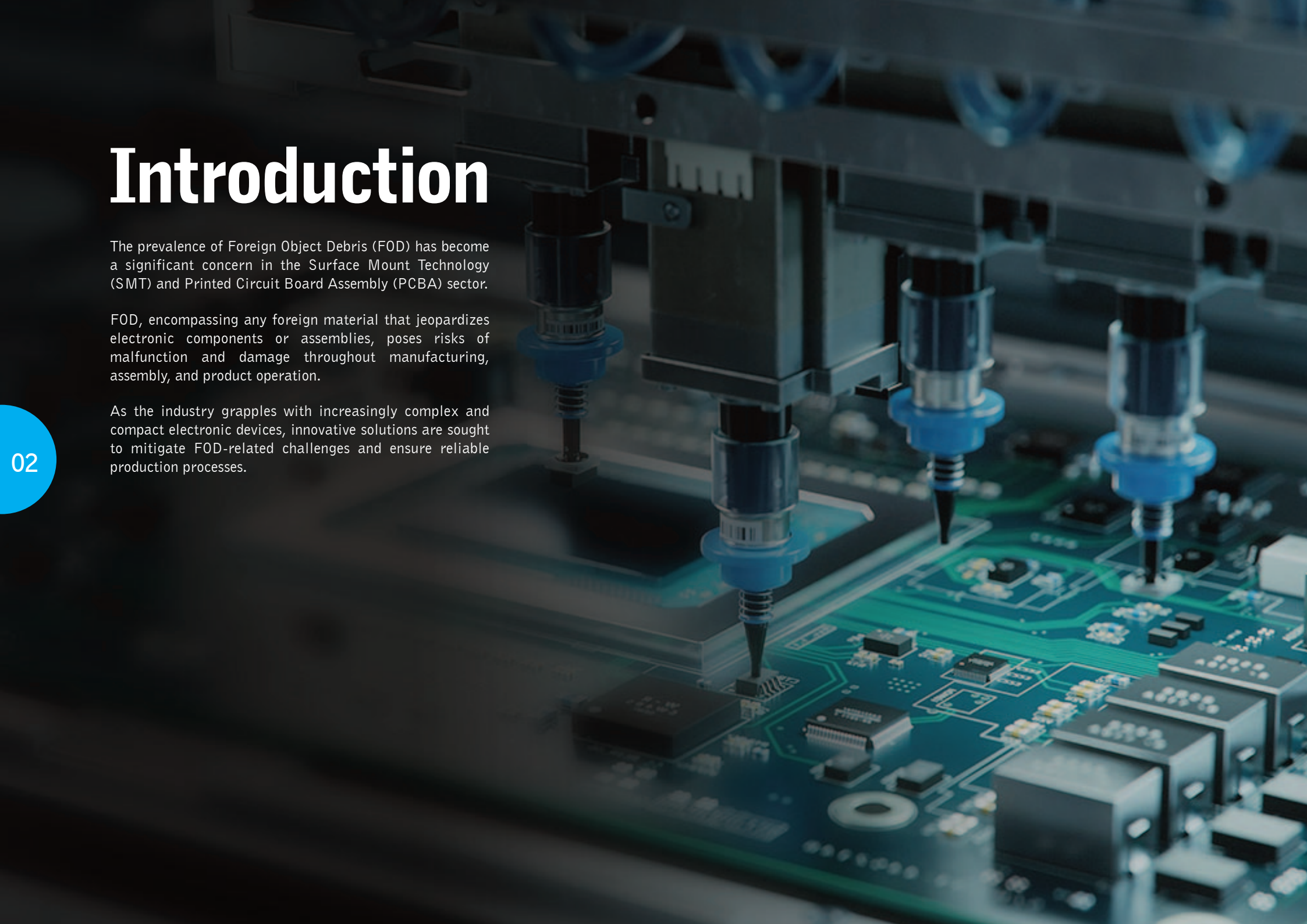
Introduction

The prevalence of Foreign Object Debris (FOD) has become a significant concern in the Surface Mount Technology (SMT) and Printed Circuit Board Assembly (PCBA) sector.

FOD, encompassing any foreign material that jeopardizes electronic components or assemblies, poses risks of malfunction and damage throughout manufacturing, assembly, and product operation.

As the industry grapples with increasingly complex and compact electronic devices, innovative solutions are sought to mitigate FOD-related challenges and ensure reliable production processes.



UNDERSTANDING THE IMPACT OF FOD

Foreign Object Debris exerts various detrimental effects on SMT and PCBA operations. It can disrupt component placement accuracy, leading to soldering defects, electrical shorts, and compromised device functionality. Moreover, FOD-induced failures may surface post-production or during product operation, incurring substantial costs related to rework, repair, and potential recalls. Consequently, addressing FOD is pivotal to maintaining profitability and safeguarding brand reputation.

FACTORS CONTRIBUTING TO FOD

A multitude of factors contribute to FOD occurrence in the SMT and PCBA sector. These include the complexity of electronic assemblies, the miniaturisation of components, and the adoption of advanced manufacturing techniques. Additionally, diverse materials used in production, such as solder paste and adhesives, heighten the risk of FOD contamination. Human error and inadequate cleaning practices further compound the problem.

CURRENT INDUSTRY INITIATIVES

Industry stakeholders are actively implementing measures to mitigate FOD risks and enhance process reliability. Advanced inspection technologies, including automated optical inspection (AOI) and X-ray inspection systems, are increasingly deployed to detect and eliminate FOD during production stages. Additionally, stringent cleanliness standards and protocols are enforced to minimise contamination risks.

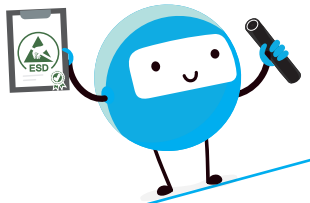
CONTACT CLEANING TECHNOLOGY & TEKNEK BOARD CLEANERS AS SOLUTIONS

By incorporating Teknek Tek-BC board cleaners into manufacturing processes, companies can enhance component placement accuracy, minimize soldering defects, and improve overall product reliability.

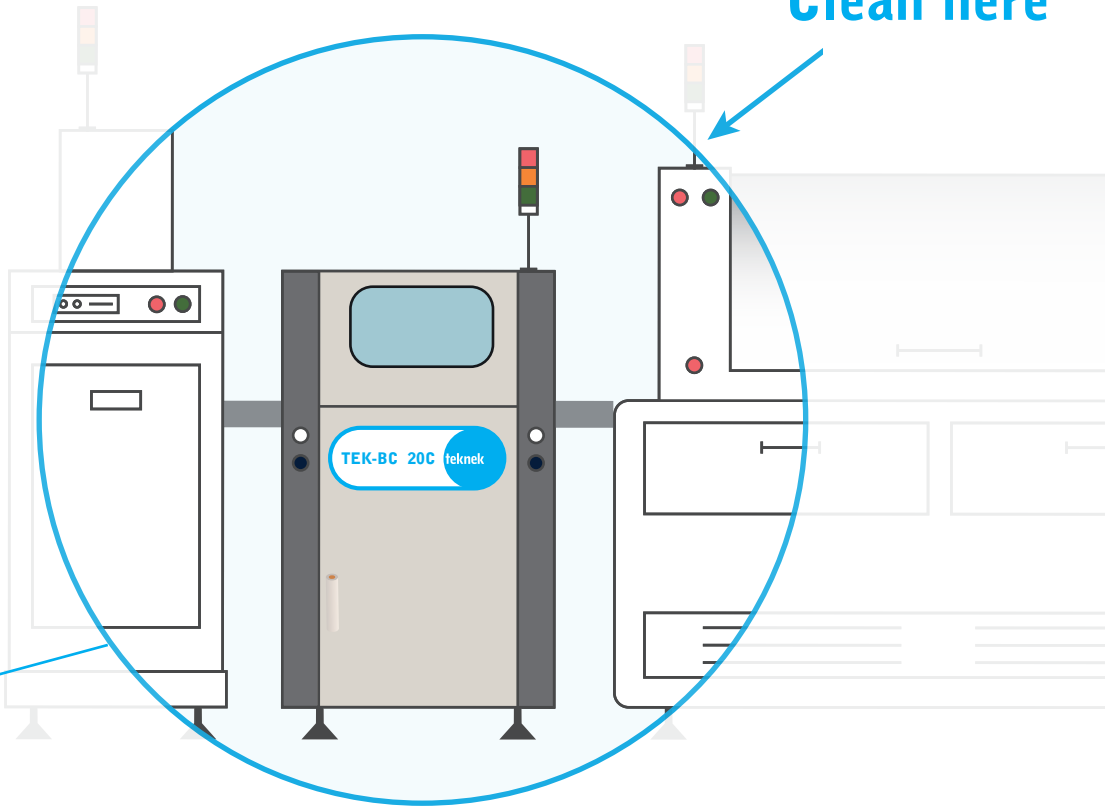
Teknek board cleaners utilize innovative contact cleaning rollers that effectively capture and remove particles from surfaces without leaving residues or damaging sensitive components. Teknek board cleaning systems provide precision touch and guaranteed low static cleaning.

Independently certified to ANSI ESD s20.20, Teknek Tek-BC board cleaners are designed to address the specific cleanliness requirements of electronic assemblies, ensuring compliance with industry standards and specifications. By proactively integrating Teknek board cleaners into production lines, manufacturers can mitigate FOD risks and enhance the quality and performance of electronic devices.

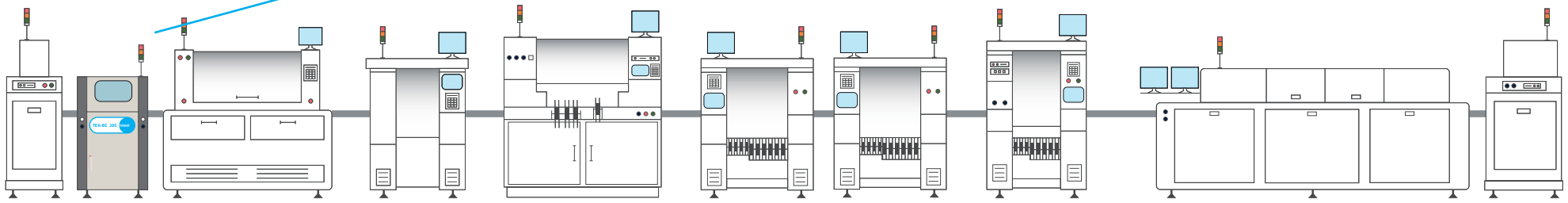
Our Tek-BC-20 provides low strain, low static cleaning independently verified to ANSI ESD s20.20.



Over 60% of defects at solder print= **Clean here**



SMT Process with Board Cleaner



Board Cleaner, Teknek Tek-BC 20 | Screen Printer | Solder Paste Inspection (SPI) | Chip Placement | #1 IC Placement | #2 IC Placement | Automatic Optical Inspection (AOI) | Reflow Process Inspection (RPI) | Reflow Oven

FUTURE DIRECTIONS AND EMERGING TECHNOLOGIES

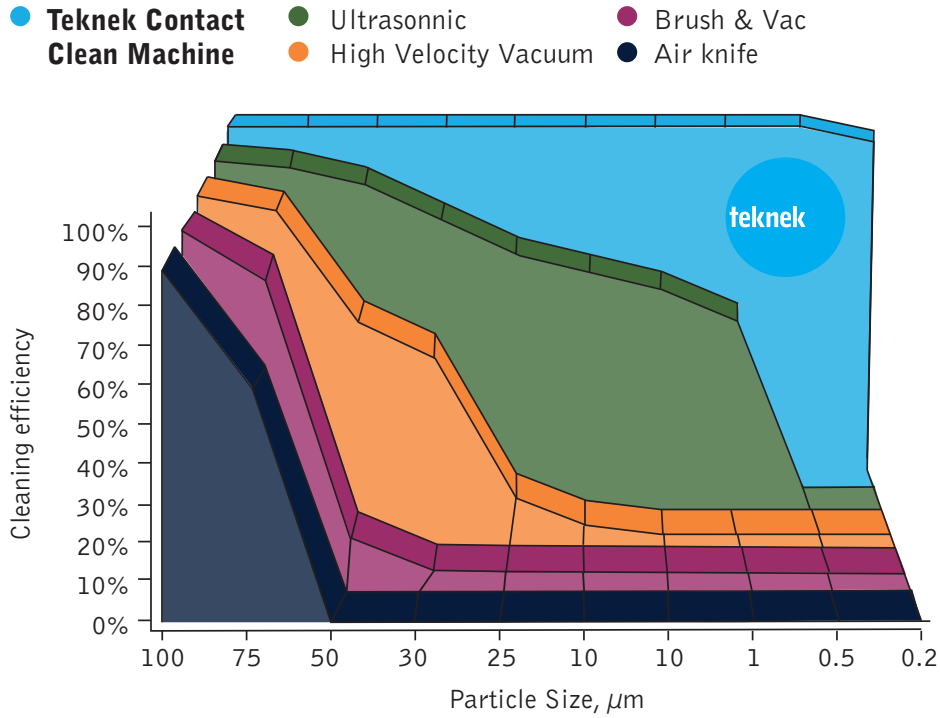
Looking ahead, advancements in contact cleaning technology and board cleaning systems are expected to further augment FOD prevention efforts in the SMT and PCBA sector. Continued innovation in materials science and cleaning techniques will enable the development of more efficient and versatile cleaning solutions. Furthermore, integration with Industry 4.0 principles, such as data-driven monitoring and predictive maintenance, will facilitate real-time detection and mitigation of FOD risks, enhancing process reliability and efficiency.

CONCLUSION

In conclusion, Foreign Object Debris poses significant challenges to the SMT and PCBA sector, impacting production efficiency, product reliability, and brand reputation.

However, by integrating contact cleaning technology, such as Teknek Tek-BC board cleaners into manufacturing processes, industry stakeholders can effectively mitigate FOD risks and ensure the integrity of electronic assemblies.

Efficiency of different cleaning methods



Tekkie fact:

Only Teknek provides 98% cleaning efficiency for particles from 20 nanometer to 30 micrometer!

Surface mount devices

01005	0.4 x 0.2mm	0805	2.0 x 1.25mm
0201	0.6 x 0.3mm	1008	2.5 x 2.0mm
0402	1.0 x 0.5mm	1206	3.2 x 1.6mm
0603	1.6 x 0.8mm	1210	3.2 x 2.5mm

"By prioritizing FOD prevention initiatives and leveraging innovative cleaning solutions, the SMT and PCBA sector can uphold quality standards, enhance operational efficiency, and deliver reliable electronic products to meet market demands."

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