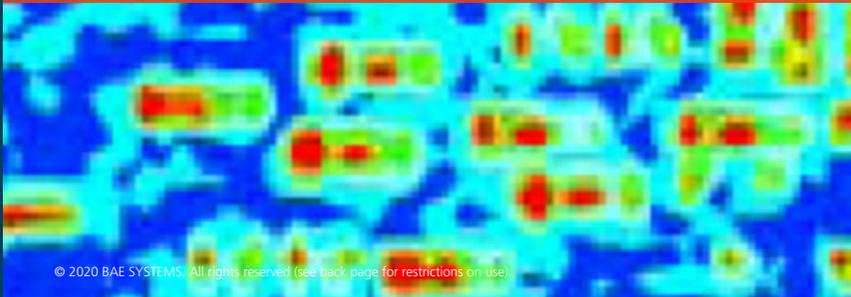
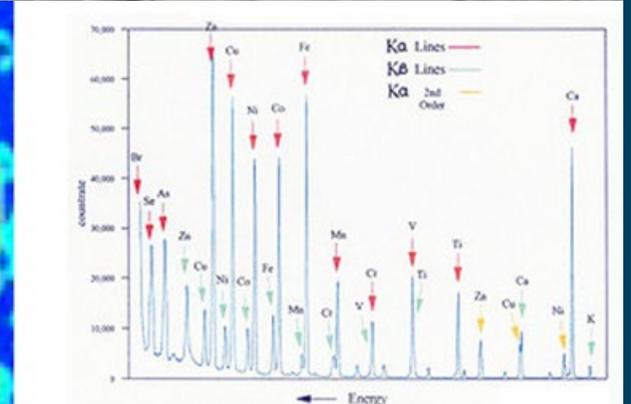
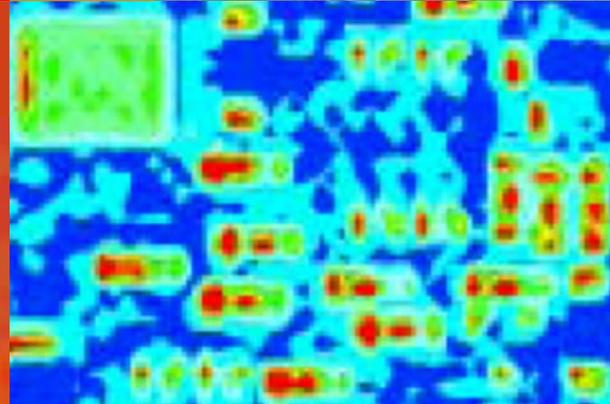
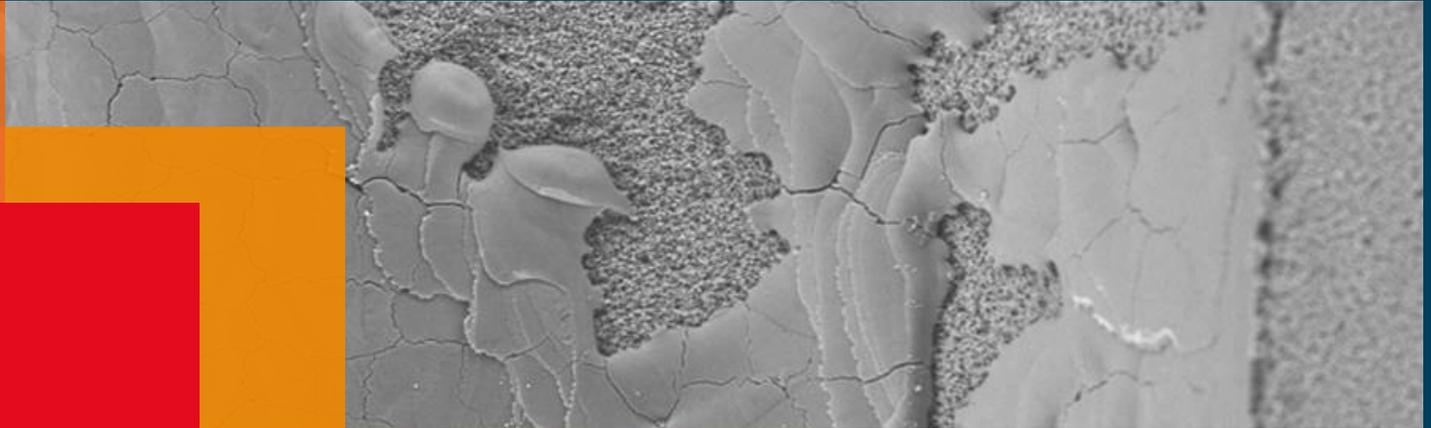


Manufacturing

Non-destructive testing

We provide a trusted and innovative total manufacturing capability for highly complex electronic integrated systems, sub-systems, modules and printed electronic circuit assemblies where quality is paramount. Our ethos is to add value through our people, scale, capability and engineering know-how, allowing us to provide a vital advantage to our customers where it counts.

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Surface topography

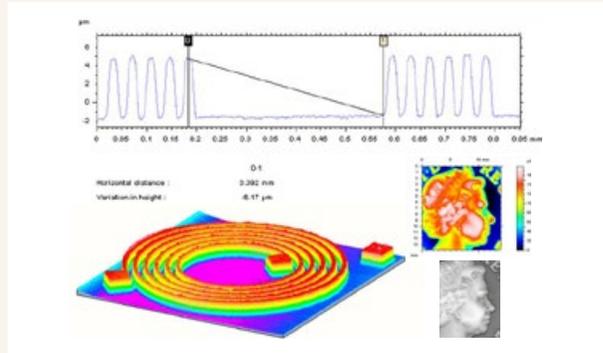
Talyscan 150: 3D surface topography system

Used to measure feature variations ranging from extremely delicate thin film patterns through to the surface flatness of item housings. The 3D image negates the need for a sacrificial item to carry out destructive batch testing.

Key features:

Can measure surface flatness to within $0.5 \mu\text{m}$. Step height of $0.25 \mu\text{m}$

This facility removes any error associated with both human and automated operation with regards to 'shadowing' in standard optics that were used prior to the Talyscan.

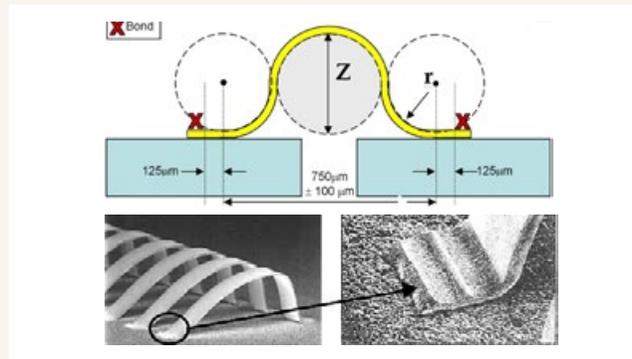


Non-destruct pull testing of gold ribbon

It is known that failures can occur at the bond heels of gold ribbons after many hundreds or thousands of thermal cycles; this is in the most part due to longitudinal and lateral movement of the two assemblies being bonded to. See diagram for pictorial example of the potential failure area.

Once this movement has been minimised by design it is then essential that we ensure we have built non-destructive preventative quality checks in to the manufacturing processes involving gold ribbons. This is done via pull-testing, where a test wire is bonded on each substrate and subsequently pulled to a pre-programmed load, dependant on the ribbon size, to check for both bond and ribbon integrity.

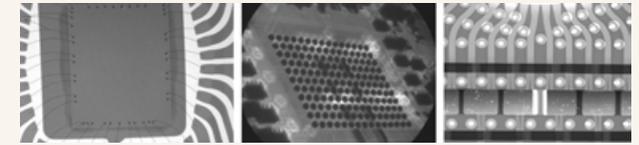
Photo illustrates some test bonds that are carried out during each set up of the bonding machines prior to production use.



X-ray

The real-time focus x-ray system is ideally suited for batch inspection and quality control activities. From the images it is clear to see how this capability is advantageous not only in inspection but also in assisting preventative engineering by enhancing production processes before a problem is built in to a design.

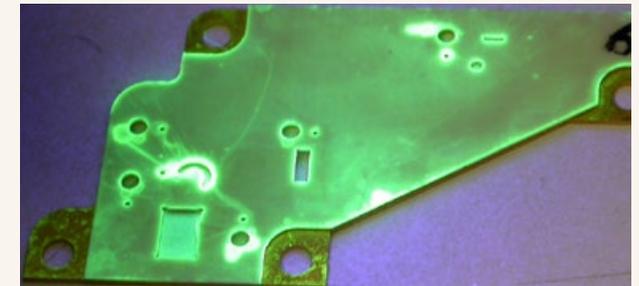
The main advantages to manufacturing are in detecting the quality of welding, soldering and component and material structures. The system has a number of different uses.



The three examples shown are fine wire bonding, a BGA assembly and a complex machined waveguide housing.

UV crack detection

The combination of large heat transformation during processing and differing CTEs of fragile micro-electronic materials lead to an elevated risk of materials cracking. While this is minimised via design for manufacturing Integrated Project Teams (IPTs) involving both suppliers and customers, this method of crack detection prevents us from building in potentially weakened product. The item is coated with a dye penetrate that is visible under UV light, this will soak in to cracks and indicate them as shown below.



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