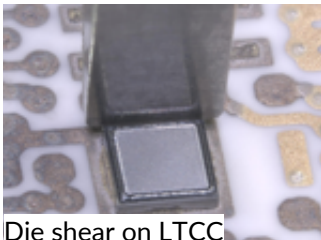


Self aligning shear tool: the application is mounted on a special die shear work holder

Die shear test

- Die shear test from a few grams up to 500kgf
- Eliminate die cracking with patented high force self aligning die shear tooling
- Automatic rotation alignment of tool to die
- Ultra thin die testing
- Soft shear option complies with industry standards
- Flip chip BGA testing
- Impact die shear test
- Sensor accuracy $\pm 0.075\%$
- Shear and impact shear testing at up to 500°C
- In accordance with MIL-STD-883 2019.9 Die shear strength

[Video not included in PDF: [click here to view online](#)]



Die shear on LTCC

Technology leader for many die shear applications

Shear force can vary significantly depending on the type of bond (soldered, adhesive conductive, adhesive nonconductive) and the dimensions of the die.

To cover this range, XYZTEC offers an extensive selection of tools and work holders. Additionally customized tooling can be supplied. Our Condor 150HF can achieve forces up to 500kgf.

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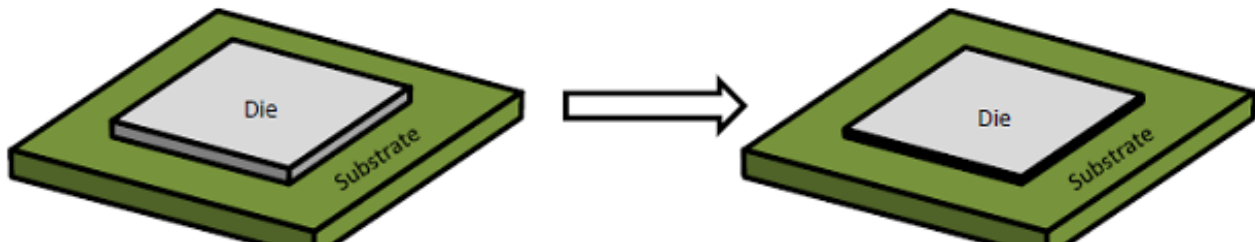
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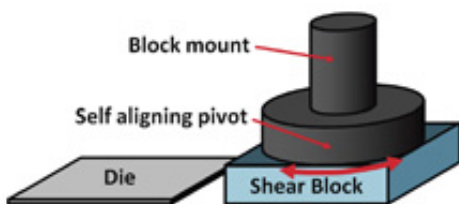
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Patented Self Aligning Shear test solution



There are three aspects of these designs that make testing difficult. Firstly, the reduced ratio of die thickness to die bond area, shown in this illustration. Secondly, die and substrate warpage can be a problem. And thirdly, the bond strength is often very high, for example when silicon is bonded directly to silicon or other similar materials.



The self aligning shear tool is designed for forces up to 500kgf

A fundamental problem exists when shear testing large die; the strength of the bond is in proportion to the area of the die but the area available to apply the shear load is much smaller being limited to that of one of its edges. As die become larger and thinner the relative sizes of these two areas can result in the stresses created by the shear tool being higher than the yield strength of the die causing it to splinter or shatter before the bond is tested.

In many cases this undesirable effect can be eliminated with the use of XYZTEC's latest shear tool development*. The part of the tool that contacts the die is a shear block. It should be a relatively soft material like aluminium or mild steel. Because it is softer than the die it deforms at the points of contact that inevitably result due to surface irregularities between the edge of the die and the tool tip. This deformation considerably reduces the high contact stresses that would otherwise cause the die to fail.

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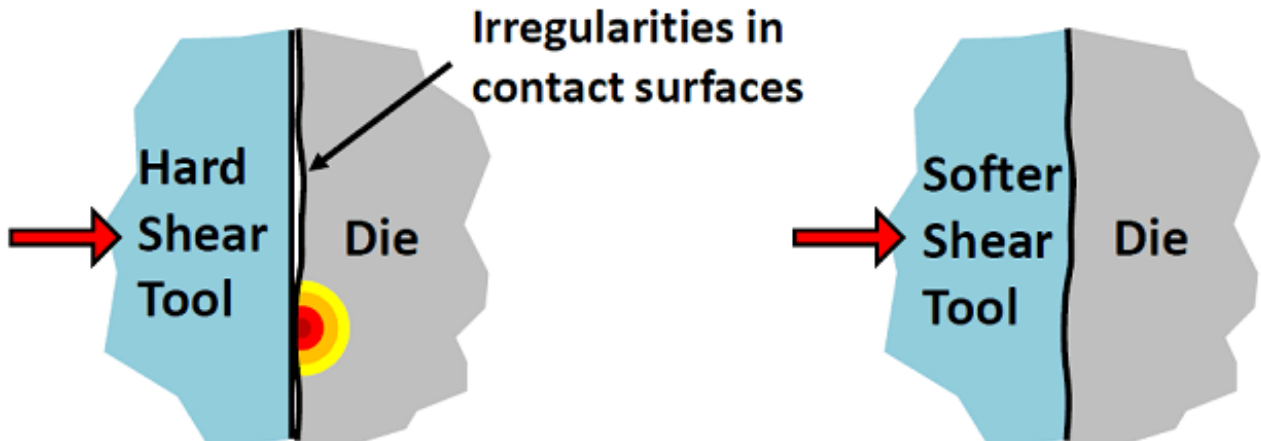
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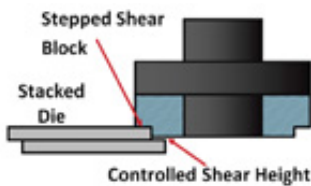
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XYZTEC discovered that it is often better to use a shear tool made of a relatively soft material when performing high force die shear



Side view self aligning shear tool

The shear block is held in place on a mount by vacuum. The block can rotate slightly (self alignment). Another feature is that its underside can include an undercut that ensures a precise shear height. Without this system deformations in the vertical axis caused by the very high shear forces can cause the shear tool either rise or fall relative to the substrate. If the tool lifts it increases the stress concentration on the edge of the die making die failure likely. This feature is ideally suited for testing stacked die which are very thin and require such precise control of shear height. XYZTEC offers a complete solution for die shear testing that consists of the self aligning tool and a special die shear work holder. This combination supports high shear forces. The work holder also offers a protection cap for the safety of the operator and with special masks it is possible to test dies on different angles and in different sizes.

[Video not included in PDF: [click here to view online](#)]

* **Patent** PCT/NL2010/050545, CN102770747, EP2473832, WO2011028107

[Click here](#) to download the flyer on our "Self Aligning Shear Solution" (PDF).

Contact us

Did we catch your attention? Please **contact us** for more information, to request a demonstration or a quotation.

Self Aligning Shear solution

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