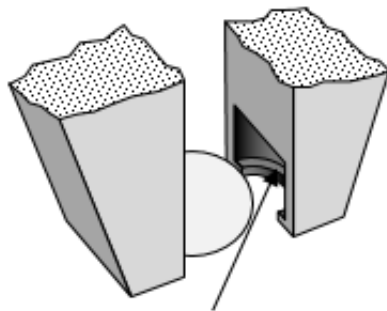


## How to test bonds » Cold Bump Pull (CBP)



Cavity



When the jaws close they should  
reform the ball to this shape  
Jaws not shown in this drawing

Cold Bump Pull jaws reform the solder ball when closing

[www.coldbumpull.how](http://www.coldbumpull.how)

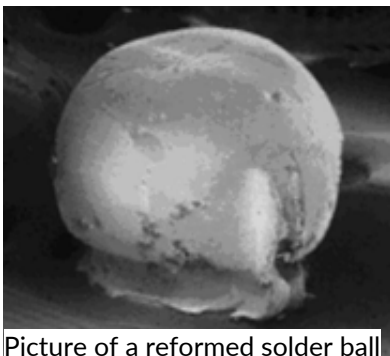
This extensive how-to consists of 13 paragraphs and 7 pages. Please use the navigation on the right.

### 1. Introduction

This manual is a guide advising what to consider and how to best setup a Cold Bump Pull (CBP) test. It generally refers to solder ball testing but the principles apply equally to most bump testing. Hence, some say Cold Ball Pull testing.

### 2. What is CBP?

CBP stands for Cold Bump Pull or Cold Ball Pull. Our [CBP test type page](#) contains a [video of 80µm cold bump pull](#).



Picture of a reformed solder ball

To grip a ball we have to reform it to the shape something like a mushroom. This is done with special tweezer jaws that have cavities that reform the ball when they close.

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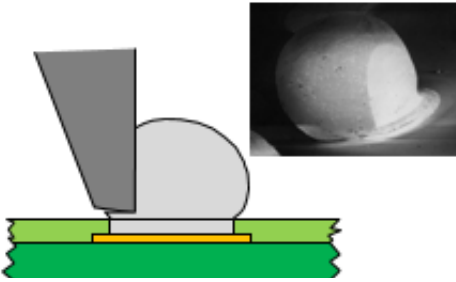
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- Condor *Sigma Lite*
- Condor *Sigma W12*
- Condor *150HF*

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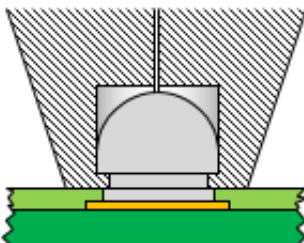
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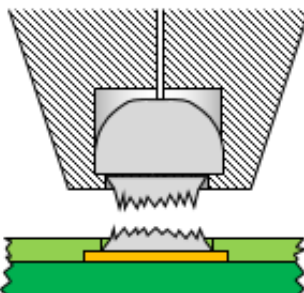
In a shear test the reforming at a typical test force is often more and a lot of it over the bond

You might think reforming is bad but think about a shear test. In a shear test the reforming at a typical test force is often more and a lot of it over the bond.

If we get a higher test force by “over gripping” the ball so that the reforming cuts over the bond this is better than a lower force with a ductile or extrusion where the bond was still not tested but at a lower force.



Ideal mushroom shape during CBP



The ductile failure mode may not have been what you were looking for, but the bond was tested to the highest force possible

Ideally the “stem” of the mushroom shape is the larger or the same diameter as the bond but if over gripping tests the bond at a higher force, it is a better test.

We might still get a ductile or extrusion when we over grip, but the bond has been tested to the highest force possible.

### 3. What kind of balls can be tested?

Not all balls can be effectively gripped by the CBP test method. The ball height to diameter

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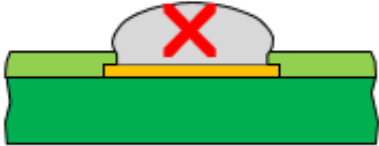
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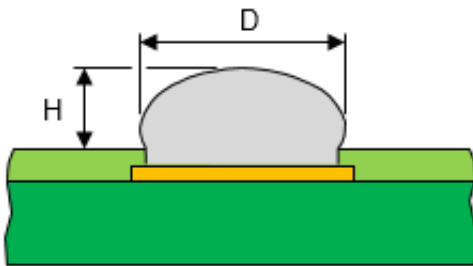
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affects what can be tested. The ratio of what can be tested is roughly defined by diameter /



What kind of balls can be tested?



$$D/H < 2.2$$

The limits of CBP:  $D/H < 2.2$

Continue to read:

Next page: Objectives / Jaw size

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