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Counterbores – All About

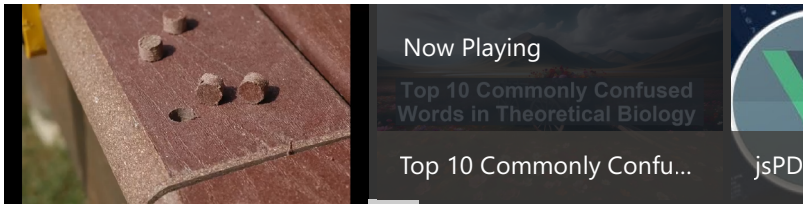
February 16, 2021 by [Brandon Fowler](#)

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What is a counterbore?

A counterbore is a circular hole with a flat bottom which coincides with another hole. The counterbored section allows a bolt head or other fastener to be recessed.





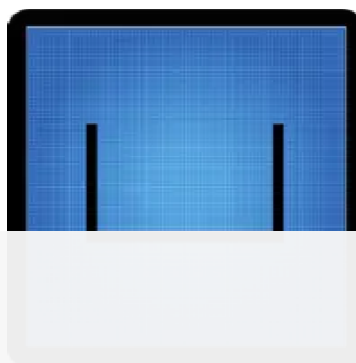
What does a counterbore look like?



An example of a counterbore in a piece of metal

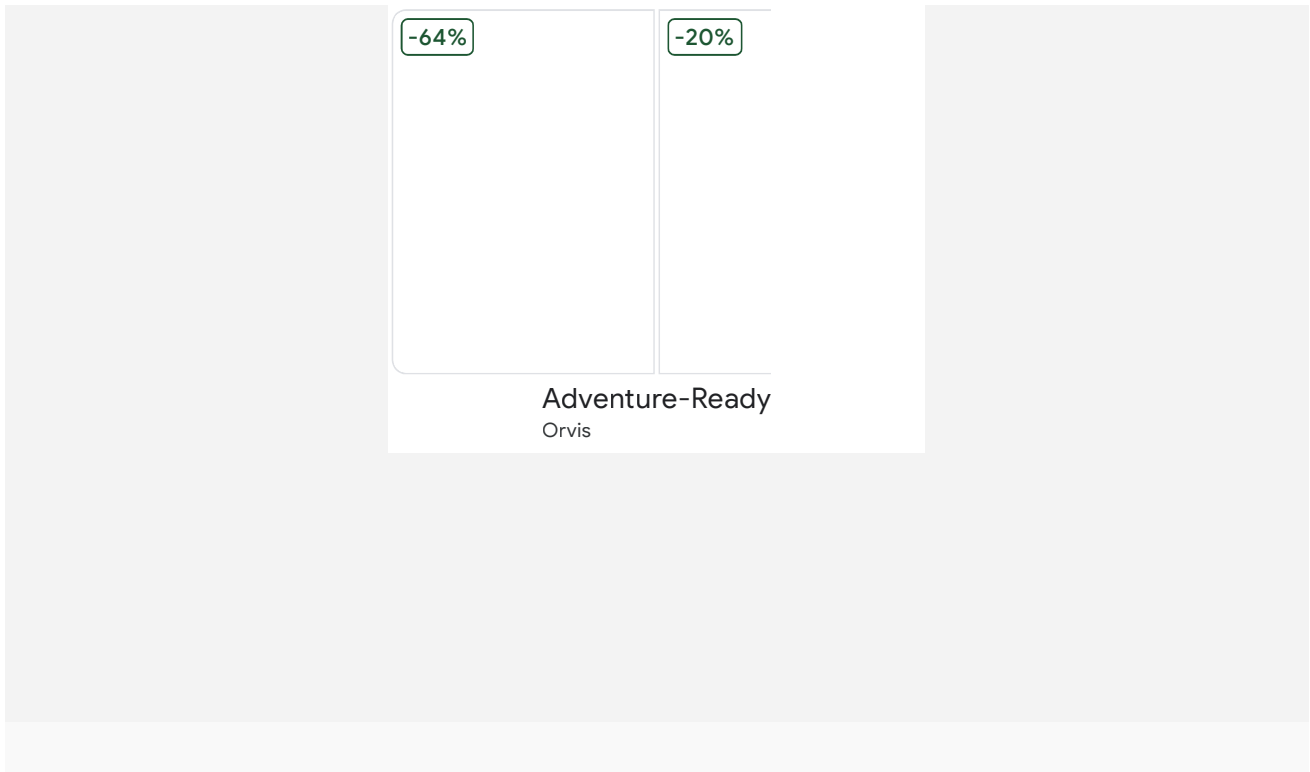
Counterbore symbol

The [GD&T callout](#) for a counterbore is shown below. The counterbore symbol will often be used together with the diameter symbol and the depth symbol. Older blueprints may specify a counterbore with the notation CBORE instead of the counterbore symbol.



Counterbore symbol

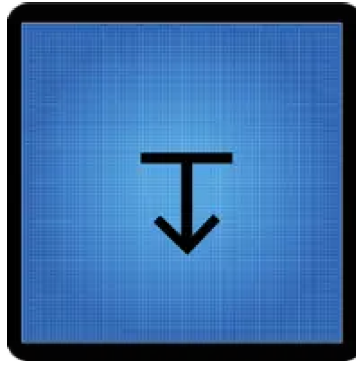
If you want to type the $\varnothing$ symbol, hold the ALT key and press 9012. See [this list](#) for other common keyboard shortcuts for GD&T and blueprint symbols.



How to dimension a counterbore



Diameter symbol

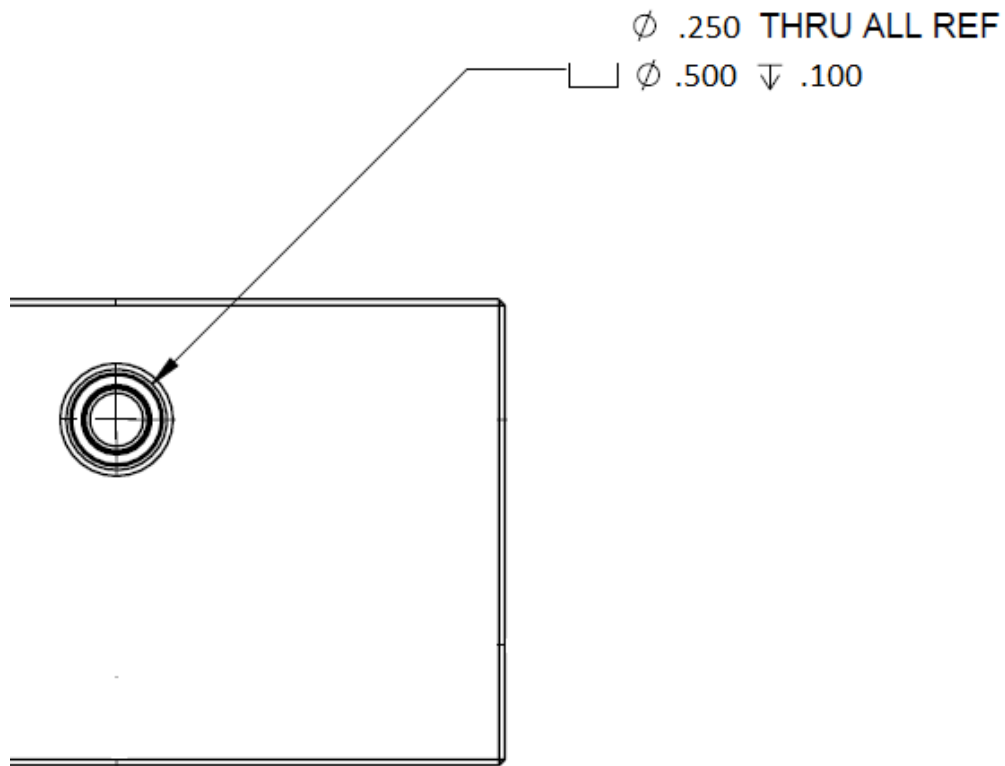


Depth of symbol



A counterbore is dimensioned by including the diameter of the counterbore along with specifying the depth. The two ways to specify the depth are to specify how deep the counterbore is or the thickness of the remaining material. Both methods are acceptable and commonly seen.

In the example below, the part has a .250 hole and a .500 diameter counterbore to a depth of .100.

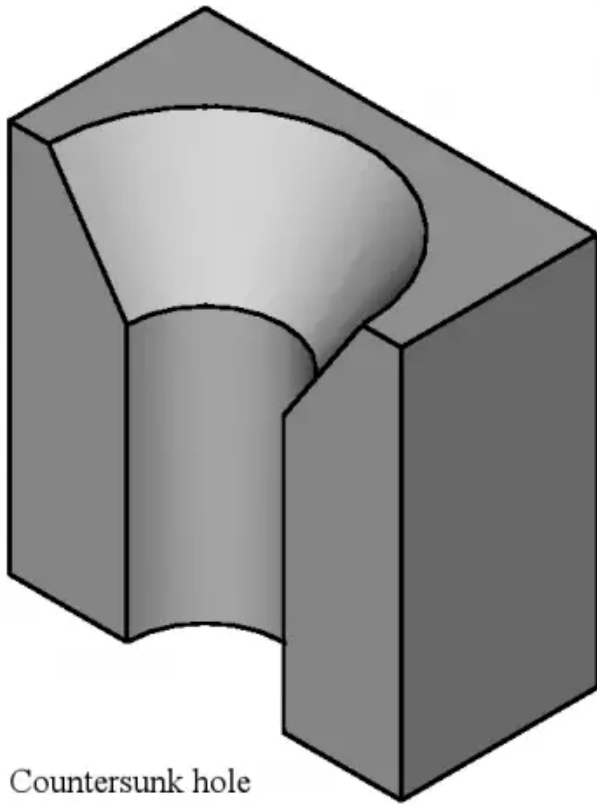


How to measure a counterbore

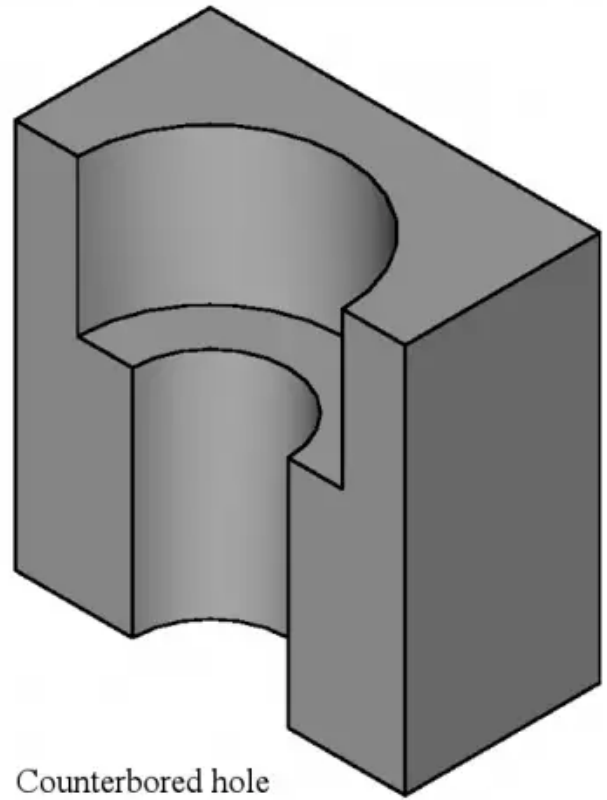
Counterbores can be measured with many different types of gauges. The simplest inspection tool to use, assuming the tolerances aren't too tight, would be a [caliper](#).

Pocket comparators, gage pins, and depth micrometers are other types of measuring equipment that are frequently used to measure counterbores.

Counterbore vs countersink



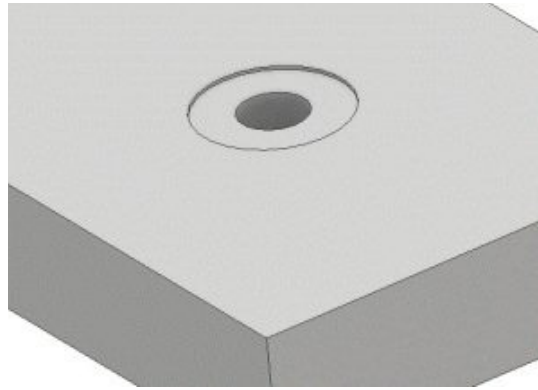
Countersunk hole



Counterbored hole

The difference between a [countersink](#) and a counterbore is that a countersink has an angled bottom and a counterbore has a flat bottom. The angle of the countersink can vary with many different angles used such as 82° , 90° and 100° .

Counterbore vs spotface



A counterbore and a [spotface](#) are very similar. A counterbore is used to recess a fastener while a spotface is used to create a flat surface located allow a fastener to be used. A spotface is used to let a fastener sit flat and in a specific location. A spotface is basically a shallow counterbore.

Want to learn more?

GD&T is a complicated subject and understanding it correctly can be the difference between a perfect part and scrap.

The best way to learn GD&T is from experienced teachers who can break down the material into manageable pieces.

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