

Kinematic Mount Design Explained

What is a kinematic mount?

A [kinematic bed](#) coupling is designed to constrain the mechanical components with optimal precision and positional accuracy. For example a kinematic coupling uses three radial v-grooves in one part that mate with three hemispheres in another part. A kinematic mount, which is ideal for bed leveling and proper mechanical constraint. A kinematic mount is a mount in which all six degrees of freedom (three translations and three rotations) of a 3D object are restrained from moving without overconstraint. See [SolidCore Kinematic Bed Design](#)

How does a kinematic mount work?

A kinematic mount is a type of mounting mechanism used for positional accuracy. Typically, the movable frame that holds the print bed pivots on a ball bearing which is set into a hole in the fixed frame.

Kinematic Constraints

Kinematic constraints are constraints between mechanical components that decrease the degrees of freedom of rigid systems. The degrees of freedom or DOF of a rigid body is defined as the number of independent movements it has. To determine the DOF of this body we must consider how many distinct ways the bar can be moved. On a two dimensional plane such as a 3d printer build plate, there are 3 DOF. The print bed can be translated along the x-axis and y-axis, and rotated about each axis.

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