

BUILD CONFIGURATIONS

PANDA™ has been designed to accommodate multiple build configurations, housed in essentially the same overall platform with common system footprint. This design approach makes it easy to configure the system to customer needs, with common training and operations. Custom configurations are also possible for specific needs not accommodated by our standard offerings.

GENERAL DESIGN

The PANDA build chamber employs a dual-platter design, in which a supply reservoir full of powder moves up, and the build platter (upon which the powder is melted to a build plate) moves down. For each layer, the supply platter moves up a fixed amount and the build platter moves down, and then the recoater (spreader) pushes across a fresh layer of powder to be melted by the laser. The process repeats until complete, at which point a solid part lies encased in powder. The build platter is then raised, with excess powder swept into a powder catch for recycling, and the part is removed. PANDA uses approximately 1.5-to-1 ratio of supply volume to build volume, to allow for adequate “dosing” of powder from the supply reservoir across the build plate.

The large build chamber measures 48” W × 23” D × 17” H (1219 × 584 × 432 mm), providing ample space for hand tools, powder containers, or add-on mechanisms. The system operates in an inert gas environment.

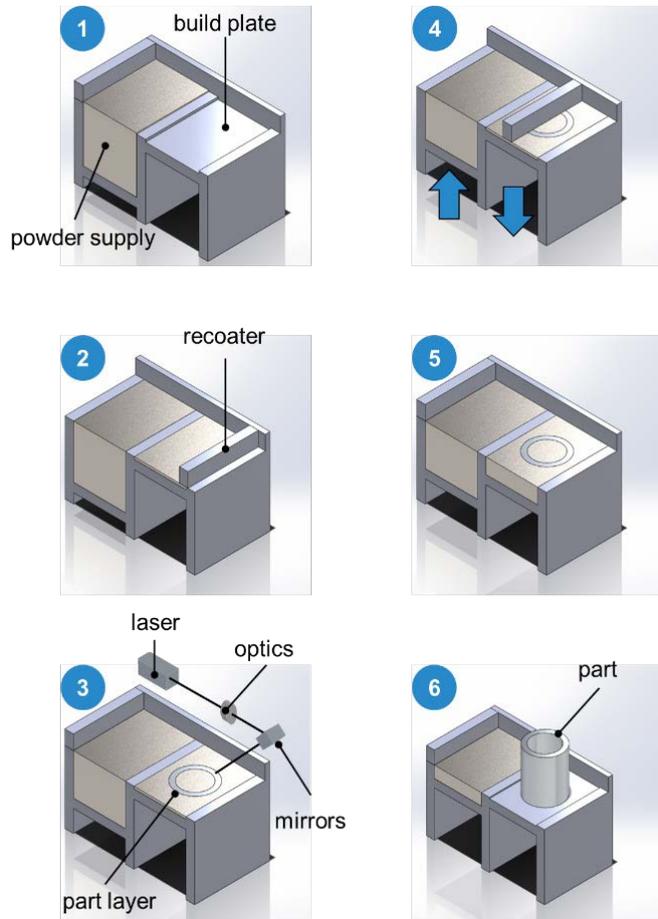


Figure 1. Laser powder bed fusion process

SMALL BUILD CONFIGURATION

The standard small build configuration (PANDA-SM) features **6.0” × 6.0” × 9.5” build volume** (152 × 152 × 241 mm). This volume provides adequate capacity for a wide range of smaller parts, and is well suited for research, technology development, materials and process development, and training/education.

Note that vertical height includes build plate, as different thickness plates may be desired for different materials or applications. For example, the maximum build height for the small configuration is approximately 8.5” (216 mm) with a 1” thick plate, or 9.0” (229 mm) with 0.5” thick plate.

LARGE BUILD CONFIGURATION

The standard large build configuration (PANDA-LG) features **11.0" × 11.0" × 12.5" build volume** (280 × 280 × 318 mm). This larger volume provides significantly more capacity for production, whether larger parts or multiple parts in one build, while still keeping the same overall system footprint. Due to the large size and weight of the build plate, Open Additive offers a hand cart with mechanical assistance tailored for use with PANDA as an ancillary equipment option for setup and removal of builds.

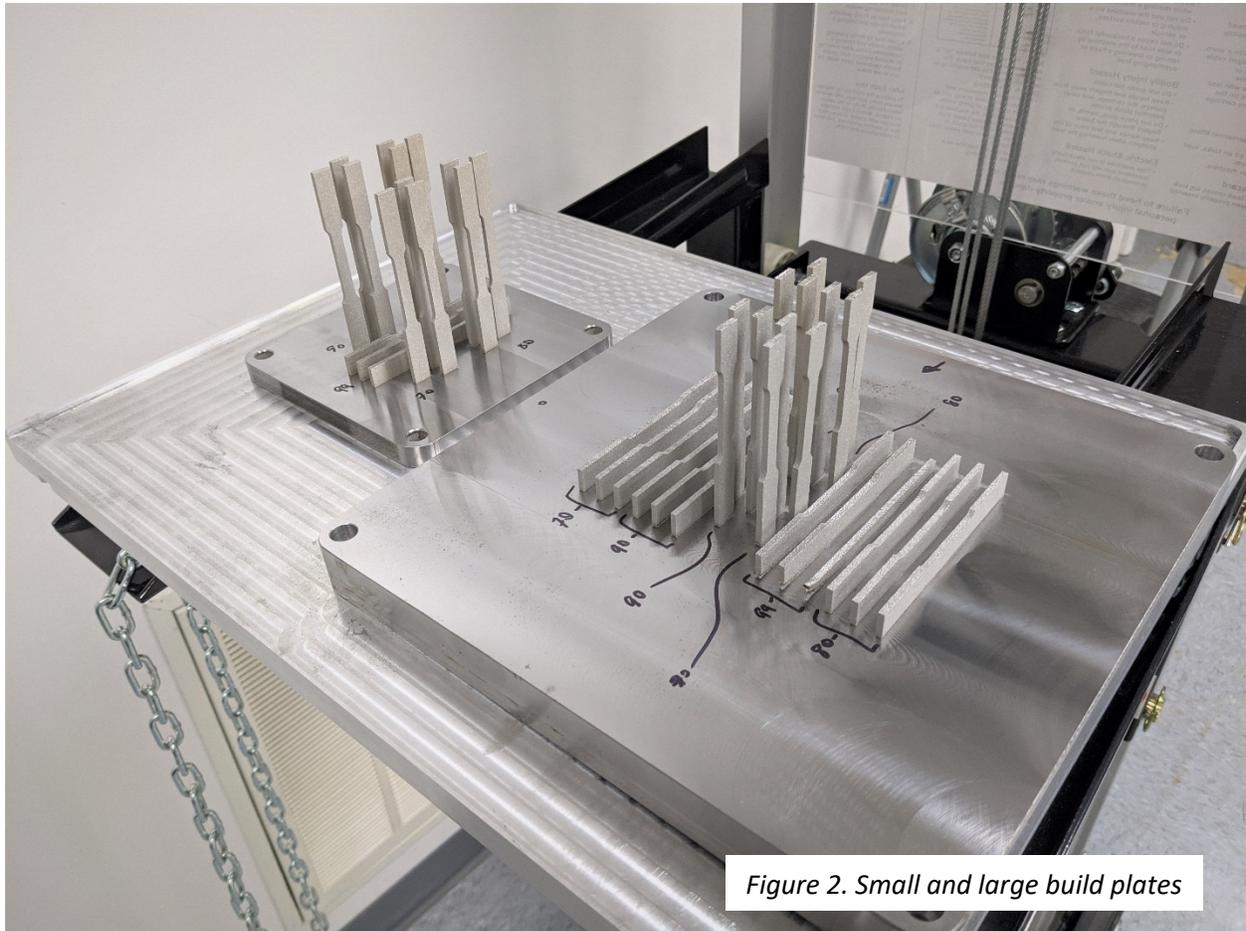


Figure 2. Small and large build plates

HIGH TEMPERATURE CONFIGURATION

PANDA can also be configured with a heated plate for processing at up to 500°C. The standard high temperature configuration (PANDA-HT) is available with **6.0" × 6.0"** (152 mm) or **4.0" × 4.0"** (100 mm) build plate. The system involves significant changes from the non-heated configuration to accommodate the higher temperatures. These changes include heat-resistant materials for gas flow and powder catch components, insulation for the build platter assembly, integrated heater controls, scan head chiller, and separate filter housing for flow cooling into the filter. This configuration is most suited for researchers investigating effects of various heating conditions on microstructural evolution. It can also be useful for building parts from exotic materials which are difficult to process under standard conditions.

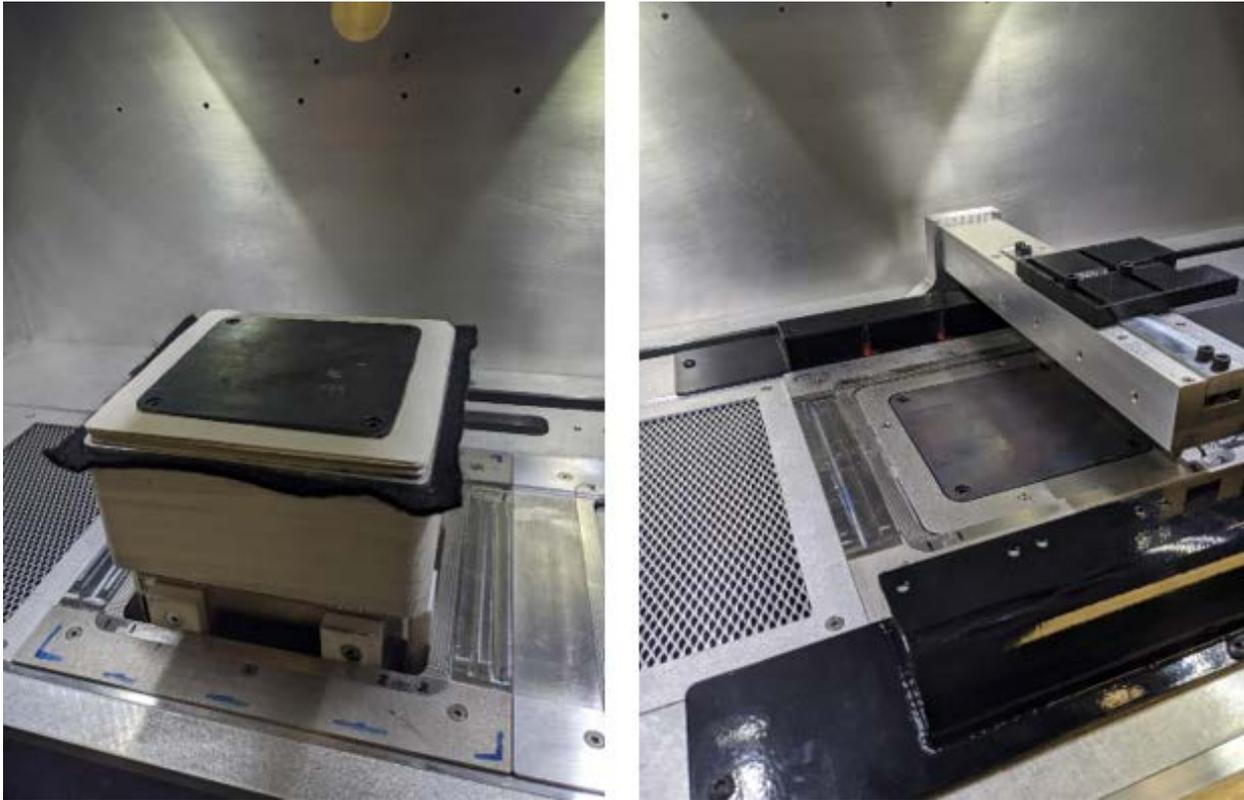


Figure 3. Heated plate, shown without shroud (left) and as fully installed (right)

CUSTOM CONFIGURATION

Open Additive has the design and system development/testing expertise to deliver a custom build configuration (PANDA-CC) to meet specific user needs. One example is a door modification with gloves to allow filling the system with powder in a completely inert environment, rather than with the door open. This is especially beneficial for processing highly reactive materials that cannot be exposed to air for any considerable length of time. Another example includes smaller build plate size for processing limited quantity or highly expensive powders. We can also customize the spreader assembly with features specific to research or processing objectives. Custom configurations may involve non-recurring engineering costs and additional lead times, as warranted.

RECOATER ASSEMBLY

The standard recoater assembly for PANDA configurations includes a unique 3-blade design, compatible with both hard and soft blades. The recoater is designed with versatility in mind, and the user has the ability to use one or more blades at once, raise and lower the blades to preferred heights, use alternate blade materials and geometries, and even mount add-on mechanisms to the spreader using the provided set of threaded holes. As such, PANDA is an ideal platform for process development studies for any powder. Of course, for simple “print to build” operations involving standard materials, a basic soft or hard recoater blade set at a sufficient height to push powder across the build plate is all that is

needed. Figure 4 shows the recoater design, with left image highlighting the slot bolts for easy adjustment of blade height on outer blades, and right image showing simplicity of swapping blades. The center blade is attached to a drop-in fixture which can be adjusted in height with easy-to-swap blades.

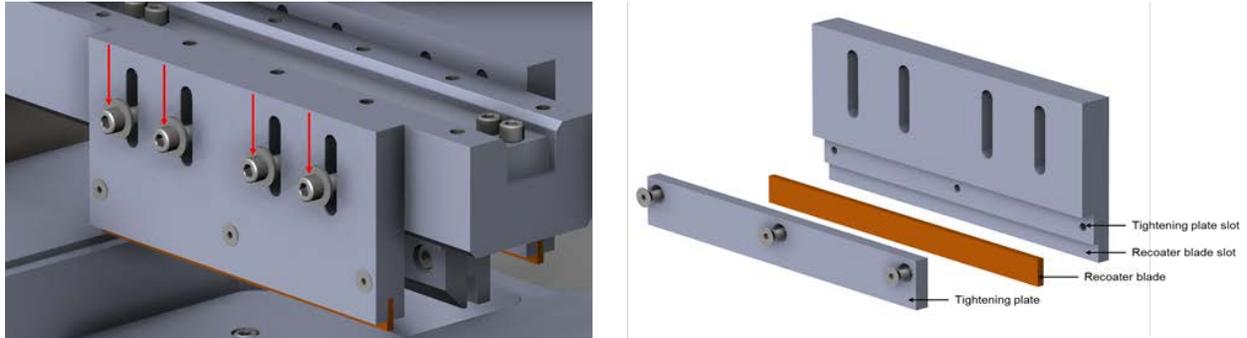


Figure 4. Recoater blade system

POWDER CATCH

Another useful feature of the PANDA design is the addition of a powder catch that funnels into a container below the process chamber deck, making it easy and safer to extract unused powder (rather than hand scooping it out of a collection bin). Powder is swept into the catch, going into a metal canister with screw top and handle that can be removed and replaced using the convenient second door, as shown below. The catch area is enclosed as part of the overall sealed chamber.

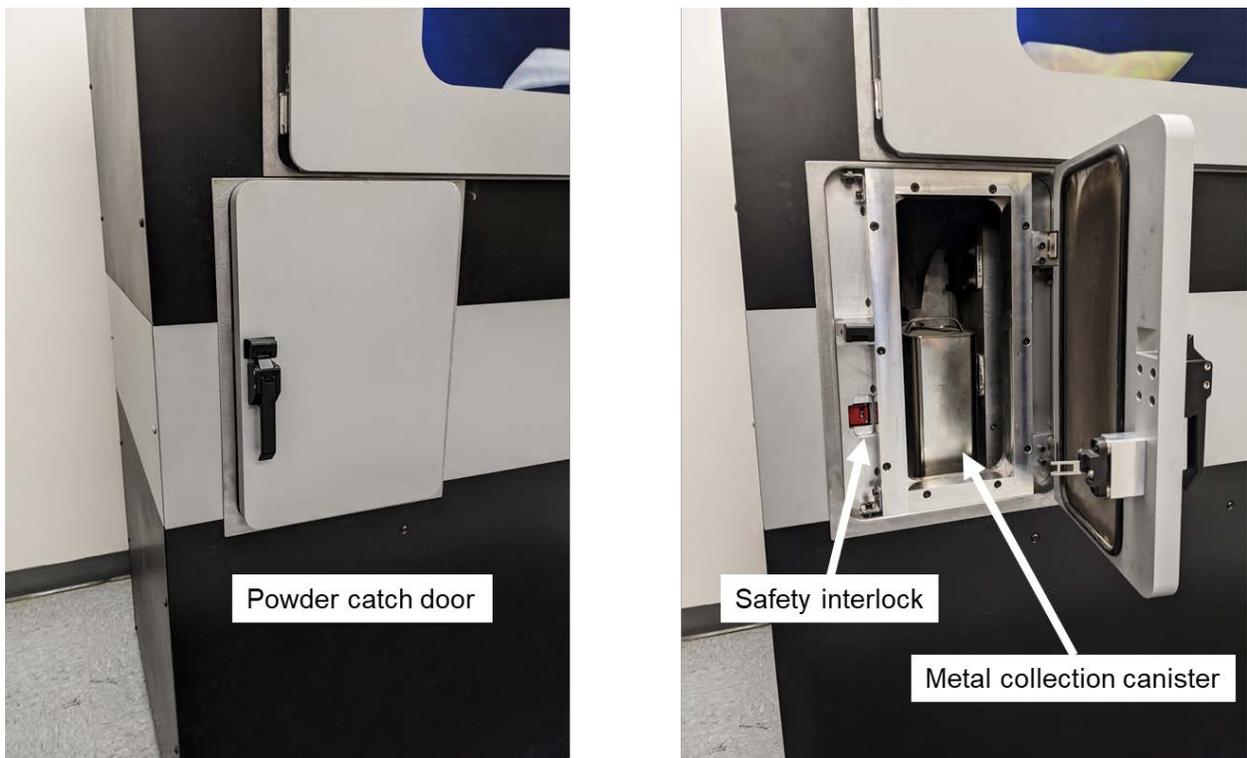


Figure 5. Powder catch access door

BUILD PLATES

Build plate CAD files are available to customers wishing to source plates independently. Open Additive also offers plates at an affordable price in low carbon steel, stainless steel, aluminum, and titanium. For 6" build plates, both 0.5" and 1.0" thicknesses are offered, while only 1" is offered for the 11" plates.

Plate schematics are shown below, with dimensions in inches (1" = 25.4 mm).

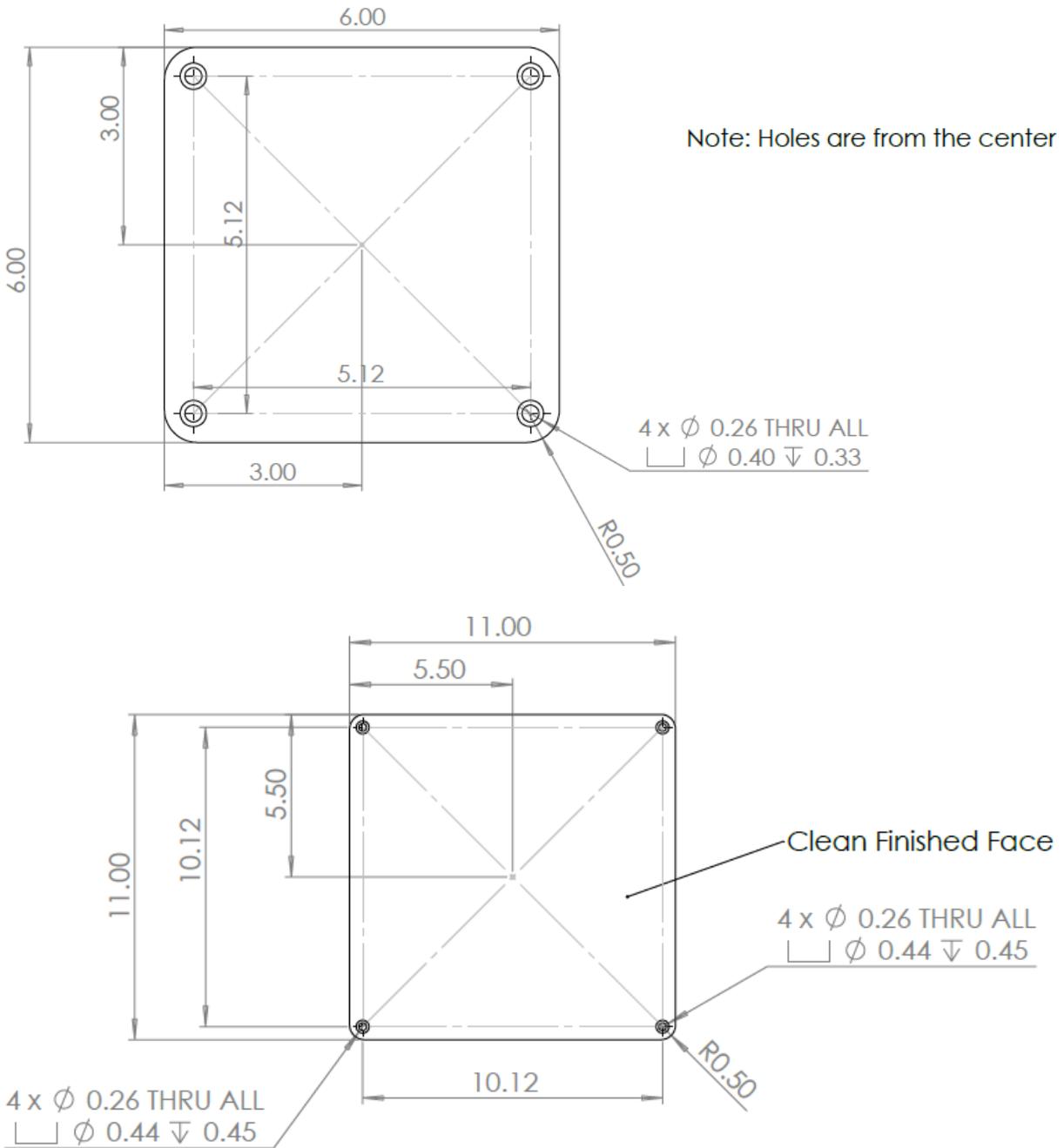


Figure 6. Standard build plate dimensions