

# Binder Jetting



Binder Jetting is a flexible technology with diverse applications, ranging from low-cost metal 3D printing, to full-color prototyping and large sand casting mold production.

In Binder Jetting, a thin layer of powder particles (metal, acrylic or sandstone) is first deposited onto the build platform. Then droplets of adhesive are ejected by an inkjet printhead to selectively bind the powder particles together and build a part layer-by-layer. After the print is complete, the part is removed from the powder and cleaned.

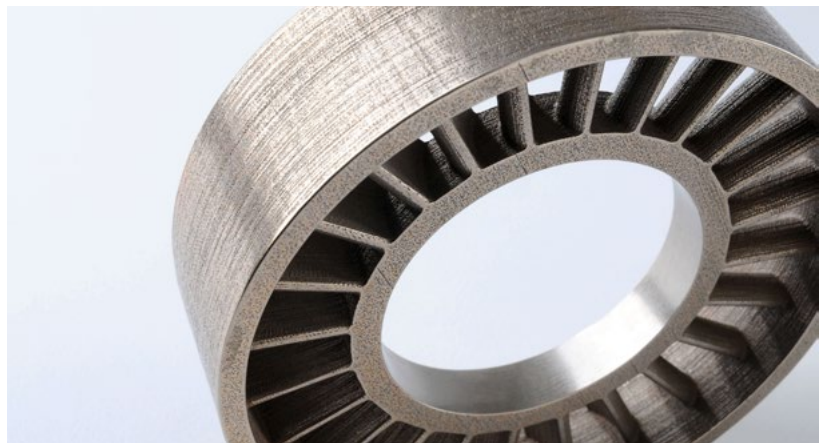
At this stage it is very brittle and additional post-processing is required. For metal parts this involves thermal sintering (similar to Metal Injection Molding) or infiltration with a low melting-point metal (for example, bronze), while for full-color parts are infiltrated with cyanoacrylate adhesive.

Binder Jetting can produce metal parts and full-color prototypes at a fraction of the cost of DMLS/SLM or Material Jetting respectively. Very large sandstone parts can also be manufactured with Binder Jetting, as the process is not limited by thermal effects (for example, warping).

Since no support structures are needed during printing, metal Binder Jetting parts can have very complex geometries and, like SLS, low-to-medium batch production is possible by filling up the whole build volume. Metal Binder Jetting parts have lower mechanical properties than the bulk material though, due to their porosity.

Due to the special post-processing requirements of Binder Jetting, special design restrictions apply. Very small details, for example, cannot be printed, as the parts are very brittle out of the printer and may break. Metal parts might also deform during the sintering or infiltration step if not supported properly.

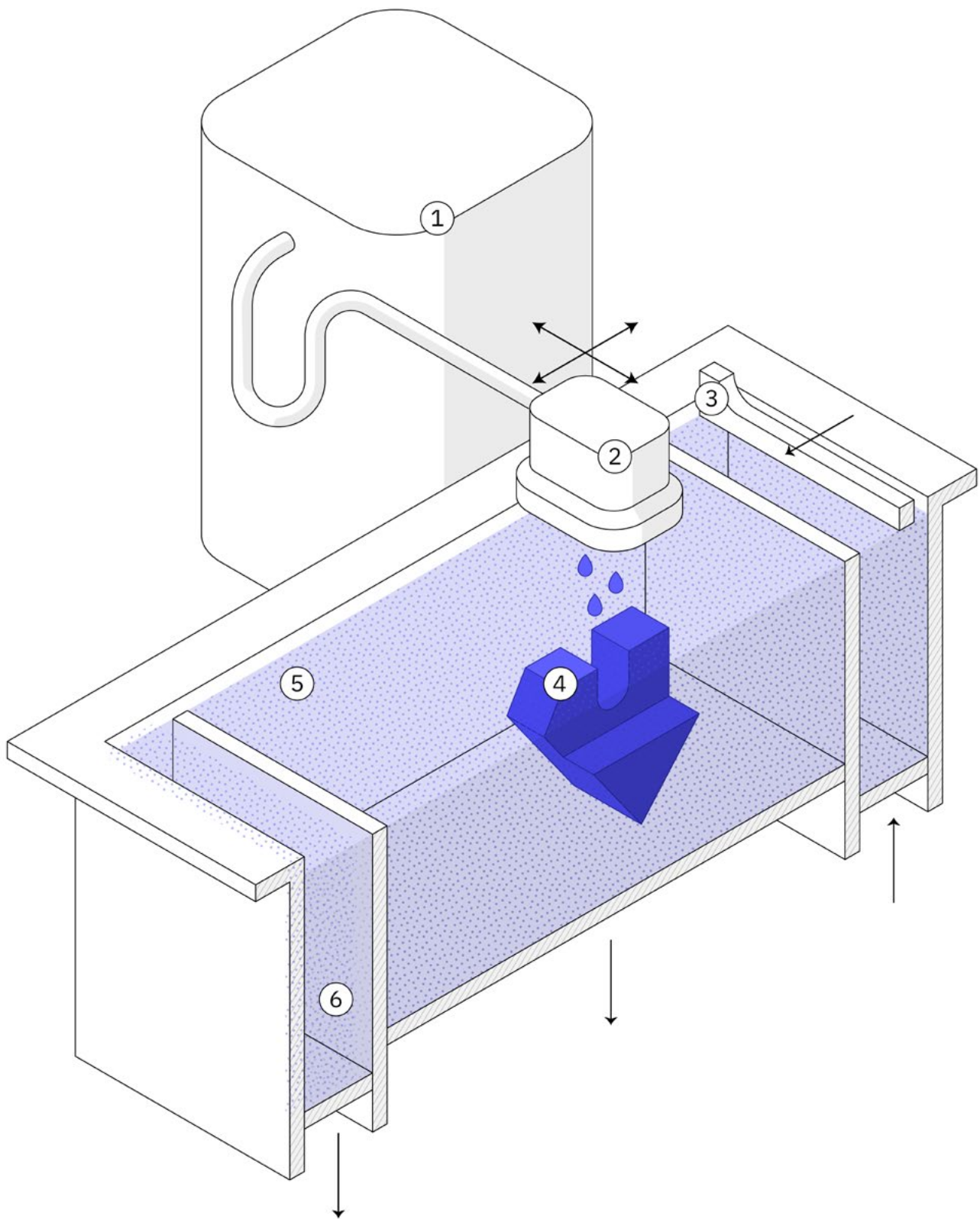
[Learn more about the Binder Jetting process →](#)



## Popular Binder Jetting materials

Binder Jetting is most commonly used for full-color parts, low-cost metal printing, and large sand casting molds.

> Stainless steel



- |                      |                |
|----------------------|----------------|
| ① Material container | ④ Printed part |
| ② Inkjet print head  | ⑤ Powder bed   |
| ③ Recoater           | ⑥ Overflow bin |

### Pros

- + Low-cost batch production of metal parts
- + Full-color prototyping in acrylic or sand
- + Very large printing capabilities in sand

### Cons

- Inferior material properties to DMLS/SLM
- Design restriction due to post-processing
- Fine details may not be printable