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What makes the KODAK Portrait 3D Printer special?

Kodak's first professional desktop 3D printer incorporates numerous features that make it stand out among the many available professional 3D printers currently on the market. It joins a very crowded marketplace with hundreds of models, making it difficult to identify which printer is better than the others. However, the following considerations justify why this printer is in a class by itself.

The KODAK Portrait 3D Printer was conceived with design and engineering professionals in mind.

It has an above-average print volume of 200x200x235 mm (10 litres), perfect for making the majority of conceptual models and functional parts, yet it still fits comfortably on a desk and can be transported by a person or two.

Few FFF printers have dual material/color printing capabilities. The KODAK Portrait 3D Printer has dual extruders with dual hotends, and incorporates some key features that are needed for this configuration to work *effectively*, a reason why other printers do not generally offer dual extrusion. The most important of them is a hotend lifting system, which enables the inactive hotend to get out of the way when the other one is printing. This is key to prevent the second hotend from dragging the deposited material.

Another notable feature of the printer's extrusion system is its ability to handle a wide range of materials reliably. While most desktop printers have been designed for printing PLA, with an open top and a PTFE hotend, the KODAK Portrait 3D Printer is a versatile device. It offers one PTFE hotend for PLA+, Flex or PLA and one all-metal hotend for engineering materials such as PLA Tough, ABS, HIPS, PETG, Nylon 6 or Nylon 12.

Very few 3D printers are fully enclosed. The enclosed print chamber keeps fingers away from hot or moving parts, reduces the noise and keeps warm air in and cold drafts out, which induce warping in large printed objects. The enclosure is fundamental for making large parts without warping. In addition, the built-in HEPA / activated carbon filter makes it suitable for use in classrooms, laboratories and offices.

The quick-exchange mechanism for substituting the hotends is notable. A single easily accessible screw and an electrical connector is all that the user needs to release to change a hotend assembly. If a hotend clogs up, you can quickly detach it and put in a replacement.

For ease of use even by inexperienced personnel, the KODAK Portrait 3D Printer has several important features. It has an automatic print bed leveling capability that uses the hotend itself to probe the printing surface. Prior to each print job, the printer will probe the print surface at several points to determine any tilt (which is *always* present) and calculate a correction that will make the printed object truly perpendicular to the print surface. The print plate is firmly held by magnets (no clips required), easily detached for cooling and cleaning or for removing the printed object. The printer is provided with a special premium glue stick to improve adhesion for certain filaments, to use on the glass plate.

The printer software is a truly differentiating factor for the KODAK Portrait 3D Printer. The printer movement is carried out by a dedicated 32-bit controller board using 1/32 microstepping, while the user interface and connectivity is separately carried out by a separate 32 bit quad-core processor board connected to a 5" color touch screen. The printer software provides advanced multi-user features. You can register the printer with the KODAK 3D Cloud, which gives you access to a great deal of functionality:

- Uploading objects into cloud storage
- Fixing and slicing objects without installing software on your computer. You do not need a PC to use or monitor the printer, you can do it from your tablet or phone.
- Managing a print farm
- Sharing objects with others
- Accessing your files on Dropbox or Google Drive, so you can have a shared repository of files. This is useful in a classroom or work environment.
- Remote monitoring via the built-in camera
- Automatic recording of a time-lapse movie of printing the object
- Preview of the sliced object
- Sharing of printers over the internet
- Statistics on printer usage, hours printed, etc.
- More features to be added!

To preserve filament quality and to help ensure repeatable results, KODAK 3D Printing Filaments fit inside the supplied protection cartridges, which contain anti-humidity gel packets. The filament is removed from the special airtight foil packaging and placed in these cartridges which connect to the extruders, forming a system where the filament is never exposed to the ambient humidity or dust. This preserves the filament qualities, and in particular facilitates printing with hygroscopic filaments like PVA or nylon polyamides.

The printer itself is rigidly built using 2mm steel sheets, precision laser cut. Thick 12mm guide rods and industrial bearing blocks and a CoreXY mechanism move the print carriage smoothly and precisely. The external paneling made of fire-retardant plastics provides unparalleled visibility into the printer (a feature especially designed for efficient office or classroom use). All of the electronic and electrical components are hidden inside the printer but are easily accessible for servicing. Z-movement is done via a 12mm SFU1204 precision ball screw. It will not wear out while doing the constant bed-leveling movement.

An interesting and useful feature is the color LED lights, which not only illuminate the printer interior while its working, they also convey printer status information at a distance. The lights indicate the printer status as follows

BLUE:	Idle and ready for use
ORANGE:	Heating up, requires some caution
WHITE:	Active 3D printing
GREEN:	Print completed successfully, must clear the build plate
RED:	Operator attention required

The printer aims to be consistent and reliable, easy to use and easy to share.