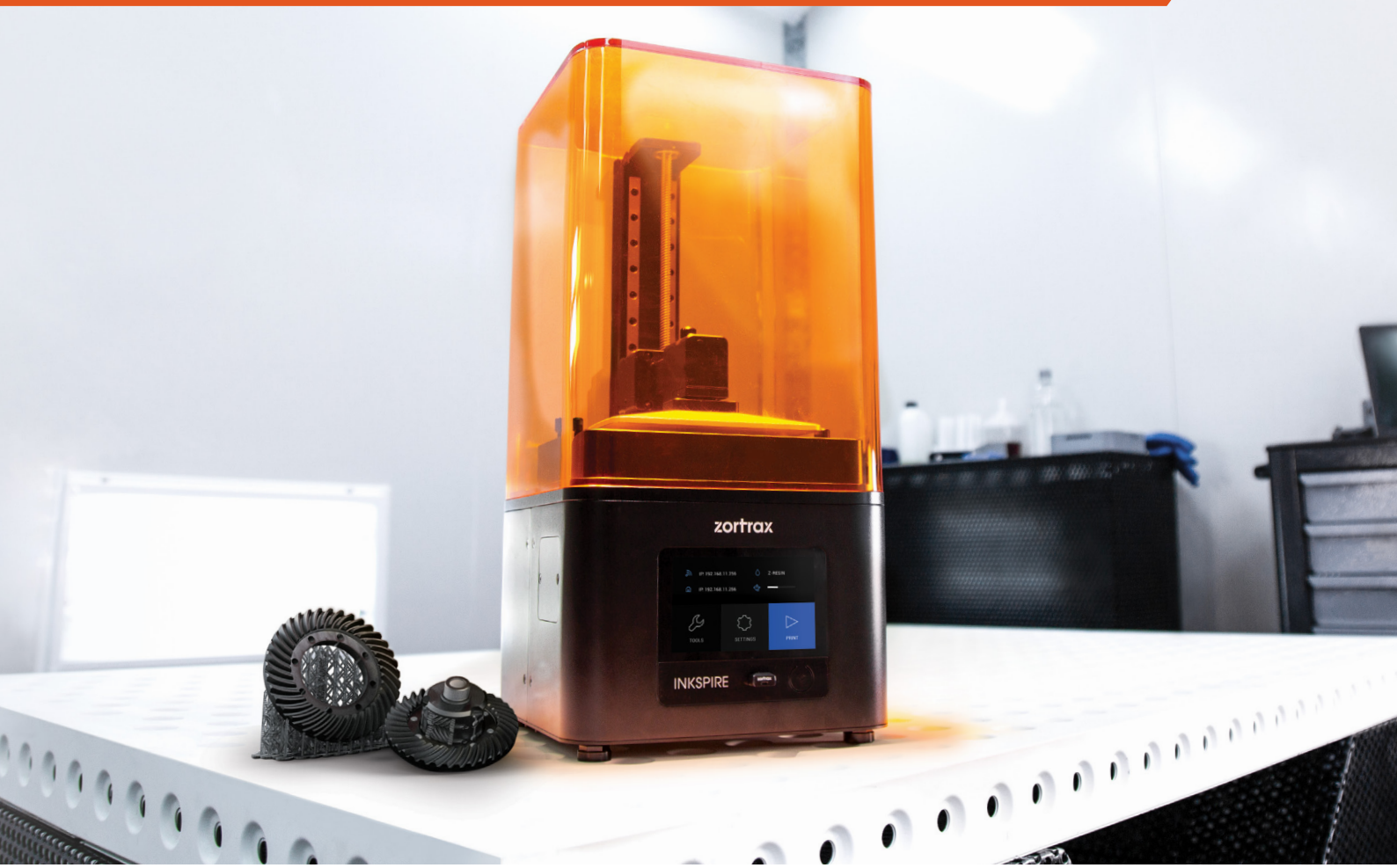
Zortrax Inkspire

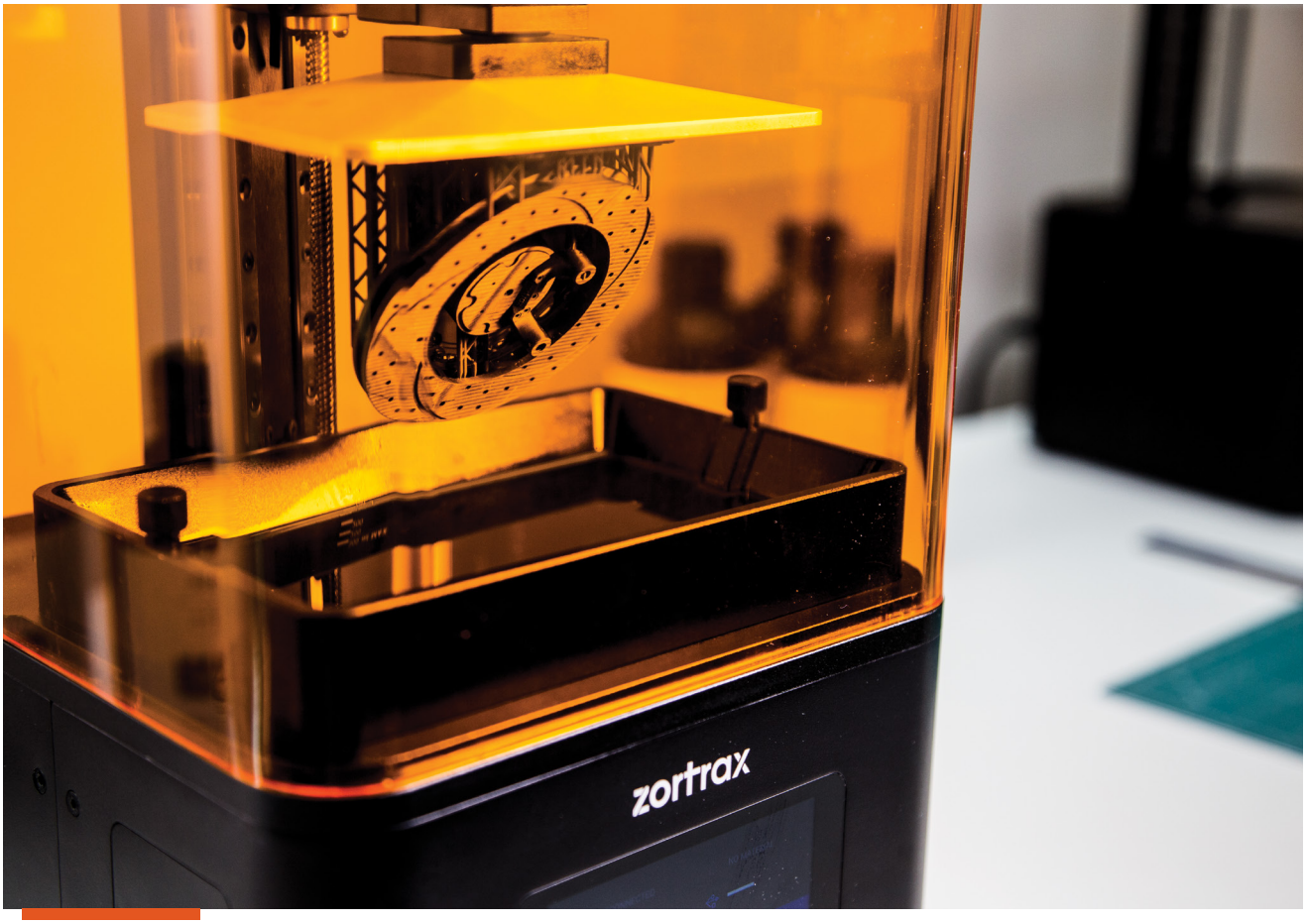
RESIN UV LCD 3D PRINTER



Instrument of Precision

The UV LCD technology in Zortrax Inkspire relies on a high resolution LCD screen with UV LED backlighting to solidify photopolymers layer by layer. With 50x50 microns XY resolution and 25 microns minimal layer height it is up to 9x more precise than leading SLA 3D printers. Because the entire layer is projected onto the photopolymer's surface all at once, it is also up to 8x faster. An intuitive touch interface asks about the current amount of resin in the printer and automatically schedules pauses each time a refill is going to be needed. Microscopic precision makes Zortrax Inkspire perfect for engineers, designers, jewelers or dental prosthetists. Due to the high speed of operation, the printer can work as a basic production unit in 3D printing farms offering low to medium scale manufacturing capabilities.

zortrax



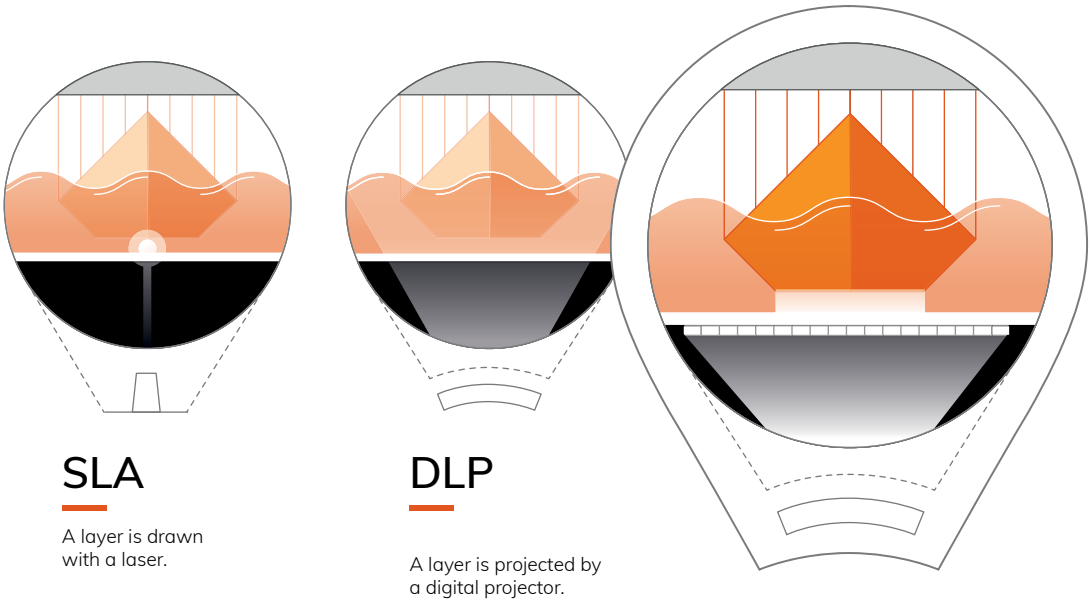
A scale model of an automobile breaking system before removing it from the Zortrax Inkspire's build platform.

Meet the UV LCD Technology

Resin 3D printers typically work in either SLA (stereolithography) or DLP (digital light processing) technology. In SLA, the precision is constant, but the speed of operation is in inverse proportion to the amount of workspace taken by the model. It is so because an entire layer has to be drawn with a laser. In DLP, the speed of operation is constant, but the precision falls as the amount of used workspace increases. Because they are designed around digital projectors, popular DLP 3D printers can work with relatively small pixel size, provided that the projected layer's image is limited to a small part of their available workspaces. But when the projected image is enlarged to fill the entire workspace, pixels grow dramatically to 70 microns or larger. Zortrax UV LCD offers constant high speed and constant high XY resolution regardless of how much of the workspace is used.

In Zortrax UV LCD technology, UV light is processed in three distinct stages. First, it hits a polarizing film arranged along a horizontal axis. Only a part of the spectrum vibrating horizontally gets through. Such horizontally polarized light then goes into an array of liquid crystals. Each crystal can let it pass unchanged or rotate it 90 degrees. In the last stage, the light hits another polarizing film, this time arranged vertically. If a liquid crystal between those two films does not rotate the light, the pixel is off because the horizontally polarized light can't get through the vertically polarized film. But if the light is rotated, it can pass through both films and the pixel is on.

Comparison of Resin 3D Printing Technologies



SLA

A layer is drawn with a laser.

DLP

A layer is projected by a digital projector.

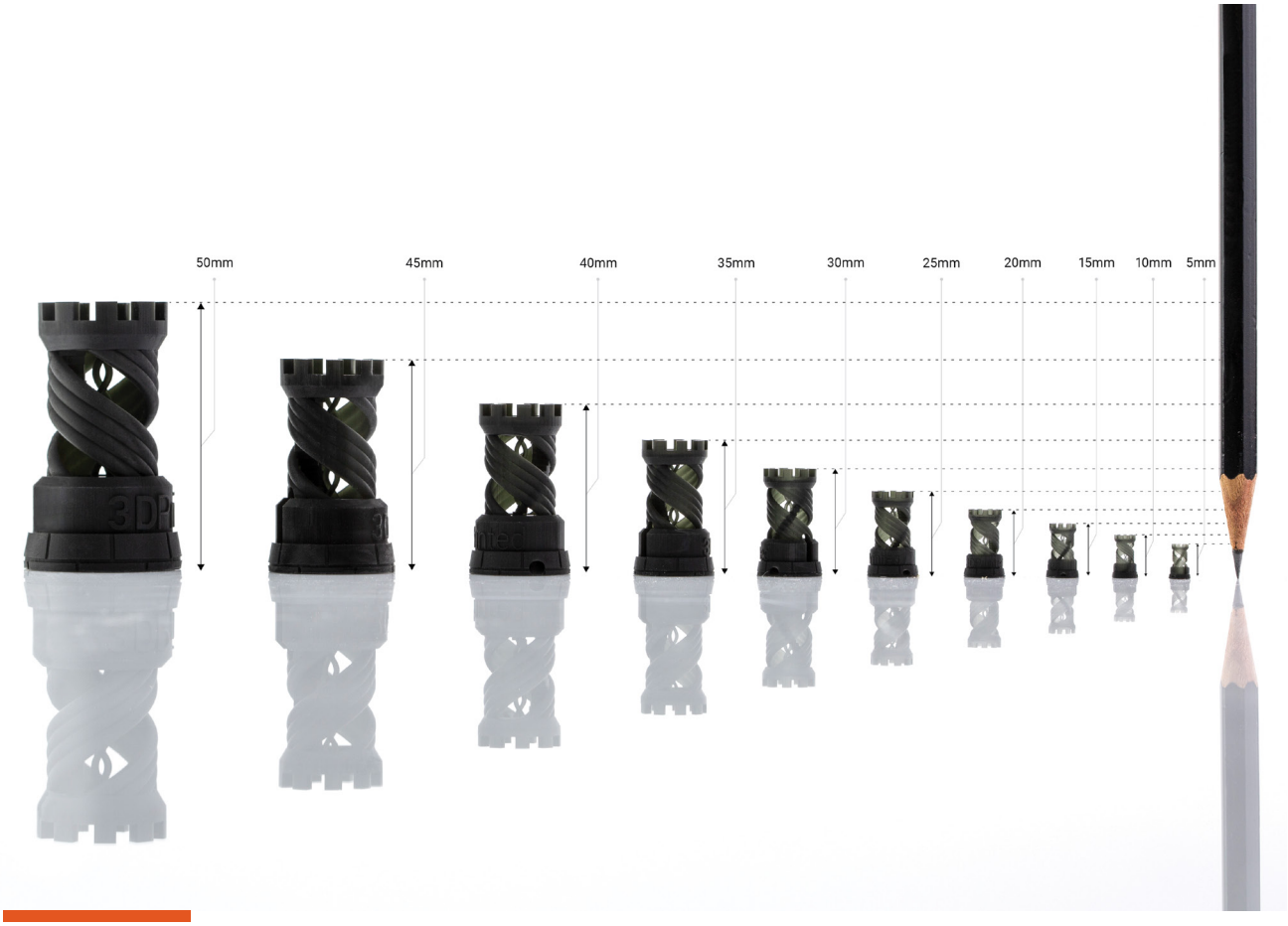
UV LCD^{Z}

A layer is projected on a high-res LCD screen with UV LED backlighting.

Compatible Resins

Zortrax Inkspire works with a dedicated Zortrax Resin Basic, a photopolymer designed to guarantee impeccable accuracy of details and great mechanical properties of prints at the same time. External resins compatible with Zortrax Inkspire include special purpose photopolymers made for applications in dental prosthetics or jewelry design among others. All resins cured by light with 405 nm wavelength are supported.

Zortrax Inkspire works with castable resins. This combination is perfect for creating incredibly detailed jewelry designs.



Rooks 3D printed on Zortrax Inkspire with Zortrax Resin PRO.

Microscopic Precision

The smallest possible object a naked human eye can see measures about 0.1 mm. The smallest possible object Zortrax Inkspire can 3D print is a cuboid measuring 50x50x25 microns. That's why it can produce details that can only be seen under a microscope or through a powerful magnifying glass. Surface texture and ornaments on the 5 mm high rook look the same as on the one measuring 5 cm. Almost no detail has been lost due to scaling the model down.

Flexible Manufacturing

Zortrax Inkspire maintains constant high speed of operation and accuracy regardless of how much of the workspace is used. Working with relatively small models like HDMI cover caps, one Zortrax Inkspire can 3D print 77 of them in 51 min. 30 Zortrax Inkspire 3D printers can make 650,000 caps per month working in a 3D printing farm operated with one 8h long shift per day. Now, because as all Zortrax 3D printers, the Inkspire is made of high-quality parts, it can operate incessantly for long periods of time. Therefore, it is possible to increase the number of shifts per day and run the printers 24/7. In such scenario, a monthly output of 30 Zortrax Inkspire 3D printers can jump up to over 1,000,000 parts or higher, taking a business well into medium or even large scale production territory.

77 HDMI cover caps 3D printed on Zortrax Inkspire in 51 min.

A farm of 30 Zortrax Inkspire 3D printers can offer 650,000 to over 1,000,000 parts of monthly output.

Z-SUITE Inkspired

Z-SUITE is a dedicated slicing and 3D printing farm management software that comes free with every Zortrax 3D printer. Now it has a number of additional functionalities to make working with Zortrax Inkspire an effortless experience. Times of exposure to UV light for the model and support structures can be set independently to make the support structures harder and therefore easier to remove. It also makes supports thinner which reduces their overall footprint on the model and consequently, the amount of post-processing needed to make the surfaces perfectly smooth. Specific settings chosen for each particular resin can be easily saved as complete profiles and reused when necessary. Z-SUITE can remotely pause, resume, and monitor the printing process on each Zortrax Inkspire connected to the same Wi-Fi network.

Zortrax Inkspire Main Features

- UV LCD is up to 8x faster than SLA
- UV LCD is up to 9x more precise than SLA
- The speed of operation is 20-36 mm/h
- The XY resolution is 50x50 microns
- Calibrates build platform automatically
- The minimal layer height is 25 microns
- Has a built-in carbon filter
- Offers serial production capability
- External 405 nm resins are supported
- External slicing software is supported
- .zcodex and .cws file formats are supported
- Workspace measures 74x132x175 mm
- Wi-Fi and Ethernet connectivity
- Has an intuitive touch interface

A precise scale model of an automobile brake 3D printed on Zortrax Inkspire for the automotive industry.

Zortrax Ultrasonic Cleaner

Zortrax Ultrasonic Cleaner is a device that uses high frequency sound waves propagated in liquid detergent to automatically clean models.

Zortrax Inkspire Technical Data

Printing	
Technology	UV LCD
Pixel size	50 microns (0.05 mm)
Layer thickness	25, 50, 100 microns
Print speed	20-36 mm/h

Device	
Build volume	74 x 132 x 175 mm (2.9 x 5.2 x 6.9 in)
Platform calibration	Automatically
Support	Mechanically removed - printed with the same material as the model
Light source	UV integrated light (wavelength 405 nm)
Connectivity	Wi-Fi, Ethernet, USB
Operating system	Android
Processor	Quad Core
Touchscreen	4" IPS 800 x 480
External materials	Applicable

In the box
3D Printer, Z-SUITE, Starter Kit, Zortrax Photopolymer Resin Basic (500 ml)

Temperature	
Ambient operation temperature	20 - 30˚ C (68 - 86˚ F)
Storage temperature	0 - 35˚ C (32 - 95˚ F)

Electrical	
AC input	110 V ~ 5.9 A 50/60 Hz 240 V ~ 2.5A 50/60 Hz
Maximum power consumption	50 W

Software	
Software bundle	Z-SUITE
Supported file types	.stl, .obj, .dxf, .3mf
Supported formats	.cws, .zcodex
Supported operating systems	Mac OS X / Windows 7 and newer versions

Additional information
All information contained in this brochure and specification is subject to change without notice.

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