

DELIVERING ADVANCED PRODUCTION  
CAPABILITIES TO HIGH-TECH  
INDUSTRIES WORLDWIDE



**zortrax**

INDUSTRIAL  
ADDITIVE  
MANUFACTURING  
TECHNOLOGIES

Maximum  
extruder  
temp. 480 °C

Maximum  
chamber  
temp. 200 °C

Maximum  
platform  
temp. 220 °C



## CUTTING EDGE RESEARCH PLATFORM

Zortrax Endureal works in a number of advanced research projects. We are developing a capability to 3D print composite models out of two high-performance materials at once and working on covering PEEK parts with metals for the European Space Agency. And we are just warming up.

### DUAL EXTRUSION

The LPD Plus dual extrusion technology used in the Zortrax Endureal has been traditionally used to print support structures out of different material than the model itself. But we wanted it to do way more than that, recognizing that there is an increasing demand for advanced composite parts 3D printed out of two high-performance polymers. This is exactly what we have achieved. Zortrax engineers used ESA's experimental blend of electrically conductive PEEK in combination with standard Z-PEEK to print space-ready parts with power and data transfer capabilities.

### ELECTRICALLY CONDUCTIVE PEEK

ESA engineers working at the European Space Research and Technology Centre have invented a blend of electrically conductive PEEK. This has been achieved by adding carbon nanotubes and graphite nano plates to standard poly ether ether ketone. What ESA ended up with was a 3D printing material that had all the mechanical and thermal characteristics of PEEK which at the same time could be used for printing data and power transferring lines or provide ESD protection functionalities.

### COTS HARDWARE

In the space industry, COTS stands for commercial-off-the-shelf-components which are widely available and more cost-efficient than custom made solutions used for space exploration in the past. The Endureal 3D printers in all ESA projects have the same hardware configuration as commercially available machines. Customers can rest assured that the Endureal 3D printers they order come fully equipped to do all the amazing things achieved by our research teams.





## TECHNICAL SPECIFICATION OF ZORTRAX ENDUREAL

DEVICE	
Build volume	400 x 300 x 300 mm (15.7 x 11.8 x 11.8 in)*
Nozzle diameter	0.4 mm (0.016 in)
Extruder	Dual material
Extruder cooling system	Two fans cooling the extruder; radial fan cooling the print
Hotend	High-temperature dual hotend**
Platform	Heated, aluminum plate coated with PEI
Material Sensors	2 x mechanical endstop, 2 x material weight sensor
Connectivity	Wi-Fi, Ethernet, USB
Operating system	Android
Processor	Quad Core
Touchscreen	7" IPS 1024 x 600
Camera	Yes

TEMPERATURE	
Maximum printing temperature (extruder)	480 °C (896 °F)
Maximum platform temperature	220 °C (428 °F)
Maximum build chamber temperature	200 °C (392 °F)
Ambient operation temperature	17-30 °C (63-86 °F)
Storage temperature	0-35 °C (32-95 °F)

PRINTING	
Technology	LPD Plus (Layer Plastic Deposition Plus) advanced technology depositing melted thermoplastics with breakaway and dissolvable support structures
Layer resolution	200-250 microns (for 0.4 mm nozzle)
Minimal wall thickness	450 microns (for 0.4 mm nozzle)
Platform levelling	Automatic measurement of platform points' height

ELECTRICAL	
AC Input	120 V ~ 13 A 50/60 Hz 200 - 240 V ~ 9.5 A 50/60 Hz
Maximum power consumption	120 V - 1600 W 200-240 V - 2300 W

SOFTWARE	
Software bundle	Z-SUITE
Supported input file types	.stl, obj, .dxf, .3mf, .ply
Supported operating system	Mac OS Mojave and newer versions / Windows 7 and newer versions

FILAMENTS	
Dedicated for single extrusion	Z-PEI 9085, Z-ULTRAT Plus
Dedicated for dual extrusion	Z-PEEK, Z-PEI 1010, Z-PEI 9085, Z-SUPPORT ATP, Z-SUPPORT ATP 130***, Z-SUPPORT High-Temp, Z-ULTRAT Plus
External materials	Applicable
Support	Mechanically removed - printed with the same material as the model; Breakaway - printed with a different material than the model; Soluble - printed with a different material than the model
Filament container	spool
Filament diameter	1.75 mm (0.069 in)

IN THE BOX	
3D printer, Z-SUITE, starter kit, maintenance kit, spool of model material, spool of support material, spool of high-temperature model material, spool of high-temperature support material, USB memory stick	

MAINTENANCE KIT CONTENTS	
material endstop (2 pcs.), extruder filament gear (2 pcs.), extruder filters set (carbon & HEPA) (2 pcs.), PEI plate (2 pcs.), high-temperature hotend module (2 pcs.), extruder cable	

\* In dual-extrusion mode project's dimensions cannot exceed 390 mm (15.35 in) in the X axis and/or 290 mm in the Y axis.

\*\* Remember to use a separate high-temperature hotend module with each high-temperature material type you use.

\*\*\* the material profile available only in Z-SUITE 3.0 BETA



EXTRUDER



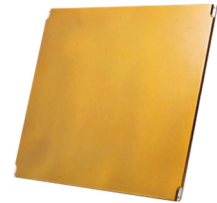
HEPA & CARBON FILTERS



HIGH-TEMPERATURE  
HOTEND MODULE



EXTRUDER FILAMENT  
GEARS



PEI PLATE



EXTRUDER CABLE



FILAMENT ENDSTOP

**ADDITIONAL PARTS&ACCESSORIES  
DELIVERED IN A MAINTENANCE KIT**

PARTS & ACCESSORIES	DESCRIPTION
HEPA & Carbon Filters	2 sets of spare HEPA and carbon filters
Extruder	a dual-extrusion module designed to process filaments in a wide range of temperatures
Extruder Cable	the cable connecting the extruder with the motherboard
Extruder Filament Gears	2 spare gears facilitating filament feeding
Filament Endstop	2 optical sensors detecting the presence of filament
High-temperature Hotend Module	2 heating modules designed to process high-temperature polymers
PEI Plate	2 spare PEI plates to install on the heatbed

\*the material profile available only in Z-SUITE 3.0 BETA

**3D PRINTING THERMOPLASTIC FILAMENTS  
COMPATIBLE ZORTRAX ENDUREAL 3D PRINTER**

FILAMENTS	DESCRIPTION	SPOOL
Z-PEEK	very strong, radiation-resistant high-performance polymer with excellent thermal properties ● Natural	net weight: 1000 g ±5%
Z-PEI 1010	a highly rigid and thermally stable filament with resistance to chemicals ● Natural	net weight: 1000 g ±5%
Z-PEI 9085	a highly durable and flame-retardant filament widely used in aerospace industry ● Natural	net weight: 1000 g ±5%
Z-SUPPORT ATP	soluble support filament designed with high thermal stability in mind ○ Natural	net weight: 750 g ±5%
Z-SUPPORT ATP 130*	soluble support filament dedicated for 3D printing with high-temperature conditions ○ Natural	net weight: 750 g ±5%
Z-SUPPORT High-Temp	a breakaway support filament designed to withstand high temperatures ○ Natural	net weight: 1000 g ±5%
Z-ULTRAT Plus	a versatile and highly resilient filament based on ABS ● Blue, ● Graphite, ○ Ivory, ● Pure Black	net weight: 2000 g ±5%



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