# HYREL International, Inc.

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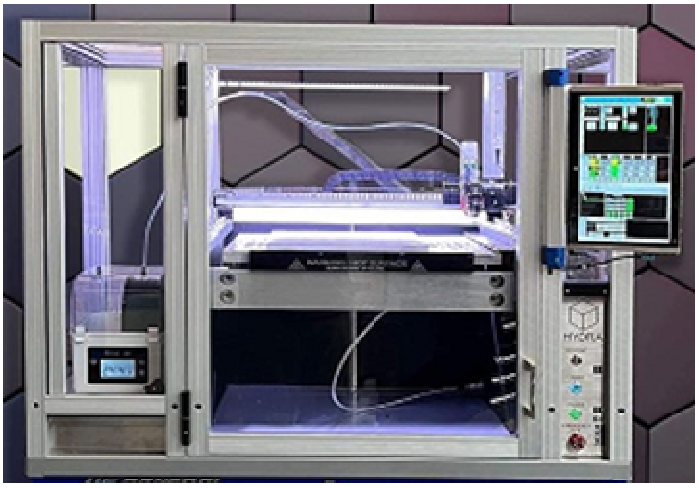
**Hydra 21 Spec Sheet**

The Hydra 21, or H21, is designed for the widest range of laboratory needs. It can handle all of our accessories, including a 200°C build plate up to 400x600mm, 4th and 5th axis options, a three-phase spindle tool, a pick-and-place head, and more.

The H21 has a 42x24" base. It sits on any flat surface, and is also designed to sit well on standard 44x22" toolboxes.

Details are listed below. Please reach out to us with any questions about Hyrel additive and combined manufacturing equipment.



| | |
|---|---|
| Motion, X/Y/Z: | Head/Head/Bed |
| Exterior Dimensions, X/Y/Z: | 42x24x33 in; 107x61x84 cm |
| Power Requirements: | 8 A / 208-240 VAC Single Phase / 50-60 Hz |
| Build Volume, X/Y/Z: | 16x12x10 in / 400x300x250 mm standard; *20x16x10 in / 500x400x250 mm optional* |
| Max Payload, Bed/Yoke: | 20 lbs (9 kg) bed / 5 lbs (2.2 kg) yoke |
| Bed Temperatures: | Ambient to 120°C standard; *Amb to 200°C or Amb to -5°C optional* |
| Chamber Temperatures: | Ambient to 65°C at present |
| Printing Speeds: | Up to 60 mm/sec (3600 mm/min) recommended |
| Positional Resolution, X/Y/Z: | 0.006 mm / 0.006 mm / 0.001 mm |
| Positional Accuracy, X/Y/Z: | 0.06 mm / 0.06 mm / 0.01 mm |
| Positional Repeatability, X/Y/Z: | 0.06 mm / 0.06 mm / 0.01 mm |
| Output for Bioplots, X/Y/Z: | 0.1 mm lines with 0.2 mm spacing |
| Tool Positions, Std/Max: | Five; *10 with limited X range optional* |
| Filament Heads: | All: 1.75 and 2.85 mm filaments at up to 260°C or up to 450°C |
| Reservoir Heads: | All: from 1 cc to 300 cc, ambient, heated (to 270°C) or chilled (to -5°C) |
| Mixing/Blending Heads: | All: active or passive blending, and fixed or programmable ratios |
| Spindle Tool Heads: | All: 12 Vdc single-phase and 48 Vdc three-phase versions |
| Laser Tool Heads: | 6 W, 450 nm diode laser tool |
| UV Light Pens: | All: 1 W in 365, 405, or 450 nm |
| Extra Axis Options: | All: 4th lathe-style or 45h/5th combo trunnion style |
| Pick-and-Place Compatible: | Yes, both first- and second-generation models |
| USB Microscope Compatible: | Yes |

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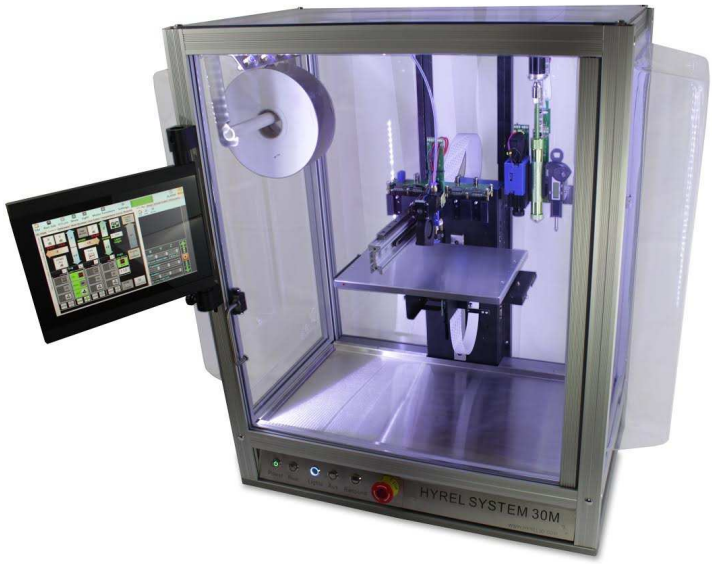
System 30M
Spec Sheet

The System 30M, or just 30M, is designed for a wide range of laboratory needs. Designed for most thermoplastics, it is also able to print liquids, gels, and clays from ambient, cooled, or heated temperatures, with or without UV curing.

The 30M has a 34x16" base, and sits on any flat surface.

Details are listed below. Please reach out to us with any questions about Hyrel additive and combined manufacturing equipment.

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|---|---|
| Motion, X/Y/Z: | Bed/Head/Bed |
| Exterior Dimensions, X/Y/Z: | 34x16x32 in, 87x41x82 cm |
| Power Requirements: | 15 A / 110-120 VAC / 60 Hz or |
| | 8 A / 208-240 VAC (single phase) / 50-60 Hz |
| Build Volume, X/Y/Z: | 200x200x200 mm standard; |
| Max Payload, Bed/Yoke: | 5 lbs (2.2 kg) bed / 5 lbs (2.2 kg) yoke |
| Bed Temperatures: | Ambient to 90°C |
| Chamber Temperatures: | Ambient to 50°C |
| Printing Speeds: | Up to 30 mm/sec (1800 mm/min) recommended |
| Positional Resolution, X/Y/Z: | 0.005 mm / 0.005 mm / 0.001 mm |
| Positional Accuracy, X/Y/Z: | 0.05 mm / 0.05 mm / 0.01 mm |
| Positional Repeatability, X/Y/Z: | 0.05 mm / 0.05 mm / 0.01 mm |
| Output for Bioplots, X/Y/Z: | 0.1 mm lines with 0.2 mm spacing |
| Tool Positions, Std/Max: | Four |
| Filament Heads: | All: 1.75 and 2.85 mm filaments at up to 260°C or up to 450°C |
| Reservoir Heads: | All: from 1 cc to 300 cc, ambient, heated (to 270°C) or chilled (to -5°C) |
| Mixing/Blending Heads: | All: active or passive blending, and fixed or programmable ratios |
| Spindle Tool Heads: | 12 Vdc single-phase only |
| Laser Tool Heads: | 6 W, 450 nm diode laser tool |
| UV Light Pens: | All: 1 W in 365, 405, or 450 nm |
| Extra Axis Options: | None |
| Pick-and-Place Compatible: | No |
| USB Microscope Compatible: | Yes |

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Engine SR
Spec Sheet

The Engine, Standard Resolution, or ESR, is an unenclosed version of our 30M. Designed for liquids, gels, and clays from ambient, cooled, or heated temperatures, with or without UV curing, the ESR can also print filaments with low-temperature requirements.

The ESR has a 13x21" base, and sits on any flat surface as well as fitting inside many fume hoods or glove boxes.

Details are listed below. Please reach out to us with any questions about Hyrel additive and combined manufacturing equipment.

| | |
|---|---|
| Motion, X/Y/Z: | Bed/Head/Bed |
| Exterior Dimensions, X/Y/Z: | 13x21x22 in, 33x54x56 cm |
| Power Requirements: | 15 A / 110-120 VAC / 60 Hz or<br>8 A / 208-240 VAC (single phase) / 50-60 Hz |
| Build Volume, X/Y/Z: | 200x200x200 mm |
| Max Payload, Bed/Yoke: | 5 lbs (2.2 kg) bed / 5 lbs (2.2 kg) yoke |
| Bed Temperatures: | Ambient to 90°C |
| Chamber Temperatures: | No enclosure |
| Printing Speeds: | Up to 30 mm/sec (1800 mm/min) recommended |
| Positional Resolution, X/Y/Z: | 0.005 mm / 0.005 mm / 0.001 mm |
| Positional Accuracy, X/Y/Z: | 0.05 mm / 0.05 mm / 0.01 mm |
| Positional Repeatability, X/Y/Z: | 0.05 mm / 0.05 mm / 0.01 mm |
| Output for Bioplots, X/Y/Z: | 0.1 mm lines with 0.2 mm spacing |
| Tool Positions, Std/Max: | Four |
| Filament Heads: | All: 1.75 and 2.85 mm filaments at up to 260°C or up to 450°C |
| Reservoir Heads: | All: from 1 cc to 300 cc, ambient, heated (to 270°C) or chilled (to -5°C) |
| Mixing/Blending Heads: | All: active or passive blending, and fixed or programmable ratios |
| Spindle Tool Heads: | 12 Vdc single-phase only |
| Laser Tool Heads: | 6 W, 450 nm diode laser tool |
| UV Light Pens: | All: 1 W in 365, 405, or 450 nm |
| Extra Axis Options: | None |
| Pick-and-Place Compatible: | No |
| USB Microscope Compatible: | Yes |

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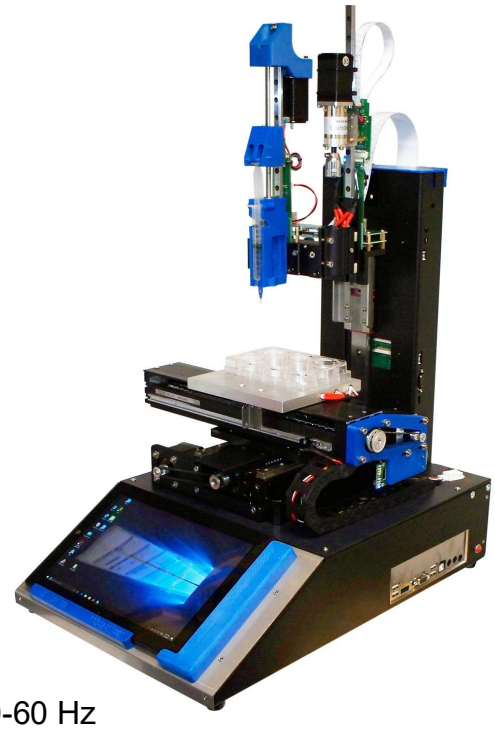
Engine HR
Spec Sheet

The Engine, High resolution, or EHR, is designed for precision applications with biological materials or fine conductive, magnetic, and metallic traces. With precision ball screws in every axis, its positioning accuracy, resolution, and repeatability are unmatched.

The EHR has a 13x20" base. It sits on any flat surface as well as fitting inside many fume hoods or glove boxes.

Details are listed below. Please reach out to us with any questions about Hyrel additive and combined manufacturing equipment.



| | |
|---|---|
| Motion, X/Y/Z: | Bed/Bed/Head |
| Exterior Dimensions, X/Y/Z: | 13x20x19 in, 33x51x49 cm |
| Power Requirements: | 15 A / 110-120 VAC / 60 Hz or<br>8 A / 208-240 VAC (single phase) / 50-60 Hz |
| Build Volume, X/Y/Z: | 100x100x100 mm standard; *inquire about extended build volumes* |
| Max Payload, Bed/Yoke: | 5 lbs (2.2 kg) bed / 5 lbs (2.2 kg) yoke |
| Bed Temperatures: | Ambient to 120°C standard; *Amb to 200°C or Amb to -5°C optional* |
| Chamber Temperatures: | No enclosure |
| Printing Speeds: | Up to 60 mm/sec (3600 mm/min) recommended |
| Positional Resolution, X/Y/Z: | 0.001 mm / 0.001 mm / 0.001 mm |
| Positional Accuracy, X/Y/Z: | 0.01 mm / 0.01 mm / 0.01 mm |
| Positional Repeatability, X/Y/Z: | 0.01 mm / 0.016 mm / 0.01 mm |
| Output for Bioplots, X/Y/Z: | 0.1 mm lines with 0.2 mm spacing |
| Tool Positions, Std/Max: | Five |
| Filament Heads: | All: 1.75 and 2.85 mm filaments at up to 260°C or up to 450°C |
| Reservoir Heads: | All: from 1 cc to 300 cc, ambient, heated (to 270°C) or chilled (to -5°C) |
| Mixing/Blending Heads: | All: active or passive blending, and fixed or programmable ratios |
| Spindle Tool Heads: | All: 12 Vdc single-phase and 48 Vdc three-phase versions |
| Laser Tool Heads: | 6 W, 450 nm diode laser tool |
| UV Light Pens: | All: 1 W in 365, 405, or 450 nm |
| Extra Axis Options: | None |
| Pick-and-Place Compatible: | No |
| USB Microscope Compatible: | Yes |