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 **Helix**

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www.helixdesign.net

• Product Design

• Product Forecasting

• Engineering

• Prototyping

Pumping-out and mocking-up solutions...

Operation:

- The first liter vessel fills, overflowing into the second and third.
- The water float in the third vessel opens, rerouting the flow into the lower vessel and spilling the contents of all three vessels into the lower vessel.
- The water float in the third vessel closes the drain valve as it floats to the bottom, rerouting the water flow to the first liter vessel.

Brushed metal lower vessel

CircuLite

CIRO108-Synergy



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Display and pump are removed with bezel assembly

Pump and water vessels are illuminated to highlight pump and water flow

CircuLite

CIRO108-Synergy

Concept B Refinement Helix

CircuLite is a groundbreaking cardiovascular device company that approached Helix Design with an intriguing development need: design a tradeshow display that would highlight the extraordinary performance of its Synergy[®] Pocket Micro-Pump, the world's smallest implantable blood pump (and currently in a CE Mark clinical trial). Designing and fabricating a display to demonstrate the Synergy[®] pump's capabilities and draw tradeshow attendees into the CircuLite booth presented our team with a terrific opportunity to generate concepts, implement CAD geometry, and fabricate solutions under aggressive timelines with immediate results.

A short timeline meant generating sketch concepts very quickly. We needed to highlight the Synergy[®] pump's small size, so placing it front and center and within reach of attendees was key. All designs needed to show a Synergy[®] pump moving 2-3 liters of fluid in one minute, which led our design team to explore a variety of visually arresting water- and gravity-driven mechanisms. After preliminary testing, we proposed a series of three separate one-liter volumes that filled sequentially but emptied in unison into an internal 3+ liter tank. The Synergy[®] pump was fed by this tank and continually pumped fluid back into the first liter volume to repeat the process.

Upper vessel is marked clearly to demonstrate volume

Pivot point

High gloss pearl

Operation:

- The water vessel fills through the hinge point, until the weight of the water causes the vessel to tip, spilling the contents into the lower vessel.
- Water flow is temporarily routed to the bottom vessel through a valve at the upper vessel pivot point.
- The upper vessel recovers by its own weight, to open the hinge valve and begin filling again.

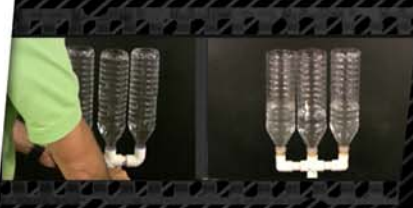
Pump is highlighted by an illuminated reflector dish

- Color lamp
- Clear tubing treatment
- Polished metal bezel

CircuLite

CIRO108-Synergy

Concept A Helix



Given the importance of measuring the Synergy[®] pump's performance in one minute increments, we spec'd a legible LCD display and enlisted the aid of a network partner to craft the electronics and software necessary to open and close three internal solenoid valves every sixty seconds. Once the merits of the designed were verified and proven out in mock-ups, we set about generating the 3D geometry that would allow us to take advantage of our in-house prototyping and fabricating capabilities.

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...Fabricating and refining what works



Synergy Display, initial show model



Refinements improved function and enhanced visual appeal



Faceplate removes to keep pump secure after-hours



Synergy Display, refined show model

CircuLite wanted to remove the Synergy® pump from the display at the close of each day, so we incorporated dual quick-connectors behind a snap-in bezel that secured the Synergy® pump and housed high intensity blue LED's to back-light the device. We used polished acrylic tubes to fabricate graduated cylinders, and we cast soft urethane sluiceways to direct flow into each cylinder before diverting overflow back into the internal tank.

After an initial performance run-through we uncovered a few areas that needed improvement, such as: reduce the number of bubbles that clung to the sides of the cylinders, conceal the fasteners that wed the graduated cylinders to the base, enhance measurement legibility, and make the display easier to prime. We incorporated blue acrylic inner pipes that reduced bubble formation by "catching" water pouring out of the sluiceways, and the dark blue back-drops also markedly improved legibility. Cast urethane features captured the inner pipes at top and bottom and concealed the fastening hardware. We also codified the best way to prime the Synergy® display for future use, and sent the updated display off to CircuLite for its next tradeshow.

The Helix Design team enjoys product development in all its forms and excels at designing the un-designed: if you have needs or challenges in product development, let us execute intuitive product design that gets your products noticed and wins you more business! Contact Troy Barber @ 603.836.0290 when you are ready to get started.

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