

Care and Storage (Immersion Tank)

SynDaver Synthetic Human (SSH) muscles, organs, skin and open vasculature system (if present) are made from SynDaver's patented SynTissue, which was developed to mimic the properties of live tissue. With a high water content (similar to living tissue), the SynDaver Synthetic Human must be stored in a liquid solution to avoid dehydration. In such an environment, it's necessary to actively combat common biological contaminants present in the air, in non-sterile water, on surfaces and the hands of those interacting with the model.

A novel storage solution, consisting of 90% water, 10% isopropyl alcohol and essential oils (1 mL per gallon of IPA) effectively protects the SynDaver model's SynTissue structures from a wide array of contamination sources such as poor municipal water quality, airborne contaminants and physical handling during normal use. The IPA-based storage solution is long lasting, with only occasional replenishment required.

Due to the presence of diluted isopropyl alcohol in the solution, the use of the solution requires adherence to good laboratory safety practices including utilizing appropriate personal protective equipment (apron, gloves, goggles) while maintaining the model. It is further recommended that an eyewash station be in close proximity to the model storage area.

During normal interaction (when the SSH is not submerged in its tank), users should touch the model only while wearing gloves.

With proper laboratory and SSH handling protocols, the IPA-based storage solution is safe and extremely effective in maximizing the lifespan of your SynDaver Synthetic Human model.

Please follow all applicable federal, state and local laws for the disposal of the IPA-based storage solution.

Monitoring the Health of your SSH

Visually inspect your SynDaver Synthetic Human model and tank conditions during each use or at a minimum, every two weeks. The IPA -based storage solution may become cloudy. This is normal and does not affect the efficacy of the solution.

Over time, your SSH should remain pristine and free from any sort of microbial growth. As the model ages, it is normal for muscle and organ colors to fade slightly. The white portions of the model (tendon, skeleton) should remain white.

While the IPA-based storage solution overcomes most issues with water quality variations (by neutralizing microbes), the presence of sediment in your water supply may adversely affect the aesthetics of your SSH model. The presence of sediment can be identified by its accumulation at the bottom of the tank and/or a browning of the white portions of the model, most often recognizable on the hands and feet. While discoloration due to sediment is not a serious issue, SynDaver does recommend installing a sediment filter if sediment is present in your water supply.

In the Event of Issues with your SSH

Should you encounter any issues with your SynDaver Synthetic Human model, please contact our SynDaver Care team immediately. Additional information for the care and storage of your SSH model can be found at www.syndaver.com/syndaver-care (QR code below).

Email: care@syndaver.com

Phone: (813) 600-5530



SynDaver Synthetic Human

NOTE: This instruction is for Immersion Tanks manufactured by Morteck Industries and sold by SynDaver Education. Nominal tank capacity ~100 gallons.

If using a different make of immersion tank with a different capacity, determine the nominal total capacity of storage solution, and refer to the IPA chart on the reverse side of this document.

Initial Fill (Required Items)

- Clean Water source
- Eleven (11) gallons of 99% Isopropyl Alcohol (customer supplied)
*10 gallons for initial fill, 1 gallon for replenishment
- Essential oil and pipette (SynDaver supplied)

Steps

STEP 1: Premix IPA and Essential Oil Additive

- Premix 99% IPA and essential oil. Add 1 mL of essential oil into each gallon of IPA.
- Securely close the IPA container and gently agitate to mix contents. The solution is now ready for use.

STEP 2: Begin Filling Tank with Clean Water

- With the SynDaver Synthetic Human model in the empty tank, begin filling the tank with clean water.

STEP 3: Add Premixed IPA + Essential Oil solution

- When the tank is ~half full, add ten (10) gallons of premixed 99% IPA + essential oils. **Do not pour the IPA directly onto the SSH.** Mix the solution by moving the filler hose to different positions in the tank during the remainder of the fill.

Replenishment

Verification of IPA concentration and the replenishment of storage solution is a CRITICAL process that allows your SynDaver Synthetic Human model to remain in excellent condition during its lifespan.

Storage Solution levels in the Immersion Tank will decrease over time due to spillage and evaporation. To maintain the appropriate concentration of IPA in the storage solution and the appropriate level of storage solution in the tank, refer to the Replenishment instruction on the reverse side of this document.

Please do not hesitate to contact SynDaver Education with questions about these instructions or with any other questions related to your SynDaver Synthetic Human model. We are here to support you.

Monitoring Tank Health

Visually inspect your SynDaver Synthetic Human model and tank conditions during each use or at a minimum, twice per month. The IPA-based storage solution may become cloudy. This is normal and does not affect the efficacy of the solution.

Over time, your SSH should remain pristine and free from any sort of microbial growth. As the model ages, it is normal for muscle and organ colors to fade slightly. The white portions of the model (tendons, skeleton) should remain white.

While the IPA-based storage solution overcomes most issues with water quality variations (by neutralizing microbes), the presence of sediment in your water supply may adversely affect the aesthetics of your SSH model. The presence of sediment can be identified by its accumulation at the bottom of the tank and/or a browning of the white portions of the model, most often recognizable on the hands and feet. While discoloration due to sediment is not a serious issue, SynDaver does recommend installing a sediment filter if sediment is present in your water supply.

Using the Atago PAL-37S Refractometer to Measure IPA Concentration

STEP 1: Press START to power up the Refractometer

STEP 2: Thoroughly clean the optic (see arrow) with a soft cloth

STEP 3: Calibrate the Refractometer by filling the optic well half full with DISTILLED water. Press ZERO. To confirm, press START to get a reading on the distilled water. The reading should be 0.0% IPA. If the reading is NOT zero, return to STEP 2.

STEP 4: Empty the optic well and clean with a soft cloth

STEP 5: Using a pipette, collect a water sample from the storage tank, 3"- 4" under the surface of the storage solution

STEP 6: Fill the optic well half full with storage solution

STEP 7: Press START. The percentage of IPA in the solution (by weight) will be displayed.

Optimal IPA concentration as read by the Atago PAL-37S refractometer is between 7% and 8.5%

A 7% reading by weight = 8.9% IPA concentration by volume

An 8.5% reading by weight = 10.8% IPA concentration by volume

Best practice: Take multiple readings of the storage solution with the refractometer to confirm concentration



If the reading is below 7%, add straight 99% IPA to the storage solution (do not pour directly onto the SSH) to bring concentration levels up to between 7%-8.5% (by weight as measured by the refractometer). Agitate the storage solution to evenly disperse/mix the added IPA.

Calculating IPA Requirements for Non-Standard Storage Containers/Tanks

If storing your SynDaver Synthetic Human in a non-standard tank, use the following formula to determine the amount of water and IPA needed for the initial fill. The replenishment process does not change based on storage tank size.

First, determine the total amount of storage solution required. Considerations to take into account are the total capacity of the storage tank and the amount of storage solution displaced by the SSH model. Use 2/3 or 3/4 of the total tank capacity as a starting point.

$$[\text{Calculated Storage Solution Quantity}] \times 0.9 = [\text{Amount of Required Water}]$$

$$[\text{Calculated Storage Solution Quantity}] \times 0.1 = [\text{Amount of Required 99\% IPA}]$$