

F R E E

While the world of beauty has never taken kindly to the word “dry,” **new innovations in the “this lasts longer and doesn’t involve water” skin-care** variety may sway even the staunchest supporters of the standard. —*Liz Ritter*

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→ **In the history of elementary-school field trips**, there was nothing more anticipated (at least for a very specific group of us living in the northeast corridor of the U.S. on planet Earth during the ‘80s) than a visit to Washington, D.C. The early-morning bus ride, a quick glimpse of the White House, the Hard Rock Café T-shirts, and the culmination: A few minutes at the end of the day for some unchaperoned free time at the mothership of all gift shops, the Smithsonian National Air and Space Museum, where rows and rows of freeze-dried astronaut ice cream awaited those of us armed with a few months of saved allowance and some extra room in our backpacks.



IMAGE SOURCE/GETTY IMAGES

Fast-forward to now: The space race is back in full-force and so is an increased interest in everything freeze-dried—only this time, it's showing up in skin care.

"Freeze-drying has been done for years in the food industry, and now the cosmetic world is catching up to how efficacious it can be," says celebrity aesthetician Veronica Barton Schwartz. "There are many countries that use this technology—Korea has been using freeze-dried collagen and hyaluronic acid patches to heal skin wounds for a while; I also saw it in Japan and China when I visited a few years ago, and now it's here."

As cosmetic chemist Kelly Dobos explains, in a nutshell, freeze-drying—which she coins "the latest trend in waterless beauty"—is done by using a low-temperature dehydration process. "Freeze-drying is a sophisticated process in which pressure and a small amount of heat are applied after a material has cooled below freezing so that water sublimates—meaning it goes from a frozen solid state to gas without melting into a liquid first. This process preserves the qualities of the original ingredients in their natural and raw form. The dried ingredients are rehydrated by mixing with water to activate just prior to use."

While Dobos says not every skin-care ingredient is suitable for the freeze-drying process ("sophisticated proteins and peptides are fragile and can be damaged; plus, it is difficult to freeze-dry multiple ingredients together because of differences in the freezing behavior of the individual components"), she does see the technology as especially useful for botanical ingredients that contain heat-sensitive components that can easily degrade with other drying methods. "Controlling the size of ice crystals formed in the process can also rupture cell walls of plant materials, allowing for the more effective release of some beneficial components. Some freeze-dried

ingredients like aloe vera have been used in cosmetics for years because of the benefits in handling and storage, but the processing can be costly, so up until now, its use on a larger scale has been fairly limited."

Another plus: Freeze-drying extends shelf life, which in turn, could be gentler on the environment, and sensitive skin types as well. "Due to a lack of preservatives, freeze-dried skin care is also hypoallergenic. When water is present in a formula, that formula needs a preservative to keep it safe, but freeze-dried ingredients don't need to be preserved [microbes need water to survive], so there is less chance of contamination to the ingredients," Barton Schwartz says, pointing to ingredients like hyaluronic acid and polyphenols as working especially well. "Researchers are still doing studies on what actives can and cannot be freeze-dried, but using fewer and fewer preservatives on our skin may be a win-win for everyone, especially in the post-COVID era."

While Rochester, NY dermatologist Lesley Loss, MD says there is definitely something intriguing about the "more potent and purer" promise, she stresses that a number of factors must be considered, including how the ingredients are prepared and any potential mishandling by the end user. "It's too soon and the technology is too new to say if these products are more effective," she adds. "I think the technology and innovation with freeze-dried beauty will continue to evolve, and we'll see even more advancement in product efficacy that allows improved delivery of active ingredients, all while eliminating preservatives, fillers and stabilizers."

"From professionals recommending the most effective products for particular treatments to over-the-counter products and those who wish to minimize unnecessary ingredients from daily use, freeze-dried beauty may hold a key," Dr. Loss says.

Science Class

The removal of water also reduces weight for transport, says Dobos. "It's why NASA uses freeze-dry technology to get food supply to the space station. Cost and the types of ingredients that can be freeze-dried successfully are limiting factors, but sustainability and eco-friendly beauty trends favor its broader application in cosmetics."

PASCAL BROUZE/GETTY IMAGES

"Freeze-drying has been done for years in the food industry, and now the cosmetic world is catching up."

Dry Nice

These powdered actives deliver some potent skin-care solutions—just add water.



Rael Moisture Melt Snowball, \$24, getrael.com



Beauty Pie Superdose C Vitamin C Ampoules, \$100, beautypie.com



Saro de Rüe Freeze-Dried Hyaluronic Acid Anti-Aging System, \$170, saroderue.com



Weibo Eye Masks, i-solu.com