



Cosmesis: The Art of Making Artificial Limbs Look Lifelike

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Cosmesis is the art of making artificial limbs look lifelike. Artificial hands can now be made to look very “real” with freckles, veins, hair, fingerprints and even tattoos. In fact, many people cannot tell them apart from actual hands.

Kim Doolan has a story to tell about her hand cosmesis. She talks about a time when she was going through airport security and her artificial hand set off the metal detector. But security did not believe she had an artificial limb because it looked so real. “They can’t see that my right forearm and hand aren’t flesh and blood. They usually have to feel the prosthesis several times before convincing themselves,” she says.

Here are some reasons why Doolan’s prosthesis “fools” people into thinking it is real:

- The prosthesis is painted to match her other arm. This includes subtle color changes around her knuckles and palm.
- It is carved just for her. This was done by an impression taken from her other arm.
- It has lifelike-looking fingernails. These include lunulae (half moons) at the fingernail bases and white at the tips.
- The prosthesis has a clear outer “skin” that, in many ways, acts just like natural skin. For instance, veins show through the skin and do not look like they are just painted on.



Another reason why Doolan’s arm looks so real is that she does not try to hide it. “I know most people won’t notice I’m wearing a prosthesis. That gives me confidence to keep it out in public and not hide it beneath long sleeves or inside pockets.” Doolan adds, “I walk with a more natural gait with both arms swinging at my sides and feel free to use my prosthesis to help me with various two-handed activities.”

While some amputees prefer not to wear lifelike-looking prostheses, most say they would rather blend in than look different from others. Mike Holt is president of a company that makes cosmeses. He explains that they not only look good but also can help with comfort. For instance, he says that custom-made cosmeses can help:

- Improve gait and posture
- Ease lower back pain
- Relieve pressure on bone spurs and other sensitive areas
- Protect tissue from further injury.

Cosmesis options

There are many options for cosmeses. These affect: durability (how long prostheses last); quality (how well they are made); accuracy (how well they work); realism (how lifelike they look); and cost. Here are some facts to know about options.

Materials. Cosmeses can be made from either silicone or PVC (polyvinyl chloride). Here are some facts about each:




Silicone:

- Looks lifelike
- Resists stains
- Does not fade in color as much as PVC
- Is flexible and easy to bend
- Is not as likely to be damaged by the sun or extreme hot and cold temperatures
- Is not as likely to cause body reactions
- May last for years

PVC:

- Does not tear as much as some types of silicone
- Costs in the hundreds (not thousands) of dollars
- Shows stains and dirt and will need to be replaced about every six months






Standard cosmeses. These come ready-made in several sizes and are made from either silicone or PVC. Standard cosmeses are often low-cost but are not as realistic.

Custom-made cosmeses. Most of these are made of silicone. They may cost thousands of dollars if there is a lot of detail. William J. Hanson is president of a company that provides custom cosmeses. He says that they can include details such as freckles, veins, hair, tattoos and even painted fingernails.

Custom-made silicone covers. These combine features of both standard and custom cosmeses. For instance, covers can be made to match a person's skin color but not include hair, wrinkles, age spots or other details. Covers come in so many colors that people can almost always find one to match their base color, suntan color, and even palm color (if they have dark skin). Covers cost less than custom-made cosmeses. They tend to be of higher quality than standard cosmeses.

James G. Stuart is president of a company that makes covers. He talks of the benefits, saying that covers resist stains, do not absorb moisture, and are not likely to tear. Stuart adds that the elasticity of covers “makes donning and doffing easy and allows good movement of the underlying prosthesis.”

Michael Kaczowski is president of a company that makes covers for lower-extremity prostheses. The covers he makes come in two elastic sizes and have




details such as custom toes. Kaczkowski says that the covers fit without the use of glue or a heat gun. People can just “stretch them on and go.”

Urethane “skin” finish. This finish is applied to a prosthesis by spraying or brushing. Jeff Kingsley is president of company that makes such a product. He says that finishes come in three standard colors that can be tinted to match most skin tones. After the finish is applied, features such as freckles or the appearance of hair can be added. “This finish provides a durable, waterproof urethane protective coating that is easy to clean. When applied over a foam cover, it has the texture and feel of actual skin,” says Kingsley.

Ways cosmeses are attached include:

- Adhesive (glue)
- Suction
- Form fitting
- Sprayed, painted, or brushed onto the prosthesis
- Stretchable skin. For above-knee prostheses, this “skin” is applied to a foam cover and stretches when the prosthesis bends.
- “Skin” sleeve. The sleeve goes on top of the prosthesis and then is heated and shrunk to fit.



Cosmeses today are very good, but companies are looking for ways to make them even better. For instance, companies are looking for ways to make cosmeses change color during certain activities (such as being in the sun) or fade at the same rate as natural skin. They are also finding new ways to make them last longer and not get damaged, torn or stained.

Today, you have a lot of cosmeses options. Soon, you will have even more.

*Translated from **The Wonderful World of Cosmesis***
<http://www.amputee-coalition.org/military-instep/cosmesis.html>

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