CHAPTER SAMPLER

Guide to Truama Makeup for Theatre and Film

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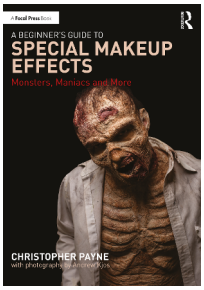
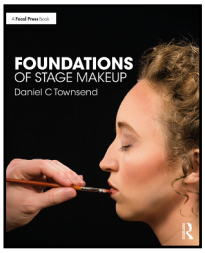
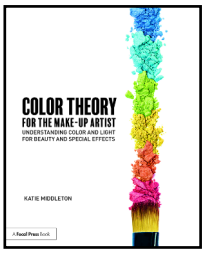
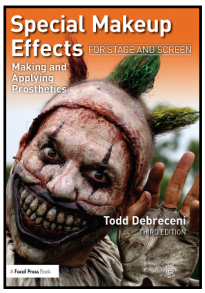
Contents









SEVERE BURN

The **Basic Burn** was a fairly simple method for creating a burn injury, but the time has come to create a more advanced (and much gorier) option. You've already used gelatin to create boils, and I briefly mentioned using it for burn scars in the **Skin Texture** chapter. Now you'll use it to produce a **Severe Burn** makeup.

You can use gelatin in your hair without worrying about it getting stuck. If you have longer hair, it helps to either pin it in place first with bobby pins or slick it down with hair gel so you have a flat surface to work on (let the gel dry before you begin the makeup). Using a bald cap for full-head burns will make cleanup a lot easier.

STEP 1

Cut a few strips of flesh-colored tulle or silk. These strips should be about a ½-inch wide and 2 inches long. The more delicate the fabric, the more easily it will disappear into your skin.

STEP 2

Glue the end of a strip to your upper lip, then carefully pull it up and glue the other end to your cheek to pull your lip open into a grimace. Repeat this technique on the lower lip.

FIGURE 24.1 Step 2

STEP 3

Glue the back of your ear to the skin behind it to flatten it against your head as much as possible.

STEP 4

Mix one tablespoon of unflavored gelatin powder with one tablespoon of hot water in a small cup. As with the plague boils, you can also add a quarter-teaspoon of glycerin to help prevent the gelatin from drying out. This isn't required, but it will help your makeup last longer.

Use a craft stick to mix the water and powder together. Keep stirring the mixture until it begins to cool.

> **Professional Tip:** *Test the temperature of the gelatin on the inside of your wrist. If it's okay on your wrist, it should be okay on your face. Better to have some of the gelatin cool in the cup than to get burned for real!*

FIGURE 24.2 Step 5 in progress

STEP 5

Spread the gelatin onto a section of your face. Don't worry about covering the whole thing; you will create this makeup using several overlapping batches.

Tap the flat side of your craft stick against the gelatin as it starts to cool, which will pull up strings that you can goop back and forth to get some pretty cool texture. When you're happy with that section, let the gelatin finish cooling.

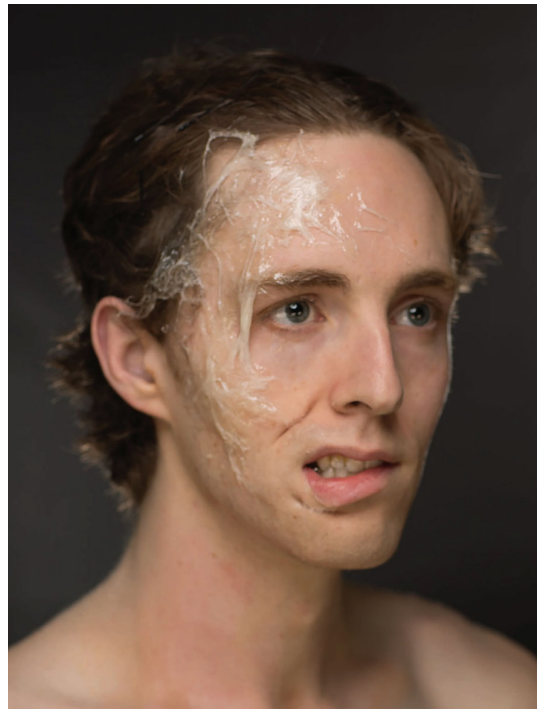


FIGURE 24.3 Step 5 complete

STEP 6

Apply more gelatin to your face, building up the burn gradually section by section. You can extend the gelatin into your hair to make it look like it's been burned away. Your eyebrows can get covered too, but stay away from your eyelashes.

FIGURE 24.4 Step 6

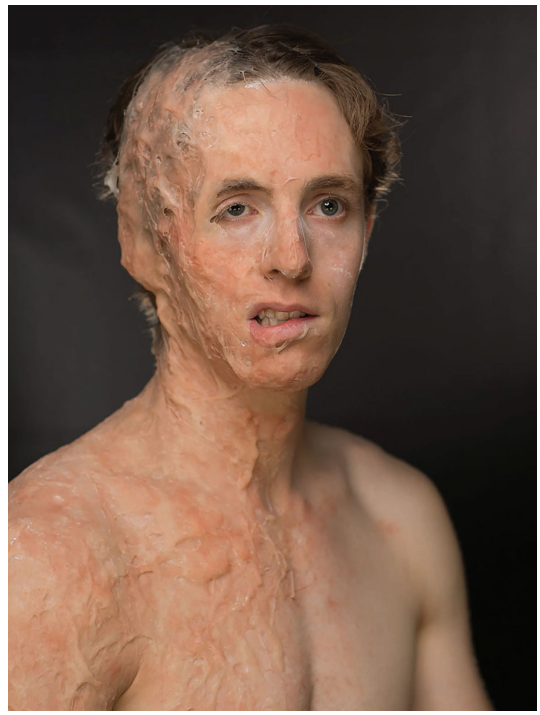


FIGURE 24.5 Step 8

They could get pulled out, and that's way too close to your eyeball to be applying hot gelatin anyway.

STEP 7

Powder the burn when you're done building it up to eliminate the natural stickiness of the gelatin.

STEP 8

Apply sunburn-red makeup over the entire burn, extending it past the edge so it blends into your skin. You can mix the cream makeup with a little rubbing alcohol to create a thin wash of color. As the gelatin has a sort of nasty flesh color already, let some of that show through.

> ***Author's Note:*** *For a healed burn scar, you can stop here. The following steps will turn the makeup into a fresh, raw burn.*

STEP 9

Shadow the deeper areas with maroon to sink them in and make them look irritated.

STEP 10

Subtly add some pale-yellow highlights here and there to give the impression of melted fat. Don't go too heavy with the yellow (or too bright) or you'll start to get the dreaded pizza face. This is

FIGURE 24.6 Step 9

FIGURE 24.7 Step 10

another area where a thin wash of color works better than a heavy coat.

STEP 11

Use the maroon to fill in any exposed skin on your eye as well. Keep this area blotchy so it doesn't look out of place. Powder when you're done.

STEP 12

Lightly add some black to the high points to give the illusion of charred flesh. You can use makeup, black setting powder or even an additive such as crushed Oreos for extra texture (and a chocolatey smell). Subtlety is key here. You took a lot of time doing this makeup, so don't cover the entire thing in a solid layer of black!

STEP 13

Finish the burn with a light coat of KY to give it a shiny, raw appearance. This last step will really make the burn seem nasty. Brush your hair over any hard edges in the gelatin to hide them.

Because gelatin melts in hot water, this makeup is super easy to remove. Just take a hot shower and let it come off on its own! I like to use a drain cover to catch any big chunks, which get thrown away. Anything small enough to slip through the little holes will just dissolve.

TRAUMA MAKEUP

The term *trauma* encompasses a variety of effects. For theatrical purposes, it means a bruise or wound on the skin. The size and severity of them may vary, but they can be as mild as a small cut or as serious as a severed limb. There is no end to the trauma effects one can create, and it is easy to get carried away with stage blood and fake gore. Before exploring advanced techniques, it is important to master the basics. The standard makeup kit should contain everything needed to achieve these special effect makeups, with the exception of a few additional products. The following is a list of several basic effects and the steps needed to recreate them.

EFFECT #1: BRUISES

Before creating a bruise with makeup, several questions need to be answered.

1. What caused the bruise?
2. Where is the bruise?
3. When did the impact occur?
   - First comes the discussion of what caused the bruising effect. If there is a facial bruise, then it is usually caused by an assault by another individual or a solid object coming in contact with the face. Most things that come in contact with the body can leave different bruises. What caused the impact determines the shape of the bruise being created. For instance, punches and kicks will make bruises along with ropes and hard objects. Depending on the situation, impacts with walls and concrete will also leave bruising. The intensity of the impact will also change the intensity of the bruise.
   - Second, the location of the bruise must be determined. Different areas of the body will produce a different type of bruise. Color, size, and intensity will all vary depending on the impact's location. For

instance, fists make good bruises around the eye areas while hard objects leave bruises and welts on the forehead. Impacts to walls and blacktop can cause bruising on the chin and cheekbones; however, bruising seldom occurs on the fleshy part of the cheeks. When it comes to the neck, the most common theatrical bruise would be a strangulation caused by a hand or rope. The same holds true for arm bruising. These forms of bruising will contain more violets and blues in the early stages, while black eyes will have more pockets of red. Answering this second question produces the majority of information about this trauma effect.

- Last, but equally as important, is knowing when the impact occurred. This can be the trickiest question to answer and may require research to ascertain. Trauma effects are special because they all have a life-cycle. A life-cycle, in this context, means they have a moment of creation where the wound is fresh, then as time goes by, the process of healing occurs. Eventually most trauma effects can heal to a final point, and that would be the end of the life-cycle. For a bruise, this is very important. At impact, and usually a day or two after, bruises are their most vibrant shade. On the face, arms, and neck, bruises are often purple and blue with deep maroon under the skin signifying blood trapped beneath the surface. Over time, as bruises heal, the purple and blue fades giving way to brown and sallow yellows. The last stages of a bruise are slightly yellow with a tinge of brown before they vanish completely.

- Bruises are very interesting with no two ever alike. While applying bruises to the skin, be sure to make them asymmetrical with pockets of intensity. Following are three major stages of bruising from the moment of impact to being almost healed. The following directions are the same no matter your skin tone. The only difference for darker skin tones would be using a deep golden tone as a substitute for the yellow cream mentioned here. Also remember that no matter the effect, powder when it is finished.

  A. Fresh bruises contain the most intense colors. Using a sponge or finger, apply a thin layer of yellow cream to the desired bruise area. When focusing on a black eye, good areas to apply are on the outer corner below the eyebrow and under the eyelid. Also adding color in the lacrimal area will make the bruise look convincing as a place blood naturally pools. Refrain from laying color all the way around the eye. This can look raccoon-like and destroy the effect. Now dab a light to medium layer of violet cream mixed with navy cream. Be creative with this application and make the bruise interesting. After these colors are down, apply pockets of maroon in the lacrimal area or a small amount on the outer eye. Concentrate intensity in spots so the

FIGURE 16.1 *Fresh bruise.*

Credit: Zeek Creative

wound looks uneven and asymmetrical. Try using the stipple sponge; dabbing pockets of violet and maroon onto the wound (see Figure 16.1).

B. Mid-range bruises are in flux between bold fresh colors and the subtle colors of healing. During this period yellow and brown will appear, and maroons will vanish. Start by applying a layer of yellow cream makeup over the area, varying the location just as before. Keep the color restrained to the outer and inner eye areas for best effect. Use brown cream in light spots over the area. Brown tones appear as the maroons and navy colors disappear. They are never dark but subtle shadows of drying blood. Now add light areas of pale violet or navy amongst the brown and yellow makeup. Apply it in different intensities, keeping the original shape. Do not saturate the bruise but keep it light (see Figure 16.2).

C. Healing bruises contain soft colors. A bruise toward the end of the healing process can be light with only fading yellows and browns to denote its existence. When creating an old bruise on stage; however, it still must be bold to be seen by the audience. Start by applying a heavy layer of yellow cream makeup using a sponge or finger. Once applied, use contour color to create dimension and depth to the fading wound. Vary the spots to make them look natural. The brown cream will never be heavily applied, but it should blend well with the yellow to create a realistic fading bruise (see Figure 16.3).

FIGURE 16.2 *Mid-range bruise.*

Credit: Zeek Creative

FIGURE 16.3 *Healing bruise.*

Credit: Zeek Creative

EFFECT #2: CUTS AND ABRASIONS

These effects encompass lacerations, cuts, abrasions, and any other wound where the skin is sliced open using a sharp instrument. The nice thing about abrasions is that they can go anywhere on the body, and the same rules will

still apply. The key to making cuts and abrasions believable is inconsistency. If cuts are too straight, they look fake. When determining the best place to apply them, consider surfaces that are curved – the nose, cheeks, eyebrows or lips. Follow these steps to achieve simple yet effective stage effects.

Step 1: Irritation color

- Skin, when irritated, turns pink or red. This is a good first color to lay down. Apply a light coat of pink cream makeup to the area where the cut should be. It is fine to spread it out from the area just a bit, but do not overdo it.

Step 2: Shadow color

- Stage cuts should have a bold outline, so they can be viewed by the audience. Using a sharp, black eyeliner pencil or a thin brush with black or dark brown makeup, trace the shape of the cut. Even if it is supposed to be a straight cut, the edges should be jagged to create a more natural look. When drawing the cut, allow a thin space in the middle. The black not only outlines the abrasion but will double as the shadow tone.

Step 3: Red color

- The center of the black lines is where the tissue is exposed. Apply a blood red color to the inside of the laceration. Keep it concentrated only to the inside of the cut.

Step 4: Blending

- Contour on wounds is still important, and now you can start adding realism. Using a tiny brush, blend small areas of the black line away from the interior of the cut. Don't do it all the way around but vary the blending. Remember, the key to realism is inconsistency.

Step 5: Highlight

- Wherever there is shadow, highlights also exist. Apply a small amount of highlight to small outside edges of the black line. This makes it appear like the skin raises at the edges of the laceration creating dimension (see Figure 16.4).

Step 6: Blood

- If the intent is to create a fresh cut, adding blood will complete the effect. With a small brush, apply spots of blood to the interior of the wound. For a newly created wound, consider what path the blood takes as it drips from the cut. Varying this path creates another layer of realism to the basic trauma effect.

EFFECT #3: SCARS

Scars are simple to create and very effective no matter the skin tone. The most effective scars are old lacerations and cuts that have healed over

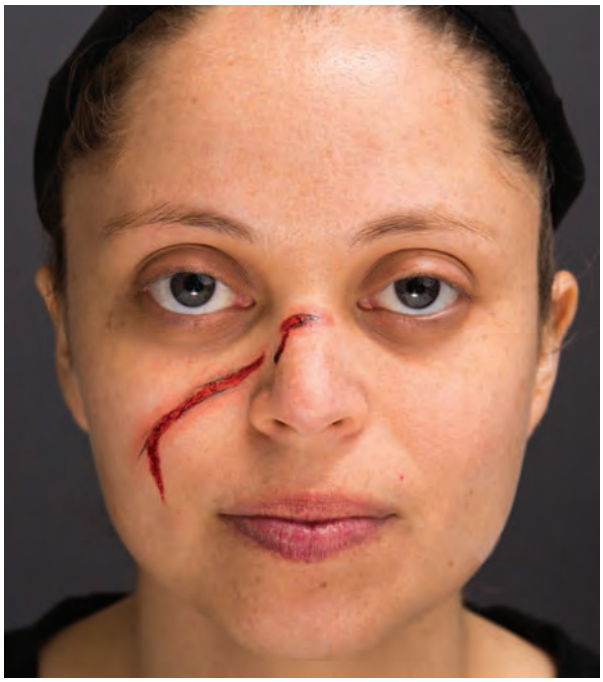


FIGURE 16.4 *Completed cut.*

Credit: Zeek Creative

time. Before getting started, know what created the initial wound and how long it took to heal. Scars can be any shape, just remember the rules for highlight and shadow. The intensity of the colors will vary depending on the size of the performance space.

- For lighter skin tones, use a pink cream tone and place it in a line where you want the scar. Next, apply a broken soft line of highlight color. If you make the line too uniform, it will not look natural. Now use a thin brush to add a light application of contour color under the soft highlight line. This will give the scar dimension and make the skin appear slightly raised (see Figure 16.5).
- For darker skin tones, apply a soft line of contour color in a broken line. Scars deepen in color on darker skin tones, so the color should be noticeable from the audience. Consider using a thin line of black or ebony inside the contour line in spots to denote depth. Next, take your highlight color and place that underneath the contour color in soft spots. You can even apply highlight on either side of the contour stripe to give the appearance of raised skin on either side of the indention (see Figure 16.6).

FIGURE 16.5 *Scar for light complexions.*

Credit: Zeek Creative

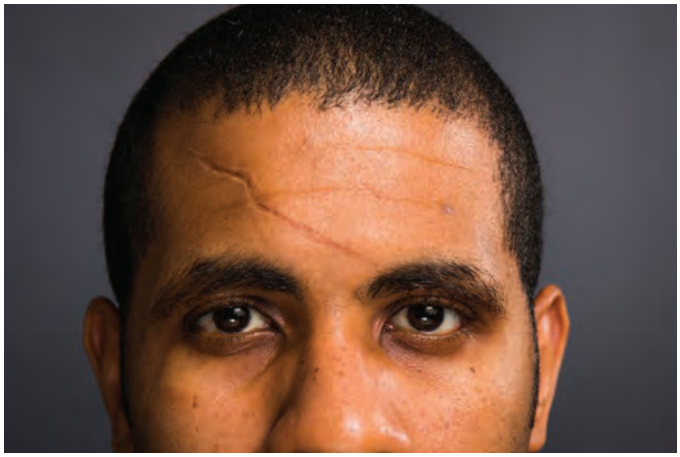


FIGURE 16.6 *Scar for dark complexions.*

Credit: Zeek Creative

EFFECT #4: BURNS

Some of the best trauma effects contain three-dimensional elements. Burns are a great first-step in exploring this three-dimensional quality. For this application, powdered, unflavored gelatin can be used to create dynamic burns in a short amount of time. Generic brand gelatin can be found at many grocery stores, or pectin – a vegan substitute – may be used as well. Both are sold in small boxes with individual packets inside. For this

makeup, a few small packets will be enough. Be sure to have a small cup to mix the product and a stick to stir.

Step 1: Mix the gelatin

- Empty 1 packet of gelatin into a small paper cup. Add one tablespoon water into the gelatin and mix with a small wooden stick or the end of a makeup brush. Water temperature affects how quickly the gelatin solidifies. Using cold water will make the gelatin solidify faster while warm water will make the gelatin solidify slower. The same can be said with the amount of water used. Less water used will make the gelatin lumpier; more water used makes the gelatin smoother. Practice mixing the product before the final application.

Step 2: Apply the gelatin

- Use the stir stick to apply the gelatin to the skin where the effect should be. Do this quickly before it completely solidifies, or the product will not stick to the surface. Make sure the burn area is bumpy and rough. The more texture created the stronger the three-dimensional effect. Consider using multiple applications of gelatin for a severe burn.

Step 3: Add makeup

- Once the gelatin has solidified and cooled, makeup can be applied. When applying makeup to the wound, add it to the skin as well. This will transition the gelatin burn to the skin hiding any seam there may have been (see Figure 16.7).
- Mimic skin irritation from a burn by applying a light coat of pink cream makeup over the area. Using a sponge or brush, apply the color to low and mid-range areas.
- Next, apply contour color or maroon to low areas. This helps to emphasize the depth of the burnt flesh. Once the contour color is applied, add soft dabs of highlight to the peaks of the gelatin. How fresh the burn is determines how the colors will be, so make sure to know the life-cycle of the wound.

Step 4: Detail the wound

- Now that the basic coloring is in place, details can be added depending on the freshness of the wound. Apply a deep red to parts of the lowest areas. These may overlap or blend with the contour color, but that is fine. The wound should appear as if bright flesh is exposed. Once this is complete, dab the stipple sponge into black or dark brown cream makeup. Apply this color sporadically as it will represent the charring of skin.

Step 5: Apply blood

- Adding stage blood is the cherry-on-top. Dip the stipple sponge or makeup brush in a bit of stage blood to give the area a wet smattering of blood. If the burn is fresh, then this is the essential final step (see Figure 16.8).

FIGURE 16.7 *Cooled uncolored gelatin.*

Credit: Zeek Creative

FIGURE 16.8 *Completed burn application.*

Credit: Zeek Creative

EFFECT #5: POPPED PUSTULES AND PEELING SKIN

Creating peeling skin, popped boils, and pustules can transform even the most simplistic makeup into a grotesque creation. These two effects utilize liquid latex and follow similar instruction for application. The following outlines these techniques together and shows how they vary. Please note, if there is a latex allergy then this effect should be avoided.

Step 1: Liquid latex

- Using a brush, apply a moderate layer of latex over the affected area. It will take several layers of latex, but if using thick layers, then only a couple of coats will do. Now use a hairdryer, on the cool setting, and direct it on the wet latex to decrease drying time. This can take three to six minutes, or until the first layer dries completely. After the initial layer has dried, apply a second layer of liquid latex over the first. Repeat the drying process. If there is time to do a third layer of latex, then follow these same steps. The goal is to make the latex thick enough to manipulate. Also, pay attention to the edges since they should be thin and blend into the skin (see Figure 16.9).

FIGURE 16.9 *Applying liquid latex.*

Credit: Zeek Creative

Step 2: Add Undertone

- Apply a layer of burnt red or dark pink cream to the dried latex. Allow the color to blend over on the skin to help conceal the transition from latex to skin. Just like with blocking out eyebrows, the red tone adds a natural flush under the foundation color. Powder over this, then apply the foundation and powder.

Step 3: Cutting the latex

- At this point determine which effect will be created, then follow the steps listed here (see Figure 16.10).

  A. **Peeling skin**: Using tweezers or fingernails, pick at a small point in the middle of the latex. Now pull the latex away from the skin and use a small pair

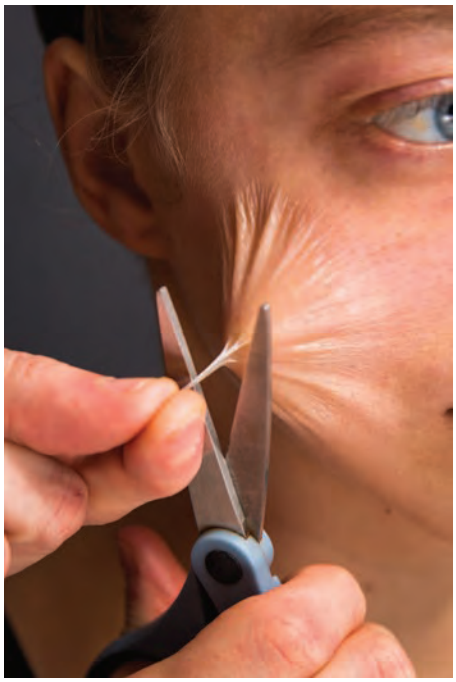


FIGURE 16.10 *Cutting technique for dried latex.*

Credit: Zeek Creative

FIGURE 16.11 *Uncolored peeling skin effect.*

Credit: Zeek Creative

of scissors to cut the latex and allow it to bunch or hang. Depending on how serious the wound is, cut and pull whatever bits should be shredded. This will now simulate mangled skin hanging from muscle tissue (see Figure 16.11).

B. **Pustules**: Pustules can be popped boils or other exposed skin diseases. Utilizing the same technique as with peeling skin, pull up a portion of the latex with tweezers or fingernails until there is a section separated from the skin. Now make a clean snip with the scissors, then let the latex relax. The result should be a rounded hole in the latex exposing the skin underneath. Do the same effect to other areas of the skin and the pock marks will seem inconsistent and a natural progression of an infection. If the makeup calls for multiple pustules, vary the size of each one (see Figure 16.12).

Step 4: Skin coloration

- Now that the under-skin is exposed, it is time to apply the color. Crimson or blood

FIGURE 16.12 *Uncolored pustule effect.*

Credit: Zeek Creative

red cream makeups are good colors to paint the under-skin. Using a brush, cover the area inside the holes and underneath the latex. Next use dark brown or black to color the under-edge right at the jagged cut of the latex. This adds a shadow and visually pulls the latex wound away from the bright red flesh underneath. Blend the dark color into the red to add a natural shadow effect. Consider adding a touch of highlight to the outer rim of the latex as another way to visually pull the latex from the skin and increase the three-dimensional quality of the effect (see Figures 16.13 and 16.14).

Step 5: Blood

- To add a freshness to the wound, apply a small amount of stage blood. Using a brush or a stipple sponge, dab blood into the wound. Blood will make the wound look wet and fresh, completing this gory effect.

FIGURE 16.13 *Completed peeling skin effect.*

Credit: Zeek Creative

FIGURE 16.14 *Completed popped pustule effect.*

Credit: Zeek Creative

EFFECT #6: EXTRUSIONS

Boils, cysts, large moles, pox, and skin lesions all fall under the category of extrusions. Extrusions are wounds that tend to be isolated and enlarged. Nose putty or wax can be used to achieve these basic, yet convincing effects. These products come in several makeup kit versions, but they can also be purchased at most local costume supply stores or ordered online. A cotton ball and a small amount of spirit gum – a theatrical adhesive also found in most makeup kits – are also necessary to complete this effect.

Step 1: Applying spirit gum

- Determine the location of the protrusion and apply a small amount of spirit gum to the skin. Pull a small amount of cotton from the cotton ball and stick it onto the spirit gum. This small amount will help the putty grip the skin firmly without sliding off (see Figure 16.15).

FIGURE 16.15 *Cotton attached with spirit gum.*

Credit: Zeek Creative

Step 2: Preparing putty

- Roll a small amount of putty or wax between the palms of the hands. This process warms the product and makes it pliable. By the time a small ball of putty has formed, the spirit gum and cotton should be dry and ready to go.

Step 3: Molding the putty

- Mold the putty onto the cotton while blending the edges onto the skin. Depending on the shape for the wound, there may be a large amount or small amount of putty. While blending, try to make the wax as smooth and seamless as possible. To help smooth the wax, use a very small amount of hair gel. Using gel is a great way to get the putty edges very smooth and thin to the skin; however, using too much gel will cause the putty to run (see Figure 16.16).

Step 4: Using latex

- Cover the putty in a single, light layer of liquid latex and allow it to dry. The latex gives the makeup a surface to adhere.

Step 5: Applying undertone

- Apply a layer of burnt red or orange undertone makeup first. This color is essential as it adds natural warmth to the piece. Powder the undertone color on the putty.

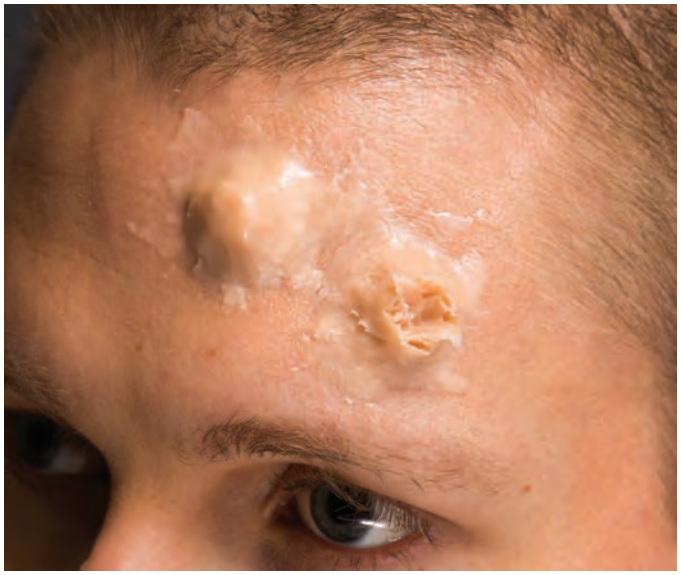


FIGURE 16.16 *Shaped putty for extrusions.*

Credit: Zeek Creative

FIGURE 16.17 *Completed extrusions.*

Credit: Zeek Creative

Step 6: Finishing the wound

- Now apply whatever colors necessary to make the wound convincing. Any of the following hues would be great to color the piece: foundation color, yellows, browns, reds, and purples. Be sure to use highlight and shadow where appropriate to make the extrusion stand out (see Figure 16.17).

APPLYING COLOR THEORY TO SPECIAL EFFECTS MAKE-UP

COLORS IN THE BODY

As special effects make-up artists, we're often given the task of creating a convincing illusion. Whether you're mimicking a simple black eye or fabricating a complex sea monster, it's important to research relative things in nature in order to achieve a believable make-up design. Researching nature can also be a great way to draw inspiration during the preparation process.

One of the more common requests for television and film is to create simple cuts, bruises, and wounds. It's important to understand what these injuries actually look like before attempting to produce them. Reference photos and thorough research are necessary if your goal is realism.

The Circulatory System

When blood pumps from your heart, it moves through the three types of blood vessels: **arteries**, **veins**, and **capillaries**.

Blood

The red hue in our blood results from the mixture of iron and oxygen. **The more oxygen that is present in blood, the brighter the red**. Blood makes its journey by travelling from the heart through arteries, and then moves back toward the heart through the veins.

Arterial blood contains more oxygen because it has travelled through the lungs after leaving the heart. By the time the blood reaches the **veins**, it contains less oxygen. Therefore, the arterial blood is brighter than the deeper-colored blood that flows through the veins.

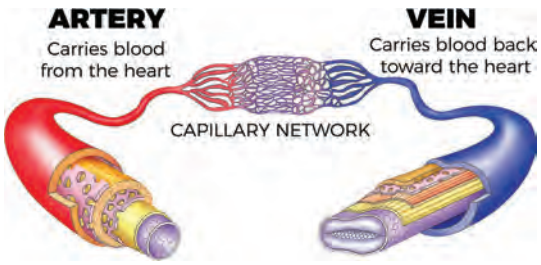


FIGURE 5-1 Original Image by ALEXILUSMEDICA/©SHUTTERSTOCK.com. Edited by author.

However, this doesn't explain why we see veins as blue or blue-green. Veins can only be seen through the skin, and the individual wavelengths of blue and red light penetrate the skin differently. **The thicker areas of skin only allow blue wavelengths to pass through, so we perceive veins as blue when the wavelengths are reflected back to our eyes**. This explains why veins seem to vary in color, depending on the individual's undertone. For example, the blue wavelength underneath a yellow undertone would give the appearance of blue-green veins. This also explains why people have **blue discoloration** under their eyes. The skin is much thinner in the area surrounding the eyes (about 1/4 the thickness of the rest of your body), which allows more light to pass through, causing discoloration and blood vessels to be more visible.

Arterial Blood—Brighter red, more oxygen (moves from the heart)
Venous Blood—Darker red, less oxygen (moves to the heart, closer to the skin)

Blood moves from the arteries and flows to the **capillaries**, which distribute oxygen to the different tissues.

> OUR LIPS AND CHEEKS APPEAR REDDER THAN OTHER PARTS OF OUR FACE, BECAUSE THEY ARE FULL OF CAPILLARIES.

When blood leaves the body, it begins to dry and release all of its oxygen, which causes it to become an even darker brown-red. Many times, if a character is wounded in a story, you may see

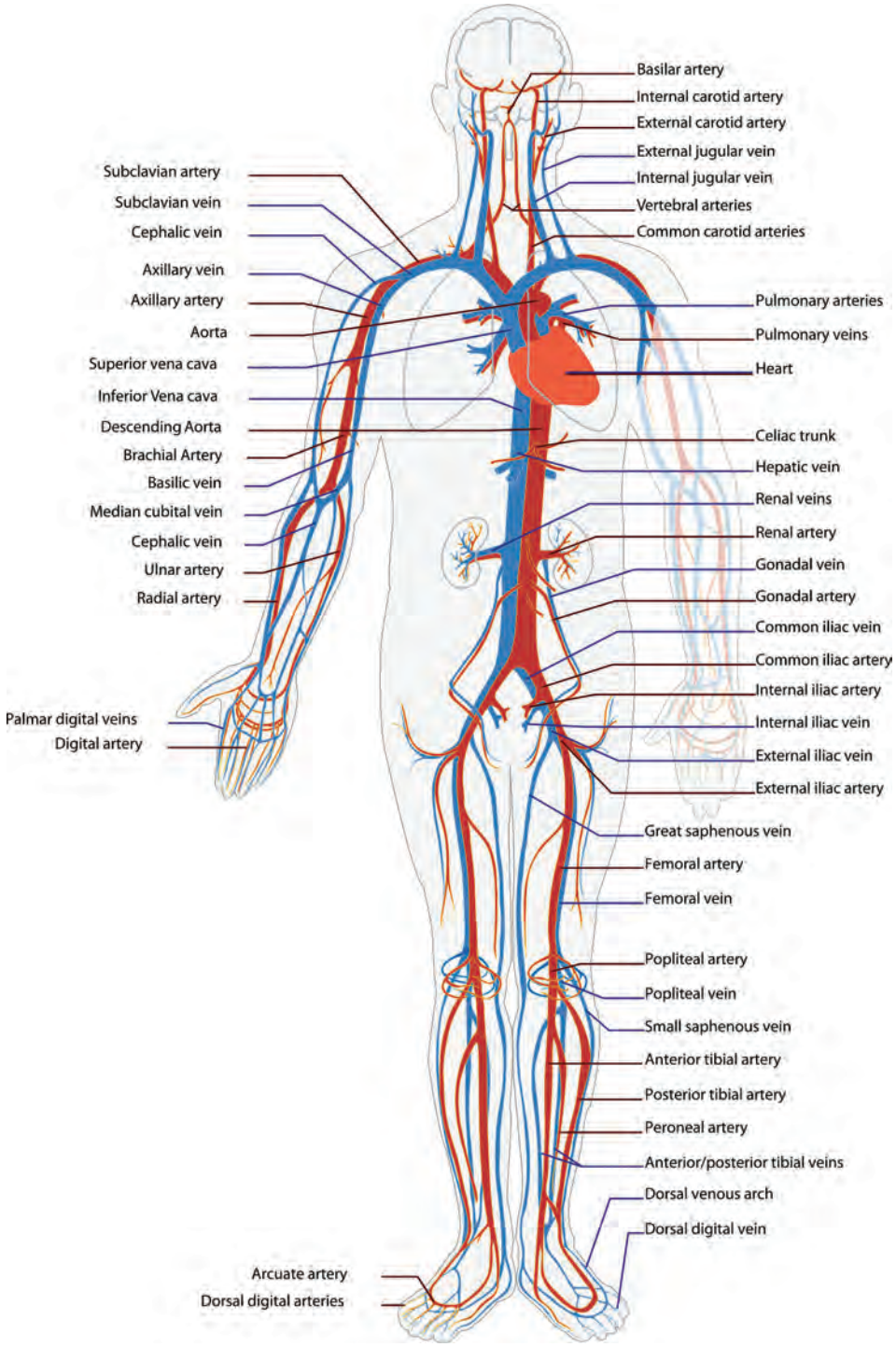


FIGURE 5-2 THE CIRCULATORY SYSTEM.

different stages of healing. It's important to observe how colors change over time as wounds heal in order to replicate them accurately and consistently.

FIGURE 5-3 Photography by ThamKC, schankz, Pakenee Kittipinyowat/©Shutterstock.com. Edited by author.

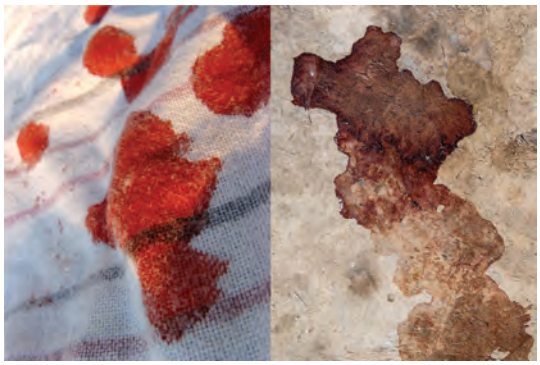


FIGURE 5-4 Original Image by Saivann, ratsadapong rittinone/©Shutterstock.com. Edited by author.

Also, notice how the area around an injury can become red, due to irritation and increased blood flow to the wound. Recreating this irritation can help authenticate your effect. Look at the person's natural cheek coloring or another flushed area of the skin. Try to match this color and use it to surround any areas of damaged skin.

FIGURE 5-5 BLOOD PASTES IN A DRIED BROWN-RED, YELLOW-RED, AND BRIGHT RED. *Fleet Street Blood Pastes*. Owned, developed and maintained by Kenny Myers/CMI, Manufactured by PPI.

When shopping for fake blood, you'll notice that it comes in a variety of colors ranging from bright reds to dark chocolate colors. Some appear more orange, and some are more pink. Be sure to consider where in the body the blood is coming from, as well as the lighting and setting of the story. A bright red blood may show up well in a very dimly lit set, but appear too bright and fake in the daylight.

FIGURE 5-6 ALCOHOL-BASED BLOOD COLORS. *Skin Illustrator Bloody Five Palette*. Owned, developed and maintained by Kenny Myers/CMI, Manufactured by PPI.

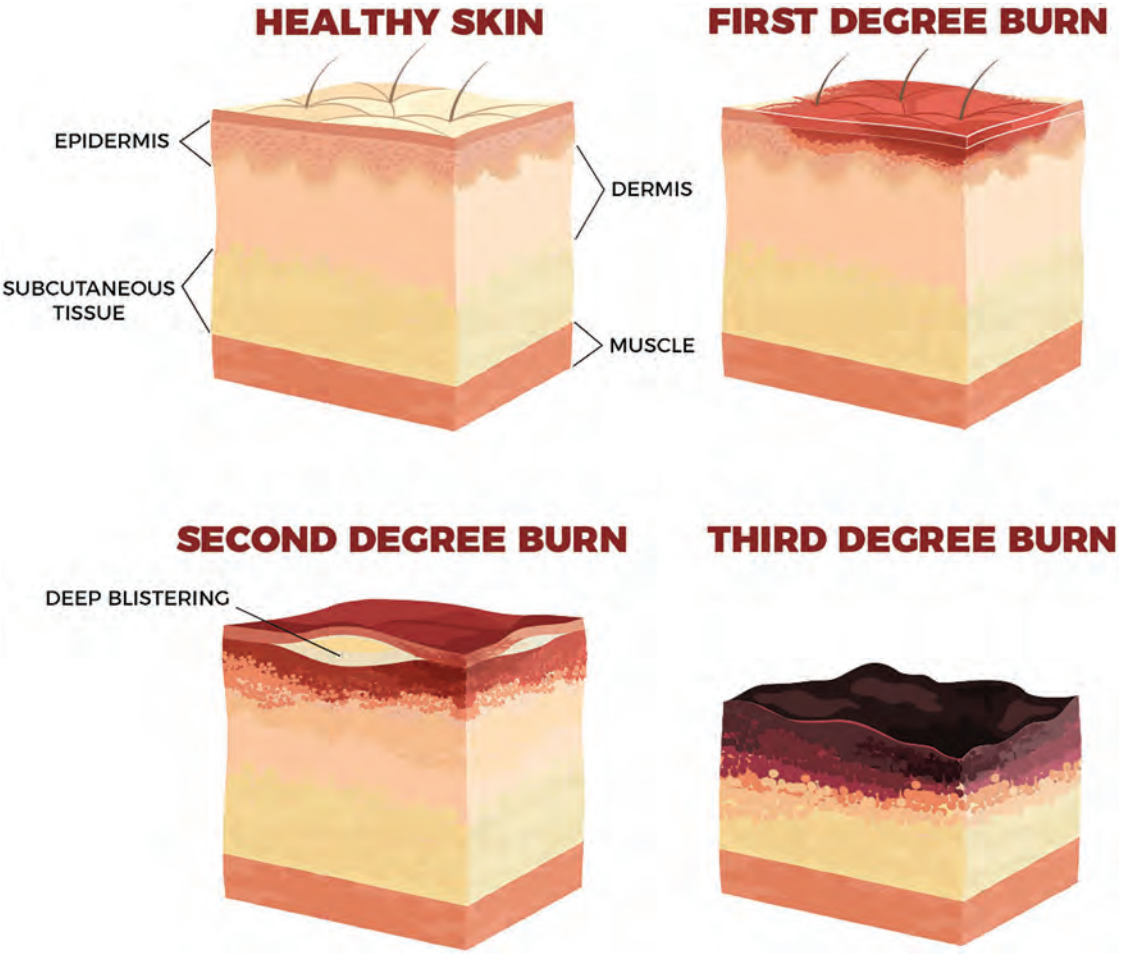


FIGURE 5-7 Original Image by logika600/©Shutterstock.com. Edited by author.

Burns

Skin tissue can be damaged from different types of burns, for example, fire, hot liquids, chemical burns, and electrical burns. The skin can turn red, pink, and yellow, and blister or peel when it's healing. Severe burns can even turn the skin black or white. It's important to find reference pictures of the severity and type of burn you are trying to recreate before you start your make-up application.

First-Degree Burn / Superficial Burn—Reddened skin without blistering.

Second-Degree Burn / Partial Thickness Burn—Reddened skin with blisters.

Third-Degree Burn / Full Thickness Burn—Skin becomes white and waxy. Skin may be charred dark brown or black. A full thickness burn can also be categorized as a fourth-degree burn when it affects the muscles and even bones.

When recreating burns with make-up, a good place to start is to mix an intense bright red with the person's natural blush color. Usually, the result is similar to the color that is present at the site of the burn. Then, you can adjust your mixture by adding deeper blood reds and charred colors where appropriate.

Sunburn

A **sunburn** is a type of radiation burn that can occur when a person is overly exposed to ultraviolet rays from the sun. The skin can turn very red and even blister, depending on the skin type and the amount of sun exposure. The blood flow is increased to heal the affected area, which explains the warmth and redness that occurs.

Sometimes adding a touch of red make-up on the nose, cheeks, and top of the forehead can be effective if you're recreating the appearance that someone has been in the sun all day.

FIGURE 5-8 Suzanne Tucker/©Shutterstock.com.

Bruises

When you're injured and a **contusion** (bruise) appears, it means the small **capillaries** have burst, and blood becomes trapped under the skin. As the wound heals and the blood breaks down, the colors change. This explains why bruises appear in so many different colors.

Bruises can form quickly when the injuries are close to the skin (typically with minor injuries), because the blood travels faster to the surface. These colors can even be noticeable within a few minutes.

When the injury is more **substantial** (like a sprained ankle), the bleeding is much deeper and takes longer to rise to the skin's surface. Sometimes, the color won't be very apparent for days.

Bruises go through a progression of colors as they heal. When working in television or film, many times a character will develop a black eye or a bruise that heals throughout the story line. It's important to know how these colors may shift so that your effect is believable once the scenes are edited together.

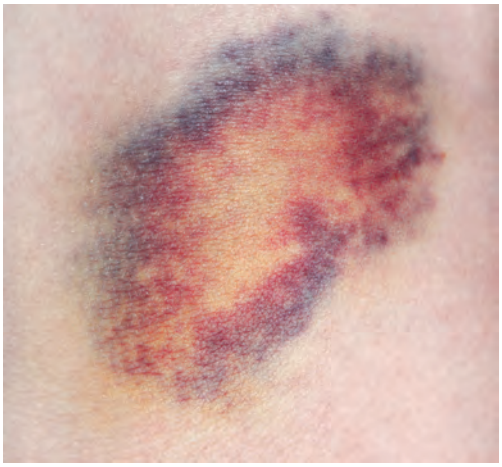


FIGURE 5-9 Lukiyanova Natalia frenta/©Shutterstock.com.

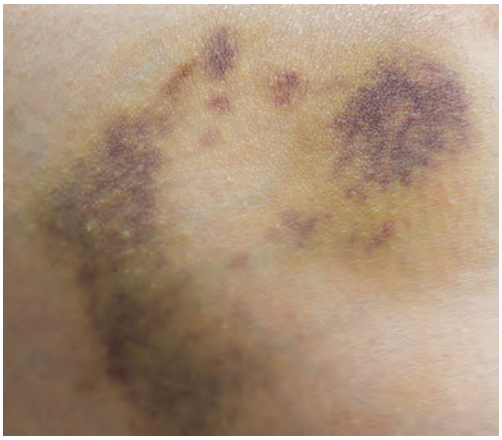


FIGURE 5-10 Patcharapa/©Shutterstock.com.

FIGURE 5-11

Bright Red

Bruises usually start as red spots, due to the fresh blood that has risen to the surface of the skin. The blood is still full of oxygen, which makes it appear brighter.

Dark Red

When the blood in a bruise begins to lose oxygen, it darkens. The iron in the blood breaks the bruise down, creating dark reds and darker purples.

Dark Purple/Blue

When there is little to no oxygen left in the blood, the bruise becomes dark purple or blue. Bruises also appear darkest when they are deep under the skin. They can even look black where the purple is most concentrated.

Green

Green appears around the bruise when the **hemoglobin** (protein in the blood which transports oxygen) begins to break down. During this process, **biliverdin** (a bile pigment) is formed, which is green in color.

Yellow/Brown

Yellow and brown appear around a bruise when **bilirubin** is present. Bilirubin is a yellow-brown substance, and it is created as red blood cells are broken down while the body is clearing away blood from a bruise. Bilirubin is usually visible during a bruise's final healing stage.

A **black eye** is a form of a contusion. The blood travels and pools around the eye and is more apparent because the skin is much thinner. A black eye doesn't necessarily form because of trauma directly to the eye. Many times the blood can pool underneath the eyes when an injury has occurred to a surrounding area or to the nose.

FIGURE 5-12 A REAL BLACK EYE. Dimedrol68/©Shutterstock.com

When choosing the correct colors to replicate your bruising effect, make sure to test them on the skin. Often, make-up will appear much darker in the container than it does on the skin, and can vary depending on the skin tone. Pay close attention to reference photos and color patterns before beginning your make-up application. Try to break up your colors (don't use solid strokes), so the camera reads them more naturally. Also, be selective with your reference photos, because sometimes even a real photo of a solid black eye can look fake when replicated if the color pattern is too solid or appears in a distracting shape.

FIGURE 5-13 SWOLLEN BLACK EYE MAKE-UP ON ACTOR DANIEL HENSHALL. Make-up and prosthetics by the author.

Scars

Most likely you've had a scar, and you may have noticed the progression of color changes through the stages of healing. Typically, when the skin is broken, blood vessels are damaged, and the initial color of the scar becomes red or red-purple due to increased blood flow to the area.

FIGURE 5-14 Credit: Photographs by Patcharapa, Joe Thongsan/©Shutterstock.com. Edited by author.

Over time, the darker reds will fade and can appear more pink. Sometimes, the **melanin** producing melanocyte cells (pigment-producing cells) are damaged, so the scar never returns to the natural color of the skin. This is why many scars can appear lighter or white over time. Sometimes too much melanin can be produced during the healing stage, which results in **hyperpigmentation** and darker brown areas. The skin repairs itself quickly, but scars may fade and change in color or texture for one or two years as they heal. Sun exposure can also affect the color of a scar while it's healing, because it can prevent fading.

Scars come in a variety of colors, shapes, and sizes, because skin heals differently depending

on the trauma and the individual. Again, be sure to carefully study your reference photos before deciding which colors to paint a prosthetic scar.

Cold and Frostbite

When you're exposed to extremely cold temperatures, blood vessels in your skin constrict, which can cause your lips to appear blue. Damage to the skin can even occur if it is exposed to freezing temperatures or ice. If the skin tissue freezes, the blood flow to the affected area is reduced. This is called **frostbite**. It can occur anywhere on the body, but it's most common in the outer extremities because they are more exposed to the cold.

- **First-degree frostbite** will mainly turn red (and sometimes yellow) and is not very severe.
- **Second-degree frostbite** will result in dark blisters and leathery skin.

In more extreme cases, **third-degree** and **fourth-degree frostbite** can form, which is when the freezing occurs below the skin. Blisters can turn black and deep red, and may even become gangrenous. Typically, the outer extremities (nose, tips of toes and the fingers) will turn black first, and the skin can peel and appear rubbery. Again, it is very important to utilize reference photos, and pay close attention to the colors and patterns that are visible.

Sickness and Death

You may have noticed a loss of color in your face when you're sick. Complexion color can be a good indicator whether or not you're healthy. That's because there is reduced blood flow and oxygen to the face when you're unhealthy. Blood moves to more vital areas like the organs, and away from extremities. Blood can also move to the organs when dealing with stress or anxiety or when regulating the body's temperature, which also can cause paleness.

When someone dies, blood is no longer circulating through the body, which results in a much more noticeable loss of color (especially in the face). If you're creating a death make-up, or a very ill look, one of the quickest and most effective techniques is to add a pale flesh tone to the lips and to remove any redness from the face.

Accentuating **dark circles** under the eyes is another way of convincing the audience that someone is sick. Purples and reds can be effective, but be careful not to make them look like black eyes. Thinning out the product is a good way to keep the effect subtle.

Jaundice is a type of sickness that can occur which creates a yellowy skin color. This happens when the liver doesn't properly break down **bilirubin** (a yellow pigment found naturally in mucus and skin), so the color becomes noticeable. Jaundice is common in babies whose livers are still developing.

Dirt and Mud

If a character needs to be dirty, be aware that there is not one universal color of dirt. Don't select the first brown you have available without assessing the situation. You should always first determine where the dirt originated. For example, a script could describe a character as being "dirty", but you would never want to send an actor to set wearing red clay dirt make-up, only to discover later that the set is filled with a white, chalky dust. Try to visit the set in advance, or speak with someone about the type of dirt or mud that is present so you're prepared.

Expect to find a range of light to dark browns, grey and/or black soot, chalky whites, earthy reds, yellows, and even green dirt.

FIGURE 5-15 Original Image by Wlad74/©Shutterstock.com. Edited by author.

FIGURE 5-16 ALCOHOL-BASED PALETTE IN 10 DIRT COLORS. *Skin Illustrator Grunge Palette*. Owned, developed and maintained by Kenny Myers/CMI, Manufactured by PPI.

Tattoos

Color is very important when creating a fake tattoo. When a real tattoo is made, ink is deposited into the skin's **dermis** (second layer of the skin), and is trapped underneath the **epidermis** (the top layer of skin). No ink is present in the epidermis, so the tattoo that we see is actually visible through a translucent layer of skin. This is why mimicking a tattoo by using a dark black or intense color of make-up can instantly appear fake. It will look more realistic if you select colors that are lower in intensity and in value, so they won't appear to sit on top of the skin. If you're creating the tattoo on a computer, be sure to tone down the overall saturation. You may also want to add a thin layer of foundation or a colored powder on top of the tattoo, so that it appears as if it's below the skin's surface.

Also, keep in mind that tattoos do not always retain their color over time. Pigments found in tattoo ink are much more stable today, but they can still fade and change colors. The older the tattoo, the more it will fade. Black is typically the most noticeable color that changes, because it can turn blue-black or even blue-green. Therefore, you should keep in mind how long a character is

FIGURE 5-17 TATTOO DESIGNED BY HAND, DIGITALLY COLORED, AND PRINTED ON TRANSFER PAPER. Designed and applied by author.

FIGURE 5-18 ALCOHOL-BASED TATTOO COLORS IN A FADED GREY-BLUE AND BLUE-GREEN. *Skin Illustrator Tattoo Classics*. Owned, developed and maintained by Kenny Myers/CMI, Manufactured by PPI.

supposed to have had a tattoo when designing it. If the character has an old tattoo that was supposed to be poorly done, you'll likely want to fade it more dramatically to a grey blue-green. A new and professionally applied tattoo should appear more saturated, and better-quality inks are more stable. If the character has just been given the tattoo within the past few days, remember that the body sends blood to an area that is inflamed. Adding a wash of red to simulate the irritation around a new tattoo can help convince the viewer that it is real.

As always, reference photos are extremely helpful for creating a realistic application, but try to look closely at a tattoo in person to compare how colors read through the layers of the skin.

Teeth

A very effective way to change a character's look is to change the color of their teeth. Adding brown or yellow stains is a quick way to give an impression of poor hygiene. Black can even be added to give the illusion that teeth are broken or missing. This is because the black colorant gives the appearance that the tooth is not present to reflect the light, which creates the illusion of a void. When creating a fictional character, adding more unusual colors like green or blue to the teeth can also be helpful.

PAINTING PROSTHETIC APPLIANCES

Painting prosthetic appliances or pieces like bald caps can be challenging. If you want the prosthetic to blend seamlessly to the skin, then you'll need to be selective about color for a convincing match. If you simply match the color of the skin and paint the prosthetic a solid color, it will be very apparent that the added piece is not real. Think about layering colors the same way that they are scattered through transparent layers of the skin.

A portrait painter has to consider this, too, when starting with a white canvas. The painter can't simply paint a face a solid skin color and expect it to be interpreted as realistic skin. Colors of light and shadow must be carefully observed, and the paint must be layered to imitate the complexity and texture of skin. We do not just see the surface color of skin, but we also see blood through capillaries, blue or green veins, and pigmentation like freckles. It's impossible to account for all of these layers by using only a single, solid base color.

It's also important to use color theory when you need to neutralize or to add specific colors. For instance, if your prosthetic looks too orange, you can apply a layer of blue over the top to cancel out the orange. Again, don't be afraid to reference your color wheel.

Stippling

When creating effects with make-up, sometimes layering color products can result in a "muddy" mixture where colors have been unintentionally blended. You may have envisioned for the paint on your prosthetic to have red in one spot and green in another, but you accidentally overworked both colors so they combined and formed a dull grey-brown. Another problem you could face is discovering that your prosthetic doesn't seem to have any depth on camera, because you've painted it a solid color.

Think about the **Pointillist** painters (mentioned in Chapter 1) who painted with tiny dots of color.

This technique allows the eye to **optically mix** the colors (as opposed to physically mixing them together), which creates rich blends and adds dimension. **Georges Seurat**'s painting "Circus Sideshow (Parade de cirque)" is a great example of how stippling can be effective. When you're standing far away, the painting appears full of neutral colors. On closer inspection, you'll see the painting is made of intense colors like oranges, blues, and greens.

Consider this technique while painting prosthetics. If you're painting something you intend be a neutral grey, you may want to try alternating dull blue and orange patterns, rather than selecting a grey paint. The camera typically blends these colors the same way our eye optically mixes them. This will give your prosthetics a layered look rather than a flat opaque result. It will help mimic the complexity that is apparent in skin and other textures that you may be trying to match.

One method of keeping colors separate is called **stippling**. Using a sponge with a pattern, you can press colors directly onto the skin or the prosthetic in layers. This keeps the colors from blending together and provides a textured look.

You can buy stipple sponges or natural sea sponges that come in many different patterns. Make sure to cut off any hard edges and round out your sponge so that you don't end up with unwanted straight lines. Some brushes that have spaced-out bristles can be great for stippling, too. You can even cut up a make-up wedge to create particular patterns and use it as a stamp. A finer

FIGURE 5-19 "CIRCUS SIDESHOW" (PARADE DE CIRQUE) BY GEORGES SEURAT. Oil on canvas. Paris 1859–1891. The Metropolitan Museum of Art, New York.

FIGURE 5-20 DETAIL OF "CIRCUS SIDESHOW" (PARADE DE CIRQUE) BY GEORGES SEURAT. Oil on canvas. Paris, 1859–1891. The Metropolitan Museum of Art, New York.

FIGURE 5-21 BLACK STIPPLE SPONGE, NATURAL SEA SPONGE, ORANGE RUBBER STIPPLE SPONGE, AND A BRUSH FOR STIPPLING.

texture can be created by flicking or spattering colors off a stiff brush for a sprayed effect. Don't be afraid to experiment with different tools and textures. Squint your eyes, step backwards, or look at your work in a mirror. This will help you estimate how your make-up may read on camera.

Also, consider stippling instead of painting when you quickly need to tone down a color that is too strong. You may arrive on set and realize certain lighting negatively affects your paint job. Then, you might want to change the overall color but without affecting the texture and detail that you have already created. Stippling a thin and translucent layer over your work is a quick and effective way to deal with a colorcast, while preserving your paint layers. You also may find it a helpful skill if you need to reduce contrast when highlights or shadows are too strong.

Stippling is a great way to shift color from a person's skin to a **prosthetic** or a **bald cap**. Think about how layered, detailed, and textured the skin is, and how different a smooth rubber or vinyl bald cap is. Stippling and stamping texture to transition the two into each other can help give the appearance that they blend seamlessly.

Stippling can also be helpful when creating new textures, like scrapes and bruises. Fine sponges can be used to mimic **broken capillaries** and tiny abrasions to the skin.

FIGURE 5-22 SCRAPES CREATED WITH A BLACK STIPPLE SPONGE AND SKIN ILLUSTRATOR ALCOHOL-BASED PAINT.

If you're creating a **beard shadow** on a freshly shaven face, stippling can also be very effective. As mentioned in Chapter 4, you may want to start with a low intensity blue wash over the face where the beard shadow starts. Then, stipple on a darker brown to create a texture that looks like hair follicles protruding through the skin. The stipple sponge can help create tiny dots that would be incredibly time-consuming to add with a brush.

FIGURE 5-23 BEARD STUBBLE CREATED WITH A BLACK STIPPLE SPONGE.

If you're matching a natural skin color, hopefully your prosthetics have already been colored to resemble your subject's skin tone. Many times, this isn't the case. If you're starting with a white bald cap or a prosthetic that's the wrong color, you may find it helpful to start by painting it a base color that matches the skin. Next, you can layer a red pigment that matches the person's natural flush. It helps to stipple this and keep a pattern which allows your base color to show through underneath. Next, think about the blue veins that are noticeable in many people's skin. You may want to overlap patterns of a low intensity blue, too. Blue can also help fade any unnatural colors like bright oranges. At this point, step back and look at your overall color. You may choose to add warmth by adding a wash of yellow or olive tone. It's important to remember the **complementary color** pairs, so that you can balance or neutralize colors accordingly. Then you can proceed with thin washes and stippled colors to mimic veins, freckles, and capillaries.

There is no right or wrong way to add color, but beginning with reds can be an effective way to quickly bring life into the prosthetic. Pay close attention to where the red may be more concentrated; for example, you'll see that the hands have more red on the knuckles and fingertips.

Intrinsic Color

You may find yourself not only painting prosthetics, but fabricating them, as well. When you're working with a clear or translucent material (like silicone or Pros-Aide prosthetic transfer material), you can color your prosthetics intrinsically, which basically means to trap a color inside the material while it's being created. **Intrinsic** is defined as "belonging to or lying within a given part".

Depending on the amount of color you add, your piece can vary in opacity or translucency. Liquid tints can dramatically color your prosthetics and make them opaque. **Flocking** can also be used to create a natural and subtle color effect, while allowing the material to hold on to its translucent properties. Flocking is made of tiny colored fibers and it can be suspended into the material intrinsically while it is being fabricated. For example, flocking can be stirred into silicone before it sets, so that the fibers become trapped when the silicone hardens. This helps mimic the different colors we perceive throughout the layers of skin, and our eye optically mixes them together. Opaque prosthetic materials (like foam rubber latex) can't be fabricated with the same type of intrinsic color depth, so the textures and color layers must be added on top of the prosthetic, instead.

It can be very helpful to suspend colors like red and blue flocking, because they can appear trapped under the skin the same way blood vessels and veins are. If the person you're

FIGURE 5-24 FLOCKING FIBERS USED FOR COLORING PROSTHETICS INTRINSICALLY.

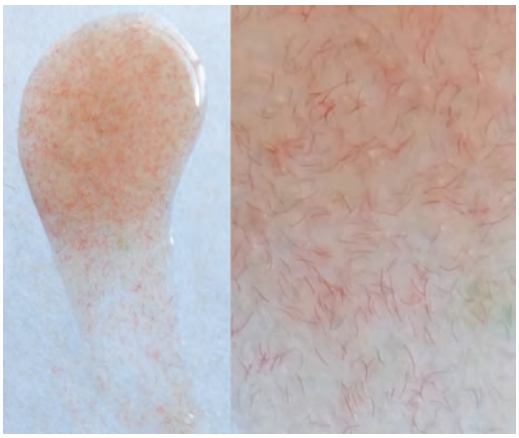


FIGURE 5-25 FLOCKING FIBERS SUSPENDED IN SILICONE.

matching is more olive-skinned, you may want to add blue-greens instead of only blue. Look closely at the two swatches of silicone in the photo. You can see how the individual blue and red fibers add to the overall coloring and texture.

In the next photo, you can see the unpainted silicone belly (left) that is colored intrinsically with flesh tones, reds, and blues. The next photo (right) shows where color is added and painted on top of the same belly in reds, blues, yellows, and browns.

When to Add Black

As mentioned in Chapter 1, changing a color by adding black will make the color appear dull. Darker and less saturated colors tend to make objects appear as if they are farther back, so you need to be selective when you choose to use black. However, using black can be a helpful tool if you're trying to make an area appear as if it is receding. For example, if you're painting a bullet-hole prosthetic, placing black in the hole can give the illusion on-camera that it goes much deeper than it actually does, because it appears there is no light present. Black can also be a great choice in bold designs, because it can accent lighter-valued colors, like a bright yellow.

FIGURE 5-26 AN UNPAINTED SILICONE PREGNANT BELLY (LEFT), PAINTED SILICONE PREGNANT BELLY (RIGHT). Fabricated and painted by the author.

COLOR INSPIRATION FOR CHARACTER DESIGN

Psychological Effects of Color

When creating an expressive type of make-up design (e.g., fashion, body painting), you may want to consider the psychological effects that people naturally feel from looking at certain colors.

Colors can evoke emotions, and trigger certain moods. **Cool colors** are associated with relaxation and tranquility and are linked to water and the sky. **Warm colors** are linked to fire and the sun and are related to energy and intensity.

The feelings that evolve from seeing certain colors can be so effective that many businesses take these

RED - energy, passion, love, strength, power, intensity, aggression, violence

PINK - sensitivity, delicateness, love, sweetness

ORANGE - energy, creativity, friendliness, happiness, excitement, courage

YELLOW - cheerfulness, positivity, uplifting, happiness, optimism, joy

GREEN - hope, nature, harmony, tranquility, growth, freshness, life, envy

TURQUOISE - peace, balance, creativity, calmness, healing, uplifting

BLUE - calmness, trust, comfort, relaxation, loyalty, wisdom, tranquility, coldness

PURPLE - spirituality, serenity, fantasy, royalty, mystery, luxury, calmness, peace

BROWN - conservativeness, earthiness, reliability

GREY - balance, practicality, neutrality, dullness

WHITE - cleanliness, purity, peacefulness, innocence, virtuousness

BLACK - drama, tradition, formality, intelligence, power

FIGURE 5-27

connections into consideration when branding and marketing their products and companies.

Listed above are common emotional associations that are related to individual colors. Keep in mind that some colors can have multiple meanings, depending on how they are used.

Inspiration: Colors in Nature

When painting appliances or creating characters, your task won't always be matching a human flesh tone. When you're creating a fantasy make-up or a character that doesn't have a typical skin color, it can be very helpful to draw your inspiration from nature. For example, if you need to create a green creature, pull photos of green reptiles, birds, plants, and even food. You'll be surprised how many colors are layered and what patterns you may find when you are carefully observing them.

You may also want to reference the various color schemes (found in Chapter 1 on page 10–11) when creating make-up designs for characters. For example, you could choose a scheme like a split-complementary color combination on which to base your design. Laying out color patterns ahead of time can help you prepare for a successful application.

FIGURE 5-28 Photography by YIUCHEUNG, Giancarlo Liguori, Arif Supriyadi, Napat, BOONCHUAY PROMJIAM, Fotoluminate LLC, Andrew Mayovskyy, Dave Nelson, Ollinka, Nuttapong Jeenpadipat, Narupon Nimpaiboon, Anton Gvozdikov, VicW, Lena Lir, Anna Hoychuk, Wanida_Sri, SWP222, Petrenko, Andriy/©Shutterstock.com. Edited by author.

Casting the Appliances

KEY POINTS

- Understanding silicone (continued)
- Coloring silicone intrinsically (internally) for translucence
- Color Theory
- Gel-filled appliances, filling the mold, and removing the appliance
- Foam latex and its properties
- Running foam latex
- Casting urethane (cold) foam
- Casting gelatin and foamed gelatin
- Casting dental acrylic
- Painting and seaming (cleaning up) appliances and teeth

INTRODUCTION

This chapter describes the methods for creating prosthetics using silicone, foam latex, foam urethane, gelatin and foamed gelatin, and dental acrylic. Rather than make a laundry list of materials needed to cast prosthetic appliances, I will add the list of materials specific to a particular type of appliance, such as foam latex, gelatin, and silicone, for each section.

KEVIN WASNER/KERRIN JACKSON—GOATMAN PROJECT

Diary entry:
Oct. 2017

Painting: We used a combination of Skin Illustrator and European Body Art inks to prepare these appliances. This was done just a few days prior to application.

FIG. 6.1 Cast, unpainted face and chest prosthetics. Silicone pieces cast by Derek Krout, Dragon Richard Radic, Lou Kiss, Miles Watson, and Cameron Martin.

Images reproduced by permission of Kerrin Jackson and Kevin Wasner.

FIG. 6.2 Torso paint.
Images reproduced by permission of Kerrin Jackson and Kevin Wasner.

The horns were already made (by KNB) when Kevin utilized them for sculpting the face and head piece. We believe John Wrightson sculpted them, though not sure what for. They are latex and polyfoam, with armature wire running in the center so we could pose them and change the shape once in position on the makeup.

Just a few colors and layers were added at this time, in anticipation of doing painting during the makeup application and also knowing how extensive the hair work was going to be and how much handling there would be of the pieces before application took place.

MATTHEW MUNGLE

Step-by-Step Nosferatu Makeup—Casting the Prosthetic Appliances

1. Apply thin layer of Ease Release 205 to both the positives and negatives and let dry; next spray three coats of thinned Super Baldiez onto the positives and negatives.
2. Spray one layer of Pro-Bond Primer onto the positive and negative molds. Pro-Bond Primer is designed to prevent de-lamination between the cap plastic and silicone.
3. After the Super Baldiez and Pro-Bond have set for

FIG. 6.3 Spraying Super Baldiez and Pro-Bond Primer.
Images reproduced by permission of Matthew Mungle.

FIG. 6.4 Deadened Gel-10 going into mold.

Image reproduced by permission of Matthew Mungle.

FIG. 6.5 Closing the mold; clamping.

Images reproduced by permission of Matthew Mungle.

FIGS. 6.6 & 6.7 Opening the mold; finished silicone GFA nose prosthetic.

Images reproduced by permission of Matthew Mungle.

35 minutes, a 175% deadener/Polytek PlatSil Gel-10 mixture (with pigment) is poured into the negative mold.

4. The mold is closed and clamped shut using two small boards and large C-clamp.
5. The nose mold is opened, powdered with RCMA No Color Powder, and carefully removed from the mold.
6. Follow the same procedure for the forehead—Ease Release 205/Super Baldiez/Pro-Bond Primer—before injecting silicone using the same deadener/silicone mix ratio—175% deadener to 100% A/B Gel-10.

FIG. 6.8 Injecting the clamped forehead mold.

Image reproduced by permission of Matthew Mungle.

FIG. 6.9 Injecting the clamped face and neck mold.

Image reproduced by permission of Matthew Mungle.

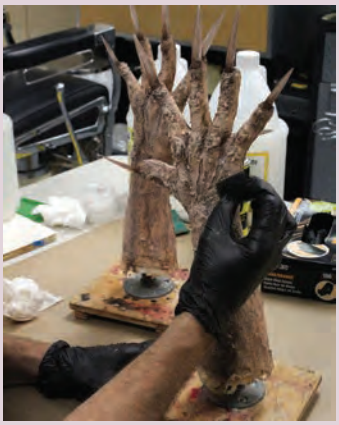
FIG. 6.10 Removing the face and neck piece; finished painted and punched prosthetic pieces.

Images reproduced by permission of Matthew Mungle.

7. Follow the same procedure for the face and neck piece as well—Ease Release 205/Super Baldiez/Pro-Bond Primer—before injecting silicone using the same deadener/silicone mix ratio—175% deadener to 100% A/B Gel-10. Before injecting the silicone, bolt the two halves together. In the photo you can see clay plugging small bleeder holes that were drilled earlier to allow air to escape, and to ensure that silicone fills every part of the mold.
8. When the silicone has cured, carefully unbolt the mold and open it. Powder with RCMA No Color Powder and gently remove the prosthetic from the mold.
9. Paint the prosthetic pieces, and punch eyebrow hair. (This is covered in Chapter 8.)
10. Hands were created as gloves by building up thickened Smooth-On Dragon Skin FX Pro over casts made with plaster bandages, and Smooth-On 300Q hand positives. Hand positives were released with Ease Release 205.

FIG. 6.11 Brushing up the FX Pro.

Image reproduced by permission of Matthew Mungle.



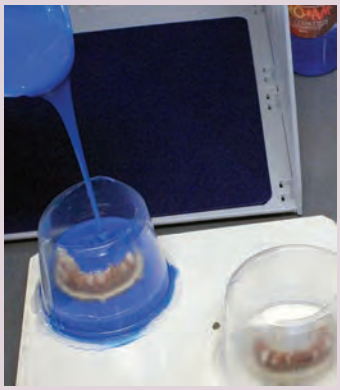
FIGS. 6.12 & 6.13 Painting and finishing with Sil-Poxy.

Images reproduced by permission of Matthew Mungle.

11. The finish paint job on the Dragon Skin FX Pro gloves was done with Smooth-On Sil-Poxy and Sil-Pig pigments.
12. As a finish, a thin wash of Sil-Poxy was painted over the finished gloves.
13. Impressions were taken of the model's teeth, and a master mold made using Mold Star 30. A Smooth-Cast 385 positive of the teeth was made, and a vac-form positive of the uppers and lowers was made.
14. The teeth and gums were sculpted on the vac-formed plastic.
15. When the teeth are ready, a negative is made with Mold Star 30.
16. When ready, the clay is removed and dental acrylic is put into the tooth and gum cavity, liquefied with acrylic monomer, and the vac-formed plastic and resin positives are pushed into the mold. (This is often submerged under pressure to cure.)
17. When the acrylic is cured, the plastic is trimmed and the dentures are painted.

FIGS. 6.14 & 6.15 Smooth-Cast 385 teeth positives; teeth and gums sculpted over vac-formed plastic.

Images reproduced by permission of Matthew Mungle.



FIGS. 6.16 & 6.17 Pouring up Mold Star 30 negatives; untrimmed dentures.

Images reproduced by permission of Matthew Mungle.

FIGS. 6.18 & 6.19 Trimmed dentures; painted dentures.

Images reproduced by permission of Matthew Mungle.

SILICONE: PLATINUM AND TIN

I've talked at length about one of the materials commonly used for creating prosthetic appliances, but so far, only as it applies to mold making: silicone. As for prosthetics, appliances made of silicone look and feel remarkably like real skin. They certainly can, anyway. And they're made mostly using platinum RTV (Room-Temperature Vulcanization) silicone because platinum silicone is generally considered safe for use directly on the skin.

There are also some wonderful tin RTV silicones available for prosthetics, specifically encapsulated tin silicone gels; they can be accelerated, but as you'll recall, a fast catalyst will ultimately weaken the silicone. Perhaps that won't happen quickly enough to be a problem for your application if its use is immediate. If you make multiples of a piece with the intention of storing them over time, they may become unusable, even brittle, if the cure is accelerated. This can happen within a matter of days, especially if you use only a fast catalyst and none of the regular catalyst. I've seen it happen with some of my tin RTV mold rubber; I am making an assumption that it will be true for other silicones as well. However, you are far less likely to accelerate the cure of a prosthetic silicone than that of a mold.

Silicone appliances can be cast in a number of types of molds, including Ultracal, Hydrocal, fiberglass, Forton MG, urethane, and even silicone, provided it's supported by a jacket mold and well released. However, remember that platinum silicone cannot be cast into a tin silicone mold—it will not cure. Platinum into tin is not okay. Tin into platinum is okay; tin into tin is okay; platinum into platinum is okay. But the molds *must* be released well to prevent the new silicone from permanently bonding to the silicone of the mold.

NOTE: There are products on the market that do make it possible to successfully cast platinum silicone into a tin silicone mold, such as *Inhibit-X* by Smooth-On (Mann), and FuseFX's *BondFX*. Care should still be taken, and test whenever possible to prevent soul-crushing failures on a larger scale.

COLORATION

One of the great things about silicone is its similarity in look and feel to human skin when it is colored intrinsically with pigment. Human skin is actually translucent. When silicone is colored internally with any number and type of pigments, most notably colored rayon flocking, the silicone color has actual depth, just like skin.

Silicone can also be colored intrinsically with opaque pigments that significantly lessen the sense of depth and translucence; however, if the amount is very small, translucency can be maintained. This is something that will require experimentation on your part; there is no formula for coloring silicone, though many agree that pigmenting roughly 1% of the total silicone volume is good. You can always add pigment, but you cannot remove it. I believe you want to maintain slight translucency, not go completely opaque with your coloring. I will tell you this, too: Silicone can be very difficult to paint. Silicone is resistant to acids, bases, solvents, chemicals, oils, and water. Virtually *nothing* sticks to silicone . . . except other silicone.

The method I use most often is one I learned from Neill Gorton, and it works well. I will make a mark on my mixing stick with a Sharpie marker and add drops of pigment into the silicone a few drops at a time, and stir. When I lift the stick out of the silicone (I do this individually to part A and part B, *not* when they're mixed together) I'll let it drain mostly off the stick and if I can just barely see the mark on it, then the amount of pigment will give

just the right amount of translucence. If I can still see the mark clearly, I need more pigment; if I can't see it at all, I need to add more A/B.

You have a number of options when coloring your silicone intrinsically. You can use silicone pigment, of course, but also oil paint can be used, flocking, and even artists' acrylic paint! Yup! Liquitex makes a color called Vivid Lime Green, and it's *perfect* for *Shrek the Musical*. I did silicone and spandex gloves, and tinted the silicone with Vivid Lime Green. Worked like a charm!

If you choose to forgo intrinsic coloring and you color your appliance extrinsically, you will need to use a silicone-based coloring system. You can achieve relatively decent results with a crème foundation that is not silicone based, but the moment your actor rubs his nose or accidentally brushes against something or someone, that makeup is going to wipe right off, no matter how much powder or sealer you applied to set the makeup. Fortunately, there are some terrific silicone-based airbrush paints and makeup foundations designed for use on silicone appliances. Canadian artist Guy Louis-XVI's FuseFX platinum silicone paint system has become quite popular and is widely used. You can also color with alcohol-activated pigments, such as Premiere Products' Skin Illustrator palettes, developed by Kenny Myers, and W.M. Creations' Sta-Color palettes, developed by Matthew Mungle. Just know that this method will rub off.

FIG. 6.20 Adding pigment.
Photo by author.

FIG. 6.21 Shrek gloves.
Photo by author.

NOTE: You can tint silicone—both tin and platinum—intrinsically with artist's acrylic paint, such as Liquitex and Golden. Just be aware that if you use it with a tin silicone, the water content in the paint will cause the silicone to kick quicker. The more paint, the more water, the faster the cure. Always try a small test if you can.

FIG. 6.22 Mixed acrylic paint for tinting silicone.
Photo by author.

FIG. 6.23 Sampling of FuseFX silicone pigments.
Photo by author.

COLOR THEORY

I don't know how closely you looked at the image above of mixed acrylic paint for tinting silicone, but the flesh tone in the cup was mixed from those four tubes of paint. Using the three primary colors—red, blue, yellow—and white, you can match any skin tone. Okay, maybe you'll need a touch of black occasionally . . . The point is, with Blue, Red, Yellow, Black, and White (CMYK in the print world, for *C*yan—blue; *M*agenta—red; *Y*ellow; *K*ey—black, printed on white paper) you can make *any color*. This book was printed using only CMYK ink. That is Color Theory, and you need to fully understand it to create beautiful prosthetic appliances that match the wearer's skin tone. Color theory is "theory" the way gravity is still a theory; we know how it actually works.

Stuart Bray and I have put together this section so when you get to the next section you'll be better prepared. First off, you're going to find it immensely useful to get yourself a

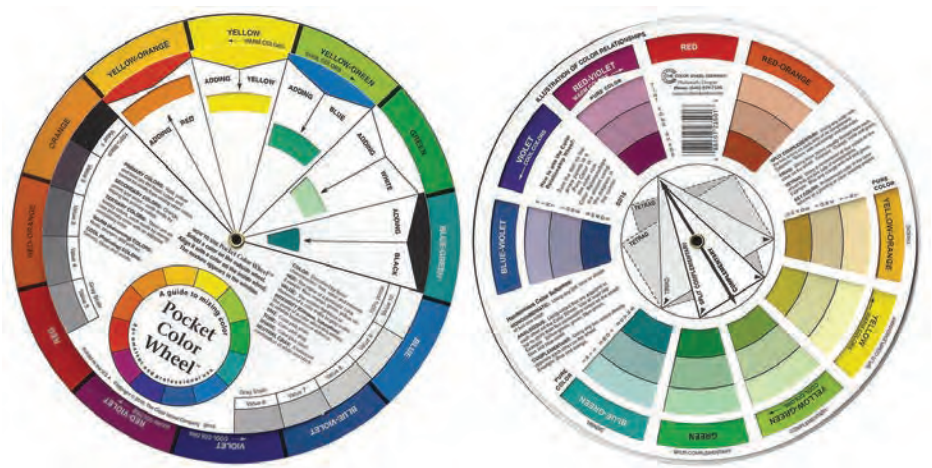


FIG. 6.24 Pocket color wheel front and back.

Photo by author.

FIG. 6.25 Mixing flesh tones.

Photo by author.

good color wheel if you don't already own one. A color wheel is going to be handy in fleshing out the basics (excuse the pun) for creating proper skin tones. However, what a color wheel won't show you is an actual formula for skin tones.

What the color wheel will show you is the result of adding colors, plus white and black to the human color spectrum, as well as color complements (opposites), split complements, hue, intensity, value, tint, tone, shade, etc. To understand color theory for our purposes as makeup effects artists—that is, using a mixture of actual pigments plus the use of lighting to create color—is going to be fundamental to your efforts.

When mixing skin tones, you start from nothing and you create it from scratch. Not only that, but you're going to be mixing a base which has to match an existing skin tone. That color already exists—you have to replicate it.

Mixing a skin tone to match a person is a great exercise, because like sculpting or drawing, you start with nothing and have to recreate it one step at a time. It is in the act of taking those steps where you'll gain confidence. But, there is a conundrum (of sorts) regarding the difference between mixing light—called additive color—and mixing pigments—called subtractive color. The conundrum results from the fact that the absorption of light by physical objects (a prosthetic makeup, for example) follows a different set of rules than the perception of light by our eyes.

FIG. 6.26 Actor Terry Crews and matched skin tones.

Image reproduced by permission of Mark Garbarino.

A makeup that looks good in the light it was applied under may look completely different on stage or on set with different lighting conditions; it may appear dull, dark, or blown out. Even specific cameras can view makeup differently because of how sensors perceive color and light. There are two kinds of color which we need to be keenly aware of: the color of *pigment*, and the color of *light*—and annoyingly they are not the same. This just builds on the information from Suzanne Patterson in Chapter 1; maybe go back and reread it if you need to.

Light—that is, the "white" daylight (which is actually blue) that we see by when we walk around outside in the daytime—is made up of colors. You can mix as many paint colors together as you like, and you can be sure that the resulting color will never be white. However, this is the case with light.

White light is actually made up from Red, Green, and Blue (RGB). To demonstrate this, Stuart got these colored LED lights and shined them onto a piece of white paper. When all three lights intersect they do indeed create white light!

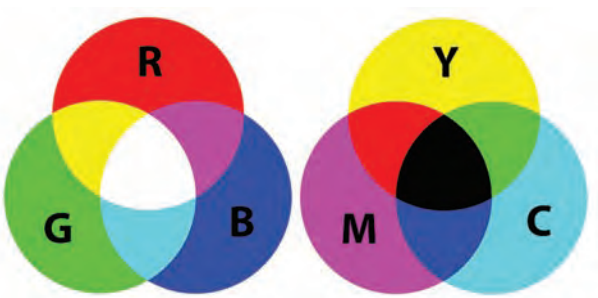


FIG. 6.27 Additive color (L) and subtractive color (R); illustrations by Stuart Bray.

Images reproduced by permission of Stuart Bray.

FIG. 6.28 Red, green, and blue making white light.
Image reproduced by permission of Stuart Bray.

Because these three colors are required to make white light, they are called primary colors. Because of the red, green, and blue primaries, this is typically known as the RGB color model.

Pigments, on the other hand, work slightly differently, in that the primary colors (that is, the colors you cannot create by mixing) are the purest colors from which all visible colors are made: Cyan (Blue), Magenta (Red), and Yellow. Mixing these three in equal amounts creates a brown color, and mixing two of these primary colors creates secondary colors (orange, green, and purple). Printers use this color model all the time, and it is known as the CMYK model (Cyan, Magenta, Yellow, and Key Black).

So how do you take all of this technical information and turn it into something believable in a prosthetic makeup? The first obvious step is reference. Find good reference images for the skin tone you want to reproduce, or match. Human skin tones contain a myriad of tones—a primary skin tone, undertones, and subtle tones throughout the skin; just take a look at the back of your own hand to immediately see the variety of skin tones at work.

It's pretty easy to see if the skin is dark, medium, or light, but it's also crucial to consider the undertones; for example, not everyone would think of skin tones containing blue or even purple tones, but they do. By evaluating the tone you've referenced, you can make a more informed decision about the subtle tones that are a part of the skin. Then you can create a palette of tones around your base skin tone so you can add proper accents.

The pigments that you use to create your skin tones matter too. Most pigments, such as silicone pigments, will dry the same as when wet. That holds true with the alcohol-activated colors, as well as oils (which can be used to tint silicone, believe it or not) and flocking, and watercolors (which can tint thickened Pros-Aide and gelatin too); however, acrylics, which can be used to make PAX, or to tint silicone, tend to dry a bit darker than when wet, so that needs to be factored into your mixing equation (algebra!).

If these skin colors are going to be part of an ongoing makeup project, make notes of the colors (and amounts) that went into the mix. Heck, making notes is important, so do it anyway. Document everything that you do.

FIG. 6.29 Back of author's hand; mixed skin tones.
Photos by author.

If you're mixing from scratch, create your initial palette with the primary colors yellow, blue, and red. White and black are optional, but also quite helpful to lighten or darken your color. If you do choose to use black, be very sparing. Black can react with the yellow in skin tones to create an ugly greenish, muddy look. Try starting with a small amount of each primary in equal amounts rather than adding any black to the mix. Just about every skin tone contains a little yellow, blue, and red, but in varying ratios. Your initial outcome will probably be a bit dark, but it's generally easier to lighten the color with white than to darken it with black. Then, it becomes just a matter of refining and creating a palette of monochromatic, analogous, and complementary tones around your base.

A word on "skin color." Skin is not one consistent color all over the body; there are variations on different areas, and all over there are often minute fluctuations, mottling, moles, freckles, scarring, or other pigmentation variables. Usually the skin on the face is different from that on the neck, and the outside forearm is darker than the inner, soles of feet are different from the color of the lower back. Race, lifestyle, and the environment all have their part to play and the effects of these things is more noticeable over longer periods of time. The amount of variation depends on the person, as some people have noticeable freckles and some people seemingly have flawless, even skin—but creating a makeup with a dead flat and solid color is likely to look artificial.

FIG. 6.30 Various skin tones.
Photo by author.

FIG. 6.31 Skin tone palette notes.
Photo by author.

It's a good idea to get and keep clear, good-quality reference images of all kinds of people—young/old/black/white etc., and get used to what happens with skin. Some of the final effect is the responsibility of the base color, some will be added later during painting and application. The point is, if you don't know what they are or how they happen, you won't do a great job of recreating them.

MATERIALS

I'm not going to detail a set list of tools and materials that you'll need to cast an appliance in silicone, for the simple reason that though there are certain similarities in the process for casting any silicone appliance, each makeup will be different. Here are some items you will most likely want/need to have:

- Two-part silicone (most likely a platinum silicone)
- Non-latex (nitrile or vinyl) gloves
- Mixing sticks
- Mold
- Mold straps or clamps
- Screwdriver
- Vacuum/pressure chamber
- Mixing containers
- Digital scale
- Mold release
- Powder
- Air compressor/vacuum pump
- Syringe (60–100 ml)

Silicone can be cast into a mold in more than one way. It can be poured, brushed, stippled, or injected. Or it can be cast using a combination of these methods. The way the silicone gets into the mold is largely dependent on the type of prosthetic being cast. A full-head cowl appliance would be impossible to pour. A thin layer of silicone could be stippled into the mold halves first, to ensure that all details have been captured before placing the mold pieces together and then injecting the balance of the silicone into the mold.

FIG. 6.32 Stippling thin encapsulating layer of silicone into mold.

Images reproduced by permission of Neill Gorton.

DE-AIRING/DEGASSING SILICONE

Because silicone is relatively viscous as a liquid (compared to water), air bubbles easily become suspended in it when the components are mixed together. For that reason, it is often recommended that silicone be de-aired or degassed in a vacuum chamber before it goes into the mold. You can eliminate air bubbles (or at least make them very, very small—almost invisible) by pressurizing the silicone instead of pulling a vacuum. You still need a pressure chamber to do it, but air compressors are far less expensive than vacuum pumps and you probably already have access to an air compressor.

Degassing silicone with a vacuum pump requires that the silicone to be degassed be in a container several sizes larger than the original volume of silicone because when the air begins to leave the silicone, it will froth and bubble madly and expand in volume several times its original volume for two or three minutes until all the air is exhausted and the silicone collapses back to just under its original volume. It's quite a sight! If you don't use a large enough container, the frothing silicone will spill out all over the inside of your vacuum chamber and create a contained mess, and a ruined batch of silicone.

A good vacuum pump can be purchased online relatively inexpensively; the one I have is a two-stage Robinair vacuum pump Model

FIG. 6.33 Robinair vacuum pump.
Photo by author.

FIG. 6.34 Venturi-type vacuum pump.
Photo by author.

15500, with a 5CFM (cubic feet per minute) capacity, and it ran me about $200 (£140) when I purchased it several years ago. It's a workhorse.

Small vacuum/pressure chambers can be found rather easily online, and if you're dead set on vacuum de-airing, for about $18 (£13) from Harbor Freight you can buy a Central Pneumatic air-vac, a Venturi-type vacuum pump that uses air pressure to create enough vacuum to de-air your silicone in short order!

Your air compressor needs to generate at least 90 lb of pressure to pull 28.3 inches (71.9 cm) of mercury at sea level. From the same vendor you can also find a 2½-gallon pressure paint tank that is great for pressure or vacuum for under $100 (£71). With a little more effort you can replace the opaque metal lid with a clear Plexiglas cover (¾–1 inch thick or 2–2.5 cm) so you can see what's going on inside. Often, however, simply allowing the silicone to sit at room temperature until the air bubbles have risen to the surface and disappeared is all you need to do before pouring or injecting the silicone into the mold cavity, provided the silicone is slow-setting. Many prosthetic silicones are thin enough and have a working time that will allow bubbles to evacuate on their own.

FIG. 6.35 Vacuum chamber with clear lid.
Photo by author.

GEL-FILLED SILICONE APPLIANCES

If you've ever held a silicone breast implant in your hand (pre-implantation), you know how soft and squishy they are, or can be. Squeeze your cheeks (gently) or feel your (or someone's) love handles . . . that's the consistency and softness a gel-filled appliance (GFA) should have. The best GFAs are made with a gel that has a much firmer consistency than you'd find in a silicone breast implant or breast enhancement product.

GFAs are arguably the single most difficult type of prosthetic appliance to make by reason of the steps involved in merely casting the appliance into the mold. The silicone gel must *fill* something; it is a gel-*filled* appliance. The gel is one component. The other, an envelope or capsule, must be created for the gel to fill. How is that accomplished? By using

FIG. 6.36 Encapsulated seamless full-neck wound GFA. Photo and prosthetic by author.

an encapsulator, which (several years ago) would have been silicone, and can still be depending on the need, or a liquid vinyl cap material that will cure to a solid, flexible skin. The ones that have become industry standard today are soluble with either alcohol or acetone.

Using an encapsulator other than silicone could cause the gel and the encapsulating envelope not to bond well and to separate, or de-laminate (since nothing sticks to silicone except other silicone), causing unwanted and largely unfixable problems with the appliance. But, as long as you don't try to add a platinum gel to a tin encapsulator, the silicones should cure and bond permanently to each other without a problem. However, the "deadened" or softened silicone gel is quite sticky on its own, and may provide enough adhesion to bond well to the encapsulator. A spray of 3M spray cement over the encapsulator prior to adding the silicone to the mold will also help with adhesion. Problems with de-lamination tend to occur more to large appliances with intricate detail than small, less intricate pieces. There is a product called Pro-Bond Primer that is designed specifically to prevent de-lamination by creating a permanent microscopic bond between the cap plastic encapsulate and the deadened silicone. The amount of deadener is something of a personal taste issue, but common ratios of deadener to silicone (A and B together) can be up to 250%. Baldiez and Super Baldiez—acetone and alcohol-soluble vinyl cap plastics from Mouldlife—have become industry-standard materials for encapsulating GFAs. A few others have also entered the marketplace in recent years, including Michael Davy's alcohol-soluble Water-Melon, Motion Picture FX Company's acetone-soluble BaldFX, Neill Gorton's Key-Cap Plastic and Key-Cap Beads, and Smooth-On's Q-Ballz.

■ Filling the Mold

Prepping the mold is the first order of business. Depending on how long it's been since the mold was made, it might need to be cleaned again to ensure that no contaminants such as dust and stray hairs have found their way onto the negative surfaces of the mold interior.

Once the mold pieces are clean and dry (if they're stone molds) they will need to be sealed and released; if the mold is made of fiberglass or other resin, it probably doesn't need to be released, though it's never wrong to release a mold if you have any doubt as to whether the silicone will stick or not without it.

■ Injection Filling

To inject silicone into your mold, at least two holes must be drilled in the mold positive: one to inject silicone through and the other to allow air to escape as the mold fills. The syringe for injecting the silicone should be made of polyethylene or polypropylene and should not have a latex rubber end on the plunger; that would cause platinum silicone inhibition—it won't cure. Make sure the mold pieces have been thoroughly released, including the injection hole and the vent holes.

1. Release the mold pieces.
2. For creating a GFA, spray, brush, or stipple a thin coat of mixed silicone encapsulator material on both halves of the mold, positive and negative. *Be careful not to spray,*

brush, or stipple the encapsulating material over the cutting edge of the appliance mold. If spraying, spray several thin layers to achieve enough thickness so there won't be any thin spots or pinholes in the encapsulate that silicone can leak through.

3. When the encapsulator material begins to set, close the mold and clamp or bolt securely together.
4. Allow the encapsulator material to fully cure inside the mold. You might want to accelerate the cure by applying heat. As a rough guide, the recommended cure schedule for a 1-inch-thick Ultracal mold is 2 to 3 hours at 200 °F (93 °C).
5. Allow the mold to cool.
6. Mix the gel components together and add pigment and/or flocking, then de-air them in an evacuator (vacuum chamber); or simply let the air bubbles rise and disperse on their own (only if you're using a slow-cure gel). Fill the syringe with the gel and *slowly* inject it through one of the holes until it begins to come out the second hole. Even better, gently pour the silicone into the mold via a funnel and pour tube, and let it rise to find its own level in the mold. Injecting too strenuously can potentially cause damage to the encapsulate. If your silicone has a long working time, letting gravity help fill the mold is the better way.

TIP: Gently pour the silicone into the mold via a funnel and pour tube, and let it rise to find its own level in the mold. Injecting too strenuously can potentially cause damage to the encapsulate. If your silicone has a long working time, letting gravity help fill the mold is the better way.

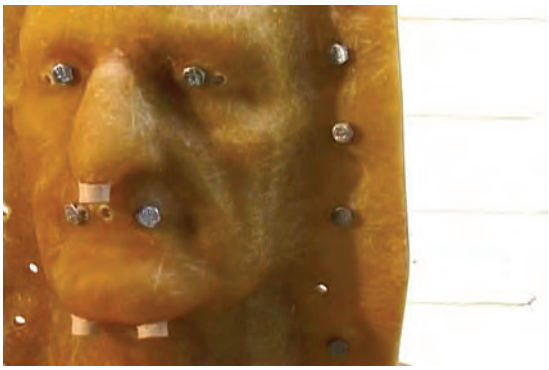


FIG. 6.37 Hand-tighten bolts, then tighten with wrench.

Image reproduced by permission of Neill Gorton.

FIG. 6.38 After injecting as much silicone as mold can take, remove plunger so silicone will continue to fill (L); silicone exiting bleeder holes (R).

Photos by author.

TIP: Use a toothpick to gently lift up an edge of your cap plastic encapsulate to see if it's thick enough. There should be no small pinholes. If there are, add another layer or two of encapsulate. Be sure to test in an area where lifting the plastic from the mold surface will not affect the casting.

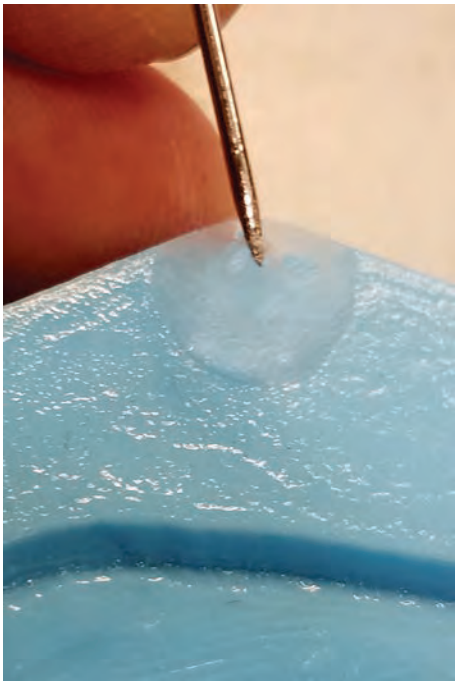


FIG. 6.39 Checking for holes in cap plastic.
Photo by author.

NOTE: To know how much silicone gel to mix, you need to use the weight (or volume) of the clay you saved from the appliance sculpture, then mix a bit more than that so you have room for overflow. It's better to have a bit more than you need than not quite enough and need to start over.

7. Carefully remove the syringe and gently tap the mold, and tilt it to work any remaining air through the vent holes.
8. Re-insert the syringe and top off the mold with gel if necessary.

NOTE: If you're using the gravity-fill method, steps 7 and 8 are unnecessary. Leave the fill tube in place and allow any silicone remaining in it to cure.

9. Allow the gel to cure at room temperature for 24 hours (or as long as the manufacturer recommends) or place it back into the oven for 1–1½ hours at 200 °F (93 °C) for the gel to cure. Allow the mold to slowly cool enough to be handled (90–100 °F/32–37 °C)—if the mold is gypsum, it may crack if cooled too quickly—and *carefully* demold the appliance. Wash off any release residue and trim the injection and bleeder sprues.
10. Cover the trimmed sprue points with fresh encapsulator material and allow it to cure. Then powder the appliance; it is ready for painting and application.

NOTE: Depending on the release used in your mold (dish soap, for example), you may find it helpful to soak the mold in water to facilitate the release of the appliance from the mold.

You should store your appliance in an airtight plastic bag if it's not going to be used in the near future. For painting, it would be handy to have a duplicate of the positive for the appliance to lie on or a generic positive so that the prosthetic will have the relative shape it is supposed to have.

You do not have to be making a gel-filled appliance in order to inject silicone. Injecting silicone merely ensures that you will have an easier time filling a more complex mold shape. The steps are the same, minus the encapsulator.

TIP: Brushing a light dusting of talcum or baby powder into your mold before pouring will help draw your prosthetic material into tight spaces through a physical phenomenon called *capillary action*; the talc releases surface tension, drawing liquid into spaces it would otherwise be prevented from entering due to the physics of surface tension. A light air dusting (not brushing) of talc in the mold after adding the encapsulate will also let you see where it is thin, and possibly need more added. Also, a light air dusting of talc (not brushing—it would potentially mix the talc with the release, and you don't want that) into the mold (the negative)—*after* releasing but *before* spraying the encapsulate—will give the encapsulate a matte finish.

Hand Filling

The hand-fill method for making a GFA is similar to the injection method, though the injection hole and vent hole are not necessary.

1. Release the mold sections the same way you would if you were going to inject the silicone. Make sure the release is completely dried before the next step.
2. Brush or stipple a thin coat of mixed silicone encapsulator on both halves of the mold, positive and negative. You might want to experiment with thixotropic agents if you find the encapsulator is too runny, even when stippled on thinly. You shouldn't need to, however.
3. Mix up the silicone gel and allow it to de-air; when the encapsulator has dried (but not cured—there's a difference), pour the gel into the mold negative. If you are going to color the gel intrinsically, now is the time to do it!
4. Fit the positive carefully into the negative and clamp the two halves together securely, then oven cure it at 200 °F (93 °C). Again, the recommended length of time is 2 to 3 hours for a 1-inch (2.5 cm) Ultracal or other gypsum mold. The remaining three steps are exactly the same.

Frequently, molds are tightly closed not with clamps, but weights, or with mold straps. The point is to obtain a closure tight enough to get a good, clean cutting edge, and in the case of this squash mold with an encapsulate, to squeeze out the silicone so the encapsulate on both halves of the mold will meet and bond.

FIG. 6.40 Mold clamped closed.
Photo by author.

FIG. 6.41 Weights on mold.
Photo by author.

FIG. 6.42 Mold strap and aid.

Images reproduced with permission of Rick Connelly.

Australian FX artist Rick Connelly has devised an ingenious yet simple aid to strap a mold with a flat bottom. Thanks for sharing this, Rick!

NOTE: The oven curing is not essential. If you do not have access to an oven or hot box, the silicone will cure at room temperature; it will simply take longer. The results will be identical. I have never placed a mold of mine in the oven to accelerate the silicone cure for two reasons:

1. The only oven I have that's large enough for some of my molds is my foam oven; latex and silicone do not play well together, and,
2. I've seen cap plastic bubble when trying to help evaporate the solvent by applying heat from a blow dryer.

Chances are the silicone you're using for your prosthetic won't have a cure time longer than 4 hours. Be patient, or be a better time manager.

REMOVING THE APPLIANCE

1. Allow the mold to slowly cool enough to be handled (90–100 °F)—if the mold is gypsum, it may crack if cooled too quickly—and carefully demold the appliance. Ignore this step if you are not heat-accelerating the cure.
2. Wash off any release residue and trim the injection and bleeder sprues.
3. Cover the trimmed sprue points with fresh encapsulator material (cap plastic) and allow it to cure. Then powder the appliance; it is ready for painting and application.

The steps for casting a regular silicone appliance are exactly the same—injected or hand-filled, minus the encapsulator; the oven curing is also an option and is by no means a necessity. In fact, if you use Polytek's PlatSil Gel-10 platinum RTV silicone, for example, it kicks pretty quickly (within 15 minutes at room temperature) and can usually be demolded in less than an hour with no additional heat.

VINCENT VAN DYKE AND SASHA CAMACHO

"The first thing I can really remember watching and getting really inspired by was *The Hunchback of Notre Dame* with Lon Chaney," says Vincent. "I was in awe of it even though it was silent and I was so young, but it was enough to keep my interest. I immediately ran to my makeup kit at the time—I must have been 6 or 7—and grabbed some silly putty and some of my mom's makeup and went to town…"

FIG. 6.43 Sasha and Vincent and hairy friend.

Image reproduced by permission of Vincent Van Dyke and Sasha Camacho.

FIG. 6.44 Vincent sculpting in WED clay.

Image reproduced by permission of Vincent Van Dyke.

"Ever since, I have had a true passion for creating characters. Eventually I realized that this was a possible profession and I never thought twice about anything but doing what has now been an amazing career for me."

Vincent has been creating characters for over a decade. Sasha has been working in the makeup effects world for over a decade as well. With Vincent working primarily as a sculptor and painter, he eventually found his way to one of Hollywood's leading makeup effects companies, The Burman Studio, where he became creative director and project supervisor. He was given the core foundation there by

FIG. 6.45 Vincent opening small urethane block mold.

Photo by author.

FIG. 6.46 Thom Floutz, Vincent, and Sasha.

Image reproduced by permission of Vincent Van Dyke.

FIG. 6.47 Old Sasha, Young Sasha.

Image reproduced by permission of Vincent Van Dyke and Sasha Camacho.

FIG. 6.48 *Hanging Man* sculpture.

Image reproduced by permission of Vincent Van Dyke.

FIG. 6.49 Vincent, Carl Lyon fitting *Hanging Man* teeth.

Photo by author.

owners Bari and Tom Burman that he needed to start his own company. Sasha got started with Nicole Michaud working on full-head silicone masks, and then went over to Burman studios and gained perspective and learned to train her eye from Bari Burman. And that's when Vincent and Sasha met. She still freelances, but is also the hair department head at VVDFX, Vincent's company. Is it easy to balance personal and professional lives when you work together so much? Says Sasha, "I'm not gonna lie, it's hard. Our work is our life so to not have that blend together is almost impossible." Vincent adds, "The balance is difficult, and can almost be more so because the worlds blend together. But this can also sometimes mean that our time off lines up so that we both have the same days off—which is really helpful."

Vincent says, "I think it's very common for couples to form within the industry. It's kind of hard not to—we live and breathe our work. I think to work successfully together, you have to have each other's back and bring out the best in one another." Sasha concurred, "Vincent and I work and socialize with many couples in the industry, and are fortunate to call them friends. They're all amazing artists and we work from time to time with some of them, hang out and have fun when we can. I think the makeup FX community is very small. Everyone knows everyone, or has heard of them. It's kind of nice."

About their work, Vincent says, "My goal is to bring a sense of realism into everything I create, even if that means it does not exist in this world. If it's not believable, then you've lost everything, including your audience. In a time where people's expectations for makeup effects are so high the bar must be raised constantly. To stay up on this you must have a fresh outlook on things that may have been done before and bring a new twist to them. I hope that is something that comes across in my work."

Vincent's credits include *Nip/Tuck*, *Grey's Anatomy*, *Star Trek*, *Day of the Dead*, *Scream Queens*, *Tropic Thunder*, *Code Black*, *Longmire*, and *The Lost Tribe*. Sasha's include *American Horror Story*, *Code Black*, *Longmire*, *Black Mass*, and *True Blood*.

CONFORMING MOLDS

In Chapter 5, there was an overview of making conforming molds; here we'll cast an appliance into one.

The first step is to prep both the silicone negative jacket mold and the gypsum positive.

1. Release the positive with Al-Cote dental separator, or the equivalent. Let it dry, then spray with Epoxy Parfilm. Release the silicone negative with Epoxy Parfilm also. Brush

just a very thin bit of petroleum jelly into the gypsum jacket so it will be easy to re-seat the silicone into it. *Do not* get petroleum jelly on the flange; we will be spraying Super Baldiez, and we want the Baldiez to stick to the flange, not release from it.

2. Lightly dust the silicone negative with baby powder or pure talc; blow off the excess to leave a matte surface.
3. Using an airbrush or a sprayer such as one by Preval which can be purchased inexpensively at just about any hardware store in the US (I'm certain there are equivalents in the UK and elsewhere), spray five or six layers of thinned Super Baldiez (thinned 4:1, 99% IPA:Baldiez) into the negative, letting each layer dry before adding the next. If a spray method is unavailable, you can sponge in the Baldiez, stippling each layer carefully.

FIG. 6.50 Negative mold ready for silicone.
Image reproduced by permission of Neill Gorton.

FIG. 6.51 Preval sprayer.
Photo by author.

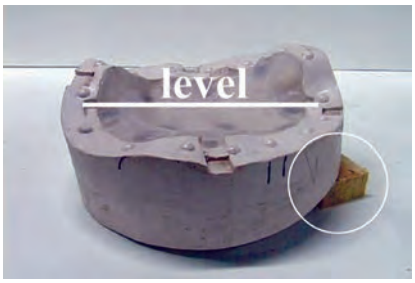


FIG. 6.52 Mold adjusted so silicone will pool evenly in the bottom.
Image reproduced by permission of Neill Gorton.

Now you're ready for the silicone to go into the mold. The silicone negative mold should sit so that the silicone will pool evenly like in the bottom of a bowl when it is poured into the mold.

Of course, you kept the clay from the prosthetic sculpt and the flashing so you'll know how much silicone (and deadener) to mix…

4. We want the silicone to be deadened for three reasons: (1) To make the silicone soft and flesh-like; (2) To help it adhere to the Super Baldiez; and (3) To help the appliance adhere to the skin when applied (with adhesive). Mix the silicone—degas if you can—and pour the silicone into the mold. Brush a little onto the gypsum positive too, to help prevent air bubbles from forming when you put the two pieces together.

NOTE: There are some inherent differences between Baldiez and Super Baldiez cap plastics, beyond the fact that Baldiez is acetone soluble and Super Baldiez is alcohol soluble. While both of the cap plastics are quite good, the Super Baldiez is considerably stretchier than Baldiez, with outstanding tear strength. Releasing your mold surface very well is frequently more critical with Super Baldiez than with Baldiez. If the mold surface hasn't been sealed (gypsum) and well released, Super Baldiez is capable of grabbing onto micropores in the mold surface and snagging—even in epoxy, fiberglass, or urethane molds, making removal of an encapsulated appliance unscathed somewhat difficult, and can even lead to de-lamination and/or tearing of the appliance, neither of which is likely to be repairable. Super Baldiez and Michael Davy's Water-Melon are the only alcohol-soluble cap plastics I am aware of, but there are several that are acetone soluble besides regular Mouldlife's Baldiez: Neill's Materials' Key Cap Plastic, Kryolan's Glatzan L, Smooth-On's Q-Ballz, and Motion Picture FX Company's BaldFX.

FIG. 6.53 Silicone into mold.

Image reproduced by permission of Neill Gorton.

FIG. 6.54 Closing mold.

Image reproduced by permission of Neill Gorton.

FIG. 6.55 Place just enough weight on top to ensure good edge.

Image reproduced by permission of Neill Gorton.

FIG. 6.56 Submerge mold to release silicone.

Image reproduced by permission of Neill Gorton.

FIG. 6.57 Release suction gently.

Image reproduced by permission of Neill Gorton.

FIG. 6.58 Drain and let dry.

Image reproduced by permission of Neill Gorton.

5. Add just enough weight to the top of the mold to ensure a good edge without displacing the silicone negative.
6. When the silicone is fully cured, submerge the mold in warm water for about 10 minutes, and gently pry to help release the suction.
7. Let the water drain from the negative, and let it dry by itself (you can use a hair dryer, but be careful not to blow any dust or foreign debris into the silicone); do not touch the silicone with tissue or paper towel . . . it is very sticky!
8. Clean wet Al-Cote separator off the gypsum positive.
9. Be careful to keep the appliance in the mold, but remove the silicone negative from the gypsum jacket. You may need to use small, sharp scissors to help trim away overlapping silicone and Baldiez.
10. With a small soft brush, brush a layer of Super Baldiez over the sticky flashing so it won't be sticky anymore. The appliance is now ready for application. Set the piece aside in a small covered container. You can also brush a light dusting of baby powder or talc over the silicone to temporarily remove the stickiness.

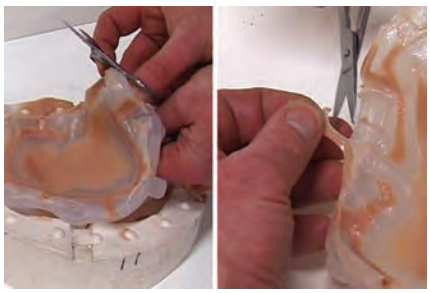


FIG. 6.59 Carefully remove silicone negative from gypsum jacket (L); trim excess flashing and Baldiez (R).

Images reproduced by permission of Neill Gorton.

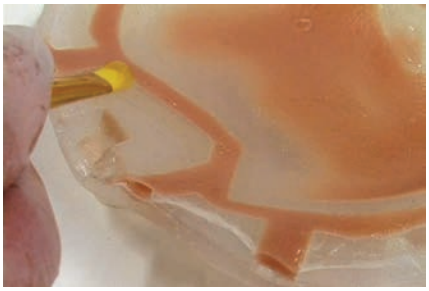


FIG. 6.60 Brush Super Baldiez over sticky flashing.

Image reproduced by permission of Neill Gorton.

NOTE: There is a product called *Pro-Bond Primer* that is specifically designed to prevent the de-lamination of encapsulated silicone. The application of Pro-Bond Primer to the encapsulate prior to the silicone gel ensures a permanent bond between the encapsulate and the silicone gel. Without trying to explain the chemistry, suffice it to say that Pro-Bond Primer works on a microscopic level; think of it as *microscopic Velcro*. It will even bond silicone gel to metal.

FIG. 6.61 Pro-Bond Primer.

Photo by author.

FOAM LATEX

As a material for making prosthetic appliances for special makeup effects, foam latex is, in my opinion, unrivaled for performer comfort. Stuart Bray and I have spent a great deal of time talking about foam latex together, and with foam latex Master Rob Burman. We had a lengthy discussion with Rob for our podcast *Battles with Bits of Rubber*. It was podcast #12, and you can listen to it here: www.learnmakeupeffects.com/rob-burman/.

Silicone has been the poster child material for prosthetics for some time now, and is an outstanding material because of how closely it can mimic the movement and feel of real skin. Foam latex is not such a squeaky wheel, and as such doesn't get the oil. Or attention. However, foam latex as a stalwart prosthetic material never went away, but largely because of the skill and equipment involved in its manufacture, many makeup schools simply don't cover its use nearly as much as they should, and many artists don't use it for the same reasons.

The whole point of being an artist is to create, and work outside your comfort zone. We're going to do our part to get more people using foam latex. If you're new to foam latex, this will be a lot of information to absorb.

So why use foam latex instead of silicone? As a material for making prosthetic appliances for special makeup effects, foam latex is unrivaled for performer comfort. Materials such as silicone might mimic the appearance and feel of human skin more believably and realistically, but silicone does not breathe, and an active actor wearing silicone appliances will begin to perspire rather profusely beneath the silicone if it is worn for an extended period of time, as many actors must. And it can get heavy. Gelatin will probably start to melt. Don't get us wrong; the material for a given appliance should not be chosen randomly or by economy, and we have nothing against working with silicone or gelatin as an appliance material. Appliance materials must be chosen based on numerous factors: climate, shot framing, performance, and budget.

FIG. 6.62 Rob Burman and Ray Shaffer applying RubberWear appliances.

Image reproduced by permission of Rob Burman.

FIG. 6.63 GM Foam (top) and Monster Makers foam latex (bottom) components.

Photos by author.

NOTE: A caveat to those of you wanting to try foam latex for the first time: Be aware that purchasing a foam latex kit during the winter months can be problematic; if the latex base freezes during shipping, it will be unusable. The same goes for shipping Pros-Aide during winter months; if Pros-Aide freezes it becomes a solid and remains that way. Many retailers will not ship foam latex or Pros-Aide during winter months for that reason. (That is how Pros-Aide transfers are made.) Silicone, on the other hand, can freeze and be fine once it thaws. The same is true for urethane rubbers, plastics, and foams.

I particularly love foam latex for its texture and feel. I even like the smell of it! Don't judge me. When it's made well, it feels better than velvet, and every subtle expression and nuance of emotion is translated beautifully through the foam from the performer; it *becomes* the performer. A nearly full-face appliance will likely weigh less than an ounce and, when applied, is almost undetectable by the actor wearing it. Foam latex breathes somewhat—certainly more so than silicone or gelatin, so it is comfortable and an actor can wear it all day long, as is frequently the case. Adhesion techniques can also help channel away perspiration from the performer, aiding in the actor's comfort level over time.

Materials

- Foam latex components (latex base, foaming agent, curing agent, gelling agent, color)
- Misc. additives
- Timer
- Digital scale
- Oven mitts
- Mold straps
- Weights
- Mixer and bowl
- Appliance mold(s)
- Foam latex oven
- Foam injector

Quirks

However, though foam latex is extremely light, strong, breathable, and expressive, there are some qualities that could be construed as negatives by some. I must confess, to get that extremely light, strong, breathable, and expressive appliance, there are a

FIG. 6.64 Rob Burman mixing foam.

Photo by author.

number of hoops that must be jumped through. Though every material used to make prosthetics has quirks and idiosyncrasies, foam latex is probably the most difficult material to work with overall, from several perspectives.

First, foam latex is opaque. You can't see through it. Unlike silicone and gelatin, which can be colored intrinsically to be semitransparent or translucent, just like real human skin, foam latex is naturally opaque. To create the semblance of translucency, the appliance must be painted with numerous transparent layers of pigment, usually with an airbrush, to achieve the look of real skin.

Second, foam latex requires a heat cure in an oven, and it *cannot* be the same oven you use to bake toll house cookies and Thanksgiving turkeys! Why? Because, third, foam latex gives off toxic fumes during the heat cure that will render your oven forever unfit for cooking. There are a few alternatives, one of which is building your own makeshift oven using infrared heat lamps in a well-insulated plywood box—you can see it in Fig. 6.65.

Later, I acquired an old GE consumer oven that I rewired from 220v to 110v. It wasn't very large—a standard home kitchen oven—but I could fit a two-piece mold for a full-face appliance and two smaller molds in it pretty easily. I'd have been hard pressed to get a full bust mold for an over-the-head cowl in it, but it served its purpose well, and I couldn't pass up the price—*free*—when a neighbor remodeled his kitchen and asked me if I had any use for his old oven. (On the plus side, I got terrific results with it.)

I am presently using an oven I built that is the size of a medium-sized refrigerator. It will easily fit two full-head and shoulder molds, and is a convection oven with continually circulating air so the heat inside is distributed evenly. If you're interested in building one of your own, you can watch the DIY tutorial video on my YouTube channel (www.youtube.com/watch?v=u5KWz9F0u3E). You'll also find detailed instructions

FIG. 6.65 Foam latex hot box; author's first "foam oven."

Photo by author.

FIG. 6.66 Rescued kitchen appliance terrific for baking small to medium prosthetics.

Photo by author.

FIG. 6.67 Author's DIY foam latex oven.

Photo by author.

on the companion website. It's on wheels, so it's quite mobile, pretty light—easily picked up by two people—and when laid on its back fits perfectly in my car.

Whatever you use as your latex oven, your foam latex should cure in an oven that cannot exceed a controllable/maintainable 200 °F (93 °C). Ideally, foam should cure no hotter than 185 °F (85 °C). I now bake at a lower temperature of 140 °F (about 60 °C) for a longer time, as I will describe a little further on.

Foam latex is time and temperature sensitive. When I was first learning how to run foam, I remember mixing the foam according to the instructions for using GM Foam and watching the foam solidify in mid-pour from the mixing bowl into the mold. D'oh! It was like watching a cartoon.

Foam latex shrinks. The denser the foam, the more it shrinks. That's not to be confused with the volume of the foam; lower-volume foam (heavier) will shrink more than high-volume foam (lighter) because it has more air and a lesser proportion of foam latex components. It is water loss that causes shrinkage in the foam. Since higher-volume foam stretches more than denser low-volume foam, any shrinkage that does occur can usually be compensated by stretching, with little force exerted on the foam.

What the mold is made of also contributes to the shrinkage of the foam or the lack thereof. A porous mold like Ultracal will cause the foam to shrink less because it absorbs moisture from the foam.

Foam latex, being essentially a foam rubber sponge, will collapse into itself when it moves, such as with a fold of neck skin, whereas silicone appliances displace themselves remarkably like real tissue. These are tradeoffs that you must decide on during the design (and budgeting) phase of your makeup. Foam latex is more delicate than silicone and rarely survives removal in one piece at the end of the day, necessitating fresh appliances for each performance day the actor is in makeup. Silicone, if handled and treated carefully, can be robust enough even for delicate edges to survive multiple applications.

Before I describe the process for running a batch of foam latex, let me give you a little backstory on latex itself. Latex is a natural liquid that comes from the Hevea tree grown in Malaysia, Thailand, Indonesia, the Philippines, and other tropical countries. The tree is tapped and a small amount of latex (only a few ounces) is collected from each tree before the cut on the tree congeals and heals itself. Each tree is tapped only once every two days. According to GM Foam's technical information, over 95% of all-natural latex is concentrated by a method called *centrifuging*. The result is a high-quality product containing 60%–65% solids, used mainly for dipping compounds such as rubber gloves and condoms. The remaining latex, which is less than 5% of the world's production, is concentrated by another method called *creaming*, a process whereby ammonium alginate is added to the raw latex, causing separation. The watery "serum layer" is drained from the vats, leaving a higher concentration of latex.

Latex itself was discovered as far back as the late 15th or early 16th century, and got its name *rubber* in 1770 from English chemist Joseph Priestley who used coagulated latex to remove pencil marks from paper; since it *rubbed off* the marks, he called it rubber. Foam latex—not the stuff we know today, but still foam latex—goes back pretty close to the turn of the 20th century, though it was actually the accidental discovery of *vulcanization*—the conversion of curing latex into a more durable material through the addition of sulfur and heat—by Charles Goodyear in 1839 that made the creation of foam latex possible. It was companies like Uniroyal, Firestone, and Goodyear that began experimenting with a 10-component formula instead of the 4-component mixture used today, though the resulting foam was much stiffer than the soft foam we are accustomed to; it was more like cardboard

initially. In the early 1900s—the silent films of the teens and twenties—regular latex was used for character creation and was backed with sheets of premade foam, but it was the 1930s in films like *The Wizard of Oz* when foam latex really hit its stride. The foam we've come to know today was formulated in 1936; it was the work of multi-talented makeup artist Charlie Gemora, and can be seen in *The General Died at Dawn* used for Asian eyelids on actor Akim Tamiroff.

One thing you'll notice when you open a container of liquid latex—whether it's balloon latex, slip casting latex, mold latex, or foam latex base—there's a *big* ammonia odor. That's not the smell I like. Ammonia is added as a preservative; this prevents the latex from coagulating, leaving the final concentration at approximately 68% latex solids. Creamed latex separates over time and will continue to separate unless it is shaken on a weekly basis, to keep it mixed and fresh. This type of latex has a greater stretchiness than the centrifuged latex, so it is also considered the best latex for making prosthetic foam.

Since latex is a natural product, its composition is dependent on environmental conditions. The Hevea trees and the latex are affected by how much rainfall there is in a given season, how many sunny days, how young the trees are, and so on. Thus, the quality of rubber varies from season to season, year to year, and month to month. These fluctuations can wreak havoc for artists running foam for makeup effects, because the latex will behave differently all the time. What GM Foam does when it purchases creamed latex is to calibrate its own latex base. When the company receives the latex, it first adjusts the pH balance, then conditions the latex with additives, and finally makes a special blend with other types of latex. By doing this GM Foam can carefully control the cell size, foam volume, flow, and gel time. This means that if you follow the instructions provided with GM Foam latex, Monster Makers or Burman foam, the foam should perform exactly as predicted, every time. In theory. Though there is significant science involved in making foam latex prosthetics, it is every bit as much an art.

TIP: If you need to thin latex because it's too thick, use ammonia, not water. Water will weaken the structure of the rubber.

Provided that you have already created your appliance sculpture, made the molds, and dried, sealed, and released them properly, you are now ready to run some foam! Basically, the operation goes like this: A batch of latex is mixed together with a foaming agent, a curing agent, and a gelling agent and maybe even a little pigment for color. It is whipped into frothy foam at high speed in a mixer; I use a 5-quart KitchenAid, kinda like beating egg whites into meringue. But sometimes I use a 5-quart Sunbeam mixer. I have five mixers—three KitchenAid and two Sunbeam, and they're each a little different. If you run foam long enough, you will eventually be able to gauge its readiness by smell, not time. Anyway, once you've mixed the foam and it's ready, it's poured or injected into the mold, and the mold is placed in the oven and heated to 140 °F (60 °C) for about 7–8

FIG. 6.68 Mold ready for oven.
Photo by author.

hours, depending on mold thickness. Any temperature above 185 °F (85 °C) and you will risk overcooking your foam and ruining it. And, by baking the foam at a lower temperature, you'll wind up with a softer foam as a result.

Regardless of your location, some experimentation in mixing the foam might be in order to find the right blend of mixing for your foam. Gil Mosko, creator of GM Foam, makes a point of telling people, "Don't be a slave to the schedule. All mixers run differently and many conditions can affect how the foam will rise in the mixer." A key point to remember is that *you must be able to pour the foam from the mixing bowl into the mold*. If the foam is too light and fluffy, which happens when you achieve a very high volume of foam, you may get a really, really soft-cured foam, but you are also very likely to have enormous empty cavities where the foam was unable to get into all parts of the mold due to the lightness of the high-volume foam and its non-pourable condition.

■ Running Foam Latex

A typical batch of foam latex now consists of 170 grams of high-grade latex base (up from 150 grams), 30 grams of foaming agent, 15 grams of curing agent, and 14 grams of gelling agent. There are other ingredients and quantities that can be added for different foam characteristics, but this is a good place to begin. As I mentioned, this operation is time and temperature sensitive as well as humidity sensitive; optimal conditions would be in a room at 69–72 °F (20.5–22 °C) and with 45%–55% humidity. I live in Colorado, so I have humidity (rather, the *lack* of humidity) to contend with as well as a lower high-elevation air pressure that also affects what I do. The above "optimal" conditions are based on mixing at sea level, so I'll stick with that, since most of you will probably be working at lower elevations.

A typical batch of foam latex consists of:

- 170 grams of high-grade latex base
- 30 grams of foaming agent
- 15 grams of curing agent
- 14 grams of gelling agent

NOTE: You can make smaller batches than a 150/170-gram batch (as well as larger), but if you go smaller than a half batch, take detailed notes as your ratios may need adjusting; precision measuring becomes more critical. The margin of error for small batches is almost non-existent.

Weigh the first three components—the latex base, the foaming agent, and the curing agent—and add them to the mixing bowl. It would be good for you to have an accurate digital gram scale. Even better, a good triple beam scale.

Weigh out the gelling agent into a small cup and set it aside. We won't add that until we're almost done mixing. If you're adding pigment, put a few drops of your color into the bowl, too. Then place the mixing bowl into position and you are ready to begin. This will be a 12-minute mix. A timer that will count down is a plus, but if you can tell time and count, a clock or a watch will suffice. (Since you're reading this book, I know you're all very smart.)

FIG. 6.69 Accurate scale essential for foam latex.
Photo by author.

1. Your mold must be sealed and released—both the positive and the negative—to prevent the foam latex from sticking and tearing when you attempt to remove it after it cures. If you are using GM Foam, follow the simple instructions for GM's release agent. If you are using different foam, do as you're instructed to for that product. Price Driscoll's Ultra 4 Epoxy Parfilm works pretty well (but only if the stone mold you're using has been sealed and is no longer porous).
2. For the first minute, mix the ingredients on speed 1.
3. For the next 4 minutes, whip the ingredients on speed 10. This will froth the foam and increase the volume in the bowl. As I've already said, Gil Mosko, GM Foam's founder, says to not be a slave to the schedule. Once you understand how foam latex works, you will be able to adapt to any situation.

FIG. 6.70 Triple beam scale.
Photo by author.

What the high-speed mixing does in addition to creating high-volume foam is remove ammonia from the latex. *Too much ammonia loss and your foam will gel too quickly; not enough ammonia loss and your foam might not gel at all.* It might seem like you need a degree in chemistry to run foam (it certainly wouldn't hurt) but that is why there is a mixing guideline to follow, so you don't have to know specific pH values and other scientific-type stuff. Simply understanding the function of the ingredients and the stages of the process should be enough information to do some experimentation. Such as:

- The *foaming agent* acts as a soap that bonds to the cells of the latex, lowering the surface tension of the latex and allowing it to froth and rise more easily.
- The *curing agent* contains sulfur to help vulcanize (strengthen and add elasticity to) the latex.
- The *gelling agent* creates a reaction that changes the foam from a liquid into a solid. The mix is basically bentonite clay filler, water, and sodium silicofluoride. That's it. It's the one standard formula across all brands of foam latex.

There are other additives you can use such as Flow Enhancer which makes even high-rise volume batches flow easier over fine detail without catching air, Foam Stabilizer which is an advantage in hot, humid conditions, and MICAD which keeps the foam cells small in high-rise volumes, yet makes the foam very soft.

Record detailed notes of what you do when you are just beginning to work with foam latex as well as when you make changes to any part of the process. Things you might want to include in your notes are:

- Air temperature
- Humidity
- Curing agent (amount, brand, date, and batch number)
- Foaming agent (amount, brand, date, and batch number)
- Gelling agent (amount, brand, date, and batch number)

FIG. 6.71 Mixing foam with KitchenAid mixer.
Photo by author.

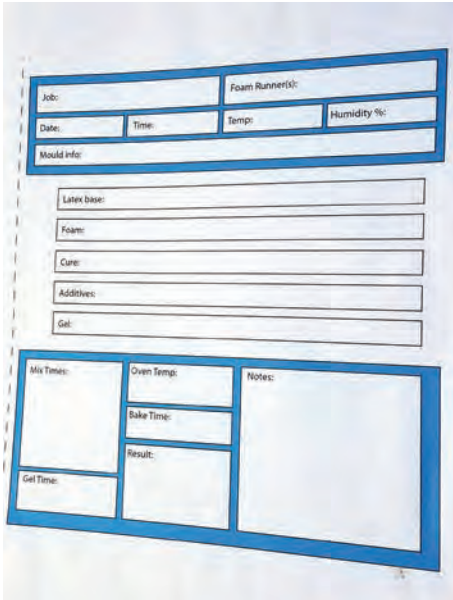


FIG. 6.72 Foam run notes form; designed by Stuart Bray.

Photo by author.

- Latex base (amount, brand, date, and batch number)
- Additives: accelerators, stabilizers, etc.
- Mixing times
- Pigmentation (amount and color)
- Gel time: start and finish
- Baking time: in and out
- Oven temperature
- Mold: Ultracal, fiberglass, old, new, etc.
- Results

Prepping the Mold

Foam can be run in a variety of molds, including gypsum, fiberglass, and epoxy. Ultracal is porous, so it needs to be properly sealed and released to prevent the foam latex from adhering to the mold. Every bit as important as sealing and releasing the mold is making certain that there is no moisture left in the mold before baking foam latex in it. This is important for two reasons. Residual moisture in the mold will prevent moisture from the latex being absorbed by the mold, thereby causing the foam to shrink more after curing. Moisture in the mold can also cause steam pockets to form within the mold, which can ruin the foam. Water heated under pressure (as in a clamped, sealed mold) can boil at a lower temperature than normal (212 °F/100 °C), such as those needed for baking foam latex (under 200 °F). To prevent that from happening, your stone molds should be *post-cured*—heated for several hours at nearly 200 °F (93 °C) to remove any residual moisture. This is particularly true of new molds. It is also very important that the foam has fully gelled in the mold before going into the oven. More on that in a bit.

The same is true of fiberglass molds—not to remove residual moisture (because there is none) but to vent off styrene remaining in the mold, which can react badly with the sulfur given off during the foam latex curing process and transfer to the foam.

Okay, back to the process:

4. Turn the speed down to 4 for 1 minute. This stage will begin to refine the foam, breaking up the biggest bubbles.
5. Turn the speed down to 1 for the last 4 minutes to further refine the foam. When there are 2 minutes left, begin adding the gelling agent and continue mixing for 12 minutes. It is critical that the gelling agent be mixed well, and depending on what mixer you use, the methods of assuring that the gelling agent is sufficiently mixed can vary.
6. At 12 minutes, turn off the mixer and remove the bowl and you are ready to carefully fill your molds.

NOTE: This recipe is the general one recommended by GM Foam at sea level. I suspect Monster Makers and Burman would concur. Check with each manufacturer to be certain.

I've had good results with these times, but have also had disastrous results with these times; a movie I did several years ago in Colorado required numerous foam appliances, and the following mixing times worked beautifully every time and have become the high-altitude schedule with a KitchenAid mixer. It is a 9-minute schedule instead of a 12-minute schedule:

09:00 Speed 1—*Mix ingredients*
08:00 Speed 10—*Whip to volume*
07:00 Speed 4—*Break largest bubbles; remove ammonia*
05:30 Speed 1—*Refine bubbles*
03:00 Speed 1—*Add gelling agent*
00:00 Stop

Monster Makers' schedule is this:
12:00 Speed 1—*Mix ingredients*
11:00 Speed 10—*Whip to volume*
07:00 Speed 4—*Break largest bubbles; remove ammonia*
06:00 Speed 1—*Refine bubbles*
02:00 Speed 1—*Add gelling agent*
00:00 Stop

These schedules can be varied. Be sure to take notes of every change made, and remember: Don't be a slave to the schedule!

In general, the curing agent will be roughly 10% of your foam base, the foaming agent will be about 20% (this way you can mix varying amounts in appropriate combination).

If your foam gels too fast, shorten the run or add less gelling agent. If it gels too slowly or not at all, next time run it longer or add more gelling agent. Make a note of it. Since gelling varies depending on temperature, humidity, and times, the proportions might be close to the 10% of curing agent, but the many factors affecting it make it a +/– kind of thing according to conditions.

Once the foam has fully gelled (you can tell by gently pressing on the foam; it should give a little and bounce back), you can place the molds in the oven and heat them until the foam is fully cured. If the foam feels at all squishy beneath the outer skin that has formed, it is not fully gelled. As long as the foam is gelling, there is no rush to get it into the oven. However, the longer it takes for the foam to gel, the greater the risk of foam collapse.

FIG. 6.73 Testing to see if foam has gelled. Photos by author.

■ Filling the Mold

There are really only two ways to get foam latex into the mold: pouring it in or injecting it into the negative mold. For molds that are no larger than a face, pouring works very well.

If there are deep areas in the mold, such as a long nose for the character of Cyrano de Bergerac (think Steve Martin's character in the movie *Roxanne*), you might first want to spoon or use a spatula to get some foam down into the nose tip to ensure that it fills and doesn't create an air pocket before you pour or spoon in the rest of the foam. You will learn over time how much or how little foam you actually need to place in the mold to fill it; when you press the

FIG. 6.74 Shrek cowl mold ready for injecting.
Photo by author.

positive into the negative, the foam will spread out and into other areas of the mold. If there are deeper portions the foam needs to reach, you will want to use a spatula, craft stick, or even your hand (in a rubber glove!) to spread it into those areas to avoid trapping air.

As the foam is pressed outward by the positive, the excess has to go somewhere; that's why you created flashing when you made the mold. It might even be worthwhile to have drilled small escape holes, called *bleeders*, in the positive and/or the negative to help facilitate the escape of air and excess foam latex. Having an air escape will facilitate foam getting into areas where trapped air would have prevented the foam from reaching. Foam latex has a lot of resistance to compression, and for your appliance to have fine, ultra-thin edges, both halves of the mold must be able to close completely and touch at the mold's cutting edge.

It's often necessary to inject the foam latex into a mold—say, for a full-head cowl piece or large three-piece mold (one inner core positive and two front and back negatives) that would be difficult or very messy to hand-pour.

Large foam injection syringes are available for sale from several sources listed in the appendix. Making your own is relatively easy, as well. I've made a few. I'm going to make a large, transparent one, but the clear plastic is pricey. When foam is injected, it is fundamentally different than when you pour the foam onto an open mold. The mold is tightly closed, making it almost airtight, and the act of injecting foam into the mold will create pressure in the mold; air in the mold will need to escape. Without numerous small bleeder holes drilled or bleeder channels etched into the mold positive, foam will not be able to flow easily into those areas. Collapsing the foam structure is also a danger from injecting too strenuously.

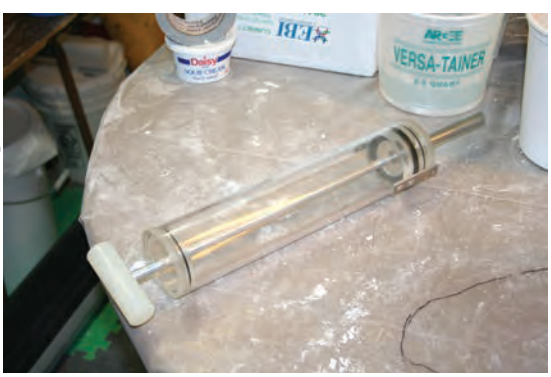


FIG. 6.75 Foam latex injector.
Photo by author.

FIG. 6.76 DIY foam latex injectors.
Photo by author.

■ Heat-Curing Foam

Once the mold is closed and the foam has gelled, it's time to pop it into the oven. But first, you need to understand the following: (1) Higher ambient room temperatures make the

foam gel faster, and (2) higher ambient room humidity makes the foam gel faster. This is not necessarily a bad thing, just be aware of it. To correct for these conditions, follow these tips: In hot and/or muggy conditions use less gelling agent into the mix and pour it sooner. Another way to extend your working time is to add extra foaming agent, which will prevent the latex from gelling too fast. GM Foam offers a product called *Foam Stabilizer* that is designed for use in high-humidity, high-temperature environments.

The following points are also very important to understand before embarking on a foam run:

FIG. 6.77 Molds going into the oven. Photo by author.

- The cure "window" is larger at lower temperatures. At 185 °F (85 °C), foam may take 3 hours to cure, but at 4 hours it could be over-cured. This over-cured foam loses tear strength and in extreme cases becomes crumbly. The same foam, cured at 140 °F (about 60 °C), could take 7 or 8 hours to cure, but even if cured for 9 hours it would still be fine. In other words, a low-temperature cure could have a 3-hour window where the cured foam would be usable. A 200 °F (93 °C) cure may only have a 20-minute window before the foam is unusable.
- Steam lakes are areas of foam that have been pushed away from the mold surface by pockets of steam, and then cured into that incorrect shape. These areas have all the detail of the sculpture, but they are depressed and too dense. This is a hazard in nonporous molds, such as epoxy and fiberglass, or molds that have not been properly pre-dried. However, it is a problem that can be remedied:

  1. The first step is mold preparation. Nonporous surfaces are to be coated with a thin solution of paste wax (such as Johnson's wax for floors) that has been cut with 99% alcohol. This "alcowax" should be thin and runny. Brush it into the inside of the mold, do not allow to pool, and when it's dry, brush it out with a dry brush. The mold surface will become polished and shiny. More important, the mold surface will be sealed from outgassing, which causes sites for steam laking to begin.
  2. Cure at a lower temperature (for a longer time). GM and Monster Makers Foam recommend curing at 160 °F (71 °C) for 3 to 4 hours for larger molds, and 2 to 2½ hours for small molds. I prefer 140 °F (60 °C) for longer times.

NOTE: The most critical part of making foam latex is gelation. The latex *must* gel. The latex will cure, gelled or not, but it won't be foam if it does not gel. The foam will collapse back into liquid. Not having your foam fully gelled can also be a cause of foam collapse, as could baking for too long. Once your foam has gelled, it will remain foam, and if you're not in a hurry, the foam will cure and vulcanize on its own. It will just take a long, long time if it isn't helped with heat. I once cured a neck appliance by putting the mold in the back of a black pickup truck in an asphalt parking lot all day one sunny summer day. The foam was beautiful!

FIGS. 6.78 & 6.79 Freshly demolded Shrek cowl and face.
Photos by author.

■ Removing the Appliance

Once you determine that your foam is fully cured, turn off the oven and let the molds begin to cool. If you try to cool the molds too rapidly, they will crack and break; you do not want to rush the process! When the molds are still warm to the touch, you can carefully demold your appliances; they will come out more easily when warm than if you let the molds cool completely. Carefully pry the mold halves apart and help remove the appliance with the use of a blunt wooden tool (so you don't scratch the mold's surface detail), powdering as you go to keep the thin foam edges from sticking together. I want to stress this point: You probably went to a fair amount of trouble to ensure that your appliance would have thin, beautiful edges; if you are not careful and methodical about powdering the appliance during removal, your thin beautiful edges will fold over on themselves and become thick ugly edges that you can't separate.

FIG. 6.80 Freshly demolded piece.
Photo by author.

After you've removed the appliance, it must (should) be gently washed in warm water containing only a few drops of dishwashing liquid (I use either Ivory or Palmolive dish soap) to remove any residual sulfur from the curing agent. (Leaving sulfur in the foam will lead to its eventual breakdown more quickly, and it stinks!) Repeat this procedure until there is no more visible residue in the water, then rinse until all the soap is gone, and gently squeeze out the water; you might want to press the appliance between two towels, then allow it to dry completely on the lifecast so that it will maintain its shape.

When the foam pieces have been washed, dried, and powdered, they should be stored resting in their

FIG. 6.81 Foam piece being washed. Photos by author.

FIG. 6.82 Bagged foam appliances ready for painting and application. Photo by author.

natural curvature in airtight containers, away from light if possible. It is convenient to use either zip-lock plastic bags or plastic refrigerator containers that have airtight lids. These baggies or plastic containers can then be stored in a cardboard box or any other opaque container that can keep out the light. If stored like this, foam latex pieces can be kept for years without any deterioration. If a foam piece is stored or left to air out with a crease or fold in it, the piece could wind up with a permanent crease line or indentation. Store the appliances in their natural curvature if possible.

Now the foam is ready for painting and application. The appendix at the back of this book includes more detailed information from GM Foam about run schedules.

COLD FOAM (URETHANE)

Cold foam is urethane foam and is called *cold foam* because it is not heat-cured like foam latex; urethane foam cures at room temperature. Cold foam (Kryolan makes a urethane foam soft enough for prosthetic work—*but see note below*) is an alternative to foam latex and could be a good place to begin working with foam instead of with latex simply because it does not require a lengthy heat cure and can be ready to use quickly. Cold foam is not to be confused with poly foam, which is also flexible urethane foam but has a different use and density associated with it.

NOTE: Urethane is not considered skin safe, so any appliances made using cold foam should be sealed to avoid direct skin contact in order to prevent irritation problems.

That said, urethane foam is *not* a substitute or replacement for foam latex. It is a different material with different properties. It is soft foam suitable for facial and body appliances, but even at its softest, it's not as soft and pliable as foam latex.

You will probably want to work with good ventilation and might actually want to wear a NIOSH-approved respirator (for the ammonia vapors), but working with foam latex does not mandate that you do so; it is not inherently dangerous to your health. Cold foam, on the other hand, contains isocyanates, which are considered quite toxic. It is strongly suggested that latex, nitrile, or vinyl gloves be worn in addition to a respirator. At no time should the components of foam in its liquid state come in contact with the skin or clothing; they will adhere to most surfaces, so it is important to wear proper protection when you handle the liquid components. It's always better to err on the side of caution.

In recent years, more people have been developing allergic reactions to urethane, so I offer this caveat (as I do with the use of *all* materials)—*test, test, test!* Make certain that your actor is not allergic to anything you are using against their skin, and take all necessary precautions to ensure your subject's health and safety. To err on the side of caution, once the pieces have been made and are ready to be painted, seal them to create a barrier between the appliance and the actor's skin to help avoid skin sensitivities.

■ Materials

Cold foam is a two-part A and B mixture, mixed in a ratio of 35A:65B (weird, right?), so an accurate gram scale is necessary.

- Digital scale/triple beam scale
- Challenge 90 release agent
- High-speed drill
- Wire beater (made from wire hanger)
- Mold clamps or mold straps, weights
- Latex, nitrile, or vinyl gloves
- Appliance mold
- Kryolan two-part Cold Foam System
- Food coloring
- Respirator
- 99% alcohol (for cleaning molds)
- Misc. disposable cups
- ½- or 1-inch chip brushes

Part A should be the color and consistency of a light maple syrup. Part B should be off-white or cream colored and the consistency of cream. The release agent (Challenge 90) should be light beige liquid and should be shaken well before using.

■ Quirks

The Kryolan cold foam instruction sheet suggests working in a room temperature of at least 80 °F (about 27 °C). That might be a bit warm, but colder room and mold temperatures can cause the foam to fail occasionally. High humidity can also cause foam to fail; ambient room humidity and even wooden stir sticks with any moisture can cause the foam to collapse. Stone molds or plaster molds must be clean and thoroughly dried before using. Just as for molds to be used for foam latex, new molds can be oven-dried (post-cured) for several hours at about 200 °F (93 °C); air-drying molds can take as long as several days.

Sometimes it is possible to reconstitute a collapsed piece by carefully crushing it; you will hear a popping sound like the noise when you crumple and twist bubble wrap. What you are doing is popping cells in the urethane, allowing the foam to return to its molded shape. Sometimes this will work, sometimes it won't.

FIG. 6.83 Kryolan Cold Foam.
Photo by author.

The shelf life of cold foam is limited once the product containers have been opened. The chemicals are affected by exposure to air and light; therefore, the components should be stored in a cool, dry, dark area and used fairly soon after purchase. Keep the containers tightly sealed after each use. The manufacturer's recommended shelf life is six months after manufacturing, but I've made excellent pieces with foam components much older than that.

Prepping the Mold

If you are using a stone mold that has been thoroughly dried, it must be sealed to make it as nonporous as possible before applying the release agent. New or *green* molds, or molds that haven't been used in a while should receive a second coating of release. All coats of release should be thin and dry before proceeding. Care must be taken in demolding the foam to prevent tearing the skin. Stone molds can make removal of urethane foam difficult, so beware. Every surface that the foam touches must be released because of the foam's tendency to stick to anything it comes in contact with when it sets up.

As with foam latex, finding the right amount of material to pour into the mold will take some experimentation before you become adept at just "knowing." It will partly be a factor of calculating the volume of the appliance and partly knowing how much the foam will expand as the mixed liquid components turn to foam. When you mix foam latex, the volume is dependent on whipping speed and time. With urethane foam, it rises of its own accord; under the best of circumstances, the cold foam will expand seven times its original liquid volume. The molds used for urethane foam must have escape holes drilled for excess foam to get out. If too much foam is put into the mold and the mold is then clamped tightly shut, the resulting foam will be dense and less flexible than if just enough is added and expands into all the cavities of the mold.

Though cold foam can be a pain in the neck because of its high sensitivity to any moisture, what I like about it is how tough it is compared to foam latex. It isn't as soft as foam latex, though a softer foam can be achieved by increasing the ratio of part A (I'm talking mere drops for a small mold; too much A could prevent the foam from skinning at all); an appliance made of cold foam can be used repeatedly because it is less susceptible to tearing during removal. I have had pieces made that've lasted for as many as 40 stage performances, without wear noticeable from the audience. In fairness, I must attribute at least some of that success to conscientious actors.

According to Kryolan, the optimum working temperature for the foam is 113 °F (45 °C). You can achieve this by placing the mold halves, the positive and the negative, in an oven set on warm—about 120 °F (about 49 °C) in most ovens. Heat the molds until they're warm to the touch. If that's not possible, try using a blow dryer on high for a few minutes.

Filling the Mold

Let me reiterate the importance of working in a room with adequate ventilation and a respirator. The release agent alone is reason enough for it. Whew! Just as for foam latex, make notes of what you do for each batch. The more you use cold foam, the better your results will be.

Before beginning, place a cup or other container on the scale and tare it (zero it out):

1. Pour Part B into a container; add food coloring to tint if needed. Experiment beforehand for color and amount. Unfortunately, food coloring choices are rather limited compared to pigment selections for other materials.

2. Pour Part A into a container (the ratio is 65:35 B:A by weight; multiply the weight of Part B by .53 to get the weight of Part A; 35 divided by 65 = .53). You can pour both parts into the same container if you are able to accurately do so.
3. As soon as the two parts have been added together, mix them quickly. The best results will be achieved by whipping the mixture with an electric drill and wire whisk; bending a long piece of wire (such as a coat hanger) works well. If you mix by hand, stir the mixture as quickly as possible until the foam starts to increase in volume.
4. Immediately pour the foam into your mold and clamp the halves tightly closed. The setting time is usually around 8 to 10 minutes but can take longer, depending on the temperature of the molds and of the room.
5. Cleanup can be done with soap and water, but be prepared for the fact that you might not get all the foam off your tools. Definitely wear rubber gloves for this!

There is a heat reaction when the foam begins to rise; the foam might begin to rise very suddenly, so be careful to keep your working area clear of anything you care about. Urethane foam is quite unwilling to give up anything it envelops.

■ Removing the Appliance

The cold foam will be ready to demold in approximately 30 minutes. Because cold foam is not as soft and stretchy as foam latex, care must be taken when opening the mold so that you don't tear the appliance or separate the outer skin from the inner foam structure.

The formula for Kryolan cold foam is designed to make it safer and easier to use and to hold up to repeated washings; it can be applied and worn immediately after demolding, though you might choose to wash it first and let it dry as you do with foam latex pieces. Cold foam takes paint and makeup well and can be used with any of the adhesives used for silicone and foam latex. From a cost standpoint, cold foam is less expensive than foam latex.

Cold foam is just another choice available to you as a makeup effects designer, and the decision to use it instead of another material should be based on a number of factors, not the least of which is skin sensitivity of the performer who will wear it. Kryolan's Research and Development department continues to refine the formula, and has stated that "one in a million people" might be sensitive to the foam and develop a rash; so far there have been no breathing or respiratory side effects. Just as with every substance you work with as a makeup artist, you should be familiar with each product; SDS product sheets from the manufacturers are available and contain information on just about everything imaginable for their products. All you have to do is ask for them. And you should.

TIP: Because of the potential for skin sensitivity to the cold foam, it may be prudent to seal the appliance prior to application, putting a barrier between the appliance and the performer's skin. Sealing the piece with No-Tack Pros-Aide, and applying a skin barrier such as PPI Top Guard, or Kryolan Marley Skin or Pro Shield is a good suggestion.

GELATIN AND FOAMED GELATIN

The gelatin in Jell-O is what enables you to create all sorts of different shapes. I'm sure you've all heard of gelatin, but what exactly is it? Gelatin is a structural protein called *collagen* that is found in many animals, including humans. In fact, collagen makes up nearly

one-third of all protein in the human body. Collagen is a large molecule that our bodies use to make skin, bones, and tendons strong, flexible, and elastic.

To manufacture gelatin, manufacturers grind up bones, hooves, and connective tissues of cows, pigs, and sometimes horses and treat these parts with either a strong acid or base to break down the cellular structure of the tissue and release the collagen and other proteins. After this treatment, the resulting mixture is boiled; during this process the collagen protein is broken down, resulting in the creation of gelatin. Yummy, but not vegan-friendly.

Because of its versatility, gelatin is a common ingredient in many foods and can be used in many ways; gelatin is used in foods from chewing gum to yogurt. It is even used to make capsules for medications and vitamins to make them easier to swallow.

By now some of you may be wondering, "What the heck does this have to do with special makeup effects, Todd?" Well, in addition to gelatin being used as an ingredient in foods and cosmetics, it is also one of the primary materials used in creating prosthetic appliances, along with foam latex and silicone. Gelatin has been used to create makeup effects since the 1920s.

NOTE: There are vegan alternatives to gelatin: Agar (Agar-Agar or Kanten); Carrageenan (Carrageen or Irish Moss); and Vegan Gel. Whether any of these are even suitable alternatives for prosthetic gelatin I cannot say. Feel free to do some testing, and let me know your results.

Materials

You can find a number of formulas for making your own gelatin on the Internet, as well as purchase premade gelatin prosthetic material from various industry suppliers. When describing gelatin, manufacturers refer to *bloom*. The *bloom factor* or *bloom strength* of gelatin is an industrial standard that measures the relative firmness of the gelatin in a cured state. Gelatin used for makeup effects work usually has a bloom factor of 300, whereas gelatin you can purchase from your local grocer (Knox brand gelatin, for example) will have a bloom somewhere between 200 and 250.

This might be just fine for work you will be doing, but just be aware that the tear strength will not be as high as when using a gelatin with a bloom of 300. (The 300-bloom gelatin is also more expensive.) However, there are additives you can put into your gelatin formula that will also increase tear resistance, strength, and durability.

- 300 bloom gelatin (UK gelatine)
- Glycerin (UK glycerol)
- Distilled water
- Appliance mold
- Zinc oxide powder
- Quick-rise yeast
- Epoxy Parfilm
- Elmer's Glue (white)
- Ascorbic acid powder (vitamin C)
- Liquid plastic sealer (alcohol based)
- Petroleum jelly (for release)
- Microwave
- Sorbitol (liquid)
- Scale
- Microwave-safe bowl(s)
- Baking soda
- White vinegar
- Vegetable oil spray (release)
- Tartaric acid (Cream of Tartar powder)
- Witch hazel (for blending edges)
- Misc. plastic cups
- Large craft sticks

There are so many formulas for making gelatin suitable for prosthetics that I've listed every ingredient I remember ever seeing in a recipe. Probably not all of them should be used in

the same formula if you want to have a product that is soft, light, and strong enough to use. Fortunately, none of the individual elements is expensive; in fact, gelatin is the least expensive of the prosthetic materials used for makeup effects. Gelatin ingredients are inexpensive, and you can buy just about everything you need to create gelatin appliances at your local grocery store and pharmacy. Experiment! Or you can buy premade gelatin, both foaming and non-foaming, that needs only to be heated and poured into a released mold. Several suppliers are listed in the appendix and on the companion website.

NOTE: If you want to experiment and spend even less money, everything you need to make prosthetic gelatin can be purchased at your local supermarket; substitute Karo corn syrup for Sorbitol, and everything else is the same. Gelatin powder is generally in the baking aisle, glycerin in the pharmacy section, etc.

Some of the ingredients listed above may seem oddly out of place, so let me describe the purposes of some that might not seem obvious:

- Vinegar: foaming agent
- Ascorbic acid (vitamin C): foaming agent
- Baking soda: foaming agent
- Zinc oxide: strengthener (but will reduce translucency)
- Tartaric acid: foaming agent
- Quick-rise yeast: foaming agent
- Sorbitol: reduces shrinkage, increases strength
- Elmer's Glue: adds strength and stability

■ Quirks

Gelatin is more translucent and moves better than some materials, has a very realistic texture, and doesn't take much makeup to get good cover. However, gelatin breaks down with heat and perspiration; that is, it melts and dissolves, respectively. There are several effective workarounds for sweat-related problems, but heat, such as working under hot stage lights or on location near the equator, is another matter, and there's not much you can do about that except use something other than gelatin.

Gelatin is considered to be *hypoallergenic*, that is, allergy-free for use on most people. That's a good thing. Gelatin is also considered *hygroscopic*, which means that it has a tendency to absorb moisture from the atmosphere. This is both good and not so good: *Good* in that it allows gelatin to be soluble—to liquefy and dissolve. With the addition of water, the gelatin particles swell and expand, actually absorbing up to ten times their weight in water (which, in turn, can make gelatin appliances somewhat heavy); *not so good* in that gelatin appliances can swell in proportion to humidity changes in the air and shrink over time through evaporation.

One way to help minimize this change due to humidity is to substitute glycerin for almost all the water used in the gelatin appliance formula. This is very good for creating a variety of wounds and injuries—cuts, burns, bullet holes, swelling, and the like. This gelatin can be colored with flocking material, food coloring, or powdered cake makeup and stored in small squeeze bottles to be heated until the gelatin liquefies. This is similar to a number of gelatin effects kits that are available commercially. Just be very careful not to overheat the gelatin; because it is organic material, it can be severely damaged or ruined if heated

too much (or too often), and you don't want to burn your actor by applying gelatin that is too warm. *Always test the temperature before application!*

As I mentioned, glycerin is also hygroscopic, so some formulas replace some of the glycerin with Sorbitol, which is derived from corn syrup and is less affected by changes in humidity than glycerin. Sorbitol also increases the structural integrity of gelatin formulas, making them more tear-resistant, which is critical for prosthetic work. (I've seen formulas that added Elmer's white glue for the same purpose with good success.) Zinc oxide powder can also be used in small amounts to add strength and greater tolerance to temperature changes (remember, gelatin tends to melt when heat is applied). You will have to experiment when using zinc oxide because it will affect the translucency of your finished gelatin appliance. Zinc oxide powder is the preferred form, but sometimes it can be tough to find; zinc oxide ointment will work too, though. Regardless of the formula you wind up using and calling your own, keep your finished appliances in airtight plastic bags, away from the light and in a cool place. They will last much longer.

For prosthetic appliance work, the gelatin you use will need to be light and soft—foamy. So, the recipe I'll give you is for a foaming gelatin. The resulting gelatin will not be as light and soft as foam latex, but it will be substantially lighter and spongier than a solid gelatin appliance and definitely lighter than silicone gel.

NOTE: You can double, triple, or quadruple these formulas. Very small batches aren't as easy to mix as a medium batch, which this describes; but once you've mixed a medium batch, you can take smaller amounts from it and use them in small molds.

■ Making Foamed Gelatin

Here is a basic gelatin formula (you will notice that the recipe does not have Sorbitol, white glue, or zinc oxide; do some experimenting—a good makeup effects artist must be part mad chemist). This is for foaming gelatin so we've added an ingredient that will cause the gelatin to foam—yeast and a bit of distilled water:

- 160 grams (¼ cup) glycerin
- 40 grams (⅛ cup) gelatin
- 1 gram (1 tsp) quick-rise yeast
- 3.5 grams (3½ tsp) distilled water
- Pigment color of your choice (you can also use colored flocking, food coloring, or powdered cake makeup)

1. In a microwave-safe bowl, pour the glycerin. Slowly add the gelatin granules to the glycerin. If you are adding a pigment, mix the pigment into a small amount of glycerin before adding it to the batch. Heat the glycerin and gelatin in the microwave for a minute or two, in 5- to 10-second increments, being careful to *prevent bringing the gelatin to a boil*. If the gelatin boils, the collagen in the gelatin will be destroyed and you will need to start over. Gelatin melts at about 70 °C, or close to 160 °F, depending on altitude.
2. When the gelatin has completely liquefied, pour the gelatin into a plastic quart cup. Let the gelatin cool completely (you can put it in the freezer or refrigerator; you're essentially making Jell-O), then re-melt the gelatin in the microwave three or four

times—again in 5- to 10-second intervals so it won't boil—to ensure that all the water has evaporated from the glycerin, to minimize shrinkage of the finished appliance.

Filling the Mold

1. Before going on to the next step, apply a very thin layer of petroleum jelly, vegetable oil (PAM), or Epoxy Parfilm onto both the positive and negative of your mold as a release agent so that the gelatin won't stick to the mold surface when you demold your appliance.
2. When you're ready to cast your appliance, mix the yeast with the water and let this mixture sit for at least 2 minutes; melt the gelatin, being careful not to let it boil, then add the yeast and water mixture, stirring it into the melted gelatin. It will immediately begin to foam.
3. Stop stirring and let the gelatin mixture rise until it stops, then stir well with a large craft stick to refine the gelatin—that is, to remove large air bubbles and to make the foam mixture consistent. It should be the consistency of meringue. If the gelatin cools too much, reheat it briefly so it is pourable. Like foam latex, foamed gelatin can be poured or injected into a mold.
4. It is a good idea to heat the negative half of your mold in a warm oven until it is warm to the touch. This is an optional step, but it could provide a better appliance surface. The positive can be either heated or chilled prior to foaming your gelatin. If chilled, it should be cold to the touch but not frozen. The goal is to speed up the gelling time. Pouring warm foam into a frozen mold, or even a cold one, could crack it, which, as you can imagine, would be bad. Experimentation will dictate what is best.

FIG. 6.84 Foaming gelatin rising.
Photos by author.

NOTE: Instead of using the water/yeast mixture to make the gelatin foam, you can substitute a small amount of vinegar and/or baking soda to achieve the same result. Ascorbic acid powder (vitamin C) will also cause a foaming action. You do not have to foam the gelatin to achieve an excellent appliance. It is presented as an option, albeit a good one, I believe. Gelatin can have some weight to it (though it's still lighter than silicone), and foaming the gelatin will make it lighter by using less material.

FIG. 6.85 Foaming gelatin going into mold.
Photo by author.

5. When your foam is ready to pour, fill your mold; use a spatula or large craft stick to work the gelatin into the warm negative mold and close it immediately.

Be careful not to trap air bubbles when you're closing the mold. Clamp or press the mold halves together tightly to ensure a thin blending edge of the appliance, then place the closed mold into a freezer or refrigerator to gel. Depending on the size of your mold and the temperature, it could take anywhere from 30 minutes to an hour or more before the appliance is ready to be demolded.

■ Removing the Appliance

You can tell when the foamed gelatin has set by touching the overflow or any remainder from the mixing bowl; if it bounces back, it's ready to demold.

1. Carefully open the mold halves and find an edge; begin to remove the piece, powdering the gelatin as you go, to prevent it from sticking to itself. Place it back on the positive and it is ready for painting and/or application.
2. If the appliance piece is going to be applied to the skin, a barrier layer is recommended between the gelatin and the skin to prevent perspiration from prematurely breaking down the piece (dissolving it).
3. Apply a light plastic (such as bald cap plastic), vinyl, or acrylic layer over the areas of the appliance that will come in contact with the skin. Pieces for around the eyes—swollen bruises or eye bags, for example—should be completely sealed; you can even encapsulate gelatin in the same way you encapsulate silicone (but not with silicone as the encapsulator).
4. After sealing, powder the piece again before storing it in an airtight container. Another option is to also cover the back of the piece (but *not* the edges!) with Pros-Aide adhesive in addition to the sealer, allow it to dry, and then powder it.

Before moving on to casting dental appliances, I'm going to share another recipe with you for gelatin appliances—a non-foaming one—from Matthew Mungle:

- 100 grams Sorbitol (70%) liquid
- 100 grams glycerin
- 20–30 grams of 300-bloom gelatin
- Coloring: flocking, food coloring, powdered cake makeup, etc.

Here's how to prep and fill the mold and remove the appliance:

1. Mix the ingredients together and let them sit, preferably overnight, so that the gelatin has time to dissolve in the glycerin and Sorbitol.
2. Heat in a microwave (in a microwave-safe container) for approximately 2 minutes (in 10- to 15-second increments), stirring frequently.

Do not let the gelatin boil (bubble or foam); that will burn the gelatin, causing it to change color and leave bubbles in the finished appliance.

3. Gently swirl and jostle the mixing container to get rid of any air bubbles in the gelatin.
4. Carefully pour the gelatin into the warmed mold, holding the container as close to the mold surface as possible.

FIG. 6.86 Melted gelatin in microwave-safe container.
Photo by author.

FIG. 6.87 Slowly pour gelatin from near mold surface.
Photo by author.

Pouring from higher up may cause the formation of air bubbles that become trapped (with silicone, pouring from higher up causes air bubbles in the silicone to stretch and break).

5. Tilt the mold from side to side, allowing the gelatin to coat the surface of the mold and allowing air bubbles to escape.
6. Press the positive into the negative and close the mold tightly.
7. Allow the gelatin to cool and set up.
8. Carefully remove the positive, trying to keep the appliance in the negative. If there are bubbles, they will be easier to repair if the gelatin is still in the negative.
9. Trim around the flashing at the cutting edge and powder the inside of the appliance.
10. Carefully begin to peel up an appliance edge and gently remove the piece, powdering as you go. Powder both sides of the appliance.

TIP: When I make my own gelatin, I have several small glass rectangular containers that are perfect to pour the liquefied gelatin into to cool for making nifty little slabs of gelatin that are easy to re-melt, or put in small zip-lock bags to stash in my kit. I think the containers belonged to one of my grandmothers.

FIGS. 6.88 & 6.89 Rectangular glass container and gelatin in glass containers.
Photos by author.

I've already suggested that you take some time and experiment with gelatin because it is quick, easy, and inexpensive. What's also cool about it is that if your appliance turns out badly in the mold, you can simply clean out the gelatin, re-melt it, and pour it again! There is a caveat, however: Eventually the collagen in the gelatin will begin to break down from the repeated heating, but in the learning stages, that doesn't really matter, since you probably won't be making an appliance for a major project while you're just learning how to do gelatin well (I hope).

You will notice that the two formulas/recipes for gelatin I gave you are quite different; I can't say that one is better than the other (Matthew Mungle, however, might disagree). Much of how you make the gelatin is dependent on the way it will be used. If it is going to be for a prosthetic appliance, one way could be preferable over another, but if you are making a prop body part, you could decide on a different formula to suit the project.

Michael Davy, veteran makeup artist and the inventor of foaming sponge gelatin (which I think is fantastic), has developed a method of foaming his water-based vinyl cap plastic Water-Melon. The recipe is in Appendix B.

DENTAL ACRYLIC

I'll start this section off with another disclaimer because, next to your eyes, your teeth are the most sensitive and delicate body parts you will be working with. Now you're probably thinking, "Eyes, I can understand, but teeth? Really? They're hard. There are a lot of them. They're designed for tearing through meat and chewing food into itsy bitsy little pieces!" True, we don't always think of our teeth as sensitive and delicate . . . until something is *wrong* with them, and then we find out how tough (or not) we *really* are. Many of us would certainly divulge state secrets if some lunatic went to messing with our sensitive and delicate teeth. Anyone remember Dustin Hoffman and Laurence Olivier in *Marathon Man*?

For this reason alone, I caution you about the risk involved in working in and around anyone's mouth without being a licensed dental technician. *Any dental appliance that is not made by a licensed dental technician is to be considered and treated as cosmetic only, not therapeutic or corrective*. Cosmetic (theatrical) dental appliances are not suitable for chewing food. Never use force when inserting or removing a cosmetic dental appliance. I stated this in Chapter 3 and am reiterating it here in case you missed it there: *It is illegal to practice dentistry without a license.* (I must've been a lawyer in a past life to feel the need to say something so obvious. Sorry.) While I'm still on the subject, you should never attempt to take an impression of someone's teeth if they're wearing any kind of braces, real dentures, or removable bridge.

MATTHEW MUNGLE

Making Custom Zombie Dentures

This tutorial picks up where the dental impressions tutorial ended. If you make it to the end of the book, you'll see these choppers in a full makeup. It does require a small vacuum-forming machine.

1. You'll need these materials: dental acrylic polymer shade #77 (tooth shade), dental monomer (liquid), silicone teeth molds; dram/cc cups.
2. Measure approximately ½ oz of the polymer (dental acrylic powder) into a cc cup and add ½ oz of the monomer (dental acrylic liquid) into the cc cup. Mix the materials together. This product

sets in approximately 3–4 minutes depending on the room temperature so work *fast*.

3. Pour the liquid into the teeth molds.
4. Scrape off any excess material with a tongue depressor or metal spatula.
5. Materials: Vacuum form machine, .04 PETG vacuum forming plastic, and teeth casts.
6. Vacuum forming .04 PETG plastic to upper and lower teeth casts.

FIG. 6.90 Acrylic tooth shade #77, monomer and tooth molds.

Image reproduced by permission of Matthew Mungle.

FIG. 6.91 Adding monomer to acrylic tooth powder.

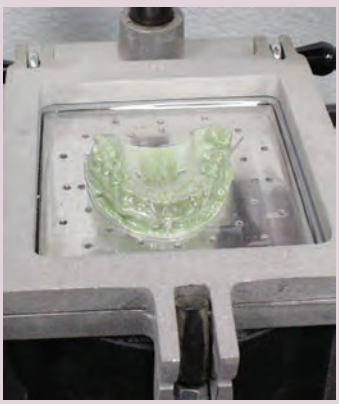
Image reproduced by permission of Matthew Mungle.

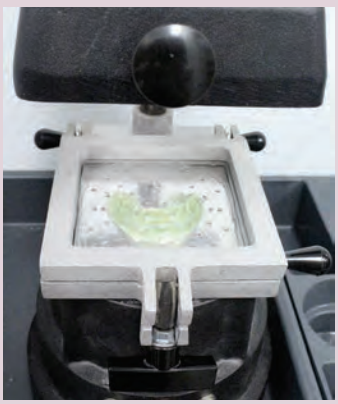
FIGS. 6.92 & 6.93 Pour liquid into molds; scrape off excess.

Images reproduced by permission of Matthew Mungle.

FIG. 6.94 Vac form machine, .04 PETG, and teeth casts.

Image reproduced by permission of Matthew Mungle.





FIGS. 6.95 & 6.96 Vac forming of upper and lower teeth with .04 PETG.

Images reproduced by permission of Matthew Mungle.

FIGS. 6.97 & 6.98 Vac formed teeth; teeth casts coated with petroleum jelly.

Images reproduced by permission of Matthew Mungle.

7. Materials: Teeth casts, plastic vacuum formed teeth trays (cut and trimmed) and teeth pulled from teeth molds. Coat the teeth casts with a very heavy coat of petroleum jelly *before* re-attaching the plastic vacuum form trays.
8. Mix another batch of dental acrylic, dip the back of the teeth into the liquid acrylic and place each tooth onto the plastic trays. Arrange the teeth as desired onto the trays. The material sets fast so make sure the final look of the teeth has been worked out before mixing the dental acrylic.
9. Fill in the back of the teeth with dental acrylic.

FIG. 6.99 Placing teeth on vac form.

Image reproduced by permission of Matthew Mungle.

TIP: Have a small cup of the dental monomer (liquid) nearby to dip the metal tool into. The liquid will help smooth out any setting acrylic.

FIG. 6.100 Filling in behind the teeth.

Image reproduced by permission of Matthew Mungle.

FIG. 6.101 Finished teeth placement.

Image reproduced by permission of Matthew Mungle.

FIG. 6.102 Coral dental acrylic.

Image reproduced by permission of Matthew Mungle.

FIGS. 6.103 & 6.104 Adding gum-colored acrylic to teeth; finished gum and teeth placement.
Images reproduced by permission of Matthew Mungle.

FIGS. 6.105 & 6.106 Grinding dentures; finished dentures after grinding.
Image reproduced by permission of Matthew Mungle.

10. Finished teeth placement.
11. Materials: Coral-colored (gums) dental polymer, dental monomer, cc cups, metal spatulas, teeth casts.
12. Mix the gum-color acrylic the same as the tooth-color proportions and fill in the gum area on upper and lower teeth as desired. Let set 2 hours.
13. Pull the finished dentures from the teeth casts and grind down the gum area and teeth to a desired look. Make sure there are no sharp areas on the dentures.
14. Buff the dentures with a buffing wheel or Dremel tool.

FIG. 6.107 Buffing dentures.
Image reproduced by permission of Matthew Mungle.

15. Materials: PPI AcrylStains Character Kit, dentures, brushes, and paint palette.
16. Start with Nicotine stain on the teeth roots. Thin the stains with the thinner if a translucent color is desired. Continue coloring with the Brown.
17. Bloody stain added to desired areas.
18. Zombie Green applied to teeth in selected areas.

FIG. 6.108 AcrylStains.
Image reproduced by permission of Matthew Mungle.

FIGS. 6.109 & 6.110 Nicotine and brown application.
Images reproduced by permission of Matthew Mungle.

FIGS. 6.111 & 6.112 Blood stain and Zombie Green.
Images reproduced by permission of Matthew Mungle.

19. Finished zombie dentures ready to wear.

FIG. 6.113 Finished zombie dentures.
Image reproduced by permission of Matthew Mungle.

Materials

One of the materials used in making theatrical teeth appliances is a liquid monomer that dissolves the dental acrylic powder; you will need to wear a good NIOSH-approved respirator that is rated for organic vapors whenever you are working with monomers. This stuff is unpleasant! This protection will hopefully help ensure that your brain continues to function properly for years to come. Never use monomers near any open flame or sparking heat source, either. Monomer vapors are heavy and will seek the lowest point, so do not use monomers in any room that has floor vents that lead to a heater or furnace or you may get to see your neighborhood from the air through thick smoke and flames.

If you will be casting acrylic in a silicone mold (and you will), you need to know that all silicones will absorb monomer. So, if you cast acrylic in your silicone mold more than twice in a row (in close succession), the silicone will swell, making the dentures you are casting thinner than they are supposed to be. Using a hair dryer (on *low*) on the mold for a few minutes will evaporate much of the monomer that's been absorbed. The mold should be cool before you use it again. A spray release agent such as Ease Release 200, Frekote 1711, or LIFFT, designed for molded polymers in silicone molds, will help prolong your mold life.

FIG. 6.114 Vacuum formed teeth.
Photo by author.

FIG. 6.115 Vacuum formed teeth with braces hardware.
Photos by author.

Vacuum forming has become another method of creating dental appliances, particularly for thin painted veneers directly over someone's own choppers, or for creating the illusion of wearing a retainer or braces. The wires and supports can be glued directly to the thin clear plastic molded veneer and then slipped right over the actor's own teeth and no one in the audience will be the wiser.

- Flexacryl acrylic powder
- Gum-shade acrylic powder
- Round-nosed pliers
- Variable-speed Dremel
- Al-Cote dental separator
- 400 and 800 grit wet/dry sandpaper
- Mechanical pencil
- X-Acto knife with #11 blades
- Tooth-shade acrylic powder
- .028 ball clasps
- Acrylic liquid monomer
- Misc. Dremel bits
- Medium bowl with hot water
- Dental wax
- Glycerin

Filling the Mold and Removing the Appliance

The process of casting dental appliances can be rather complicated and time consuming, considering how small they can be, but considering how important our mouths and teeth are, it is important to take great care to do this task well. Sculpting and casting dental appliances is fun, but be prepared for disappointment. This job is not easy and takes much practice to become proficient; unless you are called on to do this regularly, dentures might be an aspect of makeup effects that you'll want to leave to a specialist.

TIP: Curing dental acrylic under water and at 30 psi of air pressure will cause the acrylic to cure faster, denser, and with fewer surface flaws.

1. Place your dental positive in water and then brush it with a coat of Al-Cote dental separator. When the first coat is dry, add a second coat. You might also opt for a thin layer of petroleum jelly instead of or in addition to the Al-Cote.
2. Put some dental wax in the indentations between the teeth. This is fairly easy to do, but the wax must be melted; you can also use wax or oil clay instead of dental wax. This will prevent the dental acrylic from filling that space—which is an undercut—and risk breaking the stone when you remove the acrylic cast from the positive.
3. Mix tooth-shade acrylic 50/50 with Flexacryl, then add monomer and slowly pour it into the mold when it starts to thicken, tilting it back and forth to make sure the material gets into all the cavities of the mold.
4. Press the positive into the mold, but don't press so hard that suction is created when you remove your hand; you don't want to suck air into the mold with the acrylic.
5. Now you can do one of two things: You can place the mold in a bowl of hot water to cure the acrylic (it must be large enough to submerge the entire mold), or you can submerge the mold in a pressure chamber; Harbor Freight and Northern Tool & Equipment sell a 2½-gallon paint tank that is perfectly suitable for this task. You need to have an air compressor that is capable of delivering 30 psi of pressure, which isn't much. This will cause the acrylic to cure faster, denser, and with fewer surface flaws. You can demold after about 20 minutes.
6. Remove any excess acrylic from the appliance to prevent unwanted thickness in the finished piece.

FIG. 6.116 Dental wax removes potential undercuts that can hinder denture removal.

Photo by author.

NOTE: Undercuts can hinder the removal of your acrylic cast from the positive, or altogether prevent it. It only takes a fraction of a millimeter to mess up your work.

FIG. 6.117 Dental acrylic poured into mold (1), assuring full coverage (2), positive pressed into negative mold (3), finished cast (4) ready to trim and paint.

Photos by author.

FIG. 6.118 Simple dental appliances; upper and lower.

Teeth and photo by author.

Now, here is where I would ordinarily be done with casting dentures. All that remains is to trim away any acrylic that might be causing pressure or discomfort, paint them with Minute Stain, wash them, and wear them. What follows is more advanced, and I strongly suggest that you practice quite a bit before attempting this task for a paid gig. These next steps (7 through 23) border on the realm of a professional dental technician. *I am providing this information as information only and do not advocate or encourage its use*.

7. Draw lines on the teeth and gums with a mechanical pencil to show where the incisal layer is; this is a translucent outer layer on all teeth. Use the Dremel to carefully grind off some of the acrylic, leaving a thin layer around the teeth at the gums and at the base of the teeth in a somewhat jagged pattern. You will be recasting the teeth with clear dental acrylic, thereby adding a sense of depth.
8. Remove the pencil markings with a Q-tip dipped in monomer.
9. Brush Al-Cote or any dental separator over any exposed stone on the positive before casting the dental acrylic to ensure that it won't bond to it.
10. Mix 1 oz of clear acrylic with 1 tsp of tooth-shade acrylic with monomer—enough to liquefy the powder; when it begins to thicken slightly, pour it into the mold and press the positive back into the mold. You can repeat step 5 now. After the teeth have been demolded, they need to be prepped for casting the gums. Take the mechanical pencil again and draw around the teeth at the gum line. Then take the Dremel and remove as much of the existing acrylic covering the gums as you can, leaving a thin layer only. Then remove any remaining pencil markings with another Q-tip dipped in monomer.

NOTE: Wear a dust mask to avoid inhaling acrylic from grinding.

11. Since more dental acrylic is going to be added (pink gum color), we want to prevent it from bonding to the teeth.
12. Mix ¼ oz of Al-Cote separator with ¼ tsp of glycerin. Brush four coats onto any surface you don't want the gum color to adhere to. Make sure that each coat is completely dry before adding the next.
13. Mix the gum color and when it begins to thicken slightly, pour it into the mold and then press the positive into the mold. When the excess acrylic gets spongy and bounces back when you press into it (return memory), you can demold the positive.
14. Cut around each tooth at the gum line and the vestibule area (small cavity where the midline frenum muscle attaches the upper lip to the gums) with an X-Acto knife (#11 blade).
15. Carefully remove the gum acrylic from the teeth, front and back, as well as gum material that is covering the soft palate. *Note*: This might be easier said than done. Then remove the appliance from the positive and do a rough trim with the Dremel, grinding almost to the base of the teeth on the back side. Be careful not to grind through the acrylic and into the stone positive!
16. As an additional anchoring option, you can add a ball clasp to the appliance to help hold it in place, but it is not an essential step. Carefully bend the clasp into a curve that will fit around the back tooth of the appliance. Glue the wire in place with a drop of Superglue.
17. Use the Dremel to remove a section of the gums so that the appliance can be placed back on the stone positive without affecting the placement of the clasp.

FIG. 6.119 Using Dremel to trim.
Image reproduced by permission of Darren Grassby.

18. Release the area of the positive with a bit of petroleum jelly and place the appliance back on the positive. Mix up some new pink gum acrylic and carefully rebuild the gum over the wire clasp. When the acrylic has begun to set, place it in hot water to cure.
19. Use the Dremel to smooth out the new gum acrylic to match the rest of the appliance. Also grind down any high spots or rough areas on the inside. Be careful not to grind a hole in the appliance! Sand any rough edges with high grit wet/dry paper.
20. Use the same 400 and 800 grit paper to sand the front of the teeth and gums; then use a fine grit silicone point bit over the appliance, followed by a bristle brush bit to clean off any silicone residue. Then use a rag wheel bit with some acrylic polish to buff the appliance to a shine.
21. Use an old toothbrush and some dishwashing liquid to remove any remaining polishing compound from the appliance. The last step before painting the teeth will be to reline the inside of the appliance with a soft acrylic.
22. Brush a thin layer of petroleum jelly over the front and back of the positive. Then mix some Flexacryl (2:1) with monomer. The flexible nature of Flexacryl will make the appliance more comfortable to wear. Work quickly; this could set up rather fast.
23. Rub the inside of the appliance with a Q-tip dipped in monomer, then place the Flexacryl evenly on the inside of the appliance before placing the appliance onto the positive. Clean up any excess with another Q-tip dipped in monomer. Cure the acrylic in hot water and remove it. Then trim the excess, and it's ready to paint and wear!

NOTE: Don't leave the appliance on the positive for several hours or overnight without removing it at least once after the acrylic has cured. If you don't remove the appliance from the positive soon after curing, you may never get it off the positive! You don't need to ask me how I know this, either.

SILICONE (PART 2)

By Naomi Lynch

Not all silicones can be thickened effectively, and some work only with their own specially composed additives. There are different thixotropic agents for platinum and tin silicones. Don't mix them up. Some silicones thicken a lot, others hardly at all. *Test!*

You cannot mix different types of uncured silicone either. Each is specially formulated to give a specific result and won't work correctly if you mess with that. You can, however, add another layer on top of the first once it has passed the gel stage.

Residual solvents or monomers that may inhibit cure:

- Chlorinated hydrocarbons that contain amine stabilizers
- Alcohols—ethanol, methanol
- Esters—ethyl acetate, vinyl acetate
- Compounds with unsaturated bonds

These are "temporary inhibitors"—meaning once they evaporate they won't affect the cure—as opposed to permanent inhibitors which are . . . permanent. Sometimes if you haven't let the solvents evaporate

completely this may affect the cure, but if you leave the mold for a few days it may set properly, as the solvents disappear.

Residual solvents that don't inhibit cure include non-chlorinated aromatic and aliphatic solvents—toluene, xylene, hexane, mineral spirits.

Stuff like lighter fluid and naphtha therefore shouldn't cause problems, but isopropyl alcohol can.

I recommend covering your sculpt between working sessions, to avoid the chances of airborne contaminants settling on it.

If the room temperature is cool, that can interfere. Low temperature alone won't stop curing, it just slows it down. A rule of thumb I remember from somewhere was that every 10 degrees below 73 °F doubles cure time. Which means every 5–6 degrees below 23 °C will double cure time; however, you can blast it with a dryer or heater once it has gelled to stop that, or even rig up a "hotbox" to give it a warm environment.

SEAMING AND PAINTING PROSTHETIC APPLIANCES

As has already been pointed out, nothing really sticks to silicone except other silicone, which can make silicone somewhat difficult to paint, especially if you want the paint to stay put. This section deals with paint options as much as with painting technique (if not more so). Each makeup that you create will be different, so how you paint it and what you use to paint it will differ as well.

Let's begin by taking for granted that you have given your silicone appliance (or appliances) a foundation color that is at least in the ballpark of the base color you need for the overall makeup. You would have done this as you mixed the silicone prior to casting the appliance. But first we have to clean up the appliance by getting rid of seams and other surface blemishes that don't belong and should be corrected.

FIG. 6.120 Seams prior to seaming.

Photo by author.

■ Seaming and Patching

The term for cleaning up seam flashing and surface blemishes is *seaming*. The process actually *de-seams* the prosthetic.

■ Silicone

Starting with a small pair of sharp, fine scissors and your fingers (careful!) or a good set of tweezers, carefully lift the seam flashing and trim as close to the surface as possible.

Neill Gorton suggests that rather than simply trimming the flashing to the surface, which often still leaves a detectable remnant, cut a very slight channel

FIG. 6.121 Start with small, sharp scissors; lift seam flashing and trim carefully.

Image reproduced by permission of Neill Gorton.

along the seam. It is much easier to fill a small channel than to mask small bumps that could be left behind by simply trimming the seam close. These channels and indentations can be patched invisibly with small amounts of the same mixture of silicone used to cast the appliance initially.

After the flashing and other blemishes have been cut away, very carefully clean the surface of the prosthetic with a little isopropyl alcohol or acetone to remove fingerprints, dirt, dust, powder, mold release residue, or whatever. If the piece has been handled, you need to give it a good, gentle cleaning so that the silicone patch will grab and stick properly. Be careful to avoid appliance edges.

Using a small, accurate digital scale, mix a small amount of the silicone in the same proportion used for the appliance. Then, start applying it, working in only small areas at a time on the seam—no more than 3 inches (about 7.5 cm)—which will be easier but somewhat dependent on the silicone you use. Using a platinum-cure silicone such as Polytek's PlatSil Gel-10 will allow you to work quickly. The following steps will work best if your appliance is resting on either a soft foam or rigid foam form of your model.

1. Apply a thin line of silicone along the channel cut using a small dental spatula to place the silicone.
2. Then place a piece of clear plastic wrap (cling film) over the patch and lay it down carefully to make sure there are no trapped air bubbles. It is best if you can pin it taut in place. If the patch is on the neck, you can use tools to match and follow existing wrinkles and so on. A hair dryer will also accelerate the silicone cure.
3. As the silicone begins to thicken and set up, indentations can be added on top of the plastic wrap. After the silicone is fully cured, the plastic wrap can be carefully peeled away (nothing sticks to silicone, remember?), leaving an invisible patch where there was a noticeable seam before. Voilà! Perfect.

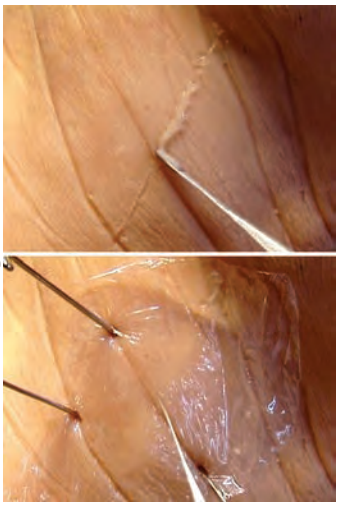


FIG. 6.122 Apply thin line of silicone along channel cut using small dental spatula to place silicone. If patch is on neck, you can use tools to match and follow existing wrinkles.

Images reproduced by permission of Neill Gorton.

■ Foam Latex

Seaming and patching foam latex can be a real pain in the caboose if you actually try to seam and patch with foam latex, because it requires a heat cure again. Unfortunately, foam latex is probably the best material to use because it will be the same as the rest of the appliance. However, in many cases seams are in areas of the appliance where you may be able to get away with using a different material that doesn't move in the same manner as the foam. It probably won't really be enough for anyone to notice but you.

Pros-Aide makes a terrific patching material, and there are two ways to use it. First, you can pour a small amount into a small cup and let it sit exposed to the air for a while; as the water evaporates from the adhesive, it will thicken up and you can then fill the seam or blemish. As the Pros-Aide begins to dry, you can texture it carefully with a tool or a (damp) stipple sponge. When it is dry (it will be completely clear when dry), powder it, and you're good to go. Alternatively, you can add a small amount of Cab-O-Sil to fresh Pros-Aide to thicken it into a paste and apply in the same manner. Pros-Aide mixed with Cab-O-Sil is affectionately called *bondo* after the polyester car body filler Bondo. Oddly enough, the Pros-Aide will still dry clear, even though the Cab-O-Sil is white (unless you've added a lot of the filler). A fine brush dipped in 99% IPA (isopropyl alcohol) can be

used to feather the edges to nothing while the Pros-Aide is still soft.

You could even try a bit of melted gelatin as a seaming and patching material on foam latex, provided you don't apply it when the gelatin is too liquidy and seeps into the foam. A fine brush dipped in hot water can be used to smooth the gelatin. Texture the same way as the Pros-Aide; freshly set gelatin is very sticky until it is powdered, so a light dusting of powder may facilitate texturing if the appliance needs it.

FIG. 6.123 After silicone cured, peel away plastic wrap, leaving invisible patch where there was noticeable seam.

Image reproduced by permission of Neill Gorton.

■ Gelatin

If your appliance is made of gelatin, I do not recommend using gelatin as the seaming material. The reason should be pretty obvious: You must melt gelatin to apply it to a seam, and melted gelatin is hot—warm, at least—and gelatin melts when it gets too warm or wet; hence, you don't want to re-melt the appliance you've just spent considerable time and effort to make. Use Pros-Aide instead. Pros-Aide (bondo) is also the preferred method of seaming cold foam (urethane foam).

PAINTING THE APPLIANCE

Painting prosthetic appliances can be handled in a variety of ways, and your method should be decided upon based on a combination of personal preference, personal style, the material of the appliance you'll be painting, and whether you'll be painting it prior to application, or after.

■ Silicone

To save yourself time and paint, I suggest that your appliances be pre-colored at the time you cast them. Because the silicone we use for prosthetics is clear or translucent, it is an excellent material for intrinsic (internal) coloring. You can color the silicone with either a pigment that approximates the character's coloring or with rayon fiber flocking material mixed to approximate the character's coloring. Materials you'll need:

- Alcohol palette
- Naphtha or white spirit
- Clear RTV silicone caulk
- Scissors
- Misc. sponges
- Wood craft sticks (for mixing)
- Clear RTV silicone adhesive/sealant
- Fine disposable brushes
- Heptane (Bestine rubber cement thinner)
- 1-inch and ½-inch chip brushes
- 99% IPA in a spray bottle
- Mixing cups
- Silicone pigments or artist oil paints
- Hair dryer
- Vinyl or nitrile gloves

NOTE: Nothing sticks to silicone except other silicone. To paint silicone in a way that will ensure it won't rub off with normal wear, your silicone appliance must be painted with silicone paint; that is, silicone that has been pigmented and thinned for application with an airbrush or fine bristled brushes.

FIG. 6.124
Paasche double-action Talon airbrushes and a Paasche H model single-action airbrush.

Photo by author.

An airbrush might seem to be a more practical and efficient way to paint an appliance, regardless of what material it is made of. It comes back to personal preference and how you were taught (or are being taught). For painting appliances, I believe you will be better off not using an airbrush and instead using chip brushes and cut-down chip brushes. Don't get me wrong, I love airbrushes; I have many of them ranging in size from very fine detail to big enough to paint a house. But unless you have an assistant whose job is to keep your airbrushes clean and unclogged, you may spend a lot of time cleaning your needles and nozzles every time you change colors, even if you are using several at a time.

Airbrushes clog quite easily, *especially* when you (try to) run thinned silicone through them. I was taught how to get superb results using thinned RTV silicone adhesive and RTV silicone caulk as the medium for applying color to silicone appliances. I think it worth noting that this method of painting is for *pre* application of the appliance, not *post*. RTV silicone caulk is tin silicone, and uncured it is not FDA-approved for applying directly on skin.

Now:

1. Start off by thinning the silicone adhesive (sealant) in a cup with some Heptane, Bestine (rubber cement thinner) or naphtha so that it is a pretty thin wash of about 10 parts solvent to 1 part silicone.
2. Of course, you have a polyfoam (soft or rigid urethane foam) form of your model that the appliance is resting on to hold its shape and facilitate easier painting.
3. Brush this clear wash onto your appliance, but be careful not to paint all the way out to the edges. Because there is a lot of solvent mixed with the silicone, you can ruin the edges; the silicone will absorb the solvent and swell.
4. Since you seamed with silicone gel, this wash will also create a thin layer of silicone over the seam patch. This wash of silicone adhesive will kick very quickly, setting up in less than an hour and resulting in a very strong bonding surface for the color you will add next.
5. You can use either silicone pigments to make your flesh tones or whatever color you need for your appliance, or you can use artist oil paints, which will work just as well. These colors will be used as detail highlight and shadow coloring on various parts of your appliance.

6. Mix another thin wash of silicone, this time mixing naphtha with some of the RTV silicone caulk instead of Heptane, Bestine, or naphtha with silicone adhesive. The ratio is about 10:1—10 parts solvent to 1 part silicone.
7. Mix a bit of the color you need and brush it onto the appliance, getting into all the creases and folds. Dab off any excess with a piece of sponge and continue until you achieve the effect you're going for.
8. Next take one of the chip brushes and cut the bristles down about halfway. The next step is to flick or spatter paint onto the prosthetic. This can be done by alternating heavy and light amounts. Mix another batch of silicone with naphtha in the same ratio, and mix colors to complement the complexion you are creating.
9. With your fingers (wear non-latex gloves), flick the brush bristles so that the paint spatters randomly onto the appliance.
10. Use another chip brush with longer bristles and tap it against the handle of the cut-down brush to apply spatter in a slightly different way, with different spatter amounts.

You could also do this with an airbrush. Be careful with the amount of color; it's very easy to overdo it, particularly with reds.

11. When you've spattered sufficiently, you can move on to adding vein color if it is appropriate to the prosthetic, dabbing with a sponge to remove excess color. Vein coloration should be very subtle.

FIG. 6.125 Use wash of silicone adhesive (caulk) to prime painting surface.

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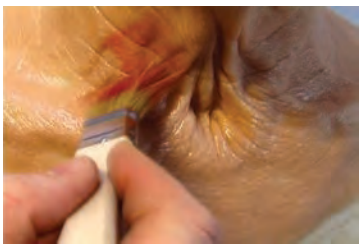

FIG. 6.126 Mix color and brush onto appliance, getting into creases and folds. Dab excess with sponge; continue until desired result achieved.

Image reproduced by permission of Neill Gorton.

FIG. 6.127 Flick brush bristles to spatter randomly onto appliance (wear non-latex gloves).

Image reproduced by permission of Neill Gorton.

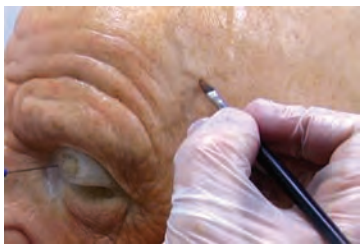

FIG. 6.128 Vein coloration should be subtle.

Image reproduced by permission of Neill Gorton.

12. You can continue to add color in the form of moles and age spots, if that is appropriate to the makeup, or you can stop and let the silicone paint cure, which will take several hours.

When the silicone has set, the appliance is ready for application. Then you can finish painting the appliance with an alcohol-activated color palette once the prosthetic is glued in place.

■ Foam Latex

Foam latex can be tinted during the batch mixing process to approximate the character's skin tone as closely as possible, and then it can be detailed after the appliance has been washed, seamed, and patched. As you should recall, foam latex is opaque, so any sense of tissue depth will be the result of painting, not the result of intrinsic coloring.

The process for painting a foam latex appliance is essentially the same as for painting a silicone appliance (with the notable exceptions of needing to use silicone paint for a silicone appliance, and *you do not want to paint latex with silicone paint because it will not cure*). One thing to be aware of is that foam latex is essentially a very soft sponge, so application of color should be sparing, applying just a little at a time and letting it dry to avoid saturating the foam with paint. Light airbrush or the previously described spatter technique work well.

Here are the materials you may need:

- Alcohol palettes
- AA airbrush paints
- Chip brushes
- 99% IPA in a spray bottle
- Artists' acrylic paint
- Makeup sponges
- Artists' oil paint
- Plastic cups
- Scissors
- Fine brushes
- Pros-Aide
- Airbrush and compressor
- Nylon stocking

1. With your appliance resting on a shaped form, open your color palettes and pick your colors.
2. Spray the color you will use first with alcohol and begin to liquefy the color with a cut-down chip brush. You do not want the color too saturated or concentrated or it will go onto the appliance too rich and vibrant and will look artificial. The color should be soft and natural; add color gradually to give the appearance of depth. All of the AA palette colors are also available in liquid form for airbrushing, too.
3. Repeat step 2 for the other colors as well. Human skin, or any skin for that matter, is not one solid, uniform color. There are reds and blues, browns, yellows, and greens in our coloration.
4. Interchange spatter techniques by using the cut-down brush and your fingers as well as tapping the longer bristle brush against the handle of another brush or even against your hand.
5. Try getting some color on your fingers and gently dabbing your fingers onto the appliance to create age spots, if appropriate.

It's very important to have a plan before you begin painting your appliance. You should have lots of reference photos as well as an already formed idea of what you want the finished piece to look like. (Refer back to the Color Theory section in this chapter.) As artists, part of

our unwritten job description is that we have to see all the things that other people, ordinary people, don't notice but that are there nonetheless—things like the way the skin at the tip of your knuckles where the digits begin is a bit pinker than the rest of the skin surrounding it, or that the color of the skin on the back of your hand is a good representation of the coloration of your face, or that the skin on the back of your arm is a different texture than the skin on the bottom of your arm . . . and so on.

6. Repeat steps 2–5 until you get the effect you want, and then stop. Learn to know when to stop. That's something you'll have to learn to recognize on your own.

Once the appliance has been applied to the actor, you can finish up with an alcohol palette, or you can stipple and brush other makeup, such as Ben Nye. Another industry standard for painting foam latex is with PAX paint, a 50/50 mixture of acrylic paint and Pros-Aide adhesive. The Pros-Aide helps keep the acrylic pliant and flexible once it dries; it won't crack, which it would eventually do otherwise. PAX can be applied with a sponge-and-stipple technique, with an airbrush, or both. If you have the time to do it, airbrush is a wonderful tool, especially if you have at least two or more so that you can dedicate colors to each airbrush. If you have only one, it can become a real chore because of clogs and having to clean the brush for every color change. There are several brands available, and the choice is personal—whether you choose Grex, Iwata, Paasche, Thayer-Chandler, or Badger —but, you should consider a double-action airbrush, one that allows you to control both air and the amount of pigment. Well, that's not entirely accurate—the Paasche H model is a workhorse airbrush and it is single-action, and it is easy to control the airflow and pigment. And a very inexpensive entry into learning how to use an airbrush if you are not already proficient. I have a number of airbrushes and compressors, but I am a big fan of Paasche. I have quite a few Paasche airbrushes; two of them I've been using since the mid-1970s.

Applying PAX with a makeup sponge or sponges is fine and pretty simple. Running PAX through an airbrush, though doable, is asking for trouble, in my humble opinion. Here's what I suggest:

1. Apply your base foundation with PAX by hand.
2. Mix oil paint in the color or colors you want to apply next with the airbrush, and then add 99% alcohol. Stir it well, breaking up as much of the oil medium as you can.
3. Strain the alcohol/oil paint mixture through a piece of nylon hose (stocking) so that only colored alcohol filters through, leaving the oil medium in the nylon.
4. Run this through your airbrush in a stipple pattern; the alcohol evaporates almost instantaneously, leaving behind only the color. This is *much* easier to clean out of your airbrush than PAX. It is also a nice, translucent color to which you can add to achieve your skin coloration.

How do you stipple with an airbrush? Airbrushing for makeup requires very low pressure to begin with and an even lower pressure to get the airbrush to spit and spatter for the stipple effect. All you need to do is lower the air pressure of your compressor (3–4 psi should be all the pressure needed) and remove the needle cap (if your airbrush has one; it ought to). If your airbrush doesn't have an air pressure adjustment, you can just lightly pinch the hose to lessen the pressure. Your airbrush should be set to stipple. Test it first on a piece of waxed palette paper for the pattern you want before trying it on your appliance. Now you're in business.

FIGS. 6.129 & 6.130 Air pressure adjustment; pinching air hose.
Photos by author.

This brings up a safety point. The very nature of an airbrush puts vapor into the environment where you're working. Even though it's not a lot of vapor and most of the pigments you will work with are nontoxic and not a health hazard, you are still breathing in foreign matter in very tiny particles. If you use an airbrush, please consider wearing a mask or respirator.

You can't very well ask an actor to wear a mask if you are applying airbrush makeup to their face, however; for this reason, it might be a better idea to use a chip brush and hand-spatter technique with alcohol-activated palette colors for this application. The actor can take a deep breath and close his eyes for a moment, you can apply the spatter, and then your subject can open his eyes and breathe.

■ Gelatin and Cold Foam

Both gelatin and cold foam (soft urethane foam) will require a sealer before painting. There are a number of acrylic sealers that can be used and will work just fine. Why do gelatin and urethane foam need to be sealed before coloring? For the same reason they need to be sealed before application.

1. If you apply adhesive to gelatin without a sealer, the adhesive won't stick very well, and when gelatin gets wet it begins to lose its shape and becomes weak. If you try to paint unsealed gelatin, the wet paint will seep into the gelatin in ways you can't control as well as weakening the gelatin by dampening it. You can prevent this by applying a light coat of acrylic sealer: Kryolan's Fixier spray, Reel Creations' Blue Aqua Sealer, Ben Nye's Final Seal, plastic cap material (which works great), or BJB Enterprises' SC-115. I think this stuff is awesome, especially as a thin coating over polyurethane; it is water based and dries very quickly to form a very soft, stretchy skin.
2. Remember how you've been told that nothing sticks to silicone except silicone? Things we need to use really don't like to stick to the cold foam, either. However, applying a light coat of an acrylic sealer (BJB SC-115 is my preference for using with cold foam) will allow paint, or even makeup, to grab and stay. One word of caution: Apply just a small amount, a very light coat at a time, to prevent the urethane from wrinkling and collapsing due to moisture. It will return to its proper shape when all the moisture is gone. Since you are creating a watertight seal on the urethane, you want to make sure no moisture is trapped within the foam.

Once the appliances have been sealed, painting can proceed in the same manner described for painting foam latex above. You'll need the same materials.

PAINTING TEETH

Maybe this should be part of the next chapter, but I think the teeth should be done and ready to go in your actor's mouth when it comes time to paint and apply the pieces you've learned how to make in this chapter. Getting your prosthetic choppers looking right for the makeup you've created might be the easiest part of the whole process, but it's by no means the least important. By *easiest* I mean it represents the least amount of surface area to color. Painting teeth to look natural (for character or creature makeup) is as critical as sculpting them to look real in the first place.

FIG. 6.131 Dentures painted with George Taub's Minute Stain.
Photo by author.

FIG. 6.132 Clear vacuum formed denture veneers painted with Skin Illustrator; makeup by Neill Gorton.
Photo by author.

Provided you've already done all the prep work to get the dentures ready to be worn, you don't need much else than what's listed below. You might or might not need or want to use the Ben Nye or PPI temporary stains on these teeth, but you will definitely want them in your kit, so in this case I think it's better to have them and not need them than to need them and not have them.

■ Materials

- George Taub Minute Stain 7 color kit
- Fine sable brushes (¼ inch)
- Minute Stain Black and Violet
- Ben Nye temporary tooth stains
- PPI tooth palettes
- Alcohol activated palette

Using Minute Stain is really quite simple; Taub recommends the 7 color kit for effects work because its colors look natural and it also has darker stains such as pink and brown. The seven colors in the kit are yellow, cervical blend (kind of a toffee/tan), gray, white, pink, blue, and brown, plus a clear glaze, thinner (for colors), brush cleaner, brush, and a small ceramic mixing slab.

FIG. 6.133 AA tooth palettes.
Photo by author.

NOTE: The Minute Stain colors are *not* for use directly on a subject's teeth, but *only* on prefabricated prosthetic theatrical teeth or vac-formed teeth.

The following instructions for using Minute Stain come directly from George Taub Products and David R. Frederick, DMD, ScD:

1. Shake the Minute Stain bottles gently to disperse pigments. Shake bottles vigorously only if intense, concentrated colors are desired.
2. Dip the brush into bottle, wipe the excess off at the bottle neck, and bleed additional excess from the brush onto a ceramic or glass mixing slab. The pigments should be evenly dispersed.
3. Quickly apply the stain to the surface of the restoration using a minimum of straight, even strokes. Let the surface dry. Setting time is 10 seconds.
4. Stains must be applied thin. Clean the brush in the thinner bottle after each application and dry with a paper towel.
5. The translucent colors may be built up in intensity with multiple applications using a slight overlap of coats to create a gradual color shift.
6. Apply two coats of Clear Liquid & Glaze to protect the colors and to provide a glaze-like finish. Allow each coat of glaze to completely dry between applications, cleaning the brush in thinner each time.

NOTE: Keep the bottles tightly sealed when not in use. Clean the bottle necks and the insides of caps to maintain a proper seal. Add a few drops of thinner periodically (or as needed) to maintain proper, thin consistency. Once colors have set on the slab, do not try to revive them. Go back to the bottle(s) for a new mix.

■ Special Effects

Color suggestions:

- *Yellow*: To deepen shading of 66-67-69-73-77-78.
- *Cervical blend*: To deepen shading of 62-65-68-81-85; interproximal stain. *Cervical* refers to the neck-like region of a tooth near the gum line.
- *Blue, white*: Incisal blend, decalcified areas.
- *Gray*: To tone down shades and produce tetracycline shading; incisal stain.
- *Brown*: Tea, coffee, and tobacco stains; surface erosions.
- *Pink*: Root surfaces.
- *Color mixes*: Yellow-brown, orange (yellow-pink), purple or violet (blue-pink).
- *Technique*: Blend the colors on a slab with brush of thinner; mix well. Bleed excess on slab before applying to restoration. For reapplication of the mixed color, add some thinner to the mix on the slab, bleed excess, and reapply to the restoration.
- *Fractures*: To create a hairline fracture illusion, score the facial surface of a tooth with a fine scalpel and scrape off the flashing. Place brown over the score line and wipe off the excess immediately. The brown will seep into and remain within the score line. If color does not penetrate, repeat with scalpel to make the line deeper. Do fracture lines before incisal staining.

- *Occlusal*: To highlight grooves, pits, and fissures, bleed brown onto these surfaces with a fine brush or instrument. *Occlusal* refers to any linear elevation found on the surface of a tooth.
- *Decalcification*: Use a fine brush or instrument tip with white to create this effect. The spot should be matted and asymmetrical for best effect.
- *Tobacco and erosion-type effects*: Use brown and/or concentrated cervical blend. Layer color for the most realistic effect.
- *Incisal*: Delicately place blue or gray along incisal edge, perpendicular to the edge, unevenly in three or four strokes, to cover the entire width of the incisal area. It is best to dilute the gray with thinner for best control. *Incisal* refers to the cutting edge of anterior teeth, the incisors and canines.
- *Root surfaces*: Use a thin pink or cervical blend to create the effect.
- *Denture base staining*: Use pink as is or concentrated for intense colors and/or blend with white or blue on a mixing slab. Add thinner to the mix. Apply in quick, even strokes.
- *Lighten shades*: Dilute white on a slab with thinner or glaze to reduce intensity. Apply one or two thin coats.
- *Tone down colors*: Dilute gray with thinner to reduce intensity and place directly over (stained) surface, or first blend with stain on initial application.

NOTE: To remove unwanted stains when shading is incorrect, grind it off with a rubber wheel and re-polish the acrylic resin. If Minute Stain bottles solidify, fill bottles with thinner, let stand five days, and stir. Should liquid merely thicken (from solvent evaporation), just add thinner to the proper consistency. If the stain becomes too thin, add clear liquid to restore the body. Do not use monomer to dilute colors.

Shake bottles gently to produce light, translucent colors. It is not necessary to disperse all pigments in the bottle. Doing so could create an intense, concentrated, and unnatural stain.

Here are some helpful hints:

- Do not have excess stain on the brush when you apply to the resin surface. This could cause color runoff resulting in too-intense pigment buildup, visible brushstrokes, colors not drying uniformly or rippled, and grainy surfaces. Always bleed excess off onto the slab before applying color.
- In cervical areas, it is best to apply in straight, even strokes in a vertical direction from cervical (root) to gingival (gum) or cervical (root) to incisal (cutting edge).
- Apply stains quickly. Use a large (#1) brush (camel hair) for large surface areas to minimize brushstrokes. Use a fine brush for smaller, delicate areas.
- To clean the slab, use a single-edge gem razor blade and scrape the surface clean. Use thinner to clean small, loose scraps from the slab surface.
- Always clean the brush between each application of color and when finished and wipe it dry on a paper towel. If bristles have stiffened after the last use, simply dip into thinner for a few seconds to revive. Do not use inexpensive plastic brushes, since solvent will destroy them.
- Allow surfaces to dry before reapplying additional or new colors. Doing so will help you avoid creating unwanted brush marks.

- To remove excess (dried) color around small areas, such as along a fracture line or occlusal grooves and fissures, dip a clean brush in thinner, bleed the excess onto a slab, and immediately wash the affected area gently, until unwanted colors are brushed away. Wipe clean.
- For concentrated or intense pigment, dip the brush into the bottom of the bottle.
- If pigment streaks, simply blend on the slab until it is uniform.
- If colors are too intense, blend on the slab with thinner of glaze, bleed excess off the brush, and apply.

These instructions provide more information than you will need as a makeup artist, unless you suddenly decide to go to dental school.

CHAPTER SUMMARY

In this chapter, you were given a further understanding of the following:

- Using silicone and coloring silicone intrinsically (internally) for translucence.
- What types of molds can silicone be cast into?
- You were given an introduction to Color Theory.
- What are primary colors?
- What will a color wheel do for you?
- Is makeup additive or subtractive?
- Silicone gel-filled appliances, or GFAs, filling molds, and removing appliances were also described in detail.
- What types of cap plastic are used for encapsulating prosthetics?
- Is it necessary to degas silicone for GFAs?
- What is the best way to fill a mold for a silicone prosthetic?
- What are some things that can inhibit the cure of silicone?
- Foam latex and its properties were outlined, as was the process for running foam latex.
- What are the advantages of using foam latex for prosthetics?
- What are the quirks of foam latex?
- Where does latex come from?
- Casting urethane (cold) foam was described, as was casting gelatin and foamed gelatin.
- How safe is cold foam as a prosthetic material?
- What is gelatin?
- How does gelatin foam?
- Casting dental acrylic was detailed step by step.
- What precautions need to be taken when using acrylic monomer?
- What does "cervical" refer to when talking about teeth?
- This chapter also detailed the steps involved in painting and seaming appliances.
- How do you seam and patch foam latex?
- How do you seam and patch silicone?
- What's the best way to seam and patch gelatin and urethane foam?
- You learned about the different parts of a tooth for painting.
- What are the different parts of a tooth you must consider when painting?