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Esthetician – Nail Technician Gel Systems

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Gel Systems

Rationale

Why is it important to learn this skill?

Creating artificial nails is the central act for an esthetician-nail technician.

Outcome

When you have completed this module, you will be able to:

Understand the theory behind gel systems and create a full set. Crucial to creating structurally sound nails is the visualization of the apex and c-curve.

Objectives

1. Describe manufacturer's specifications and multi-step systems.
2. Describe flexibility levels, viscosities, self-levelling, porosity, uses, and cautions.
3. Describe the steps of preparing a natural nail plate for application.
4. Describe applying product for correct c-curve and arch.
5. Describe curing.
6. Describe filing and shaping.
7. Describe sealing.
8. Demonstrate applying a gel system on one full set of nails.

Introduction

In the Canadian market, gel became the dominant material for artificial nail enhancements, beginning in the 1990's. Gel systems have held a strong place in the Canadian market for many reasons: gel nails are light, gel systems have always been odourless, they are easy to remove, and their rigidity is customizable. As disadvantages, gel products are expensive when compared to acrylic products, and the lightweight filings easily become air born.

Objective One

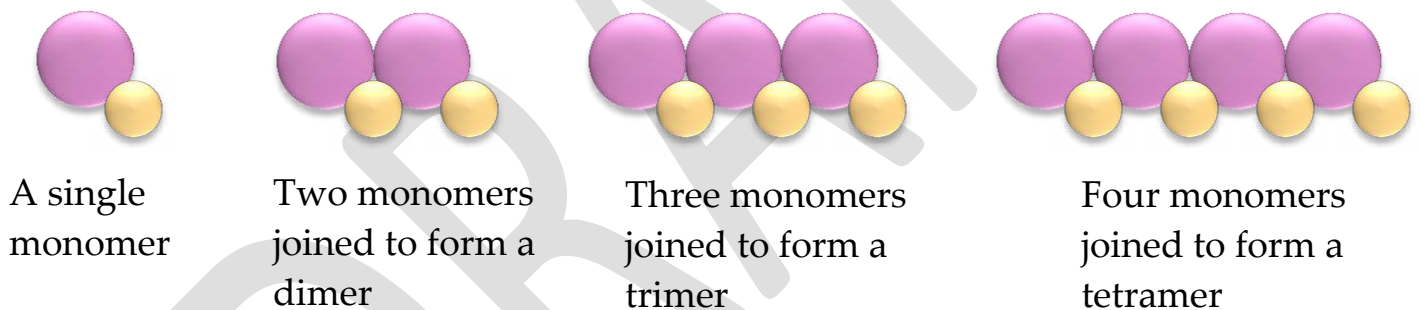
When you have completed this objective, you will be able to:

Describe manufacturer's specifications and multi-step systems.

What is Gel?

The word 'gel' is a generic name of used to describe a pre-mixed semi-solid made up of monomers and oligomers that are hardened to polymers when exposed to UV-A light.

Gels are chemical compounds made up of monomers. A **monomer** is an atom or small molecule that may bind chemically to other monomers. If only a few monomers join together, they form an **oligomer**, which is a molecular complex that consists of a few **monomer units**. Dimers, trimers, and tetramers are, for instance, oligomers composed of two, three and four monomers, respectively.



Many oils are oligomeric, such as liquid paraffin (also known as mineral oil), a highly refined petroleum derivative that is sometimes formulated into skin care products to create a protective layer on the skin that helps retain hydration.

Gel nails are formulated with several different combinations of acrylic monomers and oligomers. Some of the molecules are **photoinitiators**, special molecules that, when exposed to ultraviolet (UV) light, break apart to form free radicals. A **free radical** is a molecule, atom, or ion that has as an unpaired valence electron. These unpaired electrons make free radicals highly chemically reactive towards other substances or themselves. Free radical molecules will often spontaneously polymerize to form polymers. A **polymer** is formed when many monomers join to create a large molecule composed of repeating structural units. In the case of gel, the free radicals begin

attacking the bonds that hold together the gel's molecules. Eventually, all of the gel's molecules combine to form long, interlocking chains during the polymerization, a process known as cross linking. These long, bonded chains make the gel hard and chemically resistant. Another word for polymerization is 'curing.'

Most gels are made from acrylates which are derived from acrylic acid. Ethyl acrylate acts as an adhesive to apply artificial nails and eyelashes, allowing sculptured artificial nails to mold and adhere to the natural nail plate. In most artificial nail products, ethyl methacrylate (EMA) makes up 90% of the products. Methyl methacrylate (MMA) is a chemical similar to EMA; however, MMA is toxic to humans and is banned in some jurisdictions. MMA must never be put into contact with a person.

A gel can incorporate any of the following additional chemicals:

- Stabilizers: chemicals that are added to prevent discoloration.
- Inhibitors: ingredients that prevent the gel from prematurely hardening or pre-polymerizing while still in its original container.
- Pigments (optional): insoluble, finely ground substances that impart color. A pigment can reflect or absorb UV, thereby slightly altering how the gel will cure; in other cases, the pigment may prevent high quality curing.
- Non-energy curable resins (optional): functional fillers added to modify the properties of the gel, such as thickening or toughening the product.
- Solvents (optional): substances that dissolve other substances.

Fixtures and Lamps

Gels are cured with a lamp that emits light in the correct spectrum to activate the photo-initiator in the gel. Most gels contain photo-initiators that react in light wavelengths of 340 to 405 nanometers (nm). Bulbs can be either UV or light-emitting diode (LED) types. UV bulbs emit wavelengths in the lower range, while LED bulbs emit wavelengths in the upper range. Some photo-initiators are designed to work only with either a UV or an LED lamp. It is important to note the manufacturer's specifications regarding the gel product. Some gels will only be cured with UV bulbs, some will only be cured with LED bulbs, and some are called 'hybrid' and can be cured with either.

Although each style of lamp emits the wavelengths needed for curing, they also emit other wavelengths. LED's emit fewer unneeded wavelengths. The bulbs used in UV nail lights contain special internal filters that remove almost all unneeded wavelengths. The bulbs used in UV systems range in wattage from 4 to 9 watts, while units may put out a total of 72 watts that will be distributed evenly among the bulbs.

Bulbs are housed in a fixture, but the complete unit of fixture and bulb are often referred to as 'lights'. Fixtures commonly house from one to five bulbs. The distance between the gel nail and the bulb can have an effect on curing. In general, every time that the distance between nail and bulb is doubled, the intensity of the light source drops by 75%. As bulbs age, their output decreases, and curing time will increase. Eventually, bulbs will need to be replaced. Always keep track of the serial number of the bulbs, so the correct ones can be purchased in the future. It is a good idea to purchase a spare set of bulbs when the fixture is purchased.

One-Step and Multi-Step Systems

There are three components to building a structured nail. The first component is referred to as a base, or bonding layer. The function of this layer is to act like a double-sided tape that secures the gel to the nail. The second component is called the building layer; its function is to define the shape of the nail: thickness, c-curve, and apex; also, it provides a structure on which the finished layer will sit. The third component can be referred to as the sealant or the top gloss. The function of this layer is to seal the gel product and create a high-gloss shine.

One-Step Systems

A one-step system is a system in which one jar of gel product functions as all three components listed in the previous section. This one product acts as the base, builder, and sealant. These gels tend to be medium viscosity. On average, two to four layers are applied. Each layer is individually cured.

Multi-Step Systems

It is important to check the specifications of each manufacturer. Some manufacturers produce products that are bond-only, build-only, seal-only. These are not

interchangeable. They can only be used in their exact, specified layer. Other manufacturers produce a two-step system that contains one gel that functions as both bond and builder, and a separate, second gel that functions as the sealant.

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Objective One Self-Test

1) What happens to the liquid gel during curing?

2) What is the purpose of a stabilizer chemical?

3) What is the purpose of an inhibitor chemical?

4) Which of the following two chemicals is safe for contact with humans? Methyl methacrylate (MMA) or ethyl methacrylate (EMA)?

5) What are the two types of bulbs used for curing? Are they interchangeable?

6) What are the three components to a gel system?

7) How many of the components in Question 6 are in a one-step system?

Objective One Self-Test Answers

- 1) During curing, all of the gel's molecules combine to form long, interlocking chains.
- 2) Stabilizers are added to prevent discoloration.
- 3) Inhibitors are added to prevent the gel from prematurely hardening or pre-polymerizing while still in its original container.
- 4) Ethyl methacrylate (EMA) is safe for contact with humans.
- 5) Bulbs can be either UV or light-emitting diode (LED) types. No, they are not interchangeable.
- 6) The three components to a gel system are: bonding, building, and sealing.
- 7) All three of the components in Question 6 are in a one-step system.

Objective Two

When you have completed this objective, you will be able to:

Describe flexibility levels, viscosities, self-levelling, porosity, uses, and cautions.

Viscosities and Flexibility

Viscosity is the state of a fluid being thick, sticky, and semifluid. A high internal friction among the fluid's molecules causes viscosity. Fluids with a high viscosity do not flow easily, while fluids with a low viscosity (such as water) will flow easily.

Gels come in various viscosities, depending on their chemical makeup, and each viscosity has its own purpose. For example, a high viscosity gel may be made up of monomers with longer chains of bigger molecules. The longer chains and larger molecules have a higher friction and will not flow as easily. A high viscosity gel feels thicker and is suitable for extending the nail on forms or building the apex of the nail.

Natural nail plates are composed mostly of the strong and flexible protein keratin. For best results, match the flexibility of the cured builder to the flexibility level of the natural nail plate. Matching the flexibility levels will reduce the possibility of the artificial nail lifting from the natural nail plate.

Rigid gels have the advantage of resisting chipping. They have a disadvantage in extreme trauma. If the artificial nail is pulled violently, it may tear the natural nail plate away from the nail bed, yet still remain fully attached to the natural nail plate. When exposed to the same violent circumstances, a more-flexible gel nail may not tear the natural nail plate from the bed, but will most likely tear from the natural nail plate. Unfortunately, some damage to the natural nail plate may occur. A more-flexible gel nail will be prone to chipping. When choosing flexibility levels and artificial nail length for the client, their lifestyle must be considered. A client who is hard on their nails is best matched with short, less-flexible artificial nails.

Common Gels

Gels and associated products must be matched with the client's health and needs in mind. With experience, a nail technician will mix and match components of various

brands to provide the highest-quality outcome for their clients. In order to mix and match for best results, it is important to understand the manufacturer's specifications and the information in this ILM. Please make special note of the trouble-shooting guide in Objective 8. Photo-initiators are chemicals that absorb light and convert it into the energy needed to drive the polymerization process (the chemical reaction that causes a gel product to turn from liquid to solid state). During the chemical reaction, heat is given off. Any natural nail that has been damaged, traumatized, over filed, etc, will be extremely sensitive to the heat generated by the photo-initiators. After applying a thin bonding layer, use caution to only apply products with low levels of photo-initiators to these sensitive spots. It is important to understand photo-initiators and the heat they produce in order to avoid causing pain to a client.

Dehydrators are alcohol-based products that, when applied to the natural nail plate, remove the excess moisture from the nail. After they dry, the nail plate will appear chalky-white. Dehydrators do not contain photo-initiators. If a natural nail plate has an excess moisture level, the bonding layer will not adhere. If a client has clammy hands, they will most likely have excessive moisture in their natural nail plates.

Primers are used to remove natural body oils from the natural nail plate. Primers are applied sparingly to the natural nail only, where the natural nail is exposed. When fresh primer is applied, the natural nail plate appears wet and glossy. Primers air-dry and turn to a chalky-white and must dry completely. The photograph to the right shows a nail that has freshly applied primer. If nails do not dry completely, the artificial nail will lift. They are applied with a very small brush. Acid-free primers remove the natural oils from the natural nail plate, while acid primers remove the oil and dehydrate the natural nail plate. Acid primers chemically restructure the nail plate by pitting it, allowing the first applied component to adhere better. Acid primers must not contact the skin. Primers do not contain photo-initiators. A client may have high levels of natural oil in their natural nail plates if the nail plates have a high gloss without any product being on them. If a nail has been



prepared, and the shine returns to the nail plate, the client has a high level of natural oils.

Protein / keratin bonders are applied after the primer with a very small brush. These products have a low viscosity, and they connect to the keratin in the nail. They are very helpful in dry climates where the natural nail curls away from the product at the free edge. Sometimes, using a dehydrator and a protein / keratin bonder is superior to using a primer. They help adhesion in a more natural way. For other clients, only acidic primers will achieve reliable adhesion. Protein / keratin bonders do not contain photo-initiators, and they are safe to use on clients, even those with healthy nails.



Gel System Components

The first component to be applied to the natural nail plate can be either a base gel or a bonder. The choice between base gel or bonder depends on what works best for each client. The purpose of the bonding component is to allow the gel chemicals to adhere to the natural nail plate.

A bonder is a product that has a low viscosity. It is applied sparingly to the natural nail plate using a brush in a scrub-like motion to move it into the fibres of the nail. Bonders are made as either UV or LED compatible, so be sure to check the manufacturer's specifications. They can be either acidic or non-acidic. Where the bonder is placed, the sculpting gel will follow. If bonder leaks into the cuticle, the sculpting gel will too, and then lifting will occur. Bonders contain a high percentage of photo-initiators. If a bonding layer is applied too thick and then cured, the photo-initiators will cause painful heat to be generated. Fortunately, bonders have a low viscosity, making it nearly impossible to apply a thick layer.

Base gels are usually of a higher viscosity than builder gels, yet of a lower viscosity than a bonder. When cured, they are very flexible. This flexibility is required because

the cured product has to mimic the natural nail plate. The natural nail plate includes older and stiffer sections at the tip, as well as younger and more supple areas near the cuticle. When fully cured, the base component acts as a double-sided tape. The side of the layer that is exposed to oxygen remains sticky. This stickiness will adhere to the next layer. Base gels contain a high percentage of photo-initiators, and they have a lower viscosity, so they can be accidentally applied thickly, causing excessive heat generation during curing. It is important to apply a thin layer and then cure it.

The second component to be added is a building component. The purpose of the building component is to form the bulk of the artificial nail. The building component is also used to create the two most crucial structures of the artificial nail: the apex and the c-curve. A **sculpting gel** is a building component which has a medium-high viscosity. They will cure medium-hard, and will be flexible after curing. The higher viscosity helps to maintain the height and location of the product as it is applied to the base layer. A sculpting gel can be relied upon to stay put while it is sculpted, inspected, re-sculpted, and then cured. Sculpting gels contain a low percentage of photo-initiators; therefore, it is safe to apply and cure thicker layers.

Self-levelling gels are building components that have a low viscosity. They are applied over top of a sculpting gel. The function of a self-levelling gel is to fill in any troughs to form a smooth surface. These gels flow to the lowest point which is usually the sidewalls. Apex height is hard to achieve with this component. One method of achieving height is to apply multiple layers of self-levelling gel, flash curing each one. This method requires an experienced and fast technician. If a technician is too slow, then they must use a sculpting gel to achieve height. Self-levelling gels contain more photo-initiators than sculpting gels. An inexperienced technician may try to apply a thicker layer of this product in order to build with it. If this occurs, the client will experience painful heat during curing. Only apply thin layers and flash cure each one before applying the next.

Fibre gels are building components that have a high viscosity and they cure very strong and hard. The gel contains small fibres that sit in a crisscrossed position (similar to fiberglass cloth). They are lightweight, can be applied in very thin layers, and can be used on tips and forms. A finished artificial fibre gel nail is more rigid than a sculpting gel nail. Fibre gels contain a high level of photo-initiators. Since this

product is mostly used for repairing cracks and tears in the natural nail plate, only small amounts are usually applied and excessive pain is not generated during curing.

There are two types of **coloured gels**. One is a building component, and the other is cosmetic. The cosmetic gel can be applied under or on top of the builder. All cosmetic coloured gels contain high percentages of photo-initiators. Essentially, these products are a pigmented sealing gel. Builder coloured gels have a low percentage of photo-initiators, and are often under-cured by inexperienced nail technicians. White builder gels are particularly tricky because the white pigment reflects the curing lights. Apply a white builder in thin layers, cure the top side of the nail, remove the form, and then turn over the hand over and cure the underside of the nail. At the time of publishing this ILM, curing white builder is a prevalent problem, but in the future, manufacturer's may solve this issue.

The third component to be added is a **sealing gel**. The function of a sealing gel is to create a high gloss shine and protect the artificial nail from the elements. These can also be referred to as: sealant, top gloss, tack-free top gloss, and matte sealant. Sealing gels should be non-porous. A porous sealing gel will discolour and allow moisture and bacteria to penetrate into the artificial nail. A product referred to as a sealant has a lower viscosity, a high shine, and a high percentage of photo-initiators. A product referred to as a top gloss has a higher viscosity with a high shine, and a lower percentage of photo-initiators than sealant. Top gloss is used to cover art work or embellishments such as sparkles or shells. Tack-free top gloss can be either porous or non-porous, has a high percentage of photo-initiators, and was designed to be a step-saving surface on which art can be applied (such as art or chomes). A matte sealant has a matte finish.

Gel polish is an independent system that is porous. The porosity aids easy removal. Gel polish contains a bonding component, a colour component, and a sealant. This system does not use a building component, as it is designed to apply colour only. Gel polish has a high percentage of photo-initiators.

Other Factors That Affect Viscosity

Temperature can affect the viscosity of gels. In a colder environment, a gel's viscosity will increase; conversely, in a warmer environment, a gel's viscosity will decrease.

Because gel does not cure until it is under the light, it will bond very well to the natural nail, whether cool or warm, during application.

Humidity may affect how a bonder adheres to the natural nail plate. Humidity increases the moisture content of the natural nail plate. If the moisture content of the natural plate is too high, the bonder might not effectively attach; as a result, the bonding component may lift. Moist nail plates can be counteracted by applying a dehydrator, a primer, or an acid primer. A primer (usually protein primer) does not remove humidity; instead, it helps the bonding component adhere to the keratin. An acid primer will remove moisture from the natural nail; as well, it chemically restructures the natural nail, thereby helping the bonding component adhere. Caution must be exercised to keep the acid primer from contacting skin. Acceptable acid primers do not contain Methyl Methacrylate acid (MME).

Gel Uses and Cautions

Manufacturers' systems are generally designed as porous or non-porous. In a porous system, all components are porous, while in a non-porous system, all components are non-porous. For an inexperienced nail technician, it is not recommended to mix and match porous and non-porous layers; however, the layers can safely be mixed and matched.

A non-porous product is designed to encase the natural nail plate and protect the artificial and natural components from the elements. A complete porous system is generally designed for short-term use (approximately two weeks) and removal is done by soaking the product in a solvent. For example, gel polish is designed for easy application and removal because it is made to be frequently renewed.

A mistake may be made when a nail technician applies a non-porous sealing component a porous base, thinking that the upper layer will soak off. The sealing component will not soak off, it must be removed with a file. The solvent will not penetrate the non-porous component. Hygienically, it is safe to apply a non-porous sealing component over a porous base.

Non-porous products are only designed for fingers because the health of the nail must be kept in mind. Any time that a natural nail plate is covered, the moisture content of

the natural nail rises. Gel polishes were designed to be removed frequently. This constant removal allows the nail technician to inspect the natural nail. Inspection is important because porous systems can allow bacteria to penetrate to the natural nail plate. Considering that the natural nail plate has an elevated moisture content, the addition of bacteria can cause negative conditions such as pseudomonas. Bacteria can penetrate a porous product and grow along the natural nail plate, because of the elevated moisture content of the feet, higher temperatures, and lack of air circulation. For these reasons, gel polishes should not be used on feet.

Gel polishes are not designed for use over extended periods of time. Gel polishes shrink the natural nail plate. This shrinking may cause the natural nail plate to curl.

Lifting is a problem that often occurs to inexperienced nail technicians. In order to combat lifting, some new technicians may resort to the use—and possible overuse—of acid primers. Overusing acid primers can permanently damage the natural nail plate. Common causes of lifting include not letting primer dry, touching nail after the plate has been cleaned and prepared, client trauma (they may not always admit), flooding bonder or gels into the cuticle during component application, mismatching flexibility levels of components to the natural nail plate. Refer to troubleshooting guide.

Objective Two Self-Test

1) Is water a high viscosity fluid or a low viscosity fluid?

2) Why is it important to consider the flexibility of the natural nail plate when choosing product?

3) What possible problem can occur during curing when a thick layer of product has been applied and contains a high amount of photo-initiators?

4) Why is a dehydrator used on a natural nail plate?

5) A nail technician is performing nail preparation on a client with healthy nails. Is it safe to use a protein / keratin bonders on this client?

6) What is the function of a bonding component? Is it possible to *not* use one?

7) What is the function of a building component?

8) What is the function of a sealing component?

9) Can a gel polish system be used to build an artificial nail?

10) Why is it unsafe to use a porous product, such as gel polish, on toenails?

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Objective Two Self-Test Answers

- 1) Water is a low viscosity fluid.
- 2) Matching the flexibility levels of the product to the natural nail plate will reduce the possibility of the artificial nail lifting from the natural nail plate.
- 3) If a thick layer of product has been applied and contains a high amount of photo-initiators, excessive heat can be caused during curing.
- 4) A dehydrator is used on a natural nail plate to remove excess moisture. If a natural nail plate has an excess moisture level, the bonding layer will not adhere.
- 5) It is safe to use a protein / keratin bonder on a client with healthy nails.
- 6) The purpose of the bonding component is to allow the gel chemicals to adhere to the natural nail plate.
- 7) The function of a building component is to form the bulk of the artificial nail, the apex and the c-curve.
- 8) The function of a sealing gel is to create a high gloss shine and protect the artificial nail from the elements.
- 9) A gel polish system cannot be used to build an artificial nail. This system does not contain a building component.
- 10) Bacteria can penetrate a porous product and grow along the natural nail plate, because of the elevated moisture content of the feet, higher temperatures, and lack of air circulation.

Objective Three

When you have completed this objective, you will be able to:

Describe the steps of preparing a natural nail plate for application.

Preparing the natural nail plate is the basis for anchoring a well-structured nail. Improper nail preparation is what most nail technicians will battle because it will directly result in lifting problems. The main objective to prepare the nail is to remove all shine and to create a slightly etched surface. A natural nail plate will appear shiny when it is smooth or it has been covered with—mostly—oil from the skin. Preparation of the natural nail plate is the single most important step to creating nails that adhere well, and will result in client satisfaction and retention.

Review EST 1 for preparing tools, equipment, and stations. This first section describes how to prepare the natural nail for a full set. The preparation for tips and forms is mostly the same; where it is not, this section will distinguish the differences. The final sections describes preparing the nails for a fills.

Nail Preparation

Manual nail preparation:

- Push back cuticle with a cuticle pusher at a 45° angle, and then gently scrape the dead skin cells and debris forward. See photo to the right.
- Wipe the skin cells and debris away with a dust brush.



- Etch the cuticle area with a medium grit file. 180 grit works well. Hold the file as per the photographs below. Rough up the surface to remove the shine. Pay special attention to the sidewalls. Pull back the skin of the sidewalls and rough up the nail plate along the sides.



- Shorten the free edge as per the photographs below. Watch for an extended hyponychium and make sure not to cut it.





Buff the entire surface with a buffer block. See the photograph to the left.

Cleanse the nail. See the photograph to the right.



Inspect for any shiny areas of the nail plate. If shiny areas are found, file, buff, and cleanse them. The photograph on the left shows a completely prepared nail.

Electric nail preparation:

- Push back cuticle with a cuticle pusher at a 45° angle, and then gently scrape the dead skin cells and debris forward. Wipe the skin cells and debris away with a dust brush. This procedure is the same for manual preparation.
- If using a diamond cone bit on a low RPM, gently rough up the surface to remove the shine. Hold the bit at a 45 ° angle to the nail plate and rough up the perimeter of the nail plate. Pay special attention to the sidewalls. Pull back the skin of the sidewalls and rough up the nail plate along the sides. Laying the bit flat along the nail plate may be uncomfortable for clients.



The following four steps are the same as in the manual preparation.

- Shorten the free edge.
 - Buff the entire surface with a buffer block.
 - Cleanse the nail.
 - Inspect for any shiny areas of the nail plate. If shiny areas are found, file, buff, and cleanse them.
-
- A second method of electric nail preparation involves a fine arbor band instead of a diamond bit. Before touching the client with the arbor band, use a file to dull the rim of the band. This will reduce the chances of cutting a client.
 - Push back cuticle with a cuticle pusher at a 45° angle, gently scraping dead skin cells and debris. (The same as for manual preparation).

- On a low RPM, use the arbor band in the same process as the diamond bit. The arbor band may be more comfortable than a diamond bit when laid flat on the nail plate.



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Objective Three Self-Test

1) What are the six steps for manual nail preparation?

2) Why is it important to inspect the nail plate after cleansing?

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Objective Three Self-Test Answers

- 1) The five steps for manual nail preparation are: push back cuticle, etch the cuticle area, shorten the free edge, buff the nail plate, cleanse the nail plate, inspect the nail plate.
- 2) It is important to inspect the nail plate after cleansing in order to determine that the nail plate has been filed, buffed, and cleansed. If the plate has not been entirely prepared, the artificial nail will not adhere.

Objective four

When you have completed this objective, you will be able to:

Describe applying product for correct c-curve and arch.

Introduction

The application of product differs depending on whether tips or forms will be used. When tips are used, the free edge is already intact for the technician. When using a form, the entire artificial nail—including the free edge—must be created. Sculpting with forms allows the technician to produce a wider variety of free edge shapes. Tips can be customized only to a limited amount. Since tips are already formed to a mild c-curve, they do not offer much opportunity to vary the c-curve. In opposition, forms offer a great opportunity to determine the c-curve. Regardless of whether tips or forms are used by the technician, in both systems, the product only enhances the shape that is created. The structure that is created by form placement or tip customization must be structurally sound. For more information on tips and forms, see ILM EST 28. This ILM will cover applying product on both tips and forms.

Brushes

Although techniques vary between technicians, the single most important factor is how the brush is manipulated. Regardless of technician, correct brush manipulation is central. Brushes come in a variety of shapes. Bristles can be round, flat, or almond. Round bristle brushes are very narrow, and they come to an elongated point. Square bristle brushes have shorter bristles and they are flat across the end of the bristles. Almond bristle brushes have a shape that is in between round and flat. Each technician chooses the style of brush that works best for them. If a technician has trouble controlling product with one shape, try a different shape. Brushes ranging from 4mm to 8mm across are the most popular. Most brushes for applying gel products are synthetic. Sable brushes are not recommended for gel products because the products will build up in the bristles. Synthetic brushes will chemically react with acrylic products and the bristles will melt. Sable brushes are recommended for acrylic products. Brushes are the most critical tool for this ILM. Make sure to choose high-quality brushes. Although brushes are expensive, a knowledgeable tradesperson

purchases high quality 'money maker' tools. Money can be saved on purchasing tools that are not critical or are rarely used.

Brush Maintenance

Each new brush must be seasoned. The bristles will be stiff. Soften the bristles with the thumb to soften them and make sure that each bristle is separated from the other. Next, dip the brush into a bonding product and work a small amount of product to the base of the bristles. Wipe excess product off of the brush with a dry wipe.

Brushes should be cleaned with the least amount of solvent possible. If bristles contact strong amounts of solvent over a long period of time, the bristles will fray and become fragile. Wipe brushes with a dry wipe.

It is best practice to use one brush for bonding, building, and sealing. A second brush is to be used for colour application. Do not interchange these brushes.

A new brush is best used for building. It performs the best and can be used with the highest degree of accuracy. When a building brush is too old for building, the bristles will not remain tightly packed and accuracy is lost. Trim the bristles with a sharp pair of scissors and downgrade the brush to a colour brush. Colour brushes are then downgraded to a sparkle brush.

Keep brushes out of direct sunlight. UV light will cure the product that in the bristles. Most brushes come with lids. It is best practice to put the lids on and keep them in a drawer. When a brush has a small amount of product in the bristles, it can be gently formed with the fingers before the lid is put on.

Applying the Bonding Component

A bonding component is applied to every natural nail plate, regardless of which type of system has been chosen. Sometimes, the bonding component is its own component, other times, the bonding component is mixed with another component such as a builder. Regardless, a bonding component is always used.



Pick up product sparingly, scrub into the nail plate. Motion can be back and forth, or circular. Leave an area 1mm way from the cuticle and paronychium. Cover the entire nail plate. If the client has free edge available, make sure the bonding component goes all the way to the free edge, and then swipe across the tip of the free edge (in the same manner as 'capping' the nails with colour during a manicure). Most products shrink during curing; capping the free edge will ensure that the free edge has product on it after curing. After bonding component has been applied to one hand, cure the hand and begin on the second hand. If an appropriate amount of product has been applied, it will not run during the application phase. If too much has been applied, it will run before curing. Wipe the brush with a dry wipe and then brush away excess product.

If tips are being used, it is a good practice to extend the bonder over the tip, capping the free edge. If using a form, it is not necessary to extend the bonder past the free edge of the nail.

Apex

Before building components can be applied, it is necessary to determine the apex of the nail. An apex is created by building the thickest amount of product over the nail's stress area. If a person presses down on the free edge of their nail, they will notice a white band appear under



the natural nail plate. This white area is the area of the nail that receives the most stress during trauma. It is the area where the phalange presses against the nail bed. This is the impact zone for any trauma to the nail. Artificial nail product will be thickest at the apex for maximum strength. When an artificial nail is viewed from the side, the product begins thin at the cuticle, and then thickens as it moves toward the free edge. Product is thickest at the apex, and begins to thin as it approaches the free edge. The product is 1mm thick at the free edge. The placement of the apex will shift slightly with the length of the artificial nail. If an artificial nail is made very long, the apex is placed closer to the cuticle. As the length of the nail increases, the apex will be thicker and slightly longer from cuticle to free edge.

Shaping and filing a smooth transition along the length of the artificial nail is both aesthetically and structurally important. If an artificial nail is viewed from the side, and a divet has been created, the divet will be a weak point. When looking at an artificial nail from the side, the overall structure is a gradual arch. Arches are very strong shapes. Any defect in the shape will cause a weak spot. The apex balances the c-curve and provides longitudinal strength to the nail.

C-Curve

The c-curve balances the apex and provides lateral strength to the nail. When looking down the barrel of the nail, the free edge is shaped in a curve, and the product over top of the nail plate is shaped in a matching curve. Product over the nail plate is thickest at the centre of the nail (to match the thickness of the apex) and tapers as it approaches the paronychium where it is 1mm thick (product

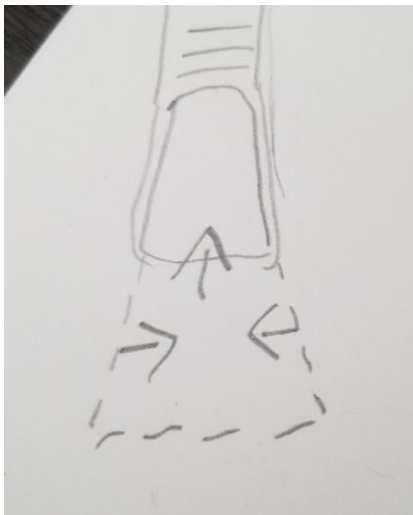
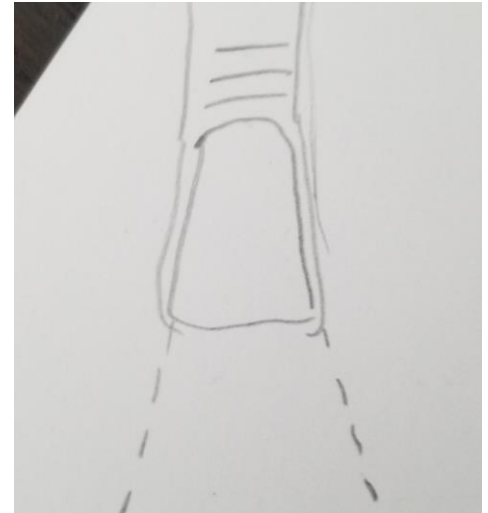


remains 1mm away from all skin contact). At the free edge, the product will be 1mm thick for the entire c-curve. Artificial nails that are made for shows have a c-curve that is half of a circle. Salon-level nails have a c-curve that either matches the client's natural curve or is slightly more curved. Regardless of a c-curve's shape, it must be symmetrical as viewed down the barrel, and have an equal thickness of product on both sides.

To maintain a proper c-curve structure, it is imperative that the artificial nail extend straight out from where the sidewalls end. **The sidewalls are the side edges of the natural nail plate.** Some sidewalls are parallel, while others move apart as they approach the free edge. Maintain a constant 1mm thickness of product down the entire length of the sidewalls, past the end of the natural nail, and across the free edge.

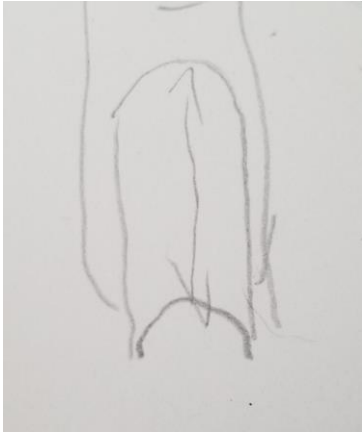
Fan Nails

Determining the shape of the sidewalls can be done by holding a file parallel from a top corner of a cuticle to the free edge corner of the nail plate. If the sidewalls slowly separate as they move from the cuticle to the free edge, the nail is called a **fan nail**. Although the nail plate of a fan nail may have a c-curve at the cuticle, the c-curve will flatten out significantly by the time the free edge is reached. The diagram to the right shows an exaggerated fan nail.

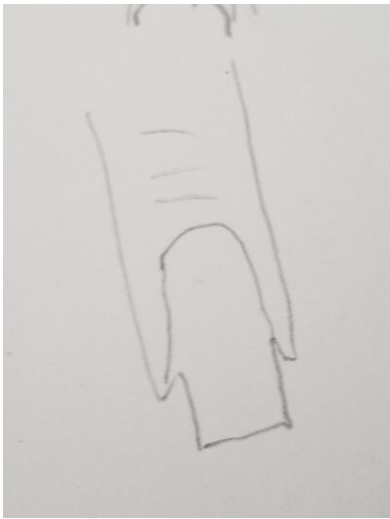


The following description is not exactly what is done, its purpose is to show—conceptually—how to avoid a very damaging problem that many inexperienced nail technicians create.

Conceptually, visualize making an artificial nail shape to match the photograph on the left. The artificial nail would be flat and shaped like a fan (as shown by the dotted lines).



Next, curl the flat fan by raising it in the middle, similar to pitching a tent. The shape as shown to the left is the shape that nail technicians want to achieve. The sidewalls of the artificial nail plate are parallel, and an aesthetically pleasing c-curve is created. The artificial nail plate as shown in the photograph to the left is built by the technician. ***This is the correct way to build artificial nails for a client with fan nails.***



The photograph to the left shows how inexperienced nail technicians will incorrectly build an artificial nail for a client who has fan nails.

An inexperienced nail technician will not build the sidewalls of the artificial nail correctly. Instead of forming the sidewalls parallel to the paronychium, along the entire length of the sidewall, the technician will begin the sidewall at the cuticle, 1mm away from the skin. However, as the sidewall is constructed toward to the free edge, it pulls away from the free edge. At the point where the paronychium meets the free edge, a large is gap is visible, and the artificial nail extends past the free edge with both sides parallel. The sidewalls are filed to final shape. Although this construction will create a visually pleasing nail, the filing of the side walls will cause permanent damage to the natural nail. This construction eventually causes the natural nail plate to lift from the nail bed (onycholysis) at the corners, and the recession of the free edges into the fingers. Also, ingrown nails (onychocryptosis) may occur.

Applying the Building Component to Tips

This stage is different for tips and forms, because the tip acts as the free edge. When using forms, the free edge must be created by the technician. Apply a thin layer exactly where the bonder has been placed, the entire area of the plate, leaving 1mm of space from the skin; doing this will allow the gel to freely move around the entire surface of the nail. If a sculpting product is used after the first layer, hold the nail sideways and determine where the apex is located. Place a medium sized droplet of product where the apex will be. During application of the droplet, the brush is laid parallel to the nail and it hovers over the apex area, barely touching the product to the nail. Slowly move the brush in an 's' motion over the apex area. The droplet will initially be shaped like a sphere, and moving the brush in an 's' motion will distribute the sphere over the entire apex area. The flatter that the brush is laid to nail, the more product can be moved. An angle such as 25 degrees is preferred by many technicians. If the product placement is accurate, flash cure the product.

At this stage, the technician can continue to build with a sculpting product or use a self-levelling product. The point of this stage is to blend the height of the apex down to the cuticle and sidewalls. As product is added to build from the cuticle and sidewalls to the height of the apex, it may not be perfectly smooth. Inspect the nail often and fill in any troughs. High spots will be filed down after curing. The ideal formation is a gradual and smooth incline from the cuticle and sidewalls up to the peak of the apex. Cure the nail when the desired shape has been achieved.

Applying the Building Component to Forms

Use the 's' motion described above. Apply the sculpting gel so that it is anchored to the free edge of the nail and build it out to the desired shape and length. Some technicians prefer to use a coloured building component instead of a clear one. A coloured component may be easier to see against the form. At this stage, do not worry about the high spots: be certain that there is full coverage on the intended shape and length. Pay special attention to the free edge and sidewalls, making sure that no areas were missed. Once the desired shape and length have been achieved, use a clean brush to sharpen up the sidewalls and free edge: this will ensure that there is enough product to remove the form. Cleaning the product in this manner also creates a tiny rim that adds additional strength to the nail. The flatter that the brush is laid to nail, the more product can be moved. An angle such as 25 degrees is preferred by many

technicians. Cure the nails and remove the forms. Once the forms have been gently removed, creating the apex, c-curve, and blending is the same as for tips. Review these five photographs with your instructor as you read the *work flow* in Objective 8.



An artificial nail is built by applying product with a brush. The desired shape of the nail is created as the nail is built. Under ideal circumstances, the apex and c-curve are formed perfectly in this process, and no product would need removal. Mastering this process reduces the time required during filing and shaping. An inexperienced nail technician may err on

the side of caution and apply the product too thickly; this product will require

reduction during filing and shaping. Strength is not obtained through product thickness, it is obtained by proper apex and c-curve structure. An artificial nail that has been created with too little product will cause problems. After this nail has been filed and shaped, the nail technician will see that it is too thin, and the nail will need to be built up again. Experience will help the technician visualize the correct shape and thickness, and then attain them by adding product.

Applying Self-Levelling Product

Applying self-levelling product is the same for both tips and forms. It is important to remember that gravity moves this product. Room temperature and product temperature both affect self-levelling products. If either is too low, the product will not flow well. If the temperature is too high, the product will flow very fast. Using a building brush, pick up a droplet of self-levelling product. The brush must be constantly rotated to prevent the product from dripping off. With pressure on the brush, wet the entire surface of the artificial nail. Pick up another droplet; this second droplet can be dropped on the artificial nail and then dragged with the bristles. This technique is called stringing and requires very little pressure with the brush. When used correctly, this product will fill in all of the low spots and can be used to bring the nail to an almost perfect shape. If the product is running too fast, pick up less on the brush. A larger droplet can be picked up and used to cover the entire nail in one application, filling in all the low spots.

Sandwiching Versus Cosmetic Colouring

Sandwiching colours is performed by some nail technicians. A layer of colour is placed between the base component and the building component. This technique allows for embedded art. Caution must be exercised when filing the artificial nail into final shape, ensuring to not file into the colour layer. If the technician files into the colour layer, bald shadowy colours will result. As a con of this option, if a client wants their colour changed, a great deal of filing is required.

Cosmetic colouring occurs when the layer of colour is applied between the building component and the sealant component, after the nail has been filed into shape. As a pro of this option, if a client wants their colour changed, very little filing is required. As a con of this option, a slight allowance must be made when finish filing, because the

colour layer will add thickness to the overall nail. After the sealant component has been added, the artificial nail plate may be too thick and the desired shape has been lost. When finish filing, file 1 or 2 mm deeper to allow for the thickness of the colour layer.

Lastly, a sealer gel is applied to add a very thin, high-gloss coat that protects the enhancement from chipping, scratching, yellowing, and moisture penetration. Sealer gel is low viscosity and can be clear or coloured.

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Objective Four Self-Test

1) What is the best practice for storing brushes?

2) What motion is used to apply bonder?

3) What is the apex of an artificial nail?

4) What imperfection can cause a weak spot in the apex?

5) When using a form, how is the fan nail corrected?

6) What negative outcome can occur if the sidewalls of a natural nail plate are filed?

7) Give one pro and one con for sandwiching colour and cosmetic colour:

Objective Four Self-Test Answers

- 1) The best practice for storing brushes is to put their lids on and lay them in a drawer.
- 2) Pick up product sparingly on brush and apply with a scrubbing or circular motion.
- 3) The apex of an artificial nail is the thickest point of an artificial nail as viewed from the side. It is located above the impact zone, or 'stress area.' Any trauma to the nail will have the greatest effect on this area.
- 4) A divet in the apex will cause a weak spot.
- 5) When using a form, a fan nail corrected by increasing the c-curve.
- 6) If the sidewalls of a natural nail plate are filed, permanent damage will be caused to the natural nail.
- 7) Pros for sandwiching: allows for embedded art.
Con for sandwiching: accidentally filing into the colour.
Pros for cosmetic: colour changes are easy.
Con for cosmetic: allowance must be made when finish filing.

Objective Five

When you have completed this objective, you will be able to:
Describe curing.

Proper Curing

Curing is a precise science. The most reliable path to proper curing is to use gel products and a curing light from the same manufacturer, and fresh bulbs, following the manufacturer's specifications. It is not necessary to use gel products and a light from the same manufacturer. It is only necessary to match the photo-initiators with the proper type of light and wavelength, curing for the correct length of time. It is in the manufacturer's financial interests to keep information secret, in order to keep technicians dependent on a certain brand. As of the publication of this ILM, most lights are being manufactured in China, regardless of the label that appears on the light. Since Chinese manufacturing can vary in quality, lights may function differently, despite being the same make and model, manufactured within the same year. Keep all receipts and warranties on hand, and do not be afraid to exchange a light if it does not seem to function correctly. *As a general rule of thumb*, UV products require 2 minutes for a full cure, while LED products require between 60 to 90 seconds.

Over-Curing

Quality gel products have a 'stop factor.' This means that if the product has been under the curing lamp for longer than ideal, the product will not be negatively affected (within reason). Over-curing may result in a loss of colour and/or a loss of gloss. It is possible that over-curing may occur if a client leaves the salon and exposes the artificial nails to excess UV. In addition to discolouration and loss of gloss, over-cured nails may crack prematurely, break, be brittle, and be difficult to remove.

Under-Curing

Under-curing can be recognized in one of two common ways. When filed, under-cured nails will file off in separating layers. This may not always happen to under-cured nails. A second indicator of under-cured nails is noticeable when wiping off the inhibition layer. The inhibition layer is a thin layer on the top of the artificial nail that

has not cured because it was exposed to oxygen during curing. The inhibition layer of under-cured nails will not come off clean; the remaining surface of the artificial nail will feel rubbery. A third indicator of under-curing is service breakdowns. This indicator is, unfortunately, the most costly. The technician does not find out that a mistake has occurred until the client returns. After the curing, all may seem fine, but the client returns with problems on multiple nails. Problems include: layers chipping off, pocket lifting, excessive chipping, overall rough appearance, dramatic loss of shine, and multiple failures. Under-curing can be caused by weak bulbs; as a bulb ages, its output decreases. With a UV lamp, when installing new bulbs, install a full set and write down the date of installation. Experience will tell the technician when the bulbs are too weak to cure in the suggested time. A nail technician working full time will need to change bulbs every 3 to 6 months. When new bulbs are installed, write down the date and change as per manufacturer's specifications. When using an LED lamp, the entire lamp must be discarded when the light output decreases too much. An LED lamp can last for between 6 months to 3 years. Most cosmetic colour gels are mixed with a sealing component. Over time, the two products can separate in the jar. If they separate, they require stirring. If the product is not stirred, the technician ends up with almost pure pigment at the bottom of the jar, and this pigment will not cure. For more information regarding under-curing, see the troubleshooting guide in Objective 8.

Thumbs have a difficult time curing in a lamp, because they are facing sideways to the lights and may not receive direct shine. It is a good idea to cure the thumbs separately. A second reason to cure thumbs separately is to reduce the running of self-levelling product. Placing thumbs in to cure by themselves assures that the nail plates can face directly upwards, preventing running.

The largest problem caused by under-cured nails is contact dermatitis suffered by technicians. This condition is caused by the repeated exposure to the under-cured chemicals. It is important to note that the hardness of a nail is not an accurate indicator of it being properly cured. Follow manufacturer's specifications.

Objective Five Self-Test

1) Give an example of how an under-cured nail might appear:

2) Give an example of how an over-cured nail might appear:

3) What is the general, rule of thumb, curing time for UV products?

4) What are the general, rule of thumb, curing time for LED products?

Objective five Self-Test Answers

- 1) An under-cured nail may have separated layers, a rubbery texture, and general service breakdowns such as: : layers chipping off, pocket lifting, excessive chipping, overall rough appearance, dramatic loss of shine, and multiple failures.
- 2) An over-cured nail may have a loss of shine and/or brittleness.
- 3) The general, rule of thumb, curing time for UV products is 2 minutes.
- 4) The general, rule of thumb, curing time for LED products is between 60 and 90 seconds.

Objective Six

When you have completed this objective, you will be able to:
Describe filing and shaping.

Selecting Shapes for Clients

Trends in nail shapes change constantly. This ILM focuses on five basic shapes—called salon nails—but it is recommended to take a shaping class once per year to stay up to date on the latest trends. Clients will have preferences, yet it is also practical to factor in their lifestyle.

The shape of the hand and natural nail also plays a part. The shape of the cuticle should influence the shape of the free edge. For example, if a cuticle is slender, then the artificial nail would be balanced if the free edge was matching in width and arch.

The maximum length of a salon nail is based on the rule: *the natural nail bed is two-thirds of the overall artificial nail length*. This rule results in an artificial nail that is aesthetically pleasing and structurally sound. A client who is new to artificial nails should be advised to begin with a set that is much shorter than the maximum. Advise clients that the nails will grow longer than they are initially created.

Filing and Shaping the Free Edge

After the building component has been cured on both tips and forms, wipe off the inhibition layer with a nail cleaner. The next step is to create the free edge. The exact procedure depends on the final, desired shape. The basic salon shapes are: square, squoval, round, oval, and almond. They are shown in the two photos below, in the order listed.



All of the finger and hand placements referred to are described to protect the client's skin. If this procedure is done correctly, the client will never be harmed. In addition, this ILM describes the procedures being performed by a right-handed technician. The photograph to the right shows a right-handed technician loosely holding a file. The file is held this way while working, balanced between the thumb and the second finger. The index finger is only used for stability. The thumb slides forwards and backwards along the file to allow for more area of file to be accessed. The whole arm moves in concert with the wrist. This position is used for filing the nail around the sidewalls, cuticle, and barrel work. The file should never be held in the palm of the hand.



Proper file position will prevent 'blind filing' when the technician cannot see the surface being filed because the file is blocking the view. The photograph to the right shows the *incorrect* way to hold a file. This technique will result in blind filing.



It is imperative to *not* file the sidewall of the natural nail plate in order to achieve the desired shape, especially the slender shapes such as almond. The slender tips derive their shape from creating the c-curve, *not* from filing the

Filing the square nail: a square nail comes straight out from the sidewalls. The artificial nail cannot be narrower than the natural nail plate. Some technicians make this mistake, but it results in ingrown nails. The correct way to have a square nail that appears thinner than the natural nail plate is to put a form on it and make the c-curve more extreme. If the free edge of a square nail is impacted at any point along the free edge, the impact is distributed over the entire width of the free edge. This shape is the best for clients with active lifestyles, or clients who are new to artificial nails, or clients who bite their nails. If a client is undecided as to which shape to choose, this is the best option. Hold the file held at 90 degrees perpendicular to the finger. Make sure all nails are uniform.



The photograph to the left shows the side view of a finished square nail. Notice that the free edge extends straight out from the sidewall of the natural nail plate.



Filing the squoval: first, create a square shape, and then tilt the file slightly, under the free edge (see the photograph on the left). File the free edge with the file in this position, this produces the squoval shape. The file is held between 70 and 80 degrees. Slightly swipe the free edge toward the centre of the nail. Make sure to only file the corner of the artificial nail. Make sure all nails are uniform. The photograph on the right shows the sidewall of the artificial nail. Notice how it comes straight out from the sidewall of the natural nail plate.

Filing the round nail: the round nail comes straight out from the sidewalls. Hold the file at a 65 degree angle (as seen in the photograph on the left) and file the free edge to the desired length. Make sure all nails are uniform. The photograph on the right shows the sidewall of the artificial nail. Notice how it comes straight out from the sidewall of the natural nail plate.



Filing the oval nail: the nail projects straight out from the sidewalls. Hold the file at a 40 degree angle and file the free edge to the desired length. Make sure all nails are uniform. The photograph on the right shows the sidewall of the artificial nail. Notice how it comes straight out from the sidewall of the natural nail plate.



Filing the almond nail: the nail projects straight out from the paronychium and curves slightly toward the centre tip. The file is held almost parallel to the artificial nail plate. File the free edge to the desired length, keeping in mind that the file removes the side material and not the tip. Most almond nails come to a point. Remove equal material on both sides, and make sure all nails are uniform.



The photograph on the left shows the correct sidewall of an almond nail. Compare this nail to those on the next page, which are not correct.



The photograph on the left shows that the sidewall of the artificial nail has been incorrectly filed back into the corner of the natural nail plate. Also notice how the underside of the sidewall arches upward instead of extending flat from the finger.



The photograph on the left shows that the sidewall of the artificial nail has been incorrectly filed back into the natural nail plate. An inexperienced technician may try to achieve a slender tip by incorrectly filing the nail in this manner. Remember that the slender shape is created by the c-curve, and **not** filing. The picture below and to the left shows the c-curve **before** the sidewall was filed in. Compare it to the photograph below and to the right, which shows the c-curve **after** the sidewall has been filed in.





The photograph to the left shows a lopsided c-curve. Instead of filing the right side to match the left side, more product should be added to the left side.

The minimum amount of c-curve that is required for a free edge to be structurally sound depends on the shape of the free edge. A square free edge requires the least amount of c-curve to be structurally sound. A squoval free edge requires more c-curve than a square nail, a round free edge requires more c-curve than a squoval; the oval free edge requires more c-curve, and the almond free edge requires the most c-curve.

For example, a square nail has a long free edge; as a result, the c-curve does not need to be dramatic for the free edge to have strength. In contrast, the free edge of the almond nail is very short, and so it requires a more dramatic c-curve to be strong. The photograph below and to the left shows a c-curve for a square nail on a pinkie finger. The photograph below and to the right shows a c-curve for an almond nail on a thumb.



Filing and Shaping the Apex and C-Curve



On the left side of client's finger, with thumb, push skin back, then file around the cuticle perimeter blending in the product to the natural nail along the top of the cuticle and the side.



Continue the filing motion and move the file toward the free edge.



Holding the file loosely, blend the sides in. File back and forth, bringing the file to the middle of the finger in a rounded motion. Change position to an overhand grip, placing the thumb and finger across cuticle as the file is rounded across the cuticle.



The technician's ring finger is used to bend the client's knuckle, and tilt the finger to access the right sidewall. Continue filing



By looking at this photograph on the left, it is easy to see the difference between the areas of the nail that have been filed, and those that have not been filed. The filed areas appear grey, while the unfilled areas appear shiny.



Once the perimeter is blended, change to an underhand grip, look down the barrel and then file towards the technician to thin out the free edge. When filing a square nail, the file is placed perpendicular to the finger and contacts the nail to blend the free edge into the apex. The file does not cut into the apex. It is held at a 45 degree angle.



This artificial nail is ready for buffing. Notice that the centre of the nail did not need to be reduced. This is because the correct amount of product was placed by the technician. If too much product had been placed here, it would have required removal.

It is important to use a dust brush and not the fingers to remove dust from the nails. Using a finger will re-introduce oils to the nail surface.

Free edges that have pronounced c-curves are filed slightly different than the free edge that has a gentle c-curve. The file is held perpendicular to the finger and flat with the nail to maximize contact surface. The file begins at the sidewall of the free edge, and is 90 degrees from the nail plate. As the file is moved toward the apex, it is rolled to the centre of the nail. When the file begins at the apex, it is held flat across the top of the nail plate. As it moves toward the free edge, it is rolled until it reaches the sidewall of the free edge where it is 90 degrees from the nail plate.

In a perfect world, the only filing that needs to occur is to taper the apex into the perimeter and the free edge. At this stage, double check all the artificial nails for uniformity, lumps, bumps, and thin spots. Repeat the filing steps with a medium or fine buffer block. Dust the nails intermittently throughout the process with a dust brush. Give the nails a final dust with the dust brush.

Objective Six Self-Test

1) What is the maximum recommended length of an artificial nail?

2) Draw the five salon nail shapes:

Square

Squoval

Round

Oval

Almond

3) Describe how to file each of the five salon nail shapes:

Square:

Squoval

Oval

Round

Almond

4) What is the function of the apex and c-curve?

5) How is a client's cuticle protected during

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Objective Six Self-Test Answers

1) The maximum length of an artificial nail is one-third longer than the natural nail bed.

2)



3) Filing the square nail: Hold the file held at 90 degrees perpendicular to the finger. The sidewalls of the nail come straight out from the paronychium, and the free edge is filed straight across.

Filing the squoval nail: File a square nail, then tilt the file to 65 degrees and file the corners into the centre of the free edge.

Filing the round nail: File a square nail, then tilt the file to 65 degrees and file the corners into the centre of the free edge.

Filing the oval nail: File a square nail, then tilt the file to 40 degrees and file the corners into the centre of the free edge.

Filing the almond nail: The file is held parallel to the nail plate, then file below the nail to create the shape.

4) The function of the apex is to create longitudinal strength, and the function of the c-curve is to create lateral strength.

- 5) The client is protected during shaping by hand position. When filing the left side of the nail, place thumb over the client's skin to act as a bumper to protect against the file. When filing the top of the nail, using an overhand grip, use the thumb and index finger as a bumper to protect against the file. When filing the right side of the nail, tilt the client's finger and use the index finger as a bumper to protect against the file.

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Objective Seven

When you have completed this objective, you will be able to:
Describe sealing.

Sealing

Sealing an artificial nail is the final step. Sealing components do not possess any building properties. They are designed to create a high-gloss finish and seal the artificial nail from the elements. The four photographs below show the process of sealing and the finished application of sealant.



Once the sealing component has been chosen, it can be applied with a brush from the bottle (if the component comes in a bottle), and others will be applied with a building-style brush (if the component comes in a jar). Because of the low viscosity, apply the sealing component to one finger, and then cure the finger. While the finger is curing, apply sealing component to a nail on the other hand. When applying the sealing component, tip the finger downward so the component does not run into the cuticle. If the component is applied too thickly, it may run into the cuticle, and it may overheat during curing. If the component is applied too thinly, it will leave bare spots after curing. Observe the product carefully as it leaves the brush. The brush should leave a tiny ridge of product on either side, as the product is wiped on. If too much product is applied, the brush will leave a wave product behind it. This excess product will likely flow to the cuticles. It may be necessary to apply two thin coats to each nail to ensure thorough coverage. Thin coats will generate less heat during curing than one thicker coat.

Sealing gels can also be referred to as: sealant, top gloss, tack-free top gloss, and matte sealant. Sealing gels should be non-porous. A porous sealing gel will discolour and allow moisture and bacteria to penetrate into the artificial nail. A product referred to as a sealant has a lower viscosity, a high shine, and a high percentage of photo-initiators. A product referred to as a top gloss has a higher viscosity with a high shine, and a lower percentage of photo-initiators than sealant. Top gloss is used to cover art work or embellishments such as sparkles or shells. Tack-free top gloss can be either porous or non-porous, has a high percentage of photo-initiators, and was designed to be a step-saving surface on which art can be applied (such as art or chomes). A matte sealant has a matte finish.

Objective Seven Self-Test

1) What are the functions of a sealing component?

2) Which is better and why: one thick coat of sealing component or two thin coats?

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Objective Seven Self-Test Answers

- 1) The functions of a sealing component are to create a high-gloss shine and seal the artificial nail from the elements.
- 2) Two thin coats of sealing component is better than one thick coat, because less heat is generated by the thin coats, reducing the chance of causing pain for the client.

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Objective Eight

When you have completed this objective, you will be able to:

Demonstrate applying a gel system on one full set of nails.

Working Efficiently

Each technician will have slightly different methods of performing this service; regardless of the method chosen, minimize the time needed to perform the service by minimizing the amount of times tools are changed. Make sure that all tools and products are laid out in the order they will be used. Developing a system will ensure that steps are not missed. The following steps will be performed working first on the client's right hand—from pinkie to thumb—and then on the left hand—from pinkie to thumb. Consult EST 1 for the proper set up and preparation for the service.

Work Flow for Laboratory Exercise

Steps		
1	push back all ten cuticles.	
2	clean all cuticles, manually or with an electric file.	
3	Shorten the free edge.	
4	buff all ten nails.	
5	clean all nails with a wipe that is saturated with nail cleaner.	
6	check for shine.	
	Forms	Tips
7	If primer is required, apply primer	Customize and adhere tips
8	Apply bonding component to the entire nail plate	Re-buff the nail plates
9	Cure	Clean nail plate with cleaning agent
10	Place forms	Inspect
11	Build out the free edge	If primer is required, apply primer
12	Cure	Apply bonding component to the entire nail plate
13	Remove forms	Cure

14	Apply building component to create c-curve and arch
15	Cure
16	Wipe inhibition layer
17	File to desired shape
18	Dust and clean the nails
19	Apply colour
20	Cure
21	Apply sealing component
22	Cure
23	Wipe inhibition layer (if needed)
24	Apply nail oil and hand cream

Note: if the colour layer is sandwiched, apply colour after the bonding component.

Laboratory Exercise

Purpose: To apply a complete gel system on one full set of nails.

Materials

Desk	UV / LED Lamp	Overhead Lamp
Chairs	Electric File	Cuticle Pusher
Electric File Bits: Diamond cone, mandrel with arbor bands (medium and fine)		
Dust Vent or Towel	Sanitizable Dust Brushes	Gel brushes
Assorted Tips	Lint-free Wipes	Files: 100 and 180 grit
Forms	Nail Clipper	Nail Cleaner
Polish Remover	Hand Sanitizer	Primers / Dehydrators
Bonding Component	Building Component	Sealing Component
Colour	Nail Oil	Hand Cream
Tip Cutters	Medium Viscosity Cyanoacrylate	
Buffer Blocks: medium and fine		

Procedure:

Please see the procedure / work flow that is outlined in the previous pages.

Instructor Signature and notes:

Troubleshooting Guide

Problem	Cause	Solution
Lifting around cuticle	Product may have been applied too thickly around cuticle	Feather product down to level of natural nail
	Product touched cuticle during application	Use less product. Try a different brush. Use a non-self-levelling product
	Natural nail plate not properly prepared	Follow proper preparation procedures. Check work. Double check work
	Natural nail plate oily	Use a dehydrator and/or a primer
Lifting at free edge	Free edge not capped when product applied	Cap free edge
	Natural nail plate has dried and curled away from product	Client applies nail oil to the back of the nail every day. Apply a keratin / protein bonder to the free edge before bonding component is applied
Pocket lifting	Trauma to nail, causing nail to bend in the middle but not break. Causes an air pocket in the middle of the nail	Suggest shorter nails to the client
	Under-curing of product	Review manufacturer's curing specifications. Check bulbs for age. When new bulbs are installed, write down the date and change as per manufacturer's specifications

No product on one nail when client returns	Look for trauma to the nail. If signs of trauma are present, the product adhered well and was torn off.	Consider shorter nails for the client
	If no signs of trauma are present, most likely cause is improper nail preparation. Other causes include incorrect product/primer for the client	Try a different primer with the client. Make sure nail preparation is perfect

Crack starting at sidewall	Artificial nail is too long	The natural nail plate should be two-thirds the length of the artificial nail
	Apex not shaped correctly and/or misplaced	Refer to apex building guide and placement in this ILM

Module Summary Self-Test

1) What wavelengths are used to cure most gels?

2) If a natural nail plate is very flexible, is it best to match the flexibility with product, or use a rigid product to stiffen the nail?

3) How is a primer applied?

4) Is it possible to construct an artificial nail using sculpting gel and self-levelling gel?

5) Considering that a sculpting gel is very stiff at room temperature (has a high viscosity), what risk is run if a technician tries to apply sculpting gel that is cold?

6) How is a non-porous product removed?

7) What is the benefit of sculpting with forms?

8) What is the best way to clean a gel brush?

9) What is the general rule of thumb for product spacing from the cuticle and paronychium?

10) At what angle is the brush held when applying a building component?

11) Approximately how often do UV bulbs need to be replaced by a full-time nail technician?

12) Approximately how often does an LED light unit need to be replaced by a full-time nail technician?

13) What two things must be considered when choosing a nail shape with a client?

14) After product has cured, what are the first two steps in filing and shaping?

15) Why is 'blind filing' dangerous?

16) Which free edge shape requires the least c-curve to be structurally sound, and which free edge shape requires the most c-curve?

17) Why is it important to tilt the finger downward while applying a sealing product?

18) Identify the likely outcome if a step of the nail preparation work flow is omitted:

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Module Summary Self-Test Answers

- 1) Most gels are cured by wavelengths of between 340 to 405 nanometres.
- 2) It is best to match the flexibility of the natural nail with the product to reduce the possibility of lifting.
- 3) Primer is applied sparingly to the natural nail plate only, and allowed to air dry.
- 4) It is possible to construct an artificial nail using sculpting gel and self-levelling gel. Both of these products are building components.
- 5) If sculpting gel is cold, it may be too stiff to manipulate.
- 6) A non-porous product must be filed off.
- 7) Sculpting with forms allows the technician to produce a wider variety of free edge shapes.
- 8) The best way to clean a gel brush is to wipe the brush with a dry wipe.
- 9) The general rule of thumb for product spacing from the cuticle and paronychium is to keep the product 1 mm from the cuticle and paronychium.
- 10) When applying a building component, the brush is at a 25 degree angle.
- 11) UV bulbs need to be replaced every 3 to 6 months by a full-time nail technician.
- 12) LED light units need to be replaced every 6 months to 3 years by a full-time nail technician?
- 13) Client preference and client lifestyle must be considered when choosing a nail shape with a client.

- 14) After product has cured, the first two steps of filing and shaping are: wipe off the inhibition layer with nail cleaner, and then create the free edge.
- 15) 'Blind filing' is dangerous because the technician cannot see how the file is interacting with the client, and the client may be harmed.
- 16) The square free edge shape requires the least c-curve to be structurally sound, and the almond free edge shape requires the most c-curve.
- 17) It is important to tilt the finger downward while applying a sealing product to prevent the product from running into the cuticle.
- 18) If a step of the nail preparation work flow is omitted, the likely outcome is lifting.