

15

Electric Filing

Chapter Outline

- Why Study Electric Filing?
- Types of Electric Files
- Battery-Operated Micromotor Machines
- Hand-Held Micromotor Machines
- Choosing an Electric File
- All About Bits
- Electric Filing Techniques
- Electric Files for Pedicures
- Troubleshooting
- Safety Tips for Electric Filing
- Continuing Education
- Procedures



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Learning Objectives

After completing this chapter, you will be able to:

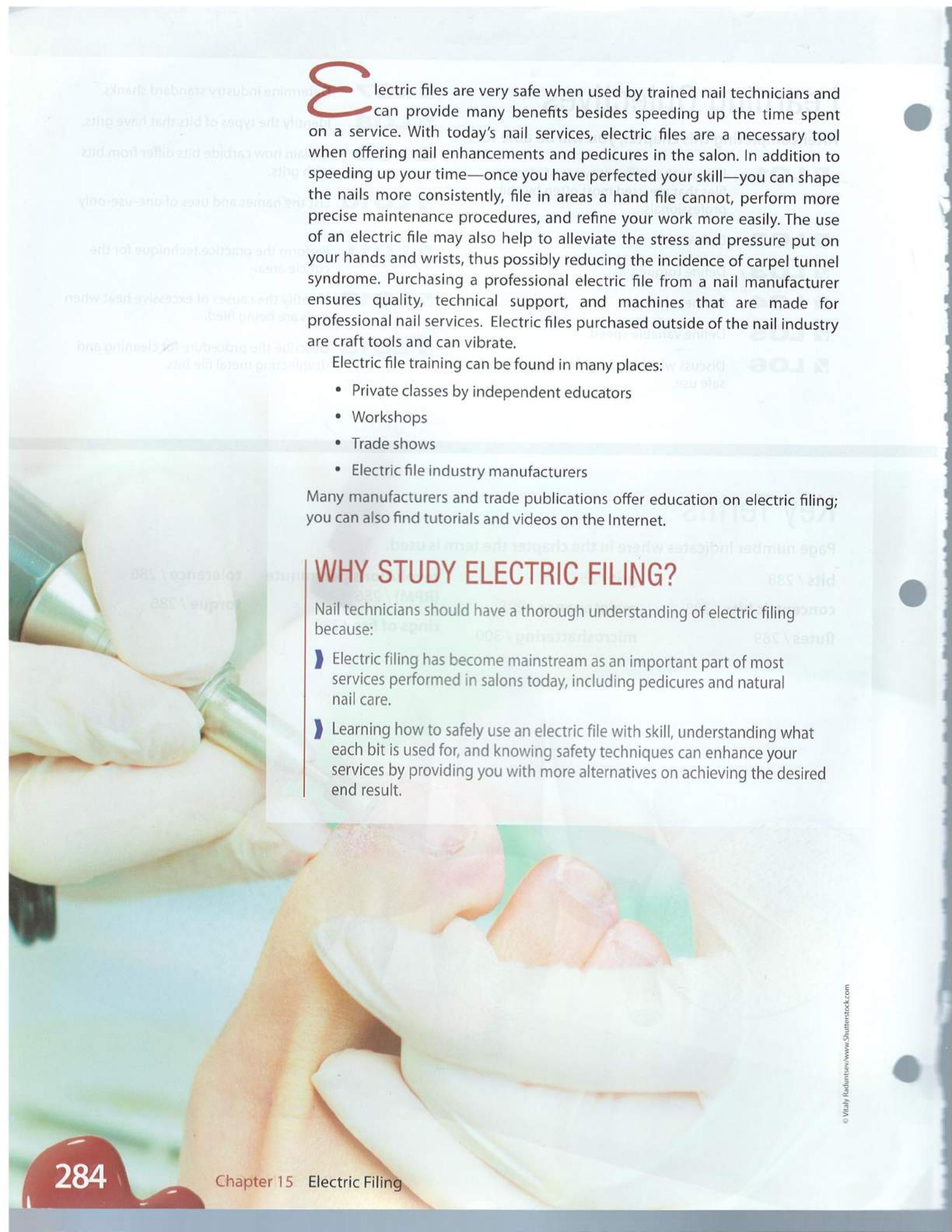
- ✓ LO1** Discuss the different types of electric files that are used most often by nail professionals.
- ✓ LO2** Define RPM.
- ✓ LO3** Define torque.
- ✓ LO4** Define tolerance.
- ✓ LO5** Define variable speed.
- ✓ LO6** Discuss why bits should be concentric for safe use.
- ✓ LO7** Determine industry standard shanks.
- ✓ LO8** Identify the types of bits that have grits.
- ✓ LO9** Explain how carbide bits differ from bits with grits.
- ✓ LO10** List the names and uses of one-use-only bits.
- ✓ LO11** Perform the practice technique for the cuticle area.
- ✓ LO12** Identify the causes of excessive heat when nails are being filed.
- ✓ LO13** Describe the procedure for cleaning and disinfecting metal file bits.

SCANNED.

Key Terms

Page number indicates where in the chapter the term is used.

bits / 288	grit / 288	revolutions per minute (RPM) / 286	tolerance / 286
concentric bits / 288	maintenance / 295		torque / 286
flutes / 289	microshattering / 300	rings of fire / 289	



Electric files are very safe when used by trained nail technicians and can provide many benefits besides speeding up the time spent on a service. With today's nail services, electric files are a necessary tool when offering nail enhancements and pedicures in the salon. In addition to speeding up your time—once you have perfected your skill—you can shape the nails more consistently, file in areas a hand file cannot, perform more precise maintenance procedures, and refine your work more easily. The use of an electric file may also help to alleviate the stress and pressure put on your hands and wrists, thus possibly reducing the incidence of carpal tunnel syndrome. Purchasing a professional electric file from a nail manufacturer ensures quality, technical support, and machines that are made for professional nail services. Electric files purchased outside of the nail industry are craft tools and can vibrate.

Electric file training can be found in many places:

- Private classes by independent educators
- Workshops
- Trade shows
- Electric file industry manufacturers

Many manufacturers and trade publications offer education on electric filing; you can also find tutorials and videos on the Internet.

WHY STUDY ELECTRIC FILING?

Nail technicians should have a thorough understanding of electric filing because:

- Electric filing has become mainstream as an important part of most services performed in salons today, including pedicures and natural nail care.
- Learning how to safely use an electric file with skill, understanding what each bit is used for, and knowing safety techniques can enhance your services by providing you with more alternatives on achieving the desired end result.

TYPES OF ELECTRIC FILES

There are several types of electric files that are made specifically for nails. These machines have warranties from electric file manufacturers that support the nail industry. A professional nail technician should never purchase an electric file outside the nail industry, as these files may not have the high quality required for nails: they vibrate and use different bits that should not be used on nails.

Micromotor Machines

Most professional electric filing machines are called micromotor machines. The motor is actually located inside the handpiece. The base box that sits on the manicuring table houses the transformer and the on/off and speed control switches. Smaller versions can have the same handpiece, with the transformer attached to the cord instead of being inside. These smaller models are just as powerful as the bigger machines. You will want to try both types to determine which one you prefer.

BATTERY-OPERATED MICROMOTOR MACHINES

The smaller micromotors are battery operated. You will have approximately 2 to 6 or more hours of battery usage before you must plug in the machine to recharge it. These models are small, compact, and powerful, but some may have much less torque.

HAND-HELD MICROMOTOR MACHINES

Hand-held micromotors have their power source and handpiece combined. The result is a larger unit that may be more difficult to manage than a two-piece unit. Also, each micromotor manufacturer recommends its own method for changing bits. Be sure to read and follow the manufacturer's directions.



Photo courtesy of Nancy King Heppel.

▲ Figure 15-1 Nail damage caused by improper use of electric files.

For example, the acrylics are composed of monomer and polymer products, and cause wrist damage to the nail technician (Figure 15-1). **LO1**

fyi

Electric file manufacturers have recently been inundated with reports of fake machines that look almost the same as the authentic, brand-name models. The design of these machines and the packaging are nearly identical to authentically produced professional machines. In most cases, only the manufacturer can determine the authenticity of a machine. One big clue is its price. If the price is much lower than others you have looked at, this is a good indication that the machine may not be a well-made, professionally guaranteed machine.

Be careful: Many people think they are getting a bargain when they find an inexpensive brand-name machine. But then when the machine needs to be repaired, buyers are told by the manufacturer of the authentic files that the machine they have purchased is a fake. In those cases, manufacturers cannot honor a warranty because the parts used in the fakes are not the same as those used by the manufacturer. Unfortunately, replacing the machine is the only option. This may cost more than buying the brand-name item in the first place.

Craft and Hobby Tools

Electric files that are purchased at craft, hobby, and tool stores are not suitable for the professional salon industry because they are usually manufactured for use on glass, wood, and ceramics. The bits needed for these electric files have a different shank size (1/8" or 3.12 mm) compared to the industry standard shank size of 1/32" (.79 mm). Most of these machines have a tremendous amount of vibration that can damage the natural nail, microshatter,



▲ **Figure 15–2** An example of an electric file with bits.

CHOOSING AN ELECTRIC FILE

When choosing an electric file, determine your needs and know how much you are willing to spend (**Figure 15–2**).

Understanding a few basic terms will be very helpful when you are deciding among the various features of the files.

Power and RPM Speed

Speed is defined in **revolutions per minute (RPM)**. This is the number of times the bit turns in a complete circle in 1 minute. Machines vary in RPM capacity, between 0 and 35,000. Think of RPM as a speedometer in a car. The motor works in the middle of the range from zero to the highest number. (You do not drive your car at the highest number on the speedometer.) Working in the middle range of its capacity prolongs the working life of the motor. **LO2**

Torque

Torque is the power in the machine or its ability to keep turning when applying pressure during filing. Machines vary in torque and RPM, so know your machine's capacity. More powerful machines have larger, better motors. This means higher torque, so you should work at lower speeds because these machines are stronger and can accomplish more at a lower speed. Less powerful machines have less powerful motors and plastic handpieces, so you will work at higher speeds and possibly use more pressure to shape the nails, which may cause heat. These lightweight, less powerful machines can handle all of the same procedures as more powerful machines, but need to work at higher speeds to compensate. Your handpiece should not "bog down" or stop rotating when you apply pressure; if it does, then there is not enough torque. Again, the more expensive handpieces have better torque. **LO3**

Tolerance

Tolerance is the tightness of the inside of the shank where the bit fits into the handpiece. If you have a bit that does not fit into the handpiece, it could be because of the tolerance. If the bit slips out while in use, the tolerance is too loose. **LO4**

Consider these features when you are purchasing an electric file:

- **RPMs.** Most techs use a range of 5,000 to 20,000 RPMs.
- **Handpiece.** The handpiece should weigh approximately 4 to 6 ounces (113 to 170 grams), should be comfortable in your hand, and have virtually no vibration.
- **Size of machine.** Most electric files are table machines that are about 4" x 4" x 4" (10.16 cm x 10.16 cm x 10.16 cm). Some are smaller and have the power pack on the outside of the box.
- **Usage.** How much you plan on using the electric file will dictate how much money you should spend. The more you use the machine, the higher quality you will need. A higher-quality file will last longer but cost more.

Here's a Tip:

Consider sending your electric file in for maintenance while you are on vacation. Most manufacturers can service and return your machine within a week to 10 days. On your last day of work, ship your handpiece to the company. Provide a phone number so you may receive a quote. Otherwise, your handpiece may not be serviced until the company can reach you for your approval. Following the repair, your handpiece will be shipped back to you. It is always a good idea to have a second handpiece as a backup. All manufacturers sell handpieces separately.

- **Warranty.** Most electric file manufacturers offer a limited warranty with the purchase.
- **Price.** The more money you spend, the better the machine. A higher quality file will last longer and have less vibration, but cost more. High-end machines can cost as much as \$500; less-expensive machines can be purchased for as little as \$150.
- **Forward and reverse.** You will only need to "shift" into reverse if you are left-handed. Keep in mind that some bits do not cut when turning in reverse.
- **Keyless chuck for ease in changing bits.** Most machines have twist-lock or push chucks for ease in changing bits.
- **Foot pedal option.** Some machines offer a foot pedal option. You can plug in a foot pedal on the back of the file and override the speed controls on the front of the machine. The foot pedal works like the accelerator of a car or like the pedal of a sewing machine. The harder you press, the faster the bit turns; when you reduce pressure, the bit slows down.
- **Closed-casing handpiece.** Some handpieces have slots or openings that allow dust and debris to get inside the file; this can damage the motor. Closed casings can prolong the life of your machine. Be sure to purchase a machine that does not have any open sections.
- **Variable speed dial.** This dial allows you to vary your speed. You will have a complete range of speed, from lowest to highest, instead of the traditional high, medium, and low speed options (**Figure 15–3**). □ **LO5**

Life Expectancy

How long should an electric file last? That depends on two things:

- **Usage.** The more you use your electric file, the greater the wear and tear on the machine.
- **Maintenance.** If you maintain and care for your electric file on a regular basis, it will be in good working order for many years. Check with the manufacturer for recommended handpiece cleaning, service, and replacement of cords.

Maintenance and Warranties

When you purchase your electric file, make sure to ask about the warranty. Do not purchase an electric file without a warranty. Terms and conditions of the warranty will vary, but most manufacturers will fix or replace a malfunctioning electric file within 1 year of purchase at no cost to you.

Machines vary in price from \$25 for battery-operated models to over \$500 for high-end machines. Keep in mind that all machines can perform the same procedures, but some do it more easily than others do. Purchase the best electric file that you can afford. It is the most valuable tool you will use in professional nail services.

▼ **Figure 15–3** The dial on a variable speed drill.



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Photography by Dino Petrocelli.

Here's a Tip:

An electric file should run smoothly, without excessive vibration. Because they are not concentric or have been dropped, wobbling or bent bits can harm the electric file or cause damage to the client's nails and may cause the nail professional to develop a cumulative trauma disorder (CTD). Handpieces or bits that vibrate excessively increase the risk of injury to your hand and/or wrist. If your handpiece creates excessive vibration, it should be serviced immediately. Remember, repetitive motions of any type, including motions used while electric filing, can cause repetitive trauma disorders such as CTDs. If you develop symptoms related to any type of repetitive trauma disorder, you should consult a physician for diagnosis and treatment.

ALL ABOUT BITS

Following are a few basic terms that will help you understand electric file bits and make it easier for you to choose your bits.

Concentric Bits

Concentric bits are balanced bits that do not wobble or vibrate. Some people refer to concentric bits as being centered. If you drop your bit while it is still in the handpiece, it may become bent; this will throw off the concentricity and render the bit unusable. If the concentricity is not perfect, the bit may actually be hitting the nail as it spins, causing damage and microshattering. **LO6**

Surface Smoothness

Check to see whether the particles on the bit are larger in some areas, missing, or unevenly distributed. Bits with these kinds of surfaces will scratch the nail enhancement as you file, instead of refining it.

Edges

Bits are cut with finished edges so that they are not sharp on the top. Feel the edges of the bit before using it. If these are sharp, dull the edges with a hand file with the bit spinning at slow speed before you use it.

Grits

Grit is measured by the number of abrasive particles per square inch. In higher-numbered grits, the particles are smaller and therefore finer: more of them are needed to cover the square inch. The coarser the grit, the lower the grit number will be and the larger each individual piece of grit will be to cover the square inch. This holds true for all abrasive boards, blocks, buffers, and electric file bits. Bits that come with grits are diamond or sanding bands, natural nail, or buffing bits.

Shank

The industry standard shank size for electric files is $3/32"$ (2.38 mm). Electric files used for crafts are usually $1/8"$ (3.2 mm) and will not fit a professional electric file. **LO7**

Types of Bits

There are many different styles of bits available in carbide, diamond, gold, silver, natural nail bits, and sanding bands. These bit styles are available in a variety of grits and shapes.

Diamond Bits

Diamond bits are made from either natural or synthetic diamond particles attached to the surfaces of metal bits. Diamond bits come in various grits, file the surface of the product, and can be used in a back-and-forth motion when the machine is in either the forward or reverse position.

Diamond bits vary significantly in quality and price, but all are capable of accomplishing the same procedures. Lower-quality bits cost less but leave scratches on the surface of the product. If you use these because of budgetary constraints, simply follow with another, higher grit to smooth out the surface of the product.

Higher-quality diamond bits have more consistency in construction because each particle on every bit is cut the same size and shape and then adhered to a stainless steel blank bit (**Figure 15–4**). **LO8**

Carbide Bits

Carbide bits are made of carbide metal with flute-like cuts that shave the enhancement product instead of scratching it the way file, sanding bands, and diamond bits do. **Flutes** are long, slender cuts or grooves found on a carbide bit. Carbide bits are measured by the number of flutes in each bit. They are categorized in the same way the grit scale measures the file: the larger and deeper the grooves, the coarser the bit. Shallower and more closely spaced grooves create a finer bit.

There are four types of carbide bits: traditional, one-way, cross-cut, and pointed flutes that cut in both directions. Traditional carbides must be used from right to left with the machine in forward rotation. If used in a back-and-forth motion, traditional carbides will work better in one direction than the other. One-way carbides can be used only in one direction and are usually made for right-handed nail technicians. With cross-cut carbides, the grooves are cut at the same angle and shave evenly when filing back and forth. Cross-cut carbides and pointed flutes can be used to file in both directions and in a back-and-forth filing motion (**Figure 15–5**). **LO9**

Small and Large Barrel Bits

The circumference of the small barrel bit is less than that of the large barrel bit, but both are the standard length (**Figure 15–6**). These bits are usually used to shorten the length and shape the surface of the nail. The flat top of the bit can be used to cut a new smile line, as well. These bits should not be used at the cuticle area as they can easily produce rings of fire damage to the nails. **Rings of fire** are grooves carved into the nail by filing with bits at the incorrect angle.

Tapered Barrel Bits

This shorter, cone-shaped bit is designed with a flat top and can be used to shape the top surface of the nail and to cut maintenance on small nails at a flat angle and at the cuticle and sidewalls (the areas on the sides of the nail plate that grow free of an attachment to the skin) as well as to prep the cuticle area product for a fill (**Figure 15–7**).

▼ **Figure 15–4** Diamond bits.



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▲ **Figure 15–5** A carbide bit.

CAUTION:

Never use carbide bits on the natural nail!



▲ **Figure 15–6** Small and large barrel bits.



▲ **Figure 15–7** Tapered barrel bits.



▲ Figure 15-8 A cuticle safety bit.

Photo Courtesy of Medcool, Inc.
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Cuticle Safety Bits

This bit was designed for safe cuticle work (**Figure 15-8**). It can be used for underneath the nail and for shaping. The shorter, tapered shape and round top of this bit allow the nail tech to get into the cuticle area and sidewalls to bevel the nail enhancement flush with the natural nail without causing damage or discomfort to the client. This bit is perfect for beveling the enhancement at the cuticle during the fill process.

Cone-Shaped Bits

This slim, long, tapered, and pointed bit can be used at the cuticle, underneath the nail, on top of the nail, and to prep the cuticle area for a fill. It comes in various sizes, depending upon the manufacturer (**Figure 15-9**).



▲ Figure 15-9 A cone-shaped bit.

Photo Courtesy of Medcool, Inc.
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Football-Shaped Bits

The football-shaped bit also can be used for underneath the nails and the cuticle area. It does have a point on the top that can damage the hyponychium, so use it with care. This bit is perfect for finishing the underside surface of long curved nails (**Figure 15-10**).



▲ Figure 15-10 A football-shaped bit.

Photo Courtesy of Bruce Awood, Awood Industries, Inc.
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UNC Bits

The under-the-nail cleaner bit (UNC) is a small, pointed bit that can be used for tight spaces such as under the nail, sidewalls, and for making designer holes in nails. The point size varies from manufacturer to manufacturer (**Figure 15-11**).



▲ Figure 15-11 A UNC bit.

Photo Courtesy of Bruce Awood, Awood Industries, Inc.
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Bullet Bits

The bullet bit is a small, slender bit that is available in a flat-topped or round-tipped version and is similar to the UNC bit. Many nail techs use this bit in a fine diamond style to prep the natural nail at the cuticle area for nail enhancement work (**Figure 15-12**).



▲ Figure 15-12 A bullet bit.

Photo Courtesy of Bruce Awood, Awood Industries, Inc.
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Needle Bits

This pointed bit is usually as slim as the actual shank of a bit. It can be used at the cuticle; underneath the nails; in small, tight spaces; and for specialty design work (**Figure 15-13**).



▲ Figure 15-13 A needle bit.

Photo Courtesy of Medcool, Inc.
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Maintenance Bits

Bits used to perform the maintenance procedure are commonly marketed and referred to as backfill bits. The backfill bit was originally designed to trench (carve) out the growth at the smile line and to replace white tip powder. Backfill bits come in two sizes: small (1/4 the size of a barrel bit) and medium (1/2 the size of a barrel bit). They are available in inverted shapes for more ergonomic and precise cutting. Backfill bits are used to cut a new smile so you can replace the white tip product. This bit is generally used by angling its top edge and cutting into the nail across the smile line area. Larger backfill bits can be used flat to the tip to remove the white tip product (**Figure 15-14**).



▲ Figure 15-14 Maintenance bits.

Photo Courtesy of Bruce Awood, Awood Industries, Inc.
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French Fill Bits

A French fill bit was designed to use sideways to carve out a "V" into the smile line area during a maintenance procedure. Made in diamond style only, these bits come in several sizes (**Figure 15-15**).



▲ Figure 15-15 A French fill bit.

Photo Courtesy of Bruce Awood, Awood Industries, Inc.
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▲ Figure 15–16 A natural nail disc.

Natural Nail Discs

The natural nail disc has a diamond surface that is used flat on the tip of the natural nail to shorten and shape. The outer edge is made of metal or plastic and acts as a safety edge when you file (Figure 15–16).

Rubber Synthetic Natural Nail Bits

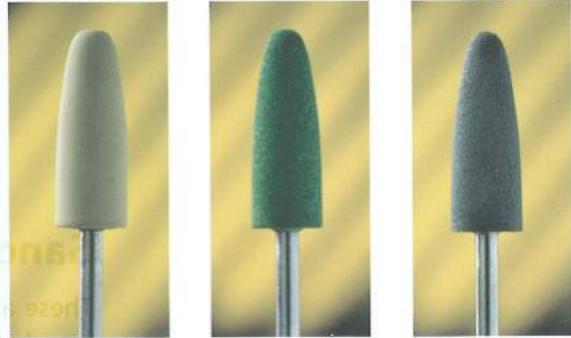
Rubber synthetic natural nail bits come in three different color grits (yellow, black, and green) and three different shapes (long barrel shape with a flat top and two different sizes with rounded tips). Use these bits to buff the surface of a natural nail smooth or to smooth the cuticle areas. You can push the cuticle back gently on a slow speed as you press down to remove any dead cuticle on the nail. These bits are perfect for difficult cuticle cleanup. Rubber bits wear down quickly and can be reshaped in between use with a clean hand file at a low speed (Figure 15–17).



▲ Figure 15–18 A high shine bit.

High-Shine Bits

High-shine bits, sometimes called buffer bits, are usually made of natural chamois, cotton, or soft leather material. They are used on the nail with buffering cream to create a high shine. High-shine bits are one-use-only bits, as they cannot be effectively disinfected (Figure 15–18).



▲ Figure 15–17 Rubber synthetic natural nail bits.

▼ Figure 15–19
A pedicure bit.



▼ Figure 15–20
A prepper bit.



Prepper Bits

Diamond prepper bits are similar to a tapered barrel shape but slightly smaller. They come in various grits. It is recommended that you use a fine grit on a natural nail to prep it at the cuticle area for nail enhancement work (Figure 15–20).

Mandrels

Mandrels are the metal or rubber bits that are inserted into the handpiece. The sanding and arbor bands (below) are slipped over the mandrels (**Figure 15-21**).

Photo Courtesy of Bruce Atwood, Atwood Industries, CA (atwoodindustries.net), 800-451-7633



▲ Figure 15-21 Mandrels.

Did You Know?

Leaving a file bit in disinfection solution for more than 10 minutes at a time can cause it to rust.

Photo Courtesy of Bruce Atwood, Atwood Industries, CA (atwoodindustries.net), 800-451-7633

▲ Figure 15-23 A jewelry and specialty bit.

Sanding and Arbor Bands

These are one-use-only paper bits that slip onto a mandrel. These bits are made of file paper just like hand files and cannot be disinfected. Sanding bands generally are used for shortening and shaping the top surface of the nails, removing a gel sealant, and filing calluses on feet. Fine sanding bands are good for smoothing the surface of toenails in preparation for nail enhancements. These bits should not be used at the cuticle area as they can easily cause rings of fire damage to the nails (**Figure 15-22**). ▲ LO10

Photo Courtesy of Bruce Atwood, Atwood Industries, CA (atwoodindustries.net), 800-451-7633



▲ Figure 15-22 A sanding and arbor band.

Jewelry and Specialty Bits

A jewelry bit is a long, slender carbide bit configured to drill a hole into the free edge of a nail enhancement to attach nail jewelry. Only use jewelry bits on the extended free edge of the nail and never over the nail bed. Other bits have a small carbide or diamond ball on the end that can be used to carve designs into the nail enhancement (**Figure 15-23**).

Disinfectable Metal Bits

Disinfectable metal bits are cleaned and disinfected in the same way that you would clean and disinfect other multiuse tools and implements such as nippers and manicure tools. Never use a dirty bit!

Be sure to:

- Wash and disinfect each bit used on clients between every service.
- Remove a dirty bit from the handpiece of your electric file when the file is not being used.
- Replace the dirty bit with a blank as part of your cleanup in between every client.

The disinfection procedure for metal bits follows the same steps and cautions as the procedure for cleaning and disinfecting all multiuse (reusable) tools and implements.

Go to Procedure 15-1 Disinfecting Metal File Bits page 302

ELECTRIC FILING TECHNIQUES

Before you use an electric file on a client, it is extremely important to get the proper education; then practice, practice, practice!

Glue a nail tip on a dowel or round clothespin and hold the dowel as you would a client's finger. Practice on a bare tip (with no enhancement) until you have gained confidence in your abilities. You need to feel the gentle pressure you should use when filing on a bare tip before applying enhancement products.

Once you have gained some experience with the machine, apply an enhancement product and practice on a classmate or salon mate who can give you honest feedback about your technique. It is important that you are comfortable holding the handpiece; use the bits at the correct angle and speed so you do not injure the client. The more you work with your electric file, the more comfortable and skilled you will become.

Practice Techniques

Hand Balancing/Fulcrum Finger

1. Sit up straight at your table with your feet flat on the floor.
2. Hold your handpiece like a pencil for comfort and control.
3. Place your forearms on the table to make sure your hands are stable.
4. Use a firm steady grip. Do not use too tight a grip as your hands may begin to cramp.
5. Balance your hands by using the pinky finger as the fulcrum finger (or balance point). This occurs when you balance the tip of one pinky finger to the tip of the pinky finger on the other hand as you work. By doing this, you will take the negative pressure off the bit and displace it with the fulcrum finger. This will give you more control of the handpiece and bit as you work (**Figure 15–24**).

Examine and Mark the Dial

Most electric files do not have an RPM chart on the variable speed dial, so it is up to you to dissect your dial and know where the best speeds are. You may want to mark the dial. For a 0 to 35,000 RPM machine, dissect your dial for slow, medium, and fast speeds (**Table 15–1**).

Table 15–1 TYPES OF FILING AND SUGGESTED SPEEDS

TYPE OF FILING	SUGGESTED SPEED
Surface work	Fast
Maintenance	Medium
Cuticle work	Slow



▲ **Figure 15-25** Middle of the bit on middle of the nail.



▲ **Figure 15-26** Top of the bit on the bottom of the nail.



▲ **Figure 15-27** Top of the bit on the top of the nail.



▲ **Figure 15-28** Safety bit at cuticle area.

Insert Bit

1. Insert a barrel bit or a sanding band into the handpiece, leaving a slight neck on the shank of the bit.
2. If it is a twist-lock chuck, lock the bit into place. If it is a push chuck, check the security of the bit.

Practice Bit Angles

1. With the machine off, practice:
 - Holding the bit in the center of the nail and moving the file from right to left (**Figure 15-25**).
 - Picking up the bit and returning it to the right side of the nail, then repeating this step.
 - Holding the bit flat to the nail, making contact with the center of the bit.
2. Repeat the placements in #1 above, using the top of the bit on the bottom of the nail (**Figure 15-26**).
3. Repeat the placements in #1 above, using the top of the bit on the top (not the cuticle) of the nail (**Figure 15-27**).

Turn On the Machine

1. Choose a low RPM after turning on the machine.
2. Make sure the file is in the forward position.

Practice Surface Work

1. Hold the bit flat to the nail so the center of the bit makes contact with the nail.
2. Start on the right side of the nail and work across to the left side.
3. Pick up the bit off the nail and return to the right side of the nail to begin again.
4. When you have mastered this, try going back and forth. Remember to pick up the bit off the nail occasionally so that you do not create heat.
5. Practice using the correct angles for the bottom, center, and cuticle areas.

Practice Cuticle Work

1. Practice cuticle work with a safety bit or a rounded-top cone (**Figure 15-28**).
2. Place the bit at the cuticle area, holding the bit at a slight angle so that the top and at least 50 percent of the bit is making contact with the nail.
3. With the machine turned off, start on the right side and work toward the left side. Use your wrists and turn the nail to meet the bit.
4. On a very low speed, practice this technique. Watch where dust appears on the bit so that you know when you are making contact.
5. Watch from the side view as you work to make sure you are beveling the product at the correct angle to be almost flush with the natural nail.

✓ LO11



▲ Figure 15-29 Rings of fire.

Important Things to Remember

1. Use the correct bit angle. When using an electric file, it is important to always keep the bit flat and parallel with the nail you are working on to avoid causing damage to the nail. Use a downward angle for the bottom of the nail, flat to the nail in the center and slightly angled up at the top of the nail, not the cuticle area. Use a safety bit at the cuticle.
2. Avoid rings of fire (**Figure 15-29**). Rings of fire are caused by holding flat-tipped bits at the wrong angle, especially at the cuticle areas, which allows the edge of the bit to dig into the surface of the nail. This can cause damage to the natural nail.
3. Choose the correct speed. Be sure to use a safe working speed. Higher speeds allow you to use less pressure. If the bit grabs and wraps around the finger, this is an indication that your filing pressure is incorrect. If the speed of the electric file bogs down, the speed is too low.

Here's a Tip:

Watch the dust! The dust will tell you where you are making contact with the nail. Every so often, stop the electric file and use a nail brush to remove the dust before continuing.

Nail Enhancement Maintenance

Maintenance is the term used for when a nail enhancement needs to be serviced after 2 or more weeks from the initial application of the nail enhancement product. The maintenance service actually accomplishes two goals: it allows the tech to apply the enhancement product onto the new growth of nail, commonly referred to as a *fill* or a *backfill*, and to structurally correct the nail to ensure its strength, shape, and durability; this is commonly referred to as a *rebalance*.

To prepare nail enhancements for a maintenance service, use a medium-grit bit to smooth old product in the growth area of the nail. Keep the bit parallel to the nail and reduce the product down to the natural nail without touching the nail itself. Use a bit with a round-tipped safety edge for this procedure.

Removing Lifted Product

Never trim or remove loose nail enhancement products with a pair of nippers. It causes the remaining product, which may not be loose, to pull away from the healthy nail, causing damage to the nail plate. There are several bits that can be used to remove the lifted areas and loosen product safely when used at a safe angle.



CAUTION:

Never use a sander on the natural nail or to remove cuticle tissue from the nail plate!

Cracks

Use a flat-tipped barrel, backfill bit, or bullet bit and place it sideways into the crack. Slowly bevel a trench with the body of the bit, exposing the crack so that new product can fill in the groove and reinforce that area.

Shaping the Top Surface

You may use a variety of bits—barrel bit, sanders, or a tapered barrel—to shape the top surface of the nail. Place the bit flat on the nail and go from one side to the other, picking up the bit to return to where you started. Repeat this step as you continue to work. Angle the bit so you use the bottom of the bit on the bottom of the nail and the center of the bit in the center of the nail. Angle it toward the cuticle (without touching the cuticle area) to bevel the cuticle area product. By angling the bit slightly as you work, you will contour the shape of the nail.

Shortening the Nails

Using a medium or coarse barrel bit, hold the bit to the tip of the nail at a 90-degree angle, making sure you have a firm grip (**Figure 15–30**). Use a faster RPM and quickly move back and forth on the outer surface to shorten the nail.

Cuticle Work

Use a round-tipped bit at the cuticle area, holding the bit flat to the nail. This will safely allow the angle of the bit to do the contouring of the cuticle product. Change the angle (east, north, or west) of how you hold the bit (keeping it flat to the nail) to get into the sidewalls of the cuticle area (**Figure 15–31**).

Maintenance Services for a Two-Color French Manicure

A backfill, the first aspect of the maintenance service, can be performed in a variety of ways (**Figure 15–32**). Some nail techs prefer to reduce the entire nail and apply a new layer of white product at the tip, while others prefer to simply thin the product at the growth area. Either can be done with any shaped, round-tipped bit. The purpose is to reshape the apex of the nail that offsets the balance when it has grown out, so it remains thin at the tip and cuticle areas. This provides strength in the center of the nail. Be careful not to touch the natural nail when filing; focus on the enhancement product as you reduce it at the cuticle area.

After you have prepped the nails for maintenance, remove the dust with a clean, dry, and disinfected nail brush. Use a medium or coarse barrel or cone or a safety bit on the tips to thin down the thickness from the stress area to the tip. Remove 75 percent of the product at an angle: do not do this by cutting a new smile line. Use your bit back and forth, from side to side, so the tips of all nails are all thinned evenly. When you replace the product, the color and density should be consistent.

Backfill bits come in different sizes: 1-week, 2-week, half barrel, and inverted backfill bit. They all can perform the same task—you should decide which



▲ Figure 15–30 Shortening the nail at a 90-degree angle.



▲ Figure 15–31 Cone bit at cuticle area.



▲ Figure 15–32 Backfill bit.

one you prefer to use. Backfill also can be done with full-barrel bits, which are big enough to cut and remove the remainder of the tip product without your having to change bits. The choice is yours.

Shaping C-Curves

Barrel-shaped or tapered bits, in any size, are best to use under the free edge to refine C-curves. Choose the size of the bit depending on the size of the underside of the C-curve you are refining (**Figure 15–33**).

Finishing

Graduating grits is the key to finishing nails without leaving scratches. Graduate bits from coarser to finer, as with hand-held abrasives, and remove the dust each time, in between changing bits as you graduate. These will keep you from scratching the surface and give a smoother finish.

Buffing Oils

Buffing oils can enhance your finish work by reducing heat and holding dust on the surface of the bit. Use buffing oils sparingly, as they can seep up the neck of the bit into the handpiece and cause damage. Rub the oil into the nails. After the buffing is complete, it is important to remove all the oil before polishing or using UV gel sealants for better adhesion.

High-Shine Buffing

After filing to a smooth finish, nail enhancements can be shined with a buffing bit and buffing cream. Lift the bit frequently and do not apply too much pressure; these bits can heat up quickly and burn your client. If your buffing does not produce a high gloss, then you did not file the nails smooth enough before buffing.

Buffing Creams

Buffing creams enhance the shine when used with buffing bits. Most creams come with pumice and can be used with any style buffing bit. Apply the buffing cream to the nail and rub it in before you use the buffing bit. If you do not rub it in, it will fly off the nail when the bit spins! You also can apply the buffing cream to the bit first.

Natural Nail Work

You should never use a metal bit or sanding band on the natural nail plate unless you have experience carrying out this procedure safely. You can use a natural nail rubber synthetic bit to prep the nail plate by pushing gently toward the cuticle. This procedure removes any dead cuticle on the nail plate safely.

You also can use a natural nail bit to smooth the surface of the natural nail plate. Use a slow speed and hold the bit flat to the nail.



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▲ Figure 15–33 Shaping C-curves.

Application Tip:

A good way to practice using the electric file when performing a two-color French application is to glue a tip to a wooden dowel, cut the length, and cover with pink- and white-colored monomer liquid and polymer powder. Practice cutting new smile lines until you have no more room, then break the used tip off and glue on another.

ELECTRIC FILES FOR PEDICURES

Electric filing on foot calluses needs to be done when the foot is dry. You can perform the pedicure first or last. Just be sure the feet are soft and dry before you start work on the callus.

Apply a callus treatment, wait the recommended length of time, and use a terry towel to slough off the product and the skin it removes. Rinse and dry the foot well. Use your pedicure bit in one direction to remove any remaining callus. Using the bit slowly and going only in one direction will keep the bit from getting hot and causing discomfort to the client. Pedicure bits can be used anywhere on the foot where there is callus, including the skin on the sides of the toenails and under the toes.

TROUBLESHOOTING

Reducing Dust

Because of the way that bits cut, different types of bits cause different sizes of dust particles. The smallest particles are caused by sanders or sleeves. The dust is finer and flies higher into the air and can enter your breathing zone. To protect your health as well as that of your coworkers and your clients, you should always wear an appropriate N-95 rated dust mask when filing. Diamond bits create slightly heavier particles that do not fly as high into the air and are not as likely to enter the breathing zone. Carbide bits shave the surface of the product and create heavier particles that are directed down toward the table and onto your hands. There is very little airborne dust when using carbide bits.

Heat

Pressure causes friction, friction causes heat. Improper filing techniques, not the bits, cause heat when using an electric file. Heat is caused by pressing down too hard and leaving the bit on the nail too long when filing. Lift the bit off the nail frequently while working and adjust the speed slightly higher so you can use less pressure as you continue to file.

Heat can cause the client discomfort and can damage the natural nail. Electric filing should not hurt the client. If it does cause discomfort, adjust your procedures.

Keep in mind that although diamond and sanding bits are appropriate to use, they require greater pressure when filing and do heat up slightly faster (because of the pressure) than a carbide bit. The carbide bit requires less pressure to shave the product because it is sharper. Natural material bits, such as a chamois, heat up faster also.

Causes of Heat

- Applying too much pressure during filing.
- Incorrect speed (RPM).
- Leaving the bit in the same place for too long while filing.
- Using sanders or sleeves. These generate more heat than metal bits.

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Solutions to Reduce Heat

- Adjust the speed of the machine (RPM).
- Apply less pressure during filing.
- Lift the bit frequently during filing. **LO12**

Grabbing

Grabbing occurs when the bit grabs the skin around the nail during filing. Grabbing can be avoided by using the bit at the proper angle when working around sidewalls and the cuticle area and the correct speed when working on the surface of the nail. It is important to remember that bits have two sides; we tend to look at the side toward the center of the nail while filing. It is the other side that is on or near the skin that can grab and cut the skin. Bits turn clockwise, so it is a given that the bit will dig into the skin if it gets too close to the sides of the nail.

Causes of Grabbing

- Improper speed (RPMs).
- Improper pressure.

Solutions to Grabbing

- Keep the bit parallel to the nail.
- Angle the finger, not the bit, to file the sides of the nail and the cuticle area.
- Use bits with rounded ends such as safety style bits.

Rings of Fire

Rings of fire are caused by holding flat-tipped bits at the wrong angle and allowing the edge of the bit to dig into the surface of the nail. This can cause damage to the natural nail and be very uncomfortable for a client.

Causes of Rings of Fire

- Wrong angle of the bit.
- Using a flat-tipped bit at an angle at the cuticle area.

Solutions to Rings of Fire

- Keep the bit parallel to the nail as you work.
- Decrease the speed of your machine.
- Reduce the amount of pressure applied during filing.

Product Breakdown

Nail enhancement products are like a densely packed jungle of vines. Trauma, heat, age, and vibration can cause the vines to snap. Products can also become brittle. Free-edge separation can be caused by product breakdown, age of the product, and how hard the client is on his or her nails. A client who is not careful

or gentle with their nail enhancements can cause their enhancements to loosen and lessen the adhesion of the product to the nail. To repair tip separation, you must remove the old product, prep the exposed natural nail again, and reapply primer and product.

As nail enhancements age with wear, they can become brittle and develop tiny cracks. This is called **microshattering** and may be caused by aggressive filing with or without an electric file. It is easier to cause microshattering with an electric file.

Potential Causes of Microshattering

- Improper speed of the machine during filing.
- Poor quality or bent bits.
- Using bits that are too coarse.
- Using low-quality and brittle nail enhancement products.
- Holding the handpiece at the wrong angle.
- Working too aggressively with the electric file.

Solutions to Microshattering

- Use a slower speed.
- Use proper filing techniques.
- Keep the bit parallel to the table during filing.
- Use correct application techniques.
- Make sure the bit is not bent.
- Use a finer grit bit.
- Use quality electric files according to manufacturer's instructions.

Vibration

High vibration is something to avoid when using an electric file. Vibration can create microshattering with enhancement products and can be harmful to the nail professional's hand, wrist, and arm. It also may lead to cumulative trauma disorders, such as carpal tunnel syndrome. Choose a machine with the least vibration.

The best way to test the vibration of a machine is to hold the handpiece, turn on the power, and feel the vibration. If the vibration is high, and it is uncomfortable just holding the handpiece for a minute or so, it will be a problem when you use the machine in the salon. The quality of the machine will play a part in the amount of vibration. The less expensive the machine, the more vibration you will experience.

Bent Bits

Bits should be concentric and run true by spinning perfectly without wobbling in the shank of the handpiece. Manufacturers join the shanks and the heads of the bits so they become one part. If this is not done precisely, they may not be concentric. Other causes of wobbling can include inexpensive manufacturing

or dropping the bit while it is in the handpiece—which nail techs tend to do frequently. When a bit is dropped it should be replaced, even if appears normal. When a bent bit is used on the nail, it can cause damage to the nail or microshattering.

■ SAFETY TIPS FOR ELECTRIC FILING

It is important that you understand and remember the following basic safety tips for electric filing. By doing so, you will ensure that your client has a good experience and that you produce beautiful results!

- Keep the bit parallel to the nail.
- Angle the client's hand and the handpiece.
- Compensate for pressure with speed. If you feel that you need to press harder, increase the speed of the machine and reduce the pressure you apply to the nail.
- Lift the bit frequently when filing to avoid causing heat buildup. Do not use bits in a heavy-handed or aggressive way.
- Keep the bit straight up (90-degree angle) and down when shortening the free edge to avoid skipping, which can cause the product to weaken and breakdown. Skipping occurs when the bit loses contact with the nail and skips or jumps across the nail because of a lack of control of the file.
- Keep a good grip and adjust your speed if this happens. Turn the client's hand, along with the bit, to file around the sidewalls and cuticle area.
- Keep your long hair tied back or put it up so that that it is not caught in the handpiece.
- Wear a dust mask during filing to avoid inhaling dust particles.
- Receive the proper education before using any machine or product.
- Wear eye protection when filing to avoid dust particles from getting into the eyes.
- Avoid repetitive motions that cause pain, swelling, or injury to the wrist, elbow, shoulder, arms, or back.

■ CONTINUING EDUCATION

A true nail professional will recognize the value of seeking advanced training on correctly and safely operating an electric file before using one on a client. An electric file is a safe tool in the hands of a skilled and knowledgeable professional.

Continuing education is valuable to every nail profession at all skill levels. Electric file training and certification is available in many locations, as well as through private, hands-on training from seasoned professionals. Remember to practice proper cleaning and disinfection at all times, keep a blank in the handpiece when it is not in use, and always use electric files safely. You will find that electric filing will enhance your work as well as save you time and money.



CAUTION:

Remember that electric filing should never hurt or injure the client; the tool should not cause nail plate damage. If it does, reevaluate the way you are using the electric file and seek additional instruction. Never use an electric file on the natural nail until you have received advanced education.

Procedure 15-1

Disinfecting Metal File Bits

A. Cleaning and Disinfecting

Remember that all bits are not disinfectable. Paper sanding bands and ceramic and porous bits are single-use-only.

- 1** It is important to wear gloves while performing this procedure to prevent possible contamination of the bits by your hands and to protect your hands from the powerful chemicals in the disinfectant solution.



- 2** Remove any nail enhancement debris from the bit with a clean, disinfected nail brush by brushing aggressively. If needed, soak the bit in acetone to soften any hardened monomer and polymer or soakable UV gel enhancement product or use a stiff or wire brush to remove residue. Keep in mind that the continued use of a wire brush can dull the finish of your bits. Brush clean and rinse all bits with warm running water and then thoroughly wash them with soap, the nail brush, and warm water. Brush grooved bits, if necessary.



- 3** Rinse away all traces of soap with warm water. The presence of soap in most disinfectants can cause them to become less effective. Soap is most easily rinsed off in warm, but not hot, water. Hotter water will not work any better. Dry bits thoroughly with a clean or disposable towel or allow to air dry on a clean towel. Your bits are now properly cleaned and ready to be disinfected.



- 4** It is extremely important that your bits be completely clean before placing them in the disinfectant solution. If they are not, your disinfectant may become contaminated and rendered ineffective. Immerse cleansed bits in an appropriate disinfection container holding an EPA-registered disinfectant for the required time (usually 10 minutes). Be sure to totally submerge the entire bit, including the shanks. If it is cloudy, the solution has been contaminated and must be replaced. Make sure to avoid skin contact with all disinfectants by using tongs or by wearing rubber gloves.

**5**

Remove bits, avoiding skin contact, and rinse and dry tools thoroughly.

**6**

Store disinfected bits in a clean, dry container until needed.

7

Remove gloves and thoroughly wash your hands with liquid soap, rinse, and store bits dry with a clean fabric or disposable towel.

Did You Know?

Acetone is not an EPA-recognized disinfectant. It can be used to remove any remaining soakable enhancement product and debris from a bit before washing and disinfecting but should not be used as a disinfectant.

LO13

■ Review Questions

1. What types of electric files are most often used by nail professionals?
2. Can a craft or hobby tool be used on the nails?
3. Define RPM.
4. Define torque.
5. Define tolerance.
6. Define variable speed.
7. Why should bits be concentric?
8. What size shank cannot be used in professional electric files?
9. Which types of bits have grits?
10. How are carbide bits different from bits with grits?
11. What bits are one use only?
12. Describe the practice technique for the cuticle area.
13. What causes clients to feel excessive heat when nails are being filed?
14. How do you clean and disinfect metal file bits?