

EST 2

30 June 2016

**Esthetician – All Trades
Tools and Equipment**

This booklet has been created by the Esthetician community of Saskatchewan. It is intended for educational use; it is not for resale or profit, and can be copied without cost. Please forward any suggestions to: electriceelinc@yahoo.ca

Special thanks to Madison Owens-Lemire and Nove Salon & Esthetics Wholesale.

Table of Contents

Objective One	9
Pushing Tools and Picks	9
Material Removing Tools	11
Buffers and Files	13
Tweezers.....	14
Applicators.....	15
Objective One Self-Test.....	16
Objective One Self-Test Answers	17
Objective Two	18
Electric Files	18
Motor	21
Hand Piece	22
Foot pedal.....	22
Power Supply	22
Maintenance.....	23
Bit Materials	23
Arbor bands	24
Diamond.....	25
Carbide	25

Chamois Buffing Wheel	26
Sapphire.....	26
Silicon Carbide.....	26
Synthetic Rubber	26
Bit Shapes	27
Ball Shape	27
Barrel Shape	27
Bullet Shape	28
Cone-shaped Bits.....	28
Discs	28
Football Shape	28
French Fill.....	29
Maintenance Bits	29
Micro-oval	29
Needle.....	29
Pedicure	30
.....	30
Polishing Cone.....	30
Prepper	30
Sciver.....	31

Under-the-nail Cleaner.....	31
Filing Techniques	31
Power Equipment	33
Objective Two Self-Test	39
Objective Two Self-Test Answers	41
Objective Three	42
General Health Concerns	42
Fatigue and Injuries	42
Blood Circulation	43
Sitting Positions.....	43
Workplace Design.....	43
Task Design.....	43
Chairs.....	44
Objective Three Self-Test	47
Objective Three Self-Test Answers.....	48
Objective four.....	49
The Neutral Sitting Position	49
The Forward Sloping Chair	50
Manual Tasks.....	51
Workstations.....	52

Task Design.....	52
Good Sitting Body Position.....	54
Things to Avoid.....	55
Objective Four Self-Test.....	56
Objective Four Self-Test Answers	57
Module Summary Self-Test.....	58
Module Summary Self-Test Answers	60

Tools and Equipment

Rationale

Why is it important to learn this skill?

A competent tradesperson must know the proper names of their tools, the proper use, and also the proper care of their tools. Of course, the most important tool is the body itself.

Outcome

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

Describe common hand tools, power tools, and equipment used in the esthetician trade.

Objectives

1. Describe common hand tools in the esthetician trade.
2. Describe common power tools and power equipment in the esthetician trade.
3. Describe working safely in a sitting position.
4. Describe common sitting positions.

Introduction

The interplay between tradespeople and their tools and their environments is fascinating. Each individual favours certain tools and certain techniques. Despite these peculiarities, certain themes are common to all tradespeople. This module will introduce apprentices to the common 'tools of the trade.'

Objective One

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

Describe common hand tools in the esthetician trade.

Pushing Tools and Picks



Name: ingrown nail file.

Purpose: file the underside of sidewalls until smooth.

Notes: always file with a pulling motion, never a pushing motion.



Name: cuticle pusher with curette.

Purpose: push back eponychium and remove cuticle.

Notes: the curved end is called the 'curette.'



Name: metal spatula.

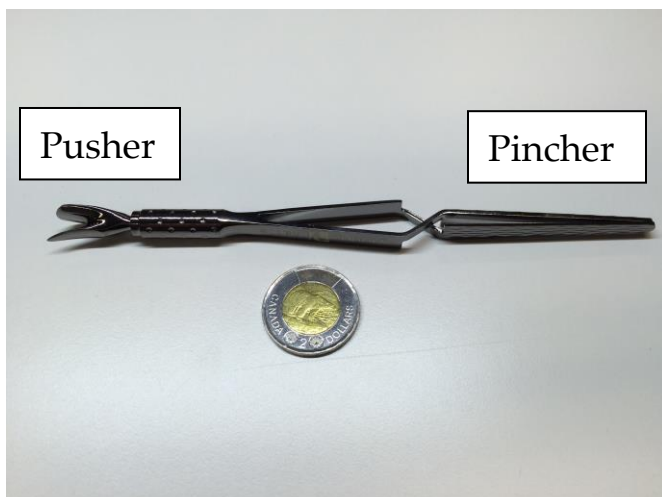
Purpose: remove products from containers to avoid contamination, and mix products.



Name: oragewood or birch wood stick.

Purpose: mix products, clean under nails, clean sidewalls, push back eponychium.

Special care: single use tool.



Name: magic wand.

Purpose: clean sidewalls with pointed tip, push back eponychium and remove cuticle, pinch gel or acrylic enhancements to create a greater c-curve in nails.

Notes: mostly used for competitions

Material Removing Tools

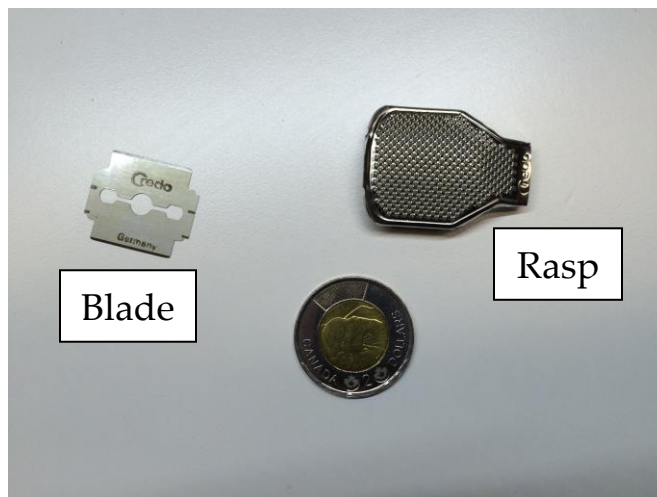


Name: credo blade.

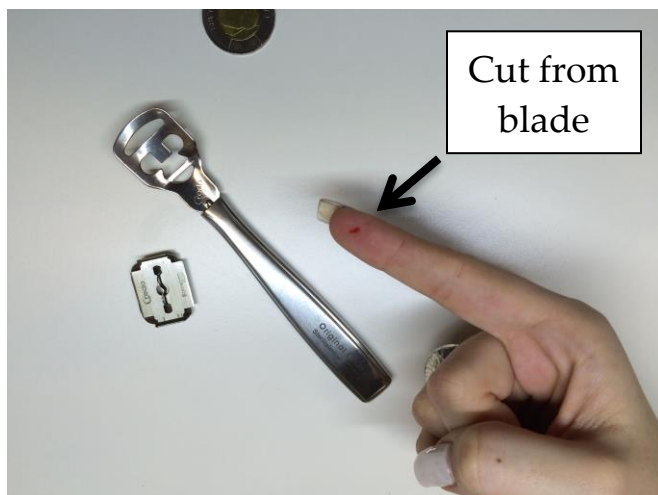
Purpose: removing callous.

Special care: blade must be disposed of in a sharps container.

Notes: all pieces combine make a credo tool.



Notes: the rasp and blade cannot be attached to the handle at the same time.





Name: nippers.

Purpose: remove hangnails, similar pieces of semi-detached skin, and cuticle.

Special care: never cut live tissue.



Name: stainless steel foot file with disposable grit pads.

Purpose: reducing callus.

Notes: this file has replaceable grit pads that are removed after each client. The handle can be disinfected.



Name: nail clippers.

Purpose: shorten natural nails.



Name: fine craft scissors.

Purpose: customize forms, tips, brow hair, etc.

Special care: not for live tissue.

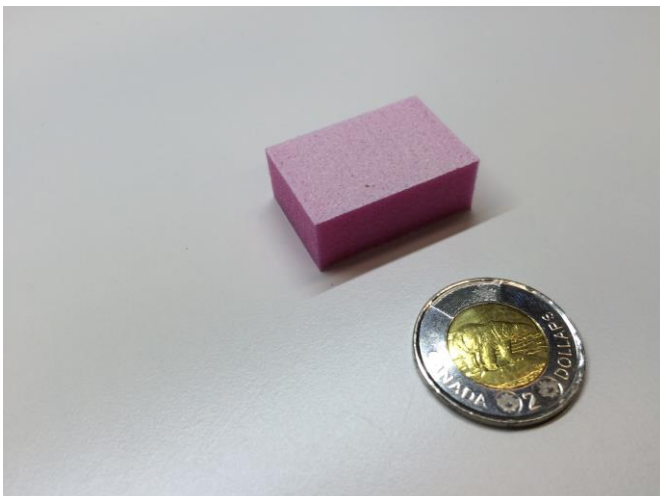
Notes: not for hangnails and the like.



Name: single use buffer.

Purpose: smoothen nails after filing, remove cuticle.

Notes: files commonly 80 – 240 grit, but as high as 5,000 grit. Buffers commonly 180-400 grit.



Same as above.



Name: files.

Purpose: shorten and shape nails.

Notes: 'Disinfectable' files with foam core usually 80-120 grit, top tool is paper file 180 grit, bottom tool is emery board likely rougher than 80. An emery board has no cushion, and is very coarse.

Tweezers



Name: tweezers.

Purpose: removing hair, applying artificial eyelash extensions.



Name: curved tweezers.

Purpose: applying artificial eyelash extensions.



Name: crane tweezers.

Purpose: applying artificial eyelash extensions.



Name: straight tweezers.

Purpose: removing hair and applying artificial eyelash extensions.

Applicators



Name: wax stick, wooden spatula

Purpose: disperse materials such as wax and lotions.

Special care: single use tool.

Objective One Self-Test

1) Which single-use tool can be used to clean under nails?

2) Which tool comes with blade and rasp attachments?

3) Files commonly come in grits ranging from _____ to _____, and buffers commonly come in grits ranging from _____ to _____.

4) Which tools are used to shape forms, tips, and brow hair, but are not for trimming hangnails?

5) Which tools are used to remove hair and apply artificial eyelash extensions?

6) Which tool is used to remove hangnails, similar pieces of semi-detached skin, and cuticle?

Objective One Self-Test Answers

- 1) An orange or birch wood stick.
- 2) A credo tool.
- 3) Files: 80 to 240 grit, buffers: 180 to 400 grit.
- 4) Fine craft scissors.
- 5) Tweezers.
- 6) Nippers.

Objective Two

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

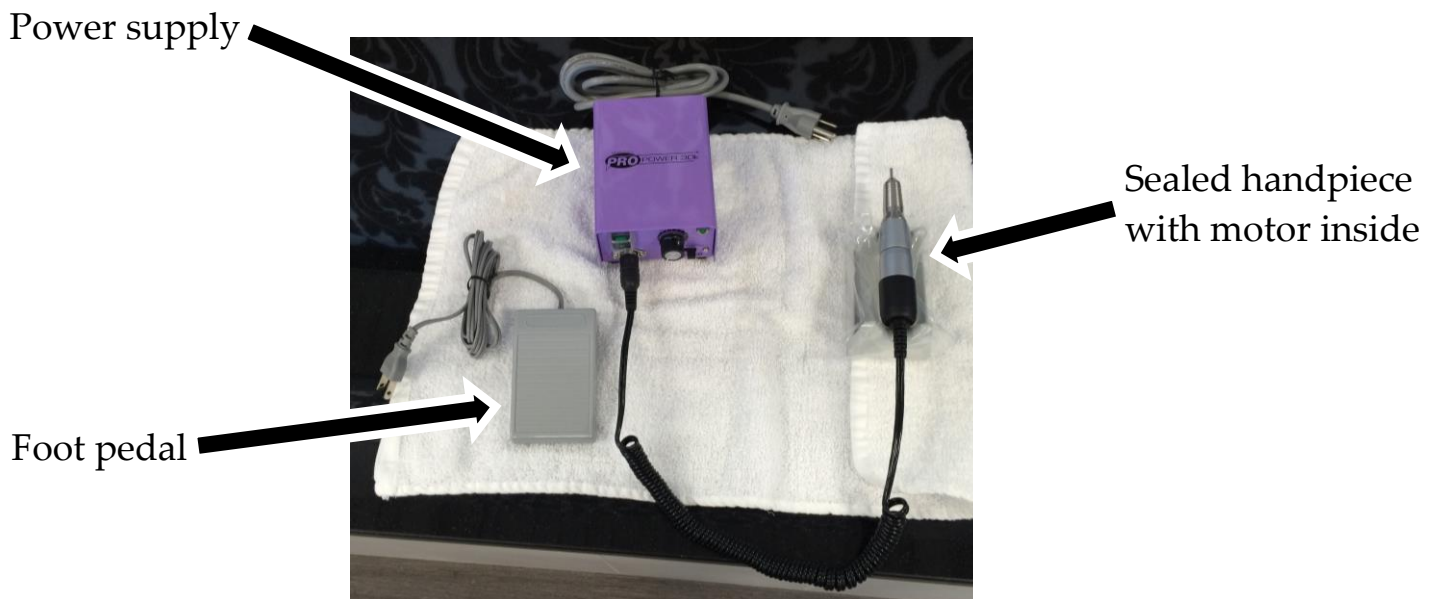
Describe and use common power tools and power equipment in the esthetician trade.

Electric Files

When compared to manual filing, electric files provide several advantages. A service can be completed in less time when an electric file is used, strain and fatigue can be reduced, and the possibility of repetitive injuries can be decreased. An apprentice must be competent with the use of hand tools before switching to power tools. Only electric files produced for the esthetics industry should be purchased. Non-esthetics files may vibrate excessively or perform poorly due to operational limitations. Electric files are commonly referred to as 'micromotor machines.'

Electric files can propel many particulates into the air while operating. Proper breathing and eye protection are required for both the apprentice and the client while electric files are operating. These files can spread particulates throughout a work area. Proper clean-up procedures are needed to remediate the dust.

Most electric files have four main components: a motor, a hand piece, a foot pedal, and a power supply. Most units have a power supply that rests on a work surface. The power supply is cord-connected to the hand piece. The motor is located in the hand piece.



Front view of power supply



Rear view of power supply





Rear view of power supply
with fuse removed



Rear view of power supply
with foot pedal inserted

Front view of power supply



Speed control

Connection to
handpiece

On / off switch

Forward / reverse
control

Information plate indicating that the motor operates on 12V DC. A transformer is located inside the power supply to change the voltage from 120V AC to 12V DC



Sealed handpiece
with motor inside

Motor

Most motors are designed to run clockwise and counterclockwise. These directions are indicated as 'forward' and 'reverse'. When changing direction, make sure that the motor has completely stopped spinning before operating it in the opposite direction. The rotational speed of a motor is describes as revolutions per minute (rpm). A motor spinning at 20 rpm will rotate 20 times each minute. A motor spinning at 400 rpm will rotate 400 times per minute. Electric files commonly range between 0 and 30, 000 rpms. Apprentices often set their electric files between 0 and 20, 000 rpm. Not all electric files can rotate at a speed slow enough to prepare a natural nail without damaging it.

Motors have torque ratings. Torque is a twisting force that causes rotation. In simple terms, torque causes a drill bit to rotate when the bit is grinding material. When a drill is grinding resistive material, it may slow down as its torque is opposed. When a drill slows down, it draws more electric current to increase its torque and speed. If a drill draws too much current, the motor may overheat and become damaged. A drill should never be burdened with excessive opposition.

Hand Piece

A hand piece should have a sealed casing to prevent dust from entering the motor enclosure. Dust and debris can wreck the motor. The chuck is located at the end of the hand piece. The chuck holds the shank of the drill bit. Most hand pieces have 'keyless' chucks (no tool is needed to change bits). The standard shank of an esthetician's bit is 3/32 of an inch. Some electric files include a collet which is a cylindrical spacer that allows the chuck to accept different sized shanks. The shank of a bit must fit snugly inside the chuck. When the chuck is tightened around the shank, it must tighten equally from all sides. This will ensure that the bit will not wobble when it spins.

Foot pedal

A foot pedal allows the motor to rotate at variable speeds without stopping operation or touching a component with the hands. This reduces risks of cross-contamination. The foot pedal plugs into the power supply. Depressing the foot pedal to various positions adjusts the speed of the motor.

Power Supply

The power supply plugs into a standard 120 V receptacle. It contains controls, a transformer that changes the voltage from 120 V to a lower voltage such as 12 VDC, and other features such as fuses.

Some electric files can be battery-operated. These units are ideal for estheticians who travel to deliver services to clients at various locations. Batteries commonly last between 2 to 6 hours. Battery life can be extended by following the manufacturer's recommendations regarding charging and discharging. Batteries have a lifespan rated in years: they will only last so long; in addition, batteries have a lifespan rated in

discharge and recharge cycles. They can only be discharged and recharged so many times before they lose their effectiveness. Always store and use the batteries within the suggested temperature range. Subjecting a battery to temperatures above and/or below their normal range can shorten their lifespan.

Some electric files have their power source located in the hand piece. These hand pieces are larger, heavier, and harder to maneuver.

Maintenance

When an electric file is purchased, it will contain paperwork that outlines the maintenance of the unit. Be sure to read and follow the maintenance schedule. If a drill is used regularly for long periods, maintenance may have to be performed more often than suggested; on the other hand, if an electric file is used infrequently, maintenance may not be performed at longer intervals. Bearings may require lubrication and eventually replacement. Clean the outside of the components daily, and store with a cover over top, or in a place where dust will not gather. Never blow air into the components. If dust and/or debris have gathered inside a component, vacuum the component. Blowing air into a component may drive dust and/or debris deeper into the component. Check cords and connections regularly. Lifespan of an electric file is also determined by quality of construction and materials. A higher quality unit will likely last longer. Research potential models before making a purchase; make sure that the model matches needs and budget.

Bit Materials

Bits can be made of a variety of materials including: diamond, carbide metal, ceramic, sapphire, sandpaper, rubber, and leather. The selection of a bit depends on several factors. Before selecting a bit, consider the following: is the bit a single- or multi-use implement? What material will the bit encounter? Does the bit shape match the application? How many rpms will the bit rotate? Carefully match the bit for the material and conditions.

Arbor bands

Arbor bands are also referred to as sanding bands or sandpaper sleeves. Arbor bands are inexpensive abrasive sleeves that slide over a special drill bit called a mandrel. The bands can be quickly and easily exchanged which makes them ideal for one-time use. The bands can be made from different materials including silicon carbide and aluminum oxide. They come in various grits (see the table below). A grit may be considered fine or medium depending on the type of abrasive material and the job being performed.

Fine	Medium	Coarse
240 -120	150 - 80	80 - 60

Arbor bands cannot be sanitized; therefore, they are single-use tools. Mandrels can be disinfected, so they are multi-use tools.



Diamond

Diamond bits are constructed by bonding naturally occurring or artificial diamond pieces to a steel base. The bonding agent is carefully selected to match the application of the bit, and wear at the same rate as the diamond particles. The size of the particles determines the grit of the bit. Smaller particles are used for fine bits, larger particles are used for coarser bits. The quality of the bit is determined by the consistency of the particles. A high quality bit has particles of consistent size, spaced consistently, and will file in a uniform, predictable manner. Lower quality bits may file in a non-uniform manner and leave scratches.



Diamond bits can be sanitized, disinfected, and sterilized. Make sure to thoroughly dry bits before storage. This will prevent rusting. These bits can be used on natural nail, callus, and artificial materials in both forward and reverse.

Carbide

Carbide metal bits are actually made from tungsten carbide and titanium carbide. Carbide stays sharper longer than steel, although it is more brittle. Carbide bits can be made entirely of carbide or have a steel core with a carbide coating. Grooves are carved into the face of the carbide bit, acting like blades that shave the work surface instead of grinding it. Grooves can be carved at various depths, spacing, and patterns. The depths, spacing, and patterns determine which materials they can cut, and if the bits operate in only one direction or two. Dual-direction bits are sometimes referred to as 'cross-cut' bits. A carbide bit with deep grooves spaced widely apart is a coarse grit, while a bit with shallow grooves spaced closely together is a fine grit. Because carbide bits shave the work surface instead of grinding it, less pressure is



required. Reduced pressure results in less dust, friction, and heat. Carbide bits are not for use on natural nails.

Chamois Buffing Wheel

The chamois buffing wheel is usually made from natural chamois, soft leather, or cotton. These types of bits are also referred to as buffer bits or high-shine bits. When combined with a buffing cream, these bits can create a high shine on natural nails. High-shine bits are one-use-only bits, as they cannot be effectively disinfected.



Sapphire

Sapphire drill bits have an appearance similar to those made of diamond, and the two are made of similar materials. Sapphire drill bits can be used to remove large amounts of material such as thick toenails and callused skin.

Silicon Carbide

Silicon carbide bits are also referred to as carborundum bits. They can be used for preparing natural nails and cuticle work. These bits are similar in appearance to diamond bits, and they come in different shapes, grades, and grits; as well, the abrasive material can be bonded with different agents, giving each type unique qualities. Silicon carbide bits are commonly used for polishing metals and glass engraving. Silicon carbide is very hard wearing, functions well under high temperature, and is an extremely tough material found in grinding wheels and cutting

Synthetic Rubber

Synthetic rubber natural nail bits come in three different grits which are represented by colours: yellow = fine, green = medium, and black = coarse. These bits are designed for buffing jewelry, and the yellow bit is too fine for work on nails. The green and black bits can be used to remove cuticle and polish the natural nail plate. Synthetic rubber

bits are barrel-shaped, but come with either rounded or flat tips. These bits can be reshaped by running them against a hand file at low speed.

Bit Shapes

Many drill bit shapes are available. Each drill bit can be designed with many considerations: task, ideal tip shape, shaft length, maximum rpm, and material to be removed. Before performing a task, select the most effective bit according to the previously mentioned considerations. Drill bits are designed to be perfectly centred in the chuck of the electric file. A drill bit that is bent or not centred will file unevenly and can cause physical harm the electric file, the apprentice, and / or the client. The tops of bits are designed to not be sharp. Check each new bit. If there are jagged or sharp edges that may cut a person, 'season' the bit by dulling the edges with a file.

Ball Shape

The ball shape can be used for detailing and precision work close to the cuticle line.



Barrel Shape

The barrel is the most common bit used in salons. It can be used to shorten the free edge, bevel the free edge, and remove material from the nail plate. Barrel bits come in various diameters, materials, and lengths.

Improper use of a barrel bit at the cuticle area can produce 'rings of fire' which are grooves carved into the nail caused by filing at an incorrect angle.

The tapered barrel bit is an adaption of the barrel bit. The tapered barrel is usually shorter than a standard barrel; in addition, it is cone-



shaped with a flat top. This bit can be used to prepare the nail at the cuticle areas for a fill and shape the nail plate.

Bullet Shape

The bullet bit is slender and small. It can have a tip that is either round or flat. This bit can be used to prepare the natural nail at the cuticle area.

Cone-shaped Bits

Cone-shaped bits come in different lengths, tapers, and diameters; in addition, they can have various shaped tips. Cones with larger diameters and rounded tips are often used for callus removal. Cones with smaller diameters and pointed tips can be used on all parts of the nail. They are fine enough to be used at the cuticle. These bits are appropriate for removing material during most tasks, at most stages.

The cuticle safety bit is a shorter cone-shaped bit with a rounded tip designed for safely working in close proximity to the cuticle. These bits can be used for underneath the nail, material removal, enhancement shaping, and beveling artificial material flush with the natural nail.

Discs

The free edge disc is often used to shorten natural nails and shape the free. Natural nail discs can have diamond or sapphire surfaces that are used to shorten and shape the free edge. The outer edge of the disc is made of metal or plastic. This edge prevents the bit from skipping off the nail and cutting the client.

Football Shape

The football shaped bit is often used around the cuticle line and under the nail. This bit is effective for working underneath long nails because of its elliptical shape and pointed tip.



French Fill

The French fill bit is a short, diamond-shaped bit. This bit is designed to use sideways, removing material with its sharp, v-shaped circumference. As the name implies, it is used during a French fill to create new smile lines. These bits come in several sizes and are only made from diamonds.



Maintenance Bits

Maintenance bits are very short barrel-shaped bits used to perform maintenance. They are also referred to as backfill bits. Maintenance bits can remove the growth at the smile line and replace white tip powder. These bits come in two sizes: small (which is 1/4 the length of a barrel bit) and medium (which is 1/2 the length of a barrel bit). Maintenance bits can be shaped like inverted cones with flat tips. These can provide more precision for cutting. Small and inverted maintenance bits can cut new smile lines, while medium bits can shorten the free edge.

Micro-oval

Micro oval bits are very small and shaped like an elongated football with a pointed tip. These diamond bits can be used for cleaning underneath the nail, working in tight spaces, cuticle care, corn removal, and drilling holes in enhancements.

Needle

Needle bits are only as wide as the bit shaft and come in many tip shapes, ranging from balls, to points, barrels, and cones. These bits can be used anywhere on the nail, and are ideal for design work and nail art.



Pedicure

Pedicure bits are also called 'callus removal bits' and are cone/ bullet-shaped and made of diamond or sapphire material. Because they are used for removing large amounts of material (callus and skin), they include flutes or holes that carry debris away from the bit surface. Pedicure bits often come with longer shanks, and the ones with a round tip can be used along the sides of toenails. These bits are used on a slow or medium speed in one direction only.



This pedicure bit consists of two parts: a mandrel and a disposable abrasive sleeve



This pedicure bit is made of diamond

Polishing Cone

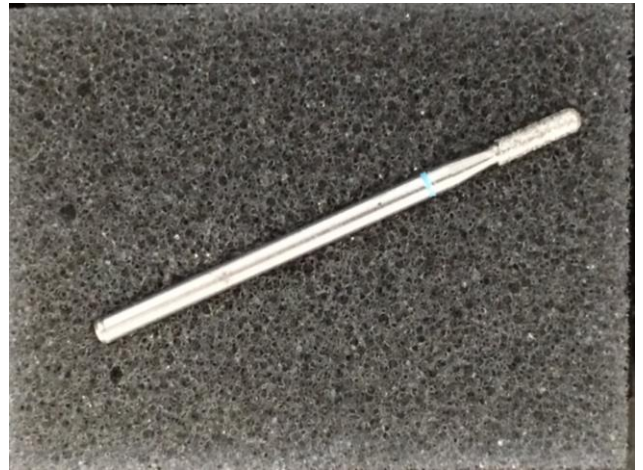
Polishing cone bits are made from silicone. They have rounded tips and can be used to clean pterygium, and smoothen, buff, and prepare natural nails.

Prepper

Prepper bits are smaller, cone-shaped bits with flat tops. They are made of diamond and come in various grits. Fine grit prepper bits can be used on natural nails, while all prepper bits can be used to shape and refine enhancements.

Sciver

A sciver bit is a diamond bit that can come in various shapes. Despite the shape, all sciver bits are very small, the size of the shank or smaller in diameter. They can be use for many purposes.



Under-the-nail Cleaner

The under-the-nail cleaner bit (UNC) is a small, pointed bit. The grooves are cut into the shank of the bit itself, so the abrasive section is no wider than the shank. The UNC bit has a pointed tip. As the name implies, the bit is ideal for tight spaces such as under the nail. This bit can be used to remove materials at the sidewalls as well.

Filing Techniques

When electric filing, consider the following:

What is the appropriate pressure for the material and the rpm?

Does the shape of the bit match the task?

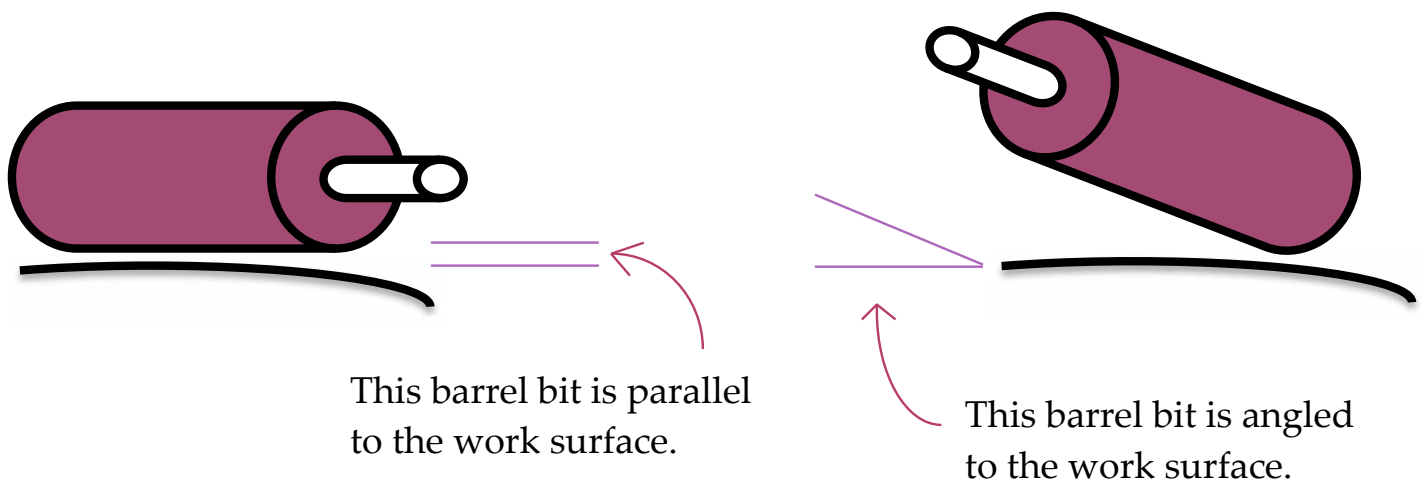
What is the best angle between the bit and the work surface?

How is smooth control maintained throughout all movements?

Does the rpm match the bit and the material?

Smooth control can be maintained by using the pinkie finger or ring finger of the hand that holds the electric file. This finger can be placed on the client's hand, acting as a brace. This finger is also referred to as a fulcrum.

When electric filing, continually monitor the angle between the bit and the work surface. The angle will change depending on how the material is to be removed.



If a large amount of material is to be removed, positioning the bit parallel to the work surface will maximize surface area and decrease the time needed. A bit may be angled to the work surface if a small amount of material is to be removed or the work surface is very small. Some bits have straight edges—whether parallel or tapered—and it is easy to see the angle between the bit and the work surface. For other bits, their sides are curved and the angle between the bit and the work surface will change depending on which section of the bit is touching the work surface. Always look straight-on at the bit to accurately see its angle in relation to the work surface.

When a bit is pressed hard against a work surface, heat is generated. Avoid constantly pressing a bit firmly against a nail. Periodically removing the bit from the work surface will allow both to cool. If too little pressure is applied, it will take longer than necessary to remove the material. Pressure will be different for each bit and the task it is performing.

Rpm will vary depending on the bit material, the work surface material, and the task. In general, use slower speeds in critical areas like near the cuticle; use higher speeds when large amounts of material are to be removed and little risk of over-filing is present.

Power Equipment



Name: light emitting diode (LED) light unit.

Purpose: curing LED gels and LED polish.

Notes: LED lights last longer and cure faster than UV lights. LED lamps are typically not replaceable.



Name: 9 Watt ultraviolet (UV) light unit. 'student light'

Purpose: cures UV gels and UV polish.

Notes: UV light units have replaceable lamps. Replace when light output diminishes, usually every 3-6 months.



Name: hot towel cabinet.

Purpose: warms towels.

Special care: must be sanitized and disinfected.





Name: dust vent.

Purpose: removes dust particles from the air while filing.

Notes: often called a 'valentino.'





Name: paraffin warmer.

Purpose: melts paraffin from solid to liquid.



Hardened paraffin.



Name: hot stone warmer.

Purpose: warms stones to a comfortable temperature.

Special care: stones must be sanitized and disinfected as per the procedure for surfaces.



The next four photos are of wax warmers.

Purpose: heats wax for easy application.

Notes: wax warmers often come with two pots, so two different types of wax can be used simultaneously.





Name: roll-on wax warmer.

Purpose: heats wax in individual wax cartridges for easy application.

Notes: only one cartridge can be used per client. Although convenient, this tool is expensive to operate for many different clients.

Objective Two Self-Test

1) Which power tool is reduce the time required to remove material such as natural nail and gel?

2) Which two types of lamps are commonly used in the Esthetician Trade?

3) What is the 'special care' note for a hot towel cabinet?

4) Which drill bit component is single-use?

5) Why do wax warmers often come with two pots?

6) Which bit has grooves carved into its face, acting like blades that shave the work surface.

7) What can a synthetic rubber bit be used for?

8) Which bit is short, diamond-shaped, and designed to use sideways?

9) Which bits are ideal for design work and nail art?

10) What is the name of the device that holds the shank of a drill bit?

11) What are two advantages of a foot pedal for an electric file?

12) How should debris be removed from inside an electric file?

Objective Two Self-Test Answers

- 1) An electric nail file.
- 2) UV and LED.
- 3) It must be sanitized and disinfected.
- 4) The arbor bands.
- 5) So two different types of wax can be used simultaneously.
- 6) A carbide bit.
- 7) Removing cuticle and polishing the natural nail plate.
- 8) The French fill bit.
- 9) Needle bits.
- 10) The chuck.
- 11) The rpm of the motor can be adjusted without stopping operation, and the possibility of cross-contamination is reduced.
- 12) Debris should be removed with a vacuum.

Objective Three

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

Describe working safely in a sitting position.

General Health Concerns

Sitting for long periods of time is a serious occupational health and safety problem that can cause injuries. Workers who sit for long periods of time are prone to injuries such as varicose veins, numbness in the legs, and stiff necks.

Physical activity in the workplace has been largely replaced by prolonged sitting. Workers who sit during employment have difficulty reaching a healthy daily minimum of activity. Common health problems suffered by stationary employees are disorders in blood circulation and injuries affecting the ability to move. Problems common among stationary workers include: decreased fitness, reduced heart and lung proficiency, and digestive issues.

Fatigue and Injuries

The muscles of the body are working while sitting; sitting requires muscles to hold the neck, shoulders, and trunk. A fixed working position squeezes the blood vessels in the muscles, thereby reducing the blood supply to the working muscles. An under-supplied muscle is prone to injury, cramping, and straining when suddenly stretched. A lack of blood flow to the muscles can also accelerate fatigue. This is why workers who sit all day doing little physical activity often feel tired after work.

A stationary, sitting occupation can contribute to injuries in the muscles, bones, tendons, and ligaments. The steady, localized tension on certain regions of the body such as the neck and lower back can also cause injuries. Prolonged sitting causes fatigue in the back and neck muscles by slowing the blood supply to these areas. In addition, tension is added to the spine, especially in the lower back and neck. Extended periods of sitting also cause compression of the spinal discs. Compression hinders nutrition to the area, and can contribute to premature disc degeneration.

Blood Circulation

The body requires less blood circulation when inactive; as a result, heart activity and the blood flow slow down. Circulation is further reduced when a worker maintains a steady upright body position.

Blood can pool in the legs when a lack of physical activity slows the circulation from the legs back to the heart. If a worker's seat is too high, the pressure exerted on the underside of the thighs can further accentuate blood pooling. Numb legs and varicose veins can be the result.

Sitting Positions

Every joint such as the hips, knees, and elbows, has a range of motion within which every healthy person can find comfortable positions. A healthy sitting position allows for proper breathing, circulation, muscle movements, and the normal functioning of internal organs. The best sitting position is a series of natural positions that a worker can move through. Positions should be changed frequently. Shifting positions can reduce the risk of injury.

Workplace Design

Sitting positions should not be restricted by the work station, task design, or workplace design. Workplace design refers to the interplay of tasks, workstations, and chairs. A healthy workplace design enables employees to work in comfort and safety while allowing them to change their working posture.

Task Design

Task design is a critical component of workplace design. First, consider the tasks that the worker will perform. The tasks may involve close visual inspection, hand manipulation, foot tasks, or a combination. A workstation will be designed differently for each type of task.

Visual tasks place tension on the neck, trunk, and pelvis. The workstation must reduce the strain on the neck. Strain can be reduced by positioning the task higher and within

a comfortable range of sight. Strain can be reduced by shortening shifts or the time spent on each task.

The movement and the forces involved with manual tasks affect body position. Wrist and arm support can reduce strain during light, manipulating tasks. For heavier tasks, arrange the work surface below the worker's elbow height. The position of the work station should allow the worker to hold the spine vertically while exerting force. Lifting and transferring loads horizontally should not be done.

Chairs

Chairs should be fully adjustable to match the worker's body dimensions, the workstation, and the tasks performed. Height should be adjustable, along with tilt, backrest height and angle, and armrests. It is important to be able to adjust the chair while sitting. The chair should match the task. A worker should be able to work with a chair for a trial period before deciding on whether to keep it or not.



The angle of both the base and backrest of this chair are adjustable.

Controls can be operated while sitting.



One control changes the height, and the other changes the tilt of the base.

The angle and height of the backrest are adjustable.



These stools are height-adjustable.

The backrest of a chair should be shaped to support the back, the front edge should be curved downwards, the fabric should be breathable and non-slip, the base must be stable (with 5 legs), and the chair should include armrests when practical. If the chair has wheels, they should suit the flooring. Rubber wheels are best for smooth floors and plastic wheels are best for carpet. Wheels should lock if needed. If a mat is used under the chair, make sure that it is big enough to fit all the legs of the chair. The seat of the chair should be about 25 to 35 cm below the work surface.

Objective Three Self-Test

1) Identify four general health concerns for workers who sit for long periods:

2) Why is the muscle of a stationary worker prone to injury?

3) What can cause blood to pool in the legs of a sitting worker?

4) What is the best sitting position?

5) How should a work surface be arranged (in relation to elbow height) when heavier tasks are performed?

6) Identify four components of a good chair:

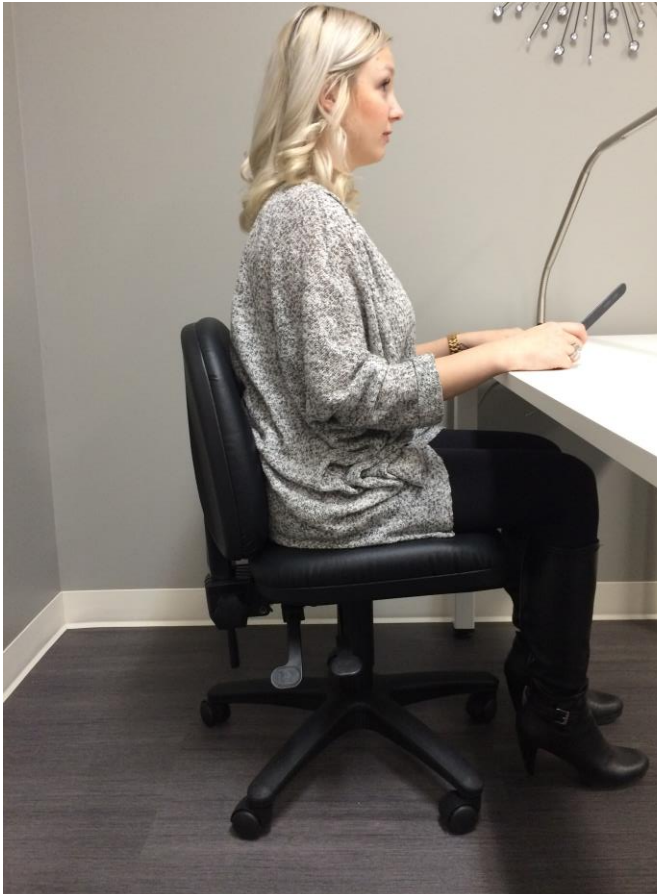
Objective Three Self-Test Answers

- 1) Varicose veins, numbness in the legs, stiff necks, disorders in blood circulation, decreased fitness, reduced heart and lung proficiency, and digestive issues.
- 2) Stationary muscles lack blood flow and oxygen. When the muscle is exercised it is prone to injury, cramping, and straining when suddenly stretched.
- 3) General inactivity and if a worker's seat is too high, the pressure exerted on the underside of the thighs can cause blood to pool.
- 4) The best sitting position is a series of natural positions that a worker can move through.
- 5) The work surface should be below the worker's elbow height.
- 6) Height, tilt, backrest height and angle, and armrests should be adjustable while sitting in the chair. The front edge should be curved downwards, the fabric should be breathable and non-slip, the wheels should suit the flooring and be lockable.

Objective four

When you have completed this objective, you will be able to:
Describe common sitting positions.

The Neutral Sitting Position



The neutral sitting position distributes the pressure exerted by gravity on the body. This position causes the least amount of strain on ligaments, muscles, and tendons.

- Hands, wrists, and forearms are straight and roughly parallel to the floor.
- Erect or upright spine.
- Arms hang naturally from the shoulder.
- Elbows are bent between 90 to 120 degrees.
- Feet are flat on the floor.
- The back is fully supported.
- Thighs and hips are supported by a well-padded seat which is approximately parallel to the floor.
- Knees are about the same height as the hips.
- Feet are slightly ahead of knees.
- The upper torso isn't twisted.

The Forward Sloping Chair



Advantages of the forward sloping chair:

- Permits an increased number of possible seating positions.
- Spine alignment is healthy.
- Improves visual distance and angle to the task on a worktable.
- Head position is improved.
- Return blood flow from the lower legs is improved.
- Pressure on internal organs is reduced.

Disadvantages:

- Transfers weight to legs and may cause fatigue.
- Clothing may ride up legs.

Note: the angle of the chair should not be more than 10 degrees. If the chair tilts more than 10 degrees, the worker may slide off the chair, and excessive pressure may be put on the legs.

Manual Tasks



Seated manual tasks should be designed to keep the spine vertical and avoid stress on the shoulders.

- Place materials at or slightly below elbow height.
- Use arm rests if practical.
- Avoid heavy hand tools.
- Avoid tasks that require the shoulder or arms to be higher than 15 cm above the work surface.
- Avoid excessive leaning and reaching.

This client's footrest can be adjusted so the feet can be elevated or lowered to a level that is comfortable for the esthetician.



This bed can be adjusted. During a pedicure, the client's toes will be elevated to a level that is comfortable for the esthetician.

Workstations

A workstation should allow a worker to sit in a neutral position with the spine aligned whether sitting or standing. The spine should be able to move freely, and the workstation should be adjustable to adapt to changing tasks. A workstation that is too high can prevent the proper use of a chair's lumbar support. The spine can be overstretched, resulting in back injury. The head may tilt forward too much, causing neck pain and injury.



Task Design

Tasks should be designed to allow workers to frequently alter positions. A well-designed task allows the spine to move. Overreaching can be harmful, and should be reduced by keeping all materials and tools at the working level and nearby. Tools and materials should be within easy reach, and heavy objects should not be moved while sitting. Avoid static positions. The vertical alignment of the head and spine should be maintained by arranging tools, materials, and work surfaces at a comfortable height and angle.



General lighting should be augmented by task lighting. The type and quality of light should offer good colour rendition and not create glare. Lights that produce a good colour rendition will show colours 'as they are.'

These workstations come equipped with task lighting, while general lighting is provided by lights located in the ceiling.

Good Sitting Body Position



No single sitting position is recommended for every worker, for every task. In general, the following tips can help. Keep the:

- Joints (elbows, knees, hips) open slightly more than 90 degrees.
- Knee joints at or below the hip joint, ankle joints in front of the knee.
- Feet flat on the floor, or flat on a foot rest.
- Upper body vertical or within 30 degrees of vertical.
- Lumbar support located at the lower back region.
- Head aligned with the spine.
- Upper arms between vertical and 20 degrees forward.
- Elbows between 90 and 120 degrees.
- Forearms between horizontal and 20 degrees above horizontal.
- Wrists straight with the forearms.
- Shoulders low and relaxed.
- Elbows tucked into the sides.
- Chin tucked in and body not bending forward when looking down and forward.

In addition:

- Support forearms when practical.
- Keep a small gap between the back of the knees and the edge of the chair.
- Place the working object so it can be viewed at 10 to 30 degrees below the line of sight.
- Avoid bending to the side and forward.
- Do not slouch.
- Alternate crossed legs.

Things to Avoid



- Tilting the head forward. Helps prevent neck injury.
- Sitting without lumbar support. Helps prevent back pain.
- Working with arms raised. Helps prevent neck and shoulder pain.
- Bending wrists. Helps prevent muscle cramps.
- Working with unsupported forearms (if practical). Helps prevent shoulder and back pain.

This chair is too high. The feet cannot rest flatly on the floor, resulting in knee pain and pressure on the thighs. Blood flow to the legs will be reduced, causing swelling in the legs, varicose veins, and swelling in the ankles. Pressure is also put on the sciatic nerve, causing pain and discomfort. This position prevents the proper use of the lumbar support.



This chair is too low. Blood circulation to the lower legs can be restricted and legs can swell. Pressure is put on the internal organs. Excessive pressure is put on the buttocks, causing discomfort.

Objective Four Self-Test

1) Which sitting position best distributes the pressure exerted by gravity on the body?

2) True / false. The forward sloping chair permits a larger number of changes in body position.

3) Identify three qualities of a good workstation:

4) Identify two qualities of good lighting:

5) Considering a good sitting position, how should the forearms and wrists be positioned?

6) What causes pressure to be put on the sciatic nerve?

Objective Four Self-Test Answers

- 1) The neutral sitting position.
- 2) True.
- 3) Allows worker to sit in a neutral position with the spine aligned whether sitting or standing. The workstation should be adjustable to adapt to changing tasks.
- 4) The type and quality of light should offer good colour rendition and not create glare.
- 5) Wrists should be straight with the forearms.
- 6) When a seat is too high.

Module Summary Self-Test

1) Which multi-use tool can be used to remove products from containers to avoid contamination, and mix products?

2) Which multi-use tool has replaceable grit pads and can be used to reduce callus?

3) Which lamp is manufactured with replaceable bulbs?

4) What is the 'special care' note for a hot stone warmer?

5) Sitting for long periods can cause steady, localized tension on which areas of the body?

6) What can compression of the spine cause?

7) Considering visual tasks, how can strain on the neck be reduced?

8) How can a worker be sure that a chair is suitable for their body and tasks?

9) Considering task design, how is overreaching reduced?

10) What is the maximum angle that a chair should be tilted when working in the forward sloping position?

11) Considering a good general sitting position how far should joints be open?

12) Identify three problems that can occur if a chair is too low:

Module Summary Self-Test Answers

- 1) Metal spatula.
- 2) Stainless steel foot file.
- 3) A UV lamp.
- 4) Stones must be sanitized and disinfected as per the procedure for surfaces.
- 5) The neck and lower back.
- 6) Compression hinders nutrition to the area, and can contribute to premature disc degeneration.
- 7) Position the task higher and within a comfortable range of sight, shorten shifts or the time spent on each task.
- 8) The chair should be used for a trial period.
- 9) Keeping all materials and tools at the working level and close by.
- 10) Ten degrees.
- 11) Joints should be generally open more than 90 degrees.
- 12) Blood circulation to the lower legs can be restricted, legs can swell, pressure is put on the internal organs, and excessive pressure is put on the buttocks, causing discomfort.