3M ESPE

Sof-Lex™

Finishing and Polishing Systems

Technical Product Profile

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Introduction

Finishing and polishing refers to gross contouring of the restoration to obtain the desired anatomy, and the reduction and smoothing of the roughness and scratches created by finishing instruments. The finishing procedure for composite restorations will usually consist of three to four steps involving a number of instruments.

- Gross reduction where excess restorative material is removed.
- Contouring, which includes the reproduction of the size, shape, grooves and other details of the tooth form. Re-establishing contact with adjacent teeth to a normal and functional form.
- Finishing and polishing establishes an even, well-adapted junction between the tooth surface and the restoration and removes scratches to produce a visually smooth and shiny surface.

A number of methods and tools for finishing and polishing restorations are available to clinicians including: fluted carbide bur; diamond burs; stones; coated abrasive discs and strips; polishing pastes; and soft or hard rubber type cups, points, and wheels impregnated with various abrasives grits.

Proper finishing of restorations is desirable not only for esthetic considerations but also for oral health. The primary goal of finishing is to obtain a restoration which has good contour, occlusion, healthy embrasure forms, and smoothness. Tight margins should blend esthetically into the tooth's natural contours. The polish should be smooth enough to be tolerated well by gingival tissue. It has been proven that rough surfaced restorations can create clinical problems such as plaque retention, gingival irritation, staining, higher wear rates, and recurrent caries. It should look like enamel, and it should maintain its polish in excess of normal return visits for cleaning and check-up appointments. [1,5,6,8]

Several factors can affect the final finish of a restoration: the matrix and fillers within the material, finishing instruments, preparation design, curing, and post cure time. A heavily filled material may require coarser instruments, whereas microfills require a more delicate touch. The finish lines of a preparation are critical to all direct restoratives since forces of mastication and the thermal coefficient of expansion are immediately transferred to the margins. Halogen curing lights must produce at least 475 nm/mm^2 of light output for most photo-initiated composite materials. Chemical cured materials must be accurately timed to complete polymerization. It has been suggested that before finishing the restoration it should be left undisturbed for a minimum of 10 minutes to allow the resin to completely polymerize. This may aid in reducing surface trauma from the finishing process.[2]

Types of Finishing and Polishing Instruments

Diamonds

Finishing diamonds are used to contour, adjust, and smooth composites, or porcelain. These burs have bits of industrial diamond incorporated into their working surfaces. They are manufactured in a variety of shapes and sizes and come in different grits, ranging from 8µ to 50µ. In most cases, they are applied in sequence, starting with a coarser grit and progressing to a finer grit. Diamond burs should always be utilized with water spray and at speeds less than 50,000 rpm. Other polishing instruments, such as rubber polishing instruments or pastes, will usually follow the use of diamonds.

Carbide Burs

Carbide burs are available in a variety of shapes that can be used for contouring and finishing. The most commonly used burs range from 8 to 30 fluted blades, and can be straight or twisted. They work well along the gingival margins because they are kinder to soft tissue as compared to many other contouring instruments.

Stones

Stones are used for contouring and finishing restorations, and where maximum abrasion is needed, such as adjusting the occlusion. They do not leave a glossy finish and it is difficult to achieve refined tooth anatomy.

Rubber Wheels, Cups, and Points

Rubber polishing instruments are used to smooth and/or polish composites. Some of these instruments may be used to a limited extent in placing anatomy. They come in a variety of grits, sizes, shapes and firmness. The abrasives used within these instruments are usually comprised of silicon carbide, aluminum oxide, or diamond. The polisher is molded to a mandrel for slow speed handpieces, and may be reusable after sterilization. The number of uses can vary depending on the wear of the instrument. They are often sold as kits with a variety of shapes and grits since the instruments are not flexible enough to reach all tooth surfaces. It is important not to use heavy pressure when using rubber polishing instruments because it can cause excessive heat. Heat can be deleterious to the restoration as well as to the tooth itself. Caution should also be exercised since most of these products contain latex (potentially causing allergic reactions) and often leave a residue on the surface of the restoration.

Discs

Finishing and polishing discs are used for gross reduction, contouring, finishing, and polishing restorations. Discs have the reputation of providing the highest polish. Most are coated with an aluminum oxide abrasive. They are used in a sequence of grits, starting with a coarser grit disc and finishing with a superfine grit. They work well on anterior restorations, such as the incisal edges and embrasures, and to a limited extent on posterior composites.

Strips

Finishing strips are used to smooth and polish the proximal surfaces of all bonded restorations, direct or indirect. They are available with a metal or plastic backing, and with different abrasives. The metal strips are more effective when contacts are very tight, but must be used with care as they can easily lacerate a patients lips or gingivae. The metal strips are typically used for smoothing porcelain, but can also be used on composite restorations. After use the metal strips can be autoclaved and used again. Plastic strips are primarily used for composites, compomers, resin ionomers, and resin cements. They are a single use item and must be discarded after each use.

Pastes

Aluminum oxide is still the primary abrasive used in most composite polishing pastes. As a general rule, aluminum oxide pastes work best when placed directly on the tooth, proceeded by a polishing instrument moistened with increasing amounts of water. Other pastes are comprised of diamonds as the abrasive and are best used dry. Both pastes are offered in various grits. The type of instrument that actually delivers the paste to the restoration is almost as important as the paste. Felt type instruments, prophy cups, and brushes used as the delivery instrument will all have an effect on how well a paste will polish. Unfortunately, most instruments offered with the pastes are too thick to get into many embrasures, and their shape limits their effectiveness at the gingival margin. They can also be very messy with paste splattering over the patient and clinician.

Nearly all of the above listed instruments fall under the general category of dental burs. However, their shape and grit is designed for specific uses. All burs have three basic parts: the shank, the neck, and the head (Figure 1). The shank can vary to accommodate different handpieces. Burs requiring an attachment to the head (like a finishing disc) are referred to as mandrels.

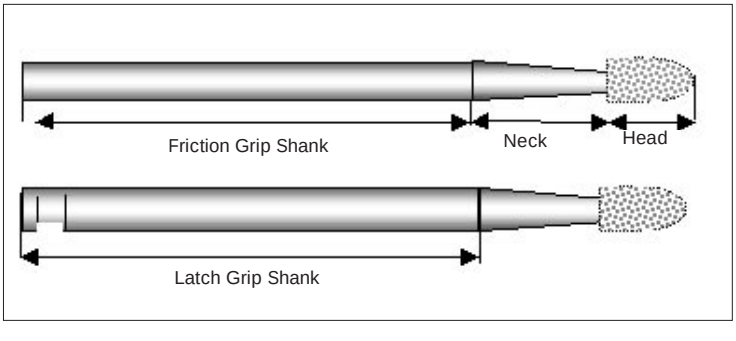


Figure 1. Example of Bur Parts and Styles.

Product Descriptions and Indications for Sof-Lex Finishing and Polishing Systems

Sof-Lex Finishing and Polishing Disc System

The Sof-Lex finishing and polishing discs are easy to use, and are considered the industry leader in producing high luster resin restorations. They are color coded which makes choosing the proper grit sequence logical and convenient. The discs have a small round eyelet that simply snaps onto the mandrel. Changing discs is fast and easy because there is nothing to align. Removal of a disc is accomplished with the flick of a finger. Each disc is reversible, which makes it very versatile for the various surfaces of the teeth.

Sof-Lex Finishing and Polishing Discs

The original Sof-Lex finishing and polishing discs are made from a urethane coated paper that gives the discs their flexibility. The system is comprised of four individual aluminum oxide grits ranging from coarse to superfine. The discs are available in three sizes; 13mm (1/2 inch), 9mm (3/8 inch), and a 16mm (5/8 inch) size with a square brass eyelet.

Sof-Lex XT Finishing and Polishing Discs

The Sof-Lex XT (extra thin) finishing and polishing discs are made with a polyester film which is one third the thickness of the original paper discs. The thinner discs are slightly stiffer and allow more precise refinement of embrasures. These discs also have four individual aluminum oxide grits, ranging from coarse to superfine. They are available in two sizes, 13mm (1/2 inch), or 9mm (3/8 inch).

Table 1. Color table of discs and strips

	Coarse	Medium	Fine	Superfine
Sof-Lex™ Finishing and Polishing Discs	Black	Dark Blue	Blue	Light Blue
Sof-Lex™ XT Finishing and Polishing Discs	Dark Orange	Orange	Light Orange	Yellow
Sof-Lex™ Finishing and Polishing Strips	Beige	White	Gray	Blue

Sof-Lex Finishing and Polishing Disc Mandrels

The Sof-Lex mandrels and disc eyelets have been patented for easy attachment and removal of a disc from the mandrel. There is a choice of three different mandrels to fit a slow speed handpiece, a contra angle latch (RA), friction grip (FG), or straight lab handpiece (HP).

Sof-Lex Finishing Brush

The Sof-Lex finishing brush is made from a thermoplastic polyester elastomer that contains aluminum oxide abrasive particles molded into a shape similar to a prophy brush. The brush itself is detachable from a stainless steel mandrel. The Sof-Lex Finishing Brush is an easy to use, one-step, reusable brush developed for polishing the concave and convex anatomy found on posterior composite restorations. The soft bristles will conform to the restoration as it travels across the surface resulting in a smooth polished finish.

Sof-Lex Finishing Brush Mandrels

The Sof-Lex Brush mandrels are available for slow speed handpieces with a friction grip attachment, or contra angle latch.

Sof-Lex Finishing and Polishing Strips

The design of the Sof-Lex strips allows for easy interproximal finishing. The strips are made of plastic and are coated with an aluminum oxide abrasive. Sof-Lex strips are free of any abrasive coating at their centers for easy interproximal insertion. Each strip contains two different grits; a coarse/medium, or a fine/superfine. They are also color coded similar to the discs. The coarser grit on each strip is a darker color than its opposing side.

Physical Properties

Typically, with finishing and polishing instruments researchers compare the results of various instruments by SEM or profilometer recordings. SEMs are qualitative tests done to reveal the scratches produced on a surface. Profilometer results will give you a quantitative recording of the surface irregularities. Neither of these tests will tell you how glossy or shiny the surface is. 3M ESPE has conducted the following tests to give the clinician a level of confidence when using any of the Sof-Lex products. All of these tests, with the exception of brush sterilization, were conducted internally in 3M ESPE laboratories.

- Profilometer Ra's recordings taken after finishing a surface roughened with a 320 grit sandpaper to simulate the true surface irregularities seen after placing anatomy with burs or diamonds.
- Profilometer Ra's recordings taken after finishing a smooth matrix surface. The test typically is used for most finishing and polishing studies.
- Gloss measurements which assign a number to the reflectance value of a surface. These tests were done following the finishing treatment on a matrix surface and a surface roughened by the 320 grit sandpaper.
- Temperature recording on a composite surface finished with various instruments in order to determine the amount of heat generated with each instrument.
- Sterilization validation tests were conducted to assure the Sof-Lex finishing brush can physically withstand steam sterilization procedures, and to assure sterility after multiple uses.

Gloss

Composite samples of Filtek™ Z250 Universal Restorative were made by filling a mold, placing a mylar matrix over the surfaces, then compressing it to form a smooth uniform surface, and light cured. In Figures 2 and 3, gloss was determined by directing light from a Micro-Tri-Gloss Reflectometer onto the surface of a sample at an 85° angle. The gloss or reflectance values are the average of 10 reflectometer readings. Initial measurements were taken on the matrix surface of composite samples and on composite surfaces that were roughened with a 320 grit sandpaper. All samples were polished with various polishing instruments according to the manufacturer's instructions prior to taking the final gloss measurement.

One-Way ANOVA was used to statistically analyze the data in Figures 2 and 3. Vertical bars depict no significant differences. The highest gloss was achieved on both composite surfaces with the Sof-Lex disc system. The gloss achieved with the Sof-Lex finishing brush was not statistically different from the gloss achieved with the Sof-lex disc system, or Astropol® system on the 320 grit finished composite as seen in Figure 2. The same type of result was achieved with Sof-Lex disc system, and Politip™ finishing and polishing kit on the initial matrix surface as seen in Figure 3.

Figure 2.
Gloss from 320 Grit Finished Surface

Data generated in 3M ESPE laboratories n=5

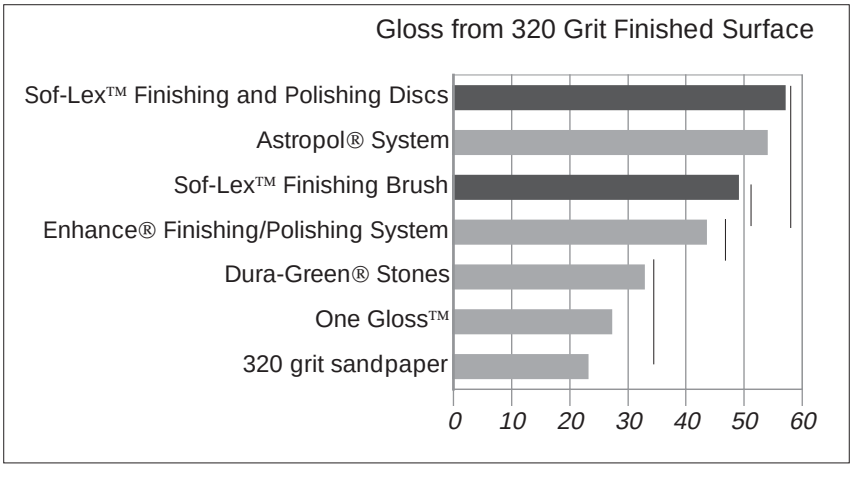
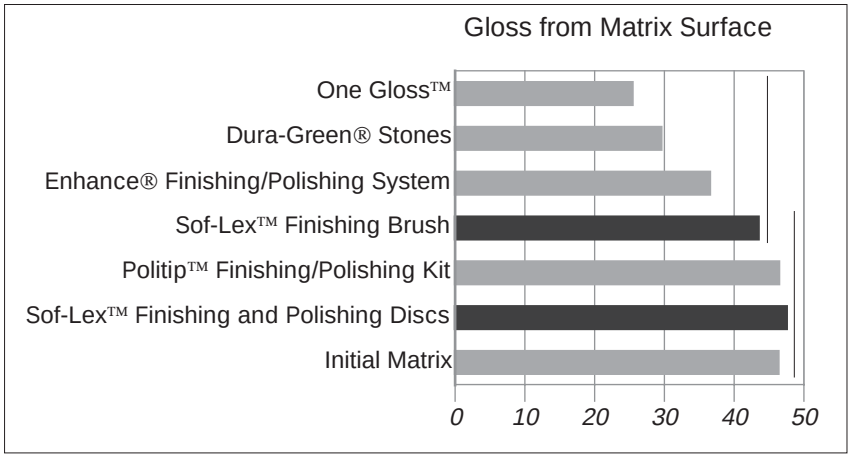


Figure 3.
Gloss from Matrix Surface

Data generated in 3M ESPE laboratories n=5



Surface Roughness

Determination of the surface roughness on a universal composite after using various polishing instruments is displayed in Figures 4 and 5. Filtek Z250 universal restorative composite samples were prepared in molds and cured under a matrix surface. Prior to finishing with the various polishing instruments, the samples were divided in half. One half of the samples were subjected to finishing the surface with a 320 grit abrasive sandpaper, and the other half left with the original matrix surface. Using a Taylor-Hobson Surtronic 3 Profilometer, 5 Ra (surface roughness recordings taken from the average height of a profile above and below a center line) readings per sample were taken and averaged for an initial value. After that, samples were polished according to each manufacturer's instructions and using the same profilometer procedure, readings were recorded.

One-Way Anova was used to statistically analyze the data in Figures 4 and 5. The vertical bars within the graph depict no significant differences. The smoothest surface was achieved on both matrix and 320 grit finished composite surfaces with the use of the Sof-Lex disc system. The average surface roughness achieved with the Sof-Lex finishing brush was not statistically different from the results achieved with the Sof-Lex disc system, or the Politip™ system on the initial matrix surface as seen in figure 4. The same type of result was achieved with the Sof-Lex disc system and Enhance® system on the 320 grit finished composite surface as seen in Figure 5.

Figure 4.
Profilometer from Matrix Surface

Data generated in 3M ESPE laboratories n=5

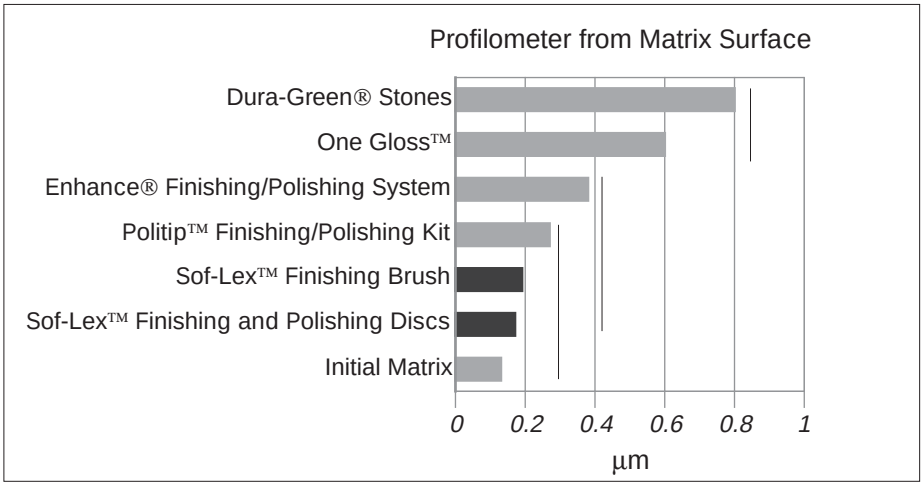
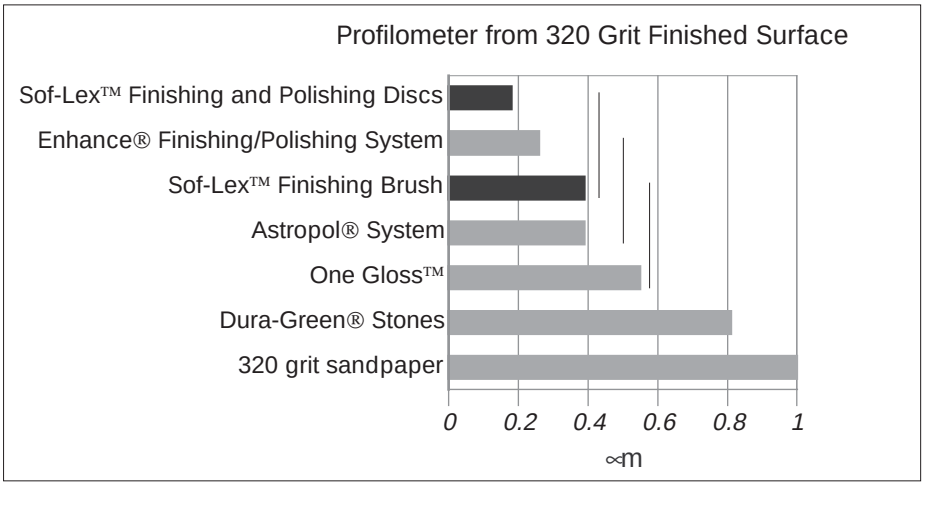


Figure 5.
Profilometer from 320 Grit Finished Surface

Data generated in 3M ESPE laboratories n=5



Figures 6 and 7 show the results of polishing on a 320 grit finished surface on various restorative materials with the Sof-Lex finishing brush. A significant improvement was shown for both the surface gloss and roughness.

Figure 6.
Gloss

Data generated in 3M ESPE laboratories n=5

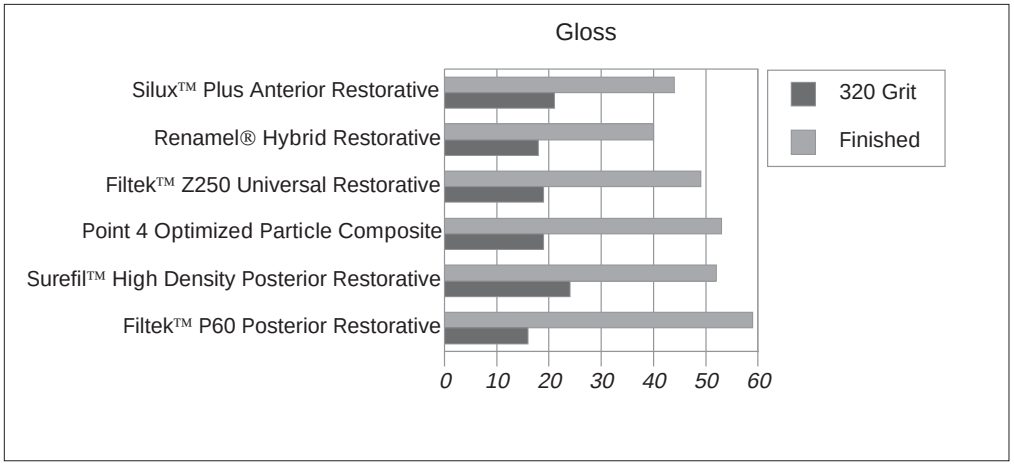
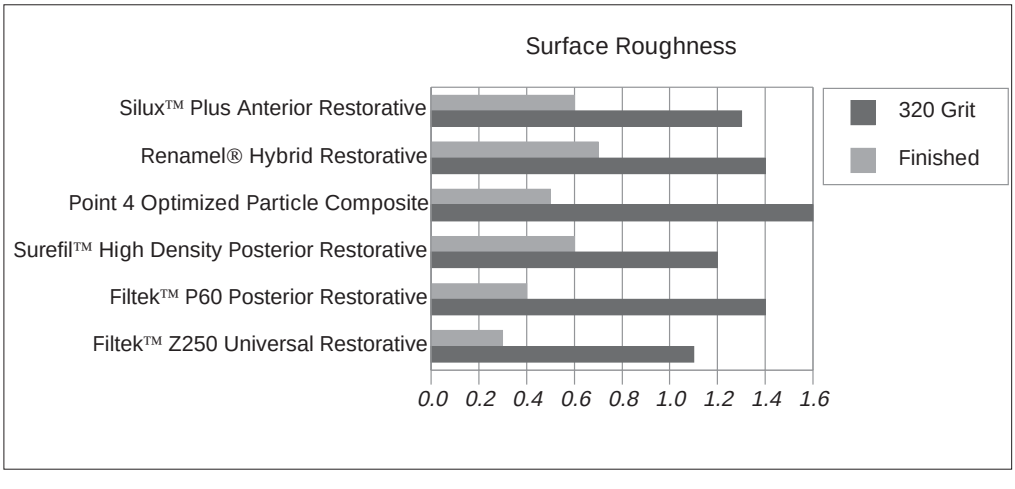


Figure 7.
Surface Roughness

Data generated in 3M ESPE laboratories n=5

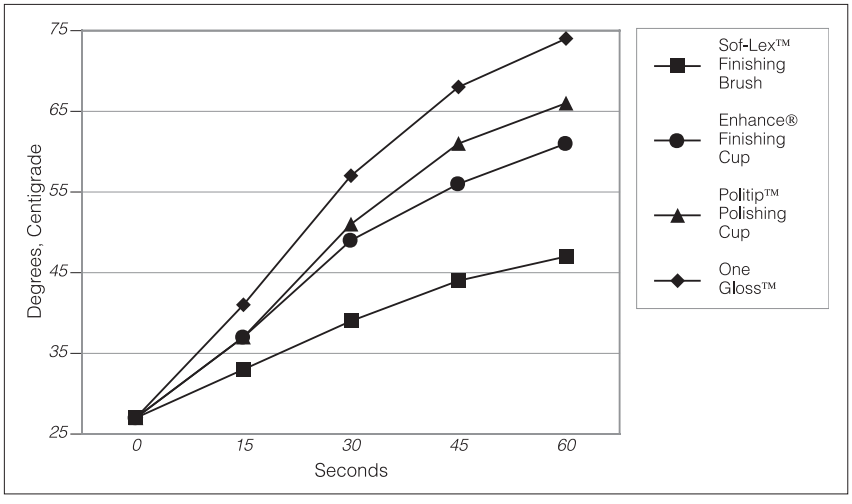


Heat Generation

A test for the amount of heat generated when polishing a composite was done to compare the differences in heat produced with various polishing instruments. Samples of Filtek Z250 universal restorative were molded 20mm long × 8mm wide × 5.5mm deep. In the side of each sample, 2.5mm below the top surface, a slot was cut to facilitate the insertion of a thermocouple. Samples were stored and tested in a constant temperature controlled environment of 27° C. In Figure 8, products tested were the Sof-Lex finishing brush, and three abrasive impregnated molded instruments, Enhance® finishing cups, One Gloss® cup, and Politip™ green cup. Each composite sample was polished using a constant force of 120 grams, and a handpiece speed of 12,000 rpm. Temperature readings were recorded at 15 second intervals up to 1 minute, and repeated 5 times per instrument. Figure 8 shows the average temperature rise of each instrument over a one minute time span. Sof-Lex finishing brush generates less heat compared to other abrasive impregnated molded finishing and polishing instruments.

Figure 8.
Heat generation on composite with abrasive impregnated polishing instruments.

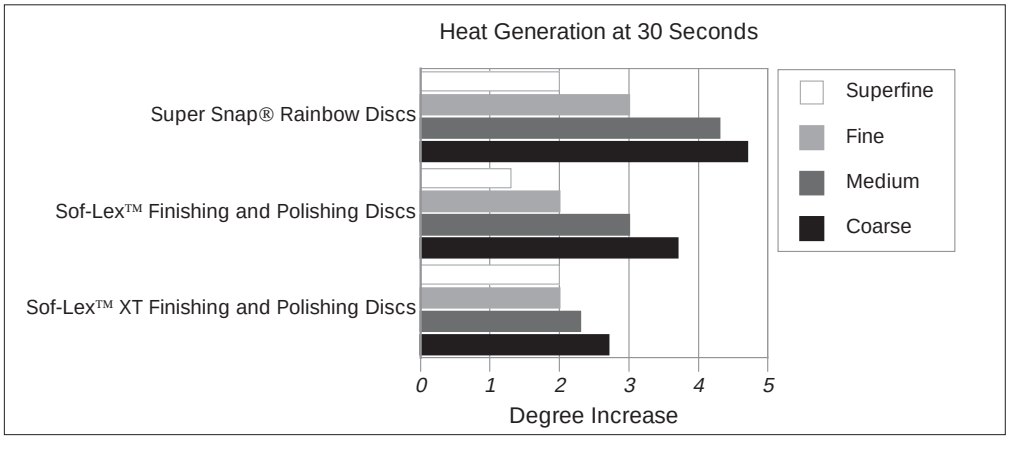
Data generated in 3M ESPE laboratories



Shown in Figure 9, different grits of discs were compared for heat generation at 30 seconds of polishing on a composite. Less heat is generated with Sof-lex discs when compared to a competitive finishing and polishing disc system.

Figure 9.
Heat generation on composite surface with discs.

Data generated in 3M ESPE laboratories



Studies and Evaluations

Sof-Lex Discs - Performance Results on Various Substrates Using Sof-Lex Discs

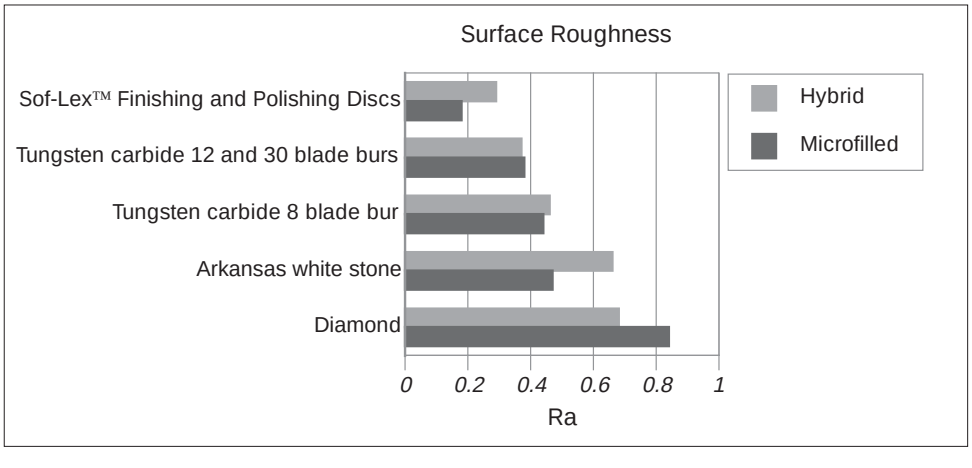
Microfilled and hybrid composites

The Sof-Lex disc system produces the highest reflectance value and the fewest surface irregularities when compared with a polishing point, a polishing paste, diamond burs (used alone and in conjunction with a polishing point), or polishing paste on a microfilled composite.[5]

Sof-Lex discs were the only instruments that managed to polish a hybrid posterior composite to its initial level of smoothness, and a high degree of smoothness to a microfilled anterior composite. In comparison to methods using a white stone, point, and wheel; a green stone, finishing bur, and wheel; and a competitive disc system. Both disc systems had an additional step added in this study where a polishing paste was used after the final disc. The paste used in this project had no significant effect, and in the case of the Sof-Lex specimen, it actually reduced the smoothness.[3]

Berastegui et al, study showed that microfilled composite resins displayed greater roughness than the hybrid composite resins treated with a similar polishing technique except with the use of aluminum-oxide (Sof-Lex) discs (Figure 10). The best results were obtained by removing the excess with 12 and 30 blade tungsten-carbide burs and polishing with aluminum-oxide discs, or 30 blade burs on difficult to access areas such as concave surfaces.[1]

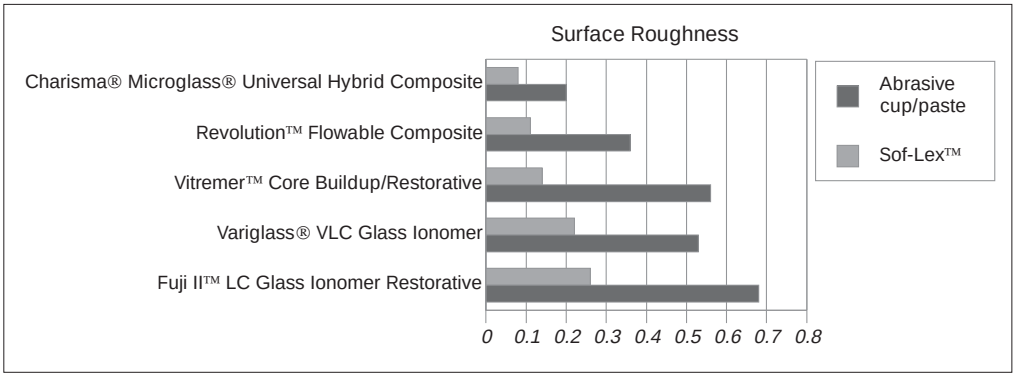
Figure 10.
Surface roughness of a hybrid and microfilled composite.



Hybrid ionomers and composites

In Figure 11, Sof-Lex finishing and polishing discs produced the smoothest surfaces for all materials including a flowable and hybrid composite when compared to Enhance® finishing and polishing system.[6]

Figure 11.
Surface roughness of hybrid ionomers and composites.



Glass ionomer cements

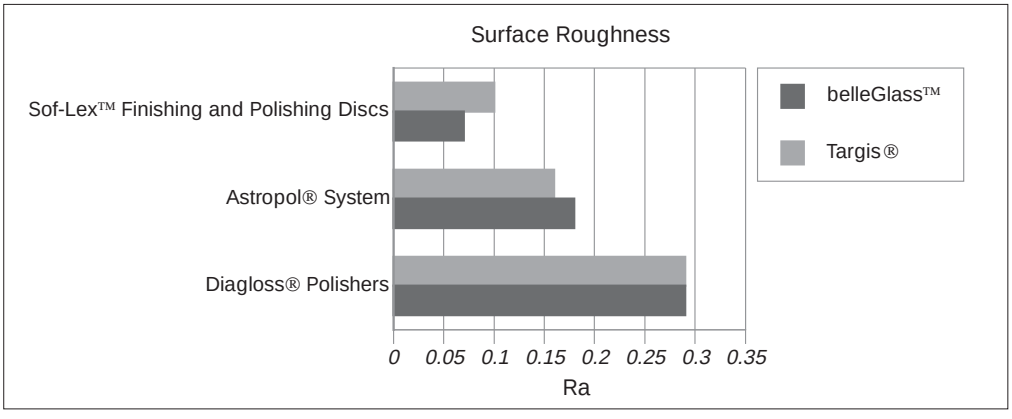
Sof-Lex finishing and polishing discs rotating in a plane parallel to the surface produce the least surface damage Ketac®-Fil anterior Glass Ionomer, Ketac®-Silver Posterior Glass Ionomer, and Chemfil® II Glass Ionomer Restorative when compared with carbide burs, diamond burs, and white abrasive stones. Finishing glass ionomer cement is an exercise in damage limitation. The less finishing performed while the setting reaction is continuing the better the surface results and the longer the restoration will last.[4]

Dental ceramics

The increasing use of ceramic crowns and inlays in posterior teeth has highlighted the clinical difficulties involved in achieving a good surface finish after corrective grinding. When polishing ceramic surfaces that have been adjusted by grinding with diamond burs the Sof-Lex finishing and polishing system produced the smoothest surfaces. Final polishing with a top end diamond paste after using the Sof-Lex finishing and polishing discs did not significantly improve the smoothness of the ceramic surface. Systems used in this study included flour and chalk pumice, felt wheel and diamond paste, a porcelain laminate polishing kit, a gold polishing kit, a rubber disc and diamond paste-containing felt wheel, and polishing points for ceramics.[9]

Surface roughness of two laboratory composites, belleGlass™ Enamel and Targis® 99 were evaluated after use of three different polishing systems. Specimen surfaces were first finished with a diamond finishing bur then polished with one of the three systems. Figure 12 shows the highest polish was attained using the Sof-Lex finishing and polishing discs.[11]

Figure 12.
Surface roughness of two indirect dental laboratory restoratives.



Sof-Lex Finishing Brush

Field Evaluation

In May of 2001, 275 general practitioners who place five or more composites per week were recruited to participate in a field evaluation of the new Sof-Lex Finishing Brush. After using the brush for two weeks, respondents were asked to complete the evaluation form and return it. A total of 224 respondents returned their questionnaire.

The majority of the evaluators used a combination of instruments for finishing and polishing. After the contouring step, 50% of the evaluators will switch instruments in their handpiece at least three times in order to achieve their polishing goal.

Seventy two percent of the total respondent rated the final polish above average. (Figure 13) If they compared the final results of the Sof-Lex finishing brush, to what they were currently using involving multiple steps/instruments by 98% of the evaluators, 85% were able to get the same or better results using only the Sof-Lex Brush in a single step.

Figure 13.
1-5 rating scale of the final polish achieved with Sof-Lex Brush

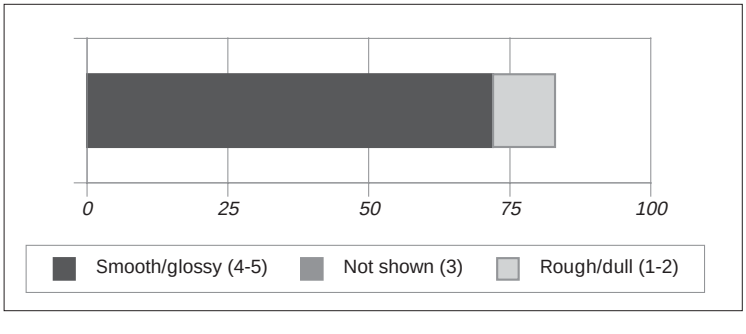
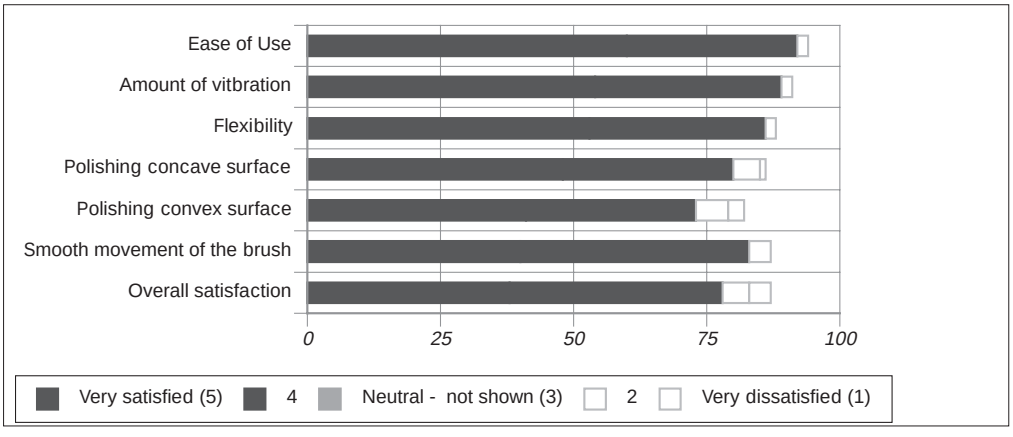


Figure 14 shows the results of performance ratings on various characteristics. The evaluators were asked to rate from “1” very dissatisfied to “5” very satisfied. Overall, the characteristics received satisfactory performance ratings with each of the characteristics being awarded a mean value of no less than four.

Figure 14. Satisfaction rating of the Sof-Lex Finishing Brush on a scale of 1-5.



Sterilization of Sof-Lex Finishing Brush

All too often, health care professionals responsible for the reprocessing of reusable medical devices are frustrated by the lack of adequate cleaning and sterilization instructions from device manufacturers. This is especially true with rotary type dental instruments. Manufacturers of reusable medical devices have the responsibility to support product label claims of reusability by providing instructions for the medical professional.[13]

To validate the reuse of Sof-Lex finishing brushes, testing was done for 3M ESPE by an outside research company. The AAMI (Association for the Advancement of Medical Instrumentation) Technical Information Report No. 24 was used as a guide. The protocol involved inoculation of the brushes after one, three, and five times of use with one of five different bacteria and also one mold. Next, the brushes were cleaned in an ultrasonic cleaner, and processed in a steam autoclave. The brushes were then placed in a culture medium for 7 days. A count of the microbial survivors was conducted at the end of this period.

The dental professional can achieve a sterility assurance level of 10-6 by following the recommendations within the Sof-Lex finishing brush instructions. For example, a probability of microorganism survival of 10-6 means that there is less than or equal to one chance in a million that a particular item is contaminated or nonsterile. It is generally accepted that a sterility assurance level of 10-6 is appropriate for items intended to come into contact with compromised tissue (e.g., tissue that has lost the integrity of the natural body barriers). A sterility assurance level of 10-3 (a one in a thousand chance of surviving microorganism) is considered acceptable for items not intended to come into contact with compromised tissue. Table 2 shows the micro-organisms tested and the results of microbial counts after the sterilization procedure. Even after five uses the tests showed the brush can be successfully sterilized.

Table 2. Testing conducted by Part Three Corporation - Analytical for 3M ESPE

Microorganism	1X Use Count	3X Use Count	5X Use Count
Bacillus stearothermophilus	0	0	0
Mycobacterioum smegmatis	0	0	0
Pseudomonas aeruginosa	0	0	0
Staphylococcus aureus	0	0	0
Salmonnella choleraesuis	0	0	0
Trichophytron metagrophytes (mold)	0	0	0

Instructions for Use

Sof-Lex Finishing and Polishing Disc and Strips

Indications

Finishing and polishing composites, ceramics, and glass ionomer dental restorations.

Precautions for Dental Personnel and Patients

- Wear eye protection when using.
- Use of disc and mandrel at speeds greater than 30,000 rpm could cause disc and mandrel to separate, which may result in injury.
- Always use Sof-Lex discs with a conventional low-speed handpiece.
- Sterilize mandrels using either conventional steam autoclave or liquid sterilant.
- Discs are a one time use only. Discard after using.

Directions for Use

- Place the disc on the mandrel by firmly pushing the eyelet portion onto the mandrel until the disc is secure and does not wobble. The polishing motion should be constant and move from the bulk of the restoration toward the margins. A back and forth movement over the composite/enamel margin is not recommended, as a white line may form.
- Use light pressure when polishing; let the discs do the work.
- To produce a smoother, more uniform finish, keep the tooth, restoration, and disc dry while polishing.
- Avoid touching the composite with the mandrel or disc eyelet because discoloration may occur. This discoloration can be removed by repetition of the finishing steps.
- Skipping a grit size in the finishing sequence may compromise the quality of the restoration’s polish.
- Remove discs from the mandrel either by positioning a thumbnail under the disc eyelet portion and pushing the disc away from the handpiece, or by grasping the disc and eyelet and peeling the disc upward and away from the handpiece.
- It is important to maintain a dry field when using this system. After rinsing, and before proceeding to the next grit sequence, dry the area.

The following procedure produces a quality polish regardless of the Sof-Lex disc system used.

1. Remove excess composite and contour to desired shape using a fine diamond or a 12-fluted carbide bur.

2. For gross reduction, use the Sof-Lex coarse-grit disc at medium speed (10,000 rpm). Rinse and dry.
3. For final contouring, use the Sof-Lex medium-grit disc at medium speed (10,000 rpm) for 15 to 20 seconds. Rinse and dry.
4. To finish, use the Sof-Lex fine-grit disc at high speed (30,000 rpm) for 15 to 20 seconds. Rinse and dry.
5. Polish using the Sof-Lex superfine-grit at high speed (30,000 rpm) for 15 to 20 seconds.
6. Wash away powder or debris from restorative surface.
7. Discard each disc after single use.
8. For interproximal areas insert the abrasive free center of a Sof-Lex coarse/medium grit finishing strip (beige/white) between contact points.
9. Position the beige portion of the strip over the composite surface to be finished, firmly grasp both ends of the strip and draw the abrasive over the composite in a vigorous, back and forth motion. Repeat the procedure using the white portion of the strip. Discard the strip after single use.
10. Repeat steps 8 and 9 with the Sof-Lex fine and superfine strip (gray/blue) using first the gray and then the blue side.

Sof-Lex Finishing Brush

Indications

Finishing and polishing composite restorations.

Precautions for Dental Personnel and Patients

- Wear eye protection when using.
- Do not use brush and mandrel on a high speed handpiece. Speeds greater than 30,000 rpm may cause brush and mandrel to separate, or brush to fragment, resulting in injury.
- Some resistance should be felt when placing brush on mandrel. If fit appears loose, replace brush.
- Mandrel will wear over time. Discard mandrel if brushes persistently feel loose.
- Do not interchange brush or mandrel with other manufacturers' mandrel or polishing instruments.
- Before re-use on another patient, the brush and mandrel must be cleaned in an ultrasonic, then sterilized in a steam autoclave unit.
- Do not use a dry heat sterilizer.
- Brush must be thoroughly dry before reuse.

Directions for Use

1. Contour restoration using diamond or carbide burs.
2. Attach a brush by inserting the end of the mandrel into the opening on the base of the brush. Make sure the brush is firmly seated against the mandrel collar.
3. Insert mandrel shank into a slow speed handpiece. For best results, operate handpiece at speeds below 15,000 rpm. Do not use a high-speed handpiece.
4. Polish composite with Sof-Lex finishing brush. This will be the final step for finishing the exposed surfaces of the restoration.
5. For finishing the interproximal surfaces use Sof-Lex finishing and polishing strips.

Sterilization Procedure

The following procedure will provide a 10^6 sterility assurance level. These sterilization parameters are only valid with sterilization equipment that is properly maintained and calibrated.

Step 1: Ultrasonic
Decontaminate brush and mandrel using an ultrasonic cleaner. Activate the unit for the time recommended by the manufacturer (usually 6 minutes).

After the cleaning cycle is complete, rinse with water and blot dry.

Step 2: Steam autoclave
Temperature and time combinations recommended for wrapped Sof-Lex finishing brushes:

121°C . . . . . .20 minutes
132°C . . . . . .8 minutes

Remove from autoclave and allow to dry completely prior to reuse.

NOTE: Use of a dry-heat sterilizer will destroy Sof-Lex finishing brush.

Use and storage

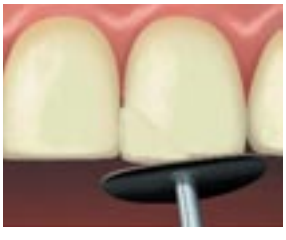
The number of times a brush can be used is variable due to individual practices and procedures. 3M ESPE has determined the lifespan of a single brush is three patient/sterilization procedures. Discard brushes sooner if: 1) bristles have lost half their original length, 2) bristles break off from brush base, and/or 3) if brush becomes loose on mandrel.

Store Sof-Lex finishing brush at 2-28 °C (36-82°F).

No person is authorized to provide any information which deviates from the information provided in these instructions.

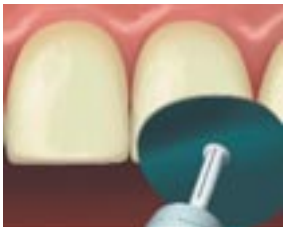
Technique Guide

Simply pop disc onto mandrel with abrasive side up or down. Keep surface and disc dry while finishing.



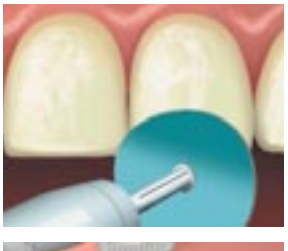
From Front

Start with coarse discs to remove excess restorative material and establish preliminary anatomy. Rinse and dry surface before moving onto medium disc.

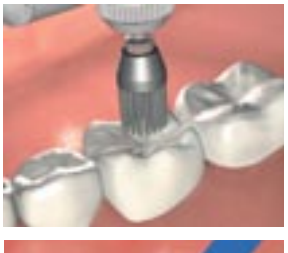


Use medium discs for advanced contouring, establishing marginal ridges and adjusting incisal edges. Rinse and dry before using the fine disc.

Follow with fine disc to further improve finish quality and prepare surface for final polishing.



Conclude polishing with superfine discs for the most durable, smoothest, high gloss finish.



To Back

After contouring posterior composite, polish surface with Sof-Lex finishing brush at low speeds.

To Everywhere in Between

Use Sof-Lex strips for finishing proximal areas by gently inserting the center gapped area between teeth. Operating sequence of strips (coarse/medium, fine/superfine) is the same as discs.

Questions and Answers

When I first used the Sof-Lex finishing brush it lost its original shape.

The speed of the handpiece will alter the shape of the brush as its used. Increasing the speed will result in the bristles pulling together tighter. This will aid you in reaching down into the pit and fissure areas. Running the handpiece at a very slow speed will allow you to force the bristles apart for the buccal/lingual areas. Remember not to use the brush at speeds greater than 30,000 rpm.

Each time I use the brush it becomes more frayed and battered looking, is it still effective?

The bristles on the brush will become worn as its used, however the polishing effects are not lost as the abrasive is distributed throughout the entire brush. You may continue to use it as long as the bristles remain attached to the base and half the length is still intact.

How do you avoid getting a white line margin?

The exact cause of this phenomena is not always known, but there are several theories.

- Restorative material was not properly cured.
- Low output of curing light.
- Restorative preparation had margins with thin knife-edges.
- Running finishing instruments back and forth across tooth and restoration.

After using the Sof-Lex disc system what kind of polishing paste should be used for the final finish?

Studies have shown that using a restorative polishing paste after the superfine Sof-Lex disc will not enhance the final finish, and in some cases will actually reduce the final gloss.[5,6] No additional polishing steps are necessary following the use of the superfine disc.

Why can't I just apply one of those unfilled resin products to create a shiny surface?

Although this is a quick and easy method, glazes traditionally have a very short life. They wear rapidly, and if the underlying restoration is rough, plaque buildup, staining, and poor esthetics will be the result. Surface glazes should be used to repair superficial defects, or to seal margins.[2]

By not using water with Sof-Lex discs or brush couldn't this overheat the area and cause possible damage to the vitality of the tooth?

All the grits of the Sof-Lex discs, and a competitive disc system were used continuously on a composite sample in-vitro for 30 seconds. The average temperature rises were between 2° C. and 3.7° C with the Sof-Lex discs. The finishing and polishing motion when using the discs should be a light brushing of the

disc across the bulk of the restoration toward the margins. Using this technique will virtually eliminate any chance of damaging the vitality of the tooth. See the test results of heat generation of Sof-Lex finishing and polishing discs and finishing brushes under “Properties.” These tests were conducted to compare the heat produced by various instruments, and do not imply the heat generated by the various instruments affect the vitality of a tooth,

Shouldn’t resin modified glass ionomers be wet finished for a smoother finish and to avoid microleakage?

Dry finishing of resin modified glass ionomers with Sof-Lex discs was found to be advantageous. It produced a smooth surface and does not contribute to microleakage, and may produce a stronger restoration. However wet finishing conventional glass ionomers is still recommended to avoid desiccation.[10]

Summary of Sof-Lex Finishing and Polishing System

Disc Features

- Sof-Lex Finishing and Polishing Discs produce an excellent final polish
  - — The standard that most finishing and polishing instruments are compared to.
  - — *Reality* has given it their highest rating, ★★★★★ stars
  - — Sof-Lex discs are listed as a “Classic” in *The Dental Advisor*. [9]
- Patented round eyelet and mandrel
  - — No aligning eyelet to mandrel unlike a square mandrel and eyelet.
  - — Easy to remove disc during procedures to change discs.
  - — Easy to reverse from abrasive side up to abrasive side down or vice versa.
  - — Need less inventory because the abrasive surface can be aligned as needed using same disc.
- Color coded
  - — Sequenced from dark (coarse) to light (superfine).
  - — Discs are black to light blue, or dark orange to yellow.
- Disc are available in three sizes
  - — 3/8 inch, 1/2 inch, or 5/8 inch.
- Choice of thickness and flexibility
  - — Sof-Lex urethane paper backed discs are more flexible than Sof-Lex XT discs which are slightly stiffer, thinner, and made with a polyester film.

- Mandrels are available in 3 choices
  - — Latch - RA
  - — Friction grip - FG
  - — Laboratory – HP

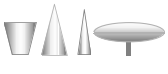
Strip Features

- Abrasive is center gapped
  - — The gap makes it easier to insert interproximally and will not abrade contacts during insertion.
- Four grits
  - — Achieve the same superior polish as discs.
- Two grits per strip
  - — So one strip does two functions and saves time.
- Color coded
  - — Sequenced like the discs, from a darker to lighter shade.
- Flexible polyester backing
  - — Resists tearing, and is gentler to gingiva than metal strips.

Brush Features

- Only one instrument needed for finishing all exposed surfaces of a tooth
  - — Brush is flexible, so it conforms to both concave and convex surfaces.
- Provides a final polishing similar to other multi-step systems with a single step
  - — Surface roughness tests and gloss measurements showed similar results compared to other instruments.
- Mandrel available in two choices.
  - — Friction Grip – FG
  - — Latch – RA
- Generates less heat
  - — Brush generated less heat when compared against rubber impregnated finishing instruments.
- Brush is reusable
  - — Tests show brush is sterilizable and survives sterilization procedure in a steam autoclave.

Comparison of Finishing Kit Contents and Steps

Brand	Grits	Configurations	Additional Items	Varied Pressure Steps
Sof-Lex™ Finishing Brush	*			No
Sof-Lex™ Finishing & Polishing Discs	* * * *			No
One Gloss™	*			Yes
Super Snap™ Rainbow Discs	* * * *			No
Enhance® Finishing & Polishing System	* * *			Yes
Astropol™ System	* * *			Yes

Catalog Numbers

Sof-Lex Finishing and Polishing Systems Introduction Kits

Item #	Units	Product information
2385P	240	Sof-Lex Discs 1/2” and 3/8”
	240	XT Sof-Lex Discs 1/2” and 3/8”
	45	Finishing and Polishing Strips
	1	RA mandrel
1750	30 ea	XT Sof-Lex 1/2” C,M,F,SF
	12	Sof-Lex Finishing Brushes
	1	Sof-Lex Disc Mandrel RA
	2	Sof-Lex Brush Mandrel RA

Sof-Lex 1/2” and 3/8” discs

Item #	Units	Product information
1980*	30ea. asst.	Sof-Lex Discs 1/2” and 3/8”
1981SF	85	Superfine Sof-Lex 3/8”
1981F	85	Fine Sof-Lex 3/8”
1981M	85	Medium Sof-Lex 3/8”
1981C	85	Coarse Sof-Lex 3/8”
1982SF	85	Superfine Sof-Lex 1/2”
1982F	85	Fine Sof-Lex 1/2”
1982M	85	Medium Sof-Lex 1/2”
1982C	85	Coarse Sof-Lex 1/2”

Sof-Lex 5/8” discs - Square Eyelet

Item #	Units	Product information
1958SF	100	Superfine Sof-Lex 5/8”
1958F	100	Fine Sof-Lex 5/8”
1958M	100	Medium Sof-Lex 5/8”
1958C	100	Coarse Sof-Lex 5/8”

Sof-Lex Extra Thin 1/2” and 3/8” discs

Item #	Units	Product information
2380 *	30 ea. asst	XT Sof-Lex Discs 1/2” and 3/8”
2381SF	85	Superfine XT Sof-Lex Discs 3/8”
2381F	85	Fine XT Sof-Lex Discs 3/8”
2381M	85	Medium XT Sof-Lex Discs 3/8”
2381C	85	Coarse XT Sof-Lex Discs 3/8”
2382SF	85	Superfine XT Sof-Lex Discs 1/2”
2382F	85	Fine XT Sof-Lex Discs 1/2”
2382M	85	Medium XT Sof-Lex Discs 1/2”
2382C	85	Coarse XT Sof-Lex Discs 1/2”

* Kit contains one RA mandrel

Sof-Lex Mandrels

Item #	Units	Product information
1983RA	3	RA Disc Mandrel (contra-angle)
1983HP	3	HP Disc Mandrel (straight handpiece)
1983FG	3	FG Disc Mandrel (friction grip)
1755	3	RA Brush Mandrel (contra-angle)
1756	3	FG Brush Mandrel (friction grip)

Sof-Lex Finishing and Polishing Strips

Item #	Units	Product information
1956	120	Fine/Superfine 7” × 5/32”
1954	150	Medium/Coarse 7” × 5/32”
1954N	100	Medium/Coarse-Narrow 7” × 5/64”

Sof-Lex Finishing Brushes

Item #	Units	Product information
1751	24	Sof-Lex Finishing Brushes

Warranty

No person is authorized to provide any information which deviates from the information provided in this instruction sheet.

3M ESPE warrants this product will be free from defects in material and manufacture. 3M ESPE MAKES NO OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining the suitability of the product for user’s application. If this product is defective within the warranty period, your exclusive remedy and 3M ESPE’s sole obligation shall be repair or replacement of the 3M ESPE product.

Limitation of Liability

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