

SS White Express Line High Speed Laboratory Burs Metal Finishing

Traditionally, dental laboratories have been cutting and finishing metal crowns and copings with stones and diamond discs¹, instruments that are not designed for rapid and efficient metal cutting. These instruments tended to cut slowly, generate a lot of heat and bounce or chatter while cutting. S S White, a number of years ago, radically re-designed the standard dental carbide bur. It increased the number of teeth or dentates on the bur and changed the blade geometry to create a very fast and efficient cutting bur. An independent evaluation by a number of dental clinicians reported that the bur was much quicker for removing amalgam and metal restorations, resulted in less vibration and needed a soft touch when cutting.² This new design became the basis of the Express Line of burs.

The Express Line Burs all have a very unique blade configuration. Each bur has a number of small teeth or dentates cut into each long blade. The blade configuration increases speed and efficiency of the bur^{3 4}. The increased number of cutting blades removes smaller amounts of material than a cross-cut bur⁵ which results in a



smoother cutting action with less jarring and vibration. They also create less heat than conventional stones when cutting metal. The smooth cutting action allows for very accurate finishing and polishing of metal copings and frameworks.

There are six burs in the system so that one can remove the sprue, do any necessary gross reduction on the metal coping, create a textured finish and remove any porosities



The system is designed for use with a high speed handpiece with light finger pressure thus minimizing muscle fatigue and pain.

The Express Line burs create a very unique surface that is ideal for bonding porcelain. Their smooth cutting action removes metal rather than folding microscopic flakes on to the newly finished surface. A rough surface with metal flakes will trap gases that under vacuum expand and create bubbles in the opaque layer or inconsistent oxide formation.⁶
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Roughening the metal surface is generally believed to contribute to increased bond strength between metal and porcelain.^{8 9} As the surface roughness increases, the contact angle between the porcelain and the metal is reduced which promotes better adhesion.¹⁰ The Express Line burs create a textured or corrugated finish on the metal coping to enhance the mechanical interlock while ensuring even wettability of the metal surface. This mechanical bond or interlock should play a significant role in bond strength of metal to porcelain^{11 12}.

Cutting metal with dental stones demands the application of constant heavy hand pressure as the stone labours to cut the metal. This not only increases heat but fatigue in the muscles of the hand. Muscles, joints and nerves are not stressed since only light pressure is needed on the high speed handpiece for cutting.

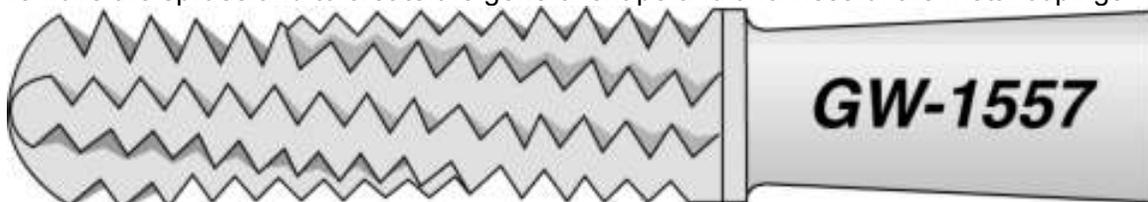
The Express Line Lab Metal Finishing Burs represents a new advancement in cutting and finishing metal. The design is a radical departure from standard carbide bur design and they are more effective than dental stones. The burs are very efficient, smooth running reducing the incidence of hand fatigue and increase productivity.

Reduce the Potential Chance of Hand Pain



The following two cases will illustrate a number of the applications of this system. Metal finishing should always be done with adequate suction and ventilation and with proper eye protection such as safety glasses or a face shield.

In the first case, we utilized the system to trim and finish the metal framework for a porcelain bonded to metal bridge. We started the trimming process with the EL1 bur to remove the sprues and to create the general shape and thickness of the metal copings



(see photo 2).

The EL2 which is a large bud shaped bur was used for gross reduction around the metal collars, pontic connectors and chamfer margins (see photo 3)



With the gross reduction complete the EL3 and EL4 burs are used to place the textured finish on all porcelain bearing areas. The unique blade geometry creates very fine corrugations on the metal surface. The blades ensure that the metal is cut and not folded over on to the surface as can occur with stones. The EL3 bur has a thin cylindrical shape with rounded tip for finishing large surface areas. The EL4 is a cross-cut round bur for finishing chamfered margins, embrasures and other small surfaces



(see photo 4).

We encountered some small pits on the surface of the bridge framework and used the EL5 to refine the metal surface and remove the porosities. The kit contains both a cylindrical bur (EL5) and a round bur (FG7006) for removing pits and porosities (see

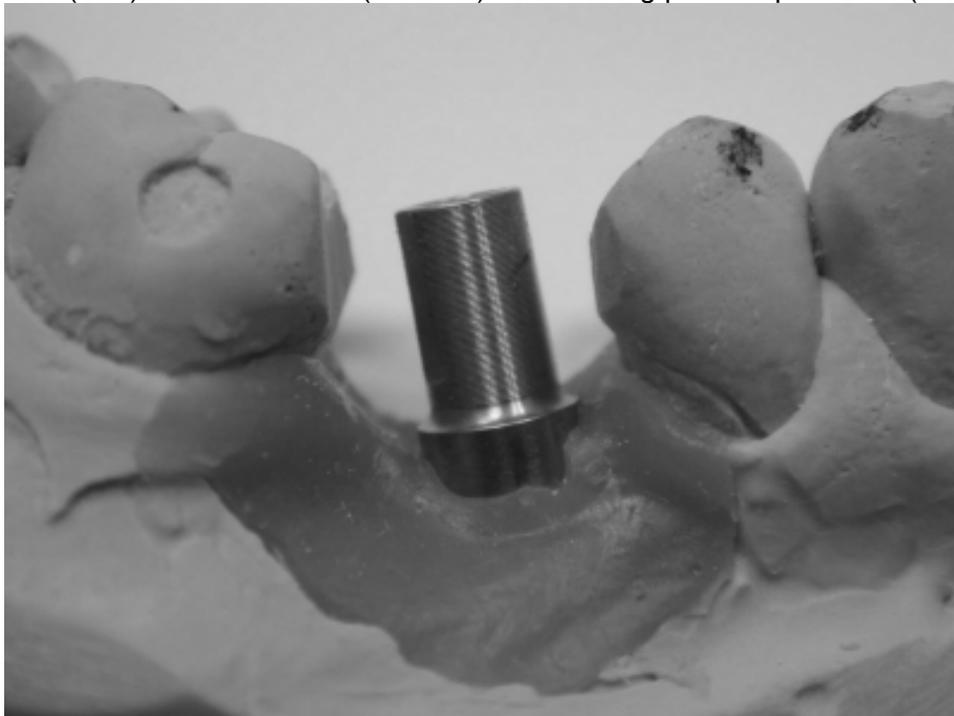


photo 5).

Once the framework is trimmed and finished the porcelain can be applied.

The Express Line can also be used to refine the titanium abutments of implants. In this situation, a 3I abutment was placed to restore a missing molar. The abutment needed

trimming in order to place the crown (see photo 6).

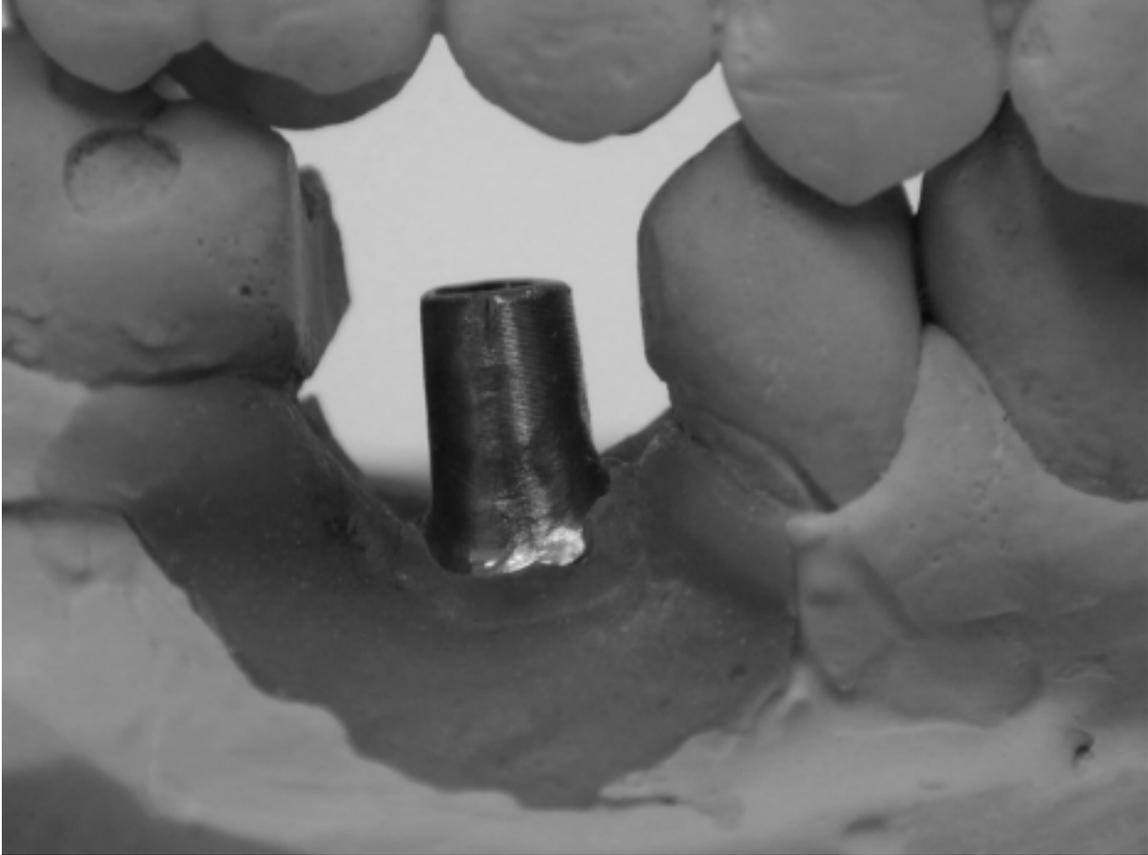


The EL1 was used to trim the abutment walls and create the gingival margins (see photo



7).

The EL2 was used to reduce the occlusal height and prepare the incisal third of the abutment (see photo 8).



The surface was finished with the EL4 bur creating very fine corrugations for increased mechanical retention of the cement. The Express Burs were able quickly and efficiently establish the proper shape and contour of the implant abutment (see photo 9).

Metal finishing is one of the key steps in ensuring an adequate bond between porcelain and metal. For years, laboratories have been using slow, inefficient tools to perform this step. Cutting metal with stones and discs not only wastes time but can weaken the bond with the porcelain. The Express Line Lab Metal Finishing Bur is designed for cutting metals. The unique blade geometry cuts easily through metal with minimal heat and hand strain. It creates a metal surface that is ideal for bonding to porcelain.

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² "Great White # 2" The Dental Advisor, February 1994, Farah, J. W., Powers, J. M., editors

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- ¹² Gavelis, J. R., et. al., "A comparison of the bond strength of two ceramometal systems", J. Prosthet. Dent., 1982, October, Volume 48, # 4, pages 424 – 427