

Corona Handpiece Sales and Repair, Inc.

For all of your handpiece needs!

Major Causes of Handpiece Failure

By Karl Wiese

Dental handpieces have many reasons for failure but the most common that we see as a repair facility can be prevented if proper care and understanding of the instrument is used.

These are:

- 1) Sterilization
- 2) Lack of lubrication or proper lubrication
- 3) Being dropped
- 4) Ran with bent bur or no bur at all
- 5) Excessive air pressure

Handpieces must be purged of any debris prior to sterilization. The debris may become hard or gummy after the sterilization process. This will dramatically affect the bearing performance and consequently the handpiece life.

Bearings are made of an inner race, outer race, retainer and either 7 or 8 solid ball bearings. Each ball is about the size of a pen tip. The bearing balls ride on a grooved surface between the inner and outer raceways. The retainer keeps the balls equally spaced as they rotate around the inner race.

Bearings are ultra high precision and are made to exacting tolerances. The bearing balls can only move horizontally or vertically .0001-.0003 (10 x thinner than a sheet of paper) inside the retainer hole.

With the tight tolerances that are required to achieve the 350,000-400,000 rpm that are needed for the Handpiece to function properly it is easy to see that any small amount of a foreign substance inside the bearing will dramatically affect its ability to perform.

The bearing retainers are made up of high temperature plastic material and are usually Phenolic or Torlon. The retainers hold the bearing balls equally spaced around the inner race. They also are permeated with a light grease to help with continued lubrication.



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When the air pressure exceeds the recommended settings of 32-35 psi, the bearing will turn greater than the 350,000-420,000 rpms that they are rated for. When this happens the ball bearings that are held equally spaced by the retainer will start to oval the retainer holes.

Eventually one hole will meet the next hole and so on until the retainer will break in half for a complete bearing failure.



If heavy side pressure on the handpiece is used it will cause the bearing balls to roll vertically in the retainer. The holes will enlarge causing increased radial play of the bur.

When handpieces are repeatedly over sterilized and or the sterilizer is not temperature calibrated correctly the excessive heat will cause the retainers to crack on top part of the ball hole at the weakest point. This will also cause the bearing to fail.



If a bur is bent and is used it will cause the bearings to run out of concentricity. It is similar to a tire being out of balance. This will also cause the bearing balls to roll vertically leading to failure.

Running without a bur may cause the chuck to back out into the cap.

If a handpiece is dropped, the head may become dented. The dent will put pressure on the o-rings and bearings. If the dent is severe enough the bearings may become squeezed and also lead to premature failure.

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Handpieces must always have a backend gasket and swivel styles must have good pliable o-rings. If a good seal is not made, either air or water will find the path of least resistance and flow where it is not supposed to causing poor performance.

Using the correct handpiece for the job at hand is important. The use of torque style (Large head) handpieces should be used when heavy cutting is needed.

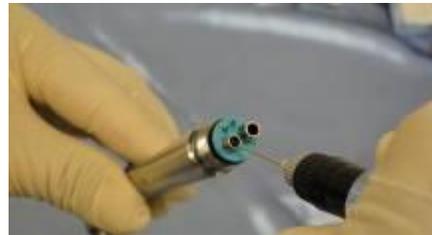
Smaller heads should be used for lighter applications.

It is not recommend to extend the bur due the chance it may walk out of the Handpiece.

Handpieces are precision instruments but will not last forever. They will wear out over time. If proper care and regular maintenance are performed they should provide several years of excellent service.



Insert and Twist Bur



Lubricate Intake Tube



Expel all Lubricant



Clean Excess Lubricant

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