

Dentivera[®] Milling Disc



What is Ultaire™ AKP high-performance polymer?

Ultaire™ AKP is a new high-performance aryl ketone (AKP) polymer. This high-performance polymer is specifically formulated to meet critical performance requirements for dental applications, including removable partial denture frames.

How is Ultaire™ AKP different from acrylic material used for RPDs?

Ultaire™ AKP is not a flexible material, but rather it is a rigid product, suitable as a metal replacement, and provided in a disc form (known as Dentivera™ milling disc) designed for use within a CAD/CAM digital workflow.

How strong is Ultaire™ AKP?

Strength characteristics for Ultaire™ AKP are well above acrylics and acetals that are on the market today. The flexural strength of any material used for RPDs needs to be high enough to withstand loading and not break. At 148 MPa, Ultaire™ AKP has flexural properties that are well above minimum requirements for denture base materials.

How stable is the material?

The properties of Ultaire™ AKP are not expected to change over time under normal conditions if the device is used appropriately and instructions for use are followed.

How resistant is the material to scratches?

Lab and clinical trials have shown that Ultaire™ AKP has a very high resistance to scratches; however, use of sharp tools or scraping of the surface should be avoided.

How sensitive is the material to temperature?

This product is made from a high temperature resin, which can withstand temperatures up to 300°C. No changes in properties are expected from exposure to hot or cold food/drinks.

Will the material burn or melt?

Ultaire™ AKP can withstand temperatures up to 300°C; however, the material will burn if it comes into contact with a direct flame. Avoid any exposure to direct flame or extremely hot surfaces exceeding 300°C.

Does Ultaire™ AKP withstand bacteria?

If the RPD is used as indicated and cleaned as instructed, bacteria levels should not exceed that which is found in the typical oral environment. We are currently investigating the behaviour of Ultaire™ AKP and how it responds to the growth of bacteria commonly found in the oral environment.

Will there be discoloration of the material over time?

Under proper use conditions, discoloration is not expected for Ultaire™ AKP. However, it is recommended that Ultaire™ AKP material be kept from direct sunlight exposure to avoid slight changes in colour. Exposure to typical staining agents, such as coffee, may affect the color of the final product over long periods of time.

Is Ultaire™ AKP coatable?

Preliminary coating testing has demonstrated that Optiglaze™ Color from GC America and VITAVM® LC color kit from VITA both bond well to Ultaire™ AKP if the procedure below is followed.

1. Roughen the surface of the frame intended for coating (sandblast Al₂O₃; 50um particle size; 2 bar pressure).
2. Use an adhesive primer on the roughened surface following the primer's instructions for use. Primers that we have tested include visio.link and signum connector.
3. Apply the coating composite and light cure the coated portions of the frame for 10-20 sec (or until hard, depending on the intensity of the light used).
4. Following the light cure, apply an air barrier coating to the coated surface and then fully cure the composite following the coating composite instructions for use.

Note: the above is a recommendation only. Validation testing of coating methods in a simulated oral environment is currently underway in order to gain a quantitative understanding of adhesion of coatings to Ultaire™ AKP.

DENTIVERA™ MILLING DISC MADE FROM ULTAIRE™

AKP

Can I use this material for other dental indications?

The Dentivera™ milling disc is currently FDA cleared for use as base material for removable partial dentures and overdentures.

What sizes are available for the Dentivera™ milling discs?

Dentivera™ milling discs are available in 18 mm and 24 mm thicknesses with a 98 mm diameter.

How can switching to RPD frames made from Dentivera™ milling discs help my lab?

The demand for metal-free dentistry continues to increase. By making metal-free RPDs possible for your dentist customers and their patients, you can position your business on the leading edge of dentistry. Incorporating the digital workflow into your business operations increases productivity, and ultimately, profitability.

REMOVABLE PARTIAL DENTURE FRAMES MADE FROM ULTAIRE™ AKP

What are the benefits of RPDs made from Ultaire™ AKP?

Removable partial denture frames made from Ultaire™ AKP are bone-like, tooth-supported, lightweight, and biocompatible, leave no metallic taste in the mouth, and offer unparalleled aesthetics.¹

How is an Ultaire™ AKP RPD different from an RPD made of metal?

An RPD made of Ultaire™ AKP is lighter in weight, more comfortable, and more aesthetically pleasing as it is tooth-coloured. It is also non-corrosive, non-irritating, and leaves no metallic taste in the mouth.

How thick is the Ultaire™ AKP frame as compared to metal?

The Ultaire™ AKP frame is slightly thicker than metal. This is to ensure that the RPD has proper rigidity, which is required for this application. Patient testing has indicated that the slightly thicker frame has not affected comfort of the frame, nor any functionality such as speaking or eating.

How much does an RPD frame made from Ultaire™ AKP weigh?

A complete post-processed frame milled from Ultaire™ AKP is about one-third the weight of a similarly designed metal frame.

Can the material be painted, coloured, stained, or coated?

Painting, colouring, staining, and coating techniques of an Ultaire™ AKP frame are currently being explored. Normal polishing techniques are possible.

Is the frame adjustable?

Frames made from Ultaire™ AKP may be adjusted with existing dental lab tools. Avoid using excessive force when adjusting the frame.

Can the clasps be modified?

No, they should not be modified. They are designed to move slightly during insertion/removal, but modification with tools may lead to breakage. Clasp design for a frame made from Ultaire™ AKP high-performance polymer was specifically designed for optimal use. Clasps are designed to move slightly during insertion/removal, but modification may lead to compromised function or breakage.

Will an Ultaire™ AKP RPD frame break?

A frame made from Ultaire™ AKP is strong enough to withstand normal forces; however, the frame could break if extreme forces are applied to it.

Can I repair an Ultaire™ AKP RPD frame?

Testing is currently being completed to determine a recommended method to repair an Ultaire™ frame in areas other than clasp regions.

Can I repair a clasp?

The most effective method is to have the doctor perform a standard pickup of the partial in the mouth. Here is a general step-by-step method:

1. Pour the cast with the partial in the impression.
2. Prep the buccal surface of the flange to accept a retention loop or tang.
3. Scan the buccal portion of the partial, and design a clasp to fit into the retentive groove and onto the proper undercuts of the abutment.

Note: we recommend designing holes in the anterior section of the clasp to increase mechanical bond strength to the acrylic.

1. Mill the clasp out of Ultaire™ AKP.
2. Cold cure the retention area of the milled clasp into the partial.
 - a. Roughen the surface of the acrylic where the clasp is being added to the frame, along with the portion of the clasp which extends into the groove.
 - b. Use an adhesive primer on the same surfaces. Primers we have tested so far include visio.link and Signum Connector.
 - c. Mix PMMA or acrylic and apply to this region, securing the clasp in the partial.

Note: the above is a recommendation only. Validation testing of repair methods in a simulated oral environment is currently underway in order to gain a quantitative understanding of repair methods to Ultaire™ AKP.

How are frames made from Ultaire™ AKP sterilized?

Dentivera™ milling discs are non-sterile and the Ultaire™ AKP removable partial denture frames milled from them are not intended to be sterilized. We recommend not to sterilize Ultaire™ AKP frames, but they may be cleaned using ultrasound.

Can I use ultrasonic/vibration welding?

Welding techniques for Ultaire™ AKP are currently being explored for repair of the frames. At this time, we do not recommend welding.

Can I repair the frame with metal?

It may be possible to repair the frame by using metal; however, more research is needed to demonstrate results.

How do I trim Ultaire™ AKP?

A standard cross cut carbide bur is sufficient to trim Ultaire™ AKP.

Do I need to wax and cast the partial?

No, there is no need for waxing and casting since this material has been manufactured as a high performance disc for milling purposes.

ULTAIRE™ AKP DESIGN (CAD)

What is the minimum rest thickness?

The minimum thickness for all rests is 1 mm, with 1.5 mm preferred.

Do I need to have a lingual bar?

Lingual bars or plating are often recommended to increase the overall rigidity of the frame.

What are the design differences between this material and metal?

There are a few differences related to the properties of this material, and those are described in detail during training.

Do I have to do anything different with scanning?

No, models scanned for designing in 3Shape™ CAD software are scanned in the same way as all models. Your scanner should output an .stl file.

Are there differences in how I engage the undercuts?

Undercut engagement should follow known RPD design principles. Some cases, however, may allow for deeper undercut engagement without the risk of ulceration.

Do I have to make any changes to the retention grid (squares or circles)?

For optimal mechanical adhesion between the polymer frame and acrylic, it is recommended to use the circle pattern for retention grids. Any sharp corners, as found with squares, should be avoided when designing a frame made from Ultaire™ AKP.

Does the dentist need to prepare rest seats differently?

No, rests can be milled to fit current rest seat procedures, although the dentist may determine it beneficial to design the rest seats differently for certain patients. Refer to the Instruction Guide for details regarding rest seat design.

What shape should the lingual bar be with this material?

The lingual bar should be designed to fit the patient's anatomical shape for optimal patient comfort.

What are the recommendations for surveying the model?

The orientation angle for surveying is also used to obtain the correct insertion angle of the RPD frame. The orientation angle may be kept as a default or adjusted by the designer. For best results, try to achieve an undercut depth of at least 0.5 mm on any teeth for clasp engagement without altering the insertion angle more than 10 degrees from vertical in any direction.

What type of clasp can I use with Ultaire™ AKP?

A specific clasp has been designed for frames made from Ultaire™ AKP called the “**Ultaire™ AKP Clasp.**” This clasp design is shorter than those used for metal applications. The Ultaire™ AKP Clasp is designed to provide adequate retention, and yet is strong enough to withstand breakage.

ULTAIRE™ AKP MILLING (CAM)

Are there differences in how or where I place supports as compared to metal RPD frames?

Milling attachments should be placed on the framework in areas that will have the least effect on the fit of the framework. Avoid attachments on clasp tips, the edge of a finish line, and the intaglio surface. Ideally, milling attachments should be placed on mesh saddles or in the middle of major connectors. Clasps should be supported during milling. Please refer to the Instruction Guide for more details.

What milling machines can be used to mill this material?

Any standard milling machine can be used to mill Ultaire™ AKP frames.

What are the tool settings I need to use?

Generally, differences in milling are largely determined by which CAM software is utilized. Please also refer to the Instruction Guide for tool settings for commonly used software combinations.

What type of burs are used to mill Ultaire™ AKP?

Both carbide and diamond burs can be used, but carbide is preferred.

Which software systems support this product?

Ultaire™ AKP has been specifically developed for use with 3Shape™ CAD software, but other CAD software options are possible. For milling, many combinations of CAM software and milling machines are possible.

How long does it take to mill this product?

Milling time can vary, but generally takes between 90 minutes and 2 hours for most frames.

How does this product wear on the burs?

You can expect the normal amount of wear that your lab has experienced with other types of polymers or acrylics.

What milling strategy do I use when milling Ultaire™?

Currently, a PMMA strategy yields the cleanest and most accurate mill. Because Ultaire™ AKP melts at such a high temperature, a faster feed rate and RPM can be used for a quicker mill time.

What mill settings (RPM) should I use?

Refer to the milling section of the Instruction Guide for recommended settings.

Should a wet or dry mill be used?

A dry mill with air cooling is recommended for this product; however, the product can be successfully milled using a wet mill.

Do I need a 3, 4, or 5-axis mill to mill Ultaire™ AKP?

Five-axis mills are recommended to optimize the quality and finish of the final frame.

ULTAIRE™ AKP POST-PROCESSING & TOOTH SET-UP

How are teeth adhered to frames made from Ultaire™ AKP? Is this a mechanical or a chemical bond?

Dental labs will use the same procedures that are currently used for adding teeth to metal frames, for example, with the use of acrylics. The acrylic portion of the denture is mechanically adhered to the polymer frame and no chemical or adhesive bond is required.

Can an Ultaire™ AKP frame be polished?

Yes, the material can be polished to a glass-like finish, first by using a medium grit pumice to bring the material to a satin like finish. A final shine is achieved by the use of a high shine polishing material, such as White Diamond or Renfert polishing paste.

Can I use adhesive on an Ultaire™ AKP frame?

There is currently no information on the use of adhesive with Ultaire™ AKP.

How do I adhere teeth to an Ultaire™ AKP frame?

Teeth can be added to the frame with the use of acrylics, as currently done with metal frames. The acrylic is bonded to the Ultaire™ AKP frame mechanically and not chemically.