

# Ultaire® AKP Specification Sheet

Ultaire® AKP is an innovative high-performance polymer specifically formulated for dental applications. Ultaire® AKP bridges the gap between metal removable partial dentures (RPDs) and those made with polymers that merely meet minimum requirements.

| Trait   | Why is it Important?  | Ultaire® AKP  |
|---|---|---|
| <b>Lightweight</b><br>Does the RPD weight impact comfort?   | Patients complain about discomfort from the weight of metal RPDs. If it weighs less, it may feel more comfortable.  | Weighs 60% less than a metal frame.   |
| <b>Flexural Strength, MPa</b><br>At what point does the material yield or break?                        | The flexural strength needs to be high enough to withstand loading and not break — and to avoid permanent deformation during mastication.   | 148 MPa <sup>1</sup>  |
| <b>Elastic Modulus, GPa</b><br>How resistant is the material to deformation? How stiff is the material? | An RPD needs an appropriately high elastic modulus to ensure that stresses encountered during biting and mastication don't cause permanent RPD deformation — without being too high (or stiff) that it becomes difficult to insert or remove the denture. | 3.5 GPa <sup>1</sup>  |
| <b>Impact Strength, kJ/m<sup>2</sup></b><br>How strong or resilient is the material?                    | When an RPD is dropped, it can lead to fracture. An RPD that is strong or resilient enough to withstand impact is preferred.  | <ul style="list-style-type: none"> <li>• As molded: 9 kJ/m<sup>2</sup></li> <li>• Post-conditioning: 10.2 kJ/m<sup>2</sup></li> </ul>                             |
| <b>Biocompatible</b><br>Is it safe to put in the body?  | Only safe, biocompatible materials can be used inside the body.   | <ul style="list-style-type: none"> <li>• No sensitization</li> <li>• Non-irritant</li> <li>• Non-mutagenic</li> <li>• No systemic toxicity or leaching</li> </ul> |
| <b>Biofilm Resistance</b><br>Will it resist unhealthy bacteria?   | Superior resistance can limit unhealthy bacteria (which can lead to bad breath, plaque, gum disease and unhealthy toxins)   | Superior performance against biofilms compared to metal frames <sup>1</sup>   |
| <b>Fatigue and Creep Resistance</b><br>Does it keep its shape over time?                                | An RPD that retains its shape over time will maintain position, comfort and strength  | Maintains original shape with significantly less distortion than metal <sup>2</sup>   |

# Testing methodologies for Ultaire® AKP

- Flexural strength and elastic modulus: followed ASTM D790 and D638 standards.
- Charpy impact strength: ISO 179 machined from ISO bars with and without conditioning (after 1 week of distilled water storage at 37°C). Notch the specimens before conditioning.
- Biocompatibility testing was completed per ISO 10993 standards.

## Ready to prescribe Ultaire® AKP?

To learn more about introducing Ultaire® AKP RPDs into your practice, contact the Solvay® Dental 360 team at **844-659-1869** or **Support@SolvayDental360.Solvay.com**.

### References

1. Solvay data on file.
2. Marie A, Keeling A, Hyde TP, et al. Deformation and retentive force following in vitro cyclic fatigue of cobalt-chrome and aryl ketone polymer (AKP) clasps. Dent Mater (2019), <https://doi.org/10.1016/j.dental.2019.02.028>.

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