

# Esthetic Finishing

## of Full-Contour Zirconia and DCL PMMA iBar Restorations

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**Bringing full-arch zirconia and PMMA hybrids to life involves approaching each arch like a master artist.** Just like a master sculptor, dental technicians must create depth, perspective, and texture after the arch is milled. Then, like a master painter, technicians must use esthetic finishing materials to create depth, perspective, and color. This is an overview of esthetic finishing steps to create life-like, full-arch restorations in esthetic, dual-crosslink (DCL) PMMA and esthetic, high strength zirconia.

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### **Esthetic Finishing of DCL PMMA Prototypes and Bar-Reinforced Finals:**

Multi-layer, millable DCL PMMA (anaxcam: The Show, anax USA) is beautiful, resilient and wear resistant. This combination makes the material well-suited for esthetic, long-term provisional hybrids. More recently with the introduction of Alien iBar restorations (full-arch overlays cemented over titanium implant bars) DCL PMMA has become a proven material for final hybrid Alien iBar restorations as well.

Highly-esthetic, layered PMMA so closely mimics the appearance of natural teeth, additional tooth characterization isn't often necessary. However, gingiva-shade materials must be bonded to the facial gingiva and sometimes lingual gingiva surfaces of PMMA hybrids to simulate the appearance of natural gingiva. Pigmented, light-cure glazes (Optiglaze Color, GC and Vita Akzent LC, Vita) are only sufficient for try-ins or short-term provisionals. The polishability of composite is essential for long-term surface maintenance and color-stability on long-term provisionals and final Alien iBar restorations.

**Below:** Alien Milling's Alien iBar Multilayer DCL is a bar-reinforced, final hybrid restoration milled in Grade 5 Ti (Alien Milling) and anaxcam: The Show DCL PMMA (Alien Milling). Photo and case by Florian Steinheber, Stuttgart, Germany



**Below:** Arch milled in anaxcam: The Show DCL PMMA (anax USA). Left half is immediately after milling. Right half is after refining and texturing with rotary tools. Photo and case by Florian Steinheber, Stuttgart, Germany



### **Gingiva-Shade Composite Application:**

After milling, rotary tools, including carbide and diamond burs and flexible diamond discs are used to refine the contours and form of the teeth, create the illusion of separation of the teeth, open embrasures, refine the gingival margin and create a natural-looking texture on the teeth.

Next, after the gingival surface is sandblasted, cleaned, dried, then primed with a light-cure bonder (Bond LC, anax USA), intensely pigmented composite stains (anaxgum Paints, anax USA) create the illusion of blood supply and root eminence. Then, after stains are light-cured, gingiva-shade composite pastes are applied over the stains and light cured, with additional layers or areas added until the desired esthetic is achieved. After curing the final layer of composite and curing the inhabitation layer by applying an oxygen barrier (Cover Gel, anax USA) and curing a final time, or by curing with nitrogen gas (Otoflash, anax USA) the composite and PMMA are polished with an ultra-fine diamond polishing paste (Pasta Grigia I, anax USA). To seal the surface with light-cure glaze, the surface is lightly sandblasted, cleaned, dried, then covered with a thin layer of nano-filled, light-cure glaze (Optiglaze, GC or Vita Akzent LC, Vita).

**Below:** Paint Layer – Gingiva composite stain layer using anaxgum Paints (anax USA). Photo and case by Florian Steinheber, Stuttgart, Germany

**Below:** Dark Pink Paste – First gingiva composite paste layer applied to left half using anaxgum Gingiva Paste in Dark Pink (anax USA) Photo and case by Florian Steinheber, Stuttgart, Germany

**Below:** Final Composite layer – Final composite layer applied to left half using anaxgum Gingiva Paste in Light Pink and Dark Pink (anax USA) Photo and case by Florian Steinheber, Stuttgart, Germany



## ***Esthetic Finishing of Full-Contour, Esthetic Zirconia:***

Milling zirconia hybrids with a C-clamp is preferred, as it allows for maximum detail to be created by the mill and saves time during green state contouring. After C-clamp milling, diamond or diamond-infused polymer separating discs, carbide burns and diamond burs are used to create the illusion of tooth separation, refine contours and create texture. Hand tools like a sharp wax carver and surgical blades facilitate

adjustments in tight spaces and can provide more control for final touches.

After shaping, infiltrating liquids can enhance chroma in different areas like tissue and embrasures. Then, the zirconia is sintered following manufacturer recommendations.

Liquid and paste ceramics (Miyo, Jensen or Soprano Surface, anax USA) can create a realistic appearance for gingiva and dentition. Sketching a diagram prior to application helps map out the desired result. Multiple bakes are typically necessary in the gingival area to create the illusion of depth similar to natural gingiva and to achieve the desired colors.

Due to zirconia's poor heat conductivity, it's vital to heat and cool the restoration slowly. Setting

a slow temperature climb rate when firing ceramic on zirconia allows ceramic powders and stains to reach the recommended firing temperatures. Allowing plenty of cooling time before the furnace opens and exposes the zirconia to room temperature protects zirconia from cracking due to temperature shock. The higher the volume of the arch, the slower the temperature climb and cooling rate should be.

## ***The Dual-Arch Alien iBar Solution:***

A new and promising full-mouth restorative option includes one arch restored with a full-contour zirconia Alien iBar, and the opposing arch restored with a DCL PMMA Alien iBar. This combination of materials eliminates the unnatural clacking sounds made by opposing zirconia hybrids in the mouth, which is one of the most common complaints from patients with upper and upper and lower zirconia hybrids. The DCL PMMA iBar arch also provides shock absorption when opposing a zirconia Alien iBar arch.

When finishing opposing arches made of different materials, it is important to select finishing material systems that will facilitate color-matching between the two arches. ■



**Above:** First stage of green state – Initial refining of milled green state zirconia. Photo and case by Vadim Vainer, Shiksha Dental Laboratory.



**Above:** Second stage of green state – Final contouring and texturing of green state zirconia. Photo and case by Vadim Vainer, Shiksha Dental Laboratory.



**Above:** Sintered after infiltration – Zirconia hybrids infiltrated in green state, then sintered according to manufacturer instructions. Photo and case by Vadim Vainer, Shiksha Dental Laboratory.



**Above and Below:** Zirconia hybrids finished with liquid ceramic (Miyo, Jensen) Photo and case by Vadim Vainer, Shiksha Dental Laboratory.



**Above:** Maxilla: Alien iBar Extreme (Alien Milling) finished with Soprano Surface Paste Ceramic (anax USA). Mandible: Alien iBar Multilayer DCL finished with anaxgum composite (anax USA) and Vita Akzent LC (anax USA). Photo by Arby Brazzel and case by Tay Harvey, anax USA.

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