

Dr. Dimitar Kosturkov

Predictable Finishing and Polishing Protocol for Posterior Composite Restorations: Step-by-Step Guide



Concept Overview

The long-term success of posterior composite restorations depends not only on marginal integrity but also on functional occlusal anatomy and surface quality. Unlike anterior restorations, posterior composites must withstand high occlusal forces while maintaining proper cusp–fossa relationships and plaque resistance.

An evidence-based finishing and polishing protocol must therefore:

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- **Preserve occlusal anatomy and functional cusp inclines**
- **Ensure seamless marginal integration**
- **Maintain fissure morphology without over-flattening**
- **Optimize surface smoothness to reduce plaque & stain accumulation**
- **Prevent thermal trauma to the pulp**

A structured posterior workflow follows:

Occlusal Adjustment ➔ Marginal Integration ➔

Groove Refinement ➔ Surface Smoothing ➔ High-Gloss Polishing

Posterior composite polishing is preferably performed under wet conditions, as the goal is to achieve a smooth, functional surface rather than a mirror-like gloss as required in anterior restorations. Continuous water cooling helps control heat generation and minimizes the risk of overheating, thereby protecting the pulp from thermal irritation or potential pulpitis.

About Dr. Dimitar Kosturkov



Dr. Dimitar Kosturkov graduated with honors from the Faculty of Dental Medicine in Sofia, Bulgaria, in 2014. Since then, he has been an endodontist and restorative dentist at Uzunov Dental Clinic in Sofia. From 2016 to 2019, he was a full-time PhD student in the Department of Conservative Dentistry at FDM-Sofia. In 2017, he began teaching students at FDM-Sofia. In 2019 he obtained his PhD degree. In 2020, he obtained a specialty in operative dentistry and endodontics from FDM-Sofia. Since 2021, he has been a chief assistant professor in the Department of Conservative Dentistry at FDM-Sofia. He is author of numerous publications in Bulgarian and international journals and scientific projects.

Clinical Protocol

Step 1

Occlusal Assessment and Functional Adjustment

Instruments

- Fine diamond finishing bur (flame or football)
- Articulating paper

Objective

Establish proper occlusal contacts before polishing. Adjust premature contacts while preserving cusp height and occlusal anatomy.

Posterior restorations should maintain:

- Functional cusp inclines
- Proper centric stops
- No interferences in lateral excursions

Clinical Considerations

- Adjust only marked contact areas
- Avoid flattening cusp tips
- Preserve triangular ridges and marginal ridges
- Re-check after each minor adjustment



Fig. 1 - 2 - Initial marginal blending of composite to enamel, creating a smooth cavosurface transition without ditching.

Step 2

Marginal Integration

Instrument

- Opti1Step™ (cup or disc)

Objective

Create a smooth transition between composite and cavosurface margin to minimize plaque retention and microleakage risk.

The instrument should lightly brush across the margin, blending composite into enamel without ditching.

Clinical Considerations

- Keep instrument parallel to the marginal ridge & with respect to the natural angles
- Use intermittent light pressure
- Avoid rounding sharp marginal ridge anatomy
- Prefer dry finishing for visual control



Fig. 3 - Refinement of fissures while maintaining natural occlusal anatomy.

Step 3

Groove and Fissure Refinement & Surface Smoothing

Instrument

- Opti1Step™ (flame)

Objective

Refine occlusal grooves and central fissures while preserving natural morphology. Eliminate micro-scratches and smooth cusp inclines while maintaining occlusal anatomy.

This step restores depth perception and light dynamics without artificially deepening fissures and prepares the surface for gloss development.

Clinical Considerations

- Use the tip inside fissures only
- Avoid widening grooves excessively
- Maintain natural anatomical direction
- Work with light vertical brushing strokes.



Fig. 4 - 5 - Final polishing to achieve a smooth, functional surface with natural gloss while.



Fig. 6 - Simplified polishing technique achieving optimal surface smoothness and functional gloss.

Step 4

Final gloss

Instruments

- Opti1Step™ (Flame)
- Occlubrush™ (Regular cup)
- Occlubrush™ (Minipoint)

Objective

Produce enamel-like luster and optimize surface smoothness, reducing plaque retention and staining susceptibility.

Posterior gloss should be natural and functional – not mirror-flat

Clinical Considerations

- Use light, sweeping movements
- Do not dwell in one area
- Perform dry polishing
- Avoid overheating by constant movement

Recommended Speed Guidelines

- Opti1Step™: 5,000–8,000 rpm
- Occlubrush™: 5,000–8,000 rpm

Biological Considerations

- Excessive pressure may generate heat and lead to pulpal inflammation.
- Over-polishing may flatten anatomy and compromise occlusal function.
- Proper marginal finishing reduces biofilm accumulation and secondary caries risk.

Conclusion

Posterior composite finishing requires a balance between anatomical preservation and surface refinement. Unlike anterior restorations, the primary focus is functional integrity combined with marginal sealing and plaque resistance.

A systematic approach ensures:

- **Predictable occlusal morphology**
- **Stable functional contacts**
- **Smooth marginal transitions**
- **Durable surface gloss**

Controlled pressure, appropriate rotational speed, and intermittent contact are essential to prevent overheating and preserve pulp vitality.

When executed correctly, this posterior finishing protocol results in restorations that are functionally stable, biologically safe, and aesthetically harmonious within the posterior dentition.



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Disclosure: Dr. Dimitar Kosturkov is a consultants for Kerr. The opinions and technique expressed in this article are based on the experience of Dr. Dimitar Kosturkov. Kerr is a medical device manufacturer and does not dispense medical advice. Clinicians should use their own professional judgment in treating their patients