

Composite 3D Printing

Workflow Characterization with IPS Empress® Direct

Notice



For details, please refer to the Adhese® Universal, IPS Empress® Direct and IPS Empress Direct Color instructions for use.

The maximum increment for IPS Empress Direct Color is 0.5 mm for all shades except for brown. The maximum increment for brown is 0.1 mm.

For optimum results, apply IPS Empress Direct Effect in layers of max. 2 mm thickness.

The instructions for use of the curing light used must be observed (see table 1).

Application of IPS Empress Direct for the characterization of printed restorations

1. Use the printed composite resin material according to the manufacturer's instructions.
2. Individual characterization of printed restorations can be performed as follows:
 - a. In the appropriate place, carve a suitably shaped characterization pattern in the surface layer.
 - b. Apply Adhese Universal to the characterization pattern surface.
 - c. Disperse Adhese Universal with oil- and moisture-free compressed air until a glossy, immobile film layer results.
 - d. Light-cure the Adhese Universal according to the indicated exposure time and light intensity in Table 1.
 - e. Fill the stain material into the characterization pattern using the cannula or a suitable instrument. Light-cure the stain according to the indicated exposure time and light intensity in Table 1.
 - f. Then, cover the stained area with IPS Empress Direct Effect Trans Opal, starting from the sides.
 - g. Light-cure IPS Empress Direct Trans Opal according to the exposure time per increment and light intensity indicated in Table 1.
 - h. Polish the restoration according to the polishing protocol.
 - i. Proceed with cementation of the restoration.

Use for the characterization of printed veneers

1. Try-in and subsequently adjust the veneers.
2. Clean and condition the inner surfaces of the veneers according to the manufacturer's instructions.
3. Wet the cleaned inner surfaces of the veneers with Adhese Universal and disperse this adhesive layer to a very thin film with blown air.

Notice

Excessively thick shade layers could compromise the fit and the esthetic appearance of the veneers.

Avoid adjustments with rotating instruments as well as additional try-ins after characterization.

Otherwise, the bond to the luting material can no longer be ensured.

4. Apply very small amounts of IPS Empress Direct Color in thin layers to the inner surface of the veneer in order to meet individual characterization requirements.
5. Light-cure the light-curing bonding agent and the stains in accordance to the information in Table 1.

Notice



The instructions for use of the curing light must be observed.

6. Place the veneer according to the instructions of the manufacturer of the luting material.

Application notes

- Restorative surfaces must be roughened or sandblasted and wetted first with Adhese Universal before IPS Empress Direct can be applied.
- Only cannulas intended for the product must be used. In case other cannulas are used, there is a risk that the cannula may suddenly become loose during application.
- Do not expose the product to intensive light while applying it, as this might lead to premature polymerization.
- Prevent incomplete polymerization of the restoration by ensuring sufficient exposure to the curing light.
- To ensure long-lasting shade effects, the product should not be applied as final layer on the surface of the restoration, but, if possible, it should be placed in carved patterns and covered with IPS Empress Direct Effect Trans Opal.
- Do not disinfect syringes with oxidizing disinfection agents.
- Use a suitable hygienic protective sleeve for the syringe as indicated by the manufacturer.
- Avoid any contact of the reusable syringe not covered with a protective sleeve with the mouth of the patient.
- Dispose of contaminated syringes.

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Finishing/Checking the occlusion/ Polishing

After cementation, check the occlusion and articulation and apply appropriate grinding corrections to prevent premature contacts or undesired articulation paths on the surface of the restoration. Use polishers as well as polishing discs and polishing strips to polish the restoration to a high gloss.

Table 1

Light intensity	Exposure time Adhese Universal	Exposure time IPS Empress Direct + IPS Empress Direct Color
500–900 mW/cm ²	10 s	20 s
1,000–1,300 mW/cm ²	10 s	10 s
1,800–2,200 mW/cm ²	5 s	–
2,700–3,300 mW/cm ²	3 s	–