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3M™ Lava™ Esthetic Fluorescent Full-Contour Zirconia

Troubleshooting Guide

How to achieve excellent esthetic results with
3M™ Lava™ Esthetic Fluorescent Full-Contour Zirconia

GOLDEN RULES

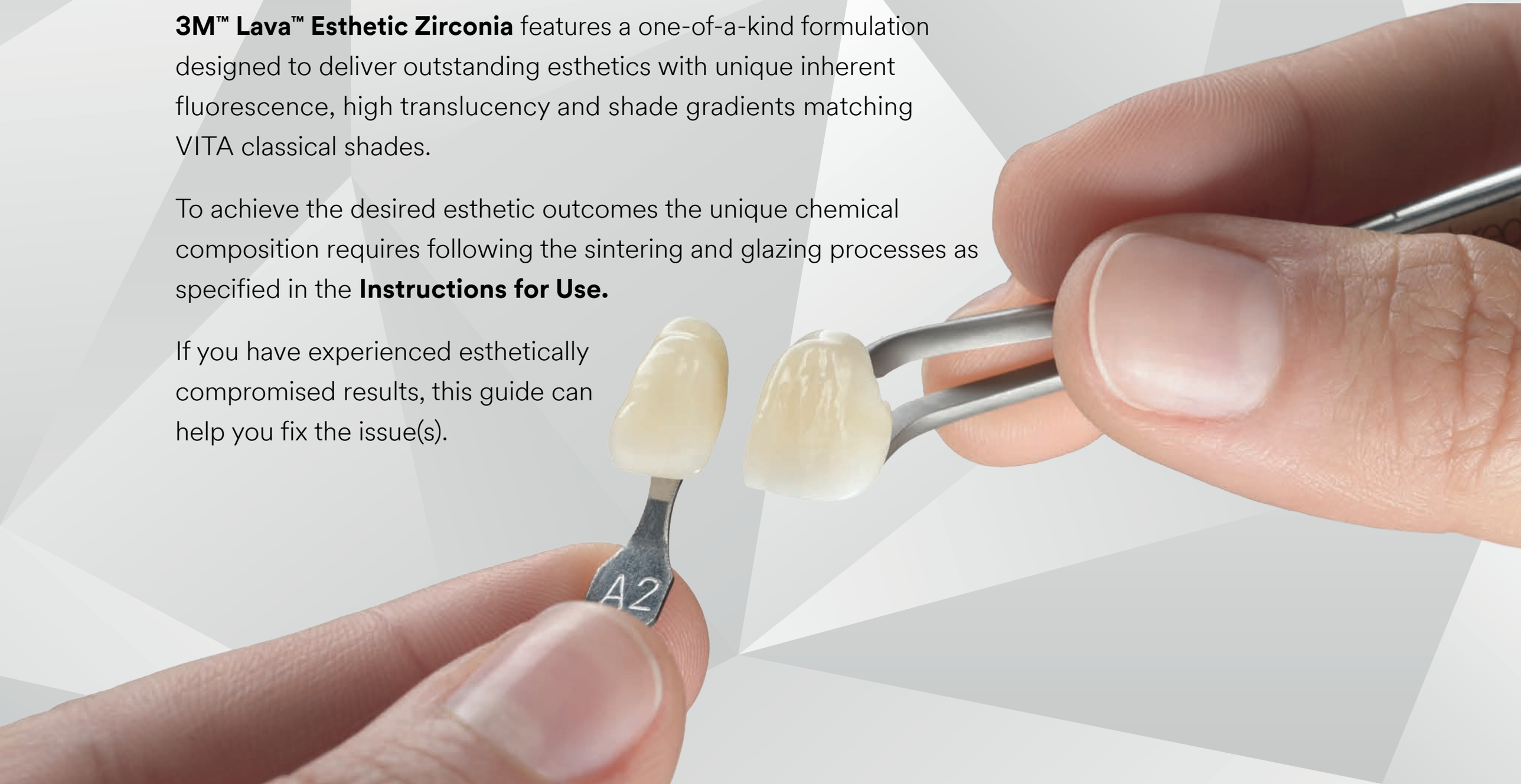
Failure modes and solutions

How to achieve excellent esthetic results with 3M™ Lava™ Esthetic Fluorescent Full-Contour Zirconia

3M™ Lava™ Esthetic Zirconia features a one-of-a-kind formulation designed to deliver outstanding esthetics with unique inherent fluorescence, high translucency and shade gradients matching VITA classical shades.

To achieve the desired esthetic outcomes the unique chemical composition requires following the sintering and glazing processes as specified in the **Instructions for Use.**

If you have experienced esthetically compromised results, this guide can help you fix the issue(s).



GOLDEN RULES

- Separate your working space for zirconia from areas where you work with other materials – such as metal, glass ceramics, veneering materials, resins, etc.
- Use a separate set of tools only for working on pre-sintered zirconia to avoid cross-contamination with metals or glass materials.
- Use only oil-free pressurized air to remove dust.
- Follow your furnace manufacturer’s service and maintenance instructions. Regularly clean and calibrate your furnace.
- Use only high-quality sintering beads (diameter recommendation approx. 1 mm) such as 3M™ Lava™ Sintering Beads to avoid contamination, sticking and misfit. Beads that are too small can easily get clamped in interdental spacing during shrinkage of bridges. Place restorations on top of the bead layer taking care to not bury them in the beads.
- Use only high-quality sintering trays such as high-purity alumina sintering trays.
- Replace sintering accessories regularly.
- Follow the recommended sintering and glazing protocol of the zirconia material.

View the 3M™ Lava™ Esthetic Zirconia Quick Start Guide

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Lab Quick Start Guide | 3M™ Lava™ Esthetic

Esthetic Fluorescent Full-Contour Zirconia

- Cubic zirconia material
- High strength of 800 MPa*
- High translucency optimized for esthetic full-contour
- Gradient pre-shaded with true color match to VITA classical shades
- First zirconia with inherent toothlike fluorescence
- Available in eight shades and three heights

Item numbers (1 disc per pack)

	14 mm	18 mm	22 mm
Bleach	69319	69327	69335
A1	69320	69328	69336
A2	69321	69329	69337
A3	69322	69330	69338
A3.5	69323	69331	69339
B1	69324	69332	69340
C1	69325	69333	69341
D2	69326	69334	69342

* 3-point bending strength according to ISO 6872:2015; qualified for Type II, class 4; indications: crowns, bridges with one pontic between two crowns, inlays, onlays and veneers.

1 CAD design

Indications

- Crowns
- Bridges with maximum one pontic between two crowns
- Inlays/onlays, veneers

Design parameters

The following design specifications must be fulfilled for the finished restorations:

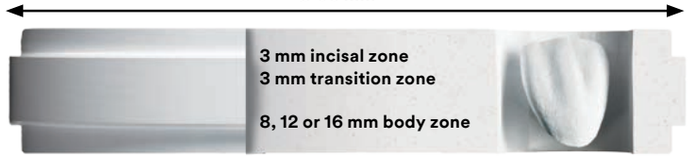
	Wall thickness	Bridge connector cross section
Anterior	≥ 0.8 mm	≥ 12 mm²
Posterior	≥ 0.8 mm	≥ 14 mm²

! Maintain **0.8 mm** minimum wall thickness

2 CAM positioning and scaling

Layer concept

The two upper zones are always 3 mm thick. The thickness of the body zone (8, 12 or 16 mm) varies with the disc height.



Scale factor

3 Milling – 98 mm disc with step fits open zirconia dry mills

Default milling parameters

Job	Feed (mm/min)	Step down (mm)	Step over (mm)	Spindle speed (RPM)	Carbide tool diameter (mm)
Roughing	600	0.4	0.6	10,000	2
Rest material roughing	600	0.3	0.3	30,000	1
Finishing inside 3D/occlusal	1,350	n.a./0.15	0.15	25,000	2
Finishing margin line 3D	500	n.a.	0.1	25,000	2
Finishing outside cavity	800	0.15	0.15	25,000	2
Fine finishing inside 3D	1,000	n.a.	0.12	20,000	1
Fissure machining	800	1	0.2	30,000	1
Fine fissure machining	500	0.5	0.15	30,000	0.5

Before using the products described, please refer to the instructions for use provided with the product packages.

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Lab Quick Start Guide | 3M™ Lava™ Esthetic

Esthetic Fluorescent Full-Contour Zirconia

4 Green finishing

- Remove the sprues with a handpiece and a fine, cross-meshed hard metal milling tool
- Adjust and smoothen the surface with white universal polishers
- 3M™ Lava™ Esthetic Zirconia must not be used in combination with dyeing liquids

5 Sintering

- Positioning on an approx. 3 mm layer of sintering beads, e.g. 3M™ Lava™ Sintering Beads (Item No. 68594)
- Air circulation required, do not use closed trays
- Sintering parameters listed in the table must be set for sintering Lava Esthetic zirconia

Heating	20 °C/min to 800°C 10 °C/min to 1,500°C
Holding time	120 min at 1,500°C
Cooling	Max. 15 °C/min to 800°C Max. 20 °C/min to 250°C

- Make sure that the furnace can reach the required heating rates and maximum temperatures
- Calibration of the sintering furnace should be checked at regular intervals

6 Finishing after sintering

- Use a turbine at 30k – 120k RPM or a fast-running handpiece at up to 30k RPM
- Water cooling is recommended
- Use only fine-grain diamonds ≤30 µm
- Smoothen ground areas with rubber polishers
- Make sure to maintain a minimum wall thickness of 0.8 mm

7 Stain and glaze

- Glazing is recommended to achieve the best shade match
- Use low-temperature (< 900°C) glazes and stains for zirconia
- Vacuum during holding time is not recommended

8 Sandblasting

Before sending to dentist:

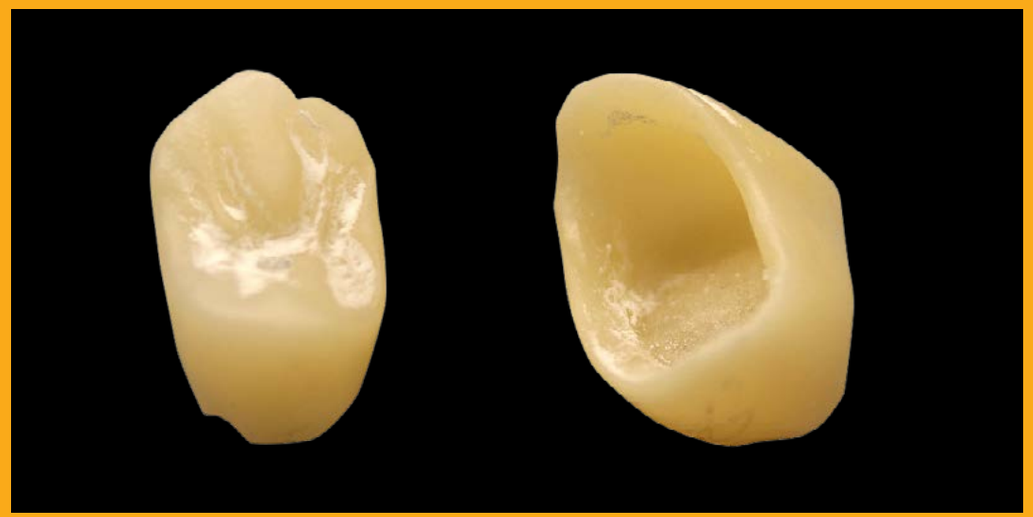
- Sandblast bonding surfaces with alumina, grain size ≤ 50 µm at 2 bars (30 PSI)
- Clean with alcohol and dry with oil-free air
- For crown and bridge cementation, 3M™ RelyX™ Unicem 2 Self-Adhesive Resin Cement is recommended

Before using the products described, please refer to the instructions for use provided with the product packages.

3M.com/Dental

Failure mode

Whitish spots are visible on the sintered restoration surface.



Cause

Milling dust was not completely removed from surface before sintering.

Solution

Touch the restoration only with clean, non-oily hands. Use an artificial hair brush to remove any milling dust completely from all surfaces of the restoration, including the inner surfaces of the crown, and oil-free pressurized air.

Failure mode

Restoration looks too opaque, layers are visible, color is off.

VITA classical A3.5 shade tab

Glazed 3M™ Lava™ Esthetic Zirconia crown A3.5, using wrong ZirkonZahn sinter program “Slow Prettau Zirkon” with slow heating rate to 1600°C for two hours holding time

Cause

3M™ Lava™ Esthetic Zirconia not sintered according to the instructions for use: Wrong sintering cycle with differing heating rate and/or maximum temperature and/or holding time.

Solution

- Program your furnace with the Lava Esthetic Zirconia sintering program. Programs used for Katana™, BruxZir®, Prettau®, etc. are not compatible and do not lead to the desired esthetic result.
- Position the Lava Esthetic Zirconia restorations in the hot zone of your sintering furnace. Suitable sintering accessories have to be used to store restorations in the hot zone of your furnace on a non-contaminating surface.
- Check furnace calibration.
- Check sintering program regularly using e.g. high-temperature control rings. Ask your 3M sales representative for further information.

Failure mode

Restoration looks too opaque, layers are visible, color is off and fluorescence is not visible.

VITA classical A3.5 shade tab

Sintered 3M™ Lava™ Esthetic Zirconia crown A3.5 contaminated from $MoSi_2$ heating element

Cause

Contamination from $MoSi_2$ heating elements. Molybdenum is emitted from heating elements with damaged passivation layer.

Solution

- Restore the passivation layer by performing an empty clean firing cycle with fast heating rate to high temperature and longer holding time (see furnace manual for further instructions).
- You can use a piece of unshaded zirconia sintered simultaneously with 3M™ Lava™ Esthetic Zirconia restorations to check if a contamination of $MoSi_2$ heating elements has occurred. A yellow/greenish discoloration of the unshaded zirconia piece at the surfaces facing towards the heating elements is a proof of contamination.
- Shading liquids exhaust can damage the passivation layer. Consider not sintering liquid-shaded restorations in the same furnace that is used for Lava Esthetic Zirconia.
- If problems persist, ask your furnace provider about the availability of higher quality $MoSi_2$ heating elements with higher purity and better surface adhesion.
- If your lab operates a furnace with SiC heating elements consider using this furnace for your Lava Esthetic Zirconia restorations (e.g. DEKEMA AUSTROMAT µSiC or baSiC).

Failure mode

Color of restoration is off and opacity too high.

Sintered 3M™ Lava™ Esthetic Zirconia crown A2

Sintered 3M™ Lava™ Esthetic Zirconia crown A2, contaminated with a silicone putty material in the pre-sintered state

Cause

Contamination of the restoration during handling in pre-sintered state with silicone material.

Solution

Avoid contact with silicone materials (e.g. FINOPASTE S90 Putty) in pre-sintered state. This leads to an increase in opacity, white spots and undesired shade.

Failure mode

Color of restoration is off and too light after glazing.

VITA classical A3.5 shade tab

3M™ Lava™ Esthetic Zirconia crown A3.5, glazed with Vita Akzent at 950°C

Cause

Firing temperature setting for glaze/veneering firing too high.

Solution

- Use only low-temperature firing glazes/veneering material with a firing temperature below 900°C.
- Calibrate your furnace regularly using the silver wire test.

Failure mode

Color of restoration is off and too chromatic after glazing.

VITA classical A3 shade tab

Glazed 3M™ Lava™ Esthetic Zirconia crown A3, color change by wrong glaze furnace atmosphere

Cause

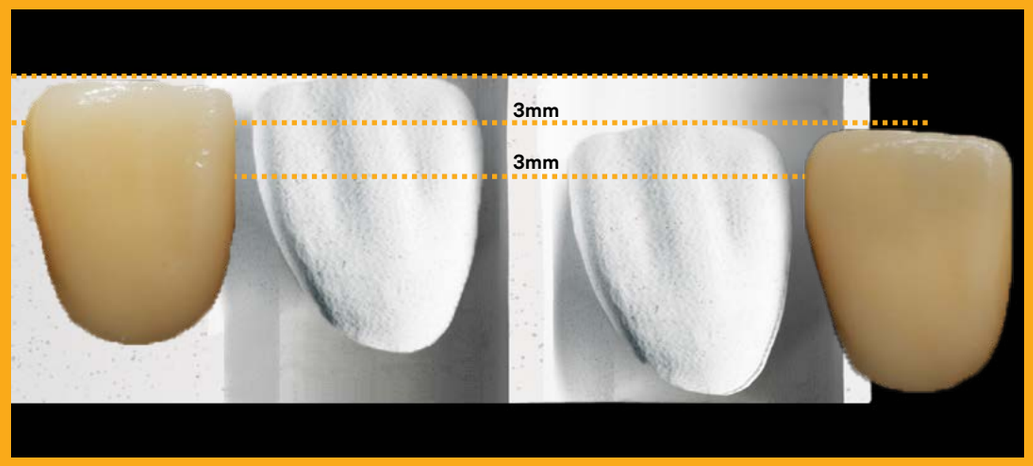
Porcelain furnace atmosphere is lacking oxygen.

Solution

- Fire without vacuum during holding time.
- Consider firing 3M™ Lava™ Esthetic Zirconia restorations separately from other restorations.

Failure mode

Lack of enamel shade in the incisal area.



Glazed 3M™ Lava™ Esthetic Zirconia crown A3, z-position for milling at top of 18 mm disc

Glazed 3M™ Lava™ Esthetic Zirconia crown A3, z-position for milling at bottom of 18 mm disc

Cause

Restoration positioned too low in the disc.

Solution

Position the 3M™ Lava™ Esthetic Zirconia restoration in the CAM module at the top of the disc to capture the full incisal area.

3M.com/LavaEsthetic

For more information, call Customer Care at 1-800-634-2249.

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