Technical data sheet

CAD/CAM Restoratives
3M ESPE Lava™ Ultimate

Manufacturer

3M Deutschland GmbH
Dental Products
Carl-Schurz-Str. 1
41453 Neuss
Germany

3M Deutschland GmbH is certified according to

- **DIN EN ISO 13485**
- **RL 93/42/ECC (CE 0123)**

Description

CAD/CAM Restoration material ***3M ESPE Lava™ Ultimate***

Resin nano ceramic (RNC) with approx. 80% nano ceramic particles

Description

3M ESPE Lava™ Ultimate is an alternative to conventional ceramic blocks. The CAD/CAM restorative is a very stable, abrasion-resistant and highly aesthetic material. The effectiveness of the Lava™ Ultimate CAD/CAM restorative is comparable to or exceeds the capability of glass ceramic and composite materials.

Indications

- Inlays
- Onlays
- Veneers

Contraindications

- All applications not listed as an indication

Options

Lava™ Ultimate CAD/CAM restoratives are available in eight shades and two translucent designs, based on the VITAPAN® classical shade guide.

LT (Low Translucency): A1 / A2 / A3 / A3.5 / B1 / C2 / D2 / Bleach HT (High Translucency): A1 / A2 / A3 / B1

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Preparation

Preparation for a proper reduction of the hard tooth tissue is the prerequisite for an optimal strength, colour and retention of a polished restoration.

- **Inlays and onlays**: the conventional inlay/onlay preparation is recommended. Do not create an undercuts Preparation of the cavity walls at an angle of 5° to 6° to the tooth axis. All corners and edges must be rounded. The occlusal reduction must be 1.5 to 2 mm in centric and dynamic occlusion.
- **Veneers:** The standard reduction of the labial surface is 0.6 mm and in the gingival area 0.4 mm, since the tooth enamel is thinner in this area. The reduction of the incisal, oral lip angle is 0.5 to 1.5 mm. The preparation margins should lie in the tooth enamel. The margins for the veneers must lie above the gingiva. For all veneer edges, the preparation of a hollow flute or concave fillet is recommended. Approximal extensions must be placed far enough in the approximal area to avoid the preparation margins as well as approximal gingival intersections to be seen.

Temporary dental prosthesis

Use a temporary dental prosthesis to protect the prepared tooth until the final restoration is completed. Do not use eugenol-containing cement for the temporary dental prosthesis

Protection of the pulp

If the pulp is exposed or the dentine is close to the pulp, first apply a layer of calcium hydroxide, this will help capping the pulp. Subsequently, apply appropriate means to minimise the risk of pulp irritation.

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Finishing the restoration

CADstar will provide the finished and sanded restoration, already cemented; however, on request, you may do this procedure in-house.

The Lava™ Ultimate CAD/CAM block is offered to the user in a cured/cross-linked polymerised form. Never attempt to fire the material in a ceramic furnace during the preparation, assembly or application.

Attachment of the restoration

Do not etch with hydrofluoric acid (HF).

Do not use phosphoric acid to clean the restoration.

1) Ensure best accuracy with minimal gap in the cement.
2) Use an ultrasonic or steam cleaner to clean the polished restoration. Subsequently, carefully dry with oil-free air pressure.
3) If necessary, adjust the fitting accuracy, then finish and polish the restoration.
4) Sandblast the adhesive surface with aluminium oxide (Al_2O_3) < 50 µm using a pressure of 2 bar (30 psi).
5) Clean the restoration with alcohol. Surface must be free of impurities (abrasive residues, abrasive liquids, saliva, grease, acetone, fit checker or similar silicone material, etc.).
6) Use an adhesive mounting composite to attach the Lava™ Ultimate restorations. Apply a suitable primer/bonding agent, depending on the mounting material.
7) Follow the instructions for composite-based materials provided by each manufacturer.

Build-up or addition to the Lava™ Ultimate restorations

Supplements and repairs to the Lava™ Ultimate restorations can be carried out with methacrylate-based light-curing composites. To ensure a polished appearance, surface lustre, and the necessary wear characteristics, it is recommended to use 3M™ ESPE™ Filtek™ Supreme XTE Universal Composite.

"Guidelines Setup/supplements to the Lava™ Ultimate Restorations" instructions are available on request.

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Chemical composition

Proportion of nanomeric and nanocluster filling particles
~ 80 %

Lava™ Ultimate is a resin nanoceramic (RNC) that contains about 80% (mass fraction) nanoceramic particles, bound in the resin matrix. The ceramic particles consist of three different ceramic fillers which reinforce a highly cross-linked polymeric matrix. The fillers consist of a combination of non-agglomerated/non-aggregated 20 nanometer (nm) silicon oxide fillers, non-agglomerated/non-aggregated 4 to 11 nanometer (nm) zirconium dioxide fillers and aggregated zirconium oxide / Silicon oxide cluster (consisting of 20 nm silicon oxide and 4 to 11 nm zirconium dioxide particles).

Physical properties (guidelines)

Fracture toughness $\mathbf{K_{Ic}}$	**2.02**	[MPa*$m_{1/2}$]
Elasticity modulus	**12,770**	[MPa] or [N/mm^2]
Flexural strength $\mathbf{\beta_B}$	**204**	[MPa] or [N/mm^2]
Flexural modulus	**12.80**	[MPa] or [N/mm^2]
Compression strength $\mathbf{R_e}$ (R_p)	**383**	[MPa] or [N/mm^2]
3-media abrasion according to ACTA, Loss of material after 200 cycles	**6.3**	[µm]
Resilience **R**	**~ 1,7**	[MPa] or [N/mm^2]

Resilience is the ability of the material to absorb energy when subjected to elastic deformation, and to resume its original size and shape as the load is reduced. In other words: Resilience is the maximum energy per unit that can be stored elastically.

CADstar Digital Dental Solutions