

# S3 Guideline - Direct composite restorations in permanent anterior and posterior teeth

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## Background

The global prevalence of caries highlights the need for standardised treatment guidelines. The use of tooth-coloured composites has become the preferred method of restoration for many, however, there are several material choices available. In addition, there is a high degree of variability in the quality of care due to differences in clinical application knowledge. The development and implementation of an evidence-based guideline is therefore essential to optimise the consistency of treatment quality and maximise the ethical benefits by prioritising minimally invasive procedures and tooth preservation.

## Aim

The guideline is designed to provide insight into the longevity and quality of composite restorations in different cavity classes and expanded indications, with clear delineations and process quality recommendations to ensure quality assurance. It is intended as a practical resource for practitioners, educators and researchers. It aims to identify the clinical scenarios in which direct composite restorations can be used for anterior and posterior teeth; the durability of these restorations in different indications; recommended materials for different indications; guidelines for the processing of direct composites; and recommended protocols for the use of adhesive systems.

## Main recommendations

### Direct composite restorations in restoration classes I and II

Composite restorations can be used for the direct restoration of Class I and II cavities.

As an alternative to composite, glass ionomer cement\* can be used in specific indications (e.g. smaller cavity sizes, limited compliance, increased caries risk) for the direct restoration of Class I and II cavities in permanent teeth.

Indirect composite inlays should not be used for Class I and II cavities if they can be restored with direct composite restorations.

If Class I and II cavities cannot be restored with direct composite restorations, indirect ceramic restorations or cast metal restorations can be used as an alternative.

\*This refers to glass ionomer cements that are approved by the manufacturer for permanent use in the posterior region.

### Direct composite restorations with cusp replacement in posterior restorations

Composite restorations can be used for cavities with cusp replacement in the posterior region.

Indirect composite restorations can be used for cavities with cusp replacement in the posterior region, especially when there are specific tooth, mouth or patient factors (e.g. limited compliance, poor accessibility, complex functional rehabilitation, etc.).

### Direct composite restorations in restoration classes III and IV

Direct composite materials shall be used to restore Class III and IV defects

Glass ionomer cements should not be used for the permanent restoration of Class III and IV defects.

### Direct composite restorations for tooth shape corrections in the anterior region

Direct composite materials shall be used for tooth shape corrections in the anterior region.

For tooth shape correction in the anterior region, minimally invasive direct procedures that preserve tooth structure shall be preferred whenever possible; indirect ceramic veneers can be used as an alternative.

### Direct composite restorations in restoration class V

For Class V restorations, direct composite materials can be used if adequate contamination control and adhesive technique are ensured.

As an alternative to composite, glass ionomer cements/modified glass ionomer cements can be used to restore Class V defects.

If direct composite restorations are used to restore Class V defects, 2-step-self-etch, 3-step-etch-and-rinse adhesive systems or universal adhesives should be used.

### Caries excavation

Both selective and non-selective caries excavation procedures can be used. In the case of dentin lesions close to the pulp, one-stage selective caries removal should be preferred to gradual or non-selective caries removal.

### Work field isolation

Both relative and absolute isolation techniques can be successfully used to control contamination in direct composite restorations on permanent teeth. Contamination control with a rubber dam (absolute isolation) could have a positive effect on the longevity of the restorations in the long term.

### Matrix technique

Both metal and acrylic matrices can be used for sufficient proximal contact design.

An anatomically preformed sectional matrix in combination with a wedge and ring system should be preferred for Class II restorations to optimize the contact point design and avoid excess.

### Adhesive technique

To improve the long-term quality of the enamel margin and prevent marginal discoloration, the enamel of all direct composite restorations should be etched with phosphoric acid.

2-step-self-etch, 3-step-etch-and-rinse adhesive systems or universal adhesives should be preferred for direct composite restorations.

### Light polymerisation

Light polymerisation is a decisive factor for the clinical success of composite restorations. The correct handling (e.g. polymerisation direction, distance, diameter of the light cone), the energy applied (power x time) and the opacity and shade of the composite are relevant.

Bulk-fill composites can be polymerised safely up to a depth of 4 mm with polymerisation units of appropriate power.

### Polishing and finishing

The composite restoration should be polished to improve the surface and reduce plaque build-up.