

## **ADHESIVE SYSTEMS AND THEIR CLASSIFICATION**

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### **ANNOTATION**

Adhesive system is a material, including the main components agents (etchant, primer, bond) in various combinations and provide micromechanical and chemical bonding of dental materials with hard dental tissues. The following article is devoted to the study of adhesive systems clinical requirements for adhesive systems and their classification.

**Key words:** adhesive systems, dentin, filled and unfilled adhesive systems, light-cured and chemo curable adhesive systems.

Adhesive systems are a complex of complex fluids that promote the attachment of composite and other materials to the hard tissues of the tooth.

Requirements for adhesive systems:

- providing an immediate, resistant to chewing load, long-lasting effect of binding to the tissues of the tooth;
- compensation for stress resulting from shrinkage of the composite material;
- the strength of adhesion to dentin should be similar or equal to adhesion to enamel;
- biocompatibility with dental tissues and insolubility in the oral fluid;
- providing excellent marginal adaptation of the restoration to prevent microleakage, marginal pigmentation and the development of secondary caries;
- providing convenience and ease of use;
- long shelf life;
- versatility and compatibility with most composite materials;
- no sensitizing effect on the patient and the doctor.

Currently, a fairly large number of different adhesive systems have been developed that can provide a strong attachment of the composite to hard dental tissues and other dental materials (plastics, metals, porcelain, etc.). The adhesion

between two substances can be mechanical or chemical in nature, and a combination of these two types of connection is also possible. In the case of attachment to the enamel, a mechanical bond is formed, achieved by the formation of peculiar protrusions by the composite, which enter into the recesses formed after acid etching.

Adhesion to dentin is more difficult because it contains more fluid, which increases when it is irritated. In addition, a smear layer is formed on the surface of the dentin after preparation, consisting of its own smear layer and plugs of the smear layer that clog the dentinal tubules. The composition of this layer includes fragments of dentinal tubules, particles of hydroxyapatite, denatured collagen fibers, microflora cells. The layer reaches a thickness of 0.5-7 microns, depending on the type of preparation, clogs the dentinal tubules and covers the intact intertubular dentin like a gasket. The smeared layer is weakly attached to the underlying tissues: the shear bond strength is 2-6 MPa - this is the ultimate strength of the composite attachment (for comparison, the adhesive strength of the GIC is 4-8 MPa).

Classification of modern adhesive systems. Clutch mechanism:

1st generation, 2nd generation, 3rd generation;

4th generation, 5th generation, 6th generation.

In composition:

- filled;
- unfilled.

By type of solvent:

- acetone-containing,
- alcohol-containing;
- water based;
- combined.

By appointment:

- for adhesion to hard tissues of the tooth;
- universal multifunctional systems.

According to the polymerization method:

- light-cured;
- chemocurable.

## INDICATIONS AND CONTRAINDICATIONS FOR THE USE OF ADHESIVE SYSTEMS FOR DENTAL RESTORATION

Modern adhesive systems have a wide range of indications, allowing you to work with most dental materials. Adhesive systems can provide adhesion to tooth tissues of all light-curing filling materials (composites, composites, brokers); chemical and dual-curing materials (chemo composites, cements for fixing dual-curing orthopedic structures); amalgam, ceramics, noble and non-precious alloys.

Clinical indications for the use of adhesive systems:

1. Direct restorations of carious cavities of I-V classes according to Black.
2. Restoration of non-carious lesions of the teeth.
3. Methods for minimally invasive treatment of dental caries.
4. Correction of color, shape and position of teeth.
5. Treatment of dentine sensitivity.
6. Protection of the pulp after the preparation of teeth for orthopedic constructions.
7. Tooth preparation before fixation of indirect restorations (mechanical)
8. Fixation on the teeth of orthodontic appliances (brackets).
9. Adhesive amalgam technique. tall, ceramic, composite, combined crowns, bridges, inlays, onlays, all types of intracanal pins).
10. Direct restoration in the oral cavity of old fillings from composite, amalgam, repair of ceramic, metal-ceramic, metal-accelerated reel, plastic crowns.

Clinical contraindications to the use of adhesive systems:

1. Allergy to any of the components of the adhesive system.
2. The impossibility of isolating the working field from saliva, gingival liquids.
3. Direct pulp capping.
4. Poor oral hygiene in the patient.

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