

Dental Materials Fact Sheet - Dental Board of California

What about the safety of filling materials? Patient health and the safety of dental treatments are the primary goals of California's dental professionals and the Dental Board of California. The purpose of this fact sheet is to provide you with information concerning the risks and benefits of all the dental material used in the restoration (filling) of teeth.

The Dental Board of California is required by law to make this dental materials fact sheet available to every licensed dentist in the state of California. Your dentist, in turn, must provide this fact sheet to every new, and all, patients of record only once prior to beginning any dental filling procedure. As the patient or parent/guardian, you are strongly encouraged to discuss with your dentist the facts presented concerning the filling materials being considered for your particular treatment.

Allergic Reactions to Dental Materials. Components in dental filling may have side effects or cause allergic reactions, just like other materials you may come in contact with in your daily life. The risks of such reactions are very low for all types of fillings materials. Such reactions can be caused by specific components of the fillings materials, such as mercury, nickel, chromium, and/or beryllium alloys. Usually, an allergy will reveal itself as a skin rash and is easily reversed when the individual is not in contact with the material. There are no documented cases of allergic reactions to composite resin, glass ionomer, resin ionomer, or porcelain. However there have been rare allergic responses reported with dental amalgam, porcelain fused to metal, gold alloys, and nickel or cobalt-chrome alloys. If you suffer from allergies, discuss these potential problems with you dentist prior to a filling material being chosen.

Toxicity of Dental Materials. Dental Amalgam: Mercury in its elemental form is on the State of California's Proposition 65 list of chemicals known to the state to cause reproductive toxicity. Mercury may harm the developing brain of a child or fetus. Dental amalgam is created by mixing elemental mercury (43%-54%) and alloy powder (46%-57% composed mainly of silver, tin and copper). This has caused discussion about the risks of mercury in dental amalgam. Such mercury is emitted in minute amounts as vapor. Some concerns have been raised regarding possible toxicity. Scientific research continues on the safety of dental amalgam. According to the Centers for Disease Control and Prevention, there is scant evidence that the health of the vast majority of people with amalgam is compromised. The FDA and other public health organizations have investigated the safety of amalgam used in dental fillings. The conclusion: no valid scientific evidence has shown that amalgam fillings cause harm to patients with dental restoration, except in the rare cases of allergy. The World Health Organization reached a similar conclusion stating, "Amalgam restorations are safe and cost effective.: A diversity of opinions exist regarding the safety of dental amalgams. Questions have been raised about its safety in pregnant women, children, and diabetics. However, scientific evidence and research literature in peer-reviewed scientific journals suggest that healthy women, children, and diabetics are not at an increased risk from dental amalgam in their mouths The FDA places no restriction on the use of dental amalgam. Composite Resin: Some composite resins include crystalline silica, which is on the State of California's Proposition 65 list of chemicals known to the state to cause cancer.

It is always a good idea to discuss any dental treatment thoroughly with your dentist.

The durability of any dental restoration is influenced not only by the material it is made from but also by the dentist's technique when placing the restoration. Other factors include the supporting materials used in the procedure. The length of time a restoration will last is dependent upon your dental hygiene, home care, diet and chewing habits.

Dental Materials - Advantages and Disadvantages

Dental Amalgam (Silver) Fillings. Dental amalgam is a self-hardening mixture of silver-tin-copper alloy powder and liquid mercury. It is sometimes referred to as silver fillings due to its color. It is often used as a filling material and to replace broken parts of teeth.

Advantages	Disadvantages
Durable and long lasting	Refer to, "What About the Safety of Filling Materials"
Wears well - holds up well to the forces of biting	Gray or silver colored; not tooth colored
Relatively inexpensive	May darken and stain teeth over time due to corrosion
Generally completed in a single visit	Requires some removal of healthy tooth structure
Self-sealing, minimal shrinkage, resists leakage	May weaken and fracture remaining tooth structure in larger fillings
Resistance to further tooth decay is moderate and easy to find	Conducts hot and cold temperature, which may cause tooth sensitivity
Frequency of repair or replacement is low	Contact with other metals may cause occasional, minute electrical flow

Composite Resin Fillings. Composite fillings are a mixture of powdered glass and plastic resin, sometimes referred to as white, plastic, or tooth-colored fillings. It is used for fillings, inlays, veneers, partial and complete crowns, or to repair portions of broken teeth.

Advantages	Disadvantages
Strong and durable	Refer to, "What About the Safety of Filling Materials"
Tooth colored	Moderate occurrence of tooth sensitivity; sensitive to dentist's method of
Resists breaking	Costs more than dental amalgam
Maximum amount of tooth preserved	Material shrinks when hardened and could lead to further decay and/or
Does not corrode	Requires more than one visit for inlays, veneers, and crowns.
Generally holds up well to the forces of biting, depending on the product used	May wear faster than dental enamel
Resistance to further decay is moderate and easy to find	May leak over time when bonded beneath layer of enamel.
Frequency of repair or replacement is low to moderate	

Glass Ionomer Cement. Glass ionomer cement is a self hardening mixture of glass and organic acid. It is tooth-colored and varies in translucency. Glass ionomer is usually used for small fillings, cementing metal and porcelain/metal crowns, liners, and temporary restorations.

Advantages	Disadvantages
Reasonable good esthetics	Cost is very similar to composite resin (which costs more than amalgam)
May provide some help against decay because it releases fluoride	Limited use because it is not recommended for biting surfaces in permanent
Minimal amount of tooth needs to be removed and it bonds well to both the	As it ages, this material may become rough and could increase the accumulation
Usually completed in one dental visit	Does not wear well; tends to crack over time and can be dislodged

Resin Ionomer Cement. Resin ionomer cement is a mixture of glass and resin polymer and organic acid that hardens with exposure to a blue light used in the dental office. It is tooth colored by more translucent than glass ionomer cement. It is most often used for smaller fillings, cementing metal and porcelain metal crowns and liners.

Advantages	Disadvantages
Very good esthetics	Cost is very similar to composite resin (which costs more than amalgam)
May provide some help against decay because it releases fluoride	Limited use because it is not recommended for biting surfaces in adult teeth
Minimal amount of tooth needs to be removed and it bonds well to both the	
Good for non-biting surfaces	
May be used for short-term primary teeth restorations	
May hold up better than glass ionomer but not as well as composite	
Good resistance to leakage	
Usually completed in one dental visit	

Porcelain (Ceramic). Porcelain is a glass-like material formed into fillings or crowns using models of the prepared teeth. The material is colored and is used in inlays, tooth-veneers, crowns, and fixed-bridges.

Advantages	Disadvantages
Very little tooth needs to be removed for use as a veneer; more tooth needs to	Material is brittle and can break under biting forces.
Is resistant to surface wear, but can cause some wear on opposing teeth	
Resists leakage because it can be shaped for a very accurate fit	
The material does not cause tooth sensitivity.	

Nickel or Cobalt-Chrome Alloys. Nickel or cobalt-chrome alloys are mixtures of nickel and chromium. They are a dark silver metal color and are used for crowns and fixed bridges and most partial denture frameworks.

Advantages	Disadvantages
Good resistance to further decay if the restoration fits well	Is not tooth colored; alloy is a dark silver metal color
Excellent durability; does not fracture under stress	Conducts heat and cold; may irritate sensitive teeth
Does not corrode in the mouth	Can be abrasive to opposing teeth
Minimal amount of tooth needs to be removed	High cost; requires at least two office visits and lab services
Resists leakage, because it can be shaped for a very accurate fit	Slightly higher wear to opposing teeth

Porcelain Fused to Metal. This type of porcelain is a glass-like material that is "enameled" on top of metal shells. It is tooth colored and is used for crowns and fixed bridges.

Advantages	Disadvantages
Good resistance to further decay if the restoration fits well	More tooth must be removed (than for porcelain) for the metal substructure.
Material does not cause tooth sensitivity	
Resists leakage, because it can be shaped for a very accurate fit	

Gold Alloy. Gold alloy is a gold-colored mixture of gold, copper, and other metals and is used mainly for crowns and fixed bridges and some partial denture framework.

Advantages	Disadvantages
Good resistance to further decay if the restoration fits well	Is not tooth colored; alloy is yellow
Excellent durability; does not fracture under stress	Conducts heat and cold; may irritat sensitive teeth
Does not corrode in the mouth	High cost; requires at least two office visits and lab services
Minimal amount of tooth needs to be removed	
Wears well; does not cause excesive wear to opposing teeth	
Resists leakage because it can be shaped for a very accurate fit	