

# Dental Material Fact Sheet

## What About the Safety of Filling Materials?

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

The Dental Board of California is required by law\* to make this dental materials facts available to every licensed dentist in the state of California. Your dentist, in turn, must provide this fact sheet to every new patient and all patients of record only once before beginning any dental filling procedure.

As the patient or parent/guardian, you are strongly encouraged to discuss with your dentist the facts presented concerning filling materials being considered for your particular treatment.

\**Business and Professions Code 1678-1648.20*

## Allergic Reaction to Dental Material

Components in dental fillings may have side effects or cause allergic reactions, just like other materials we may come in contact with in our daily lives. The risks of such reactions are very low for all types of filling materials. Such reactions can be caused by specific components of the filling 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 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 response 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 your dentist before a filling material is chosen.

## Toxicity of Dental Materials

### Dental Amalgam

Mercury in its elemental form is on the State of CA 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%) & an alloy power (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 majority with amalgam is compromised.

The Food and Drug Administration (FDA) & other public health organizations have investigated the safety of amalgam used in dental fillings. The conclusion: no valid scientific evidence has shown that amalgams cause harm to patients with dental restorations, expert in rare cases of allergy. The World Health Organizations reaching a similar conclusion stating, "Amalgam restorations are safe and cost effective."

A diversity of options exists regarding the safety of dental amalgams. Questions have been raised about its safety in pregnant women, children and diabetics. However, scientific evidence suggest that otherwise healthy women, children and diabetics are not at an increased risk from dental amalgam in their mouths. The FDA places no restrictions on the 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.

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



# DENTAL MATERIA

## DENTAL AMALGAM FILLINGS

Dental amalgam is a self-hardening mixture of silver-tin-copper alloy powder and liquid mercury and is sometimes referred to as silver fillings because of its color. It is often used as a filling material and replacement for broken teeth.

### Advantages

- ♥ Durable; long lasting
- ♥ Wears well; holds up well to forces of biting
- ♥ Relatively inexpensive
- ♥ Generally completed in one visit
- ♥ Self-Sealing; minimal-to-no shrinkage and resists leakage
- ♥ Resistance to further decay is high, but can be difficult to find in early stages
- ♥ Frequency of repair and replacement is low

### Disadvantages

- Gray color, not tooth color
- Refer to "What about the Safety of Filling Materials"
- May darken as it corrodes; may stain teeth over time
- Requires removal of some healthy tooth
- In larger amalgam fillings, remaining tooth may weaken & fracture remaining tooth
- Because metal can conduct hot & cold temperatures, there may be a temperature sensitivity to hot and cold
- Contact with other metal may cause occasional, minute electrical flow

## 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

- ♥ Reasonably good esthetics
- ♥ May supply some help against decay because it releases fluoride
- ♥ Minimal amount of tooth needs to be removed and it bonds well to both the enamel and the dentin beneath enamel
- ♥ Material has low incidence of producing tooth sensitivity
- ♥ Usually completed in one dental visit

### Disadvantage

- Cost is very similar to composite resin (which costs more than amalgam)
- Limited use because it is not recommended for biting surfaces in permanent teeth
- As it ages, this material may become rough & could in-crust accumulation of plaque & chance periodontal disease
- Does not wear well; tends to crack over time & can be dislodged

## 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 & complete crowns, or to repair broken teeth.

### Advantage

- ♥ Strong & durable
- ♥ Tooth colored
- ♥ Single visit for fillings
- ♥ Maximum amount of tooth preserved
- ♥ Small risk of leakage if bonded only to enamel
- ♥ Does not corrode
- ♥ Generally holds up well to the forces of biting depending on product used
- ♥ Resistance to further decay is moderate and easy to find
- ♥ Frequency of repair or replacement is low to moderate

### Disadvantage

- Refer to "What about the Safety of Filling Materials"
- Moderate occurrence of tooth sensitivity; sensitivity to dentist's method of application
- Costs more than dental amalgam
- Material shrinks when hardened and could lead to further decay and/or temperature sensitivity
- Requires more visits for inlays, veneers & crowns
- May wear faster than dental enamel
- May leak over time when bonded beneath the layer of enamel

## RESIN - IONOMER CEMENT

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

### Advantage

- ♥ Very good esthetics
- ♥ May supply some help against decay because it releases fluoride
- ♥ Minimal amount of tooth needs to be removed and it bonds well to both enamel and the dentin beneath enamel
- ♥ Good for non-biting surfaces
- ♥ May be used for short-term primary teeth restoration
- ♥ May hold up better than glass ionomer but not as well as composite
- ♥ Resists leakage

### Advantages

- ♥ Material has low incidence of producing tooth sensitivity
  - ♥ Usually completed in one dental visit
- ### Disadvantages
- Cost is very similar to composite resin, which costs more than amalgam
  - Limited use because it is not recommended to restore the biting surface of adults
  - Wears faster than composite & amalgam

## S Advantages & Disadvantages

### PORCELAIN (CERAMIC)

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

#### Advantages

- ♥ Very little tooth needs to be removed for use as a veneer; more tooth needs to be removed for a crown because its strength is related to its bulk (size)
- ♥ Good resistance to further decay if the restoration fits well
- ♥ Is resistant to surface wear but can cause some wear on opposing teeth
- ♥ The material does not cause tooth sensitivity

#### Advantages

- ♥ Resists leakage because it can be shaped for very accurate fit

#### Disadvantages

- Material is brittle & can break under biting forces
- May not be recommended for molar teeth
- Higher cost because it requires at least two office visits & laboratory services

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

### NICKEL OR COBALT - CHROME ALLOYS

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

#### Advantages

- ♥ Good resistance to further decay if restoration fits well
- ♥ Excellent durability; does not fracture under stress
- ♥ Does not corrode in mouth
- ♥ Minimal amount of the tooth needs be removed
- ♥ Resists leakage because it can be shaped for a very accurate fit

#### Disadvantages

- Is not tooth colored; alloy is a dark silver color
- Conducts heat & cold; may irritate sensitive teeth
- Can be abrasive to opposing teeth
- High cost; requires at least two office visits & laboratory services
- Slightly higher wear to opposing teeth

### PORCELAIN FUSED TO METAL

This type of porcelain is a glass-like material that is enamelled to top of metal shells. It is tooth-colored and is used for crowns and fixed bridges.

#### Advantage

- ♥ Good resistance to further decay if restoration fits well
- ♥ Very durable, due to metal substructure
- ♥ The material does not cause tooth sensitivity
- ♥ Resists leakage because it can be shaped for a very accurate fit

#### Disadvantages

- More tooth must be removed (than for porcelain) for the metal substructure
- Higher cost because it requires at least two office visits & laboratory services

### 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

- ♥ Good resistance to further decay if the restoration fits well
- ♥ Excellent durability; does not fracture under stress
- ♥ Does not corrode in mouth
- ♥ Minimal amount of tooth needs to be removed
- ♥ Wears well; does not cause excessive wear to opposing teeth

#### Disadvantages

- Is not tooth colored; alloy is yellow
- Conducts heat & cold; may irritate sensitive teeth
- High cost; requires at least two office visits & laboratory services

- ♥ Resists leakage because it can be shaped accurately fit



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