

3M Science.
Applied to Life.™

A close-up photograph of a tooth with a silver amalgam filling. The filling is a dark, metallic, textured material that fills a cavity in the tooth. The tooth itself is white and glossy, with some natural staining and wear visible. The background is a soft, out-of-focus pinkish-red, likely representing the gum tissue. A thin black line runs diagonally across the image, separating the top-left corner (containing the 3M logo) from the rest of the image.

Alternatives to Amalgam

Introduction: Minemata convention on Mercury

“ The Minamata Convention on Mercury is a global treaty, signed by the UK and over one hundred countries from all over the world in October 2013 with the intention of protecting human health and the environment from the adverse effects of mercury. It contains clauses which, for example, limit the use of mercury from all sources, with that including LED light bulbs, fluorescent tubes, fertilisers, thermometers and, of course, dental amalgam. However, dentistry was the only area which ‘escaped’ with a ‘phase down’ in mercury use as opposed to a total ban. The agreement intimated that the mercury limitation would commence within four years, and Annex A part II dealing specifically with dentistry. At the time of writing, the Convention has been ratified by 55 countries and signed by 128 countries, with the arrangements sealed within the Convention being that the Convention would enter into force on 15th August 2017 in the ratifying countries, that being 90 days after the fiftieth ratification was received. The implication of this being that, from 1st July 2018, amalgam use will be banned in the UK for children under the age of 15 years and for pregnant or nursing women.

Where does that leave us? The need to find an amalgam ‘replacement’ is now urgent. Nothing currently exists which possesses all of the ideal properties but Glass Ionomers such as 3M™ Ketac™ Universal Restorative may be suitable for class I cavities where the occlusal load is not excessive, but bulk fill restoratives such as 3M™ Filtek™ One Bulk Fill Restorative may be used for all loadbearing situations in posterior teeth.”

Ideal properties of an amalgam substitute:

- ▶ Self adhesive
- ▶ 5mm depth of cure
- ▶ Low shrinkage stress
- ▶ Good physical properties including good wear resistance
- ▶ Quick and easy to place



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Bulk fill materials as an alternative to amalgam

Resin composite materials have excellent physical properties, when compared with amalgam⁸, but traditional resin composites take longer to place⁹. Bulk fill composites such as 3M™ Filtek™ One Bulk Fill Restorative address this concern with the ability to cure up to 5mm in one increment. Until the 'magic' material which is self adhesive and therefore does not need a bonding stage becomes available, bulk fill materials may well be the best alternative to amalgam in the short-medium term.

3M™ Filtek™ One Bulk Fill Restorative



Filtek One bulk fill restorative is a visible-light activated, restorative composite optimised to create fast and easy restorations. This material provides excellent strength¹ and low wear for durability² and improved aesthetics³. The material can be placed and cured up to 5 mm deep, enabled by a stress-relieving resin system and optimised optical properties. Filtek One bulk fill restorative serves to enhance the 3M lineup of restorative materials by improving the aesthetic properties of a bulk fill material to allow for broader use in both posterior and anterior restorations.

Features

- ▶ Fast and easy one-step placement
- ▶ Increased opacity for improved aesthetics³
- ▶ Stress relief to enable up to 5mm depth of cure⁴
- ▶ Excellent adaptation⁵
- ▶ Excellent handling and sculptability⁶
- ▶ True nanotechnology for superior wear resistance and excellent polish retention²
- ▶ High radiopacity⁷
- ▶ Available in 5 shades: A1, A2, A3, B1, C2

Indications for use

- ▶ Direct anterior and posterior restorations (including occlusal surfaces)
- ▶ Base/liner under direct restorations
- ▶ Core build-ups
- ▶ Splinting
- ▶ Indirect restorations including inlays, onlays and veneers
- ▶ Restorations of deciduous teeth
- ▶ Extended fissure sealing in molars and premolars
- ▶ Repair of defects in porcelain restorations, enamel and temporaries

References

- 1 3M Oral Care Internal Data. Strength. Claim 6841.
- 2 3M Oral Care Internal Data. Nanotechnology; durability, polishability and polish retention. Claim 6809.
- 3 3M Oral Care Internal Data. Increased opacity for improved aesthetics. Claim 6810.
- 4 3M Oral Care Internal Data. 5mm depth of cure. Claim 6822.
- 5 3M Oral Care Internal Data. Easy adaption to cavity and margins. Claim 6763.
- 6 3M Oral Care Internal Data. Excellent adaption and ability to sculpt. Claim 6778.
- 7 3M Oral Care Internal Data. High radiopacity. Claim 6871.
- 8 Burke FJT. Attitudes to posterior composite filling materials: A survey of 80 patients. Dent. Update. 1989;16:114-120.
- 9 Combe EC, Burke FJT, Douglas WH. Clinical Dental Materials. 1999, Kluwer Academic Publishers.

Glass Ionomers as an alternative to amalgam

Whilst bulk fill resin composites provide us with most of the desired properties for an amalgam replacement, there are some situations where a resin composite would not be suitable, such as clinical situations where: moisture control is difficult, rubber dam placement compromised, there is a known allergy to composite or partially erupted teeth. In these circumstances, a glass ionomer restorative may be the next best alternative. Glass ionomer restoratives offer self adhesive one step placement and aesthetics superior to amalgam, however wear resistance and longevity of the restoration are not comparable.

3M™ Ketac™ Universal Glass Ionomer Restorative



Ketac Universal glass ionomer restorative is a strong¹⁰, radiopaque¹¹ glass ionomer restorative which is available in both capsule or handmix format and is used as a bulk placed, vita shaded restorative. The ability of the material to bond chemically to enamel and dentin ensures gentle preparation which is a major advantage over conventional amalgam placement. In Class I and Class II restorations, amalgam often requires the use of a retentive cavity as adhesion to enamel and dentine does not occur. Ketac universal glass ionomer provides an excellent seal on the margins of fillings¹² and can be applied without the need of a liner, cavity conditioner or final glaze for protection. Unlike amalgam, Ketac universal glass ionomer releases fluoride ions¹³ and is available in various shades corresponding to the VITA classical colour system.

Features

- ▶ No need for conditioner or coating
- ▶ Low stickiness for an easy placement¹⁴
- ▶ Available in 6 shades:
White, A1, A2, A3, A3.5 and A4
- ▶ Long-term Class I and Class II with restrictions¹⁵
- ▶ Continuously releases fluoride for over 9 months¹³
- ▶ Self-adhesive
- ▶ Self-cure
- ▶ Radiopaque¹¹

Indications for use

- ▶ Linings for single- and multiple-surface composite fillings
- ▶ Core build-up prior to crown placement
- ▶ Primary tooth fillings
- ▶ Stress-bearing Class I restorations with at least one additional support outside of the filling area
- ▶ Stress-bearing Class II restorations when the isthmus is less than half of the intercuspal distance and with at least one additional support outside of the filling area
- ▶ Cervical fillings
- ▶ Single- and multi-surface temporary fillings
- ▶ Fissure sealing

References

- 10 3M Oral Care Internal Data. Higher compressive strength. Claim 6178
- 11 3M Oral Care Internal Data. Ketac Universal is radiopaque. Claim 06156
- 12 3M Oral Care Internal Data. Adaption to cavity margins. Claim 6224
- 13 3M Oral Care Internal Data. Fluoride release. Claim 6327
- 14 3M Oral Care Internal Data. Low stickiness to instruments allows easy placement. Claim 6232.
- 15 3M Oral Care Internal Data. Long term restricted stress bearing. Claim 6324

Additional products to complement your procedure



3M™ Scotchbond™ Universal Adhesive



Scotchbond Universal Adhesive is a single-bottle solution that offers a simple one-step, one-coat, 35-second application¹⁶ – without compromising strength. Years of clinical evaluations have stacked the evidence. It can be used in all etching techniques, including total-etch, self-etch and selective-etch;¹⁷ in both direct and indirect applications;¹⁸ and on all dental surfaces, without any extra primer¹⁹ – taking versatility to a whole new level.

3M™ Astringent Retraction Paste



Designed predominantly for gingival retraction prior to impression taking, Astringent retraction paste is also indicated for use during the preparation of Class II and V restorations. The paste is able to give good gingival control and haemostasis while making access and moisture control feasible. This was described in the published clinical article by Dr Dawett (Gingival Control, The Dentist, 98, March 2017).

3M astringent retraction paste contains 15% aluminium chloride. The paste is placed directly into the sulcus via a highly innovative, easy to use, hygienic unit-dose capsule. The capsules are compatible with most composite dispensers. Astringent retraction paste is indicated for the temporary retraction of the marginal gingiva to provide a dry sulcus when the periodontium is healthy.

References

16 3M Oral Care Internal Data. 35 second application. Claim 5124.

17 3M Oral Care Internal Data. Uncompromising performance in all adhesive techniques. Claim 4801.

18 3M Oral Care Internal Data. Uncompromising performance in both direct and indirect indications.

19 3M Oral Care Internal Data. Scotchbond Universal bonds to any dental surface without the need for a separate primer. Claim 4820.

Ordering information

3M™ Filtek™ One Bulk Fill Restorative

Shade	Syringe	Capsule	
A1	4866A1	4867A1	Syringe shade refills include:
A2	4866A2	4867A2	1 – 4g syringe; Technique guide; Instructions for use.
A3	4866A3	4867A3	Capsule shade refills include:
B1	4866B1	4867B1	20 – 0.2g capsules; Technique guide; Instructions for use.
C2	4866C2	4867C2	

3M™ Ketac™ Universal Aplicap™ Restorative

Code	Product information
61085	50 capsules Shades White, A2, A3
61086	50 capsules Shade White
61087	50 capsules Shade A1
61088	50 capsules Shade A2
61089	50 capsules Shade A3
61095	50 capsules Shade A3.5
61096	50 capsules Shade A4
61097	Giant Pack A3 300 3M™ Aplicap™ Capsules
73040	3M™ Aplicap™ Activator
73050	3M™ Aplicap™ Applier
76300	3M™ Rotomix™ Capsule Mixing Unit

3M™ Ketac™ Universal Hand Mix Restorative

Code	Product information
61105	12.5g powder Shade White
61106	12.5g powder Shade A1
61107	12.5g powder Shade A2
61108	12.5g powder Shade A3
61109	12.5g powder Shade A3.5
61110	12.5g powder Shade A4
61111	8.5ml liquid
61104	Intro Kit A3 12.5g powder · 8.5ml liquid · spoon · mixing pad

3M™ Scotchbond™ Universal Adhesive

Code	Product information
41254	3M™ Scotchbond™ Universal Adhesive Intro Kit – Vial 1 – 5ml adhesive vial; 50 disposable mixing wells; 50 disposable microbrushes; 1 – 3ml etchant syringe
41258	3M™ Scotchbond™ Universal Adhesive Refill 1 – 5ml adhesive vial
41255	3M™ Scotchbond™ Universal Adhesive Intro Kit – Unit Dose 40 40 unit dose; 1 – 3ml etchant syringe

3M™ Astringent Retraction Paste

Code	Product information
56944	3M™ Astringent Retraction Paste 25 Capsules Refill Pack
56945	3M™ Astringent Retraction Paste 100 Capsules Value Pack

Note: The content of one unit-dose capsule is sufficient to treat up to three (3) teeth.
The capsules are for single use and must not be used on more than one patient.

3M Oral Care

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