

What are the excipients in toothpastes?

Prepared by UK Medicines Information (UKMi) pharmacists for NHS healthcare professionals
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Background

Toothpastes contain a large number of excipients including fluoride, abrasives, detergents, binding agents, humectants, preservatives, colouring agents, antiseptics and flavourings (1). There are reports that some of these excipients cause adverse oral reactions such as cheilitis (due to allergic or irritant contact dermatitis – ACD and ICD), peri-oral eczema, stomatitis, lichenoid reactions, burning mouth syndrome, loss of taste and systemic reactions such as anaphylaxis, rhinitis and breathing difficulties (1-31). There are no data on frequency of toothpaste allergy in the general population (2). However, in case reports and series of patients investigated for cheilitis, the frequency of allergic reactions to toothpastes ranges from 0% to 47%, with a rate of 10% in the largest series involving 202 patients (2,3).

Excipients implicated are flavourings (and their active compounds) – spearmint (carvone), peppermint (menthol), fennel (anethole) and cinnamon or cassia oil (cinnamic aldehyde) (1,4,5). Also the antibacterial, triclosan (6,7), foaming agents such as cocamidopropyl betaine (8,9) and sodium lauryl sulphate (10,11), and preservatives such as parabens (4), polyethylene glycol (8,12) sodium benzoate (13), olaflur (amine fluoride) (14,15) and tin in stannous fluoride (16). Pyrophosphates in tartar-control toothpastes have caused ICD with ulceration, sloughing, erythema, fissuring and a burning sensation (17,18). Tartar-control toothpastes containing pyrophosphates can be a particular problem as they contain higher concentrations of flavourings and detergents to mask the bitter taste of these compounds and increase their solubility (17,18). Essential oils (tea tree oil and propolis) (4,32) and fragrances (limonene and linalool) (33) have also been reported to cause allergy. There are no reports of ACD or stomatitis from fluoride in toothpaste with positive patch test to fluoride, and no reported evidence to support claims that fluoride is allergenic (2).

For patients who experience adverse effects that are thought to be due to their toothpaste, changing to another product that does not contain the suspected excipient results in complete resolution of symptoms within a few weeks or months (4,9,14-18,21,22,24,25,34). If ACD is suspected, patch testing can be helpful in identifying the likely allergen (35,36), but careful technique is needed to avoid false-positive and false-negative reactions (2).

Answer

- The following table is a list of toothpastes widely available in the UK and the excipients they contain that are associated with irritant or allergic reactions affecting the mouth and lips, or systemic adverse effects.
- It can be used to choose a suitable product that does not contain excipients suspected to be the cause of adverse reactions.
- The table also includes fluoride content, and sweeteners and other excipients which may be undesirable.

Key:	CAPB	cocamidopropyl betaine	NS	detail not specified
	PEG	polyethylene glycol	PPM	parts per million
	PP	pyrophosphate	SLS	sodium lauryl sulphate

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
AloeDent by Optima Health & Nutrition (Telephone 01274 526360)										
Children's Fluoride-free	None	Tea tree						Sorbitol Xylitol		
Miswak	None	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Sensitive Fluoride	1500	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Sensitive Fluoride-free	None	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Triple Action Fluoride	1500	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Triple Action Fluoride-free	None	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Whitening Fluoride	1500	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		
Whitening Fluoride-free	None	Tea tree	Menthol Peppermint		Limonene			Sorbitol Xylitol		

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Aquafresh by GlaxoSmithKline (Telephone 0800 783 8881)										
Big Teeth	Yes		Aroma <i>NS</i>	CAPB	Limonene			Sorbitol	Saccharin	
Complete Care Whitening	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Extreme Clean Pure Breath	Yes		Aroma <i>NS</i> Citral	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Fresh n Minty	Yes		Aroma <i>NS</i>	SLS	Limonene	PEG-6/PEG-8		Sorbitol	Saccharin	
High Definition White Illuminating Mint	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
High Definition White Tingly Mint	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Intense Clean Deep Action	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Intense Clean Lasting Fresh	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Intense Clean Whitening	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Little Teeth	Yes		Aroma <i>NS</i>	CAPB	Limonene			Sorbitol	Saccharin	
Mild n Minty	Yes		Aroma <i>NS</i>	SLS	Limonene	PEG-6/PEG-8		Sorbitol	Saccharin	
Milk Teeth	Yes		Aroma <i>NS</i>	CAPB				Sorbitol	Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Arm and Hammer by Church and Dwight UK (Telephone 0800 121 6080)										
Advance Cavity Care	1100		Aroma <i>NS</i>	SLS	Limonene		Tetrasodium PP	Sorbitol	Saccharin	
Advance White	1450		Aroma <i>NS</i>	SLS			Tetrasodium PP	Sorbitol	Saccharin	
Advance White Intense Fresh	1450		Aroma <i>NS</i>	SLS	Limonene		Tetrasodium PP	Sorbitol	Saccharin	
Advance White Sensitive	1450		Aroma <i>NS</i>	SLS	Limonene			Sorbitol	Saccharin	
Enamel Pro Repair Sensitive	1100		Aroma <i>NS</i>	SLS	Limonene	PEG-8 PEG/PPG-38/8 copolymer PEG/PPG 166-66 copolymer			Saccharin	
Enamel Pro Repair Whitening	1100		Aroma <i>NS</i>	SLS	Limonene	PEG-8 PEG/PPG-38/8 copolymer PEG/PPG 166-66 copolymer			Saccharin	
Original Coolmint	1100		Aroma <i>NS</i>	SLS	Limonene	PEG-8			Saccharin Sucrose octaacetate	
Total Pro Clean & Repair	1450		Aroma <i>NS</i>		Limonene	PEG-8 PEG/PPG 166-66 copolymer Polyethylene			Saccharin	
Truly Radiant	1450		Aroma <i>NS</i>	SLS	Limonene	PEG-8 PEG/PPG 166-66 copolymer Polyethylene			Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Beverly Hills Formula by Purity Laboratories (Telephone 00 353 1842 6611 - ROI)										
Natural White	1000	Triclosan	Doublemint	SLS	Limonene	PEG-32		Sorbitol Xylitol	Saccharin	
Natural White Gentle Sensitive	1000		Doublemint	SLS	Limonene			Sorbitol Xylitol	Saccharin	
Perfect White	1400		Freshmint	CAPB SLS	Limonene	PEG-32	Tetra-sodium PP	Sorbitol	Saccharin	
Perfect White Black	1400		Freshmint	CAPB SLS	Limonene	PEG-32	Tetra-sodium PP	Sorbitol	Saccharin	
Perfect White Sensitive	1400		Freshmint	CAPB SLS	Limonene	PEG-32	Tetra-sodium PP	Sorbitol	Saccharin	
Sensitive Whitening Expert	1000		Doublemint	SLS	Limonene			Sorbitol Xylitol	Saccharin	
Total Protection Whitening	1000	Triclosan	Doublemint	SLS	Limonene	PEG-32		Sorbitol Xylitol	Saccharin	
Biotène by GlaxoSmithKline (Telephone 0800 783 8881)										
Dry Mouth	Yes		Aroma NS	CAPB	Limonene	PEG-6		Sorbitol	Saccharin Sucralose	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
BlanX by Coswell (Telephone Acdoco 0161 359 4130)										
Active Enamel Protection	890		Aroma NS	SLS	Eugenol Limonene	Benzyl alcohol PEG-32 Sodium benzoate		Sorbitol Xylitol	Saccharin	
Advanced Whitening	890		Aroma NS		Eugenol Limonene	Benzyl alcohol Sodium benzoate		Sorbitol Xylitol	Saccharin	
Classic White	890		Aroma NS		Eugenol Limonene	Benzyl alcohol Sodium benzoate		Sorbitol Xylitol	Saccharin	
Extrawhite Intensive Whitening Treatment	792		Aroma NS	SLS	Eugenol Limonene	Parabens PEG-32	Tetra-potassium PP	Sorbitol	Saccharin	
Intensivee Stain Removal	890		Anethole Aroma NS Menthol Peppermint		Eugenol Limonene	Benzyl alcohol Sodium benzoate		Sorbitol Xylitol	Saccharin	
Sensitive Teeth	890		Aroma NS	SLS		Benzyl alcohol Parabens PEG-32		Sorbitol Xylitol	Saccharin	
White Shock White & Protect	950		Aroma NS	SLS		Benzyl alcohol Sodium benzoate		Sorbitol	Saccharin	
White Shock Protect	950		Aroma NS	SLS	Limonene	Benzyl alcohol Sodium benzoate		Sorbitol Xylitol	Saccharin	
Brilliant by Lornamead (Telephone 01225 768491)										
<i>No details available from the manufacturer or their website</i>										
Clinomyn by Lornamead (Telephone 01276 674000)										
<i>No details available from the manufacturer or their website</i>										

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Colgate by Colgate-Palmolive (Telephone 0800 321 321 32)										
2in1 Icy Blast (and mouthwash)	1100		Aroma NS Cinnamal	CAPB SLS	Eugenol Limonene	Polyethylene	Tetrasodium PP	Sorbitol	Saccharin	
2in1 Whitening (and mouthwash)	1100		Aroma NS	CAPB SLS	Limonene		Tetrasodium PP	Sorbitol	Saccharin	
Advanced Whitening	1450		Aroma NS	SLS	Limonene	PEG-12 Polyethylene		Sorbitol	Saccharin	
Anti-Tartar + Whitening	1450		Aroma NS	SLS	Limonene	PEG-12	Tetrasodium PP	Sorbitol	Saccharin	
Cavity Protection Great Regular Flavour	1450		Aroma NS	SLS	Limonene		Tetrasodium PP		Saccharin	
Deep Clean Whitening with Baking Soda	1100		Aroma NS	SLS	Limonene				Saccharin	
Fresh Gel	1450		Aroma NS	SLS	Limonene	PEG-12		Sorbitol	Saccharin	
Max Fresh ActiClean	1450		Aroma NS Menthol	CAPB SLS	Limonene	PEG-12		Sorbitol	Saccharin	
Max Fresh Crystal Mint	1450		Aroma NS	CAPB SLS	Limonene	PEG-12	Tetrasodium PP	Sorbitol	Saccharin	
Max Fresh Intense Foam	1450		Aroma NS Menthol	CAPB SLS	Limonene	PEG-12		Sorbitol	Saccharin	
Max Fresh with Cooling Crystals	1450		Aroma NS Menthol	CAPB SLS	Limonene	PEG-12		Sorbitol	Saccharin	
Max Fresh with Mouthwash Beads	1450		Aroma NS Menthol	CAPB SLS	Limonene	PEG-12	Tetrasodium PP	Lactose Sorbitol	Saccharin	
Maximum Cavity Protection 3+ Years	1450		Aroma NS	SLS		Benzyl alcohol	Tetrasodium PP		Saccharin	
Maximum Cavity Protection Fresh Mint	1450		Aroma NS	SLS		Benzyl alcohol	Tetrasodium PP		Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Colgate by Colgate-Palmolive (Telephone 0800 321 321 32) <i>continued</i>										
Maximum Cavity Protection Whitening	1450		Aroma <i>NS</i>	SLS	Limonene	Benzyl alcohol	Tetrasodium PP		Saccharin	
Max White Expert White Cool Mint	1450		Aroma <i>NS</i>	SLS	Limonene	PEG-12 PEG/PPG 116/66 copolymer Propylene glycol	Calcium PP Tetrasodium PP		Saccharin	
Max White Expert White Soft Mint	1450		Aroma <i>NS</i>	SLS	Eugenol Limonene	PEG-12 PEG/PPG 116/66 copolymer Propylene glycol	Calcium PP Tetrasodium PP		Saccharin	
Max White One	1450		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-12 Polyethylene	Tetra-potassium PP	Sorbitol	Saccharin	
Max White Optic	1450		Aroma <i>NS</i>	SLS	Eugenol	PEG-12			Saccharin	
Max White + Protect	1450		Aroma <i>NS</i>	CAPB SLS	Eugenol	PEG-12		Sorbitol	Saccharin	
Max White Shine	1450		Aroma <i>NS</i>	CAPB SLS	Eugenol Limonene	PEG-12	Tetrasodium PP	Sorbitol	Saccharin	
Minions 4+ years	1450		Aroma <i>NS</i> Cinnamal Menthol	SLS	Eugenol Limonene	PEG-12		Sorbitol	Saccharin	
Sensitive Extra Fresh with Sensifoam	1450		Aroma <i>NS</i>	CAPB SLS	Eugenol Limonene	PEG-12	Tetrasodium PP	Sorbitol	Saccharin	
Sensitive Multi Protection with Sensifoam	1450		Aroma <i>NS</i>	CAPB SLS	Eugenol Limonene	PEG-12	Tetra-potassium PP	Sorbitol	Saccharin	
Sensitive Pro-Relief	1450		Aroma <i>NS</i>	SLS	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Colgate by Colgate-Palmolive (Telephone 0800 321 321 32) <i>continued</i>										
Sensitive Pro-Relief Enamel Repair	1450		Aroma NS	SLS	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin	
Sensitive Pro-Relief Extra Strength Whitening	1450		Aroma NS	SLS	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin	
Sensitive Pro-Relief Multi-Protection	1450		Aroma NS	SLS	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin	
Sensitive Pro-Relief Repair and Prevent	1450		Aroma NS	CAPB	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin Sucralose	
Sensitive Pro-Relief with Whitening	1450		Aroma NS	SLS	Limonene	Benzyl alcohol	Tetrasodium PP	Sorbitol	Saccharin	
Sensitive Whitening with Sensifoam	1450		Aroma NS	CAPB SLS	Eugenol Limonene	PEG-12		Sorbitol	Saccharin	
Smiles Baby 0-2 years	1000		Anethole Aroma NS	SLS		PEG-12		Sorbitol	Saccharin	
Smiles 3-5 years	1450		Aroma NS	SLS		PEG-12		Sorbitol	Saccharin	
Smiles Junior 6+ years	1450		Aroma NS	SLS		PEG-12		Sorbitol	Saccharin	
Total Pro Gum Health	1450	Triclosan	Mint	SLS		Propylene glycol		Sorbitol	Saccharin	
Total Pro Gum Health + Whitening	1450	Triclosan	Peppermint	SLS		Propylene glycol		Sorbitol	Saccharin	
Total Sensitive	1450	Triclosan	Aroma NS	SLS	Limonene				Saccharin	
Triple Action Original Mint	1450		Aroma NS	SLS	Limonene				Saccharin	
Triple Cool Stripe	1450		Aroma NS	SLS	Limonene	PEG-12			Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Corsodyl by GlaxoSmithKline (Telephone 0800 783 8881)										
Extra Fresh <i>Caution: there are two formulations of this product</i>	Yes		Aroma NS	CAPB	Limonene				Saccharin	
	Yes		Aroma NS Peppermint Wildmint	CAPB	Limonene Linalool				Saccharin	Alcohol
Original <i>Caution: there are two formulations of this product</i>	Yes		Aroma NS	CAPB					Saccharin	
	Yes		Aroma NS Peppermint Wildmint	CAPB	Limonene Linalool				Saccharin	Alcohol
Dental Gel	None		Levo-menthol Peppermint							Isopropyl alcohol
Ultra Clean <i>Caution: there are two formulations of this product</i>	Yes		Aroma NS	CAPB	Limonene				Saccharin	
	Yes		Aroma NS Peppermint Wildmint	CAPB	Limonene Linalool				Saccharin	Alcohol
Whitening <i>Caution: there are two formulations of this product</i>	Yes		Aroma NS	CAPB					Saccharin	
	Yes		Peppermint Wildmint	CAPB	Limonene Linalool				Saccharin	Alcohol
Dr Organic by Dr Organic (Telephone 01792 646475)										
Aloe Vera	1000		Menthol Peppermint		Limonene	Sodium benzoate		Sorbitol Xylitol		
Pomegranate	Yes		Aroma NS Menthol		Limonene	Sodium benzoate		Sorbitol Xylitol		
Tea Tree	Yes	Tea tree	Menthol Peppermint			Sodium benzoate		Sorbitol Xylitol		

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Euthymol by Johnson and Johnson (Telephone 01628 822222)										
Original	None		Aroma NS	SLS				Sorbitol	Saccharin	
Janina Ultrawhite Whitening by Brodie & Stone (Telephone 0207 299 7400)										
Activated Charcoal	1500		Wildmint	SLS	Limonene Linalool	Parabens	Tetrasodium PP	Sorbitol Xylitol	Saccharin	
Enamel Repair	1500		Wildmint	SLS	Limonene Linalool	Parabens	Tetrasodium PP	Sorbitol Xylitol	Saccharin	
Extra Strength	1500		Wildmint	SLS	Limonene Linalool	Parabens	Tetrasodium PP	Sorbitol Xylitol	Saccharin	
Maxiwhite Super Strength	1500		Wildmint	SLS	Limonene Linalool	Parabens Phenoxyethanol	Tetrasodium PP	Sorbitol Xylitol	Saccharin	
Sensitive	1500		Wildmint	SLS	Limonene Linalool	Parabens	Tetrasodium PP	Sorbitol Xylitol	Saccharin	
Kingfisher by Kingfisher Natural Toothpaste (Telephone 01603 630484)										
Aloe Vera, Tea Tree and Fennel Fluoride-free	None	Tea tree	Fennel		Limonene					
Aloe Vera, Tea Tree and Mint Fluoride-free	None	Tea tree	Fennel Peppermint		Limonene					
Baking Soda Fluoride-free	None		Fennel Peppermint Spearmint		Limonene					
Strawberry Fluoride-free	None		Aroma NS Fennel		Limonene					
Fennel with Fluoride	1450		Anethole Fennel		Limonene					

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Kingfisher by Kingfisher Natural Toothpaste (Telephone 01603 630484) <i>continued</i>										
Fennel Fluoride-free	None		Anethole Fennel		Limonene					
Mint with Fluoride	1450		Fennel Peppermint		Limonene					
Mint Fluoride-free	None		Fennel Peppermint		Limonene					
MacLeans by GlaxoSmithKline (Telephone 0800 783 8881)										
Fresh Mint	Yes		Aroma NS	SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Ice Whitening Gel	Yes		Aroma NS	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Total Health Whitening	Yes		Aroma NS Citral	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
White & Shine	Yes		Aroma NS	CAPB SLS	Limonene			Sorbitol	Saccharin	
Oral-B by Procter and Gamble (Telephone 0800 7311792)										
3D White Luxe Glamorous White	1100		Aroma NS	CAPB SLS	Limonene	PEG-6 Sodium benzoate			Saccharin Sucralose	
3D White Luxe Healthy Shine	1450		Aroma NS	CAPB	Limonene	PEG-20M Sodium benzoate		Sorbitol Xylitol	Saccharin Sucralose	
3D White Luxe Pearl Glow	1100		Aroma NS	CAPB SLS	Limonene	PEG-6 Sodium benzoate			Saccharin Sucralose	
3D White Luxe Pearl Shine Whitening	1450		Aroma NS	CAPB	Limonene	PEG-20M Sodium benzoate	Disodium PP	Sorbitol Xylitol	Saccharin Sucralose	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Oral-B by Procter and Gamble (Telephone 0800 7311792) <i>continued</i>										
3D White Luxe Perfection	1100		Aroma NS	CAPB SLS	Limonene	PEG-6 PEG-20M Sodium benzoate			Saccharin Sucralose	
3D White Soft Mint	1100		Aroma NS	SLS	Limonene		Disodium PP	Sorbitol	Saccharin	Alcohol
3D White Whitening Accelerator	None		Aroma NS	SLS	Limonene	PEG-6 PEG-20M Propylene glycol			Saccharin	
3D White Vitalising Fresh	1100		Aroma NS	SLS	Limonene		Disodium PP	Sorbitol	Saccharin	Alcohol
Complete Extra White	1450		Aroma NS	SLS	Eugenol Limonene Linalool			Sorbitol	Saccharin	
Complete Long Lasting Fresh	1450	Cetylpyridinium chloride	Aroma NS	SLS				Sorbitol	Saccharin	
Complete Refreshing Clean	1450	Cetylpyridinium chloride	Aroma NS	SLS	Limonene			Sorbitol	Saccharin	
Complete White & Naturally Fresh	1450		Aroma NS	SLS	Limonene			Sorbitol	Saccharin	
Pro-Expert Deep Clean	1450		Aroma NS	SLS		PEG-6 Propylene glycol		Stannous fluoride	Saccharin	
Pro-Expert Healthy Fresh	1450		Aroma NS	SLS	Limonene	PEG-6 Propylene glycol		Stannous fluoride	Saccharin	
Pro-Expert Healthy White	1450		Aroma NS	SLS	Limonene	PEG-6 Propylene glycol		Stannous fluoride	Saccharin	
Pro-Expert Professional Protection	1450		Aroma NS Cinnamal	SLS	Eugenol	PEG-6 Propylene glycol		Stannous fluoride	Saccharin	

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		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Oral-B by Procter and Gamble (Telephone 0800 7311792) <i>continued</i>										
Pro-Expert Strong Teeth	1450		Aroma <i>NS</i>	SLS	Limonene	PEG-6 Propylene glycol		Stannous fluoride	Saccharin	
Pro-Expert Stages featuring Disney Cars and Planes	Yes		Aroma <i>NS</i>	SLS	Limonene	Benzyl alcohol		Sorbitol	Saccharin	
Pro-Expert Stages featuring Disney Frozen	Yes		Aroma <i>NS</i>	SLS	Limonene	Benzyl alcohol		Sorbitol	Saccharin	
Stages featuring Winnie the Pooh	500		Aroma <i>NS</i>	SLS	Limonene			Sorbitol	Saccharin	
oraNurse by RIS Products (Telephone 01438 840135)										
0-3 years	1000					Sodium benzoate		Sorbitol Xylitol		
4+ years	1450					Sodium benzoate		Sorbitol Xylitol		
Original	1450					Sodium benzoate		Sorbitol Xylitol		

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Pearl Drops by Church and Dwight UK (Telephone 0800 121 6080)										
Everyday White	1400		Aroma NS	SLS	Limonene	PEG-12	Tetrasodium PP Tetra-potassium PP	Sorbitol	Saccharin	
Instant Natural White	1100		Aroma NS			PEG-12		Sorbitol	Saccharin	
Instant White Plus	1300		Aroma NS	CAPB	Limonene	PEG-12		Sorbitol	Saccharin	
Lasting Flawless White	1450		Aroma NS		Limonene	PEG-8 PEG/PPG 166-66 copolymer Polyethylene			Saccharin	
Pro-White	1300		Aroma NS	SLS	Limonene	PEG-12		Sorbitol	Saccharin	Alcohol
Restore White	1300		Aroma NS	SLS	Limonene	PEG-12		Sorbitol	Saccharin	Alcohol
Ultimate Whitening	1300		Aroma NS	SLS	Limonene	PEG-12		Sorbitol	Saccharin	
Rapid White by Lornamead (Telephone 01225 716190)										
<i>No details available from the manufacturer or their website</i>										

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
Sensodyne by GlaxoSmithKline (Telephone 0800 783 8881)										
Complete Protection Extra Fresh	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-8			Saccharin	
Daily Care Extra Fresh	Yes		Aroma <i>NS</i>	CAPB	Limonene			Sorbitol	Saccharin Sucralose	
Deep Clean Gel	Yes		Aroma <i>NS</i>	CAPB SLS	Limonene	PEG-6		Sorbitol	Saccharin	
Pronamel Daily Protection	Yes		Anise alcohol Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	
Pronamel Extra Fresh	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	
Pronamel for Children	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin Sucralose	
Pronamel Gentle Whitening	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	
Pronamel Multi-Action	Yes		Aroma <i>NS</i>	CAPB	Eugenol Limonene			Sorbitol	Saccharin	
Repair & Protect	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-8			Saccharin	
Repair & Protect Extra Fresh	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-8			Saccharin	
Strong and Bright	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	
Total Care Gentle Whitening	Yes		Aroma <i>NS</i>	CAPB		PEG-6		Sorbitol	Saccharin	
True White	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	
True White Extra Fresh	Yes		Aroma <i>NS</i>	CAPB	Limonene	PEG-6		Sorbitol	Saccharin	

Toothpaste name and manufacturer	Fluoride (ppm)	Excipients associated with adverse reactions (see Limitations)							Other excipients	
		Anti-bacterial	Flavouring	Foaming agent	Fragrance	Preservative/Solvent	Pyro-phosphate	Other	Sweetener	Alcohol
The Clay Cure by The Clay Cure (Telephone 07971 522429)										
No 1 Sweet Fennel	None		Fennel					Xylitol		
No 2 Spearmint and Lemon	None		Spearmint					Xylitol		
UltraDEX by Periproducts (Telephone 01344 578004)										
Low Abrasion	1000		Menthol Peppermint		Limonene				Saccharin	
Sensitive	1000		Menthol Peppermint Spearmint		Limonene				Saccharin	
Weleda by Weleda UK (Telephone 0115 944 8200)										
Calendula	None		Aroma NS		Limonene					Alcohol
Plant Gel	None		Aroma NS		Limonene					Alcohol
Salt	None		Aroma NS Peppermint		Limonene Linalool					Alcohol
Ratanhia	None				Limonene					Alcohol
Children's Tooth Gel	None		Aroma NS		Limonene					

Summary

- Toothpastes contain excipients which can cause adverse reactions affecting the mouth and lips, and systemic hypersensitivity.
- Excipients most commonly implicated are flavourings such as spearmint, peppermint, fennel, cinnamon and cassia oil, but preservatives, foaming agents, antibacterials, pyrophosphates and essential oils can also cause adverse reactions.
- This Medicines Q&A lists toothpastes widely available in the UK and the excipients they contain which have been associated with adverse reactions or may be undesirable.

Limitations

1. This is not an exhaustive list of all toothpastes available in the UK. Supermarkets' or stores' own-branded products are not included.

2. Only excipients reported as relatively common allergens (1-4,33), or one of the 26 allergenic substances listed within annex III of the European Commission's (EC) Cosmetics Regulation (37) (shown in *italics* in the table below), are included in the table plus a few selected excipients which some people may find undesirable. These include:

Alcohol	Alcohol
Antibacterials	propolis, tea tree oil, triclosan
Flavourings	anethole, <i>anise alcohol</i> , aroma <i>NS</i> , carvone, cassia oil, <i>cinnamal</i> , cinnamic aldehyde, cinnamon, <i>citral</i> , doublemint, fennel, flavour <i>NS</i> , herbalmint, levomenthol, menthol, mint, peppermint, spearmint, wildmint, wintergreen
Foaming agents	CAPB, SLS
Fragrances	<i>eugenol</i> , <i>limonene</i> , <i>linalool</i>
Others	colophony, lactose, methylsalicylate, sorbitol, vitamin E, xylitol
Preservatives	<i>benzyl alcohol</i> , macrogols, parabens, PEG, polyethylene, propylene glycol, sodium benzoate
Pyrophosphates	bisodium PP, calcium PP, tetrapotassium PP, tetrasodium PP
Sweeteners	beta-D glucose, potassium acesulfame, saccharin, sucralose, sucrose octaacetate
EC allergenic substances (if not listed in the rows above):	<i>alpha-isomethyl ionone</i> , <i>amyl cinnamal</i> , <i>amylcinnamyl alcohol</i> , <i>cinnamyl alcohol</i> , <i>benzyl benzoate</i> , <i>benzyl cinnamate</i> , <i>benzyl salicylate</i> , <i>butylphenyl methylpropional</i> , <i>citronellol</i> , <i>coumarin</i> , <i>evernia furfuracea</i> , <i>evernia prunastri</i> , <i>farnesol</i> , <i>geraniol</i> , <i>hexylcinnamal</i> , <i>hydroxycitronellal</i> , <i>hydroxyisohexyl 3-cyclohexane carboxaldehyde</i> , <i>isoeugenol</i> , <i>methyl 2-octynoate</i> .

Note: Aroma *NS* and Flavour *NS*: manufacturers do not have to name ingredients on product labelling if the concentration falls below the threshold stated in the Cosmetics Regulation, even if they are one of the 26 EC allergens. The thresholds are 0.001% for leave-on products and 0.01% for rinse-off products (37,38).

3. Absence of any other excipient from the table in this Medicines Q&A (other than those listed above) does not mean it is not included within a toothpaste. Also, we cannot guarantee that the toothpaste has not been in contact with the excipient during the manufacturing process. If further information is required, check with the manufacturer.

4. Within the table, excipients have been categorised according to their most common use but many have additional uses and may be suitable for inclusion within another category – where this is the case, they have been listed only once. The source of excipients has not been stated.

5. Formulations may be subject to change, but the information contained in this document is accurate at the time of publication. Excipient content has been confirmed with the manufacturer or by checking the manufacturer's website.

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The following sources were used to assemble the tables of toothpastes and excipients:

- Manufacturer's websites. Accessed May-July 2017.
- Personal communication with manufacturers by email or telephone. May-August 2017.
- European Commission CosIng database <http://ec.europa.eu/growth/tools-databases/cosing/> Accessed August 2017.

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Search strategy

1. Embase 1974 to date - Toothpaste/ AND (Excipient/ OR exp Hypersensitivity/) - for information added since 2014/01/01.
2. Medline 1950 to date - Toothpaste/ AND (Excipient/ OR exp Hypersensitivity/); exp Dentifrices/ AND (exp Excipient/ OR exp Hypersensitivity/) - for information added since 2014/01/01.
3. In-house databases and resources
4. Internet search (www.google.co.uk – toothpaste allergy)
5. Professional bodies (www.bda.org – toothpaste or allergy)
6. Clinical experts – contacted January 2011 when developing the first issue of this Medicines Q&A:
 - Dr Lesley Longman, Senior Lecturer/Honorary Consultant in Special Care and Restorative Dentistry, and Clinical and Teaching Lead for Sedation and Special Care Dentistry, School of Dental Sciences, Liverpool.
 - Dr Anne Field, Clinical Director and Consultant/Honorary Professor in Oral Medicine, Liverpool University Dental Hospital, Liverpool.
 - Dr Clodagh King, Consultant Dermatologist, Broadgreen Hospital, Liverpool.