Toothpastes

What all make them safe for your dental care?

When it comes to toothpastes, we usually stick to the brands we know or have been using. So it's more about familiarity (or convenience, or both) than any particular consideration for the quality, efficacy or even safety aspects. Yet, no matter what our current toothpaste-shopping habits are, understanding the facts and ingredients of it can make us more informed consumers. One will be more likely to check out the ingredients list next time if one realises that many toothpastes do contain flavouring, sweeteners and other chemical ingredients. Or that there are limits for fluoride content in both fluoridated and non-fluoridated toothpastes. With so many brands and types of toothpaste in the market, and with as many advertising claims, it can be daunting to work one's way through the clutter – and hence knowing about the ingredients should be the very first important step. We tested eight toothpaste brands on attributes that determine their efficacy. Do these fulfil the basic requirements specified in the national standard? The good thing is that the restrictions for fluoride are clearly being adhered to by all manufacturers, ensuring that these toothpastes are safe for dental care.

A Consumer Voice Report

We tested the eight brands on parameters such as presence of nicotine and heavy metals, microbiological contamination, fluoride ion, fineness, foaming power, dispensing, inertness, gritty matter, pH and stability.

The samples were tested as per specifications in Indian Standard 6356 –2001, with amendments that cover non-fluoride/fluoridated type of toothpastes. The tests were conducted at an NABL-accredited laboratory.

BRANDS TESTED

Rank	Total Score out of 100 (rounded off)	Brand	Variant	Type	Quantity (gm)	MRP (Rs)	Price per 100 gm	Best before (months)	Manufactured/ Marketed by
Fluoridated									
1	97	Colgate	Strong teeth	Fluoridated	800 (buy 3, get 1 free)	264	44.00	23	Colgate Palmolive Ltd
1	97	Closeup	Ever fresh	Foaming, fluoridated	150+150	144	48.00	24	HUL Ltd
2	94	Pepsodent	Cavity protection	Foaming, fluoridated	150+150 (toothbrush worth Rs 30 free)	118	39.33	24	HUL Ltd
2	94	Sensodyne	Fresh mint (for sensitive teeth)	Foaming, fluoridated	150	160	106.0	24	GSK Asia Pvt. Ltd
3	92	Himalaya	Complete care	Foaming, fluoridated	150	76	50.66	36	Himalaya Drugs Co.
Non-Fluoridated									
1	97	Meswak	Complete oral care	Foaming, non-fluoridated	200	96	48.00	24	Dabur India Ltd
2	95	Babool	Cavity protection	Foaming, non-fluoridated	175+175 (two toothbrushes worth Rs 30 free)	88	25.14	24	Dabur India Ltd
3	93	Himalaya	Sparkling white	Non-fluoridated	150+150+80 free	170	56.66	36	Himalaya Drugs Co.

*Score Rating: >90: very good*****, 71–90: good****, 51–70: fair***, 31–50: average**, up to 30: poor**

CV RECOMMENDATIONS | TOP PERFORMERS

Fluoridated

Colgate | Closeup

Non-Fluoridated

Meswak

VALUE FOR MONEY

Fluoridated

Pepsodent

Non-Fluoridated

Babool

Key Findings

- Based on the overall test findings, Colgate and Closeup are the top performers in fluoridated category and in non-fluoridated category it is Meswak.
- The value-for-money brands are Pepsodent in fluoridated category and Babool in non-fluoridated category.
- Pepsodent followed by Colgate were found to have the highest foaming power.
- All brands fulfilled all requirements specified in Indian Standard.
- All brands performed well on quality parameters such as pH, fluoride ion, fineness, stability, dispensing and inertness.
- Nicotine was not found in any of the tested brands.
- All brands passed in the microbiological and heavy metal tests.

Toothpaste is defined as a dentifrice in the form of a smooth, semisolid, homogeneous mass containing acceptable ingredients such as abrasives/polishing agents, surface-active agents, humectants, binding agent, foaming agents and other appropriate substances for oral-health maintenance. The product can be opaque, transparent, or a combination thereof, coloured or white. It must be packed in a suitable container from which it can be extruded in the form of a continuous mass.

While no stipulations have been made regarding the composition of toothpastes, it is essential that the formulation does not contain any ingredient that may cause a toxic or irritating reaction when used in the mouth, nor shall it be harmful in normal use, keeping in mind that small amounts may be ingested inadvertently.

TEST RESULTS FOR PHYSICOCHEMICAL PARAMETERS

Nicotine | Heavy Metals | Microbiological Contamination | Fineness | Fluoride Ion | Stability | Foaming Power | pH | Dispensing | Inertness | Gritty Matter

◆ Nicotine

We tested the samples for presence of nicotine since some toothpastes are said to contain the same. Nicotine use in dentifrices can have harmful effects.

- *None of the eight brands was found to have nicotine.*

◆ Heavy metals

Presence of heavy metals above the maximum permissible limit as per the Indian Standard can be harmful. All the brands were tested for lead and arsenic. For both fluoridated and non-fluoridated toothpastes, the maximum permissible limit for lead is 20 ppm and for arsenic it is 2 ppm.

- *All brands were within the specified limit for the heavy metals lead and arsenic. Traces of these metals were found in Babool, Sensodyne and Meswak but these remained below the maximum limits.*

All eight brands were found to be microbiologically safe for consumption, having met the requirements of the national standards. These brands were tested for total viable count (TVC) and gram-negative pathogens.

◆ Fineness (particles retained on sieve)

Fineness of the toothpaste was checked on two sieves of 150 and 75 microns.

- *All the brands were within the specified limit.*

◆ Fluoride ion

The national standard has specified 1,000 ppm as the maximum limit for fluoride ion in fluoridated toothpastes and 50 ppm in non-fluoridated toothpastes.

Fluoride is the fluorine ion added to toothpastes to help protect our teeth from cavities. While increasing the concentration of systemic fluoride (e.g., through fluoridating drinking water) has not been proven to reduce the incidence of tooth decay, direct contact between fluoride and teeth strengthens and helps re-mineralize damaged enamel. At the same time, excessive fluoride content may cause fluoride toxicity, also known as fluorosis.

- *All the brands of fluoridated as well as non-fluoridated toothpastes met the specified requirements.*
- *Closeup, Colgate and Babool scored highest on this parameter.*

It may be noted that Indian Standard specifies the maximum fluoride content for non-fluoridated and fluoridated toothpastes but do not specify the lower limit.

Comparative Test

◆ Stability

The toothpaste shall not show any physical sign of deterioration during normal conditions of storage and use.

- *All brands fulfilled the required conditions.*

◆ Foaming Power

Foaming is required to be a minimum 50 ml in toothpastes as per the relevant Indian Standard.

- *Foam in all the brands was above the minimum requirement of 50 ml. Pepsodent (190 ml) generated the highest foam height, followed closely by Colgate (188 ml).*

◆ pH

pH value of toothpastes is required to be in the 5.5–10.5 range. As the toothpaste comes directly inside the mouth, its pH should be neutral or nearer to neutral.

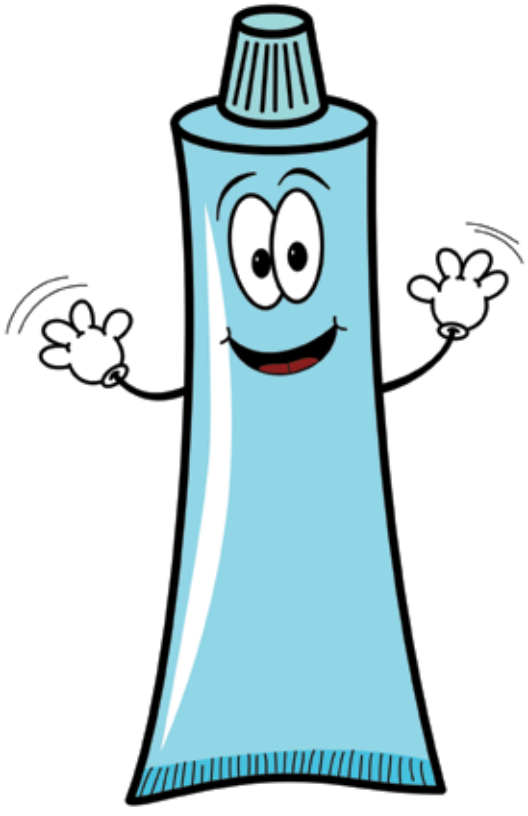
- *While all the brands were within the permissible range, only a few were nearer to the neutral value of 7.*

When chemicals are dissolved in water, the mixture's pH level can become either acidic or alkaline. pH indicates the concentration of acidity or alkalinity in the same way temperature tells how hot or cold something is.

The pH scale goes from 0 to 14, 7 being considered neutral. Anything below 7 is considered acidic and anything above 7 is considered alkaline.

◆ Dispensing

The paste shall extrude from the collapsible tube or any other suitable container in the form of continuous mass with the application of normal force. It shall be possible to extrude bulk of the contents from the container or the tube starting from the crimped end, by rolling the tube gradually.



- *All brands performed as required.*

The tube nozzle

The inner diameter of the nozzle of the tube determines how much paste will be extruded out of the tube when a user applies pressure to it. There is no specification in this regard by the Indian Standard.

The volume of paste squeezed out for a given length of squirt along the brush is increased if the diameter of the toothpaste nozzle is bigger and in such cases most users will consume the tube much faster.

◆ Gritty Matter

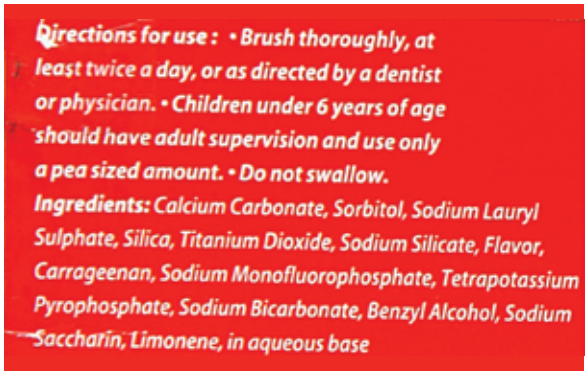
A small quantity of the toothpaste is rubbed across butter paper, which is then checked for coarse particles or scratches. This test is done to check for presence of solid particles in the toothpaste.

- *All brands passed the test.*

PHYSICOCHEMICAL SCORES

		Fluoridated					Non-Fluoridated		
Parameter	Weightage (%)	Colgate	Closeup	Pep-sodent	Senso-dyne	Himalaya Complete Care	Meswak	Babool	Himalaya Sparkling White
Nicotine	10	10	10	10	10	10	10	10	10
Heavy metals	10	10	10	10	8.70	10	9.60	8	10
Microbiological contamination	10	10	10	10	10	10	10	10	
Fineness	10	10	10	10	10	10	10	10	10
Fluoride ion	10	9.76	9.87	7.06	8.33	7.19	9.65	9.82	7.16
Stability	10	10	10	10	10	10	10	10	10
Foaming power	8	7.42	7.04	7.52	6.56	5.98	7.04	7.33	6.56
pH	8	6.03	6.18	5.68	6.64	5.22	6.64	6.50	5.11
Dispensing	5	5	5	5	5	5	5	5	5
Gritty matter	4	4	4	4	4	4	4	4	4

FOR GENERAL QUALITIES



Marking/Labelling

Each pack should feature the following details about the product:

a) Name and type of toothpaste
b) Name and address of manufacturer/marketer
c) Net mass or volume of material in tube
d) Batch number
e) Month and year of manufacturing
f) Expiry date or 'best before'
g) Fluoride ion content in ppm on fluoridated toothpaste
h) Foaming/Non-foaming
i) List of key ingredients
j) Green dot for vegetarian status
k) MRP

- *All brands have the required information.*
- *Meswak and Babool do not provide directions for use.*

Children under six years should use a pea-sized amount of toothpaste under adult supervision. There is no direction on amount of toothpaste for adults.

◆ Packing

The toothpaste shall be packed in a collapsible tube from which the paste can be easily extracted. The tube should also be of food-grade quality as the product is in direct contact with the packing material.

- *All brands were in collapsible tubes and packed in printed cardboard boxes.*

The collapsible tube or any other suitable container used for packing of the toothpaste shall not corrode, deteriorate or cause contamination of the toothpaste during normal conditions of storage and use. When subjected to a temperature of 45 +- 2 degrees C for 10 days, the paste shall be examined visually by extruding part of the contents. The internal surface of the tube shall be examined after slitting it open and removing the remaining contents. There should be no sign of corrosion, chemical attack or other damage.

Comparative Test

Net Weight

Net weight should not be less than the declared quantity and shall be within the permitted limits of Legal Metrology Rules. Permissible error for 50–100 gm is 4.5 gm and for 100–200 gm it is 4.5 per cent of the quantity declared.

Net weight in all the brands is either as per declaration or higher than the declared value.

A Mouthful of Tips

- Read the label before purchasing your toothpaste.
- Check the 'best before' date and date of manufacture before buying it. Pick one that is most recently manufactured as it will reduce the chances of the paste deteriorating due to presence of bacteria in it.
- Toothpastes are covered under Schedule S of the Drugs and Cosmetics Act and are to be manufactured under a license from the drugs control authorities. Non-conformance can lead to prosecution. Consumers with any complaint concerning their toothpastes can contact the drugs control authority of the state. Specifying the batch number will help trace the details of the product.
- Everyone's body chemistry is different. You may find that a particular toothpaste does not make your mouth feel as clean or refreshed as you would like. You may become sensitive to a certain ingredient. If you experience these or other symptoms, try changing the brand or type of toothpaste. Of course, if you have an allergic reaction or experience continuing symptoms, you should seek medical assistance right away.

How herbal is your herbal toothpaste?

Many consumers have started to switch over to 'natural' toothpastes to avoid the synthetic and artificial flavours that are commonly found in regular toothpastes. Because of the growing demand, many manufacturers now produce herbal and Ayurvedic toothpastes. This type of toothpaste may not contain dyes or artificial flavours.

The ingredients found in natural toothpastes vary widely but often include baking soda, aloe, eucalyptus oil, myrrh, plant extract (strawberry extract), and essential oils. It may be noted that many herbal toothpastes do not contain fluoride.

We did a quick comparison between standard (common) toothpastes and herbal/Ayurvedic toothpastes to understand how the ingredients differed. Surprisingly, the major key ingredients of the paste composition were common – for example, abrasives or excipients (calcium carbonate, silica), foaming agent (surfactants), anti-cavities fluoridation, flavouring agents, sweetening agents (sodium saccharin), etc. In fact, these form well over 90 per cent of the toothpaste's composition. The remaining ingredients, which also include herbal/Ayurvedic ingredients, range from traces (mg/100 gm) to 2.5 per cent or more in some cases. In light of these findings, the reasons for declaring the product as herbal or Ayurvedic does not seem justified.

Dear readers: We are open to hearing your suggestions on products and services that you believe should be reviewed/tested by Team Consumer Voice. You may write to cpt@consumer-voice.org