

Toothpaste Abrasiveness Ranked by RDA (Relative Dentin Abrasion) Value

RDA	Toothpaste Name	RDA	Toothpaste Name
0	No toothbrush- rinse only Non-Alcoholic Mouthrinse (Biotene PBF* [green label]), Act II Anticavity, Crest Pro-Health Complete, Oasis, Listerine Zero, Peridex, Peroxyl and water	95	Kid's Crest
4	Toothbrush with plain water	95	Oxyfresh with Fluoride
7	Plain Baking Soda	95-99	Crest Regular
8	Arm & Hammer Tooth Powder	96	Aim Cavity Protection Toothpaste
15	Weleda Salt Toothpaste	97	Oxyfresh Powder
23	Biotene PBF Drymouth Toothpaste	100	Sensodyne Original
25	ProNamel	100	Sensodyne Tartar Control Whitening
30	Kid's Tooth Gel Strawberry-Raspberry (pH 7.0-7.5)	100	Arm & Hammer Advanced White Brilliant Sparkle Gel
30	Elmex Sensitive Plus	100	Close-Up Cinnamon Red Gel with Mouthwash
30	Weleda Plant Tooth Gel	100 +/- 15%	Sensodyne ProNamel Iso-active – Gentle Whitening
34 +/- 15%	Pro-Namel – Iso-active – Daily Protection by Sensodyne	101	Natural White
35	Arm & Hammer Dental Care	103	Arm & Hammer Sensation
37 +/- 15%	ProNamel – Mint Essence by Sensodyne	103	Mentadent
37 +/- 15%	ProNamel – Fresh Gel by Sensodyne	104	Sensodyne Extra Whitening
40	Weleda Children's Tooth Gel	105	Crest Whitening Expressions (liquid gel)
42	Arm & Hammer PeroxiCare Tartar Control Toothpaste	106	Colgate Platinum
42	Arm & Hammer Peroxicare Regular	106	Arm & Hammer Advance White Paste
42	Arm & Hammer Advanced Whitening/Peroxide	107	Crest Baking Soda & Peroxide Whitening
44 +/- 15%	Sensodyne Iso-active MultiAction	107	Crest Sensitivity Protection
45-55	Squiggle Enamel Saver	107	Sensodyne Full Protection Whitening
45	Welenda Calendula Toothpaste	108	Crest Cavity Protection
45	Welenda Pink Toothpaste with Ratanhia	108	Crest Kid's
45	Oxyfresh	109	Crest Advanced Cleaning
48	Arm & Hammer Dental Care Sensitive	110	Amway Glister
49	Arm & Hammer Peroxicare Tartar Control	110	Crest Regular
49	Arm & Hammer Dental Care Advanced Cleaning Toothpaste	110	Prevident 5000 Booster
49	Tom's of Maine Sensitive	110	Colgate Herbal
51	Crest Plus Scope Flavor (Green Gel)	110-116	Arm & Hammer <i>Truly Radiant™</i> Toothpaste
51 +/- 15%	Sensodyne Cool Gel-Fresh	112	Prevident 5000 Booster
51 +/- 15%	Sensodyne Fresh Impact	113	Aquafresh Whitening
51 +/- 15%	Sendodyne Impact	117	Arm & Hammer Advance White Gel
52	Arm & Hammer Peroxicare Regular	117	Arm & Hammer Sensation Tartar Control
53	Rembrandt Original	118-130	Crest Extra Whitening
53	CloSYS	118	Crest Multicare Whitening
54	Arm & Hammer Sensitive + Whitening	120-150	Colgate Total Whitening

TOOTHPASTE INFORMATION - DR. TOM HUMMERT, D.D.S., PH.D., P.L.L.C. ©

55	Arm & Hammer Dental Care Icy Mint Whitening Toothpaste	120	Close Up with Baking Soda
54	Arm & Hammer Dental Care PM Bold Mint	124	Crest Sensitive Whitening + Scope
57-100	Tom's of Maine Children's Toothpaste	124	Colgate Whitening
60	Mentadent Advanced Whitening	125	Crest Tartar Protection
60	Boiron Homeodent Natural Toothpaste – Lemon Flavor	125	Crest Plus Scope Whitening (paste)
62	Supersmile	125	Sensodyne Extra Whitening
62	Clinpro 5000 Fluoride Toothpaste	125	Sensodyne Full Protection plus Whitening
63	Colgate Sensitive Enamel Protect	125	Sensodyne Tartar Control plus Whitening
63	Rembrandt Mint ('Heffernan RDA')	126	Crest Sensitivity Protection
63	Biotene Regular	130	Crest Extra Whitening with Scope
65	Arm & Hammer Complete Care Enamel Strengthening	130	Crest Pro-Health with Scope
65	ClinPro	132	Crest Whitening Expressions (paste)
68	Colgate Regular	120-140	Ultra Brite
68	Crest Plus Scope Flavor Whitening (White Gel)	135-145	Colgate Baking Soda & Peroxide Whitening
70	Colgate Total	140	Crest Pro Health Night
70	Arm & Hammer Advance White for Sensitive Teeth	142	Colgate Total Whitening
50-70	Colgate 2-in-1 Fresh Mint	144	Crest MultiCare Whitening
70-80	Tooth Builder - Squigle	145	Crest Pro Health Enamel Shield
75 +/- 15%	Sensodyne Iso-active - Whitening	145	Ultra Brite Advanced Whitening Formula
78	Biotene	145	Colgate Baking Soda Whitening
79	Sensodyne	150	Pepsodent
80	AIM	152	Crest Sensitive Whitening
80	Pepsodent Complete Care Original Flavor	155-180	Crest Pro Health
80	Close Up	160	Colgate Total Advanced Fresh
81	Arm & Hammer Complete Care Extra Whitening	162	Crest Pro Health Whitening
82	Under the Gum	155-165	Colgate Tartar Control
83	Tooth & Gum Care	165-185	Colgate Total Gum Defence
83	Arm & Hammer Complete Care Intense Freshening	168	Arm & Hammer Dental Care PM Fresh Mint
83	Sensodyne ProNamel – Gentle Whitening Alpine Breeze	176	Nature's Gate paste
83	Colgate Sensitive Max Strength	178	Arm & Hammer Dental Care PM Fresh Mints
84	Tom's of Maine	180-200	Colgate Total Advanced Whitening
85	Dentisse	187	Crest Vivid White
85	Rembrandt Intense Stain	189	Crest Pro-Health
85	Biotene Sensitive	190-200	Colgate Icy Blast Whitening
87	Nature's Gate	200	Colgate 2-in-1 Tartar Control / Whitening
88	Mentadent Advanced Breath Freshening	200	FDA Recommended Upper Limit
90	Sensodyne Fresh Mint	250	ADA Recommended Upper Limit
91	Aquafresh Sensitive		
92	Sensodyne Cool Gel		The RDA Reference Table:
93-100	Tom's of Maine Regular	0-70	Low Abrasive
94	Rembrandt Plus	71-100	Medium Abrasive
94	Plus White	100-150	Highly Abrasive
94	Sensodyne Fresh Impact	151-250	Regarded as Harmful

**** The data of this chart was compiled from various sources, including publications, independent research and company literature. The data is meant for the consumer to assess the relative abrasiveness of different toothpastes and make an informed choice. ****

ADA General Information on Toothpastes

Toothpaste is a key part of your daily oral hygiene routine. Along with your toothbrush and floss it helps to remove food debris and plaque from your teeth and gums.

Toothpastes can come in a gel, paste or powder form. While the ingredients differ slightly, all toothpastes contain the same general components:

- **Mild abrasive.** With some help from your toothbrush, these help to remove debris and surface stains. Examples include calcium carbonate, dehydrated silica gels, hydrated aluminum oxides, magnesium carbonate, phosphate salts and silicates.
- **Humectants.** This ingredient helps to prevent water loss, and keeps your toothpaste from drying out or getting gummy. Examples include glycerol, propylene glycol and sorbitol.
- **Flavoring agents.** This is what gives your toothpaste a little bit of sweetness, and that minty fresh scent. Since these do not contain sugar, they also do not promote tooth decay.
- **Thickening agents.** Also known as binders, these help to stabilize the toothpaste formula. They include mineral colloids, natural gums, seaweed colloids or synthetic cellulose.
- **Detergent.** That foaming action comes from detergent. It also helps to spread the toothpaste through your whole mouth, and helps clean teeth. They include sodium lauryl sulfate, sodium N-Lauryl sarcosinate.

They may have all the same basic ingredients, but all toothpastes are not the same. Depending on the toothpaste, other ingredients can also be added for other benefits. Here are some important things to keep in mind when choosing your toothpaste:

- **Fluoride and Decay prevention.** Fluoride is a natural cavity fighter helps to strengthen tooth enamel and fight tooth decay. Not all toothpastes contain fluoride. We recommend using a toothpaste containing this cavity-fighting mineral. The ADA recommends the addition of fluoride to strengthen tooth enamel and remineralize tooth decay. All ADA-Accepted toothpastes contain fluoride.
- **Plaque and Gingivitis.** Several toothpaste contain active ingredients that can fight plaque and gingivitis, an early form of gum disease. Stannous fluoride and triclosan help reduce gingivitis, a mild inflammation of the gum tissue.
- **Tartar.** Pyrophosphates, triclosan and zinc citrate help reduce a build-up of hardened plaque, called tartar to the layperson, but calculus to a dental professional.
- **Whitening.** If you're looking for a little extra sparkle in your smile, "whitening" toothpastes have special chemical or polishing agents that help remove more surface stains than regular toothpastes. Modified silica abrasives or enzymes can help whiten teeth by physically removing surface stains.
- **Desensitizing.** If you have sensitive teeth, you may want to consider using a desensitizing toothpaste. These contain compounds which help to reduce tooth sensitivity. Some toothpastes contain ingredients such as potassium nitrate or strontium chloride to help reduce tooth sensitivity.
- **Flavorings and Breath Enhancements.** Flavoring agents, such as saccharin and other sweeteners to provide taste. Flavoring agents do not promote tooth decay. (No ADA-Accepted toothpaste contains sugar or any other ingredient that would promote tooth decay.) Triclosan has been shown to help reduce bad breath.

Finally, always look for the ADA Seal when selecting toothpaste. The Seal helps you make sure you are choosing the best toothpaste for your dental needs. It's also your assurance that the toothpaste has met the ADA criteria for safety and effectiveness, and that it does what it says. Visit the ADA website for more information about the [ADA Seal of Acceptance and toothpaste](#).

More information (non ADA sources)

Whitening Toothpastes

Whitening toothpastes contain both a bleaching agent and an abrasive, such as silica. The bleaching agents commonly used are peroxide-based or sodium tripolyphosphate. The bleaching agents are the same ones used by cosmetic dentists who perform tooth whitening procedures, but the bleaching agents in the toothpastes do not stay in contact with your teeth long enough to do more than remove the surface stains. Whitening toothpastes also use an abrasive, such as silica or baking soda, which scrub the surface of your teeth and get them clean.

The Role of Abrasives

Abrasives are used to remove surface stains from your teeth as you brush. Silica is found in most whitening toothpastes and other whitening products, but other abrasives include hydrated aluminum oxides, titanium dioxide and calcium carbonate. There is some concern that the abrasive silica found in these toothpastes can be harsh enough to cause damage to cosmetic dental bonding or even erode your tooth enamel. Several of the Arm & Hammer toothpaste products contain sodium bicarbonate, commonly known as baking soda, instead of silica and acts as a mild abrasive.

Safety

The American Dental Association's Council on Scientific Affairs reviews toothpastes and other oral care products. Products that meet the association's criteria for safety and effectiveness earn the right to display the ADA seal. One of the variables the ADA tests is the abrasiveness, which is assigned a "Relative Dentin Abrasivity" number. Toothpastes with RDA numbers of 250 or less can gain certification from the ADA, although the FDA recommends an RDA number of 200 or less. Baking soda has an RDA of 7, Arm & Hammer Advance White Gel an RDA of 117, and natural toothpastes like Weleda Calendula and Tom's of Maine Sensitive come in at 45 and 49, respectively.

Measurement of Abrasiveness, the RDA = Relative Dentin Abrasivity = "Tooth Cutting Ability"

Toothpaste makers regularly measure their product's abrasivity. It's necessary for FDA approval, and usually is not included in marketing. Abrasivity measurements are given by what's known as an RDA value, which stands for relative dentin abrasivity (but also in the literature known as radioactive dentin abrasion.) These are RDA values for common toothpaste: 0-70= low abrasive, 70-100= medium abrasive, 100-150= highly abrasive, 150-250= regarded as harmful limit.

The Mohs hardness of dentin is 2.5, the Mohs hardness of baking soda (sodium bicarbonate) is 2.5. The RDA value of baking soda is 7. That means any toothpaste that has an RDA value higher than 7 has the potential to cut dentin. The Mohs hardness of toothbrush bristles is 2.5. Also, research shows that 50% of damage occurs in the first 20 seconds of brushing.

To measure RDA in the lab, the tester starts with extracted human or cow teeth. The teeth are irradiated in a neutron flux, mounted in methylmethacrylate (bone glue), *stripped of enamel*, inserted into a brushing-machine, brushed by ADA standards (reference toothbrush, 150g pressure, 1500 strokes, 4-to-1 water-toothpaste slurry). The radioactivity of the rinse water is then measured and recorded. For experimental control, the test is repeated with an ADA reference toothpaste made of calcium pyrophosphate, with this measurement given a value of 100 to calibrate the relative scale.

Consumer Reports reviewed toothpastes (August 1998). Unfortunately, they did not consider RDA, only stain removal. So, high-abrasivity toothpastes like Ultrabrite got the best ratings. I think you should be skeptical of their rankings. Which toothpaste is the best? Many dentists prefer Colgate Total, because it has a long-lasting antimicrobial ingredient. But in reality maybe no toothpaste is best for some people, depending on the relationship of enamel to root to sulcus (i.e. root coverage).

Other Considerations

So while toothpaste contains abrasives which help clean teeth, unfortunately, these abrasives can sometimes remove tooth enamel and dentin (usually dentin loss is at the gumline), making teeth sensitive to heat, cold and sweets. A secondary problem from the abrasiveness of the paste is notching of the tooth at the gum line (called an abfraction) causing a structural compromise. This is similar to chopping down a tree, where you get notching and loss of strength. Often a filling is necessary to protect the future integrity of the tooth. This may be to remove decay, but many times indicated to prevent more notching or abfraction. Multiple abfractions may indicate other problems with stress on the teeth and the occlusion, i.e., the "bite" and should have further evaluation. Again, selecting a paste with a low RDA can prevent both sensitivity and structural compromises that can cause the need for future restorative dentistry.

Summary

In the end, select a toothpaste you will use that does not cause more damage than help to your oral condition. If you prefer using plain baking soda or an aggressive whitening toothpaste understand the benefits and disadvantages. While oral rinses are listed as 0 at the top of the RDA table, they are recommended as adjunctive procedures, not as a substitute for brushing. Also understand that your brushing technique, relative softness or hardness of the brush, selection of brush (manual or electric), use of floss, frequency of oral care techniques, and diet all play a role in good oral health.