

PREMIUM ORAL CARE DIAMOND TOOTHPASTE

WITH SWISS DIAMOND
POWDER
FOR SENSITIVE TEETH



PRESENTATION 2021




Center of Dental Medicine, University of Zurich, Switzerland. Clinical validations were published in Swiss Dental Journal, 2018: Tawakoli P. N., Klaus B., Attin T. Abrasive effects of diamond dentifrices on dentine and enamel. Swiss Dent J SSO 128: 14-19 (2018).



LIMITED EDITION

PREMIUM ORAL CARE



 WITH SWISS DIAMOND POWDER

LIMITED EDITION



DIAMOND TOOTHPASTE

FOR SENSITIVE TEETH




-  SWISS DIAMOND POWDER
-  POLISHES TOOTH ENAMEL
-  DELICATE TO DENTINE
-  FLUORIDE-FREE

INNOVATIVE FORMULA

Pearly toothpaste contains **Swiss diamond powder** that smooths, cleans and polishes dentin gently and safely. **Diamond powder** and **xylitol** help to inhibit plaque buildup, thus contribute to restoring the natural white color of tooth enamel. **Strontium chloride** relieves tooth sensitivity and **Hydroxyapatite** contributes to tooth enamel remineralization. **Fruit enzyme papain** helps to gentle whitening, **mica** brings glow, aesthetics, and healthy appearance of a smile. **Geranium maculatum** and **vitamin E** maintain teeth and gums healthy and assist in soothing action on irritated gums. Daily use means all-round dental care, fantastic smile with a sparkling diamond shine. Delicate flavor complements the composition and gives a pleasant feeling of fresh breath.

Strontium ions penetrate the dentin and block the nerve endings, while the **particles of diamond powder** (their diameter coincides with the diameter of the dentinal tubules: ≤ 3 microns) fill the dentinal tubules and seal them. Thus, tooth sensitivity is significantly reduced.

- REDUCES TOOTH SENSITIVITY
- DELICATE TO DENTINE
- PREVENTS PLAQUE AND TARTAR BUILDUP
- RESTORES NATURAL WHITE COLOR OF TOOTH ENAMEL
- PROVIDES TOOTH REMINERALIZATION
- POLISHES TOOTH ENAMEL

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ACTIVE INGREDIENTS

DIAMOND TOOTHPASTE FOR SENSITIVE TEETH

DIAMOND POWDER

provides perfect cleaning action, smoothness and gloss to tooth enamel
is safe for sensitive dentin thanks to low abrasion
blocks dental tubules, alleviating dental hypersensitivity

XYLITOL

helps to accelerate absorption of minerals into tooth enamel
aids in preventing formation of cavities
supresses the growth of bacteria and microorganisms

STRONTIUM CHLORIDE

strontium ions penetrate the tooth enamel
to dentin and block nerve endings
reduces dentin sensitivity

HYDROXYAPATITE

protects tooth enamel and timely compensates the loss
of minerals restoring microscopic damages
promotes active remineralization and strengthening of tooth enamel

GERANIUM MACULATUM

stimulates cell regeneration
ensures astringent, hemostatic effect
helps to prevent irritation of the gums

VITAMIN E

helps to maintain tonus of mucous and gingival tissues
aids in reducing inflammation caused by bacteria, minimizes the causes
of gingivitis before it develops into periodontal disease



DIAMOND POWDER MANUFACTURER

SWISS QUALITY

FACTORY IN SWITZERLAND: MICRODIAMANT AG

Diamond powder has a history as a polishing powder for many kinds of gemstones, including diamonds, since ancient times. Over time, its applications spread into many different industries for varying polishing purposes.

Microdiamant was founded in 1952 for the manufacturing of a range of diamond powder, starting from diamond 'dust' as raw material. Managed by the grandsons of its founder, Rudolf Spring, Microdiamant today is a technology leader in its field with manufacturing and sales companies in most industrial countries. It supplies diamond powder to manufacturers of watch stones and glasses, ceramics, surface finishing, wire dies, electronics, automotive, metallography and optics, etc.

One recently developed application is the use of diamond powder as a polishing and cleaning agent in toothpaste. Kurt Spring, the son of the company's founder, developed and patented a special selection of diamond powder for a revolutionary kind of toothpaste. Finest diamond particles are replacing the usually highly abrasive cleaning powder used in conventional toothpaste formulations. The replacement of these abrasives by specially selected diamond powder in diamond toothpaste offers multiple advantages in comparison to most kinds of toothpaste available today. Learn more at: microdiamant.com



14 RESEARCH AND SCIENCE

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**ABRASIVE EFFECTS OF DIAMOND DENTIFRICES
ON DENTINE AND ENAMEL**

KEYWORDS
Abrasives
Toothpaste
Profilometry
Brushing machine
Tooth wear

SUMMARY
This study was to analyse the abrasive wear of differently composed diamond dentifrices loaded with 2.4 µm diamond particles on dentine and enamel surfaces *in vitro*. Bovine specimens were brushed with a diamond-loaded dentifrice (DD2; 2 g particles/kg), a diamond-loaded dentifrice (1.5 g/kg) containing 20% hydrated silica as extra abrasive (DD1.5-S), or a diamond-loaded dentifrice (3 g/kg) containing 20% hydrated silica abrasive (DD3-S). Values were compared to those obtained with Colgate Total (CT) and Elmex Sensitive plus (ES). Brushing was performed using a cross brushing machine (F = 2.5 N; 120 brushing strokes/min). Abrasive wear [µm] of specimens (n = 12) was measured profilometrically and adjusted to 10,000 brushing strokes (10 kBS). Data were compared between groups using one-way ANOVA and post-hoc pairwise tests with Tukey correction, alpha = 0.05. Diamond dentifrices and ES showed no difference on dentine specimens: DD2 7.7 ± 2.6 µm/10 kBS; DD1.5-S 10.1 ± 2.3 µm/10 kBS; DD3-S 10.1 ± 2.6 µm/10 kBS; ES 7.4 ± 1.1 µm/10 kBS, while CT-brushed specimens exhibited significantly higher dentinal abrasion compared to all other groups: CT 31.0 ± 7.7 µm/10 kBS. Diamond loading significantly influenced enamel wear (mean ± SD µm/10 kBS): DD2 1.8 ± 0.5 µm/10 kBS. Conversely, addition of the silica abrasive reduced these values: DD1.5-S 1.1 ± 0.3 µm/10 kBS; DD3-S 1.6 ± 0.3 µm/10 kBS. CT and ES revealed similarly low values: CT 0.3 ± 0.1 µm/10 kBS; ES 0.2 ± 0.1 µm/10 kBS. These data suggest that abrasion caused by diamond particles in experimental toothpastes is differentially affected by diamond particle load, additional abrasives, and the type of hard tissue.

SWISS DENTAL JOURNAL SSO VOL 128 1-2018

List of countries where patented products with diamond powder are:

1. European Union (incl. Switzerland and Turkey)
Patent application 09779237.8
2. Japan – Patent application /2011
3. United States of America – Patent application 13/126.398
4. Canada – Patent application 2,778,544
5. India – Patent application 2467/DELNP/2011

Validations of Zurich University [“SWISS DENTAL JOURNAL”](http://www.microdiamant.com)
SSO VOL 128 1-2018

MEDICAL AND COSMETIC BENEFITS

OF TOOTHPASTE FOR SENSITIVE TEETH

WITH SWISS DIAMOND POWDER



"First and immediately noticeable is a smooth feel of the teeth after brushing with diamond toothpaste. People with tooth hypersensitivity will also notice a remarkable reduction of pain induced by cold or hot beverages. Tooth surface roughness is polished away, the enamel becomes very smooth after a short time. Smokers will appreciate that tartar does not build up after professional removing by a dentist. And, as you would expect, the cleaning action of diamond toothpastes is perfect."

Kurt Spring
Mechanical Engineer and Inventor
Microdiamant AG, Switzerland

The most important benefits of Dentissimo® Diamond Sensitive Toothpaste:

Medical:

- Tender care about dentin at bare tooth necks: due to low abrasiveness,
- Decrease of the tooth sensitivity: the dentinal tubules are sealed,
- Prevention of plaque formation: by micro-polishing the tooth surface.

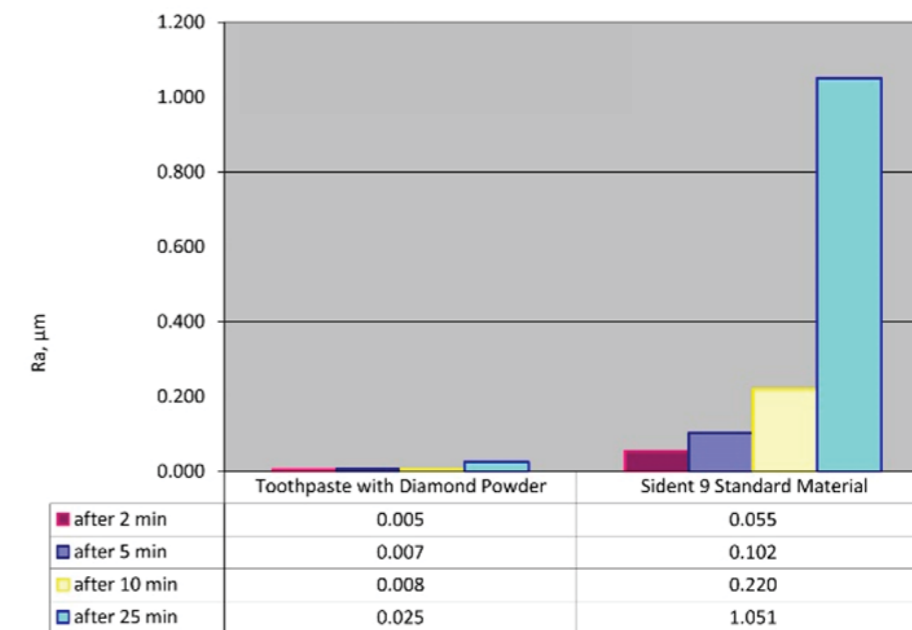
Cosmetic:

- Whitening – most often mentioned by manufacturers of diamond toothpaste – as the accompanying positive quality of the product,
- Shining of the tooth surface due to the excellent polishing of the enamel.

USE OF DIAMOND POWDER TOOTHPASTE

PROVIDES LONG-TERM SMOOTHNESS OF DENTIN AND ENAMEL (SCHEME 1)

Details are in the article ["Mechanical properties of toothpastes with diamond abrasives."](#)



SCHEME 1

CLINICAL VALIDATIONS

OF TOOTHPASTE WITH DIAMOND POWDER

FOR SENSITIVE TEETH

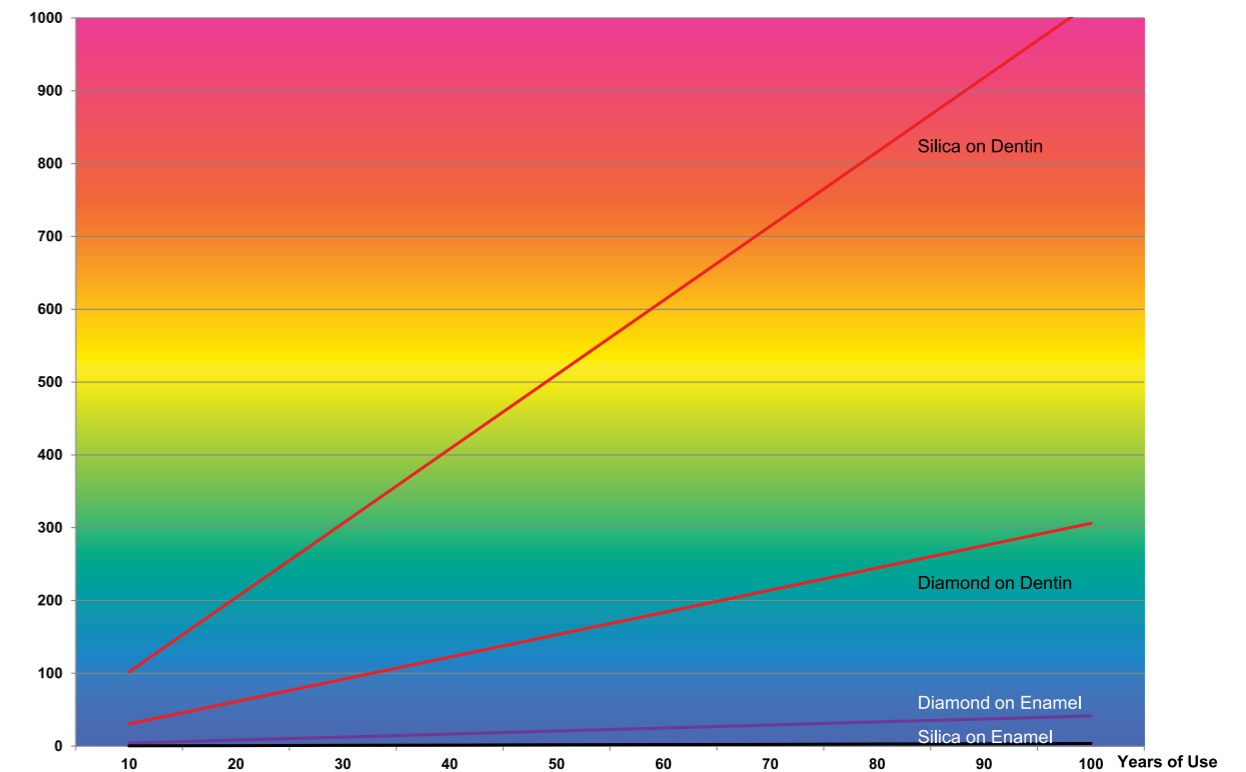
Figure 2 shows the effect of toothpaste with diamond powder on tooth enamel and dentin. The abrasion rates of tooth enamel are within acceptable limits, insignificantly higher than conventional toothpastes have. At the same time, toothpaste with diamond powder treats dentin as carefully as possible and, very importantly, does not damage the exposed dentin tissue during brushing, while other toothpastes can cause discomfort.

In older patients, gum disease and tooth root exposure are often observed – a phenomenon called gum recession. In such cases, dentin care should be cautious and least intrusive, exactly as Dentissimo Diamond toothpaste with Swiss Diamond Powder offers. Due to its low abrasion value and gentle effect on dentin, this toothpaste is safe for daily use and is suitable for adults and elderly people.

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◆ More information in the articles: Spring K., Saxer U.P., Gaiser H. [Studie: Sind Diamant-Zahnpasten die Zukunft?](#) *Dimensions – Swiss Dental Hygienists*. No 3 (2020): 12-14 [“The Future of Diamond Toothpaste”](#)



SCHEME 2

DENTAL SENSITIVITY

CAUSES AND TREATMENTS

Dental sensitivity is one of the most relevant issues in modern dentistry and it is a disease that can be detected from a young age. About 70% of adults complain to dentists about dentin and enamel sensitivity. The study of statistical data on changes in periodontal tissues showed that gum recession was detected in approximately 5-21.9% cases at the age of 7-8 years. Further, the prevalence of gum recession is increasing: from 11.6% at the age of 15 to 100% in people over 64 years.

Tooth sensitivity can be caused by dental problems, for example, caries, periodontitis, fissures in the enamel, consequences of whitening or other dental procedures or caused by general health status (pregnancy, neurological condition, heredity, etc.).



MANDATORY TOOTHPASTE QUALITIES TO REDUCE SENSITIVITY:

1. Tooth enamel remineralization. Particles of Hydroxyapatite (they are in structure very similar to dental tissues) help to reduce the sensitivity of tooth enamel due to the sealing of the smallest defects in enamel and open dentinal tubules.
2. Plaque buildup prevention. Xylitol helps to protect hard dental tissue by effectively removing bacterial plaque on the surface of tooth enamel.
3. Desensitizing Agent – Strontium Chloride. Strontium ions penetrate dentin through the dentinal tubules and block nerve endings, thereby preventing unpleasant sensations.
4. The low abrasiveness of toothpaste. It is very important to carefully clean the surface of tooth enamel without damaging the dentin in the process.

MECHANISM FOR REDUCING TOOTH SENSITIVITY

DENTISSIMO® DIAMOND SENSITIVE

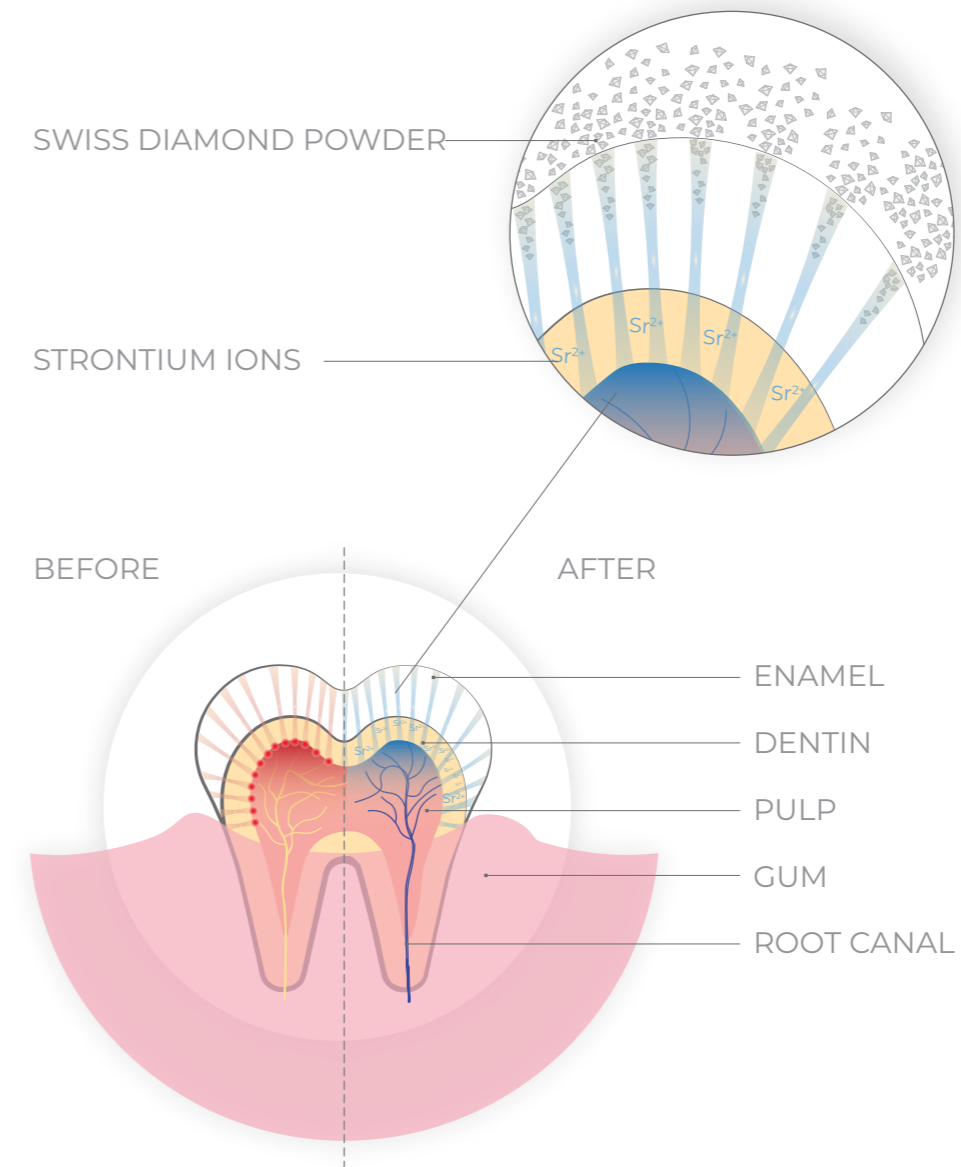
Dentin tubules are microscopic channels that extend from the surface of the tooth enamel to the inside of the tooth — the pulp. They are so called dentin tubules because they pass through the dentin. Dentin is the main structural component and the middle layer of the tooth supporting the enamel on the inside. It is less mineralized than enamel and forms the main part of the tooth.

These small hollow channels in the dentin transmit unpleasant sensations from the external part of the tooth to the internal part and people experience sensitivity.

THE COMPLEX EFFECT OF TOOTHPASTE:

Strontium ions penetrate the dentin and block the nerve endings, while the **particles of diamond powder** (their diameter coincides with the diameter of the dentinal tubules: ≤ 3 microns) fill the dentinal tubules and conceivably seal them. Thus, tooth sensitivity is significantly reduced.

In case of tooth sensitivity, dentists recommend avoiding toothpaste with fluorides, pyrophosphates, parabens, SLS, peroxides or aggressive abrasives.





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