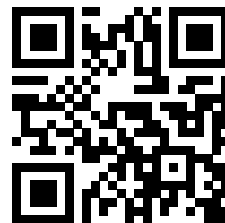


## Product Monograph

n & w

dental care

COSMETIC, IMPLANTS e SOFT TISSUE  
LINES



Prof. Dr. Ariel Lenharo, DDS, MDS, PhD  
Prof. Dr. Fábio J B Bezerra, DDS, MDS, PhD

São Paulo, Brazil | 2022



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E D I T O R I A L  
**Taking care of people  
and their Smiles!**



The simplicity of the sentence above summarizes the necessary complexity to understand that high performance Dentistry, with its increasing advances in the preventive, interceptive and therapeutic areas, must have its actions focused on the quality of life of each individual in its different stages of development and clinical needs.

This is the main reason that led us to create N&W Dental Care, considering as basic principles the biological respect, scientific basis and predictability of results, which place the Brazilian Dentistry and the highly qualified professionals among the best in the world, through certified scientific publications and amazing clinical results. We understand that, even in such a positive context from a therapeutic point of view, the oral hygiene care segment and its attributes, as well as active ingredients, clinical indications, procedure, personalized prescriptions, and efficiency of clinical use, is still in a very challenging scenario among professionals of different age groups and different social levels.

Basic information and knowledge such as the abrasive rate of the products (RDA), hydrogen potential (pH), anti-caries active ingredients, antiseptics and regenerators, as well as biocompatibility with oral soft tissues are not clear on the product packaging or thoroughly understood by dentists. Therefore, the prescription of oral care products, in most cases, is a marketing strategy routine guided by industrial brands rather than personalized treatment backed by technical and scientific knowledge. We are aware of it because, as dental professionals, we were also included in this practice for decades.

In order to change this scenario, we enlisted professionals with wide experience in high performance dentistry, national researchers of international renown, public and private universities in Brazil and abroad so we could create exclusive products, patented in Brazil, United States and Europe, according to the standards of the RDC #04 of the National Health Surveillance Agency (ANVISA) for products classified as grade 2, which require regulatory registration and are known by holding specific indicators that demand proof of safety and/or efficacy, information on care, instruction of use and restrictions; in accordance with the recommendations of the American National Standards Institute (ANSI) and the American Dental Association (ADA). We produce our lines with highest levels and certificates of good manufacturing practices (GMP), awarded with the seal of recommendation for oral hygiene products given by the Associação Dental Brasileira (ABO Nacional) for all our toothpaste and mouthwashes.

We also believe that every company should have a purpose; therefore, we have included in our priority criteria the task of contributing to our future and to our planet through respect for the environment and ethics in research. All of our products are made with recycled or recyclable raw materials with reverse logistics, so they are Eco-Friendly, Vegan, and Not Tested on Animals.

We like to introduce our first product lines: COSMETIC, IMPLANTS and SOFT TISSUE, and we want you to join us on this journey, because together we will positively impact the quality of life of an increasing number of people, creating healthy smiles wherever we are present.

Welcome to  
**our world!**



**Prof. Dr. Ariel Lenharo** DDS, MDS, PhD  
CEO

Welcome to  
**N&W Dental Care.**



**Prof. Dr. Fábio J B Bezerra** DDS, MDS, PhD  
Director of Research and Development

# Our COMPANY

The name of our company and patented brand is the result of the combined letters "N", that stands for "New" and "W" that stands for "Well Fresh", linked together by a universal synergy logogram, which is "&". The name represents the values we believe in: Innovation, Lightness and Alliance. We sincerely believe that all individuals deserve a new look on the care of their oral hygiene, just as we know that dental professionals are the main vectors for these changes to become a reality so that preventive oral health care is more humanized, personalized and effective.

Founded in 2020, N&W Dental Care Ltda. is a licensed export, import, and production industry of oral hygiene products, headquartered in the city of Ribeirão Preto, State of São Paulo, Brazil. The production area is located within an innovation and entrepreneurship center that includes universities, research institutes, startups and technology-based companies through knowledge and technology exchange, known as SUPERA Parque de Inovação e Tecnologias de Ribeirão Preto, a partnership between the University of São Paulo (USP), the City Hall of Ribeirão Preto and the Government of the State of São Paulo.



With a strong Research, Development and Innovation structure, N&W Dental Care is focused in the development of disruptive products with great clinical applicability and strong scientific background, as well as scientific alliances with important universities such as the University of São Paulo (Ribeirão Preto and Baurú campuses), Institute of Bioscience of Botucatu (IBB-UNESP), Federal University of Uberlândia (UFU), and the University of Michigan (USA). N&W Dental Care features a highly qualified scientific board with renowned researchers in high scientific impact publications.

Besides the offices located in São Paulo (Brazil) and Miami (Florida, USA - N&W Dental Care LLC), N&W Dental Care has also partnered up with industries for outsourcing production following the highest standards according to national and international certifications, starting with the suppliers rating, raw material selection, Quality Management System (QMS), regulatory approvals and administrative processes that ensure the Superior Quality of our products and enable their distribution in Brazil and abroad.

Among the priority criteria previously mentioned, we are committed to the SDGs - Sustainable Development Goals that include an agenda with 17 Goals and 169 targets to be achieved by 2030, signed by the 193 Member States of the United Nations (UN) in 2015 and that formally adopted the 2030 Agenda:



1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reduced Inequality
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace and Justice Strong Institutions
17. Partnerships and Means of Implementation, as we align ourselves with all those who believe and support small or large actions that generate positive collective impact on the lives of people, other living beings, and our planet.

# SCIENTIFIC BOARD



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# The Importance of Oral Hygiene

It is indisputable the fact that the only scientifically proven method for prevention of several oral diseases is the association of quality oral hygiene products specific to the needs of each patient, as well as proper guidance of the individual regarding brushing techniques and proper use of dental floss and mouthwash, in addition to periodic dental check up<sup>1</sup>.

Even knowing that the main oral diseases are multifactorial and can be impacted by systemic origin or adverse habits, the literature is consistent regarding the efficiency of caries, gingival, periodontal and peri-implant diseases prevention. To this end, it is essential that the oral surgeon is able to establish a personalized diagnosis for the needs of each patient in relation to several relevant aspects of their oral health such as the presence of bleeding, thermal sensitivity, presence of caries or non-carious lesions, type of treatment and ability to clean, among others. It is inconceivable to believe that the same toothpaste or mouthwash can be used on patients with intact teeth, as well as patients with composite resin restorations and patients with osseointegrated implants, because the clinical needs are completely different.

Here is a list of a few questions that will result on a proper diagnosis by the oral surgeon for the adequate prescription of oral hygiene products:

- . What is the abrasive rate of the toothpaste you are prescribing?
- . What is the pH of the recommended toothpastes and mouthwashes?
- . What anti-caries, antiseptic and regenerating active ingredients are present in the formula?
- . What side effects are present in the active ingredients of the formula?
- . How often and with what type of toothbrush should this product be used?

These are simple and direct questions that we should be able to answer without much effort, because we are aware that even though abrasive ingredients present in toothpastes can be effective for the mechanical disorganization of dental biofilm, they can also generate unnecessary and critical wear for patients with non-carious cervical lesions. Therefore, a patient with bad hygiene should use a higher abrasive product (RDA 100-120), while a patient with dentin hypersensitivity should use lower abrasive products (RDA 50-70).





In order to standardize the abrasive levels of toothpastes in compliance with the clinical requirements, it is essential to hold solid scientific knowledge reached through a complex and precise analysis methodology and research. Considering this, we partnered up with the Faculdade de Odontologia de Bauru (University of Sa o Paulo), under the coordination of Prof. Dr. Estevam Augusto Bonfante, to evaluate the initial surface roughness and hardness of different materials and subjecting them to brushing tests with toothpastes containing different parameters of RDA, with 2-year cycle (24. 000 cycles), 4 years (48,000 cycles) and 6 years (72,000 cycles), as exemplified in FIGURE 1. This methodology was used to validate the level of RDA present in N&W Dental Care products, using hydrated silica with specific geometry, hardness, shape and size as an abrasive (FIGURES 1, 2 and 3).

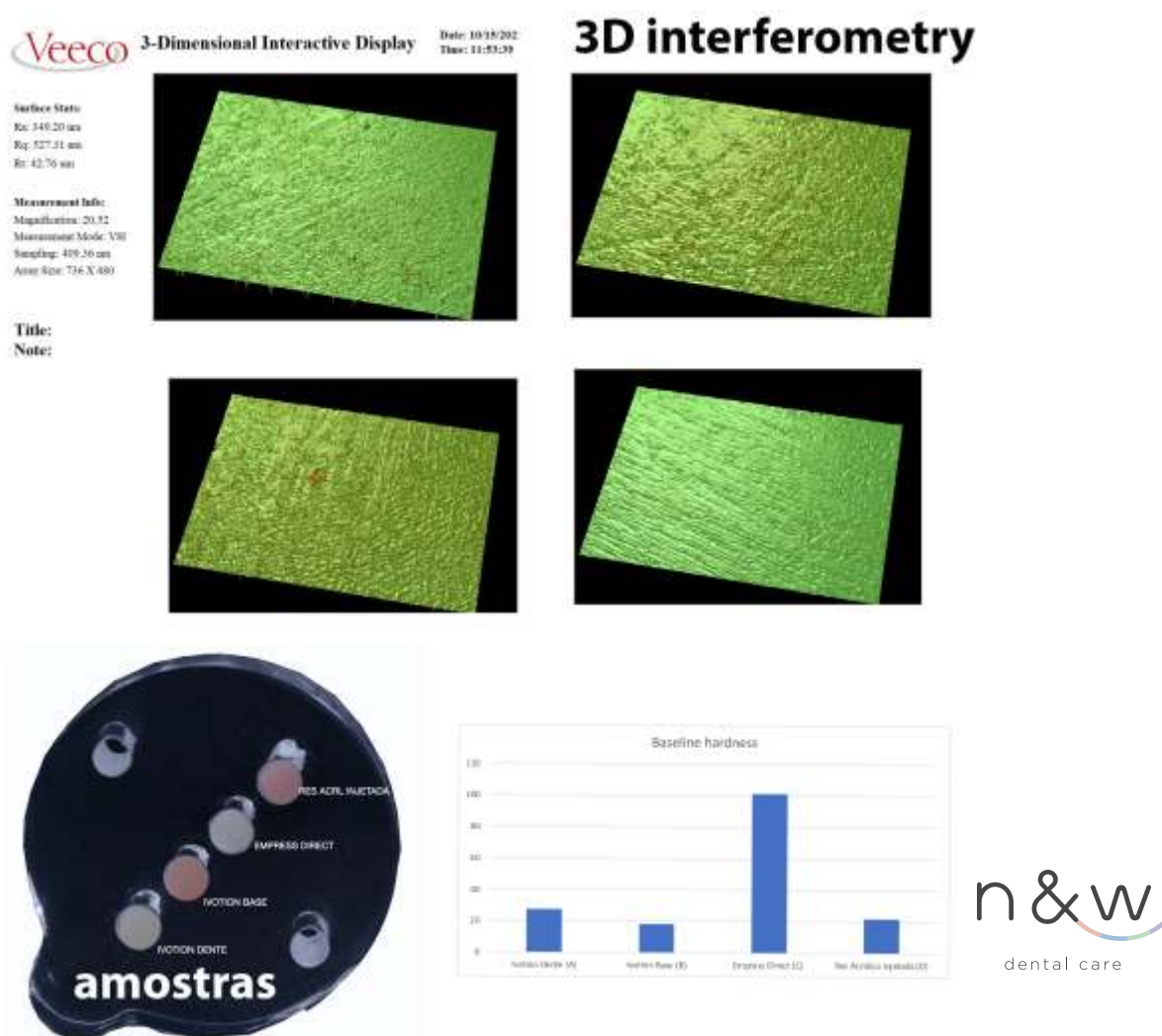


FIGURE 1: Injected acrylic resin, Empress Direct composite resin, Ivotion Base and Ivotion Tooth samples were prepared for the brushing tests with standardized toothbrush patterns. The initial and post-brushing test characterizations include 3D interferometry as well as hardness analyses, among others. A total of 72,000 cycles (6 years) were simulated in brushing tests, with brush changes every 24,000 cycles (2 years) and the analyses performed in a roughness meter. Four lines of toothpastes were evaluated regarding their potential for surface alteration generated on the different materials based on varying RDA, being 0 (control), 50 (N&W DENTAL CARE COSMETIC Line), 100 (N&W DENTAL CARE IMPLANTS Line) and 120 (N&W DENTAL CARE SOFT TISSUE Line).



FIGURE 2: Composite resin restoration in the anterior maxilla region in the final stage of polishing to ensure brightness, beauty, and longevity of results. Note that this type of material is extremely versatile, has high clinical applicability and consistent literature support, being one of the most used materials in dentistry, and its maintenance is indicated with low or very low abrasive toothpastes (RDA 50-70).



FIGURE 3: Final aspect of the composite resin restoration. Pictures courtesy of Dr. Rafael Sampaio and Dr. Adriano Araújo Correa (Salvador, BA). The same technical and scientific reasoning should be employed for clinical decision-making regarding the pH of the products, as this may be critical to the cycle of enamel demineralization and remineralization or delay post-operative healing in many cases. It is also relevant to define the need or not for fluoride, which is fundamental and essential for dental health, but can be deleterious to the titanium present in dental implants, or the presence of antiseptics, which can have critical side effects in patients who have received oral rehabilitation with resin.

These questions led us to develop each of our lines with attention to the details of their personalized and patented formulations for use, according to the needs of each patient. To this end, we sought many solutions in natural active ingredients and with high scientific evidence in systematic reviews with meta-analysis and prospective longitudinal randomized clinical studies with control group, such as green tea extract (*Camellia sinensis*) and Tea Tree extract (*Melaleuca Alternifolia*), with their antiseptic, healing, anti-inflammatory, and regenerating actions, associating them with biostimulating products for collagen formation and anti-aging, such as Hyaluronic Acid (HA) and Dimethylsilanediol Salicylate (DSBC), or even the presence of pyrophosphates (PPi) to minimize the formation of dental calculus. Thinking scientifically about the clinical needs and individual demands, we developed specific formulations for different specialties and situations. Therefore, the knowledge of each of the basic components of the formulas and their active ingredients will guide the proper prescription of our product lines introduced here and their benefits to patients.



## Basic Composition of Oral Hygiene Products

Dentifrices and mouthwashes are formulations that combine a number of essential substances that constitute the body of the product with thickening, abrasive, moisturizing, preservative, sweetener, flavoring and foaming purposes, in addition to water. They can be either toothpaste or gel and have broad purposes certified by researchers and consumers.

Their main purposes are oral hygiene, including teeth and soft tissues, polishing of restorations and teeth, removal of debris and bacterial biofilm and tissue regeneration, as well as prevention of periodontal and peri-implant diseases and dental caries. The basic composition is the thickener, which can be one or more gel-forming substances such as cellulose derivatives, gums (guar and xanthan), and thickening silica; the abrasive agent, insoluble substances such as calcium carbonate and calcium phosphate, zirconium silicate, alumina, and abrasive silica; surfactants such as sodium lauryl sulfate, sodium lauroyl sarcosinate, poloxamer or cocamidopropyl betaine; surfactant, glycerin, sorbitol, propylene glycol or polyethylene glycol 400; sweeteners: saccharin, cyclamate, stevia and xylitol as well as several flavoring agents; preservatives: parabens and benzoates, which are also basic components. Colorants and agents for therapeutic purposes are optional.

This type of formulation provides the researcher and the manufacturer with a range of possibilities to create products with the most varied purposes, from the simple cosmetic function to the use as therapeutic adjuvant.

Toothpastes and mouthwashes have been given countless attributes that generalize their indication, like the expectations of preservation, protection, hard and soft tissues treatment and currently, the care of implants, esthetic restorations made with different types of resins and ceramics, and post-operative care.

Products with multiple, but specific purposes, must fit the item formulation to meet the specificity: apart from cleaning, reduction of inflammation, promotion of healing and protection of the surgical wound.

The formulation is finished in such a manner that contributes to the efficiency of the dentifrice, safe and effective, without interfering with its specificity and respecting the limits of adding up agents with therapeutic purposes.

Therefore, the selection of the components of the dentifrice must be thorough, providing the perfect performance of all ingredients, implementing synchronously the activities that come together and complement each other in brushing, preferably with a soft or extra soft brush, with the adequate technique and pressure.

Several components have been used in toothpastes for different purposes: anti-caries, anti-tartar, anti-gingivitis, among others and, in some cases, acting together. Triclosan, cetylpyridinium chloride, sodium pyrophosphate, potassium citrate and zinc chloride are examples of these components that act in synergy in some products, classified as broad-spectrum toothpastes.

## N&W Dental Care High Performance Products

Following the high technological development, clinical needs of different specialties and having as a fundamental pillar the clinical functionality with a consistent scientific basis, N&W Dental Care developed dentifrices and mouthwashes specified for cleaning, protection and tissue repair for cases of implants (Implants Line), natural dentition and oral rehabilitation with resins or ceramics (Cosmetic Line) as well as for the health of oral soft tissues and postoperative recovery of several specialties (Soft Tissue Line), with safe and efficient active ingredients.

Hence, in order to achieve the goals of a product with such properties and fitted to the purposes of application by the dentist, these substances were harmonically incorporated into a base of dentifrices of the gel type and mouthwashes in which several components, commonly found in conventional dentifrices, were used. This resulted in a product with efficient action in hygiene, protection and faster restoration of tissues, ensuring good performance and stability.

The basic components of oral hygiene products are part of their chemical composition for different purposes and will be responsible for their physical appearance, organoleptic characteristics, biological functions and clinical performance. In general, the essential components provide cosmetic and pharmacotechnical effects. The cosmetic effects are guaranteed mainly by the abrasive components, surfactants, and by the flavoring agents, ensuring dental cleaning and polishing, in addition to a pleasant breath. The other essential components have pharmacokinetic functions, i.e. they ensure the physical aspects of the formulation<sup>2</sup>.

One of the most important components in toothpaste is the abrasive element, since they are responsible for the mechanical disorganization of the biofilm, cleaning and polishing of the tooth surface, in addition to removing extrinsic stains from food pigments or habits such as smoking. It is necessary to emphasize that the efficiency of cleaning and surface wear power depend on the size, shape, hardness and concentration of the abrasive element, in addition to the type of brush used (head size, number, shape and distribution of bristles, and the geometry and texture of the filaments that make up the tufts), associated with the pressure exerted and technique used by the individual. Therefore, it is essential to understand that the correct prescription of the dentifrice must go with a detailed evaluation and personalized prescription for each clinical case. Another important aspect to emphasize is that the type of abrasive used may directly influence the availability of fluoride in the formula. For example, the use of calcium carbonate as abrasive causes the available sodium fluoride (NaF) to be lower, which may impair the expected clinical results. Among the most commonly used abrasives in toothpastes, we can highlight Alumina, calcium carbonate, silica, titanium dioxide, aluminum oxide and methacrylate<sup>3</sup>.

All N&W Dental Care toothpastes in the COSMETIC, IMPLANTS and SOFT TISSUE lines use precipitated amorphous silica as abrasive, obtained from a process of inorganic synthesis, making the product safe for production, since they are certified ISO 9001, ISO 14001 and HACCP (Hazard Analysis Critical Control Point), considering that the abrasive of a toothpaste is measured by RDA, which stands for Relative Dentin Abrasivity, which is a laboratory test accepted in the ISO 11609 specification, while solid dentifrices (Tablets) have calcium carbonate in their composition, due to their specific characteristics and industrial production parameters.

Since there are no regulatory definitions about the RDA for toothpastes and gels in Brazil to date, we use as standard the values adopted by the American National Standards Institute (ANSI) and American Dental Association (ADA) (Dentifrices - Requirements, Test Methods and Marking, 2013), which have as arbitrary reference value the RDA of 100. According to this scale and classification, dentifrices that have up to 2.5 times the reference value (RDA 250) are considered safe and effective for clinical use 2. (FIGURES 5, 6, 7 and 8)



FIGURES 5, 6 and 7: Clinical photographs of aesthetic and functional rehabilitative treatment performed with ceramic laminates, which require the careful selection of oral hygiene products with low or very low abrasiveness, associated with anti-caries, antiseptic and tissue regenerating active principles, in order to maintain the excellence of the results in the short, medium and long term. Case kindly provided by Dr. Brunno Leite (Goiânia, GO).



In order for our products to meet your specific needs, the product should be of low-abrasive (IMPLANTS Line (RDA 100) and SOFT TISSUE Line (RDA 120) or even extra low-abrasive (COSMETIC Line - RDA 50), so that you can obtain an optimum cleaning capacity in the different clinical situations, without generating undesired side effects such as scratches on the surface of the prosthetic component of the implant, or generating surface wear on the restorations, with damage to their gloss, cervical adaptation and endurance of the treatment. Thus, along with abrasive silica with different characteristics, a film-forming product, Polyvinylpyrrolidone K30, was added to assist in cleaning (FIGURES 09, 10, 11 and 12).

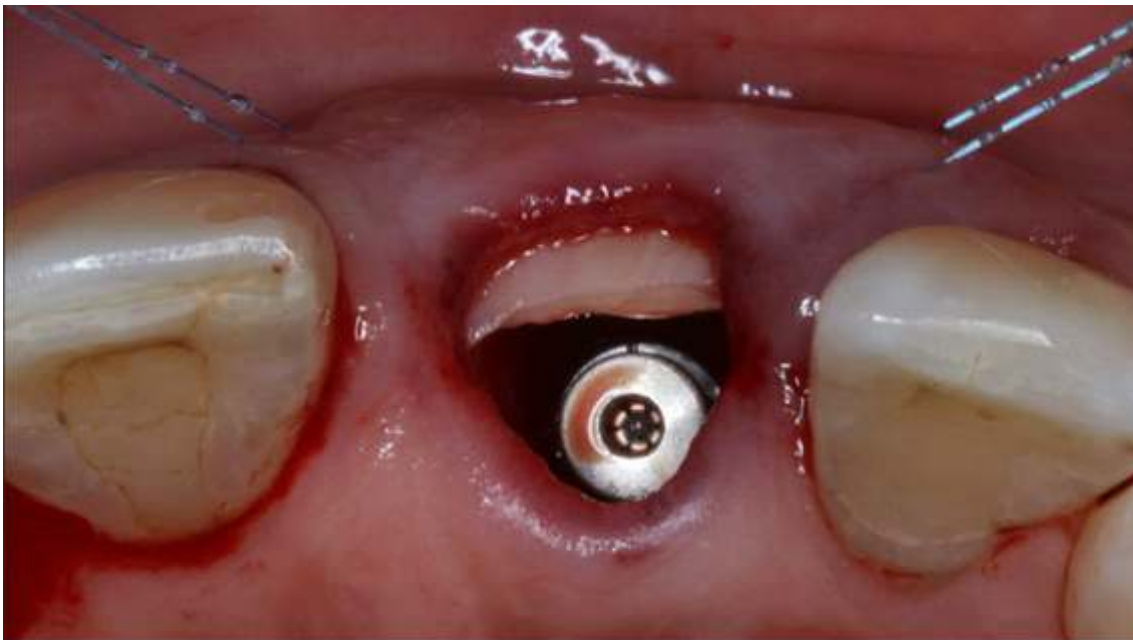


FIGURE 9: Clinical case treated with osseointegrated implant in the anterior maxilla region, associated with reconstructive techniques to alter the gingival biotype and correct the prosthetic emergence profile.



FIGURE 10: Detail of the positioned implant, filling of the alveolus with biomaterial and esthetic recontouring with a free connective tissue graft to alter the gingival biotype and correct the prosthetic emergence profile.



FIGURE 11: Postoperative aspect at 60 days showing the positive evolution of the healing process of the peri-implant mucosa, still with the presence of particles of the biomaterial used. Good tissue recovery depends directly on oral hygiene care that ensures excellent antiseptic action, in addition to biostimulation for tissue healing with appropriate active ingredients.





## IMPLANTS



**Thickener:** must be harmless, with strong enough bonds to maintain the stability of the product within its shelf life (36 months), but fragile enough to release the actives during brushing. Therefore, its rheological characteristics are fundamental. In this regard, and seeking compatibility with the actives and good associated performance, the use of carboxymethyl cellulose was chosen. This element is an anionic agent with thickening silica, chemically inert.

**Anticariogenic Agent:** NaF + MFP (1500ppm (gel) and 247.5ppm (rinse))

Caries is a chronic, non-eradicable disease, resulting from biofilm accumulation and sugar consumption. For dental health, it is recommended to use a dentifrice with at least 1,000ppm of fluoride (twice a day), because its physical-chemical effect reduces demineralization and favors remineralization, a concept widely accepted by the scientific community 4. Our COSMETIC product line has 1500ppm of fluoride in the toothpaste gel, and 247.5ppm of fluoride in the mouthwash, an association of sodium fluoride (NaF) and sodium monofluoride phosphate (MFP)

For the IMPLANTS and SOFT TISSUE lines, where fluoride is not effective because implants are not susceptible to caries, and also because they do not have direct benefits for healing and soft tissue health, a polysaccharide with anticariogenic action, xylitol, was used, as many patients may be affected by the conditions mentioned before and could present an increased risk of caries due to the absence of fluoride. Another important factor is the fact that fluoride attacks the titanium surface present on the implants, which may lead to quantitative and qualitative alterations with negative potential for the mucosa and the peri-implant bone structure.

Another important factor for the balance of the demineralization and remineralization process, as well as for scar repair and oral soft tissue health, is the hydrogen potential (pH), as these processes are influenced in their results if the oral environment is too acidic or too basic. All products in the COSMETIC, IMPLANTS, and SOFT TISSUE lines have pH between;

**Surfactant:** Glycerin was used as a wetting agent, in order to avoid drying of the oral soft tissues. Sodium benzoate as a preservative and saccharin as a sweetener.



# I M P L A N T S

## **Tea Tree Extract: *Melaleuca Alternifolia***

Natural ingredients such as Tea Tree extract (*Melaleuca Alternifolia*), with antiseptic, antifungal, healing, and tissue regenerating properties, are becoming popular as components of dentifrices and mouthwashes for their many features that can favor the objectives related to oral hygiene, since many studies confirm their effectiveness for the oral health, with emphasis on periodontal diseases, caries, reduction of mucositis in patients undergoing chemotherapy and reduction of hypersensitivity.

## **Hyaluronic Acid: HA**

In addition to the use of herbal medicines, an alternative for stimulating repair processes associated with combating inflammation can be effected through the use of bioactive substances such as hyaluronic acid (HA), which is a connective tissue component that was primarily used for papilla defect filling procedures 20. However, it has been recently shown that hyaluronic acid has the potential to be used in the treatment of inflammatory conditions by promoting the healing and repair process during the treatment of periodontal disease 21 and in the treatment of ulcers in the oral cavity, which may occur due to its bacteriostatic, anti-inflammatory, and antioxidant effects 23. The use of hyaluronic acid as a chemical agent in mouthwashes has been shown to decrease inflammation in patients with gingivitis to the same level as chlorhexidine 24 and this effect may result from the findings of an in vitro study that showed that hyaluronic acid reduced the expression of pro-inflammatory cytokines in fibroblast cultures stimulated by *P.gingivalis* by suppressing the MAPK and NF- $\kappa$ B signaling pathways.

During the development phases of the N&W Dental Care products, in a study conducted in the Bioassays and Cellular Dynamics Laboratory (Labio) of the Botucatu Biosciences Institute - UNESP, under the coordination of Prof. Dr. Willian Fernando Zambuzzi, initially human fibroblasts were treated with different concentrations of green tea and hyaluronic acid in order to know their cytotoxic role, following the recommendations of ISO 10993. After this analysis, the concentrations of 10% and 50% were chosen to know the molecular mechanism involved with the molecular response of fibroblasts. We analyzed genes important to the phenotype of fibroblasts, which showed that FGFR1 was significantly expressed in response to both compounds (FIGURE 13), leading us to suggest an increase in the proliferative rate of these cells. This hypothesis was later confirmed when we found a significant increase in genes related to cell proliferation. In FIGURE 14, we highlight the significant expression of the CDK2 gene, involved in cell proliferation.



## I M P L A N T S

Special substances were added to the formulation in order to meet the desired objectives in terms of structure. These substances were selected due to their special attributes or active ingredients that best meet these needs. Therefore, the added substances are not common in conventional dentifrices, but necessary for them to act according to the type of clinical treatment performed in diverse specialties with special features.

All these substances have vast scientific support, attesting to their safety and efficiency in mouth-acting products. The nature of the product needs to be gentle, so this led us to select the surfactants lauryl glucoside and sodium lauryl sulfate (SLS). These surfactants provide high cleaning efficiency, and do not interact with other components in the formulation.

### **Tartar control agent: Tetrasodium pyrophosphate**

Tartar or dental calculus is the result of the calcification of a thick biofilm and most commonly located near the outlet of the salivary gland ducts, mainly on the lingual surface of the lower incisors and upper molars. Salivary components, as well as microbial components, blood and dietary origin, are found in these deposits. Tetrasodium pyrophosphate was used in the formulation of our products as an anti-tartar agent. It blocks the spaces available for crystal development and compromises its progress, thus preventing the formation of dental calculus.

### **DSBC: Dimethylsilanediol salicylate**

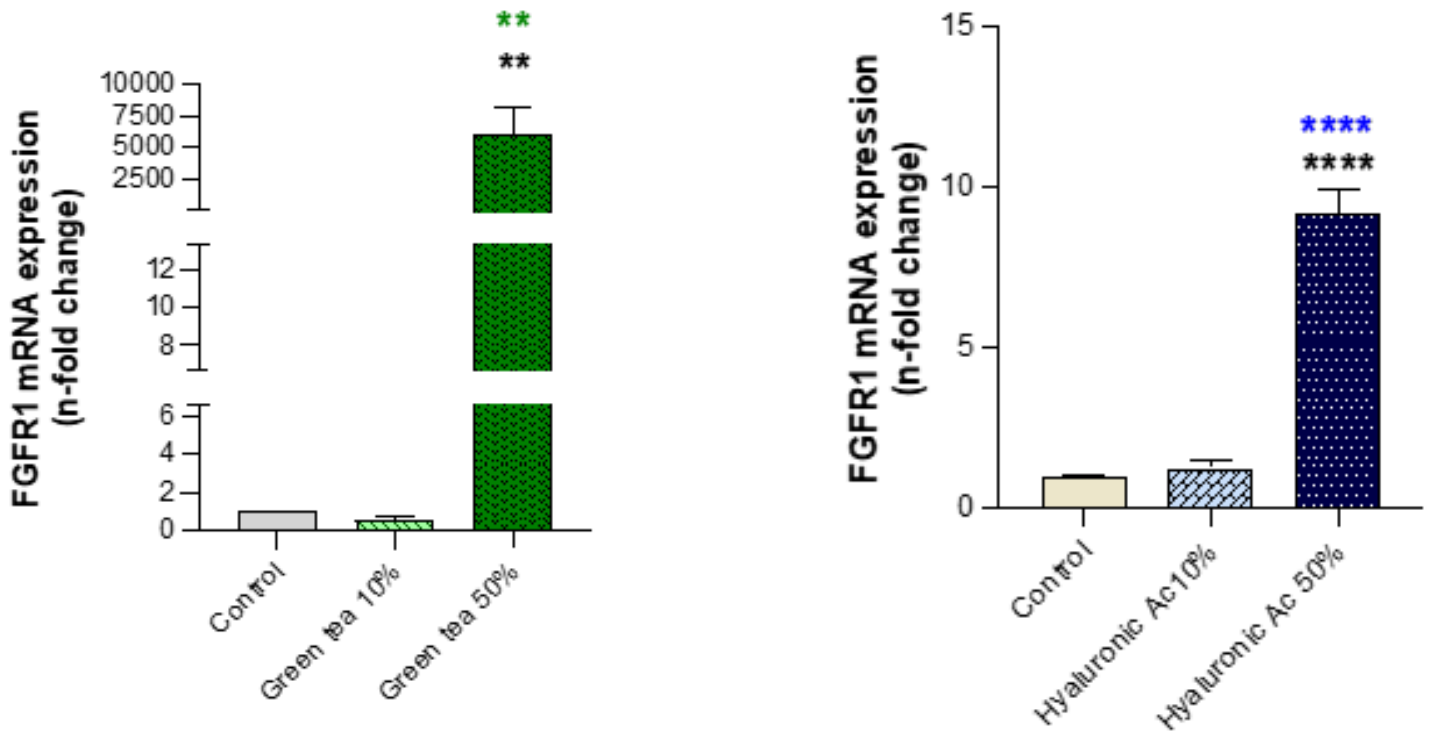
This association increases the possibilities of a new active ingredient that was incorporated with the main purpose of regenerating the gum tissue noticeably, accelerating the healing or regeneration process. This organic silicon product belongs to a silanol: the DSBC, chemically known as silanediol salicylate. It is used in oral hygiene products with properties focused on the mucosa, such as: regenerating, anti-inflammatory, and cell renewal action that voids the possible side effect of eventual scaling of the oral mucosa generated by sodium lauryl sulfate (SLS) when used in high concentration. It also promotes remineralization on teeth and prevents bone atrophy.

### **Green Tea Extract: Cammélia Sinensis**

In the search for the best clinical results, herbal medicines as active agents to control gingival inflammation and reduce oral biofilm has shown good pre-clinical 8,9 and clinical 10,11,12,13 results. Within this context, Green Tea extract (Cammélia Sinensis) has shown to be highly biocompatible 14, with good biofilm<sup>12</sup> and inflammation<sup>10</sup> control potential on patients with gingivitis due to its anti-inflammatory, antioxidant and antiseptic properties.

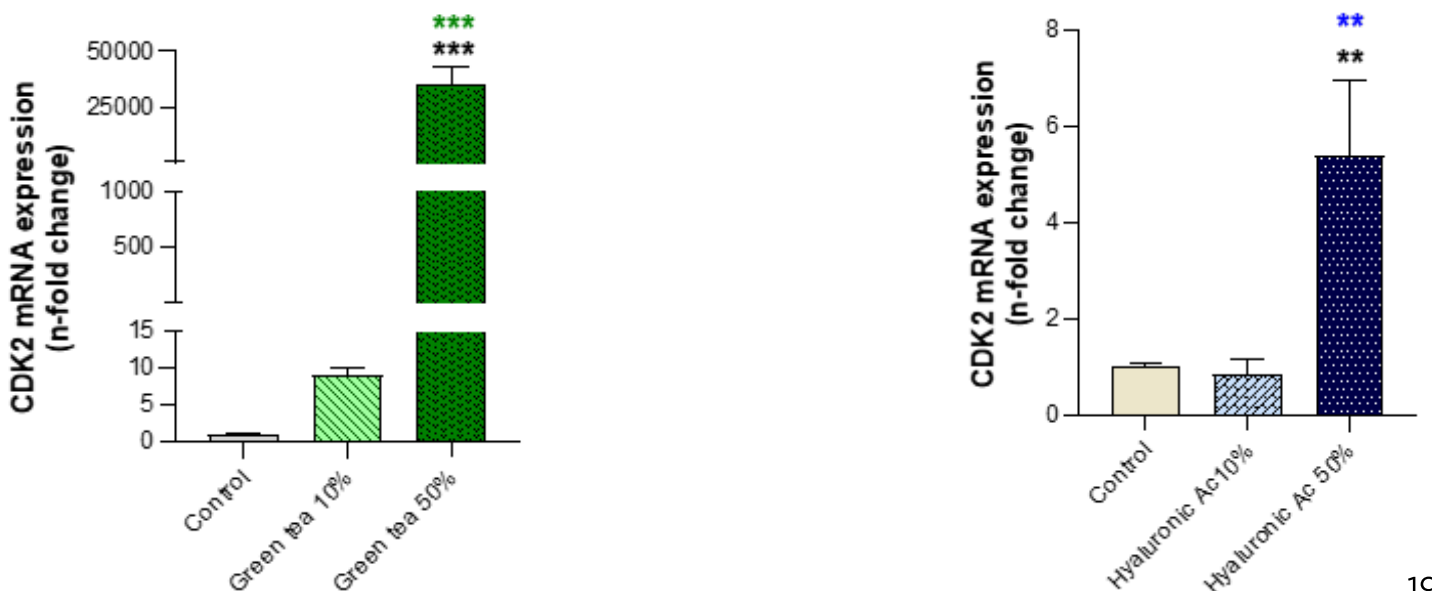
**FIGURE 13. Green Tea and Hyaluronic Acid increase FGFR1 expression.**

Fibroblasts were treated with different compounds at concentrations of 10% and 50%, when samples were collected and processed for gene expression analysis using RTqPCR methodology. FGFR1 (Fibroblast Growth Factor Receptor 1) is a gene expressing a receptor involved in the response to fibroblast growth stimuli. In the graph, monitoring shows fibroblast cultures maintained without any treatment, under classical culture conditions. Gene expression was normalized with GAPDH expression. Statistical analysis: \*\*, \*\*\*\*  $p < 0,05$ .



**FIGURE 14. Green Tea and Hyaluronic Acid promote fibroblast proliferation.**

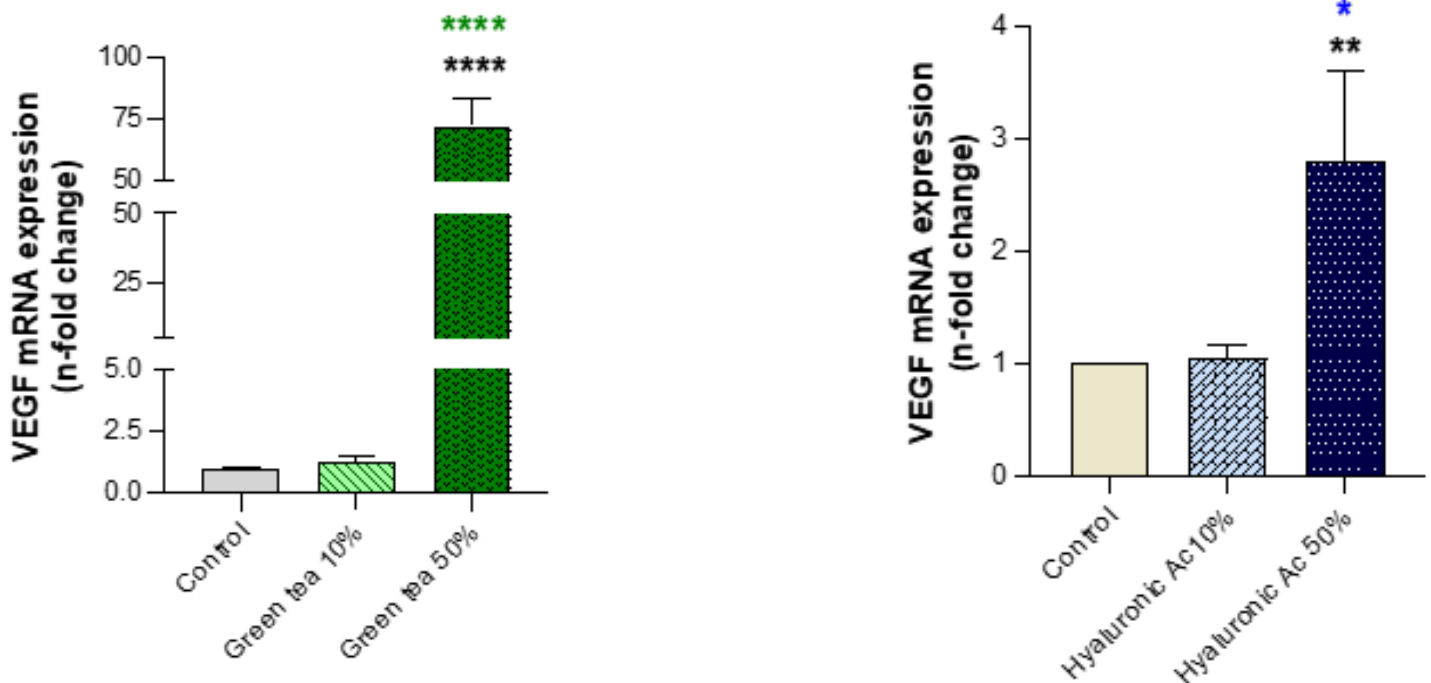
Fibroblasts were treated with different compounds at concentrations of 10% and 50%, when samples were collected and processed for gene expression analysis using RTqPCR methodology. CDK2 (Cyclin Dependent Kinase 2) is a gene expressing protein involved in cell proliferation. In the graph, monitoring shows fibroblast cultures maintained without any treatment, under classical culture conditions. Gene expression was normalized with GAPDH expression. Statistical analysis: \*\*, \*\*\*  $p < 0,05$ .



The gene expression profile promoted by Green Tea and Hyaluronic Acid compounds brings together remarkable molecular characteristics in tissue regeneration events, ensuring mechanisms for maintaining the phenotype of fibroblasts and increasing their proliferation rate. Moreover, we know that tissue regeneration mechanisms also require blood supply necessary for the maintenance of these cells, and thus angiogenesis should be developed in parallel in tissue regeneration mechanisms. Consequently, we tested the hypothesis that fibroblasts treated with green tea and hyaluronic acid do stimulate a crosstalk with endothelial cells.

FIGURE 15 clearly shows that these fibroblasts challenged with both compounds significantly increase the expression of VEGF, a gene involved with the expression of a key protein in endothelial cell proliferation and angiogenesis. Thus, we report in these preliminary tests an important effect of these compounds also on fibroblast communication with angiogenesis, further enhancing their effect on tissue regeneration mechanisms.

**FIGURE 15. Green Tea and Hyaluronic Acid establish possible communication with angiogenesis through VEGF expression.** Fibroblasts were treated with the different compounds at concentrations of 10% and 50%, when samples were collected and processed for gene expression analysis using RTqPCR methodology. VEGF (Vascular Endothelial Growth Factor) is a gene expressing protein involved in endothelial cell proliferation and angiogenesis. With increased expression of VEGF it is expected that paracrine signaling will occur between fibroblasts and endothelial cells and recapitulate molecular events decisive in tissue regeneration and oral health care. In the graph, monitoring shows fibroblast culture maintained without any treatment, under classical culture conditions. Gene expression was normalized with GADPH expression. Statistical analysis: \*, \*\*, \*\*\*\* p<0,05.



These laboratory studies were complemented by clinical studies conducted by researchers Prof. Dr. Guilherme Oliveira (Federal University of Uberlândia), Prof. Dr. Sérgio Luís Scombatti de Souza (Faculty of Dentistry of Ribeirão Preto, University of São Paulo) and Prof. Dr. Roberto Pessoa (Research Fellow BME). Roberto Pessoa (Research Fellow BME, Biomechanical Section, KU Leuven, Belgium) using N&W Dental Care products in different clinical situations with the aim of evaluating the adjuvant effect of a mouthwash containing Green Tea and Hyaluronic Acid on peri-implant clinical parameters in users of full-arch implant-supported fixed prostheses.

Eleven patients with a total of 75 implants supporting 6 lower total fixed prostheses and 7 upper total fixed prostheses agreed to participate in this short-term pilot study. Patients underwent clinical analysis of the implants at the beginning of the study and 10 days after initial product use. The probing depth, peri-implant mucosal level, clinical insertion level, peri-implant mucosal inflammation index and visible plaque index were evaluated at 6 places around all implants. To perform these analyses, all prostheses were unscrewed during the two intervention periods. Overall, the newly developed mouthwash proved to be safe with no signs of negative side effects. Furthermore, the biofilm and inflammation index were reduced, with changes at the marginal level of the peri-implant mucosa due to reduced inflammation. We can conclude that the mouthwash containing green tea and hyaluronic acid successfully reduced biofilm accumulation and inflammation around dental implants in full-arch implant-supported fixed prostheses safely in a short-term evaluation period.

The objective of the second pilot study was to evaluate the effect of different oral hygiene vehicles containing green tea and hyaluronic acid on peri-implant clinical parameters. In this study, 21 patients with a total of 112 implants used one of the tested vehicles: 1) Dentifrice (10); 2) Gel (11).

Patients who received the gel or dentifrice had implant-supported fixed partial rehabilitation. The patients underwent clinical analysis of the implants before and 10 days after the start of the use of the products. The probing depth, peri-implant mucosa level, distance from the implant platform to the bottom of the peri-implant sulcus or pocket, gingival inflammation rate, and visible plaque rate at 6 places per implant were evaluated. All products promoted a reduction in the biofilm index and inflammation, with a slight change at the marginal level of the peri-implant mucosa due to reduced inflammation.

No side effects were noticeable regarding the use of the dentifrice or gel. Thus, the conclusion of this pilot study is as follows: it is possible to reduce biofilm accumulation and inflammation around dental implants safely in a short-term evaluation period in patients of implant-supported fixed partial dentures by using vehicles containing green tea and hyaluronic acid.

The association of these active ingredients in the mouthwashes also generated an antiseptic efficiency of 99.99% in the time kill assay 26 that evaluates the activity of antiseptics on the population of oral aerobic microorganisms in specific time periods.

N&W Dental Care product lines combine this set of active ingredients to act in an effective and scientifically proven way for the different dental specialties and their specificities (FIGURES 16, 17 and 18) and are currently the only ones available in the market.



**FIGURE 16:** Periodontal surgery for correction of a vestibular esthetic defect in the upper lateral incisor using the tunnel technique and free connective tissue graft.



**FIGURE 17:** Positioning and stabilization of the free connective graft removed from the palate in the region of the oral defect.



**FIGURE 18:** Postoperative aspect demonstrating tissue health in the region of the dental emergence profile. Note that the healing process can benefit from the use of oral hygiene products including antiseptic and regenerating active principles in their composition, such as those of the SOFT TISSUE line. Clinical case courtesy of Dr. Sérgio Maia (Natal, RN)



### I. Active Ingredients and Technical Characteristics **GEL TOOTHPASTE**

- . Hydrated Silica - RDA 50 (very low abrasive)
- . Fluoride - NaF + MFP - 1500ppm
- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate

### II. Active Ingredients and Technical Characteristics **MOUTHWASH**

- . Fluorine - NaF + MFP - 247.5ppm
- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . Tea Tree Extract (Melaleuca Alternifolia)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate
- . Appearance: Smooth homogeneous gel
  - . Color: Light Pink
  - . Flavor: Typical Mint Scent
  - . pH: 7.0 - 8.5
- . Antiseptic Power (Time Kill Test): 99,99

### III. Clinical Indications

COSMETIC is a very low abrasive products line (RDA 50) that should be used together with soft or extra soft toothbrushes, following the instructions recommended by the dentist. This line is indicated for natural teeth, restorations, and rehabilitations with composite and ceramic resins, patients with accentuated dental wear and patients with increased caries risk rates. The exclusive and complex formulation offers active ingredients specially added to promote an adequate mechanical and chemical cleaning, as well as minimize dental wear, while improving soft tissues oral health and avoiding the superficial shine removal of the esthetic materials. Currently, these products with such features are exclusive in the world market.

### IV. Packaging

COSMETIC line is available in products such as 70g toothpaste tube and 300ml mouthwash bottles.



Line



SOFT TISSUE



### I. Active Ingredients and Technical Characteristics **GEL TOOTHPASTE**

- . Hydrated Silica - RDA 120 (low abrasive)
- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate

### II. Active Ingredients and Technical Characteristics **MOUTHWASH**

- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . Tea Tree Extract (Melaleuca Alternifolia)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate
- . Appearance: Smooth homogeneous gel
- . Color: Purple / Light Blue
- . Flavor: Typical Mint Scent
- . pH: 7.0 - 8.5
- . Antiseptic Power (Time Kill Test): 99.99% .

### III. Clinical Indications

SOFT TISSUE is a low abrasive products line (RDA 120) that should be used together with soft or extra soft toothbrushes, following the instructions recommended by the dentist. This line is indicated for patients who have undergone surgical procedures in various specialties, besides clinical situation such as gingival inflammation (gingivitis or peri-implant mucositis), bone loss (periodontitis and peri-implantitis), and dry mouth lesions (palate, mucosa, and tongue) 39,40,41,42.

The exclusive and complex FLUORIDE-FREE formula offers active ingredients specially added to promote tissue regeneration and high antiseptic power, in addition to adequate mechanical and chemical cleaning. Currently, these products with such features are exclusive in the world market.

### IV. Packaging

COSMETIC line is available in products such as 70g toothpaste tube and 300ml mouthwash bottles.

# Our Products

n&w  
dental care



I M P L A N T S



## I. Active Ingredients and Technical Characteristics **GEL TOOTHPASTE**

- . Hydrated Silica - RDA 100 (low abrasive)
- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate

## II. Active Ingredients and Technical Characteristics **MOUTHWASH**

- . Hyaluronic Acid (HA)
- . Green Tea Extract (Camellia Sinensis)
- . Tea Tree Extract (Melaleuca Alternifolia)
- . DSBC - Dimethylsilyl salicylate
- . Tetrasodium Pyrophosphate
- . Appearance: Smooth homogeneous gel
- . Color: Light Gray
- . Flavor: Typical Mint Scent
- . pH: 7.0 - 8.5
- . Antiseptic Power (Time Kill Test): 99,99

## III. Clinical Indications

IMPLANTS is a low abrasive product line (RDA 100) that must be used together with soft or extra soft toothbrushes, following the instructions recommended by the dentist and is indicated for patients who have had treatments with osseointegrated implants. The exclusive and complex FLUORIDE-FREE formula offers active ingredients specially added to promote an adequate mechanical and chemical cleaning, as well as minimize dental wear, while improving soft tissues oral health, especially the peri-implant 35, 36, 37, 38 and avoiding the superficial shine removal of the esthetic materials. Currently, these products with such features are exclusive in the world market.

## IV. Packaging

COSMETIC line is available in products such as 70g toothpaste tube and 300ml mouthwash bottles.

## Final Considerations

Science is updated day after day, and the constant evolution of oral hygiene care should always count on the watchful eye of dental professionals, because only their technical ability, scientific basis, and clinical commitment will be able to diagnose, prevent, and treat oral diseases that are, by definition, multifactorial. We must understand that each individual is unique, and must be the main focus of our actions, worthy of a humanized and effective treatment that has been scientifically based on obtaining consistent and predictable results.

We do not intend this monograph and the first products launched by N&W Dental Care to be the only goals, but for them to be the means of prominent science debates, promoting the urge to overcome limits and, above all, to positively impact our patients lives, who entrust us with their oral health.

Let this be the beginning of our history together, because we know that no single product will be able to obtain the results that our patients deserve without the direct interference of a qualified dentist.

We invite you to learn a more about our history and our products at

**[www.newdentalcare.com.br](http://www.newdentalcare.com.br)** or through

our social network profile **@newdentalcare\_**

so that our mission to build healthy, beautiful and happy smiles will always guide our actions.

See you soon!

Ariel Lenharo & Fábio Bezerra

# 9. Product Comparison Tables

## a. Anticaries Toothpastes

Table 1: Comparative Analysis of Anticaries Toothpastes (Cury and Oliveira 20214 Modified)

ANTICARIES TOOTHPASTES	ACTIVE INGREDIENT	OTHER INGREDIENTS	RDA	DETERGENT	OTHER INFORMATION
N&W DENTAL - LINHA COSMETIC	NAF + MFP 1500PPM	Green Tea Ext., DSBC, Hyaluronic Acid, Tetrasod. Pyrophosphate	50	Lauryl Glucoside / SLS	Antiseptic, anti-tartar, and tissue regenerator active ingredients. Not tested on animals. Vegan. pH 7 to 8.0
BioXtra	MFP 1500			Isoceteh-20	*Traços de proteína do leite e clara do ovo *Sem mentol
Close-up anticária	NaF 1450			SLS	
Close-up Liquifresh	NaF 1450		86	SLS	
Close Up Proteção Bioativa	MFP 1450			SLS	
Close Up Triple	MFP 1450			SLS	
Colgate Anticária	MFP 1450		70	SLS	
Colgate Anticária + Neutraçúcar	MFP 1450			SLS	*Arginine 1,5%
Colgate Natural Extracts	NaF 1100			SLS	*Silica / Vegan
Colgate Tripla Ação	MFP 1450			SLS	
Crest Anticavities	NaF 1100		108	SLS	
Curaprox Be You	MFP 950		50	CAPB	*Silica / Vegan
Curaprox Enzycal 950 / 1450	NaF 950 / 1450		30 / 60	Steareth-20	*It contains traces of milk *Little mint *Glycosyl oxidase + lactoperoxidase
Edel White Care Forte	NaF 1450		60	CAPB e Lauril Sarcocinate	*Vegan
Elmex Anticária	F-Am 1400		77	NO	
Elmex Erosion Protection	AmF (700) + NaF (700)	SnCl (3500 ppm Sn) + Quitosana (0,5%)	< 30?	CAPB	
Elmex Homeopathy (Europa)	F-Am 1250		77	NO	*compatible w/ homeopathic tx
Glistar Amway	NaF 950		110	SLS	
Kin Anticária	NaF 1450			SLS	
Kin Hidrat	NaF 1450		60 a 70	CAPB	
Oral B 1,2 e 3 N	NaF 1100			SLS	
Oral B 4 em 1	MFP 1450			SLS	
Oral B Extra Fresh / Escudo	MFP 1450			SLS	
Oral B Pró Saúde 100%	NaF 1450		102	SLS	
Parodontax Flúor	NaF 1400		56	CAPB	*Sodium bicarbonate *Tincture of rattan, echinacea, myrrh, chamomile
Smile for Good Colgate	NaF 1450			Lauril glicoside / Cocoil glutamate	*Imported *Natural / Vegan
Sorriso	MFP 1450			SLS	
Tandy	NaF 1100			LSS	
The Humble Co. Natural	NaF 1450		60 a 70	Lauril glicoside	*Vegan / *Natural Recyclable tube
Theory. Oral B	NaF 1100			CAPB	*Imported *Vegan, natural (no artificial sweeteners or coloring)
Tom's of Maine Orange Mango /	MFP 1070			SLS	*Compatible wih/ homeopatic tx (imported)
Ultra Action	MFP 1200			SLS	*Vegan
Xerolacer	MFP + NaF 1360			CAPB	*Triclosan

Note: This is only an example of a product table. RDA values may vary between tests. Data obtained through information of company websites or product packaging. It is important to update the data when changes in the formulation or in the product lines occur.

## b. Antiplaque and Antigingivitis Toothpastes

Table 2: Comparative Analysis of Antiplaque and Antigingivitis Toothpastes: (Cury and Oliveira 20214 Modified)

ANTIPLAQUE/ANTINGIVITIS TOOTHPASTES	ACTIVE PRINCIPLES ANTIPLAQUE AND ANTINGIVITIS	OTHER ACTIVE PRINCIPLES	RDA	DETERGENT	ABRASIVES	OTHER INFORMATION
N&W LINHA COSMETIC	NaF+MFP1500, Green Tea Extr., Hyaluronic Acid	DSBC, Ác. Hialurônico, Pirofosfato Tetrassódico	50	Lauryl glucoside /SLS	Sílica	Act. princip. antiseptic, anti-tartar and tissue regenerator. Not tested on animals. Vegan. pH 7 to 8.0
N&W LINHA IMPLANTS	NaF+MFP1500, Green Tea Extr., Hyaluronic Acid	DSBC, Ác. Hialurônico, Pirofosfato Tetrassódico	100		Sílica	Act. princip. antiseptic, anti-tartar and tissue regenerator. Not tested on animals. Vegan. pH 7 to 8.1
N&W LINHA SOFT TISSUE	NaF+MFP1500, Green Tea Extr., Hyaluronic Acid	DSBC, Ác. Hialurônico, Pirofosfato Tetrassódico	120		Sílica	Act. princip. antiseptic, anti-tartar and tissue regenerator. Not tested on animals. Vegan. pH 7 to 8.2
Colgate Total 12	NaF 1450	Citrato Zn (1,5%) + Óxido Zn (0,5%)		SLS / CAPB		*Arginine 1,5%
Oral B Pró-Gengiva Original	SnF2 (1100) + NaF (350)		158	SLS		*Sodium hexametaphosphate
Oral B Gengiva Detox (Deep Cle)	SnF2 (1100)		180	SLS		*Zn Citrate
Sensodyne Sensibilidade e Geng	SnF2 (1100) + NaF (350)					
Periogard	MFP 1450	Citrato Zn (2%)	60	SLS		
Prevent	MFP 1200	Citrato Zn (2%)		SLS	Sílica	

Note: This is only an example of a product table. RDA values may vary between tests. Data obtained through information from company websites or product packaging. It is important to update the data when changes in the formulation or in the product lines occur.

## c. Regenerating Toothpastes

Table 3: Comparative Analysis of Regenerating Toothpastes

REGENERATING TOOTHPASTES	REGENERATIVE ACTIVE INGREDIENT	OTHER ACTIVE INGREDIENTS	RDA	PH	ABRASIVES	OTHER INFORMATION
N&W LINHA COSMETIC	Green Tea Extract, Hyaluronic Acid, DSBC	NaF,+ MFP 1550 ppm. Pirofosfato Tetrassódico	50	7 a 8	Sílica	Antiseptic, anti-tartar, and tissue reg. as active ingredients. Not tested on animals. Vegan.
N&W LINHA IMPLANTS	Green Tea Extract, Hyaluronic Acid, DSBC	NaF,+ MFP 1550 ppm. Pirofosfato Tetrassódico	100	7 a 8	Sílica	Antiseptic, anti-tartar, and tissue reg. as active ingredients. Not tested on animals. Vegan.
N&W LINHA SOFT TISSUE	Green Tea Extract, Hyaluronic Acid, DSBC	NaF,+ MFP 1550 ppm. Pirofosfato Tetrassódico	120	7 a 8	Sílica	Antiseptic, anti-tartar, and tissue reg. as active ingredients. Not tested on animals. Vegan.

Note: This is only an example of a product table. RDA values may vary between tests. Data obtained through information from company websites or product packaging. It is important to update the data when changes in the formulation or in the product lines occur.

## d. Product Comparison Tables

Table 4: Comparative Analysis of Mouthwashes  
(Cury and Oliveira 2021 4 Modified)

MOUTHWASHES	ANTICARIES ACT. INGRED.	ANTIINGIVITIS ACTIVE INGREDIENTS	REGENERATIVE ACTIVE INGRED.	ALCOHOL	PH	OTHER INFORMATIONS
N&W LINHA COSMETIC	NaF+MFP 1500ppm/Xilitol	Green Tea Extract, Tea Tree Extract, Tetrasodium Pyrophosphate	DSBC, Ácido Hialurônico	NO	7 a 8	Not tested on Animals. Vegan.
N&W LINHA IMPLANTS	Xilitol	Green Tea Extract, Tea Tree Extract, Tetrasodium Pyrophosphate	DSBC, Ácido Hialurônico	NO	7 a 8	Not tested on Animals. Vegan.
N&W LINHA SOFT TISSUE	Xilitol	Green Tea Extract, Tea Tree Extract, Tetrasodium Pyrophosphate	DSBC, Ácido Hialurônico	NO	7 a 8	Not tested on Animals. Vegan.
BIANCO ADVANCED REPAIR	NaF - 226 PPM					With TCP 1%
BIANCO PRÓ CLINICAL	NaF - 226					With TCP 3%
CEPACOL		CPC (0,05%)		With (14%)	7,3	
CEPACOL FLÚOR JÚNIOR	NaF - 225	CHX (0,05%)		With (14%)	7,1	
COLGATE NATURAL EXTRACTS	NaF - 225	CPC				
COLGATE SENSITIVE PRÓ ALÍVIO	NaF - 226					With Arginina (0,8%)
COLGATE TOTAL 12	NaF - 225	CPC (0,075%) + Lactato de Zinco (0,24%)		NO	4,6	
CONTENTE	NaF - 226 C	CPC				Vegano
CURAPROX PERIOPUS BALANCE	NaF - 226 C	CHX (0,05%)		NO		With CPC
CURAPROX PERIOPUS FORTE		CHX (0,2%)		NO		With CPC
CURAPROX PERIOPUS PROTECT		CHX (0,12%)		NO	5,6	With CPC
CURAPROX PERIOPUS REG.		CHX (0,09%)		NO	6,8	With CPC/hyaluronic acid
EDEL WHITE	NaF - 250			NO		Vegan
ELMEX DENTAL RINSE	AmF / NaF - 250			NO	4,3	
FUIDO BUCAL BLUE M				NO	6,2	
HALITHERAPY	NaF - 220	CPC		NO		With Chlorine Dioxide
LISTERINE ANTICÁRIE ZERO		Essential Oils		NO	4,3	With LSS
LISTERINE ANTITÁRTARO		Essential Oils + Zinc Chloride		With		
LISTERINE ANTITÁRTARO ZERO		Essential Oils + Zinc Chloride		NO		With LSS
LISTERINE COOL MINT		Eucal.(0,092%) + Timol (0,064 %) + Sal. de Metila (0,06%) + Mentol (0 ,042%)		With (21,6%)	4,1	
LISTERINE COOL MINT ZERO		Eucal.(0,092%) + Timol (0,064 %) + Sal. de Metila (0,06%) + Mentol (0 ,042%)				
LISTERINE CUIDADO TOTAL ZERO	NaF - 100	Essential Oils (?) /Zinc Chloride (?)			4,3	With LSS
LISTERINE ORIGINAL		Eucal.(0,092%) + Timol (0,064 %) + Sal. de Metila (0,06%) + Mentol (0 ,042%)		With (26%)	4,1	
MALVATRIKIDS	NaF - 225				6,6	
NOPLAK		CHX (0,12%)		NO		
NOPLAK MAX	NaF - 225	CHX (0,12%)		NO	5,8	With CPC
ORAL B COMPLETE	NaF - 225	CPC 0,05%		NO	5,3	
ORAL B PRÓ SAÚDE		CPC (0,07%)		NO	5	
ORAL B PRÓ SAÚDE NOITE		CPC (0,07%) + Lactato de Zinco		NO		
ORTHO GARD	NaF - 180				4,45	
PLAX	NaF - 225	CPC (0,075%)		NO	5,3	
PLAX KIDS	NaF - 225	CPC (0,05%)		NO		
PERIODEFENSE		CHX (0,12%)		With (11,6%)	5,3	
PERIOGARD		CHX 0,12%		With (11,6%)	5,5	
PERIOGARD USO DIÁRIO		CHX 0,06%		NO		With CPC
PERIO THERAPY		CHX 0,12%		NO		
PERIOTRAT		CHX 0,12%		With / NO		
PERIOXIDIN		CHX 0,12%		NO		
PERÓXIDO DE HIDR. BLUE M					4	H2O2 (1%)
SAFE SMILE FGM					3,5	H2O2 (1,5%)
SENSODYNE	NaF - 217				6,6	Potassium Nitrate (3%)
ULTRA ACTION	NaF - 226	CPC				Vegan

**Note:** This is only an example of a product table. RDA values may vary between tests. Data obtained through information of company websites or product packaging. It is important to update the data when changes in the formulation or in the product lines occur.



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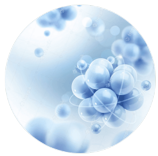
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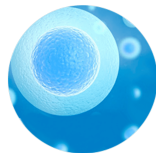
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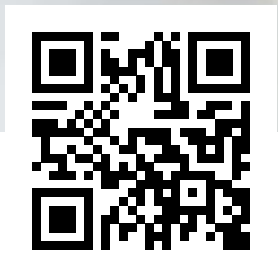
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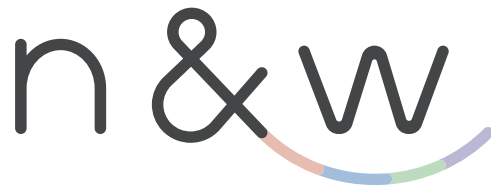


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