RMO UPdate

ROCKY MOUNTAIN ORTHODONTICS UPDATE : SPRING 2006

The NEW Technique

THE STRAIGHT WIRE LOW FRICTION (SWLF)

INTRODUCING

The all-new Synergy fx

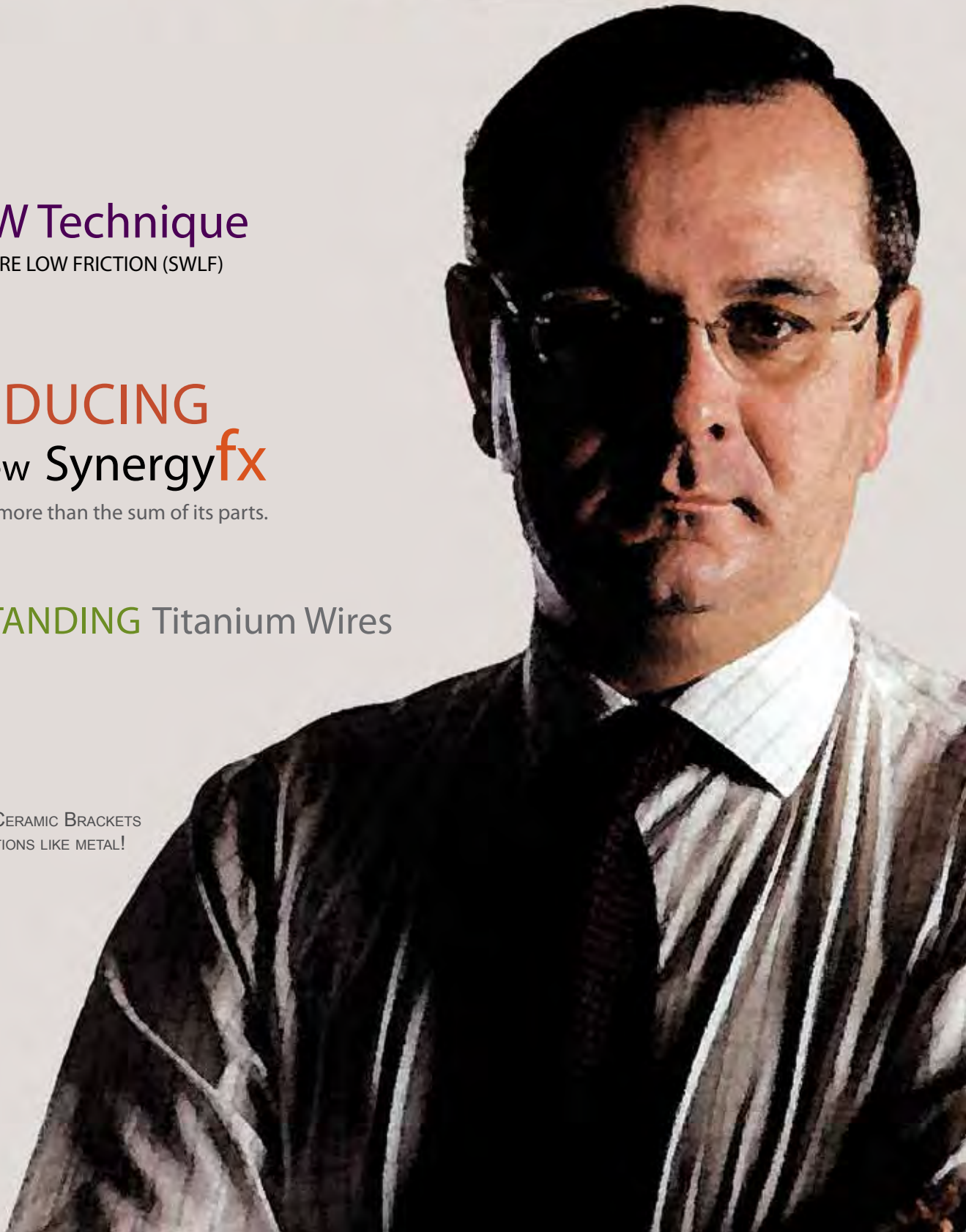
A bracket that is more than the sum of its parts.

UNDERSTANDING Titanium Wires

By Dr. Leon Laub

LUXI II

Gold Reinforced Ceramic Brackets
Ceramic that functions like metal!



SWLF - DR. SUAREZ AROUND THE WORLD

Jeddah, Saudi Arabia


Milan, Italy


Beirut, Lebanon


Kuala Lumpur, Malaysia


Capetown, South Africa

Kuala Lumpur, Malaysia


Campinas, Brazil


Tokyo, Japan


Mexico City, Mexico


Osaka, Japan


Lima, Peru


Tokyo, Japan


University of Illinois at Chicago, Illinois

Manila, Philippines


Colorado University, Denver, CO


Bangkok, Thailand


Santiago, Chile

Dr. David Suarez

The SWLF™ System is a combination of a low friction passive/active bracket and new super-elastic wires for each stage of treatment. The SWLF™ System developed by Dr. David Suarez, ensures orthodontic movement is fast and easy. Treatment time and appointments are reduced by more than 30%.

The NEW technique.

STRAIGHT WIRE LOW FRICTION (SWLF™)

by; David Suárez-Quintanilla, DDS

Straight Wire Low Friction (SWLF) provides all the advantages of straight wire but eliminates the problem of static and dynamic friction.

Friction assures occlusal stability and three-dimensional control of roots in the latter phases of treatment. But friction is a problem for alignment and levelling as it reduces the effectiveness of super elastic wires, complicating and prolonging treatment. SWLF is a simple technique which drastically reduces chair time, the number of visits and the total length of treatment.

Correcting skeletal abnormalties is accomplished with non-compliance appliances like Herbst, Wilson, Pendulum, and mini screws for anchorage. Early alignment and leveling is limited by the biology of tooth movement and craniofacial growth rather than wires and brackets. During early phases, larger stainless steel rectangular wires are used (.022" arch slot is preferred) and stabilization with fixed retainers.

SYNERGY BRACKET

The Synergy bracket maximizes sliding in the initial phases of treatment with super elastic wires like self-ligated brackets. Synergy has three pairs of wings instead of two. When the central wings with their raised sides are ligated, the wire-ligature contact is minimal or non-existent, reducing friction almost to zero and optimizing the action of super elastic wires. Several studies have shown that alignment with super elastic wires in cases with severe irregularity is much quicker and more effective with low friction brackets, like Synergy, than with twin brackets.

EARLY INSERTION OF RECTANGULAR SUPER ELASTIC WIRES.

Twin brackets arch slot openings have a 90° angle which creates difficulty inserting wires and creates binding. Addtionally it may be necessary to use "laceback" ligatures to control cuspids which is common in the MBT technique. Synergy's rounded arch walls and floor facilitate rapid insertion of rectangular super elastic wires and eliminates "laceback" ligatures. This also allows early insertion of larger wires for closing and torque. Synergy improves biomechanical effectiveness, shortens and simplifies treatment with less arch wires, less chair time, and less patient visits. Self-ligating brackets have similar charactertistics but are bulky, require special instruments, break and are expensive. Synergy also has the added feature of using colored ligatures that patients want .

INDIVIDUAL "TOOTH BY TOOTH" CONTROL OF TOOTH MOVEMENT AND ANCHORAGE.

MULTIPLE LIGATING:

Center wings "C" – To achieve maximum sliding and maximum tooth movement. For maximum displacement in initial phases of alignment with round or rectangular super elastic wires; for distalizing canines, laterals, etc.

Standard "0" – Ligate the corner wings like a twin bracket thus achieving maximum control of rotations and medium sliding. The friction originated by ligature-wire contact will control the degree of tooth movement.

"8" – Close wire-ligature-slot contact, obtaining total expression of the wire on the bracket and maximum control of the root. Used for control over three planes of space, torque control and tooth anchorage.

LOW FRICTION LIGATURES

To further reduce friction, Synergy Low Friction ligatures are recommended because they are coated with a polymer when combined with saliva, increasing sliding compared to conventional ligatures. Energy Chain elastomeric chain is also recommended since it retains its force properties longer than any other chain.

WIRE SEQUENCING

Wire selection is based on phases of treatment.

Alignment phase – The irregularity index (incisor-canine) determines the selection of super elastic nickel-titanium. Thermal NiTi wire is an excellent wire that combines shape memory with constant force independent from activation and deformation. The majority of cases begin with .018" wire and then change to .017 x .025 super elastic wire to align crowns and roots. After alignment, orthostripping is done, if needed, with a mechanical rotary dental instrument. This method is rapid and comfortable compared to manual or mechanical stripping using burs and discs.

Levelling phase – The decision to continue with super elastic wire or Curve of Spee depends on the degree of deepbite and its correlation with the biotype of the patient. In the cases with a deepbite or openbite, use Orthonol Curve of Spee and intermaxillary elastics.

Closing phase – There are two considerations in the closing phase; the amount of space to close and the degree of deepbite. When closing space in the anterior distally, the depth of the bite tends to increase and lose torque. These two factors seem to worsen in individuals with a deepbite and who are brachyfacial. RMO TruChrome stainless steel wire is the ideal alloy for space closing and torquing. It has sufficient rigidity for root and torque control. The working arch wire is the .019 x 25" TruChrome with crimpable hooks distal of the laterals. In the cases with severe deepbite, use Beta III Titainium preformed closing wires with simple "T" springs.

Finishing phase – Consider the irregularity index, the vertical relationship, the Andrews keys and the functional occlusion. Then continue with the .019 x 25" TruChrome (little irregularity, excellent occlusal relationship, etc) or change to .019 x 25" Beta III Titanium or Flex VIII (with occlusal adjustments and intermaxillary elastics) .

The SWLF Kit

Straight Wire Low Friction (SWLF) is a comprehensive technique developed with Evidence-Based Orthodontics (EBO). The biomechanics have been simplified, making learning of the technique simple and rational. The technique reduces the length of treatment, reduces extractions, increases the time between appointments, reduces cost, giving the orthodontist the options of starting more cases, seeing more patients or having more free time.

Miniscrews are very useful in the SWLF to intrude molars in the first phase of adult treatment. Miniscrews are placed using a local anesthesia and is well tolerated by patients. The screws shown here have optimal mechanical retention, permitting their immediate loading. Remove is done without anesthesia.

David Suárez-Quintanilla, DDS

Professor and Director of the Master Degree in Orthodontics and Director of the Center for Research and Treatment of the Dentofacial Deformities University of Santiago de Compostela, Spain. Councillor of the European Orthodontic Society

e-mail : david@ortodonciasq.net

Extractions are reduced in the SWLF technique. Mechanical Orthostripping is a safe and rapid method to gain space.

Tooth-by-tooth control of tooth movement and anchorage using the multiple ligating options of the Synergy bracket. "C": Center, maximum movement - low control to alignment and close space. "0": Standard , rotation control in intermediate phases. "8": Maximum 3D control and anchorage, minimum movement in finishing.

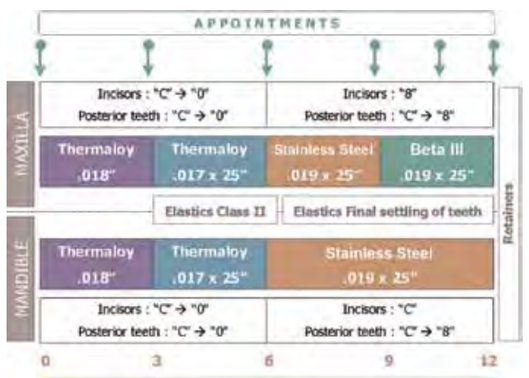
DIAGNOSIS	ARCH WIRES	
	Maxillary	Mandibular
ALIGNMENT		
High	.015" Thermal NiTi	.015" Thermal NiTi
Medium	.017" Thermal NiT	.017" Thermal NiTi
Low	.017" x .025" Thermal NiTi	.017" x .025" Thermal NiTi
LEVELING		
Normal	.017" x .025" Thermal NiTi	.017" x .025" Thermal NiTi
>2/3	.017" x .025" Orthonol Curve of Spee + Posterior elastics	
<1/3	.017" x .025" Orthonol Curve of Spee + Anterior elastics	
SPACE CLOSING		
No	.019" x .025" Stainless Steel	.017" x .025" Stainless Steel
Yes	.019" x .025" Stainless Steel	.019" x .025" Stainless Steel
FINISHING		
Children	.019" x .025" Braided SS	.019" x .025" Braided SS
Adults	.019" x .025" Beta III Titanium	.019" x .025" Beta III Titanium

Arch wire selection in the Straight Wire Low Friction.

The .019 x 25" TruChrome is the working arch wire to close space and to correct the Class II/III relationships using intra or inter maxillary elastics. Crimpable hooks are applied to the arch wire in the mouth.

This sequence of intra-oral views shows a patient with a Class I malocclusion with crowding , photographs show the arch wire in place with the low friction ligatures in the center "C" of upper cuspids and premolars to avoid friction and in the standard form "0" on lateral incisors and lower cuspids for maximum rotational control. Final figure show a satisfactory occlusion.

This is the treatment chart of the patient with months of treatment, number of appointments (only 6) , months of treatment (1 year) , arch wires, types of ligation and the use of elastics.



STRAIGHTWIRELOWFRICTION
S.W.L.F.™

Class II-1 and was treated with a Frankel Functional Appliance and then with SWLF. .019 x 25" TruChrome working arch wire with crimpable hooks and intermaxillary elastics. The final result of the treatment with good molar relationship and the correction of the deepbite.

Class II with pronounced deepbite with Synergy brackets and .017 x 25" Beta III Titanium archwire to intrude the upper incisors. End of treatment good occlusion with deepbite correction and cuspid and molar relationship.

Skeletal Class III with anterior crossbite, note the typical asymmetry observed with excessive mandibular growth to the left. (Fig. A-C), occlusion evaluation, evolution of treatment and modelling surgery using SAM III articulator (D). Synergy brackets allows the early insertion of Thermal NiTi rectangular arch wires and shortening the presurgical orthodontic phase. .019 x 25" TruChrome with surgical hooks in place (E).

Final result one year after surgery and six months after orthodontic treatment. Excellent occlusion, face and the smile. Facial profile is balanced and pleasing.

STRAIGHTWIRELOWFRICTION
S.W.L.F.™

RMO introduces the all-new SYNERGYfx

fx : more than the sum of its individual parts.

The all-new Synergy fx does more than promise the best of all worlds. It flat-out delivers. Several years ago, the first-generation Synergy opened eyes to new possibilities in orthodontic treatment efficiency around the world. With generation two, Synergy fx brings a new standard of treatment efficiency.

GREATER THAN EXPECTATIONS.

The first generation of Synergy, unleashed the potential of the new exotic wires with their super-elasticity. Synergy fx continues with this feature allowing light and consistent force for a long period of time. Super-elastic wires improve tooth movement by encouraging alveolar bone growth. Super-elastic and thermo elastic wires simplify biomechanics. Synergy fx enables these wires to reach their full potential. The new exotic wires need to slide smoothly through the brackets during alignment in order to reach their full biomechanical potential.

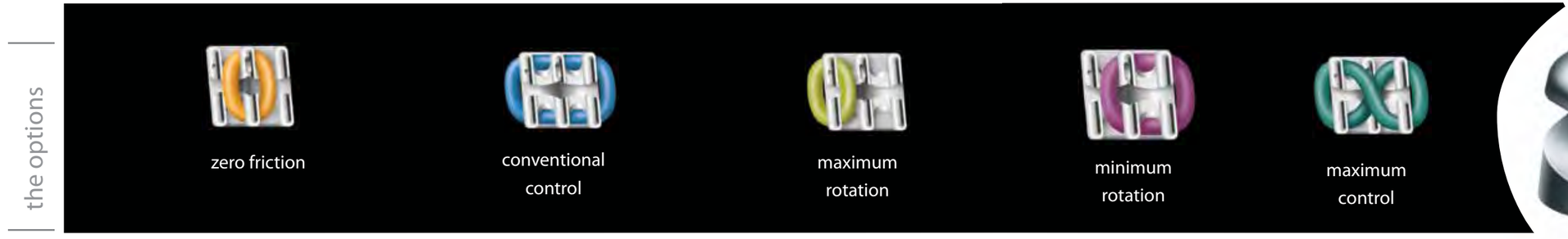
Synergy fx allows the free movement of wire during alignment. Synergy is the only reduced friction bracket that allows tooth-by-tooth control over the entire course of treatment. Synergy fx permits 6-8 week intervals between patient visits and faster overall treatment time.

MORE THAN MEETS THE EYE.

Synergy fx is totally integrated as one unit with built-in wings, hooks and base. This design also assures perfect bracket to base alignment which makes positioning the bracket on the tooth precise.

The new design has all six tie wings being the same dimension for easy ligation, strength and patient comfort. Synergy fx is rounded overall and has a new hook designed for patient comfort. The lower anterior brackets are also in the six wing Synergy design for the first time.

The patented molded bonding base, assures an excellent bond. The base has deeply-molded undercuts that grip adhesive for exceptional bond strength. Extensive laboratory bond testing and clinical bond testing show the base design allows for superb bracket-to-adhesive bonding, preventing bond failures. Mono-Lok light cure adhesive has been tested with Synergy fx and is recommended.



MORE THAN THE SUM OF ITS PARTS.

Synergy (sîn´er-je) n. the action of two or more substances to achieve an effect of which each is individually incapable.

MORE LOW FRICTION – LOW FORCE.

Synergy fx's patented rounded arch slot walls and floor eliminates binding and friction on arch wires, allowing them to perform at their optimum. The curving slot walls and floor let the arch wire enter and exit without binding. Since the arch wire isn't rigidly captured, there is a gentler and more continuous force.

Leveling during early phases is accomplished faster, like with self-ligating brackets. At the beginning of treatment, with malpositioned teeth, there is maximum deflection of the arch wire. Synergy fx's curving walls and floor maximize the effectivity of the arch wire and increase the interbracket distance adding to the effectiveness of the arch wire.

MORE LIGATING OPTIONS.

Synergy fx's ligating options; allow zero-friction when ligated around the center wing and maximum control when ligated in a figure-eight. These ligating options give control tooth-by-tooth over the entire course of treatment. Friction is controlled where and when it is needed. Synergy fx's brackets can be ligated in colors that patients love.

MORE COMFORT.

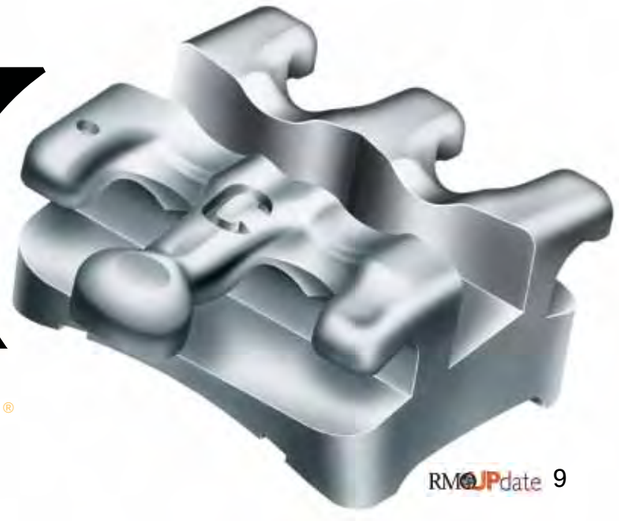
Synergy fx's low friction, light force along with it's low, rounded profile means more comfort. The low profile also assures secure bonding since tall brackets can be debonded by opposing teeth.

RESEARCH.

Independent research compared friction and arch wire binding between Synergy and competitive brackets. The results clearly show the superiority of the Synergy bracket.

Call your RMO representative to see how easy it is to incorporate Synergy fx into your practice.

SYNERGYfx®



UNDERSTANDING titanium wires

Dr. Leon W. Laub

When I was in college, one of my Professors showed me a wire that could be bent into complex shapes, then after dipping into warm water it sprang back to its original form. It was fun to play with, but had no applications at that time. Many years later, this same material has revolutionized the ability to move teeth. The material was developed for entirely other reasons at the U.S. Naval Ordnance Laboratory (NOL). It is an alloy of 55% Nickel (Ni) and 45% Titanium (Ti) and became known as NITINOL.

The internal structure of NiTi wires consists of an arrangement of atoms in patterns that differ at low and high temperature. A TRANSITION TEMPERATURE separates the low and high temperature structure. The internal structure, or configuration of atoms in the wire, changes when the temperature of the wire goes through the transition temperature. A structure that is distinct and homogeneous is known as a PHASE. The low temperature phase in NiTi wires is called MARTENSITE. The high temperature phase is called AUSTENITE. Martensite and austenite have atomic structures that differ from each other. Properties of the wire are related to its structure. Heating or cooling a wire through its transition temperature occurs with a change in properties. Therefore the properties of martensite and austenite differ. A thermal wire is delivered to the clinician in its martensite phase. Wire having the martensite phase feels soft and bends easily outside the mouth. In the mouth, the wire warms up to body temperature and its phase changes from martensite to austenite. The wire "remembers" its arch shape before the clinician bent it and attempts to return to this shape. This property is known as SHAPE MEMORY. At body temperature, the wire has an austenite phase and its properties are then called SUPERELASTIC. The superelastic wire feels stiff and springy; when the clinician attempts to bend it, it immediately recovers

Dr. Leon W. Laub

Director, Product Development, RMO, Inc.

Adjunct Clinical Professor, Dept. of Orthodontics, University of Illinois, Chicago, IL

Professor Emeritus, Loyola University School of Dentistry, Chicago, IL

to its original shape without taking a permanent bend.

ALL NiTi wires used in orthodontics have both SHAPE MEMORY and SUPERELASTIC properties. If you understand this fact, then understanding the properties and uses of the wires is easy. A transition temperature distinguishes shape memory from superelastic properties. Control of processing and heat treatment during production establishes the transition temperature. Below the transition temperature, the wire has shape memory properties. Above the transition temperature, the wire has superelastic properties. A NiTi wire can be processed during production to go through a transition at any temperature between 0˚C - 100˚C.

In orthodontics, wires are mainly used at two temperatures: Room Temperature (20˚C) and Mouth Temperature (35˚C). Manufacturers supply wires at room temperature that either have shape memory properties or are superelastic.

Superelastic wires, as-received by the clinician, are already above their transition temperature. As soon as a force is removed from bending the wire, the wire returns to its original shape. The wire is not permanently bent.

NITI THERMAL OR HEAT-ACTIVATED WIRES

A wire having its transition temperature below, but close to 35˚C, is called a thermal wire. The manufacturer supplies a wire to the clinician that is bendable and remains bent below its transition temperature. As the clinician engages the wire in the mouth, the force that he exerts is absorbed by the wire. When the wire equilibrates in the mouth, it passes through its transition temperature and becomes superelastic. Part of the energy absorbed by the wire then exerts a force on the teeth, as the wire attempts to return to its original arch shape, which leads to remodeling of the teeth. The wire's return to its original arch shape after passing through its transition temperature is the shape memory property.

Small diameter round NiTi thermal wire is often the wire chosen for initial alignment of teeth. The wire bends easily when the clinician engages it into the arch slots. When in the mouth, the patient's body temperature provides the energy to drive it through its transition temperature with the resultant change in phase. Outside the mouth, the wire is fully martensitic and soft; once inside the mouth it becomes fully austenitic and springy.

RMO's heat activated wire for the SWLF System is called Thermal NiTi. Recently, smaller size round wires were added to the product line in the Natural Arch Shape. A 0.013" round wire is used as the initial alignment wire for .018" arch slot brackets for teeth that are highly irregular. A 0.015" round wire is used for .022" arch slot brackets. These smaller heat activated wires lead to faster unscrambling of teeth.

Brands of thermal wires are not all the same. The purity of the raw materials used in the alloy, optimizing composition by adjusting the minor ingredients in the formula, whether the alloy is specifically formulated to be only a thermal wire or used to produce both thermal and superelastic wires, and processing parameters all account for differences among brands.

FIGURE 1
Tinius Olsen Stiffness Tester

(A.) Upper scale on stiffness tester (units): Force or load (% maximum bending moment 0-100). Lower scale on stiffness tester (units): Deflection (angular deflection in degrees)

SWLF Thermal NiTi starts with a formula that is optimized for heat activated wires; the same alloy is not used to also produce superelastic wires. A NiTi alloy that is used to produce both thermal and superelastic wires is similar to a multi-function tool. The tool works satisfactorily for several purposes, but doesn't excel at any one. However, the tool that is specifically designed only for one purpose excels at that application. This is one reason why SWLF Thermal NiTi is the market leader.

One way to evaluate consistent performance of a wire brand is to test round and rectangular wires from the same brand. If the manufacturer gave proper attention to the starting alloy and processing conditions, properties such as resiliency and transition temperature should be the same. Brands of thermal wires were evaluated for resiliency and transition temperature. Results are given below.

A standard industry test for wire stiffness is named after the manufacturer of the testing machine: Tinius Olsen Stiffness Test. The method is to bend a length of straight wire from 0 to 90 degrees (right angle) while simultaneously measuring the force and bend angle. Release the load after the wire is bent 90 degrees and record the set angle (angle that the wire is permanently deformed) after the load returns to 0. A stiffness test in progress is shown in Figure 1. Stiff-

ness test results are compared for three types of materials in Figure 2: SWLF Stainless Steel, SWLF Beta III Titanium (Ti-Mo), and RMO Orthonol (Ni-Ti). The clinical meaning of this result will be discussed below in the section on Ti-Mo wires.

Stiffness test results for SWLF Thermal NiTi 0.016" Round wires at 100˚F are shown in Figure 3. The loading part (forward curve) of the test, from 0 to 90 degrees deflection, is directly related to the force that a doctor puts on a wire during placement. After the wire is engaged, the force is removed. The energy absorbed by the wire exerts a force on the brackets, which leads to remodeling teeth. The unloading portion of the curve, from 90 to 0 degrees, indicates the magnitude of the force that the wire exerts on the tooth and how constant that force will be. If the wire is entirely resilient, the force returns to 0; i.e., there is no permanent wire deformation. In clinical usage, wires are not usually bent more than 30 degrees. It is clinically meaningful to focus on the unloading portion of the curve between 0 and

(B) Wire in position to begin test

(C) Wire bent 90 degrees

(D) Load removed (force returns to 0); shows set angle (permanent bend) of wire

30 degrees deflection. According to Dr. Robert Ricketts, constant low forces are considered ideal to move teeth. The NiTi wire is resilient; it is always active. As a result, the wire always provides a small continuous force to move teeth.

For some wires, after the force applied to the wire by the Doctor is removed, the wire is permanently bent and stops working to move teeth. This is the case for Stainless Steel and Beta III Titanium. See Figure 2. For these wire types, the force to move teeth diminishes rapidly and the wire is permanently bent. The angle it is bent is called the set angle; its value is the angle when the force returns to 0.

To evaluate differences among brands of thermal NiTi wires, testing was performed for stiffness, resiliency and transition temperatures. Brands included: SWLF Thermal NiTi (RMO), CuNiTi 35˚C (Ormco), Sentaloy/Neo Sentaloy (GAC), and Thermal Activated NiTi (3M Unitek). In-house test results are described below.

Stiffness results, using a Tinius Olsen Stiffness Tester at 100˚F, for both round and rectangular thermal NiTi wires, show that SWLF Thermal NiTi wires require a lower force to engage the wire during placement and have the lowest, continuous force during unloading (after the applied force is removed) to move teeth. See Figure 3.

Resiliency among brands of thermal NiTi wires was compared by bending wires back and forth multiple times and measuring the number of degrees of permanent deformation after testing. The wire having the smallest permanent deformation is the most resilient. Results show that SWLF Thermal NiTi has the lowest permanent deformation; the same low numerical value was obtained for both round and rectangular wires. All other brands had larger amounts of permanent deformation. For other brands, the round and rectangular wire results differed which indicates that the wires do not have consistent properties.

The ideal transition temperature for a thermal NiTi wire is open mouth temperature, 35˚C. When the transition temperature is close to 35˚C, the Doctor has a longer working time for placement than at lower temperatures. SWLF Thermal NiTi wires have a transition temperature of 32˚C for both round and rectangular wires. All other brands have transition temperatures in the range of 23˚ to 29˚C. For other brands, the transition temperatures for round and rectangular wires differed, indicating inconsistencies in the alloys used. More importantly, several brands had transition temperatures close to room temperature, so that the transition from thermal to superelastic properties was mostly completed before the wire was engaged in the mouth. Then, shape memory properties are nearly non-existent; it is more difficult for the Doctor to engage the wire; and it is more uncomfortable for the patient. For the low transition temperature brands, the amount that the wire can be bent at room temperature is reduced, and the wire exerts a greater force on the teeth during placement.

CONCLUSIONS BASED ON TEST RESULTS

SWLF Thermal NiTi Wires are superior to other brands of thermal wires based on test results for:

1. Stiffness Testing (loading curve): lower force needed to place wire – greater patient comfort

2. Stiffness Testing (unloading curve): lowest and most consistent force is exerted by wire to move teeth – wire is always working to move teeth; ideal force to move teeth

3. Resiliency: most resilient wire among brands tested – completely recovers in the mouth without taking a permanent bend

4. Transition Temperature: very close at open mouth temperature, and much higher than other brands – longer working time for Doctor and greater patient comfort

5. Transition Temperature: temperature is the same for round and rectangular wires – gives consistent and predictable forces to move teeth

6. Transition Temperature: wire has a large recoverable strain during placement – smallest possibility to over bend wire during placement by Doctor

NITI SUPERELASTIC WIRES

Properties of superelastic wires differ from thermal activated wires. It has been thought that temporary or permanent bends could not be made in superelastic wires. This is not true. A bend can be temporarily made to a superelastic wire in the mouth whenever needed. To do this, cool the wire through its transition temperature. The structure is converted from austenite to the low temperature phase, martensite, and the bend is made. Products that can cool the wire, such as a coolant spray dabbed on the region of the wire to be bent, change the structure at the point of application. As soon as that section of wire warms again to body temperature, the phase changes again from martensite to austenite. The wire exerts a force to move teeth, as it attempts to revert to its original arch shape. Permanent bends can be made to a superelastic wire by heating the region to red hot with a lighter, remove the flame, and bend to the shape needed. The wire becomes dead soft and will not return to its original shape.

RMO's superelastic wires are called Orthonol and Bio-Lastic. Orthonol is available in the Natural and Ideal Arch Shapes. Bio-Lastic is available in the Ricketts Penta-Morphic shapes, with a dimple in the anterior section. These wires are entirely austenite at room temperature (20˚C). These wires, as-received by the clinician, have already gone through their transition temperature.

TI-MO WIRES

Titanium-Molybdenum wires were developed to have properties between stainless steel and Ni-Ti. The composition is: 79% Ti (Titanium), 11% Mo (Molybdenum), 6% Zr (Zirconium),

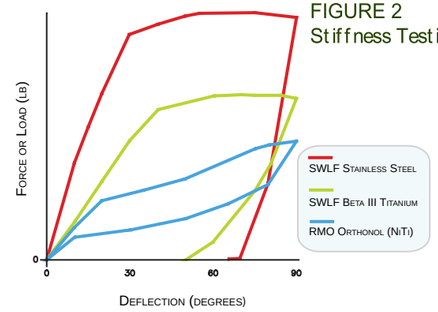


FIGURE 2
Stiffness Testing

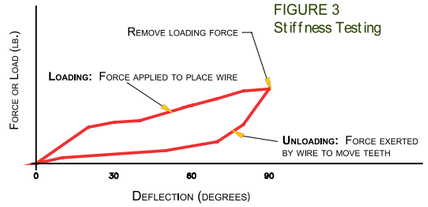


FIGURE 3
Stiffness Testing

and 4% Sn (Tin). Most Ti-Mo brands do not contain Nickel (Ni). Nickel is associated with allergic responses in some people, and Ni-containing alloys are contraindicated for them. People have become sensitized to Ni from wearing objects such as earrings or buttons that are nickel plated. The first Ti-Mo brand that was patented and commercially developed is called TMA (Ormco). The patent expired a few years ago and now there are several brands of Ti-Mo wires on the market, each having different properties.

In the SWLF System, the Ti-Mo wire that is used for finishing cases in adults and for periodontal patients is called Beta III Titanium. The name Beta III refers to a unique phase in the Ti-Mo System. Other names that are used for the same type of alloy are: Beta Titanium and Bendaloy (RMO). Beta III Titanium has excellent formability, good corrosion resistance, and a smooth polished surface.

Compared to Stainless Steel, Beta III Titanium has moderate stiffness (modulus of elasticity is lower); it is more resilient, and can be deflected more without permanent deformation. In Figure 2, the initial slopes for Stainless Steel and Beta III Titanium show the relative stiffness between the two wires. A greater slope for the initial straight line portion of the curves indicates that Stainless Steel is stiffer. Beta III Titanium wires are approximately 40-45% less stiff. Appliances made from Ti-Mo can be activated without permanent deformation compared to stainless steel.

Properties of Beta III Titanium wires make them an excellent choice for many clinical applications. Moderate stiffness permits root correction. Excellent formability allows intricate loop designs to be made. Bends can be formed for overcorrection. Tie-backs can be placed due to the wire's ductility.

SUMMARY

Titanium-based alloys have changed the way orthodontists treat cases. Clinicians are just beginning to learn how to use these wires efficiently and their performance limitations. Among alloy types, brands are not all the same. Property testing and clinical evaluations distinguish among brands. RMO has taken the leadership role among orthodontic companies to provide superior, high quality Titanium-based wires at very competitive pricing.

RMO offers

metal functionality

in a CERAMIC BRACKET

LUXI II

INTELLIGENT LUXURY.

A BRACKET THIS GOOD MAKES TREATMENT BETTER.

The LUXI II Gold-Reinforced Ceramic Bracket, the most intelligently designed ceramic bracket. A ceramic bracket that unites aesthetic luxury and ultimate functionality in ways that change thoughts of what ceramic brackets can do.

REDUCED FRICTION.

Ceramic brackets create more friction than metal due to the surface texture. The LUXI II bracket contains a reinforced gold arch slot. This patented feature enhances sliding mechanics by reducing friction as compared to conventional stainless steel and ceramic brackets.

Independent university research found that the reinforced gold arch slot in LUXI II brackets, reduces friction to a level lower than stainless steel brackets. The reinforced gold arch slot also provides lower friction than the Clarity* ceramic bracket which contains a stainless steel insert.

TECHNOLOGICAL MANUFACTURING.

The LUXI II ceramic bracket is produced from extruded alumina. The alumina is translucent, letting the color of the tooth show through making LUXI II barely visible. The extruded LUXI II ceramic produces a comfortable smooth surface with rounded corners unlike machined ceramic brackets which have sharp edges that fracture from cracking due to internal stress.

STRONG.

LUXI II contains an 18-karat (75%) gold arch slot, which is similar in composition to high-quality gold crown and bridge alloys. Studies show that a greater torque can be applied to a ceramic bracket with a reinforced gold arch slot before fracturing, or a full-size wire engaged in the bracket twists, than a bracket with a stainless steel insert or an all-ceramic bracket.

SECURE BONDING AND RELIABLE DEBONDING.

Bonding LUXI II brackets is just the same as bonding metal brackets. Use light cure or chemical cure adhesives. The patented dovetail base design has generous horizontal undercuts to capture adhesive for reliable mechanical bond retention throughout treatment as well as reliable easy debonding. Each base matches various tooth shapes. This gives the adhesive a large surface area – free of air pockets, so a sturdy, mechanical bond can form. Just like metal debonding, no special instruments or procedures are required. Simply using a debonding plier, grasp opposite corners of the bracket, twist and the bracket removes in one piece.

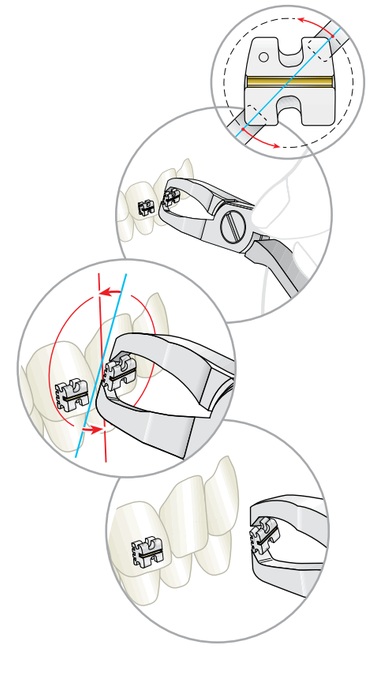
AESTHETIC LUXURY.

LUXI II brackets, camouflage the fact they function just like metal brackets. LUXI II brackets are designed not to stain or discolor over long periods of time.

The low profile makes LUXI II comfortable. The unmatched combination of aesthetics with the strength of gold, along with the self-assuredness from wearing appliances that perform as beautifully as they look, make LUXI II the ultimate choice for patients.

LUXI II IS IN ALL POPULAR TECHNIQUES: ROTH, MBT AND BIOPROGRESSIVE.

Two new posters are available for your clinic.



LUXI II debonding

LUXI II DEBONDING PROCEDURE

1. Position the tips of a bracket removing plier under the opposite corners of the bracket.
2. Squeeze gently and twist quickly.
3. The bracket debonds in one piece.

Clarity is a trademark of 3M Unitek

ALUMINUM IMPRESSION TRAYS

Never Looked So Good!

After RMO stopped production of its Aluminum Impression Trays, customer requests to reinstate them have continued. They're back and they're better! We added more features and are pleased to reintroduce a newly improved aluminum impression tray.

Advantages For Your Office

- Trays And Are Reusable and Can Be Disinfected And/or Sterilized Prior To Use
- Trays Are Available In 4 Maxillary And 4 Mandibular Sizes
- Fewer Size Trays Are Needed In The Office, So Inventory Is Reduced
- Perforations Enhance Retention Of Alginate When Taking Impression
- Trays Are Beautifully Finished To Enhance Your Office Image
- Color Coded For Easy Identification In The Office
- Trays Are Adaptable To Provide A Custom Fit

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