



PREMISE™

Technical Manual

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PREMISE

THE ULTIMATE RESTORATIVE MATERIAL

INTRODUCTION

It is a widely understood fact that Kerr's composite product line has a varied mixture of old and new technologies. Since its introduction in 1985, however, Herculite has grown to become the largest brand in the Kerr armamentarium, representing approximately twice the revenue of its closest competitor, Point 4. While Point 4 offers the dentist a high level of polish and clearly was able to grow on its own within the competitive landscape, that product faces two main challenges that are contributing to its current sales plateau:

- 1) Competition from Filtek Supreme, the only composite that can rival the polish and handling of Point 4.
- 2) Point 4 is 5 years old and perceived by many as a mature product; as a result, it receives less attention from the dealer network.

Kerr's R & D team has spent considerable resources investigating the benefits of nano technology in order to address some key issues prevalent in today's composites. Using this approach, we will be able to provide the most technologically advanced composite Kerr has ever introduced. In a general sense, this new material will have excellent polish, non-sticky handling, and a greatly reduced polymerization shrinkage value.¹

This document will discuss existing technologies, new competitive technologies, an introduction to PREMISE and the science behind the product.

¹ Polymerization shrinkage is measured in percent, either in a volumetric or "axial" fashion. The value is important because it has a direct relation to the stress encountered at the bonding interface ("margin"), which is thought to be a main contributor to a restoration's chances for long-term success.

LOOK TO THE PAST TO SEE WHERE YOU'RE GOING

A wise Product Manger once told me that in order to see clearly where you need to go, you have to take a good look behind you. He also told me, "Remember the past or you are doomed to repeat it." Well, maybe he didn't come up with the former statement but it is true when it comes to composite restorative materials. In some respects, we're living it now. PREMISE represents not only our greatest achievement in composite technology but one that sets the course for others to follow. Much like Point 4 did with its introduction in 1999, PREMISE will greatly affect how we look at microfill and hybrid technologies and the frequency with which the dentist uses them. When you consider the mechanical strength as well as the superior polish of PREMISE, the future looks bleak for the traditional microfills and hybrids. Before we say goodbye forever to those dinosaurs, let's first pay our respects.

MICROFILLS

These interesting creatures first hit the scene in the '70s. With claims of high polishability and esthetics, one might say that microfills are one of the few materials ever introduced to the dental community that actually lived up to all of its claims. They do polish quickly, easily, and they hold their polish unlike any other material currently available. The term "self-polishing" often has been used to describe the uncanny esthetic stamina of a microfill.

Microfills start out as a very small fumed silica particle, with a size approximately 0.04 microns in size. It is a common misconception that 0.04 is the average particle size of a microfill. In fact, the average size is much larger, ranging from 10-20 microns. So how does it get from so small to so large? In a word, agglomeration. Agglomeration is the process of essentially soaking these tiny fillers in resin, and then polymerizing them together to form larger groupings of filler. These groupings, while they originate from that aforementioned very small size, end up relatively large by any standard.

Common sense is telling you right now that a large particle size will bring lousy polishability, right? Correct – if that particle is just a huge chunk thrown in with some resin. But remember, the fumed silica in a microfill is surrounded by resin and then polymerized together with other fumed silica and then, finally, integrated into another resin to form a complete microfill. And, typically, microfills are only 40%-60% filled overall. This means that there is LOTS of resin in the equation to polish, including that within those agglomerated silica particles. It is this resin-rich environment that brings such ease and longevity of polish to microfills.

So what's the problem, you say? Well, there are four problems, actually. They are:

1. *weakness in stress-bearing areas*
2. *no radiopacity*
3. *“show through”*
4. *water sorption*

1. Microfills are typically reserved for anterior purposes because they are esthetic, of course – but also because they can be weak. The nature of their chemical makeup dictates that they cannot hold up under certain stress-bearing situations (Heliomolar from Ivoclar is one exception to that rule, but that material is not without its compromises, either. That's why for years, Heliomolar was sold in conjunction with an anterior microfill, Helioprogross. Filtex A110 (3M), Durafil (Kulzer), Renamel Microfill (Cosmedent) all have anterior indications only, and while they are very esthetic, they are not stress-friendly.)

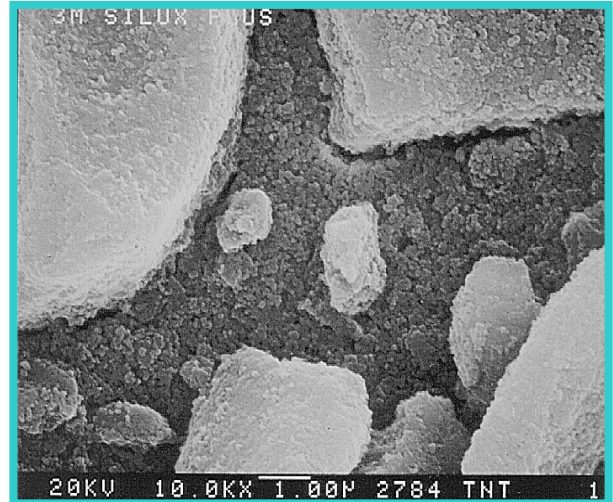
2. Anterior microfills are not radiopaque, as the fumed silica filler does not show up on an X-ray. This can, of course, present problems depending on where the material has been placed.

3. The issue of “show through” is one that has plagued microfill users since their inception. The most common case of this occurrence is during the placement of a microfill during a diastema closure. Since those typically occur between the centrals, this is surely classified as an esthetic procedure. Unfortunately, after a time-consuming procedure such as this, the darkness of the inside of the mouth comes through the freshly-placed microfill, only to ruin the shade match and vitality of the overall restoration. This show-through comes from the fact that, since there is so little filler in a microfill, there is little blocking ability against the darkening effects of the mouth.

4. Finally, a word about water sorption. With the resin-rich environment of microfills, that same liquid-turned-solid that brings polishability also soaks up moisture over time. Staining from coffee, smoking and sodas are examples of the effects of high water sorption and represents just one more nail in the coffin as we, with a bit of a nostalgic pine, bid adieu to the microfill.

SEM of Microfill:

If you look closely, you can see the small 0.04 micron filler that is the starting point of this material (shown here is Silux Plus). The filler is agglomerated, and then integrated into a resin matrix. This resin-rich environment is what brings such quick and easy polish to the microfill material. Note the resulting particle is very large – in the range of 5-10 microns. Silux Plus is loaded approximately 50% by weight, and 30% by volume, typical values for a material in this classification.



The Upside and Downside of the Microfill

Strengths

- Polish quick and easy
- Low viscosity, easy to handle
- High luster over time

Weaknesses

- Weak in stress-bearing areas
- Soak up stains
- Show through
- Not radiopaque
- Slumps when placed

Contemporary Microfills

<u>BRAND NAME</u>	<u>MANUFACTURER</u>
Renamel	Cosmedent
Heliomolar/Helioprogress	Ivoclar-Vivadent
Durafill VS	Heraeus Kulzer
Amelogen	Ultradent
Filtex A110	3M
EPIC-TMPT	Parkel

HYBRIDS

It is a fact that the first – and most successful – submicron particle hybrid introduced to the dental world was, indeed, Herculite by Kerr. Since then there have been various iterations of that technology, but the net-net of it all is: The same Herculite glass-grinding technology that pioneered the hybrid revolution still remains the standard of excellence for all other hybrids currently available. It has brought us Herculite, Herculite XR, Herculite XRV, Prodigy, and Prodigy Condensable. The market is rife with imitators, and in a market that Kerr essentially created in the first place, today’s hybrids are the material of choice for most direct tooth-colored restorations. Nearly 15 years since the inception of Herculite, however, many of the world’s most discriminating critics still regard Kerr’s hybrid technology to be the industry standard and the ultimate combination of polish, strength, shade matching and overall esthetics.

So it is with delicate footing that one should tread on such “hallowed ground,” but it is a necessary venture, nonetheless. This is true, because if you look back at Kerr’s acclaimed history of restoratives, one gets the sense that, due to the advancements of the past, the weight of defining the future of esthetics is a load that truly only we are qualified to burden. This requires that we take a microscopic eye to the classification of hybrids in an effort to identify the strengths and weaknesses that exist.

Sometimes the Truth Hurts

Answer the following question to the best of your ability:

Microfills = Shine

Hybrids = ?

- a) Strong
- b) Esthetic
- c) Universal
- d) Versatile

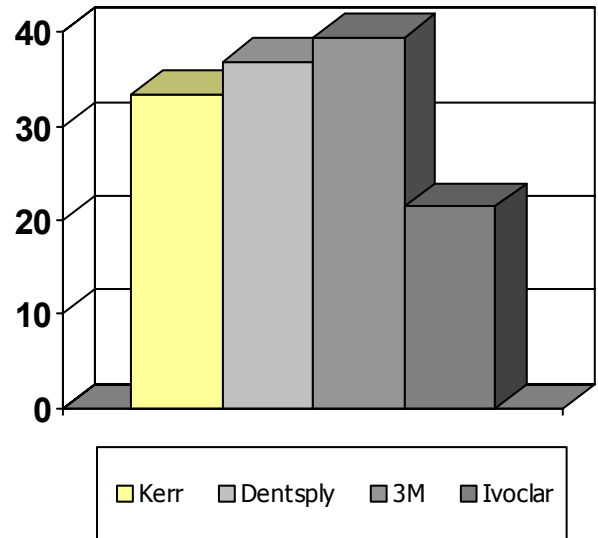
You're looking for an e) that says "all of the above," aren't you? Ok, it was a trick question. Hybrids have a fairly long list of attributes, including all of the ones shown above, which makes it no secret then, why they are so popular. As a rule, hybrids typically consist of a small amount of fumed silica, and then primarily barium glass (or zirconium in the case of the 3M hybrids), which is radiopaque. The average particle size of these materials is typically reported to be below one micron. Hybrids can best be described as the material that achieves the best balance between strength and esthetics.

What flies in the face of their tremendous success, however, is a dirty little secret that all hybrid manufacturers have been frustrated with for years: They just don't hold their polish as well as microfills – Period. Put a microfill Class V next to a hybrid of the same class restoration, and the microfill will win every time – hands down, no exceptions – for sure. Furthermore, depending on the hybrid, say, one that has a very wide particle distribution, or one that has a higher average particle size, then you see that situation worsen exponentially. This is why you see most prominent clinicians recommend the use of both microfills *and* hybrids for much of their esthetic work. Of course, a quick reality check tells us that the average dentist (in other words, almost everyone) will look to only one material for nearly all his/her direct needs, and nine times out of ten, that will be the hybrid. Still, for many, frustration exists when those restorations become frosty and dull over time, sometimes as soon as *weeks*, not months or years.

Contemporary Hybrids

Market Share and Revenue:

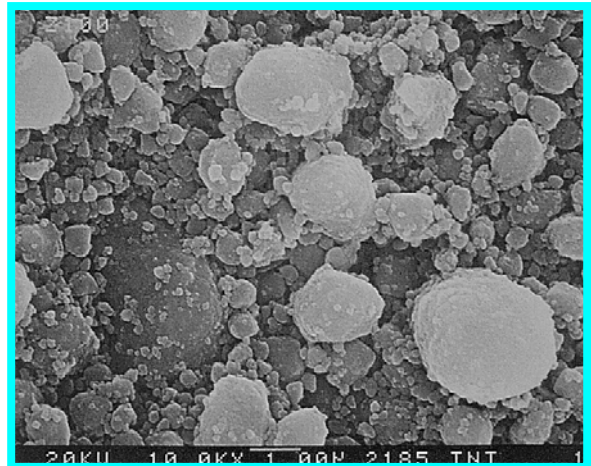
Over \$140 million per year are spent in this market through distribution alone. As you can see, we have a substantial amount of the dollars here and are in a statistical dead heat for the number one position with Dentsply and 3M ESPE, both of which are coming off either a new product introduction (3M ESPE, Filtek Supreme) or “reformulation” (Esthet-X improved). We are now in a position where Point 4, our flagship line has become a mature product. The time is right for us to reclaim our position as a leader and innovator in composite technology, build off our successes and capitalize on our competitors’ weaknesses.



(U.S. market, in millions. Source: Strategic Dental Marketing, Inc.)

SEM of Hybrid:

In order to obtain strength, hybrids rely on larger discrete particles than their microfill counterparts. In most cases, the barium glass filler starts out at least 2x as large as shown here, and then is ground smaller, to a more uniform size, and within a certain distribution. Here, the 3M hybrid Z-100, with relatively large particles and a wide distribution, exhibits excellent compressive strength, but suffers from a lack of long term luster...for obvious reasons.



The Upside and Downside of the Hybrid

Strengths

- Suitable for stress-bearing areas
- Good to excellent esthetics
- Many choices on the market
- Radiopaque
- Universal use

Weaknesses

- More effort needed to obtain suitable polish
- Stiffer handling
- Longevity of luster suffers over relatively short period

Contemporary Hybrids

<u>BRAND NAME</u>	<u>MANUFACTURER</u>
Tetric Ceram/4 Seasons	Ivoclar-Vivadent
Charisma/Venus	Heraeus Kulzer
Renamel Hybrid	Cosmedent
Vitalescence	Ultradent
Z-100/Z250	3M
APH/Spectrum TPH/Esthet-X Improved	Dentsply

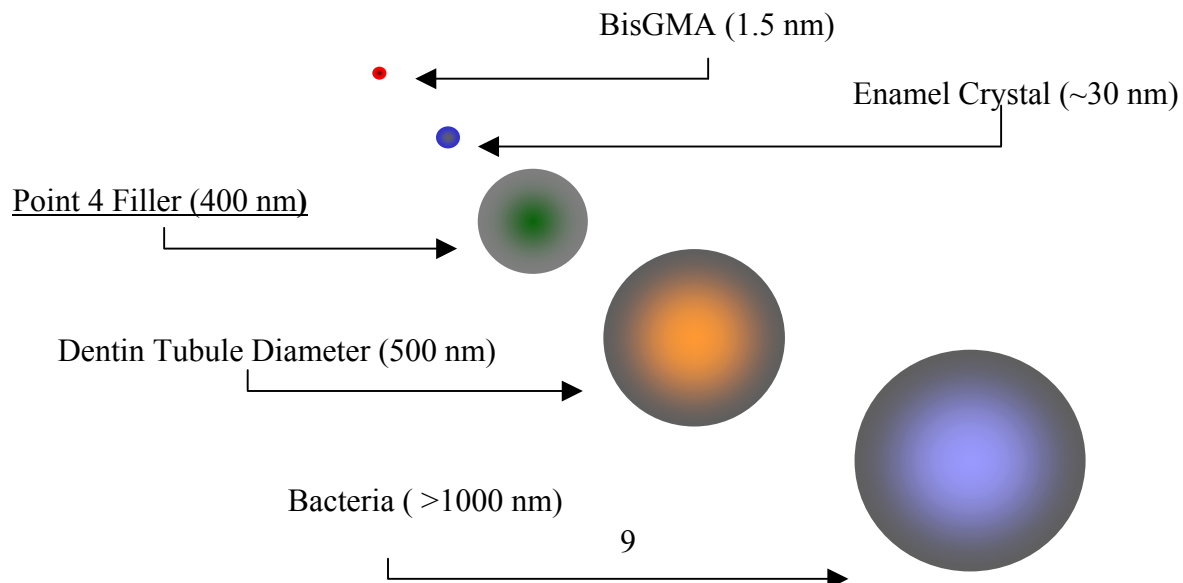
NANOFILLED COMPOSITES

In the increasingly competitive composite market, being the first to bring new technology to the table has always been Kerr's goal and that of our competitors. It has also been our goal to come to the market with a unique product and one that has clear benefits over the competition. Being first is always beneficial, but building a better product may be of more importance. It is important to note this as we enter the age of "nano-filled" restorative materials. The term "nano" has become very popular in the last couple of years and the prospects of having nanofillers in restorative materials has sent manufacturers scrambling to incorporate them into their products – not just because the word sounds technologically advanced, but because these tiny particles can aide with polish, handling and strength.

The first major entry to market with a nano-composite was 3M ESPE with Filtek Supreme. They use a "cluster" approach (an SEM of this will be shown later in this section) with their nanofillers. While this approach gives Supreme certain benefits from the nanofillers, like handling and polish, it did have to compromise its physical properties and polymerization shrinkage. Supreme is only filled to a rate of 78% (by weight) which is not much different than most hybrids on the market. With PREMISE, the Kerr R & D group's challenge was to build a material that combined the benefits of superior polish and excellent handling with low polymerization shrinkage and strength. No material had ever combined all of these important qualities, but R & D was up for the challenge and created a material like no other. PREMISE uses a "Trimodal" filler approach, combining three different fillers (nano, 0.4 and PPF), to achieve all esthetic and physical property goals.

Why Nano?

Nanofiller is much smaller than the traditional fillers we have used in the past. For example, the main filler used in Point 4 (0.4 microns), equals 400 nanometers. By comparison, the nanofiller we are using for PREMISE measures approximately 20 nanometers in size. The graphic below shows some relative ranking, to give some perspective.



The use of these ultra small filler particles allows the potential for some exciting advancements in a tooth-colored restorative. Specifically, these nanofillers provide the ability to more highly “load” (~75% by volume versus 60%) a material, which results in less polymerization shrinkage (1.5% versus 2.5-3.0%), and stronger physical properties. Shrinkage has been a factor that our competitors have used against us in earnest. A shrinkage value of 1.5% in a universal composite (can be used anywhere in the mouth) would set a new standard for others to follow. Furthermore, because of their small size, nanofillers contribute greatly to the speed and longevity of the polish of a composite. Finally, nanofillers can actually enhance the handling of a composite material as well.

Composite materials that claim ultra-low shrinkage values typically utilize large particle fillers in their chemical makeup; however, they offer poor polishability, and luster retention. On the other hand, microfills offer high polish but are typically weaker than hybrids. However, the excellent polish that comes from microfills is due to the use of PPF. Since the filler size is relatively small, the wear characteristic is much more uniform. The PPF in PREMISE is produced using 0.7 micron filler cured with Point 4 resin, and ground to an approximate size of 30-50 microns.

The TriModal Theory

Bringing technological advancement to all aspects of the direct restorative challenge – handling, polish, strength and polymerization shrinkage – was the primary goal during the development of PREMISE. Reducing polymerization shrinkage was one of the most difficult challenges. Our strategy was to optimize the particle distribution in order to realize the highest possible filler loading. This was accomplished by incorporating two new fillers along with our patented barium glass, 0.4 μm .

The new fillers used are:

- Non-agglomerated “discrete” silica nanoparticles, 0.02 μm
- Prepolymerized filler (PPF), 30 to 50 μm

The nanofiller, 0.4 μm filler and PPF work together to provide three main benefits:

- Exceptional ease of polish and gloss during service in the oral environment
- Enhanced handling characteristics
- Decreased polymerization shrinkage

Gloss

In traditional hybrid composites, the filler size (approximately 0.4 to 1 μm average) dictates a certain wear characteristic that, while acceptable, still offers room for improvement. During the life of a hybrid, these inorganic filler particles become detached from the resin matrix because of wear or “plucking.”

Over time, this effect results in loss of luster and causes the composite restorative to look dull, or even “frosty.” In 1999, in order to address the issue of polish, Kerr introduced Point 4 with an average particle size approximately one-half that of traditional hybrids. Point 4 composite contains 0.4 μm barium glass as the main filler component. With this advancement, polish at placement and at subsequent recalls greatly improved.

PREMISE builds on the proven success of Point 4 by using the same 0.4 μm barium glass filler along with discrete 0.02 μm nanoparticles as the only inorganic filler components. The discrete nature of the incorporated nanoparticles results in a material with enhanced polishability and gloss.

Handling

Like the smoothness of movement that roller bearings provide machinery, nanofillers provide their own “roller-bearing” effect when dispersed among the other filler types, giving PREMISE a non-sticky and smoothly sculptable handling characteristic. PPF particles, due to their larger size, minimize inter-particle associations, in turn reducing stickiness. The 0.02 μm nanoparticles are so small that each one is comparable in size to about 100 individual resin molecules.

Shrinkage

Shrinkage in a composite is caused by the change in dimensions as the resin cures since molecules come together to form bonds with each other; therefore, the lower the proportion of resin (higher proportion of filler or higher loading) in a composite, the lower the shrinkage will be. Composite materials that claim ultra-low shrinkage values typically use large-particle fillers to get a high loading; however, this also results in poor polishability and non-retention of luster during clinical use.

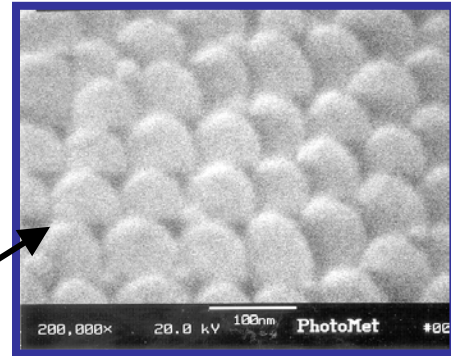
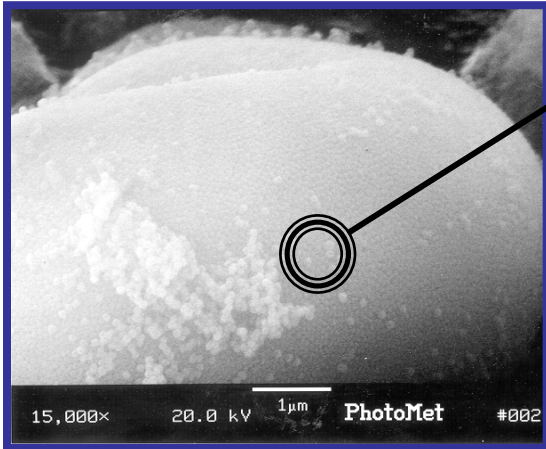
Composite materials that contain only agglomerated silica nanoparticles (microfills) show excellent polish characteristics but loading is limited because of their small particle size. To improve handling and physical properties, microfills also contain their own PPF. The PPF in microfills, however, contains only agglomerated silica nanoparticles. Since they contain no other inorganic fillers except nanoparticles, microfills offer high polish but are typically weaker than hybrids and are usually not radiopaque. This limits their use for posterior restorations.

In PREMISE we took the approach of incorporating a PPF that acts as a large-particle filler to give it physical properties equivalent to a hybrid. This PPF is composed of cured resin loaded to 81% with submicron fillers. The composition of the PPF in PREMISE is very similar to the final paste: barium glass and silica nanoparticles with an average particle size of 0.4 μm and resin.

Used in combination, 0.4 filler, nanofillers and PPF work to provide high overall loading, microfill-like wear characteristics and predictable, non-sticky handling. Since the particles are so small in size, we also incorporate nanosilica of 0.02 μm as the third filler component, which can act as a quasi-liquid (or nanomer).

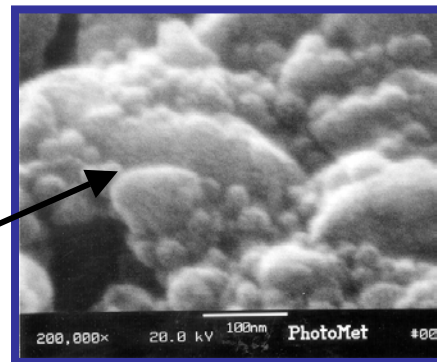
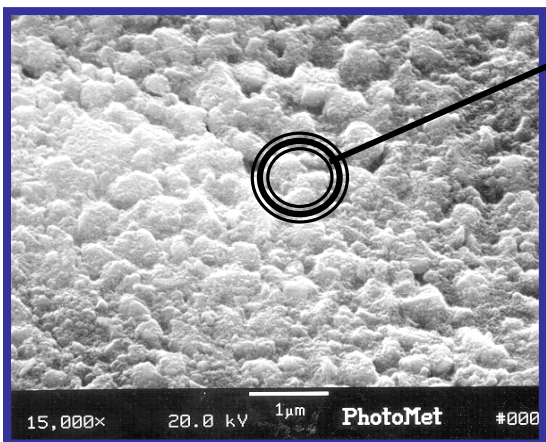
PREMISE VS. SUPREME: SEMS

Supreme



In this SEM of Filtek Supreme, you can see the filler consists of a larger filler size made of clustered nano-fillers. Because only the tiny fillers break apart during wear, instead of the entire large particle plucking out, the wear and gloss of this material is expected to be similar to Point 4, or a microfill. However, due to the nominal loading of approximately 78%, there is no advantage in physical properties or shrinkage.

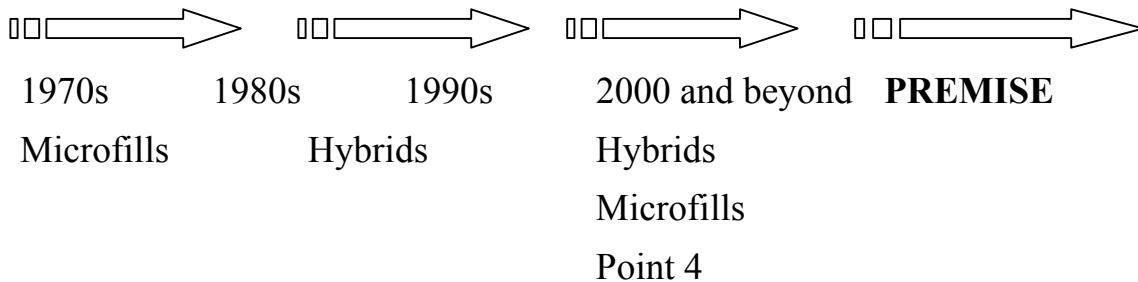
PREMISE



Unlike Filtek Supreme, PREMISE uses “discrete” or loosely associated nanoparticles along with pre polymerized and Point 4 filler particles. The result is a material that is more highly filled (84% by weight), has superior polish, strength and durability.

SETTING A NEW STANDARD

With the introduction of Point 4, we made the dental industry stand up and take notice. It was truly a first for hybrid materials, microfill-like polish and high strength. Point 4 was the new standard for hybrid polish and the only material with an average particle size of 0.4 microns. Point 4 technology was a perfect platform for the entry of PREMISE to the market.



As we toured the world in hopes of making the next revolutionary composite product, we polled many dentists on their needs and wishes for the ultimate material. The list is long, but one with characteristics that are very important to many people :

1. *It must have polish equal to a microfill*
2. *It must polish quickly*
3. *It must hold its polish over time*
4. *It must have strength equivalent to natural teeth*
5. *It must have non-sticky, non-slumping handling*
6. *It must be universal in use*
7. *It must be radiopaque*
8. *It must be more esthetic than current materials*
9. *It must have low polymerization shrinkage*

If one was to bracket, or *group*, the elements of this wish list, then certainly the first three would be attributes mainly reserved for microfills. Parameters four through seven would be common hybrid characteristics. The last two, numbers eight and nine, are standards that would then raise the bar for all to follow – and goals such as these are common to the R & D mindset at Kerr. Remember, in order to truly be all things to all people, the research team at Kerr had to meet *all* the criteria. During this development process, we stepped outside the box with our thinking; the result was the blending of the three different fillers.

3M ESPE – Filtek Supreme

Filtek Supreme is described by the manufacturer as a visible light activated, restorative nanocomposite designed for use in anterior and posterior restorations.



Kit Contents:

Introductory Kit

5 shades, 40 Prompt L-Pop, shade wheel, technique guides

Professional Kit

12 shades, shade wheel, technique guides

Claims:

- Polish like a microfill
- Strength of a hybrid
- Smoother surface than hybrid
- Improved handling over competition
- New technology

Facts:

- Gloss value is higher than previous 3M composites but lower than PREMISE
- Strength is lower than previous 3M composites
- Shrinkage is higher (1.9%) than previous 3M composites and greater than PREMISE

If you are a Z-250 user looking to switch to Supreme:

- you will lose 10-15% in mechanical properties
- you will experience higher polymerization shrinkage
- you will gain an advantage in polish due to particle size

Advantages of switching from Supreme to PREMISE:

- you will gain mechanical properties
- you will gain ease of polish and luster retention
- you will experience less polymerization
- you will not have to compromise esthetics

Dentsply/Caulk – Esthet-X Improved



Esthet-X is described as a micro hybrid designed for universal use in the mouth, including both posterior and anterior indications.

Kit Contents:

Compules Intro Kit

11 shades, Prime & Bond NT Shade Guide, technique guide, 10 Enhance discs, polishing pastes

Compules Complete System

11 shades, Prime & Bond NT Shade Guide, technique guide, 10 Enhance discs, polishing pastes

Claims:

- Polish like a microfill
- Strength of a hybrid
- Smoother gloss than other hybrids
- Non-sticky handling
- Less sensitive to ambient light

Facts:

- Polish like a hybrid
- Strength of a typical hybrid
- Gloss inferior to PREMISE
- Polymerization shrinkage of 2.89%
- Non-sticky, stiff handling
- Higher sensitivity to ambient light compared to Kerr composites

Advantages of switching from Esthet-X to PREMISE:

- you will gain mechanical properties
- you will gain speed, ease and longevity of polish
- you will no longer need to use the Esthet-X shade guide
- you will experience lower polymerization shrinkage

Ivoclar – Tetric Ceram

Tetric Ceram is described as a “state-of-the-art highly dispersed hybrid composite for direct restorative treatment with handling properties that outmatch those of other composites.”



Kit Contents:

Intro Package

4 shades, Excite Adhesive, shade guide, accessories

System Set

8 shades, Excite Adhesive, shade guide, accessories

Claims:

- High esthetics
- Non-slump handling
- Very high radiopacity
- Less sensitive to ambient light
- Fluoride release

Facts:

- Polish like a hybrid
- Strength of a typical hybrid
- Gloss inferior to PREMISE
- Non-slump handling

Advantages of switching from Tetric to PREMISE:

- you will gain mechanical properties
- you will gain speed, ease and longevity of polish
- you will experience lower polymerization shrinkage
- you will have a material with better handling characteristics
- you will have an upgrade in technology

Ivoclar – Heliomolar HB

Heliomolar HB is described as a heavy body version of their proven posterior microfill, Heliomolar. According to the manufacturer, “The first and only packable microfilled composite for the posterior region.”



Kit Contents:

5 shades, 2 flowable shades, Excite Adhesive, accessories

Claims:

- Heliomolar performance
- Non-slump handling
- Very high radiopacity
- Fluoride release
- Packable viscosity

Facts:

- Heliomolar made packable
- High radiopacity compared to other hybrids
- Still has the drawbacks of a microfill in the posterior (susceptible to bulk fracture due to lower loading than hybrid)

If you are Heliomolar user looking to switch to Heliomolar HB:

- you will gain nothing in mechanical properties
- you will have to adjust to a different handling characteristic

Switching from Heliomolar HB to PREMISE Packable:

- you will gain mechanical properties such as compressive strength
- you will experience lower shrinkage (2.1% vs. 1.4% for PREMISE)
- you will gain ease of polish and luster retention

Dentsply/Caulk – Surefil

Surefil is described as a posterior packable composite. According to the manufacturer, “SureFil ... enables the creation of superior contacts and anatomical form without slumping or rebound.”



Kit Contents:

5 shades, Prime & Bond NT Adhesive, accessories

Claims:

- More independent clinical research than any other packable
- The most proven packable used by more dentists in more patients
- 3-year simulated wear data showing wear rates equal to amalgam
- Interlocking Particle Technology - for a microstructure similar to amalgam
- Excellent packability for easy creation of contacts

Facts:

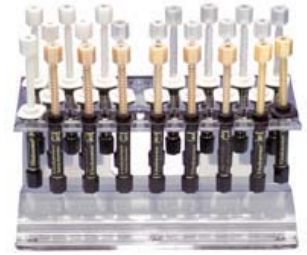
- Very stiff handling
- Composite wear is similar to other large particle composites
- Resin matrix consists of nothing new: large filler in a traditional resin
- Nothing in this material is similar to amalgam
- Poor polishability

Advantages of switching from Surefil to PREMISE Packable:

- you will gain slightly higher compressive strength due to large particles in Surefil
- you will experience lower shrinkage (2.3% vs. 1.4% for PREMISE)
- you will gain convenience of dispensing from Unidose tip
- you will gain speed, ease and longevity of polish

Ultradent – Vit-l-escence

Vitalescence is described as a universal hybrid material indicated for all areas of the mouth. According to the manufacturer, “Vit-l-escence offers a new and unique concept to composite resin restorations. Its beauty and esthetic qualities are unchallenged by any other system.”



Kit Contents:

Masters Kit

23 shades, PermaSeal Adhesive, accessories

Advanced Kit

12 shades, accessories

EnamelLite Kit

8 shades (1 each of the translucent shades)

Single Kit

10 shades in unit dose delivery

Claims:

- Excellent handling
- Lower wear than Herculite XRV
- Only composite with opalescence and fluorescent characteristics

Facts:

- Handling is similar to Point 4; PREMISE will be superior
- Composite wear is similar to other hybrid composites
- Both opalescent and fluorescent characteristics are present in PREMISE to the same extent as that in Vit-l-escence

Advantages of switching from Vit-l-escence to PREMISE:

- you will have less confusion when placing materials with an easy shading system
- you will gain physical properties
- you will experience less polymerization shrinkage
- you will gain speed, ease and longevity of polish

Ivoclar 4 Seasons

According to the manufacturer, 4 Seasons was designed to mimic the translucency, fluorescence and value of the natural tooth structure. It is said to have good polish, low wear and universal indications.

Kit Contents:

Syringe Introductory Kit

17 – 4 gram syringes, (17 shades) dentin shade guide, enamel shade guide

Cavifil Introductory Kit

106 – 0.25 gram (19 shades) Cavifils refills, dentin shade guide, enamel shade guide

Cavifil Systems Kit

168 – 0.25 gram (38 shades) Cavifils refills dentin shade guide, enamel shade guide

Claims:

- Excellent handling
- Excellent translucency
- Good polish
- Specialty shades
- Low wear rates

Facts:

- Handling is similar to PREMISE
- Average particle size is 0.6 microns
- Filler load 76% by weight
- Composite wear is similar to other hybrid composites
- Polymerization shrinkage 2.89%

Advantages of switching from 4 Seasons to PREMISE:

- you will experience less polymerization shrinkage
- you will have an easier system to use; less layering involved
- you will not have a steep learning curve with the various translucent shades
- you will gain speed, ease and longevity of polish

Voco – GrandiO

GrandiO is described as a low shrinkage composite designed for full mouth indications. According to the manufacturer, “GrandiO is 87% filled, has 1.57% shrinkage has excellent handling and enhanced color stability.



Kit Contents:

Syringe Kit

5 – 4 gram syringes shades A1, A2, A3, A 3.5 and B2, shade guide

Caps kit

50 - .25 gram caps shades A1, A2, A3, A 3.5 and B2, shade guide

Claims:

- Low shrinkage
- Improved translucency
- Outstanding wear resistance
- Good polish
- Full mouth indication

Facts:

- Large filler particles in formulation increase the loading to decrease shrinkage, but could affect the polish and gloss
- Shrinkage may not be as low as they claim

Advantages of switching from GrandiO to PREMISE:

- You will gain physical properties
- You will experience less polymerization shrinkage
- you will gain speed, ease and longevity of polish

Coltene Whaledent – Miris

Miris is described as a microhybrid designed for full indication use. According to the manufacturer, “the dentin and enamel shade materials were designed to uniquely mirror the optical properties of natural dentin and enamel. Miris is one integrated system of materials, resulting in restorations that are indistinguishable from adjacent and surrounding teeth.”



Kit Contents:

Intro Kit

6 shades, One Coat Bond Adhesive, shade guide, accessories

Full Kit

17 shades, One Coat Bond Adhesive, shade guide, accessories

Claims:

- Non-sticky handling
- Resistance to curing under ambient light during manipulation
- 0.6 micron filler for strength and polishability
- Shade guide aids in shade selection, esthetic result

Facts:

- Handling similar to other hybrids
- 0.6 filler is old news compared to PREMISE
- Shade guide represents a tremendous learning curve

Advantages of switching from Miris to PREMISE:

- you will gain mechanical properties
- you will experience less polymerization shrinkage
- you will gain speed, ease and longevity of polish
- you will not need to learn a new method of shade taking/matching

Heraeus Kulzer – Venus

Venus is described as a microhybrid designed for full indication use. According to the manufacturer, “Never before has a universal composite offered the extraordinary characteristics of Venus™. Its revolutionary properties bring together beauty, performance and strength to give you brilliant, durable restorations, unmatched by any other microhybrid..”



Kit Contents:

Basic Kit

5 shades, Gluma Etch, Gluma Comfort Bond, shade guide, accessories

Master's Kit

27 shades (including 23 Venus, 5 Durafil, 2 Flowline, and 2 color modifiers), Gluma Etch, Gluma Comfort Bond, shade guide, accessories

Claims:

- Unmatched beauty
- Outstanding handling
- “Color Adaptive Matrix” optimizes the refractive index of filler and resin
- Polishes to a glass-like finish

Facts:

- Filler size (0.7 – 2 microns) is same as previous Kulzer composite (Charisma)
- Polishability is expected to be similar to older generation hybrids
- Microfill (Durafil) is included in the “Master’s” kit, apparently to provide additional high gloss capabilities lacking in Venus.

Advantages of switching from Venus to PREMSIE:

- you will gain mechanical properties
- you will experience lower polymerization shrinkage
- you will gain speed, ease and longevity of polish
- you will not have to learn a new method of shade taking/matching

Dentsply/Caulk – Spectrum TPH

Spectrum TPH is one of Dentsply's older (8 years) composite materials which they highlight as being a more proven technology. They also tout creamy non-stick handling and good marginal integrity with the product. It is available in 19 shades and has a shade guide made of the actual material.

Kit Contents:

Compules Operatory kit

45 – 0.25 gram compules tips, shade guide and accessories

Compules Complete kit

100 – 0.25 gram compules bleach shades, shade guide and accessories

Bulk Syringe Operatory kit

6- 4.5 gram syringes, shade guide and accessories

Claims:

- No marginal breakdown
- No stick handling
- Universal application

Facts:

- Sets up fast under operatory light
- Old technology
- Lower polish and luster
- Much lower esthetics than PREMISE
- Greater polymerization shrinkage (2.87%) than PREMISE

Advantages of switch from Spectrum TPH to PREMISE:

- you will gain mechanical properties
- you will gain speed, ease and longevity of polish
- you will upgrade technology
- you will experience less polymerization shrinkage
- you will have more working time with the material

COMPARATIVE REFERENCE - PROPERTIES

In this chart, competitive products will be compared to a specific Kerr product. This will be noted in the far left column.

<i>Compare to...</i>	<i>Category</i>	<i>Product</i>	<i>Filler Load</i>	<i>Filler Size</i>	<i>Strength</i>	<i>Polish</i>	<i>Radiopacity</i>	<i>Price</i>
<i>PREMISE</i>	Nano	Supreme	Less	Smaller	Same	Worse	Same	Higher
<i>PREMISE</i>	Hybrid	Esthet-X Improved	Less	Larger	Same	Worse	Same	Higher
		Tetric Ceram	Less	Larger	Same	Worse	Higher	Same
		Vit-I-escence	Less	Larger	Same	Worse	Same	Same
		4 Seasons	Less	Larger	Same	Worse	Higher	Same
		Miris	Less	Larger	Same	Worse	Same	Same
		Venus	Less	Larger	Same	Worse	Same	Same
<i>PREMISE</i>	Packable	Heliomolar HB	Less	Smaller	Same ²	Same	Higher	Higher ³
		Surefil	Less	Larger	Same	Worse	Same	Higher ⁴

² Although wear rates are good for Heliomolar, bulk fracture protection remains a question with posterior microfills.

³ Price comparison is between Kerr Unidose tips and Ivoclar Cavafill tips. Their syringe price is similar to Kerr's.

⁴ Price comparison is between Kerr Unidose tips and Dentsply "spills" delivery. New Surefil bulk syringe has similar price point to Prodigy Condensable.

COMPARATIVE REFERENCE - SHRINKAGE

Below, a chart showing the relative ranking among some of today's composites:

<i>Brand</i>	<i>Type</i>	<i>Shrinkage – Vol. %</i>	<i>Shrinkage – Axial %</i>
Herculite XRV	Hybrid	3.0	2.6
Point 4	Hybrid	3.1	2.7
Z-250	Hybrid	2.2	1.8
Vitalescence	Hybrid	3.0	2.5
Esthet-X	Hybrid	3.0	2.6
Filtek Supreme	Nano	2.3	1.9
Durafil	Microfill	2.2	1.9
A110	Microfill	2.0	1.5
Aelite LS	Packable/Posterior	2.0	1.5
Prodigy Condensable	Packable	2.2	1.8
PREMISE	Nano	1.66	1.6
PREMISE PACKABLE	Packable	1.4	1.5