

Restore

Making the complex clear in the world of dental technology.



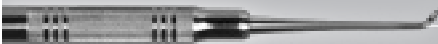
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Investing & Casting Tips

Overheating Alloy.

The overheating of alloy when casting can cause real problems with restorations. Some potential problems from overheated alloy are porosity, miscasts, rough castings or problems with the binding of the porcelain. But how do you know if you are overheating your alloy? One key sign of overheated alloy is sharp edges on the button of the casting. Alloy that is properly heated should have round edges on the buttons.

So how do you make sure you are not overheating your alloy? First, make sure that you are properly following the manufacturer's directions for the alloy you are casting. This is one of the biggest problems, as what works for one alloy may not work for another. Second, keep your casting equipment in good condition by replacing crucibles and torch tips when needed. Third, the best way to judge when an alloy is ready to cast is by using your eye. Trusting a machine, a temperature gauge or other device can cause some real problems. Some of the newer casting machines work better with automatic casting than others, but it is still a good idea to keep your eye on things.

Stop rocking bridges.

How do you stop bridges from rocking? Usually you are told to use special expensive sprues or special gluing techniques, even cast, cut and then solder. During the casting process there are tremendous pressures and vacuums that can distort restorations, all too often technicians work against these forces rather than with them. Solving these problems is as simple as using quality spool wax with the proper sprueing technique.

Elimating porosity in framework.

The last thing any lab wants is porosity in their castings; we all know it can be a real problem. The longer the metal finishing takes, the more money is spent on labor and materials. But where does this problem come from and why does it happen? Expensive sprues, oval casting rings and castings without a button definitely are not the answers. Porosity can simply not be avoided but it can be controlled. Utilizing a correct sprueing technique that leaves the porosity in the middle of the sprue, away from the restoration, is the answer to this problem. By simply following a few rules of metallurgy, technicians can usually solve all their problems.

Restoration process.

Through all phases of the restoration technicians must keep in mind that every process interacts with the next process. One example is if there are bubbles in the die, then their will be bubbles in the wax and thus bubbles in the casting. Technicians should always keep this in mind whether producing a single unit crown or a complex RPD with attachments.



Big words that mean absolutely nothing.

Robust bimodal nature? Hybrid technology? Nitrogen enriched?

Robust bimodal nature? Hybrid technology? Nitrogen enriched? Are we talking about casting investments or an SUV? These words are poor attempts to cover poor quality materials. We believe actions speak louder than words and that is why our products perform above and beyond your expectations. We don't have to recall batches, replace boxes, or fail to meet demand due to poor manufacturing processes. We spend more time working on the quality of our products rather than the quality of our words.

How much is your current investment really costing you? Casting too tight, too loose, poor surface texture or inaccurate margins? Wasted labor, burs, stones and other supplies add up to a big expense. How much is your current investment really costing you? Vacalon is willing to bet it is more than you pay for the box. Switch to N&V Z4 or Sun-Vest and stop loosing.

Building an investment Z4 and Sun-Vest are made by N&V in their advanced production facility in Schelle, Belgium. N&V's production facility is environmentally controlled to ensure the quality of the products they produce. All of N&V investments were built from the ground up to perform to specific standards. Whether it is designed to be a universal investment (Z4) or an investment for precious alloys (Sun-Vest) we started from scratch to produce the investment for these specific purposes.

Do you know for what your investments were originally intended to be used? Did they start out for casting alloys only then suddenly they could be used with pressable ceramics? Or were they originally intended to be a universal investment and then a month after their release the manufacturer realized they did not work with pressable ceramics and they dropped that theory? Furthermore do you know where your investments are really made and who really makes them? Is it just the same investment from another company with a different name? Is it a 50 year old German investment that might be the sweepings off the floor?

Ask questions. Ask where their investment is made. Ask who makes it. Ask what standards the company follows to insure that you receive the best product. Ask why they have to replace your liquid every month because they say it is a bad batch. Ask why they have to test, retest and test again to figure out the way the investment will perform. Ask why they can't make it right the first time? The door at Vacalon is wide open; the door at N&V Belgium is wide open. Feel free to ask us any questions you want and we will be happy to give you honest, real answers.

Reacting to the environment?

Investments are natural materials that react to environmental changes.

As the seasons change do your casting results change? Why does this happen? Investments are natural materials that react to changes in environment. For example, when temperatures are too hot where investing takes place expansion can be lost and castings will come out fitting tight. For best results invest in a controlled environment where the temperatures remain between 68°F-72°F. Keeping a consistent environment in your laboratory is a major key to keeping consistency in your casting results.

We think environmental control equipment that store investments at a controlled temperature is a great idea to keep results consistent. The best environmental control unit is one that can heat and cool to keep the environment within the cabinet at a constant temperature in summer and in winter. However, these can be quite expensive and sometime unnecessary depending on how much the environment in the laboratory is controlled. Usually problems are more prone to happen during summer months when laboratories tend to heat up and get humid. A practical and usable control unit would be one that merely keeps investments at a temperature of between 68°F-72°F during the summer months.

Recently there have been environmental control units introduced that keep the investments at a heated temperature and these are extremely flawed in their design. We have even seen one recently

on the market where the company recommends that you keep the investment at 10°F higher than room temperature. So if your lab is at 70°F they recommend setting the temperature to 80°F. But wait; hold on a minute, what if the temperature in your lab changes to 75°F, should you change the temperature to 85°F? This concept is simply foolish and it's an unfounded ploy to get more money out of your pocket.

A more in depth look reveals further problems with this type of unit. The chemical reaction between the investment and the powder causes the ring to heat up. If you start out with powder and liquid that are already hotter than what is recommended you are going to loose expansion, loose working time and cause other problems. Just try a simple test and use some hot water to mix up the investment. You will find that the investment sets up much quicker and if you have the time cast a coping with a heated mix you find expansion will be lost as well. So if you store your investments at 80°F it is simply too hot and 85°F, that's way too hot. There are many more approaches to keep your investments at a controlled temperature and these approaches are less expensive and work much better than these costly units.



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What is Rapid Cast Investment?

Rapid cast benefits.

:30

1560°F

It seems that this term is very loosely used to classify and describe investments and we would like to take this opportunity to clear up any confusion. To be able to be considered a Rapid Cast investment the material must meet certain standards and have certain abilities. Who sets these standards? Well N&V of course, because they invented the process.

First, to be considered a Rapid Cast the material must be able to be invested in a ring and at any time after the necessary bench set placed directly into a preheated burnout furnace, this could be 3 hours or 3 days. Second, the rings must be able to be placed directly in the burnout furnace without any need to soak, trim or place them into a plastic bag. Last, they must be able to be placed directly into the burnout furnace without the fear of inconsistent results or exploding cylinders. These properties are what make a Rapid Cast investment the most beneficial tool that a laboratory can use in their casting procedures.

Investments claiming to be Shock Heat, Fast Firing, or High Speed Investments are not Rapid Cast investments. In fact they are based on theories that are the exact opposite of what Rapid Cast means. These investments place time restraints and additional rules on burnout procedures. They make technicians rush around to meet these time restrictions and take control of the casting schedule away from the lab. These theories and rules usually end up costing the laboratory time and money.

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Easily controlled casting procedures.

With Rapid Cast investments, such as N&V Z4 and Sun-Vest, restricting casting procedures become a thing of the past. Invested rings can be placed into a preheated furnace at will with no regard to programming the furnace or to when the ring was invested. This allows the technician to focus on the quality of the work rather than watching over the rings with a stopwatch.

More consistent results.

The consistency of Rapid Cast investments can be directly linked to their bench set procedure. Why is this bench set so important to the consistency? As you may know casting investments go through two phases of expansion: Setting expansion created by the reaction between powder and expansion liquid and the thermal expansion caused by the heat of the furnace.

During the bench set the setting expansion is taking place and generally the expansion continues until the ring has cooled. With Rapid Cast investments the bench set procedures allows them to remain on the bench and become cool, dry and stable. An invested ring can be allowed to remain on the bench as long as necessary without the fear of an inconsistency in expansion.

On the other hand investments that directs you to place a ring into a hot furnace when the ring is still hot, usually a 15 or 20 minute bench set, is going to be inherently inconsistent. When you place a ring that is still hot into a preheated burnout furnace the setting expansion is still taking place and then is stopped due to the heat of the furnace. This is a major flaw in their design, a flaw that leads to inconsistent results. This flaw in their design forces the technician to become responsible for placing a ring into the furnace to stop the expansion and the ring must be placed into the furnace at the same time on every ring to insure a consistent, precise expansion. If a ring is allowed to sit on the bench for a time period longer than usual, then there will be more setting expansion. This extra expansion can be the difference between a restoration that fits perfectly and one that needs excessive adjusting and wasted time to make it fit.

So you see it is the flexibility of Rapid Cast investments that allows for more consistent results. This flexibility uses stable procedures and leaves less room for error.

Flexibility in work planning

Rapid Cast investments allow for more flexibility in work planning by requiring fewer restrictions during the casting process. No attention needs to be paid to when the ring must be placed in the furnace, how the furnace must be programmed or when the ring must be cast. By removing these requirements Rapid Cast investments give labs the ability to plan work flow in a more productive manner.

Increased productivity.

The flexibility, consistency and ability to fully control casting procedures all add up to a laboratory that can increase productivity. This increase in productivity can be obtained by merely embracing these new Rapid Cast investments and utilizing all the benefits that these products offer. Many times these cost savings and time savings are minimal in size but maximum in frequency. By continually following a predictable routine and using consistent materials a laboratory can reach their maximum potential for productivity without increasing work load or stress.

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Insured consistency.

How are investments tested to insure consistency?

Investments are made from numerous different types of quartz, cristobalite and other powders. But how do manufacturers know the proper blends of these materials to mix together to make a consistent, usable investment?

Some manufacturers make it sound as if they throw a little bit of each material into a mixer, blend it together and then do the testing. They tell you how they test and retest the finished product until the perfect fit is achieved. Some manufacturers even go so far as to issue new instructions with each batch they produce. However, if they blended it right in the first place they would not have to test so extensively. That is what makes this approach to quality control the wrong approach, it places more emphasis on being reactive rather than proactive.

As you probably understand the raw materials that make up investments fluctuate from batch to batch. The fluctuation of these raw materials is what makes analysis and formulating based on the results of this testing so important. Our testing consists of particle analysis, laser aided expansion testing, viscosity testing and other tests geared for each individual raw material all completed by an engineer with a PhD in materials science.

Our manufacturing procedures place great emphasis on completing tests before we blend the investments and in fact before we even purchase the raw materials that compose the investments. When we receive the raw materials we re-test them and if the raw materials that have been delivered don't meet up to our standards we send them back to the supplier. Then using the tests of the raw materials we calculate our formulations and reformulate if necessary to obtain end products that have the

All of these benefits add up to a higher level of quality, less stressful casting, a cost savings for your laboratory and more money in your bank account. By properly utilizing the benefits of Rapid Cast investments, such as N&V Z4 or Sun-Vest, an immediate positive impact on your laboratory can be realized.

desired, predictable results. What this means to you is that the different batches of N&V Z4 and Sun-Vest you receive from us may have different formulations, but you will never be able to tell the difference because your results will be predictable and consistent.

It is our job to make sure that once the materials are blended, packaged and delivered to your lab you can't tell the difference between your first batch and your last. You should not have to request certain batches, buy larger quantities of the same batch just to keep the results consistent and you should not have to change liquid ratios in order to keep your castings fitting correctly.

We use the best raw materials, the newest technology in materials testing, the finest in blending and packaging equipment so that we can offer the most consistent investments. We bring the technology of mixing and blending casting investments from the dark ages well into the 21st century.



Properly mixing investments
for optimum results.

To start out everyone must understand that the vacuum mixer is the most important piece of equipment in the laboratory. However, all too often the vacuum mixer is often the oldest and least taken care of piece of equipment in the lab. Too many laboratories are using outdated machines that are in bad condition or are in need of repair to restore their ability to pull sufficient vacuum. Some mixers merely need to have their mixing bowls replaced due to wear and tear. Other common problems with vacuum mixers are; clogged hoses that cause restricted air flow, worn out seals and gaskets, and missing parts that can cause unwanted problems.

The true reason the most important piece of equipment in the lab is the vacuum mixer is it can greatly impact many materials such as gypsum, investment or silicone. All of these materials are the foundation for a successful restoration. Now that we have covered the basics of the equipment we can lay down a few rules for proper mixing of phosphate investments.

Completely dry mixing bowls cause problems.

A mixing bowl that is completely dry can absorb up to 2 ml of liquid when you are mixing investment. However, a bowl with excess water in it can throw off the powder/liquid ratio. We recommend leaving water in your mixing bowls when they are not in use and wiping them out with a towel before use. As mixing bowls get older they tend to get more porous and absorb liquid more readily. This is another major factor for the necessity to replace bowls on a regular basis.

Throw out the graduated cylinders you get with your investment

Some manufacturers send a graduated cylinder with their investment to measure the expansion liquid and water. However, over time these measuring devices can fluctuate 2 ml +/- and the explanation is simple: They are cheap plastic cylinders that are not suitable for use in our industry. This fluctuation in the amount of liquid used can cause unwanted problems. As an example let's assume your measuring cylinder is off by + 2 ml and you measure 24 ml what you really have is 26 ml. In this example your liquid measurement could be off by as much as 9%. A difference of 1-2% will generally not be noticeable but a 9% difference could cause some serious problems.

In this case free is not better and the solution is actually quite simple. Purchase medical grade syringes or high quality graduated cylinders. They are not free but will save you more in the long run.

Powder First, Liquid Second.

When you're mixing most phosphate bonded investments, including N&V Z4 and Sun-Vest, you must put the powder in the bowl and then pour the corresponding amount of liquid on top of the powder. Many technicians break this rule and it can lead to serious problems such as inconsistent expansion, reduced working time and loss of expansion.

Why powder then liquid? By observing the reactions that take place between the powder and the liquid of phosphate investments we can gain a better understanding. When the liquid is introduced to the powder a reaction starts immediately. This reaction is commonly referred to as the setting expansion or bench set. Once this reaction starts so starts the setting of the investment, the expansion and the working time begins to tick away.

With phosphate investments the different quartz and cristobalite materials that comprise their makeup go through a unique saturation processes. These materials quickly absorb liquids that are introduced to them. If you pour the powder on top of the liquid some of the powder will absorb most of the liquid. This makes it extremely difficult to mix the remaining liquid and powder together thus resulting in an inconsistent mixture of powder and liquid. This may seem unimportant since you will be mixing the investment on a mechanical vacuum mixer. While in reality it is quite important as much of the chemical reaction will have taken place before the vacuum mixing even begins.

By following the powder first, liquid second procedure you can help avoid the following problems:

- Inconsistent fitting restorations
- Reduced working time
- Loss of expansion leading to tight fitting restorations

Summation

These suggestions are based on scientific facts and if they are followed decrease the chance that you will have problems with your investment or castings. However simple these suggestions may be, they should be followed and by following these suggested procedures you can make certain that you will be on your way to trouble free casting.

Have a casting question?

Have a question about your castings? Are your bridges coming out warped? Getting frequent miscasts? Can't get the answers from your current casting products supplier/manufacture?

Have a question about your castings? Are your bridges coming out warped? Getting frequent miscasts? Can't get the answers from your current casting products supplier/manufacture?

Contact	Position / Title		
Lab	E-mail		
Shipping Address	City	State	Zip
Phone	Fax		
Current alloy casting investment used:	Current pressable investment used:		
Current alloys used: Non-precious:	Percentage used:		
Noble:	Percentage used:		
High Noble:	Percentage used:		

Request a sample.

Sun-Vest ○ 60g + liquid ○ 90g + liquid

Formulated exclusively for all precious and semi-precious alloys.

Z4 ○ 100g + liquid

Z4 ○ 100g + liquid

Universal rapid-cast investment for all alloys and pressable ceramics.

Digi-Dip ○ Sample

Digi-Dip ○ Sample

Elastic dipping wax.

Ask a question. Request a sample.

To receive an answer to your casting question(s) and/or a free sample(s) please complete and fax this form to 866.270.0796 or e-mail us your request to solutions@vacalon.com.



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Taking two of these before casting?

Inconsistent investments? Inflexible investments that take control of your laboratory?
Trouble getting technical support? Vacalon knows your aches and that's why we offer
pain free casting solutions.

N&V Sun-Vest

Formulated exclusively for all precious
and semi-precious alloys.

- Excels when used with all types of
precious and semi-precious alloys,
- Suitable for PFM, full cast or
inlay/onlay alloys
- Castings are rendered ultra smooth with
a glass like texture
- Effortless devesting
- Consistent expansion for the perfect fit
- Rapid cast capabilities

80022 Sun-Vest Powder



100 env X 90 g

80027 Sun-Vest Powder



150 env X 60 g

80040 Expansion Liquid



1 Liter (Liquid is not freeze stable)

N&V Z4

Universal rapid cast investment for all
alloys and pressable ceramics.

- Can be used with any alloy or pressing
system
- True rapid cast capabilities
- Effortless devesting, critical for all
ceramic restorations
- Precise, smooth, accurate and
consistent results
- Increased productivity through flexibility

80011 Z4 Powder



100 env X 100 g

80016 Z4 Powder



150 env X 60 g

80040 Expansion Liquid



1 Liter (Liquid is not freeze stable)

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