Article

An Evaluation of Dental Stone, Traxtone, and Crime-Cast

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Abstract: Dental stone obtained in bulk from dental suppliers has been used worldwide at crime scenes for more than thirty years as the most popular casting material for recovering three-dimensional footwear and tire impressions. In recent years, preweighed products, such as Traxtone and Crime-Cast, have been introduced. This paper provides basic information about dental stone and how it should be used to cast impressions in sand and soil. The newer products are evaluated and compared to the traditional bulk dental stone. For this purpose, casts were made using each of the products in a variety of temperatures in Alaska and Florida.

Introduction

Many crime scene technicians and examiners have less-than-adequate training and information about the techniques, materials, and methods of casting impressions. Because of this, often casts of footwear and tire impressions are not made at all. Yet in most cases, a good cast of a footwear or tire impression will allow for a far more conclusive examination than having only photographs of the same impression. With the many choices of dental stone casting products that one can select from, it may not be clear to some as to which product should be used. Because of misinformation or a lack of information about casting techniques and materials, some police departments are simply

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not making casts at all, a policy that, without any doubt, often results in the loss of evidence. This article will review some general information about dental stone, the qualities a dental stone product for casting footwear and tire impressions should possess, and how to use dental stone for casting those impressions. Traxtone and Crime-Cast, two dental stone products, will be compared with Castone, a basic raw dental stone product that is available in bulk quantities and has been successfully used for decades.

Materials and Methods

Gypsum and Plasters

The term “plaster” is a generic term that is used to describe all gypsum products, including modeling plaster, plaster of Paris, stucco, and dental stones. Plasters are made from gypsum rock, which is essentially calcium sulphate dihydrate (CaSO$_4$ 2H$_2$O). The gypsum rock is mined from the ground, heated to make plaster, crushed and pulverized, and processed to produce a variety of plaster products.

There are two categories of plasters. These categories are known as alpha hemihydrates and beta hemihydrates. The beta hemihydrates are known as industrial plasters and include plaster of Paris, modeling plasters, and stucco. They are not as hard as the alpha hemihydrates and have lower compression strengths. Alpha hemihydrates are called gypsum cements and are much harder and stronger. They include the dental stones and require less water than the betas and have higher compression strengths. Dental stones are the gypsum products that should be used for casting shoe and tire impressions.

Powder-to-Water Ratio and Consistency

The powder-to-water ratio (P:W) is known as the “consistency” of the product.$^1$ The powder portion (P) of the ratio is always expressed as 100 and the amount of water (W) is the other number in this ratio. A product with a P:W ratio of 100:30 would have a consistency of 30 (i.e., 100 parts of powder should be mixed with 30 parts of water). The compression strength of the product,
expressed in pounds per square inch (psi), increases as the consistency gets lower. Thus, products with lower consistencies require less water and have higher compression strengths. Figure 1 shows a summary of several gypsum products, including modeling plaster and dental stone, and their respective P:W ratios and compression strengths.

<table>
<thead>
<tr>
<th>Product</th>
<th>P:W Ratio</th>
<th>Compression Strength (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Die Keen</td>
<td>100/21</td>
<td>18,000</td>
</tr>
<tr>
<td>Die Stone</td>
<td>100/22</td>
<td>15,000</td>
</tr>
<tr>
<td>Denstone</td>
<td>100/30</td>
<td>9,000</td>
</tr>
<tr>
<td>Castone</td>
<td>100/30</td>
<td>8,000</td>
</tr>
<tr>
<td>Ortho Plaster</td>
<td>100/35</td>
<td>6,500</td>
</tr>
<tr>
<td>Model Plaster</td>
<td>100/47</td>
<td>5,500</td>
</tr>
<tr>
<td>Lab Plaster</td>
<td>100/47</td>
<td>5,000</td>
</tr>
<tr>
<td>Mounting Stone</td>
<td>100/56</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Figure 1
As the amount of water required for mixing increases in the P:W ratio, the compression strength of the product is reduced.

Castone\(^2\), a dental stone, has been successfully used for casting footwear and tire impressions. Castone has a consistency of 30. Figure 2 depicts a portion of the Castone box that provides this information to the consumer. This information is provided with all bulk dental stone products, either on the container itself or on brochures inside the container. When converting grams (g) and cubic centimeters (cc) to pounds and ounces, the following multiplier is provided: For a 2-lb portion of powder, multiply the consistency of the dental stone by .306729 and the resulting product will equal the number of ounces of water that is called for\(^3\). Thus, in the case of a 2-lb portion of Castone dental stone powder, having a consistency of 30, the amount is computed by multiplying 30 x .306729 (9.2 oz of water).

\(^2\) Available through Dentsply International, 570 West College Avenue, P.O. Box 872, York, Pennsylvania 17405. 800-877-0020. Castone is a specific dental stone, with a compression strength of 8,000 psi dry. It comes in a cream or buff color in 25-lb cartons as item # 99043. See also www.dentsply.com.

\(^3\) The amount of water for a 2 1/2-lb portion can be determined by multiplying the consistency of the dental stone powder by .383411. As an example, a consistency of 30 multiplied by .383411 equals 11.5 ounces of water.
Unless there is a reason to have a thicker pour, as might be needed in snow impressions or in other porous or coarsely textured surfaces, it is suggested that the amount of water be slightly increased to assure that the mixture will be fluid enough to be rapidly poured, as is recommended over shallow and fragile impressions. This very slight amount of additional water, normally only 1/2 oz, will not appreciably affect the quality of the mixture but will make mixing and pouring much easier. Thus in the above example where a dental stone with a consistency of 30 requires 9.2 oz of water for a 2-lb portion, an additional 1/2 oz of water, totaling 9.7 oz, would be recommended. The accuracy of preweighing the powder and premeasuring the water is directly related to the scale, other measuring devices, and the person performing these functions. Thus, minor adjustments may be needed until procedures and measurements are satisfactory.

Dental Stone in a Ziplock Bag

Weighing a portion of dental stone into a sturdy ziplock bag for casting shoe impressions is commonly practiced worldwide. A 25-lb carton of dental stone can be divided into numerous bags of known weight and these can be conveniently carried in a crime scene kit to be used when needed (Figure 3). Some departments use 2-lb portions, and others use larger 2 1/2- to 3-lb portions. This choice is strictly based on one’s experience and needs. It is recommended that sturdy ziplock bags of a thickness of 4 mil
or greater be used rather than the store-bought ziplock freezer bags that are more flimsy and tend to leak. From the P:W ratio, the proper amount of water can be calculated and a measuring cup can be used to add that quantity of water to the bag. For a cast of a footwear impression, just a bag of dental stone and the premeasured amount of water are needed. The cast will cover or fill the entire impression area in what is called a pancake cast. The dental stone does not require any reinforcement material and there is no need for a casting form unless the impression is on a steep slope. For a tire impression, which will require more powder, the powder can be used directly from the 25-lb carton, instead of from a ziplock bag.

Figure 3
A 25-lb box of Castone dental stone can be divided into many ziplock bags, each containing 2 lbs of dental stone.

The gypsum industry states that the ideal mixing procedure involves the addition of the powder to water to produce homogeneous slurry. The crime scene use of adding a premeasured amount of water to a premeasured amount of powder in a plastic bag is acceptable because it deals with smaller and more manageable quantities and the full amount of water is added all at once to the bag [1]. However, once the water is added, the dental stone should be constantly mixed for a minimum of 3-4 minutes. Usually it only takes a minute to
consume the powder with water and eliminate any lumps. At this point, many persons are of the opinion that the powder and water are completely mixed; however, this is incorrect. Mixing must continue for the full duration of 3-4 minutes to allow all of the powder particles to completely soak up the water and become completely wetted. Failure to mix for at least 3-4 minutes will result in uneven pouring and a weaker cast.

For tire impressions, where larger quantities of dental stone are needed, an estimated amount of water can be added to a bucket and the powder can be added to the water. When larger quantities are mixed in a bucket, the powder should be mixed in gradually to avoid lumps. After adding the powder, the mixing and stirring of this larger quantity should be continuous for at least 5 minutes.

Forms

The use of forms around footwear impressions stems from the old use of plaster of Paris during and prior to the 1970s, where the need for larger quantities of casting material and a greater thickness of the cast necessitated a form to contain those materials. Dental stone is sufficiently hard and is used in lesser quantities and does not require any form, with the exception of perhaps an impression on a steep hill, where a partial form might be needed to assist in controlling the flow of the mixture.

Free Water

The amount of water called for in the P:W ratio is more than what is actually necessary to complete the reaction. This extra water allows each microscopic particle of powder to be completely surrounded by water during mixing, thus facilitating the absorption of the water by the powder. The extra water that remains in the hardened cast is known as “free water”. This water is either dried out of the cast using special equipment, or in the case of crime scene casts, the water will air-dry from the cast through evaporation. If water beyond what is recommended is in the mixture, the water will float to the surface of the cast, a process known as “watering out”. This will weaken the cast.
Drying before Cleaning the Cast

Until complete drying has occurred, which, depending on the size of the cast, will take between 24 and 48 hours, the cast has not achieved its maximum hardness and therefore should not be cleaned. This is illustrated in the chart in Figure 4, which shows that a cast does not begin to achieve its maximum compression strength until 93% or more of the free water has evaporated. Thus, if a cast is cleaned too soon, it is possible that some detail will be lost.

![Figure 4](image_url)

*Figure 4*

*A dental stone cast does not begin to achieve its maximum compression strength until 93% or more of its free water has evaporated. (Image provided courtesy of US Gypsum.)*
Compression Strength in Crime Scene Applications

The dental stone product should come with information about its P:W ratio as well as its wet and dry compression strengths. The wet and dry compression strengths are based on tests performed in industrial mixing and drying applications and are not based on mixing and drying the product as performed at crime scenes. According to an official at US Gypsum, when water is added to dental stone in a ziplock bag and the mixing is performed by hand and the resulting cast is air-dried, the resulting compression strengths are significantly reduced [1]. This is because there is less energy going into the mix when mixing by hand. Thus, if a stone with a dry compression strength rating of 8,000 psi is being used, it is likely it will only attain 4,000-5000 psi if mixed by hand and air-dried [1]. For crime scene use, a dental stone product rated at 8,000 psi that is mixed by hand and rates at 4,000 psi when dry will be sufficiently hard to permit washing and brushing during the cleaning process without loss of detail. Dental stones with very high compression strengths, such as 21,000 psi, can be used, but they are unnecessary and normally more expensive. Casting material with a compression strength of less than 8,000 psi should not be used.

Expansion

Occasionally someone voices concern about the possible shrinkage of casting materials. Alginate casting materials, used by anthropologists and others, do have considerable shrinkage rates, which is the reason they are not used to recover footwear impression evidence. But dental stones actually expand very slightly when they set. This expansion varies from product to product but is normally within a range of .08% to .14%. To put this amount of expansion in perspective, a .08% expansion of a 12-inch cast would equate to .0096 inches, and a .14% expansion of a 12-inch cast would equate to .0168 inches. Thus, expansion of dental stones is not an issue, because that small of a size change is insignificant and realistically immeasurable.

Release Agents and Fixatives

Release agents, such as hair spray, are not needed or recommended when using dental stone for footwear impressions. Spraying a fragile impression will likely risk damage to the impression. The dental stone cast can be thoroughly soaked and
cleaned in water with a soft brush, if necessary, and any soil that might stick to the cast can be removed without risk of losing detail.

Hair spray has also been recommended for fixing impressions in dusty and fragile soil, where it is believed the hair spray will make the impression more rigid and durable and will help it to survive any impact from the dental stone. The solution here is more related to the technique of pouring the dental stone over the impression, rather than relying on a fixative spray to protect it. Impressions that are fragile are more prone to be destroyed by the aerosol blast of hairspray or by the weight of the coats of hairspray or other fixatives applied to the impression. Fixatives are not needed and only risk the integrity of the fine detail within the impression.

**Pouring Methods for Footwear Impressions**

Footwear impressions vary considerably in depth from one impression to another. Different depths and different soils require different considerations when pouring the casting materials. This discussion will include instructions for pouring into very shallow impressions and for pouring into impressions that have more significant depth. These instructions do not pertain to snow casting, which requires different materials and methods.

Many footwear impressions are less than 1/4 inch in depth and may be in what is characterized as very fragile soil (e.g., dusty and powdery soils, dry fine sands, the dry sandy mix often found on the shoulder of roads). Pouring the casting material slowly or from too high above the impression means that gravity will pull the casting materials straight down onto the shallow and fragile impression, likely causing significant damage to it (Figures 5a, 5b, 5c). To pour casting material over a shallow impression, it is critical that the dental stone mixture be prepared properly and with a pourable viscosity, that is, a slightly thinner mix, as discussed previously. When pouring the mixture over the shallow fragile impression, position the bag so that the pour will begin 3 inches before the heel or toe of the impression. With the opening of the bag almost on the ground, lift the bottom of the bag upward so that the mixture rapidly leaves the bag and flows quickly across the impression (Figure 6). As you lift the rear of the bag, keep the bag opening near the ground and move it forward, thus allowing all of the casting material to cover
the entire impression. This technique directs the force of the
dental stone parallel to the ground rather than straight down
into the impression. Moreover, it covers the impression, much
like a fast-moving lava flow. There will be no downward force
that might damage the impression. This technique allows for the
dental stone to flow over the impression rather than to impact
the impression directly. If done properly, the flowing or rolling
action of the pour results in recovery of all detail with no pour
marks, interruptions in flow, or destruction of detail. It is a
technique that should be practiced prior to using it on evidence
at a crime scene. However, once the technique is understood,
these fragile impressions can easily and accurately be recovered.
Note that for these quicker pours over a fragile impression, it is
simply not possible to pour the dental stone properly if (1) the
dental stone mixture is too thick or (2) the pour is too slow or
too high above the impression.

Footwear impressions that are more stable (e.g., an impression
in moist clay soil) or have more depth can use a slower pour
than the method for shallow and fragile impressions described
previously. In these cases, pouring the dental stone involves
initially pouring it from outside the impression on an area that
will allow for the material to naturally flow into the impression,
as illustrated in Figure 7. Continue pouring the mixture, directing
its flow until it completely fills the impression. Note that once
parts of the impression have been covered with a thick covering
of dental stone, the careful pouring of additional dental stone
over these areas should not harm the impression, provided
that the casting material is poured close to the ground and not
from several inches above. Pouring, although not as fast as in the
case of the shallow fragile impressions, should be continuous to
prevent “flow lines” that will occur if the flow of the mixture is
stopped and then restarted. The pour should also be very close
to the ground and only on top of areas where the impression is
already covered with dental stone.

Field Study and Evaluation of Casting Materials

As an alternative to bulk dental stone, premeasured,
prepackaged casting materials are available for purchase through
forensic supply companies. These are marketed as ready-to-go
kits for making single casts. In general, these products include
powder for making one cast of a shoe impression, a mixing bag,
Figure 5 a

Pouring the dental stone from inches above the ground will result in the destruction of detail in the impression.

Figures 5 b and 5 c

Casts showing the damage that can result from improper pouring.
Figure 6

For fragile and shallow impressions, dental stone can be poured near ground level, beginning the pour 3 inches behind the impression and allowing the pour to rapidly spread ahead of the bag into the impression.

Figure 7

For impressions that are deeper or for those impressions that are more stable, such as those in clay or firm soil, the pour should begin from outside the impression and be allowed to flow into the impression.
and may include the water that is needed or other materials and equipment. Traxtone and Crime-Cast are two examples of such products. These two were chosen for comparison to Castone because they are products that are commonly asked about during instruction and crime scene fieldwork.

**Traxtone**

Traxtone (Figure 8) was first manufactured by Garreco, a dental supply company, and was initially sold by Evi-Paq. It is now available through Armor Forensics (Lightning Powder) and other suppliers. Traxtone powder is a version of dental stone material known as die stone. It is green in color and includes crystals that are intended to be color indicators for timing the mixing process. Traxtone is available in kits that include either five or twenty bags of casting material. Each bag is heat sealed and includes about 1.75 lbs of powder. A ziplock is included for resealing and has a thickness of between 3 to 4 mil. The kit also includes a wooden ruler, a cup for measuring water, and a 2-oz pump bottle of hairspray. To mix Traxtone, according to the directions on the bag, the heat seal is cut off the end of the bag. Water (8 oz) is measured and added to the bag. The bag is kneaded until the color indicators have dissolved, and then the material is poured slowly into the impression. The resulting Traxtone cast is light green in color.

**Crime-Cast**

Crime-Cast\(^5\) (Figure 9) is modeled after a hobby product previously sold for casting the tracks of animals. The packaging and advertising information refer to the material as a “plaster casting material”. Enclosed in the single bag are 2 lbs of dental stone powder and a bladder of water. The bag is a thick 6 mil and the bladder contains 12 oz of water. The bag is placed on a firm surface, and pressure is applied to break open the internal bladder of water. The bag is kneaded for three minutes according to directions on the package, and then the top of the bag is cut open to dispense the casting material into the impression. The final cast is a light cream color.

\(^5\) Sirchie sells a product similar in appearance to Crime-Cast called Shake-N-Cast. This product was not evaluated.
Figure 8
*A Traxtone kit of five bags.*

Figure 9
*A bag of Crime-Cast.*
Cost Comparison

The following table compares the estimated costs of Crime-Cast and Traxtone to Castone.

<table>
<thead>
<tr>
<th>Product</th>
<th>Unit price</th>
<th>Number of casts</th>
<th>Cost per cast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime-Cast</td>
<td>$14.95 / 2-lb bag</td>
<td>1</td>
<td>$14.95 plus shipping</td>
</tr>
<tr>
<td>Castone (bulk dental stone)</td>
<td>$199.51 for 200 lbs</td>
<td>100</td>
<td>$2.10 including bag and shipping</td>
</tr>
<tr>
<td>Traxtone</td>
<td>$16.95 / 5 bag kit</td>
<td>5</td>
<td>$3.39 plus shipping</td>
</tr>
<tr>
<td></td>
<td>$49.98 / 20 bag kit</td>
<td>20</td>
<td>$2.50 plus shipping</td>
</tr>
</tbody>
</table>

Figure 10

Cost information.

Evaluation of Performance

To evaluate the performance of each casting product, impressions were cast at a range of temperatures between 30 °F and 80 °F. A pair of Nike “Devastate Low” shoes was used for the evaluation. The left shoe was sent to Alaska for the colder temperature range impressions and the right shoe remained in Florida for the warmer temperature range impressions.

Because of differences in soil composition and other variables that affect detail, a penny (obverse side up) was placed in each impression for a standard comparison of detail recorded by each casting material.

Mixing and Pouring

The Traxtone directions on the bag indicate to add 8 oz of water to the provided powder. The directions in the technical information sheet provided with the kit discuss using 7 oz of water and 1.5 lbs of Traxtone, which is in conflict with the directions on the bag. The individual bags containing the Traxtone (as purchased) are adequate in thickness, and the ziplock reseals well during mixing of the material. The cup provided is useful for measuring the water. However, the hair spray and the inexpensive wooden ruler are of no use because fixers are not necessary, and more accurate and appropriate rulers should be used and should already be part of a crime scene kit. Both sets of directions in the Traxtone kit instruct the user to knead the bag until all the color pigments disappear or dissolve into the mix.
Using the crystal colors to determine when the material is ready to pour resulted in a wide range of mixing times. Most often, the colored pigments dissolved in just over one minute, which is far less than the time that dental stone should be mixed.

The directions for using Crime-Cast are located on the outside of the mixing bag. They describe how to burst the bladder and include the direction to mix for three minutes, which is the appropriate time for completely dispersing the water and casting material. The bag provided with Crime-Cast is sturdy and thick, adequate for the purpose. One of the authors had an older bag of Crime-Cast that became hard in the package during the first minute of mixing. This may indicate shelf life issues.

Both Traxtone and Crime-Cast directions include a warning that the pour of the material should begin outside of the impression and that setting time is important and that hardening should be allowed to continue for 24 to 48 hours before cleaning. The Traxtone material, mixed as directed, was a fairly thin consistency and was easy to dispense. The Crime-Cast was a bit thicker, yet dispensed nicely out of the bag as well.

Castone, a bulk dental stone, was prepared in 2-lb quantities in ziplock bags and mixed for 3 minutes as described earlier in this article.

**Time to Set**

Each casting material was used at a variety of temperatures to record the time necessary to wait before removing the cast at a crime scene. The time to set was determined by lightly scratching the surface with a paper clip. When the paper clip would no longer leave a scratch in the casting material, it was ready to be lifted from the ground. Setting times are depicted in Figure 11.

The setting time for each of the casting materials increased as the temperature decreased. In other words, the colder it is, the longer the wait to pick up the cast for any casting material. However, the setting time for Traxtone was longer than the other two materials, a factor that became even more significant in colder temperatures.
Temperatures were chosen at or above freezing. Freezing temperatures often involve the casting of impressions in snow, a process that involves other techniques. Also, it is noted that the directions for Traxtone suggest using warm water to decrease the time it takes for the material to set. Warm water was not used in the above trials, because it is often not practical to obtain at crime scenes and because the use of warm water with the other materials would also decrease their respective setting times.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Castone</th>
<th>Crime-Cast</th>
<th>Traxtone</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 °F</td>
<td>40 minutes</td>
<td>43 minutes</td>
<td>91 minutes</td>
</tr>
<tr>
<td>42 °F</td>
<td>28 minutes</td>
<td>34 minutes</td>
<td>45 minutes</td>
</tr>
<tr>
<td>60 °F</td>
<td>20 minutes</td>
<td>20 minutes</td>
<td>37 minutes</td>
</tr>
<tr>
<td>80 °F</td>
<td>20 minutes</td>
<td>20 minutes</td>
<td>28 minutes</td>
</tr>
</tbody>
</table>

Figure 11
Setting times for the three casting products at different temperatures.

Appearance of Casts and Detail Recorded

This is only subjectively addressed in this evaluation. The appearance of each cast was excellent and the recording of the detail of the penny and shoe impression was excellent in every case. No single product stood out as superior over the others in the apparent quality of the resulting cast.

Comparison of Compression Strength and Expansion

No information was provided with the purchased Crime-Cast about specific material composition, expansion rate, or the compression strength of the final cast, thus these qualities could not be compared to those of the other two materials. It is the observation of the authors that the cast made with Crime-Cast was somewhat softer than the casts made with the other two materials.

Traxtone, according to the manufacturer information provided, has a dry expansion of 0.09%. Castone has an expansion of .11%. The difference between these expansion values for Castone and Traxtone is .02%. For perspective, this would translate into .0024 inches in a 12-inch cast. This difference is not significant for the purposes of recording shoe or tire impressions.
The compression strength of Castone is 8,000 psi and for Traxtone it is provided as 18,000 psi. The actual hardness of a cast mixed by hand is probably much less than these amounts. As previously discussed, any dental stone product rated at least 8,000 psi or higher is sufficient for crime scene casting of shoe and tire impressions.

Results & Discussion

Convenience: Crime-Cast is the most convenient product, because it is the only one that includes preweighed powder and water in one package.

Cost: Dental stone purchased in bulk is the most cost-effective. Crime-Cast is relatively very expensive.

Qualities of casts: Crime-Cast, Traxtone, and Castone all produced casts with excellent detail and adequate hardness that, when dry, allowed them to be cleaned without loss of detail. We note that with regard to all dental stones, higher compression strengths, such as 20,000 psi, are not necessary and provide no better cast than dental stones that have at least 8,000 to 9,000 psi, which is more than adequate for the purpose of preserving detail. Also, expansion percentage rates for dental stones are very low. The difference in the expansion percentage rates of all three products is a negligible and insignificant difference.

Versatility: Castone is the most versatile of the materials. Purchased in bulk, it may be easily mixed in any quantity. Most applicable is the casting of tire tracks, because the bulk dental stone may be mixed in a bucket for this purpose. Traxtone, as it is sold, would require the opening of many bags to mix in greater amounts for the larger tire casts. Crime-Cast, as it is packaged with the water in a secondary bag, would also require mixing multiple bags for larger casts.

Time to set: Crime-Cast and Castone have the shortest setting times. As temperatures get colder, setting times increase. The longer setting time for Traxtone is a distinct disadvantage because it requires dedicating more time to the casting and thus the overall recovery process at a crime scene.
Conclusion

Some departments do not routinely make casts of three-dimensional impressions. The reason often cited for not making casts reflects a misunderstanding of part or all of the casting process. Casting, more often than not, results in better evidence recovery and therefore more conclusive examination results than just photographs alone. When casts are made, the most common mistakes seem to include a general lack of understanding and use of the proper P:W ratio, not mixing the mixture for at least 3 minutes, not pouring the mixture properly, and cleaning the cast before it has completely hardened.

Although Traxtone and Crime-Cast can be used for the recording of shoe and tire impressions and are certainly capable of making detailed casts, the authors recommend the use of bulk dental stone because of the following: Bulk dental stone offers more flexibility regarding the size and amount needed at the crime scene. It is readily available from many dental suppliers, thus affording greater accessibility for purchase. It costs less. It sets up quickly.

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References