



# Innovative Techniques for Collecting Snow Impression Evidence

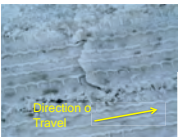
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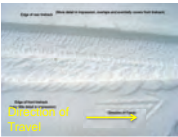


## Determining Direction of Travel with Tire Impressions

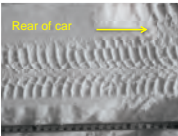
Direction of travel can be critical in reconstructing actions at the crime scene and in determining which tires are right and left. "Shelving", "Snow Wakes" and directional tire tread can help with this.



In certain snow conditions, snow "shelving" produces a ledge of snow that typically points away from the direction of travel.



"Snow wakes" occur in certain snow conditions and point towards the direction of travel.



Directional tire tread can give an indication of front vs rear (assuming they were installed properly.....)

## Locating Buried Snow Impressions

Newly fallen or windblown snow may cover older impressions. A portable battery powered leaf blower can be used to blow away loose snow from the original impression.



If the new snow is light and powdery, it is possible to carefully blow it off of the older, compacted impression.



Upper Photo: Tire impression partially cleared with leaf blower

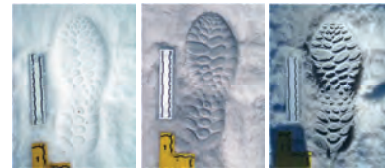
Lower Photo: Tire impression completely cleared with leaf blower.

## Coatings for Photography



Closeup snow impression photography typically requires some type of contrast enhancement. This can be done by coloring the impression with spray paint or dry powders, using oblique lighting, or a combination of both.

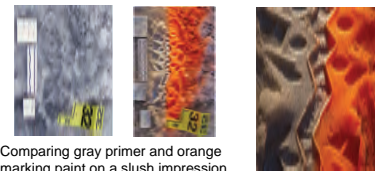
Grey spray primer has been regularly used in Alaska, and it also works well for coating the impression for dental stone casting with cold (<-10C) snow. Once the snow has been sprayed, protect the impression from the sun to prevent melting.



Original impression with ambient light  
 Impression sprayed with gray primer with ambient light.  
 Impression sprayed with gray primer using oblique light.

## Photographing Slush or Ice Impressions

The transparent nature of slush and ice requires the surface of the impression to be coated. Spray paints do a good job of coloring slush and ice, however snowprint wax does a better job of sealing slush impressions for casting.



Comparing gray primer and orange marking paint on a slush impression.



Snowprint wax on a slush impression.

## Casting with Dental Stone

Casts representing the detail present in snow impressions can be made using either dental stone or sulfur cement. The decision on which technique to use should be based on the supplies on hand, the investigator's experience and the type of snow composing the impression.

Dental stone casts at warmer temperatures require the snow impression to be coated with either a spray or powder to prevent the casting mixture from leaking through the snow grains and to help minimize melting of detail.

Cooling the dental stone and the mixing water will help avoid melting the impression. Using 1 tablespoon of potassium sulfate per cast is needed to speed up the hardening of the cooled dental stone. At cold temperatures (<-10C) the cast will freeze before hardening. Careful thawing indoors will allow the cast to harden.

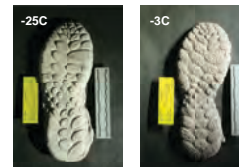
Pouring a thicker mixture of dental stone will limit leaking through the snow grains

### Casts in warm -1C fresh snow



Dental Stone with sifted dental stone coating  
 Dental Stone with gray primer and snowprint wax coating.  
 Sulfur Cement

### Using gray primer at -25C vs -3C



Gray primer works well at cold temperatures, but does not seal warm snow grains with a high free water content

## Coating Guidelines for Dental Stone Casting

### Warm Melting Snow > 0C

Lots of free water is present – use snowprint wax, spray paint with dry powder coating

### Warm Snow usually > -5C to 2C

Some free water is present use snowprint wax, heavy marking paint, dry powder coating

### Cold Snow usually < -5C

No free water present – use spray paint

### Really Cold Snow < -20C

No free water present – use spray paint

## Sulfur Cement – A Replacement for Pure Sulfur Casting

Sulfur cement is a reinforced modified sulfur material that is a safer, stronger alternative to using pure sulfur in casting snow impressions. It is melted, cooled and then poured in the manner as pure sulfur. With practice, a completed cast can be made in less than 15 minutes.



Sulfur cement is an industrial material available in a flake form in 50 lb bags.

Source:  
 Basolit Sulfur Cement No. 600  
 Sauereisen Inc. Pittsburg, PA

## Sulfur Cement vs Pure Sulfur

Flexural Strength  
 Sulfur Cement 1375psi  
 Sulfur 220psi

Compressive Strength  
 Sulfur Cement 9,000 psi  
 Sulfur 2,300 psi  
 Dental Stone 9,000 -16,000 psi

Sulfur cement is not regulated for shipping - OK to mail



Melting Sulfur Cement



Melting Pure Sulfur

## Casting a tire impression using Sulfur Cement

