

# A GUIDE TO FREEZE BRANDING

In the process of Freeze Branding, super-chilled irons are applied to the hide of an animal, altering the pigment-producing cells of the hair. As a result, the hair that grows back in the branded area will be white. In light-colored animals, the branding iron can be applied for a longer period of time to destroy hair growth altogether, producing a mark similar to one made with a hot iron. Freeze branding of livestock has become popular for several reasons.

1. The brand is more legible throughout the year than a hot brand.
2. Freeze branding is less painful and does not result in sores and fly problems.
3. A properly applied freeze brand causes no permanent damage to the skin that interferes with leather quality.

It should be noted however, that freeze branding does require more time and skill than traditional methods. Also, livestock absolutely must be restrained during freeze branding.

**Branding Irons:** Stone's Freeze Brands are heavily constructed from high-quality copper alloy for maximum temperature holding capacity. The faces of our irons are slightly rounded to insure uniform transfer and are available in wide-face for cattle and narrow-face for horses. Figures three inches in height are recommended for calves and four inches for older stock. For horses, two-inch characters will be sufficient.

**Refrigerant:** As a refrigerant, you can use either liquid nitrogen or dry ice and alcohol. Many have found it easier to get good results from dry ice and alcohol. Liquid nitrogen, however, takes less time to brand and to re-cool your iron for the next animal. You may find it somewhat more readily available, as well. Liquid nitrogen may be obtained from artificial insemination firms, who use it to store frozen cattle semen. Some welding supply distributors will also carry liquid nitrogen as well as dry ice. Dry ice may also be available from frozen food handlers. Dry ice must be used in a solution of alcohol. Methyl, Ethyl, or Isopropyl Alcohol may be used, 99% is recommended but acceptable results have been attained with as little as 95% strength alcohol. The most important thing is that the alcohol strength is strong enough to prevent it from freezing. While 95% is more readily available, 99% is preferred and may be found at your local Farm/Livestock supplier or Drug store. Acetone and Gasoline should NOT be used as coolant solution, due to danger of an explosion!

You will also need an insulated container for the refrigerant. This should be large enough to keep all of the irons submerged. A large Styrofoam picnic cooler works well but should be encased in wood or placed in another container because Styrofoam breaks easily. As much as possible, the top opening of the container should be covered with insulating material. If using dry ice, an additional will be needed prior to use.

**Preparation of Dry Ice:** Fill the insulated container with enough alcohol to cover the irons. You will need about 15-20 pounds of dry ice, part of which should be broken into small pieces for rapid cooling. Leaving the rest in larger pieces for sustained cooling. Using gloves to prevent freeze burn, add dry ice to the alcohol. This will immediately cause a rapid bubbling action to take place. Within five minutes this action will have leveled off, indicating that solution is thoroughly chilled. Some solid pieces of dry ice should remain in the solution. When you place the irons in the solution, rapid bubbling will resume around them. In about 10 minutes, this action will have leveled off, indicating that the irons have reached the proper temperature. After using an iron, return it to the solution immediately. It will take 4-5 minutes for the bubbling to level off again, indicating that the iron has returned to its proper temperature.

**Preparation of Liquid Nitrogen:** Place the irons in the insulated container and cover the faces of the irons by at least one inch with liquid nitrogen. Violent bubbling will occur; use eye protection!. When this bubbling stops, the irons are ready for use. After using an iron, return it to the container. It will be re-cooled within 20 seconds, when the bubbles once again recede.

**Other Equipment:** You will need an electric livestock clipper. It is recommended that you buy surgical blades for your clipper so that you remove as much hair as possible from the brand site. Excess hair will insulate the skin, causing a poor brand. You will also need a stiff bristle brush from removing loose hair, dead skin, and dirt before branding. Just prior to branding, the skin should be saturated with room temperature alcohol to help transfer the coldness to the skin. You should use 99% strong alcohol (methyl, ethyl, or isopropyl) or it will freeze and act like an insulator. You will need a plastic squirt bottle or sprayer to apply the alcohol. Some people prefer a 2 to 1 solution of alcohol and glycerine. You will also need gloves to handle the ultra-cold irons, a timer or watch, and a steel brush.

**Procedure:** Restrain the animal in a squeeze chute or other restraining device. Only very small calves should be manually restrained. Freeze branding takes longer than traditional methods and movement of the iron can spoil the brand. Clip, clean and wet the area as just described. Press the super-chilled brand firmly with both hands to the wetted side of the animal, using a slight rocking motion. Without allowing the face of the iron to lose contact with the skin. Use a timer or watch to obtain proper application time. Refer to the following chart for correct application time.

<b>Animal</b>	<b>Coolant</b>	<b>Application Time</b>
Colt	Liquid Nitrogen	6-12 seconds
	Dry Ice and Alcohol	16-24 seconds
Horse	Liquid Nitrogen	8-12 seconds
	Dry Ice and Alcohol	20-24 seconds
Calf	Liquid Nitrogen	21-24 seconds
	Dry Ice and Alcohol	40-50 seconds
Cow	Liquid Nitrogen	25-30 seconds
	Dry Ice and Alcohol	50-60 seconds

We recommend you begin branding using 2-30 pounds of pressure on the brand. Again, keeping records and trying more or less pressure will help you determine what works best for you.

If additional irons are to be used on the same animal, re-wet the area with alcohol before applying each iron. Best results are achieved when only one iron is applied at a time. You may find it helpful to Premark the position of the brands to insure proper alignment. After repeated use of the irons, you will need to clean the faces of the iron with a steel brush.

**Results:** After removing the iron from the animal, the skin will appear frozen. When the skin thaws it will swell slightly. It will take about a month for the dead hair to fall out completely and around three months for the white hair to grow in.

**Perfecting the process:** Time is the crucial element in successful freeze branding. An unclear brand will result if the animal is underbranded. Such brands can be touched up during the next branding season. Overbranding kills the hair follicles completely, resulting in a fair free brand similar to a hot-iron brand. Many factors affect branding time besides the age of the animal. Generally, branding times will be longer for colder northern regions than for more southerly climates. Breeds with thinner skin and hair coat require less time than others. Experience shows that Angus require less time than Herefords. Branding times should be shortened during periods of rapid hair growth, such as spring and fall (more so in spring than fall). The amount of pressure applied and the length of clipped hair also affect branding time.

**Precautions:** Dry ice, liquid nitrogen and super-chilled solutions and irons can cause serious freeze burns. Wear protective gloves, clothing and eyewear when working with these substances. (The temperature of an iron chilled in liquid nitrogen is  $-196$  degrees Celsius!!) Alcohol is flammable and should be used in open air as a well-ventilated building. Avoid smoking and keep away from open flames. Alcohol vapors are dangerous to the tissues of the nose and eyes. Do not return solution to a closed container until it has reached room temperature or it may explode.

**Note:** Before ordering a Freeze Branding iron for a registered brand, contact your state brand inspection agency. The use of such irons is subject to laws relative to each individual state. Freeze branding is primarily used for individual identification of livestock within a herd.

All information in this article is based on factual information and is believed to be true and accurate but is not guaranteed. For further information on this subject, contact your Veterinarian, County Agent, or Cooperative Extension Service.

**Sources:**

“Cattle Management Tips” by A. L. “Ike” Eller, published in Virginia Farmer.

The Complete Encyclopedia of Horses by Eugene M. Ensminger

“Freeze Branding Cattle” by Jack C. Wittier and James E. Ross, published by the University of Missouri – Columbia Extension Division.

Freeze Branding for Cattle Identification” by Gerry Bashforth and Bill Grabowsky, published in Manitoba Agriculture.