The Revolutionary CO_2 dry ice system for freeze branding

Invented and developed in New Zealand by Mr Peter Griffiths
New Zealand Patent Number 260005
Patent Pending 330276

- New Zealand National Fieldays Invention Awards 1995
- New Zealand National Fieldays New Equipment Award 1998

www.freezebranding.com

TIPS FOR SUCCESSFUL BRANDS

1. Fill digit–mould cavities completely, with well–packed ice. Over–filling is preferable. Under–filling can cause failures. Apply immediately after filling.

2. Use a wetting agent liberally (methylated spirits or alcohol) direct from a sealed container and immediately prior to branding. Do not apply with a rag or brush from an open–top container. Open containers will absorb atmosphere moisture, which will reduce the effectiveness of the brand.

3. Pressure must be applied to the brand handle from the start to the end of the application time, but **increasing** towards the end to ensure constant contact of the reducing–thickness ice with the hide.

4. If the dry–ice is light and fluffy, and sometimes falls out of the mould, or if the gun does not shut–off completely or cleanly, there is very likely a partial block of the jet. This condition will produce unsatisfactory ice and consequent poor quality brands. Remove and reverse the nozzle jet as described later in this manual.

THE BRANDABULL KIT

The Brandabull system is supplied either as a complete kit in its own hanging organiser, or as separate dry–ice gun and numbers/digits components. The hanging organiser allows the digits to be conveniently available whilst branding is in progress. Just hang it on a nearby rail or fence.

Brandabull kit complete in the optional hanging organiser.

The complete kit contains one set of ten digit moulds 0 to 9, either 2" (5cm) or 3" (7.5cm), a ***Brandabull*** dry ice gun and hose, a small plastic bottle for applying the meths or alcohol, operation manual and a demonstration video. (Note: The plastic bottle is suitable for small–scale branding jobs only, and should be replaced with a larger one for bigger jobs.) Special brand moulds to your own design, or letters A–Z, can be ordered if required. Check with your ***Brandabull*** supplier.

Note: *0–9 digits are also available in 4" (10cm) but these are not suitable for containment in the organiser depicted here.*

Brandabull is also available as a Gun Kit and Digits Set as separate components, not including the organiser.

FREEZE BRANDING OF CATTLE

Freeze branding is an ideal way of marking animals for easy and convenient identification. It involves the relatively painless process of altering the pigment–producing cells in the hair follicles by applying intense cold to an animal's hide. This process causes the hair to grow white, thereby providing an effective identification mark on animals with darker hair. For light coloured animals, applying the freeze brand for extra time kills the hair follicle completely, leaving a bald brand, which is still quite visible.
Freeze branding is of particular benefit to dairymen and cattle producers who wish to identify their stock permanently for herd recording or ownership purposes.

Advantages of Freeze Branding

1 Freeze brands are permanent and unalterable.
2 Freeze brands are highly visible.
3 There is little discomfort to the animal.
4 There is no damage to the hide

PHYSIOLOGY OF FREEZE BRANDING

1. Upon application of the brand, the skin is indented and frozen in the shape applied.
2. Within two to three minutes the skin thaws, possibly leaving a reddening of the area.
3. This is followed by a marked edema (fluid–filled swelling) which may persist for several days.
4. The edema and reddening then recede and the brand area becomes dry and scurfy.

Varying amounts of skin and hair are lost from the brand area over the next two to four weeks. Subsequent hair re–growth occurs at various times dependant on the seasonal hair growth pattern, but is usually eight to twelve weeks after branding. It is white, and grows much more rapidly than hair in the unbranded area. This is particularly so in the first year after freeze branding. The brand becomes a permanent means of identification. Brands may not be at all visible until eight to ten weeks after application.

There is a large amount of information available on the internet giving advice about branding on a wide variety of animal species. Also refer to *www.freezebranding.com* for information and assistance directly relating to ***Brandabull.***

Traditionally freeze branding has involved the process of using dry ice pellets or liquid nitrogen as the cold medium. Branding irons, usually cast from copper or bronze with a handle attached, are immersed in a solution of alcohol and dry ice, or into the liquid nitrogen. When an iron is cooled to the correct temperature, it is applied to the animal's hide for the required period.

BRANDABULL - SIMPLICITY & CONVENIENCE

The simplicity of using the ***Brandabull*** freeze branding system is due to the unique gun that produces dry ice directly from liquid carbon dioxide gas (CO_2). There is no wastage as you only make enough ice to fill each brand digit as you require it. The gun is connected directly to the CO_2 cylinder with a high–pressure reinforced hose that carries the liquid to the special barrel and nozzle assembly that will

produce the dry ice. The ice is directed into the ***Brandabull*** digit mould until it is full (this takes only a few seconds) and then the mould is applied to the hide for the correct duration, according to the animal's type, breed, age and size.
Correct preparation of the animal's hide is vital to ensure a reliable and visible brand mark.

Brandabull freeze branding can be carried out anywhere, anytime, on any number of animals.

PROCEDURE FOR BRANDING

There are seven key steps to successful branding:

1. The animal should be restrained to minimize its movement, as movement may affect the clarity and quality of the brand. This is ideally achieved by using a head–bail in cattle yards. However perfectly satisfactory results have been achieved using the veterinary race or chute in the dairy shed, or working on the platform of a rotary dairy shed or even in the milking area of a herringbone type dairy (if the animals are relatively docile).

2. Decide on the brand position required. Preferably this is where the hair is dark. Dark hair turns white. Brands on white hair are less highly visible.

3. The animal's hide must be clipped closely, to remove as much hair as possible from the branding site. The maximum amount of cold will not be transferred if hair is present, as the hair will act as insulation. It is best to use an electric clipper with a surgical–cut blade.

The brand area must be closely clipped before branding.

4. Load the digit mould with dry ice directly from the ***Brandabull*** gun by holding the barrel just above the face of the mould so that the stream of ice is directed into the mould when the trigger is operated. The barrel is then moved slowly and smoothly along the cavity allowing the ice to completely fill to well above the surrounding surface. Overlapping ice will not affect the brand clarity. With a little practice, accurate and smooth filling of the mould becomes very easy. It is important that the ice is well packed in the entire mould to ensure that a complete brand is created. Uneven or incomplete filling will affect the clarity of the finished brand. Practice filling completely in one continuous run, rather than going back and forth over the mould.

Load the brand mould by holding the gun at right angles to the face of the brand.

5. Immediately prior to applying the brand, liberally soak the area to be branded with methylated spirits or alcohol. (This should be squirted directly from a suitable plastic bottle as supplied in the kit.) This is to assist in the transfer of the cold to the skin, and to help remove any moisture and dirt, which may act as a barrier to the effective freezing of the hide.
6. Immediately after wetting apply the brand with firm and continuous pressure. This is important to ensure the dry ice is in full contact with the animal's hide. Brand pressure should increase as the ice melts, to ensure compression of the rubber mould and continuous contact of frozen ice with the hide.

The digit mould is held firmly in place for the required time.

7. The length of time that the brand is applied to the animal's hide is also very important as if held too long a bald brand may result, and if too little then the brand will not be clear or as visible as is desired. Over–branded or bald brands can become difficult to read, as the surrounding hair tends to grow over them reducing their readability, although clipping the area periodically should readily restore this. Typically branding times will vary from 20 seconds for young animals to 90 seconds for mature heavy–skinned animals.

BRAND TIMING

The times detailed below are intended as a guide only, as there are many variables that will affect the brand result.

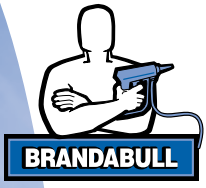
Calves	20 to 30 seconds
Yearlings	30 to 60 seconds
Mature cattle	60 to 90 seconds (average 60 seconds)

Breeds such as Friesian and Jersey take longer than do Angus. Generally the application times can be shortened during the period of rapid hair growth as the pigment producing cells are more readily destroyed during this time. Other factors that can affect the branding time and result, are the hydration of the animal, the amount of subcutaneous fat, the site chosen for the brand and how much the animal moves during branding. An alarm timer should be used to ensure exact and correct brand duration.

BLOCKED JET

If the dry–ice produced is light and fluffy, and sometimes falls out of the mould, or if the gun nozzle does not shut–off completely or cleanly, there is very likely a partial block of the jet. This condition will produce unsatisfactory ice and consequent poor quality brands. Should the gun stop operating completely, either the cylinder is empty or the jet is blocked. Blockage can be caused by small pieces of debris in the cylinder being carried through the hose to the jet. To clear this blockage the cylinder should be turned off and the gun barrel unscrewed. (Be careful to vent the remaining gas in the hose in a safe manner before unscrewing the barrel.) Unscrew the jet, reverse, and reinsert. Reattach the barrel. Resuming operation should immediately clear any blockage. Do not poke anything metal into the jet as it may damage the aperture, affecting the performance of the gun. The manufacturer's manual relating to the gun is part of the kit.

Occasionally a cylinder of CO_2 can have accumulated debris at the bottom causing repeated partial or complete blockages. If this happens we recommend immediately contacting your gas supplier and having the cylinder replaced.



SAFETY

Brandabull is safer than other methods of branding using cryogenic liquid mixtures. The risk of accidental spillage or splashes is completely eliminated.
The difficult sourcing and transport of dry ice pellets or liquid nitrogen, and the associated losses and wastage, are eliminated. CO_2 cylinders are inherently safe to transport if secured correctly, and there are no losses as the cylinders are sealed when not in use.

1. **Under normal conditions *Brandabull* freeze branding equipment is very**

SAFETY PRECAUTIONS

safe, but as CO_2 is heavier than air, care should be taken to disperse CO_2 in low lying and confined spaces as it displaces the air and is an asphyxiant.

2. CO_2 in snow form as dry ice is intensely cold (–78.5°C) and can cause freeze–burns and frostbite to bare skin. Always use protective gloves and goggles, and keep children away.
3. CO_2 cylinder valves are protected by a bursting disc to guard against over pressurization of the cylinder due to excessive filling or temperature. Operate the cylinder valve with it facing away from you. Always store the cylinder out of direct sunlight and keep away from sources of excessive heat. (You will get more brands from a cool cylinder than you will from one that has heated up in the sun).
4. Check the condition of your ***Brandabull*** equipment prior to use; check the hose and the gun for damage etc. Do not use if damage is suspected.
5. **Remember the hose will have cylinder pressure in it when operating.** *If the hose was damaged and it ruptured there would be cryogenic liquid CO_2 escaping at very high pressure, which could cause serious injury.*
6. CO_2 cylinders should be carried on the outside of a vehicle, however if they must be carried inside then they must be well secured with the valve facing away from the driver and the cylinder must not be overfilled.

7. CO_2 cylinders change weight, not pressure as they empty. The gross weight and the tare (empty) weight are stamped on the neck of the cylinder. There will always be a small amount of gas left in the cylinder that is not available to use for branding.
8. Finally, when you stop branding for the day, turn off the cylinder valve and operate the gun trigger to drain the hose. **Do not leave the hose pressurized for any extended length of time.**

CARE OF YOUR BRANDING GEAR

At the end of each day's branding it is a good idea to rinse the brands in warm water with a little mild dish–washing detergent in it. This will remove any dirt etc. Allow the brands to dry thoroughly. Store in a safe place until needed again.

SUPPLY OF GAS

The correct gas is Carbon Dioxide (CO_2) which is readily available in cylinders from any industrial gases supplier. The correct cylinder to use is the **liquid withdrawal type**. **This has an inductor tube fitted inside the cylinder so that the gas can be drawn off as a liquid, rather than as gas.**
There are a variety of different sizes of cylinders available from 6.8kg capacity up to 33kg. The smaller cylinder typically will fill approximately 70 brand digits. The larger cylinder will typically fill approximately 330 brand digits.

Due to a policy of continuous improvement, details and specifications are subject to change without notice.

BRANDABULL

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