



Maintaining Curling Ice

By Mike Bryson, December 2007

Ok you just spent the last week or so creating a curling rink that is awesome to look at. Now for the hard part. Keeping it looking that way and keeping the curlers happy. It's not an easy task. Hopefully you'll find a few tips in this article that will help you keep your curling rink in prime shape.

Powerscraping

The Equipment

A scraper is the most frequently used piece of equipment an Ice Technician has. It is an expensive tool and should be treated with the proper care by the Ice Technician.

A scraper is a simple machine comprised of relatively few parts. The most important part of a scraper is the blade. Think of the blade as a utensil like a knife: if it gets put away carelessly someone could get hurt, or if it is not cleaned it will rust and dull quickly.

Proper blade care is one of the most neglected areas of ice maintenance!

Blade Care

Free of Rust

In order for the blade to be free of rust it should first be cleaned of snow and ice then wiped with a slightly oiled rag. A blade left to rust will dull quickly.

The Blade Assembly

Keep the blade assembly well maintained also. The hand crank to adjust the blade angle should turn easily and never make any noise. Greasing the inside of the socket makes attaching the scraper to the blade easier also.

Tips on Blade Care:

1. Wear protective gloves because even a dull blade is extremely sharp.
2. Clean the blade with a corn broom while it is in the cutting position with the blade's edge still on the ice. This is a safer way to clean snow and ice off.
3. Remember to clean the bottom of the blade as well as the top.
4. Always finish by wiping the blade with a slightly oily rag.

Temperature of Blade

The blade must be kept as near to ice temperature as possible. The last thing you want to do is heat and cool the blade each time you bring your particular machine out. If you bring a warm blade out and lay it flat on the ice it will not only melt into the ice, but it will probably warp the blade ends downward, making the blade cut heavy at the ends. At the finish of a curling season oil your blade well.

Precision Ground Blades

The blades are precision-ground at the manufacturers so they are close to perfect when they arrive at the club. If you choose to change to a new sharpening company make sure they have references from other curling clubs.

Chattering

The more often a blade is used the quicker it gets dull. An easy way to tell the blade is in need of sharpening is if it starts to "chatter" on the ice or the tires of the scraper are covered in a fine layer of snow. Chattering is when the blade starts to leave small uniform ridges in line with the blade edge. If they get really bad the scraper will start to vibrate. This may also happen if the angle is too great.

A Sharp Blade

A sharp blade will not leave snow on the tires. If the blade is noticeably dull its performance can be improved by running the hone over it a few times. It is also possible to hone a specific area on the blade that is too sharp from the under side to dull it up slightly. Hone a duller area from the topside to sharpen it. Whenever honing be sure to follow the manufacturers' instructions on how to hone the blade. And before attempting to sharpen areas of the blade run the hone all the way across without changing the angle of the hone. It is easy to create sharper spots on a blade when the hone is not carefully passed across the surface.

Blade Exchange

Honing is a temporary fix and eventually the blade will have to be shipped back to the manufacturer. Fortunately there are blade exchange services available but you must make sure you get a qualified person to regrind the blade. A blade should be sent to the manufacturers' for a sharpening approximately 2 times per year.

Power Scraper Maintenance

Keeping the Parts Oiled

It is a good idea to put a bit of oil on the parts that have to move such as the blade angle changer, or the variable speed adjuster. Giving your whole machine a visual inspection before you use it is a good habit to get into. Preventative maintenance will go a long way to help keep your machine in good working order.

Tire Pressure

It is important to have both tires of equal pressure to allow the machine to track straight. If the machine pulls to one side the air pressure will need to be increased in the side the machine pulls to, or let some air out of the tire on the opposite side as the machine pulls to. Tires are loaded with calcium for extra weight, so any time air is added or removed, the machine must be away from the ice surface and the valve stem at the top of the wheel. Tire pressure will only be 6 to 8 pounds and most of the time a visual inspection can be as good as trying to use a gauge, unless you have one for very low air pressure. Tires want to have a small flat contact with the ice surface at the outer edges of the tire. Too much air pressure causes the tire to crown in the center resulting in loss of traction. Too little air pressure causes a flat side in the tire which will thump as you travel down the ice until the machine travels enough for the flat to work out.

Summer Months

When the machine is not going to be in use for a long time such as the summer months, put the machine up on blocks so the tires will not get flat spots from sitting so long.

The Cord

The scraper cord is one part of your machine that is prone to accidents. It can be stretched, nicked, cut, or even ripped in half. It's good practice to visually inspect your cord when you are putting it away. If it is damaged, either fix it with electrical tape or replace the cord entirely. Things to watch out for when moving your cord around.

1. Cords easily get caught in rock handles. If you continue to move while it is caught you can break the cord.
2. Until you are good at it, stop the machine to properly flip the cord over the other side. You can easily throw the cord over a moving machine and get it caught in the tires, breaking the cord or even damaging it slightly.
3. When lifting the blade off the ice watch where you set it back down. Blades will snip cords easily.
4. If you set the cord on the sideboards when doing an outside sheet, watch for things that the blade will get hooked onto.

Moving the Cord

Moving the cord around should be left to the person handling the scraper. Learn to manipulate the cord to where it should go.

Scraping Routing (Steps)

Typical Surface Preparation Plan:

1. Clean out hacks.
2. Clean out centers.
3. Hand scrape around hacks or burn.
4. Sweep out ends and cover hacks.
5. Cool blades, check tire pressure. (When the tires are left on the cold ice surface for extended periods, something should be put under them such as a hack cover. This will prevent "thumping" or an uneven ride when starting to scrape.)
6. Choose a different pattern than the day before. If you mark in your logbook which pattern you use everyday this task becomes a lot easier.
7. When finished clean up blade.
8. After the scraping is finished push away the piles of snow so they do not freeze into the ice. Using the same brush pick up big chunks of snow that may have been left behind out in the middle of the sheets.
9. Pebble the ice.

Dragging

Dragging the sheets is a common thing done after a double pebble but is an optional procedure. Just pull a set of rocks up and down the ice with a rock holder. The rocks should be loose enough to freely rotate and they should be cleaned afterwards. Rocking the sheets will "break down" the pebble artificially cause the ice to be a bit quicker. The only problem is that running the rocks down the ice smashes the uneven pebble rather than cutting it off.

Power Scraping Technique

Using the Scraper:

1. Cool blade down before use by setting it on the ice in an inconspicuous spot. The blade will probably melt the ice marking it slightly so do not set the blade down in any of the houses.
2. Visually check the cutting angle. To test how much it is taking off, run the scraper across the sheet near the hog lines. Go across in case the sheets are dished.
3. Going across is also a good way to see if the blade is cutting evenly.
4. Pick a scraping pattern and follow it consistently throughout the sheets. It is not acceptable to change patterns midway through a pass.
5. Once a pass is finished, check the snow to see if it is uniform all the way across. If there is more snow on one side than the other it may be that the blade is not cutting properly, but in most cases the ice is the problem. The ice may be dished or have high and low spots.

Scraping removes the old pebble, lint and dirt from the surface of the ice. When done properly it will

maintain a level sheet of ice. The amount of snow that is taken off is determined by the angle of the blade plus the amount of weight used.

Weights on the Blade

Normally no more weight is needed other than the weights inside the blade itself. The blade was designed to have these weights inside so they should be there. Extra weights are ONLY needed when the pebble has been totally removed and the Ice Technician wishes to cut the ice further. Weights could be used to take the centers of the sheets down if they are high or scraping behind the hacks if they are removable. Be extremely careful when cutting below the base of the pebble. If you go too deep, you may create a run or a dish in the ice.

The Angle of the Blade

When we refer to the angle of the blade we mean the position it has been moved to by means of the hand crank. The crank on the machine will either lower the angle or raise it up. Do not just assume the blade is always at the correct angle when starting. The angle of the blade should be less than 45° because if the blade does not cut sufficiently at this setting, it means the blade is dull. A blade should be as sharp as possible when scraping, so either hone it when it needs it or send it away to be re-sharpened. If the angle is too great the blade could chatter on the ice.

Blade Position

There are three different positions that you can put your blade in. It is important to have a set of patterns that use all three positions to maintain your ice.

HANDSCRAPING

Blade Care

The hand scraper should be treated with the same care as the powerscraper blade. Everytime the blade is used it will need to be cleaned off and wiped with an oily rag. This blade is extremely sharp and should be kept in an upright position inside its wooden sheath away from the public.

Sharpen the blade every few times you use it. Remember it is better to pass the stone over it once or twice OFTEN, then it is to try and grind a really dull blade sharp again once a year. Trying to sharpen the blade too much will result in destroying the blade.

The Routine

1) Hand-scraping the Hacks:

Technique:

1. Always keep the hand held scraper blade on the ice surface.
2. Keep the blade at a constant angle – approximately 45 degrees.
3. When moving the blade, 'press down' on blade rather than 'leaning down' onto the blade. Leaning into the blade tends to make the blade bit into the ice.
4. Take your time and keep your speed constant. Haste causes unsightly gouge marks and dips in the ice surface. The curlers can feel these dips and gouges with their sliders so be careful!
5. If you happen to make a mistake just leave it and move on. Once you have done the deed, you can only make it worse by digging deeper, not better. If it is a major mistake, fill the hole with slush and scrape off.

Where to Scrape:

1. Only scrape around the hack itself the: The power scraper will get the rest.
2. Start at one end and work across finishing all the hacks at one end before moving to the other end. Once all hacks are done then clean up the snow.
3. An alternative to scraping around the hacks is to burn the ice: This is done by using a tiger torch. The torch is moved over a portion of the ice so it just melts the surface. The dirt on top floats and can be picked up with a wet dry vacuum. Using this method does an excellent job of removing dirt and after a bit of practice can be done by one operator.

Fixing a Hole

Fixing a hole quickly:

1. Scrape some snow with the hand held scraper.
2. With a small spray bottle, fill hole with water.
3. When hole is filled put in snow from scraper.
4. Pat down with your hand.
5. Wait about ten minutes for the mound to freeze.
6. Shave off mound down to the surface level.
7. Put some pebble on the scraped area.

Shaving a Hump

Given the right conditions water vapor in the air will condense on the roof and superstructure of the arena and cause dripping on the ice surface causing humps. The size of the humps will vary from a few inches to some as large as 2 to 3 feet across. The size of the humps will be dictated by the amount of dripping and the length of time that the dripping occurs.

To remove these humps it will be necessary to scrape them off. Attempts to chip them off may result in removing a fair size chunk of ice from the surface as well. Another method is to use hot water or a propane burner to melt them off. To solve the problem increased ventilation in the rink, increased roof insulation, the installation of dehumidifiers or increasing the air temperature in the rink should be considered.

Procedure:

1. Set the hand scraper blade down to cool.
2. Using short light strokes, circle the mound and cut a little at a time, from every angle.
3. When the large part of the mound is taken off, shave the rest down to ice level.
4. Clean up shavings and then pebble area.

PEBBLING

The Equipment

The Pebbling Can

The regular plastic pebbling can is one of the most important tools in curling ice maintenance. From the end of the can there should be a length of rubber hose attached. The length of this hose is determined by your arm length and experience using the can properly. One end of the hose is attached to the can and the other end is attached to a short length of copper pipe. The pipe will have a threaded end to it to attach different pebble head. Make sure that there is a big enough air hole in the top of the can to allow water to freely flow out of the can.

The Pebble Head Design

The other consideration of the hole on the pebble head is the direction the hole will shoot the water out. This factor is determined usually by the slope or curve of the face of the pebble head. The heads when they are manufactured are drilled when they are flat, then the head is shaped and cut to

size. There are two main types of pebble heads: the beaver tail shaped one and the other more oval shaped one. The beaver tail shaped head is thinner and usually a little wider. This head is designed to fill up the centers of the sheets. The "rounder" the pebble head the more the water will shoot out to the sides of the sheet. So the other type of pebble head will naturally build up the outsides of the sheets more. A good way to actually see the pebble spread for yourself is to attach the head to a garden hose under LOW pressure. If the pressure is too high you will pop a hole in the side of the head.

Cleaning the Heads

Just use a diluted scale remover (CLR) and a toothbrush. Do not leave the heads in too long or the holes will become enlarged.

Pebbling Technique

Pebbling Technique

The most important thing to keep in mind when pebbling is technique.

Things to Follow:

1. All motion should be consistent as you travel up and down the sheet of ice.
2. The holes in which the water comes out of the pebbling head should point directly towards the ceiling. By doing this water rises in the air and falls to land on the ice evenly. When the head is too low, the pebble shoots out and just hits the ground, spreads out and leaves a flatter pebble.
3. Hands and feet should be timed in their movement. The feet should move in a small shuffling action while the hand steadily moves back and forth across a plane parallel to the floor.
4. The rate of travel down the sheet depends on the type of pebble that is being put on the ice. If a base is being laid down then go slower. Go at a normal pace if the sheet can be dragged after the pebble. If there won't be time to drag the rocks then warmer water might be best.
5. Be sure to have enough pressure in the pebbling tank. Some operators prefer to carry the water can over their shoulder on a strap and others prefer holding it on their shoulder make sure it is comfortable before you start pebbling.

Putting on a Base

A base must be put on after a scrape. The base is important because it is what separates the dirt from getting lodged into the ice during the day. The base usually differs from a normal pebble in that you do two coats rather than one.

During League Play or During a Bonspeil

A problem you might have in the club during competition is when you have to prepare the ice for consecutive games and there is not time for a scrape in between. Being able to scrape would provide the quickest and most hardy surface but time often restrains the Ice Technician from this. One solution is to do a full pebble and then either nip the heads or rock the ice if time permits. The situation you ultimately want to avoid is inconsistent ice. You do not want the ice to slow down, you usually want it to be approximately 12 seconds from hog to hog line at the beginning of the game and finish around 13 seconds. As the game progresses the curlers naturally adjust to the consistent progression from 12-13 seconds. If the ice starts out quick and slows down through the game then it is an indication that the pebble is prematurely wearing down.

Pebbles per Square Inch

Pebble Population

The choice of pebbling head ultimately lies in the rock characteristics, namely the size of the running band. If the running band is smaller you must provide more pebbles per square inch in order for the pebble to hold the increased weight of the rock. When the rocks have a wider running surface or band, the weight of the stone is distributed more evenly. So you will need less pebbles per square inch. There always has to be enough pebbles there to hold the rock up. If there is no "platform" or

“pebble population” to hold the rock, then the isolated pebbles will just be broken off. That is why moving down the sheet too quickly is a useless practice. All the isolated pebbles you put down will just be broken off by the first rock that moves over them.

The Magic Number

There should be approximately 6-8 pebbles per square inch spread evenly across the whole sheet to be considered a good pebble population. If a head will not provide this number it cannot be used by itself. It must be used in conjunction with another head. A x-fine is one of these pebble heads. There is also the size of the pebble itself that is important. Some operators will take a x-fine pebble head and using a very small drill bit enlarge every second or third hole. This will give different size pebbles. The reason for this is that when a rock traveling down the ice breaks down pebble it is caught by another pebble.

Pebbling Patterns

Varying your Pattern

Your pebbling patterns can be treated the same as your scraping patterns. It's easy to fall into the same old routine every day and just do the same pebble pattern. This may lead in an excessive build up in certain areas. It's best to try different patterns and variations to see what works for you. The best time to practice this is while you're doing the base coat, or if you are lucky enough to have your club next to a hockey rink you can use it to practice pebbling on.

Moving off the Center Line

Move around on the sheet. Always move in a straight line down the sheet, but instead of always going right down the centerline, go down let us say a foot off the centerline on each side. If you think about it, when you go down the center and really throw the pebble to the sides you are overlapping the sheets. The sidelines are always receiving a double dose of pebble. One way to illustrate this is to get your rocker out and run some rocks across the sheets and really listen to the noise the rocks make. If you listen carefully you will be able to tell the difference where there is more pebble because the rocks will make a distinct sound when they cross over more pebble.

Shaping a Sheet

Use a head shaped to throw the water to the sides and try to make sure you cover the whole sheet and a little bit, so there is an overlap at the sides. Continue this pattern, staying close to the centerline, and in a few weeks you will have built up the sides of the sheets. If you can overlap enough pebble head design will not matter. Always try to do a correction of this nature in a controlled fashion. Do it over a week rather than trying to do it in a day.

Building the Centers

The Beaver Tail

Use a Beaver Tail shaped head and move away from the centers in your patterns. Even try going down the sidelines instead of the center of the sheets. This will cause your pebbling overlap to be in the center of the sheets. Sooner or later the center of the sheets will build up. Always try to do a correction of this nature in a controlled fashion. Do it over a week rather than trying to do it in a day.

Water Temperature

What Surface Temperature Dictates

The temperature of the water should depend on your ice SURFACE temperature. If you notice that the air temperature has gone too high, let us say 40°F, then your ice surface is going to be close to melting. Use a cooler pebble to “shock” the ice and you will lower the surface temperature slightly and you might be able to hold your pebble longer. The point is that you should not just throw a pebble down without first checking your monitoring equipment. The air and ice/brine temperature determines the water temperature of the pebble.

Warmer Water

In theory you want to be able to use hot water (175°F) if you have an RO or Deionizing system. This will allow the water to release its oxygen and therefore it will freeze harder. If your pebbling water is too cold the pebbles will have air pockets in the tops of them. When a rock passes over them it will just break them off. So keep your ice temperatures down a bit and warm your water up to suit your needs.

Experimenting

Keep the different reactions of the rocks, all in your logbook. This is where you will learn the most, by just observing and experimenting. When you experiment try to only adjust ONE variable at a time, such as the temperature of the water. Do not change the head, change your pattern, change the water, and then expect to determine what caused the rocks to curl 4 feet. Experimenting is a process of trial and error, isolating variables by controlling everything you do. An example of an experiment would be ONLY to change one variable at a time.