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HELPFUL INFORMATION ON THE USE & MAINTENANCE OF CURLING CUTTING EQUIPMENT

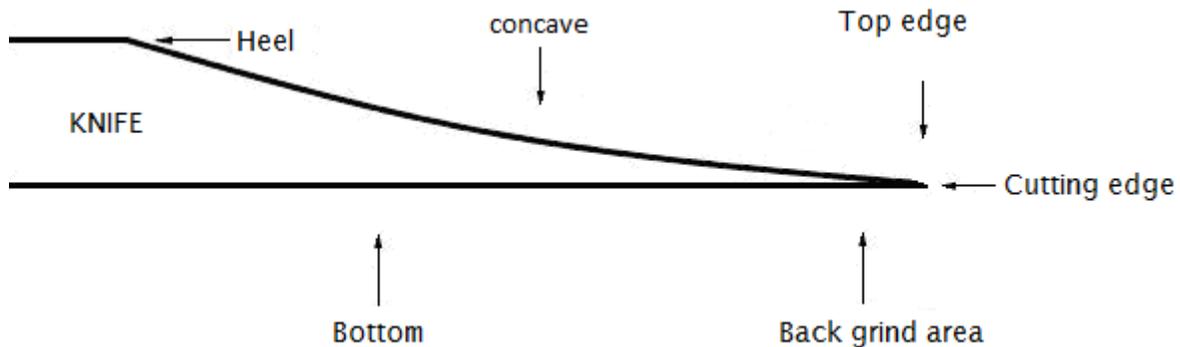
INTRODUCTION

One significant part of the ice maker's work involves the care and maintenance of cutting equipment. With the rapid advancement of technology in modern life, it becomes necessary for ice makers to re-examine traditional ways of doing this. To assist ice makers, [Dr. SAW](http://www.drsw.ca) offers the following supplementary view on the use and maintenance of blades. We will focus on ice scraper blades, but also comment on hand scrapers and nippers. We will view the maintenance cycle of ice scraper blades as a series of steps beginning with the receiving of a freshly sharpened blade, its entry into service, its honing maintenance, its protection, storage, and shipping for sharpening or re-knifing, and blade assembly replacement.

SOME ICE SURFACING TERMINOLOGY

1 Blade Assembly	This assembly is composed of a knife attached to a beam mounted on the machine to remove the whole assembly for shipping to sharpen.
2 Knife	The business end of the ice scraper machine is custom-fitted to a beam often called a blade
3 Re-knife	The installation of a new knife on an old beam
4 Beam	The metal rectangular tubing to which the knife is fixed.
5 Cutting edge	This is the point of the knife. (See diagram below).
6 Heel	This is the ridge of the hollow grind, sometimes called the shoulder. (See diagram below).
7 Top edge	The top of the cutting edge (See diagram below).
8 Bottom	The underside of the knife
8 Back grind area	Area of the bottom or underside of the knife adjacent to the cutting edge
9 Slant	The measure of adjustment applied to the blade often with a cranking lever in order to cut the ice at a shallow pitch
10 Angle	The adjustment of the blade assembly on the horizontal swivel, to be able to cut at an angle
11 Wood Guard	A protector that is bolted to the blade assembly for shipping, handling and storage
12 Wood Box	Protective container for the blade assembly; for shipping, handling and storage
13 Hand Scraper	Manual tool used to scrape the ice around or behind the hacks
14 Nipper	Manual tool used to cut or nip the pebble
15 Ice surface	The ice pad installed by flooding and maintained, without pebble
16 Playing surface	The ice pad with pebble, suitably prepared for a game of curling
17 IST	Ice surface temperature

DIAGRAM OF KNIFE



RECEIVING A BLADE ASSEMBLY FROM SHARPENING

Inspect the box or guard to make sure that no damage has occurred in shipping. If you see that the box is badly damaged, check if the blade is also damaged and report to the courier

Less precise sharpeners may leave a burr on the knife edge, and some icemakers hone this. Blades sharpened by [Dr. SAW](#) will NOT need de-burring or honing before being put into service.

PUTTING A BLADE ASSEMBLY INTO SERVICE

If you use a new blade on newly flooded ice, the salts and dirt in the surface will sometimes very quickly wear on the cutting edge. It is better to finish the surface with an old blade ready for a regrind until all the impurities have been removed and the snow is a pure white. The new blade is now ready for use.

With blades that are sharpened by many tool sharpeners, it is common to start with a steep angle until reaching the appropriate cutting pitch, however, with our precision machining technique, the icemaker should start with a very low angle and the blade will begin scraping. With this shallower blade pitch, the blade will not start chattering as soon and will stay in service much longer. Having the blade at steeper angles tends to cause chattering.

Once the blade assembly is installed, you can check performance by scraping the ice for a few inches at a 90 degree intersection to a previous pass. Choose a level piece of ice, cut across the usual path and in the middle of the rink to see how evenly the snow on the blade is.

With older technology, newly sharpened blades are not always straight and scrape the ice on only some areas of the knife. Streaks and tell-tale lines may appear in the ice. As a result, many icemakers have to use a harness or tensioner in order to try and straighten the blade to make it cut more precisely. Sometimes they even hone the blade in different areas to try and make it cut straighter. Blade assemblies manufactured or serviced by [Dr. SAW](#) will have a better result. With our blades, your harness can be hung on the museum wall!

(There are some exceptions for tournaments in a hockey rink where temperatures are warmer. The blade may be affected and a harness may be required.)



HONING THE KNIFE EDGE OF A BLADE ASSEMBLY *(Refer to diagram of knife)*

Honing is a skill that develops with thoughtful training and practice. Always wear Kevlar safety gloves! Once the icemaker is familiar with the character of the blade and when it is in need of a hone, he can begin to develop a honing routine. But be aware that ice temperature affects the wear of the knife. Colder ice is harder to cut and will blunt the knife edge more quickly.

When scraping the ice, if you notice that the blade is leaving snow behind, then this shows that the blade is dull and is in need of either honing or sharpening.

A flat honing stone is placed on the knife edge so that it simultaneously rests on the top edge of the blade's cutting edge and on the heel of the hollow grind. A few gentle swipes on the length of the blade with even pressure on the edge and the heel will create two shiny lines, one on the heel of the hollow grind and the other on the top edge of the blade. With repeated honings, these lines will become wider and the number of honing strokes needed to sharpen will increase. If initial honing does not produce two lines, the knife is probably not sharpened properly. Some icemakers will also hone the underside of the cutting edge (back grind area) as the ice maker deems necessary or useful, it is imperative that the stone be held flat against the back grind area.

Knives with an inlay of tool steel can be honed but require less honing than knives without an inlay. With [Dr. SAW's](#) standard sharpening, knives are hollow ground on top and have a back grind of less than one degree. This results in a better and straighter edge. This grind allows the blade to begin shaving the ice at a very shallow angle and delays the chattering that will eventually be caused by adjustment to steeper angles. The blade cuts a smooth surface and stays sharp much longer. Some ice makers prefer a steeper back grind angle. Let [Dr. SAW](#) know your preference and we will custom sharpen for you.

Note that it is very important for honing stones to be kept flat and clean, otherwise they will not hone the knife edge properly. For honing curling knives, [Dr. SAW](#) sells various composite honing stones. One popular stone has a course grade on one side, a fine grade on the other, and measures 8" or 16" L x 2"W x 1"H. Some ice makers use approximately 400 grit sandpaper on a solid (non-cushioned) sanding block.

PROTECTING AND STORING THE BLADE ASSEMBLY

After cutting the ice and during storage, the top and bottom of the knife should be protected with a coating of oil or WD40 because corrosion can have a very negative effect on the performance of the blade assembly. Of course, blades must be stored away from the public in a safe dry place where they cannot be damaged. Do not hit the blade against anything or leave it where a curling stone might bump into it as it will chip and need to be reground. Make sure that spare blades are securely boxed or have guards bolted to blades and that boxes are in good condition - replace if not.

SENDING OUT A BLADE ASSEMBLY FOR SHARPENING

How do you know that a blade is in need of sharpening? One indicator of dullness is snow behind the blade. For those who regularly hone the blade, honing time will become longer and longer. A chattering blade may be caused by dullness, but can also be caused by too severe a cutting angle or ice that is too warm. Other things can cause poor cutting performance such as uneven tire inflation or deformities in tires caused by improper machine storage. Bringing a warm blade into a cold arena can temporarily cause a slight warp in the blade and uneven cutting as the blade does not cool evenly.

If you have determined that the blade is in need of sharpening, it is time to send it in. When sending us a blade, call us beforehand and we will open a 30-day account for your club.



The complete blade assembly should be removed from the ice scraper machine and prepared for shipping. A blade assembly should not be disassembled. Bolt the wood guard to the blade assembly, or put it in its assigned wood box. Make sure that your club name and address are clearly visible on the guard or box. We have preferred shipping rates with many shipping companies across Canada that will pick up and deliver.

Consider insuring your shipment. [Dr. SAW's](#) curling customer's ship their blades to us with only basic insurance (\$100). If you want more insurance, you need to make a value declaration to the courier at the time of shipping.

Some sharpeners require six weeks or more to process and sharpen a blade. [Dr.SAW](#) sharpens and returns blades within 5-10 business days of receiving them. We also accept rush orders with same-day service depending on how busy we are.

Numbering blades helps both the ice maker and the sharpener track when and where they were sharpened and how they are performing. Numbering can also help track blades in shipping. All blades sharpened by [Dr. SAW](#) are numbered.

Clubs that only have one blade may use [Dr. SAW's](#) offers exchange or rental services.

TAKING A BLADE ASSEMBLY OUT OF SERVICE FOR RE-KNIFING OR REPLACEMENT

As a blade assembly wears and is repeatedly sent in for sharpening, it will eventually reach the end of its service life and need to be re-knifed or replaced. Many sharpening services prematurely recommend re-knifing. This results in unnecessary operating costs and cuts the service life of the blade assembly in half. [Dr. Saw](#) sharpens blades for their full service life. The picture to the right shows one knife at the beginning of its service life and a second knife at the end of its service life. Note that a blade should not be replaced until sharpening brings its angle flush with the support beam.



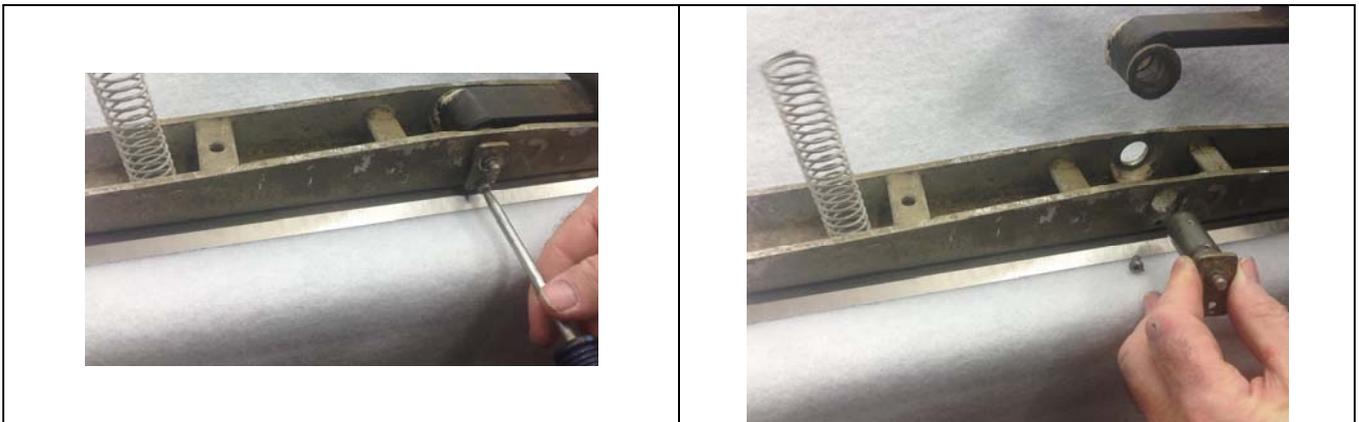
Some ice makers have been told that the back angle of their scraper blade is too steep and the blade is therefore worn out. Others have been told that their blade is twisted and needs to be replaced. Ice makers will abandon some blades because they are rust pitted. However, these types of blades are still perfectly serviceable and should be sent to [Dr. SAW](#) for sharpening. Moreover, some Ice Makers have been told that the inlay of hardened steel is only one inch long, but these inlays are typically 2 ¼ inches long. Do not scrap good blades!

A NOTE ON HAND SCRAPERS AND NIPPERS

These tools need to be protected from corrosion by coating with oil or WD40 on both the top and bottom of the blades. But even if they are rust pitted, we can still sharpen them. Use of these blades can also be extended by careful honing.

When shipping the hand scraper for sharpening, do not remove the blade from the beam. Just remove the handles. Put the blade in a wood box, a wood guard, or sturdy cardboard to protect the edge. Some icemakers send their hand scraper in for sharpening along with the ice scraper blade by taping the hand scraper blade to the ice scraper blade assembly.

When shipping the nippers, remove the knife-beam assemblies from the nipper machine. Use a screwdriver and remove the screw located below the grease nipple. Remove the screw that holds the pin then remove the pin. (See the two pictures below). Put the blade assemblies in a sturdy cardboard box with cardboard filler to protect the edge. Do not remove the nipper blades from their support beams.



We have preferred shipping rates with many shipping couriers across Canada that will pick up and deliver.