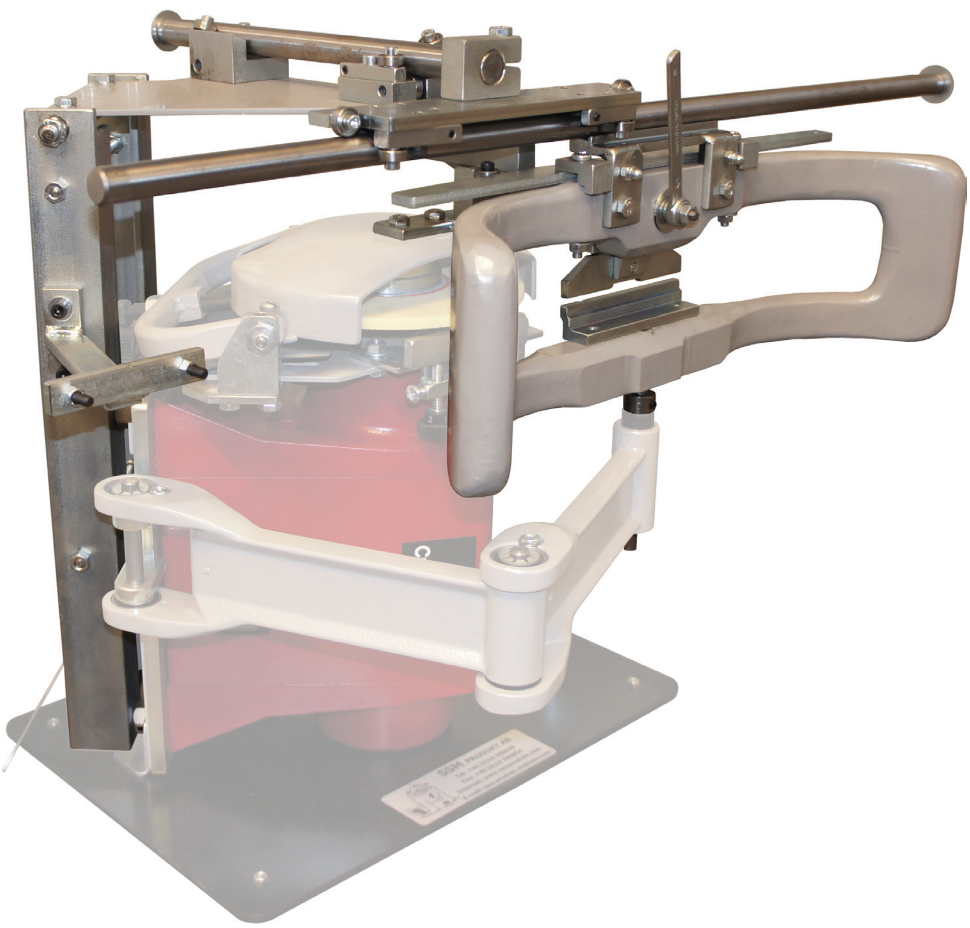
SM-6

INSTRUCTION MANUAL

WARNING!! TO REDUCE THE RISK OF INJURY, USER MUST READ AND UNDERSTAND THIS INSTRUCTION MANUAL.



ORIGINAL INSTRUCTIONS

Date of purchase: ....

Skate holder SM-6

Congratulations on your purchase of skate holder SM-6 (for SSM-2 skate sharpening machine).
We sincerely thank you for selecting a product from SSM Produkt AB.

To obtain an additional copy of this manual, please contact SSM at:

SSM SKATE SHARPENING MACHINES

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LIMITED WARRANTY

WARRANTY 2 YEAR WARRANTY

- Scope of warranty -
This warranty covers any defects in materials and workmanship under normal use.

- Period of coverage -
This warranty runs for two (2) years from the date of purchase. Please save your receipt or invoice.

- Limitations -
Failures due to abuse, misuse or an event or effect that cannot be reasonably anticipated or controlled (such as flood, earthquake, act of God etc.) are not covered by this warranty. Surface coating problems caused by excessive humidity, in-use scratches or abrasions, and direct exposure to the elements are also not covered.
Repair or replacement is the only option available under this warranty. SSM Produkt AB (SSM) is not responsible for damages of any kind, including incidental and consequential damages.
Incidental damages include but are not limited to such damages as loss of time and loss of use. Consequential damages include but are not limited to the cost of repairing or replacing property that was damaged if the product from SSM does not work properly.

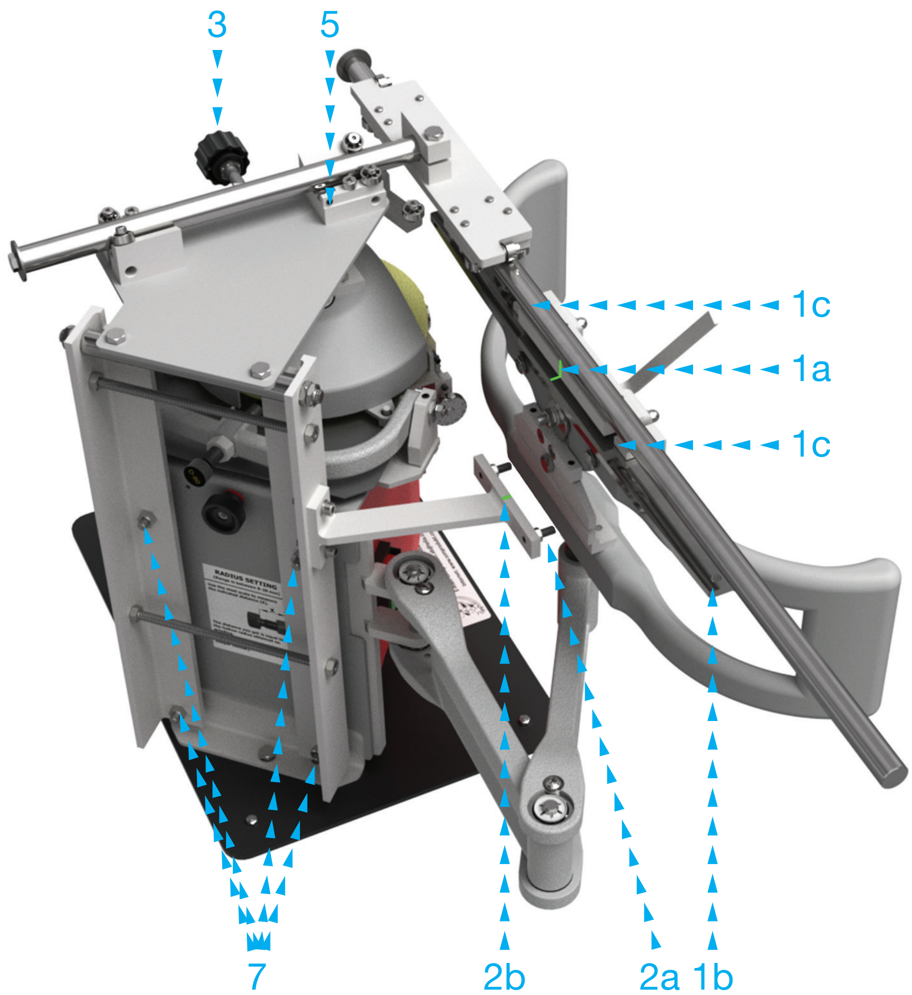
- Correction of details -
If your product cannot be repaired, we will replace your product free of charge.

- How to get service -
Please return the defective product together with the purchase receipt or the invoice. You can obtain service by contacting a dealer of SSM products or SSM directly. At our discretion, the dealer or SSM will either repair or replace your product.

- How country and state laws relates to the warranty -
This warranty gives you specific legal rights. You may also have other rights that vary from country to country and from state to state.

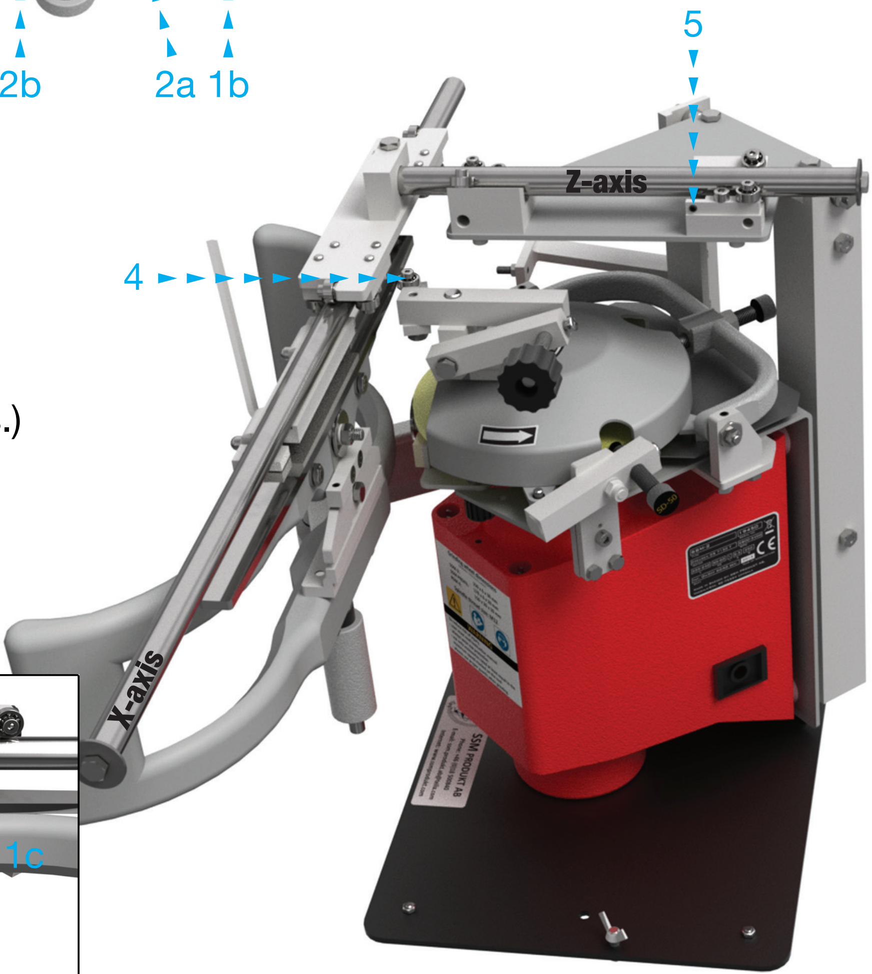
SSM PRODUKT AB RESERVES THE RIGHT TO MAKE IMPROVEMENTS AND MODIFICATIONS TO DESIGN WITHOUT PRIOR NOTICE.

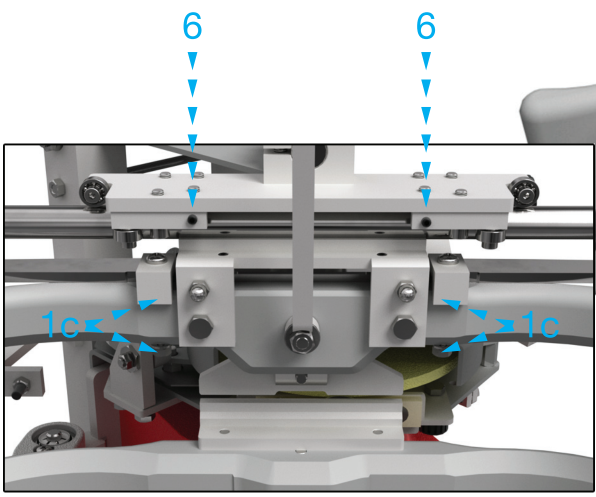
FUNCTIONAL DESCRIPTION



1a. Center mark
1b. Template
1c. Template holders
2a. Directing device
2b. Mid point

3. Feeding screw
4. Guide roller
5. Allen screws for Z-axis
6. Allen screws for X-axis
7. Fastening screws (4 pcs.)





FUNCTIONAL DESCRIPTION (continued)

The skate holder is intended to perform contouring on skate blades following a template.
This is done by manually moving the skate blade (mounted in the holder) against a dressed, rotating grinding wheel.
The open construction of the machine allows for a constant and easy supervision of the sharpening process.

1a. The center mark on the holder is aligned with the grinding wheel. This makes it easy to accurately position your template in the holder. The markings should be used to center the template before adjusting the direction of the skate blade. This is the “neutral” position.
The template can afterwards be moved forwards or backwards from center to change the relative pitch imparted on the blade when shaping the blade to the template.

1b. The Template is used to steer the holder via the guide roller (which should be held in contact with the template). There are several different templates to choose from and two are included.

1c. The Template holders are used to fasten the template.
Use the hexagon screws located a bit below the template holders (underneath) to fasten it.

2a. The Directing device is used to get the skate blade in a correct position. Place the skate blade against it as described on page 8 in this manual and then fasten the skate blade in the skate holder.

2b. The mid point is a direction point. Place the skate blade with its center point (C) positioned against it.

3. The Feeding screw is used to move the guide roller (and thereby the skate blade) inwards or outwards. This allows you to decide how much you wish to reshape the skate.

4. The guide roller will direct the movement (inwards and outwards) of the skate holder by following the shape of the template.

5. The Z-axis is guided by two pairs of ball bearings.
If the fit becomes to loose (or too tight) you can adjust with the Allen screws 8.

6. The X-axis is guided by two pairs of ball bearings.
If the fit becomes to loose (or too tight) you can adjust with the Allen screws 9.

7. Attach (or remove) the SM-6 to your SSM-2 by using the four nuts (10).

SKATE BLADE INFORMATION

The **ice hockey skate blade** can be divided into three sections, front, middle and rear. These skates has one radius shape in the middle ranging from 9′ to 13′ (2.74 m to 3.96 m) depending on manufacturer. When you contour a skate you basically only contour the middle part after a template.

Goalie skates are designed in the same way as an ice hockey skate but their factory made radius shape instead ranges from 22′ to 30′ (6.7 m to 9.14 m).

The **bandy skate blade** is basically flat from factory. Here you must contour the whole skate blade (all three sections).

A **figure skate blade** commonly uses a single radius between 7′ to 8′ (2.13 m to 2.44 m).
More expensive models use 2-3 different radiuses.

CONTOUR SHAPE INFORMATION

Radius

A larger radius gives more ice contact. This gives higher top speed and better stability, and it is more energy efficient. However, the acceleration and maneuverability will be decreased.

A smaller radius leads to increased friction (more weight on a small area). This will increase maneuverability and acceleration at the cost of top speed, stability and energy consumption.

Which template a player chooses is a personal preference. There is a trade off and most skaters will choose a radius shape that is a happy medium.

Flat part

A flat part in the middle area will not be as hard on the legs as a radius surface would be. It also gives better speed if the skates are in the correct angle against the ice. However, it will not give the same amount of ice contact as compared to using a radius surface. This is because the skate is very seldom in a completely flat angle against the ice. Using a flat part is not common today.

PIVOT/PITCH

Pivot is the lowest point on a skate blade and **Pitch** is the angle in which the skate leans against the ice. These two are dependent on each other. If you move the pivot point to the rear of the blade, the pitch of the skate and skater will lean more forward. If you move the pivot point forward, the pitch will be less forward or be neutral or to the rear. Leaning forward is more tiresome but increases acceleration.

It is difficult to determine the precise existing pivot point of a skate because different skate manufacturers may use different natural leaning pitch built in to the boots or the plastic holding the blades. Our recommendation is therefore to contour a skate and let the player test it and then tell whether the pitch should be changed in some direction.

Pitch is leaning forward — *Pitch is neutral* — *Pitch is leaning backwards*

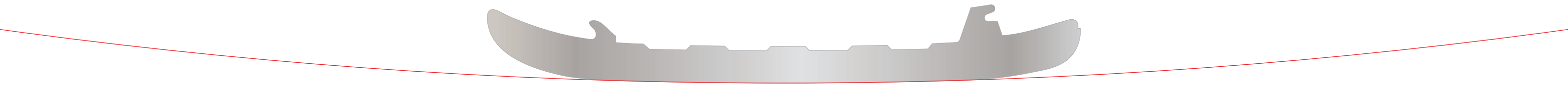
SKATE CONTOURING OPTIONS

To summarize all information from the previous page, there are several ways to get a suitable shape on the skate blade (depending on the skating style). Here are some examples:

A single base radius

This is the most common shape today. Here you use the same radius all over the middle section. This shape will give the properties described on the previous page depending on the size of the radius. Then you can pitch it to alter the abilities even further.

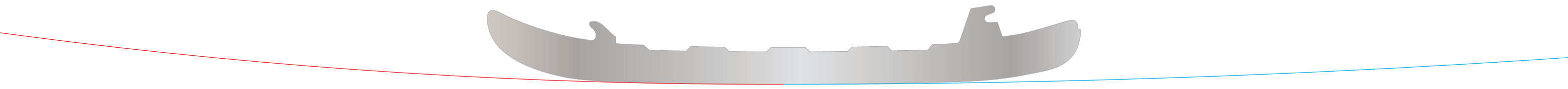
Radius 10' (3.048 m)



Adding another radius shape

By using two different radius shapes at the middle section you can combine the abilities from these curves. A smaller radius in the front of the skate blade provides good mobility and grip when accelerating. With a larger radius in the rear, you get extra support and pressure. The combination of a smaller radius in the front and a larger one in the rear results in the skate leaning (pitching) somewhat forward.

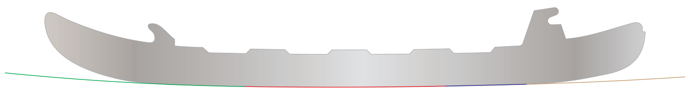
Radii 10'/20' (3/6 m)



Several radii

There are templates where you have several different radiuses underneath. These templates are designed so that you can utilize shapes with different properties on different parts of the skate blade. Most of these templates are pre-pitched. Make sure to check out our Natural Curve series.

The Natural Curve



Adding a flat part

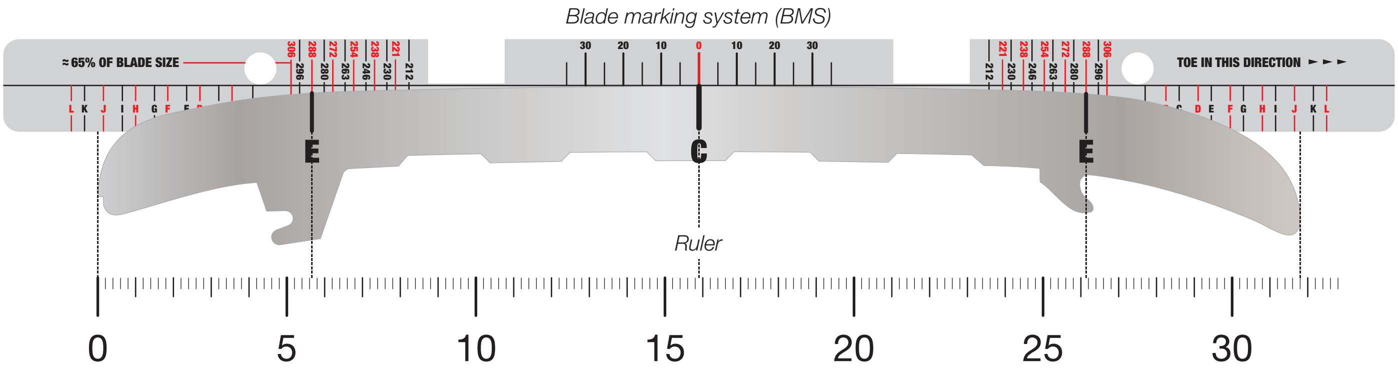
You can add a flat glide surface of custom length (should be between 3-6 cm) on the radius shape. This area can be in the middle, adjusted towards the front or adjusted towards the rear. If you move the flat area towards the front you will get a forward lean. Children learning to skate should use a flat area of 6 cm.

Flat area of 6 cm

OPERATION

1: Before profiling a skate blade you need to make some auxiliary marks with a whiteboard pen on the blade depending on how you are going to change the profile. (A good idea is to mark the plastic as well for future reference).

First off, mark the center of the skate blade. This can be done using our Blade marking system (see below) or with a regular ruler. Let us call this point the center point (C).



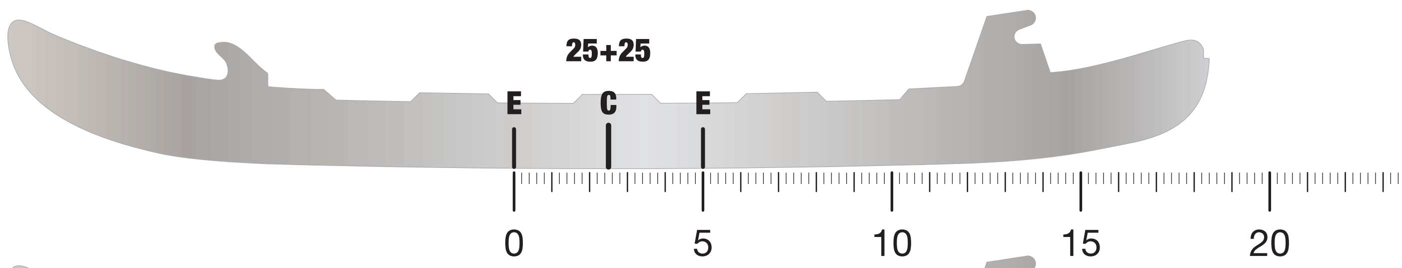
2a: Having obtained the center point (C) you should delimit the area you intend to contour. If you are sharpening a single base radius or using a custom template then you need to make two marks where the middle area (around 65%) ends. These marks are to be located in each direction from the center point. Let us call these marks end points (E).

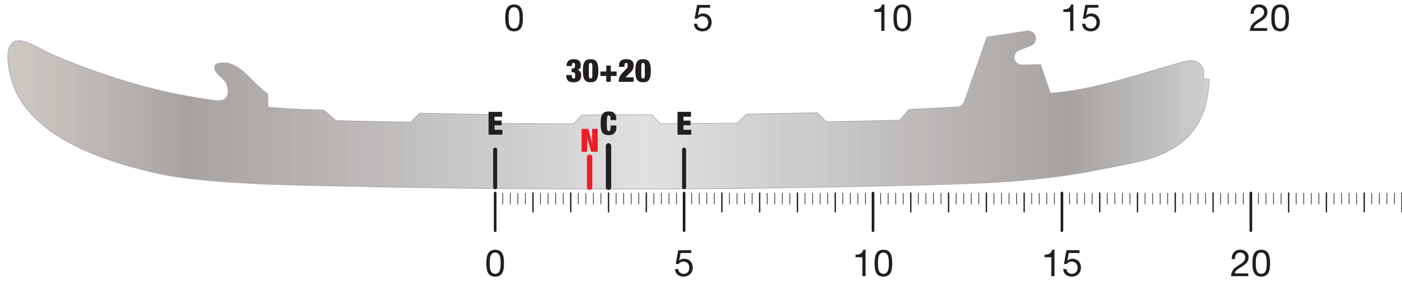
<u>Blade marking system BMS</u>:
Center the skate blade between the same type of letters closest to its outer measurements. Here they are just outside of letter J. The center point is then located at 0. The end points are located at the number of the skate blade size (here 288).

<u>Using a ruler</u>:
Place the skate blade against the ruler and measure it (318 mm). Center point is then located at 318/2, which is 159. End points are calculated by 318*0.65, which is 206.7. Divide this number by 2 and add/subtract it to the center point value to get the end points location. Place the ruler with 103.35 at point C and mark points E at 0 and 206.7.

2b: Glide surface
If you only intend to sharpen a glide surface within the current radius, you only need to mark that area. If you are making a radius shaped glide surface (must be a larger radius) you should center it around the center point (C) with the desired distance. If you are making a flat area you can either center it around the center point or shift it somewhat from the center.

A neutral glide surface of 50 mm is generally called 25+25 (or 25-50). A forward lean glide surface of 50 mm shifted 5 mm towards the front is generally called 30+20 (or 30-50). When you shift a flat surface you need to make a new center point located in the middle of that area. Let us call it the new center point (N).





3: Balancing grinding wheel

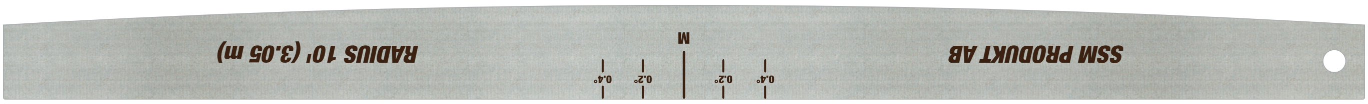
If necessary, replace the grinding wheel.
Balance it if necessary (check the SSM-2 manual how it is done).

4: Dressing the grinding wheel

If necessary, dress the grinding wheel with the diamond. Screw the diamond inwards in small amounts, at the same time turning the diamond holder, so that the diamond moves left and right past the rotating grinding wheel. The last few movements should give dressing. Dress gently.

5: Mount a template

Fasten a template (1b) with desired profile using the two template holders (1c). Put the profiled surface directed away from you with the hole to the right. Make sure that the mid point of the template is aligned with the center mark on the holder (1a). Fasten the template using the hexagon screws by the two template holders.

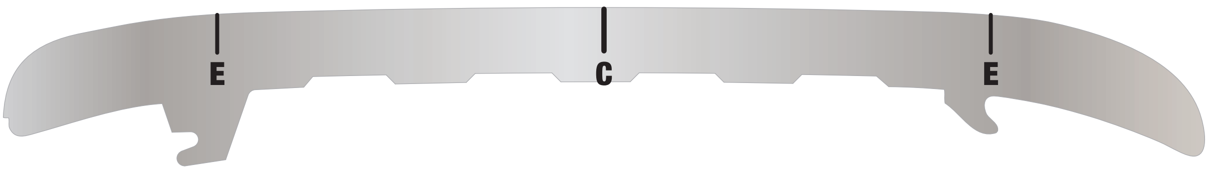


6: Mount the skate

Mount the skate in the holder, with the toe part to the right, so that the skate blade is in contact with the two directing screws (2a) while the center point (C) on the skate blade (or the new center point N) is located just at the mid point (2b) of the directing device. Press down the handle and fasten the skate.

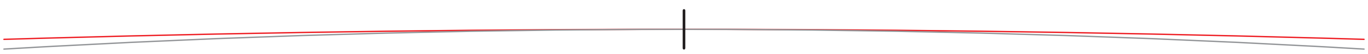
7: Preparation

The template and directing screws are aligned against each other, which means the skate blade will be in correct angle when it is mounted against the directing screws with its center point against the mid point.



7a: When going from a smaller to a larger radius

The grinding wheel will start to touch the skate blade at its highest point (center point C).
Red line is the template shape (here around 20') and grey is the current skate blade (here 10').



7b: When going from a larger to a smaller radius

The grinding wheel will start to touch the skate blade at the end points (around E) of its current radius shape.
Red line is the template shape (here around 10') and grey is the current skate blade (here 20').

9: Contouring

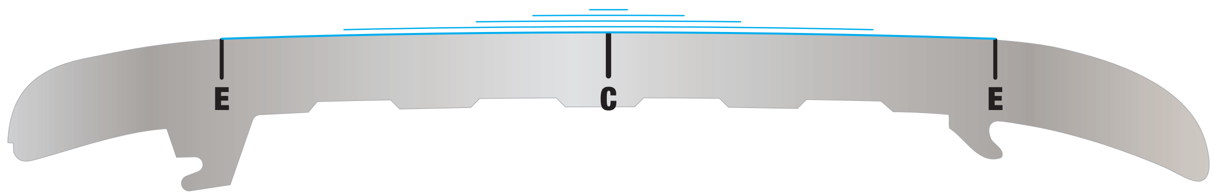
Now move the skate blade forwards and backwards against the non-rotating grinding wheel. Turn the feeding screw (3) clockwise to distance the holder somewhat so that the blade goes free when the grinding wheel starts to rotate. The feeding screw directs the skate holder via the guide roller (4) which should be in contact with the template when grinding.

When grinding using a template, the support roller must always be used, even when grinding flat. Start the machine, dress the grinding wheel for the form intended (flat or radius of hollow). The grinding wheel should be rough-dressed for best result. Rough-dressing means that the dressing diamond is moved faster past the grinding wheel (say using one second instead of three seconds for fine-dressing). Rough-dressing is better than fine-dressing for profile grinding. It gives less generation of heat, grinding will be faster and it gives a rougher surface which is desired for profile grinding because it makes easier to minimize possible discontinuities at end points of radius parts.

Center the skate blade for hollow sharpening (using the support roller) or flat sharpening. (See the instruction manual for SSM-2.) The support roller should always be located as near the grinding wheel as possible without touching it. When profiling, the support roller should also be parallel to the X-shaft of the holder. Otherwise grinding will only occur when moving in one direction.

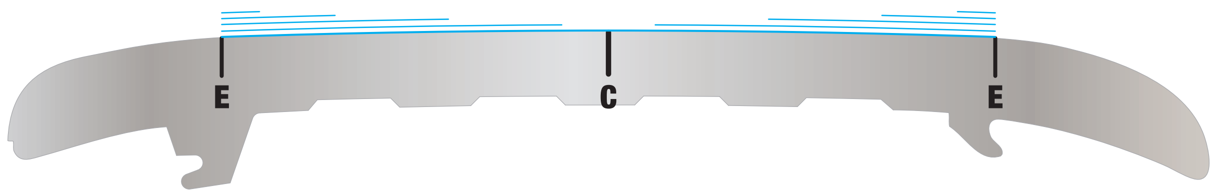
9a: Going from a smaller to a larger radius

Start moving the skate past the grinding wheel. Use the feeding screw (3) to move inwards in small steps until the sharpening area has widened from the middle all the way out to the two end points (E). When there are no more sparks (or the area is covered with an equal amount of sparks) the sharpening is done.



9b: Going from a larger to a smaller radius

In this case the grinding wheel have to work from the end points (a little outside E) and inwards on the skate. Therefore, use the feeding screw (3) in small steps until the whole area between the end points touches the grinding wheel.



9c: Going from a larger to a smaller radius

When using a template with several radii, the grinding wheel will touch the skate blade at few different points.

<u>Things to consider when profiling:</u>

If you use a Pivot/Pitch you will move outside the end points (E) on one side and inside on the other. Sharpen until you are outside on one side and touch on the other side.

If you are making a flat area you need to make it some millimeters longer than intended. This is because you will get sharp edges where the flat area ends. These edges need to be rounded down on a SSM-2 or SSM TT-3.

10: Final contouring

When you have ground the desired profile under the blade, you should grind another 10 times, in one direction only, without further feeding. (This gives better accuracy, circumventing the play in the ball bearings.)

CONTOUR TEMPLATES

Two templates of your choice (from our line up) are included with SM-6.

CONTOUR TEMPLATES *“single radius”*

Radius 7'	(2.13 m)	
Radius 8'	(2.44 m)	Figure skating
Radius 9'	(2.74 m)	
Radius 10'	(3.05 m)	
Radius 11'	(3.35 m)	
Radius 12'	(3.66 m)	Ice hockey
Radius 13'	(3.96 m)	
Radius 14'	(4.27 m)	
Radius 15'	(4.57 m)	
Radius 16.4'	(5 m)	Bandy
Radius 19.7'	(6 m)	
Radius 23'	(7 m)	
Radius 26'	(8 m)	
Radius 28'	(8.53 m)	Goalies
Radius 30'	(9.14 m)	
Radius 33'	(10 m)	

CONTOUR TEMPLATES *“split”*

NA Split 1	- radii 8.5'/9.5'	(2.6m/2.9m)	
NA Split 2	- radii 9'/10'	(2.7m/3.0m)	
NA Split 3	- radii 9.5'/10.5'	(2.9m/3.2m)	
NA Split 4	- radii 10'/11'	(3.0m/3.3m)	
SE Split 1	- radii 10'/13'	(3.0m/4.0m)	Ice hockey
SE Split 2	- radii 10'/16.4'	(3.0m/5.0m)	
SE Split 3	- radii 13'/20’	(4.0m/6.0m)	Bandy
Detroit 1	- radii 10'/20'	(3.0m/6.0m)	
Detroit 2	- radii 13'/26'	(4.0m/8.0m)	Goalies
Goalie Split	- radii 24'/28'	(7.3m/8.5m)	

CONTOUR TEMPLATES *“several radii”*

Natural Curve Quick
Radii A, 10', C, D (for sizes 246-254)
Radii A, 10', C, D (for sizes 263-272)
Radii A, 10', C, D (for sizes 280-288)
Radii A, 10', C, D (for sizes 296-306)

Natural Curve 11Q
Radii A, 11', C, D (for sizes 263-272)
Radii A, 11', C, D (for sizes 280-288)
Radii A, 11', C, D (for sizes 296-306)

Natural Curve 12I
Radii A, 12', C, D (for sizes 263-272)
Radii A, 12', C, D (for sizes 280-288)
Radii A, 12', C, D (for sizes 296-306)

Natural Curve Intermediate
Radii A, 13', C, D (for sizes 263-272)
Radii A, 13', C, D (for sizes 280-288)
Radii A, 13', C, D (for sizes 296-306)

Quad XSN
Radii 6, 8, 11 & 12'

Quad ONC
Radii 6, 9, 11 & 13'

Quad 1N
Radii 6, 9, 12 & 15'

Quad 2N
Radii 7, 10, 13 & 16'

CONTOUR TEMPLATES *“bandy”*

Bandy Youth R5/12	(radii 3m, 5m, 3m)
Bandy Youth R5/14	(radii 2m, 5m, 2m)
Bandy Youth R4/16	(radii 2m, 4m, 2m)
Bandy Youth R5/16	(radii 2m, 5m, 2m)
Bandy Youth R4/18	(radii 2m, 4m, 2m)
Bandy Youth R5/18	(radii 2m, 5m, 2m)
Bandy Youth R6/12	(radii 4m, 6m, 4m)
Bandy Elite R4/20	(radii 2m, 4m, 2m)
Bandy Elite R5/20	(radii 2m, 5m, 2m)
Bandy Elite R5/20	(radii 2m, 5m, 4m)
Bandy Elite R4/22	(radii 2m, 4m, 2m)
Bandy Elite R5/22	(radii 2m, 5m, 2m)
Bandy Elite R6/20	(radii 4m, 6m, 4m)
Bandy Elite R6/22	(radii 4m, 6m, 4m)
Bandy Elite Viklund	(radii 1m, 5m, 1m)
Bandy EX1	(radii 0.75, 3, 4, 5, 6, 0.75m)
Bandy EX2	(radii 0.75, 4, 5, 6, 7, 0.75m)