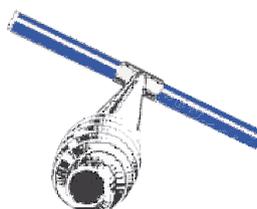
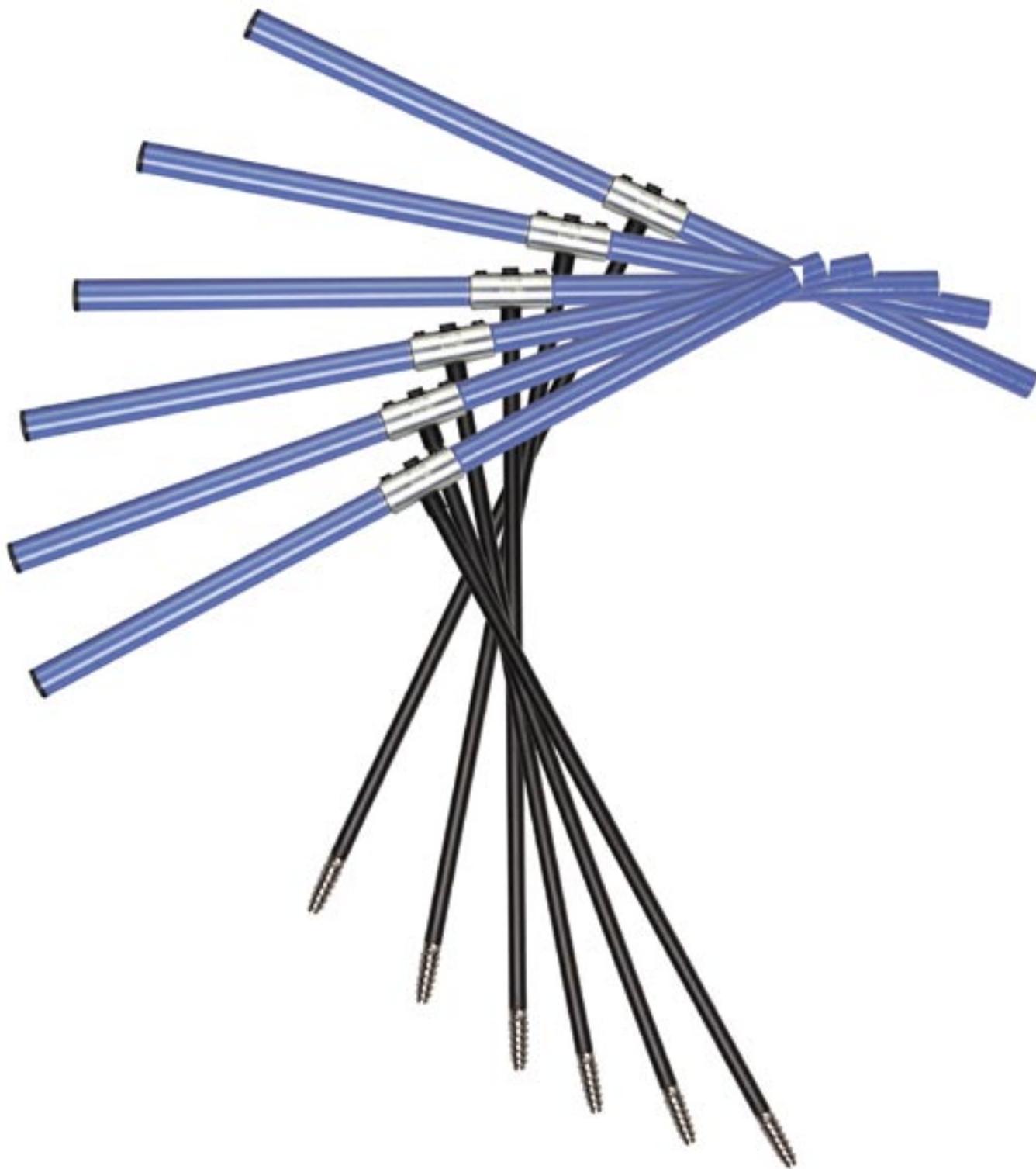


HOW TO USE AND TAKE CARE OF THE HAGLÖF INCREMENT BORER



HOW TO USE THE HAGLÖF INCREMENT BORER



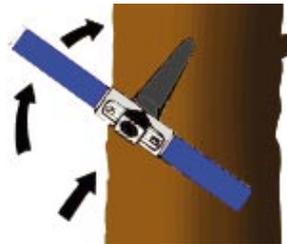
A. Unscrew the extractor from the handle.



B. Remove the borer auger (bit) from the handle along with the extractor

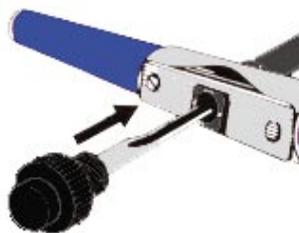


C. Turn the lock and insert the auger (bit) in the handle. Then gently turn back the lock until the auger is secured into the handle.

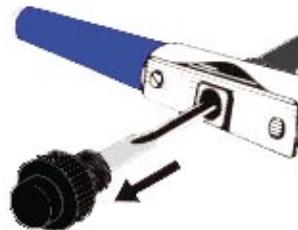


D. The borer is now ready for use. When screwing the borer into the tree, consider the following: **Do not use force when starting the penetration.** It may cause damage to your borer and small chips may

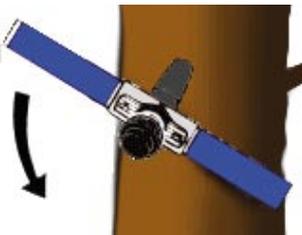
come out of the tip. If you do not have a borer starter available, guide the penetration with one of your hands and gently push and turn clockwise with the other hand at the centre of the borer handle. Hold the borer handle steady. When the initial 2-3 cm have been penetrated, use both hands to turn the handle.



E. Insert the extractor into the borer auger (bit) when reaching desired point inside the tree (usually centre of the tree)



G. Pull out the extractor along with the core.



F. Turn the auger a quarter of a turn anti-clockwise and keep the extractor knob firmly pressed into the handle. This is very important in order to keep the core intact

H. The core is ready to be examined. Gently unscrew the borer auger from the tree.



At the start and until the borer engages into the tree a few millimetres, push only moderately hard.

Do not use force and do not mistake the increment borer for a hammer! If doing so, the result will most likely be the broken tip of a perfectly good instrument. The boring should be initiated with a gentle press and at the same time screwing movement. To help the penetration, a borer starter support can be useful. This will also free both hands, help maintain a proper borer alignment and provide a stable pivot point for the core barrel and prevent cork screwing.

IMPORTANT! The increment borer should be removed from the tree immediately after the core has been extracted. Only a few moments too long in certain tree species will make the unscrewing procedure almost impossible, since the fresh wood in the tree immediately starts its recapturing process to seal the hole.

HOW TO PROTECT THE HAGLÖF INCREMENT BORER

Storing

For best performance, the increment borer should be clean and sharp at all times. A well kept increment borer can very well stand up to thousands and thousands of borer tests - it is mostly up to the user!

Do not store the borer wet and dirty, since this will shorten the life-time of the borer considerably. Cleaning can be done with a tissue and any light oil. If the borer is rusty, fine steel wool can be used instead of paper tissues.

Sharpen an increment borer

To sharpen an old increment borer, use the special sharpening kits available. The kits contain oil, sand, three different sharpening stones where one is conical for inside sharpening and beeswax. The wax is used to protect the tip and provide a better glide.

With our new increment borer, sharpening is not necessary, since tests show that the borer stays sharp throughout the lifetime of the increment borer - another positive side effect with our new production technique. The material with which the increment borer is manufactured is hardened to a certain point of hardness to obtain maximum lifetime and at the same time maximum quality.

Treatment

The material will be sensitive to knocks and violent treatment, but it will not wear out when used and maintained properly. If using a softer steel type when making a precision instrument such as the increment borer, the borer would very quickly be unsharp and wear down after short time use.

A properly maintained borer should last for 1000-2000 samples or more. We have come across increment borers that have been used regularly for 40 years, and still are going strong. Many people are of the impression that the increment borers were of better quality some 30-40 years ago, concerning both material quality and workmanship.

In our opinion, we have through the over 60 years of borer manufacturing never made a better borer bit than today. With the summed up experience and know-how from the old Sandvik borers, through the perfection of the Anders Mattson borers and old times Haglöf Mekaniska in Mora AB, the risk of purchasing a “monday morning sample” from Haglöf is close to zero.

We take pride in our work and we depend on good quality!

If you have reason to suspect wood compression on a tree, subject to boring, the operation should be interrupted. If, for example a tree is leaning towards north, the likelihood of this tree having compressed wood on the north side is very big. If boring the tree from the opposite side, the annual rings will most likely not show a representative pattern on the core. You will also run a greater risk of having the borer stuck inside the tree with compressed wood than in fresh wood. If a tree with these significations still needs to be examined with an increment borer, we recommend penetrating from another direction than north/south. Better yet to choose another tree to examine.



HOW TO SELECT THE RIGHT INCREMENT BORER

The use of increment borer is widely spread - in fact, the increment borer has been called Sweden's most widely spread product. This implies that a borer has to suit all different kinds of trees, wood and poles - fresh, impregnated or rotten. Our increment borers are manufactured in several different lengths, core diameters and with different threadings.

The product name tells only a small part of the user area for the borer - to control the increment and growth of a tree. It is a well-known fact that the borer is a valuable instrument to measure increase or decrease of pollution in the environment, to control radioactivity, to keep track of decay and percentage of rotten wood and other diseases, not to mention quality, density and age controls that are performed both for research purposes and to achieve better economic gains in the forestry industry.

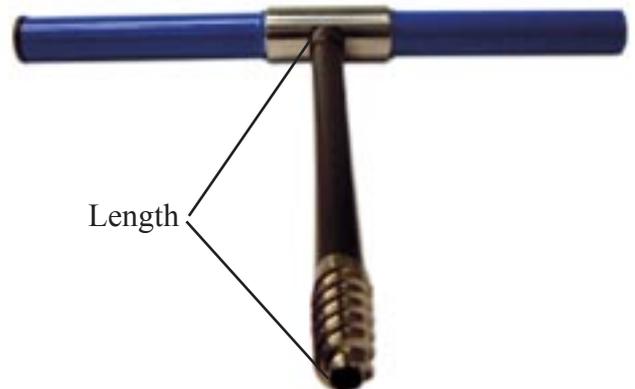
To meet up with the varying demands from the different groups using this product on a regular basis, a large diversity of models is necessary. Haglöf produces over *50 different types of increment borers!*

To select the correct type for a certain work, this is what you need to know.

LENGTHS:

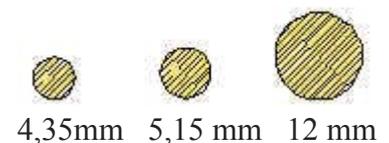
We make increment borers from 100 mm or 4" up to 1000 mm or 39". To obtain maximum bit penetration depth, the auger should be approximately one half of the tree diameter. On our Swedish home-market, the most common borer length is 200-250 mm. In Africa and Asia for

example, long borers such as the 800-900 mm are more common.



CORE DIAMETERS:

Our standard core diameters are 4.35 mm and 5.15 mm (0.169" and 0.200"). The 5.15 is more popular, since the extracted core will be easier to examine and read. Borers with core diameters 12 are also produced as standard, but not with equally large diversity of length options. The 12 mm core diameter borers are mostly used for measuring fibre length of wood and when making quantitative analysis where larger samples are necessary.



THREADINGS:

There are two different kinds of threading on our borers: 2- or 3-threading. The 2-threading is more suitable for hardwood, since it turns slower in the tree (8 mm per turn) and generates more strength when drilling. The 3-threading will be faster and easier when penetrating the tree (12 mm per turn).

A 3-threaded borer is 66% faster than a 2 threaded.



The ease at which a borer penetrates wood depends not only on the threading, but also on type of wood, friction properties and capability of the user.

HOW TO CLEAN AND SHARPEN YOUR INCREMENT BORER

Keep your borer clean and sharp at all times!

This will most likely prolong the lifetime of your borer and make it a better instrument. The borer tip can be cleaned with a small piece of soft paper tissue or cotton rag. Corrosion and dirt will eventually destroy the cutting edge. Any type of light oil can be used, sprayed directly into the borer bit and wiped with the tissue. Caution! The cutting edge is sharp and to avoid injury, wrap the tissue around for example the extractor tip, when cleaning. Steel wool can be used to remove rust.

How to sharpen your borer bit with the COSHARP sharpening kit:

The COSHARP kit contains of 1 bottle of light oil; 1 bottle of sharpening sand, beeswax and 3 different sharpening stones.

Pour a few drops of the light oil onto the flat stone.

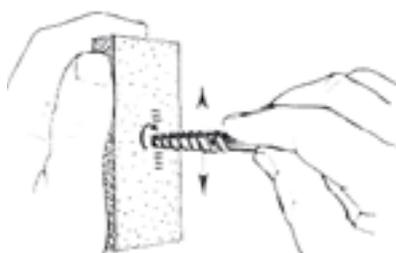
Place the tip of the borer on the oil in a 40° angle and carefully move the tip back and forth while rotating the bit. Put no pressure and do not use force. Continue until bit is sharp.

Apply a small amount of oil on the round stone (pointed end)

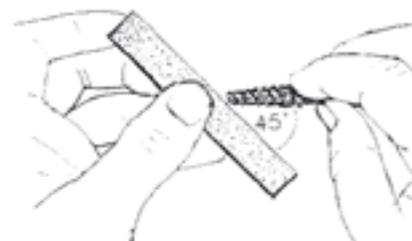
Insert the pointed end very carefully in the borer bit and rotate the borer shaft a few times only, until the inside of the borer is smooth. A magnifying glass can be a help for better vision.

The sand is used to sharpen the tip of the borer if it is rusty, or has small chips. Drill a hole with a down angle, app. 2 cm depth in a tree or a piece of wood. Pour some of the sand into the hole and carefully drill in the borer again and sharpen the tip on the sand, half turns each direction. Some oil can be poured into the hole to reduce the friction. After having done this, clean the borer with a piece of paper or clean rag, and let the paper/rag pass through the entire borer bit from end to top to remove any excessive sand.

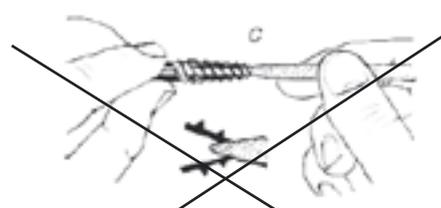
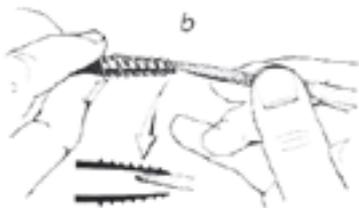
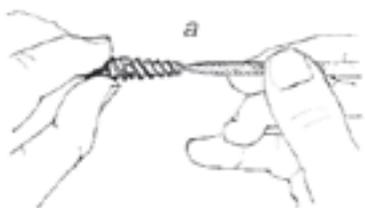
Use the flat stone to sharpen the tip of the borer.



Top view



Side view



Use the conical stone to smoothen the inside of the borer.

Do not force the pointed end of the round stone all the way in!