

Tuke Saw™ System

Operating Manual

**Safe Navigation
Through Soft Tissue**

Forever **Active**

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1 Introduction

The Tuke Saw™ air-powered hand unit drives the blade or brush through a circular motion at frequencies of up to 20,000 cycles per minute. The circular motion of only 1.5mm vibrates soft tissues without cutting them. This safety feature allows the surgeon to guide the blade accurately by hand to delicate locations normally inaccessible to conventional power tools, or where saws are not normally used; for example, the posterior tibia cortex in TKR, or highly controlled mortise cutting for ankle replacement or arthrodesis.

During resection the unique tooth-shape along with the circular motion promotes bone chip removal, making the cutting action clean and efficient. Blades with teeth on all sides will advance to penetrate a cut on the tip or on either side.

The Tuke Saw™ System features the range of blades and brushes illustrated on page 14 of this brochure. These single-use attachments make the system extremely versatile especially in the field of orthopaedic surgery where shaping and shaving are often required.

Important Notes

1. Regularly maintain the hand unit for optimum performance.
2. Do not ultrasonically clean the hand unit.
3. Do not allow water to enter the air inlet.
4. Caution: U.S. Federal law restricts this device to sale by or on the order of a physician.

2 Special features

Today's orthopaedic surgery demands accurate bone resection. The air driven one-piece Tuke Saw™ has been designed to perform this procedure with ease and without fear of soft tissue damage.

Versatility

(See blades and brushes, page 14)

Tuke Saw™ blades are available in a range of sizes and configurations to perform a wide variety of functions, such as:

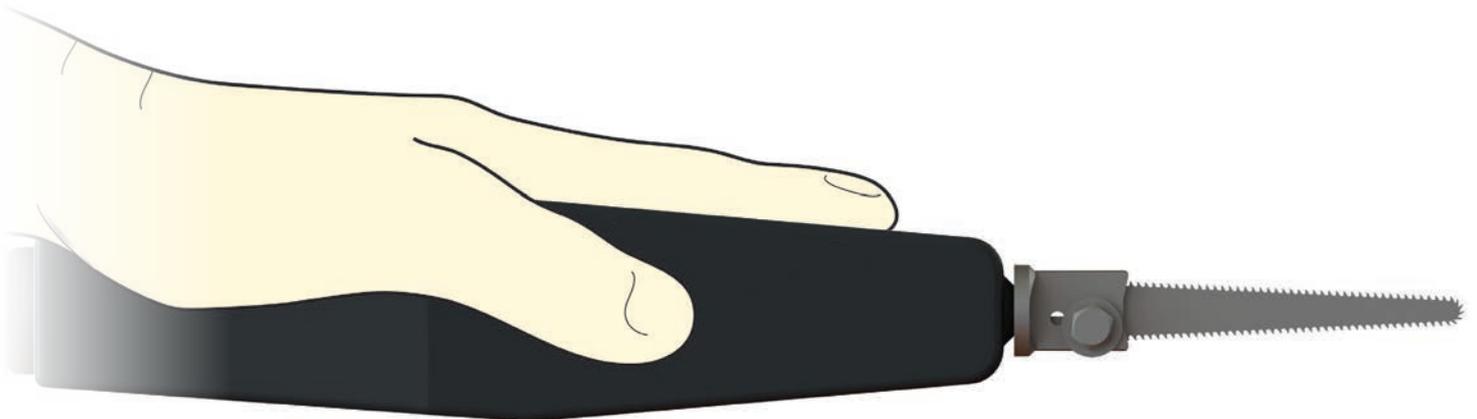
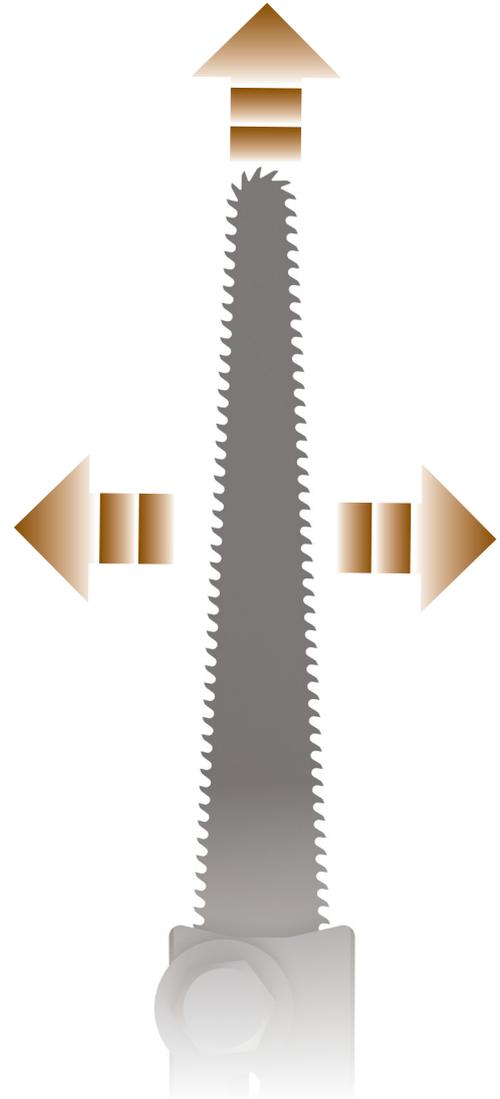
- Cutting of cortical or cancellous bone
- Making undercuts
- Cutting as a fret saw
- Entering small spaces not accessible to conventional saw blades
- Shaving and shaping of large areas of bone

During resection, the unique multi-directional motion promotes bone chip removal thereby making the cutting action clean and efficient.

Blades that feature teeth around the edge will cut on either side or can be advanced into the bone to the tip.

Precision

Since the sweep of the blade is only 1.5mm, the surgeon can see the outline of the blade in motion; this enables the surgeon to know exactly where cutting is taking place. Conventional blades with a longer sweep have a substantial area at either side of the blade where the cutting action is difficult to judge.

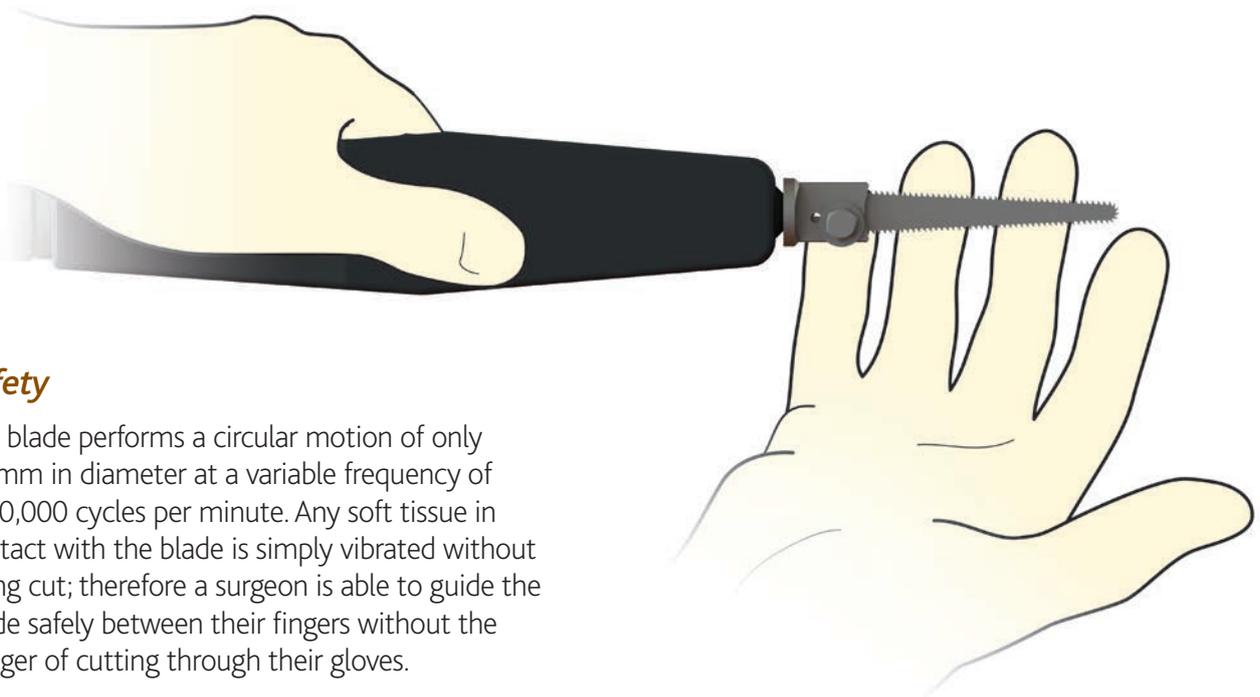
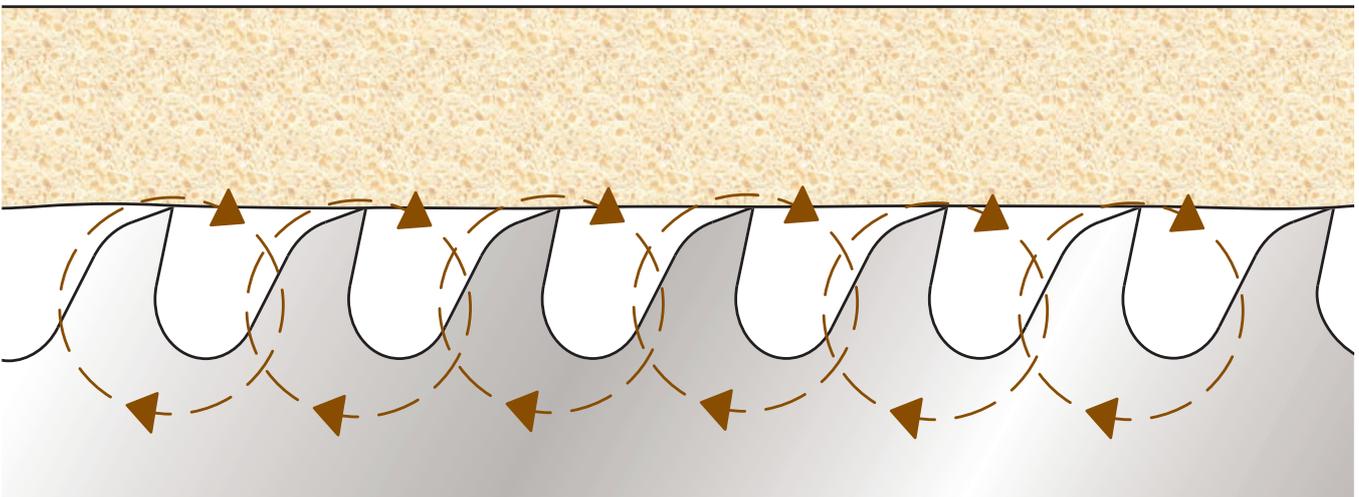
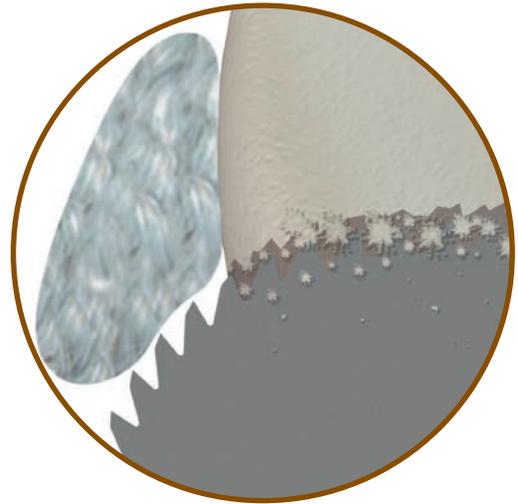


3 Operation

Effectiveness

The teeth are shaped so that during orbital motion the tips are moving forward into the bone and then retracting before second contact. Such motion enhances chip clearance and therefore promotes a more efficient cutting action. This is in contrast to conventional bone saws which utilise blades with triangular teeth which scrape over the bone during the reciprocating motion.

Bone fat and blood act as an efficient lubricant for the cutting action of the Tuke Saw™ blade. The teeth do not require side clearance, which ensures the cutting width is minimal and heat does not build up at the bone surface.



Safety

The blade performs a circular motion of only 1.5mm in diameter at a variable frequency of 0-20,000 cycles per minute. Any soft tissue in contact with the blade is simply vibrated without being cut; therefore a surgeon is able to guide the blade safely between their fingers without the danger of cutting through their gloves.

Air connection

The air hose can be attached to, or disconnected from the Tuke Saw™ quickly during an operation. To operate the connection, the outer end of the hose coupling is pressed against the hand unit and rotated clockwise (to connect) or anticlockwise (to disconnect).



Air supply

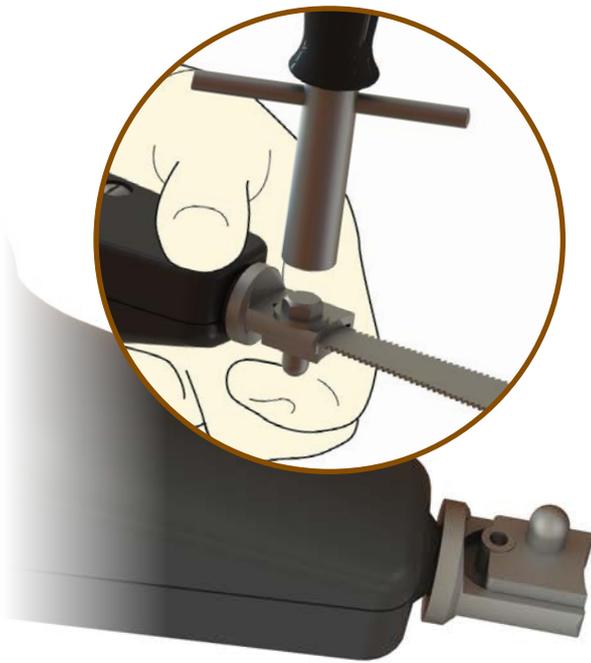
The Tuke Saw™ can only be connected to compressed air, or nitrogen can be used as an alternative medium.

Note: *Never use oxygen due to danger of fire and explosion.*

The recommended operating pressure is 6-7 bar (at the machine air inlet). If the Tuke Saw™ is used at a lower operating pressure it will lose power and not operate at an optimum level. The Tuke Saw™ requires approximately 200 l/min of compressed air.

The Tuke Saw™ has been designed for use with a double hose system. This makes it possible to remove the air escaping from the Tuke Saw™ and discharge it well away from the operating table. While it is possible to connect the Tuke Saw™ to a single hose it will mean that the air extraction function is lost.

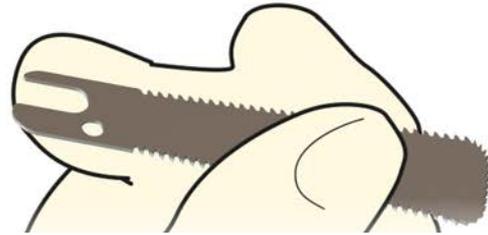
Difficulties with compressed air machines are often due to faults in the compressed air supply. Take care to ensure that the oil and water separator and the air filter in your compressed air system are in good working order.



Clamping the blade in place

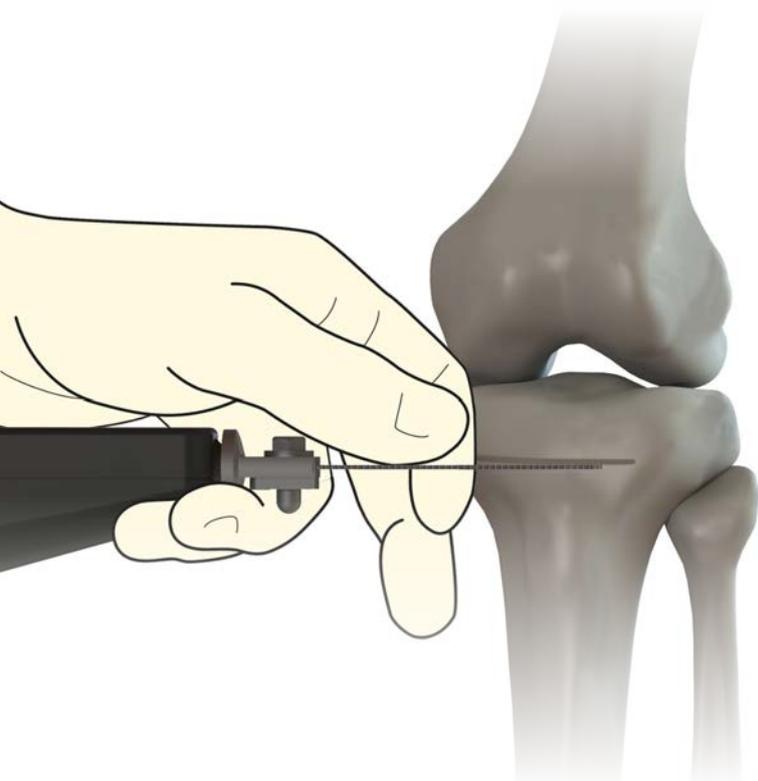
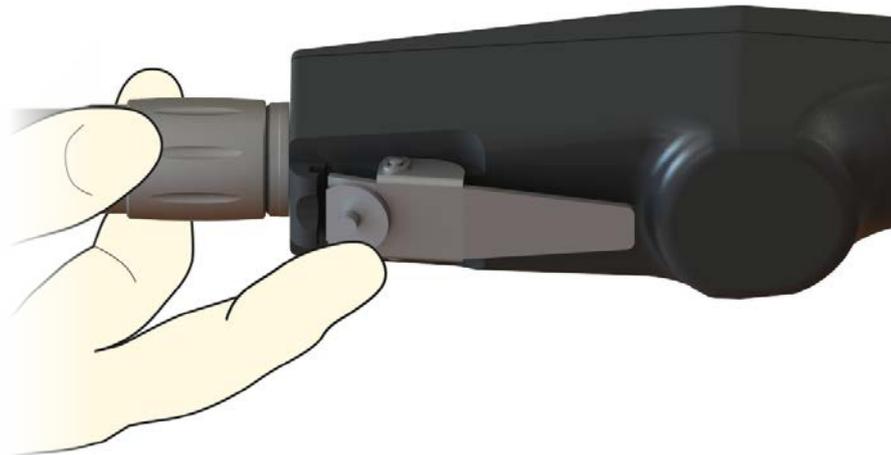
Open up the lock screw, insert the blade, push the clamp down with a finger to engage the blade and fully tighten the screw.

Note: do not try to fully remove the screw; there is a retaining device in place to prevent the loss of the screw.



Safety lock

Push forward (unlock) the safety lock on the throttle and grip the Tuke Saw with both hands.



Placing the blade in position

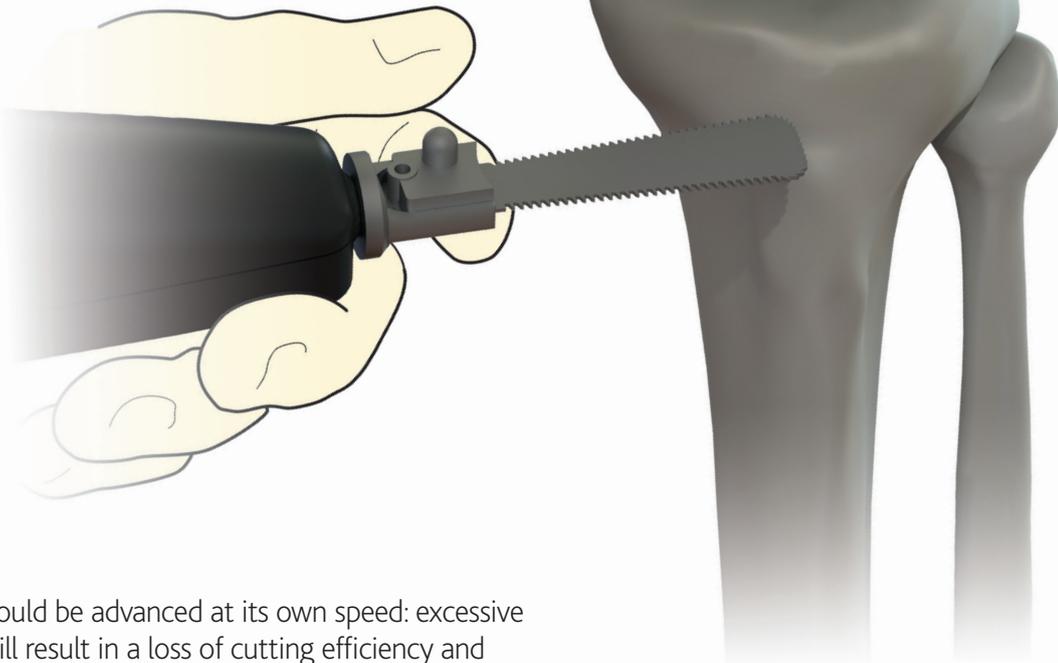
For accurate cutting, the moving blade must be placed exactly where the bone is to be cut. This can be achieved by forming a direct link between the bone and the hand holding the instrument, before the saw is placed.

The forward hand on the instrument must be placed on the saw, the blade and on the bone. This can be achieved by supporting the forward body of the saw with the palm of the hand and holding the blade lightly between finger and thumb; a finger will be sufficient to touch the bone thereby completing the link and providing a precise position for the first cut.

Resection

The Tuke Saw™ should run at approximately half speed to begin with. For best control with any blade the saw should not run at full speed until it is in contact with the bone. There is a slight tendency for the blade to travel up the bone surface before it cuts, this can easily be resisted by tilting the Tuke Saw™ towards the direction of pull.

Once the cut is started the saw should be operated at full speed. The link between the blade and the bone will by then be established directly, but the link provided by the surgeon's hand will still provide the best control.



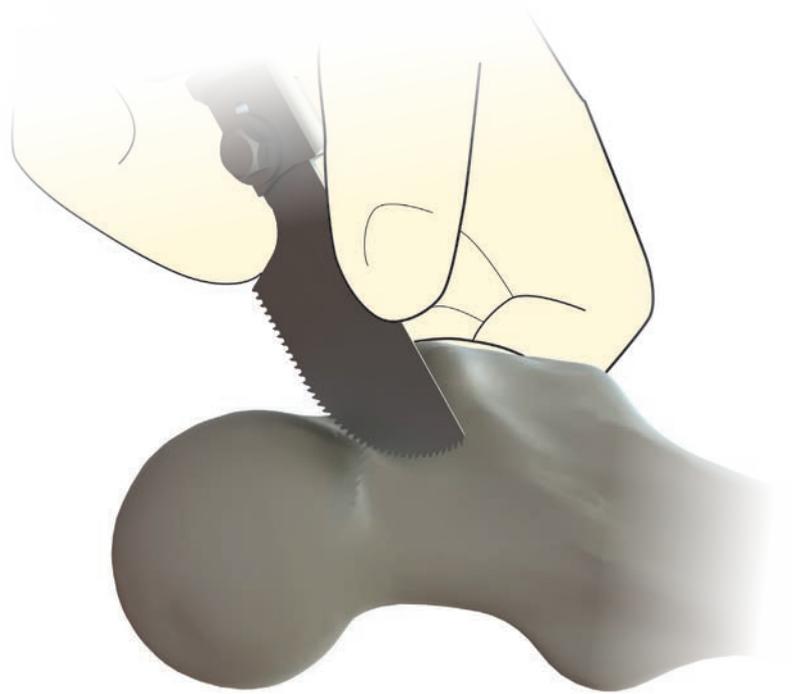
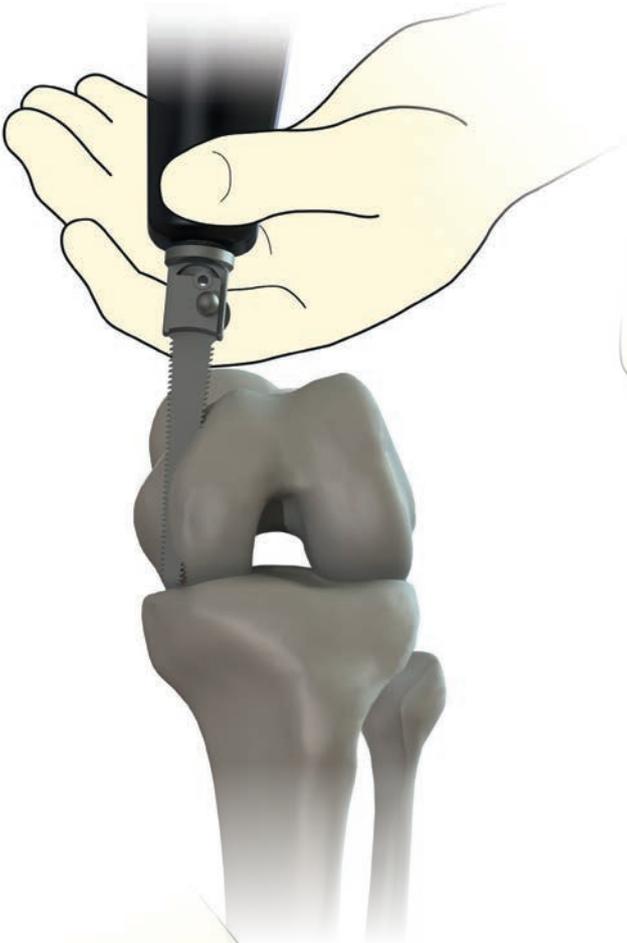
The cut should be advanced at its own speed: excessive pressure will result in a loss of cutting efficiency and an unpleasant vibration will be felt. Maximum cutting efficiency is achieved by gentle pressure and slow movement of the saw back and forth. Bone debris will then emerge from one side of the blade, thereby allowing the cleared teeth to cut more and prevent overheating of the bone.

4 Use of blades and brushes

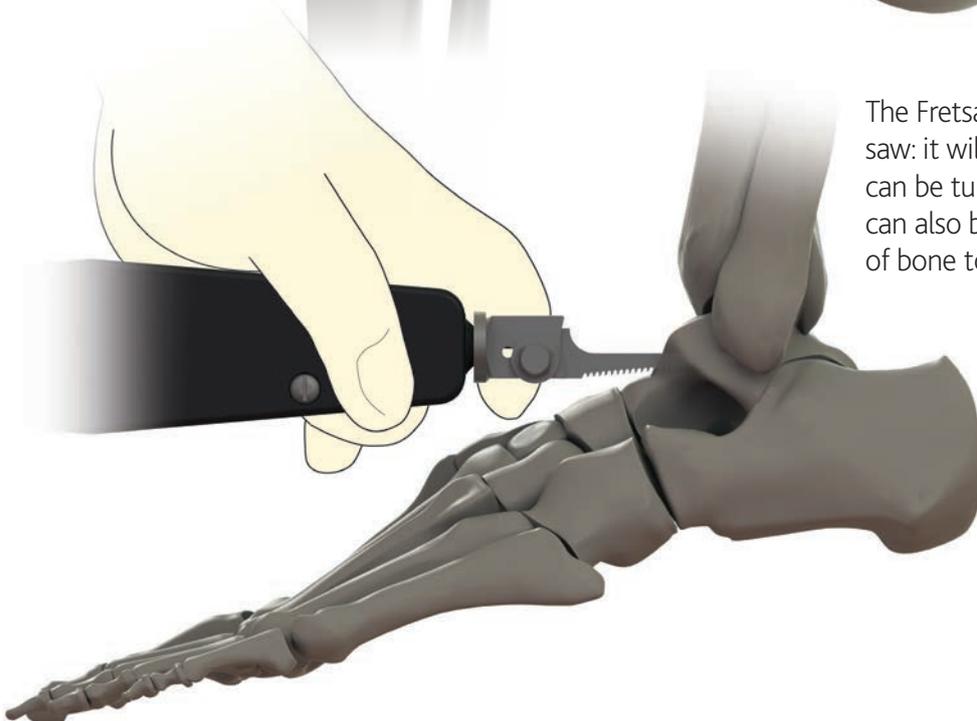
Cancellous Bone and Cortical Bone Saw Blades are used as illustrated below, often in conjunction with a slotted saw guide that has been accurately positioned and secured to the bone.

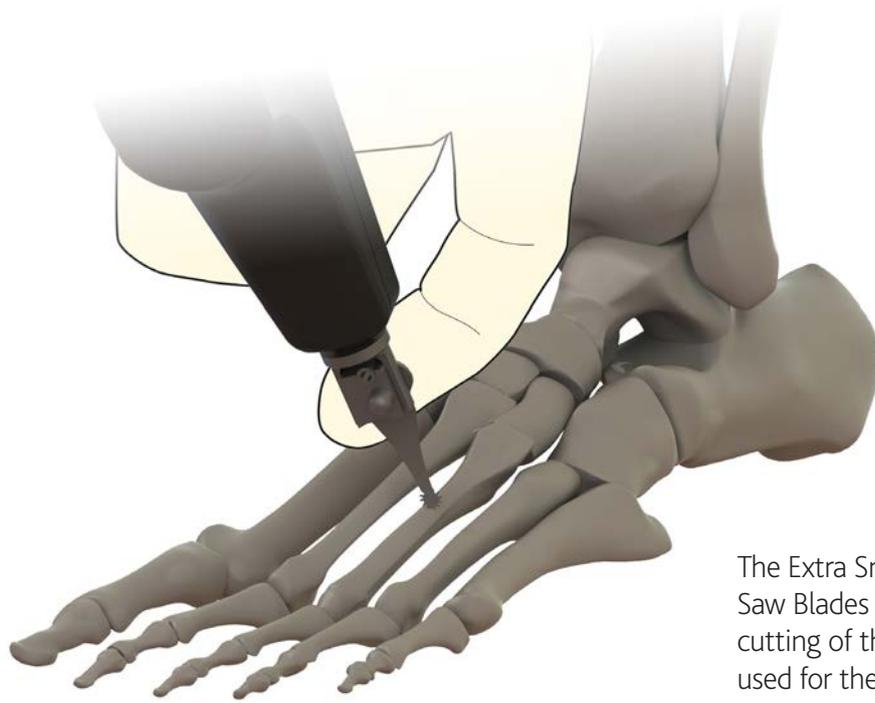
When using a saw guide, ensure that the saw blade used is compatible with the slot thickness of the saw guide.

The shortest practicable length of blade should be selected to suit the depth of the intended cut. The blades have been designed to be as thin as possible with adequate stiffness and strength for controlled cutting.



The Fretsaw Blade is intended for use as a fret saw: it will penetrate the bone with its tip and can be turned around tight corners. This blade can also be used for shaving down high spots of bone to obtain a flat surface.

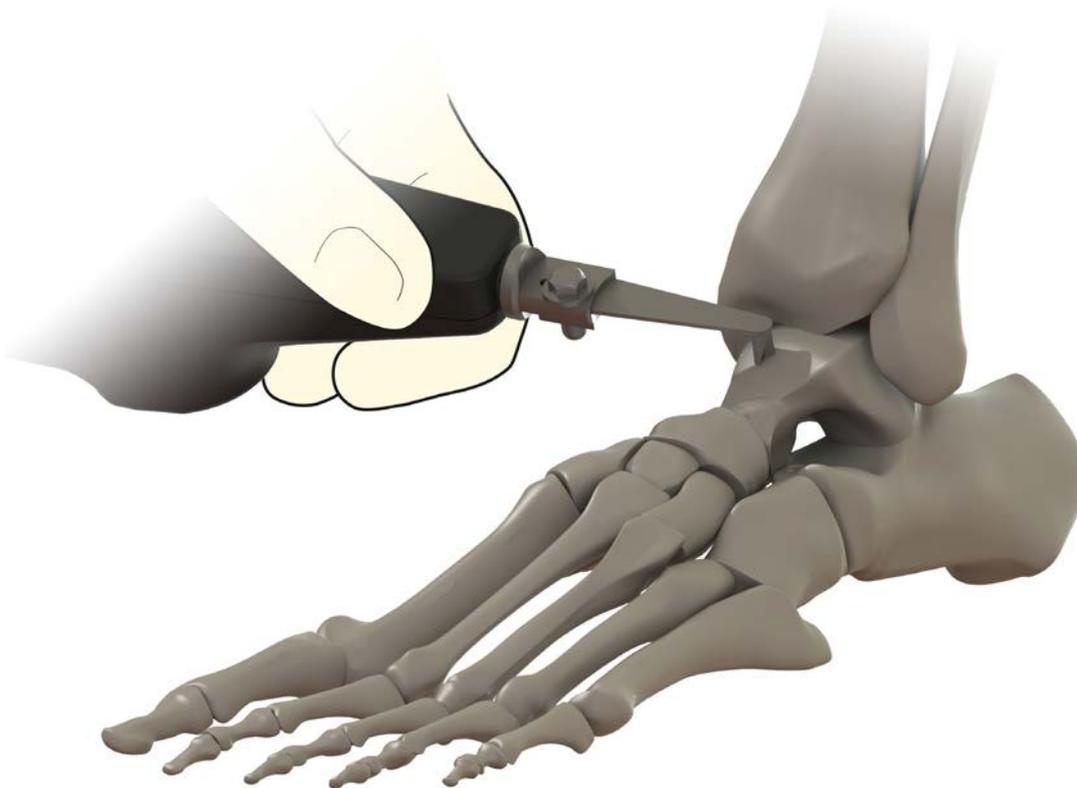




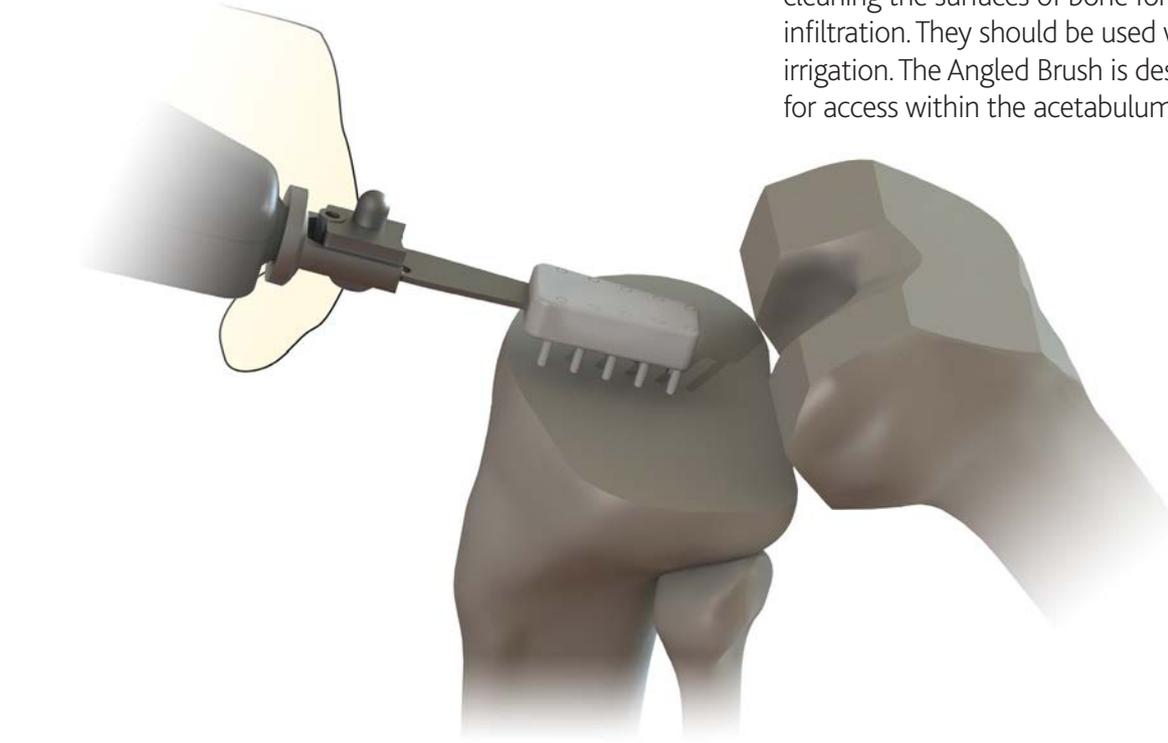
The Extra Small and Very Fine Cancellous Bone Saw Blades are very thin and designed for easy cutting of thick cortical bone. These blades are also used for the sectioning of cemented polyethylene components during revision operations.

Note: *It is particularly important to maintain a gentle stroking action when using these blades.*

The Milling Cutter is designed for the cutting of recesses and the drilling of anchorage holes in inaccessible areas; for example around corners as in the case of ankle arthroplasty.



The Brush and Angled Brush attachments are used for cleaning the surfaces of bone for maximum cement infiltration. They should be used with a little saline irrigation. The Angled Brush is designed to allow for access within the acetabulum.



Large Area Cancellous Bone Saw Blades are designed to facilitate the cutting of large areas of bone which are required to be flat, as in cementless replacement of the knee. Three of the large blades have stiffening elements fixed at the blade holding point. When using the large blades increased wear on the saw bearings should be expected; this may make it necessary to reduce the intervals between maintenance.



Note: These blades are manufactured to combine an optimum of strength, stiffness and hardness for cutting bone, but they will not withstand the cutting of metal and will quickly become damaged if this is undertaken.

5 Care and maintenance

Regular care and maintenance is required if the Tuke Saw™ is to function properly.

Cleaning

Saw

The Tuke Saw™ should be cleaned immediately after use. Before cleaning, the saw blades or brushes must be removed. The Tuke Saw™ should only be cleaned by hand; **it must not be immersed or cleaned in an ultrasonic bath.**

Using a soft brush under flowing water, clean the Tuke Saw™ thoroughly of all residue; **take care to ensure that no water gets into the air inlet.**

A small brush can be used to clean the blade clamping device.

Saw blades and brushes

All blades and brushes are designed for single use only.

Lubrication

After cleaning, the turbine must be lubricated using resin-free oil:

- Hold the Tuke Saw™ with the hose connector facing upwards and drip 3 to 4 drops of oil into the air inlet
- Depress the switch lever to ensure that the oil gets into the Tuke Saw™
- Connect the Tuke Saw™ to a single hose and let it run at full power for 10 to 20 seconds to distribute the oil inside the saw

Or

- If you use a double hose, insert the lubricating connector so that no oil will get into the exhaust hose. **Never use a double hose without a separator when oiling the unit.**

Maintenance

If the Tuke Saw™ is used regularly, it should be serviced once a year by the manufacturer.

Maintenance and repairs on the Tuke Saw™ may only be carried out by MatOrtho®.

Please contact the Customer Services department for more information: customer.services@matortho.com

Sterilisation

The Tuke Saw™ and accessories can be sterilised using standard autoclave procedures. Proper validation of the autoclave is essential to ensure proper sterilisation temperatures and cycle times. **Procedures for accelerated sterilisation should not be used.**

Sterilisation with ethylene oxide is not recommended and should only be used in exceptional cases. If this procedure is used, proper exposure and aeration time must be established depending on the sterilisation equipment and the sterilisation cycle parameters. The connecting rod which has the blade clamp must be pulled out to its fully extended position.

Hoses must be separated from the Tuke Saw™ before sterilisation.

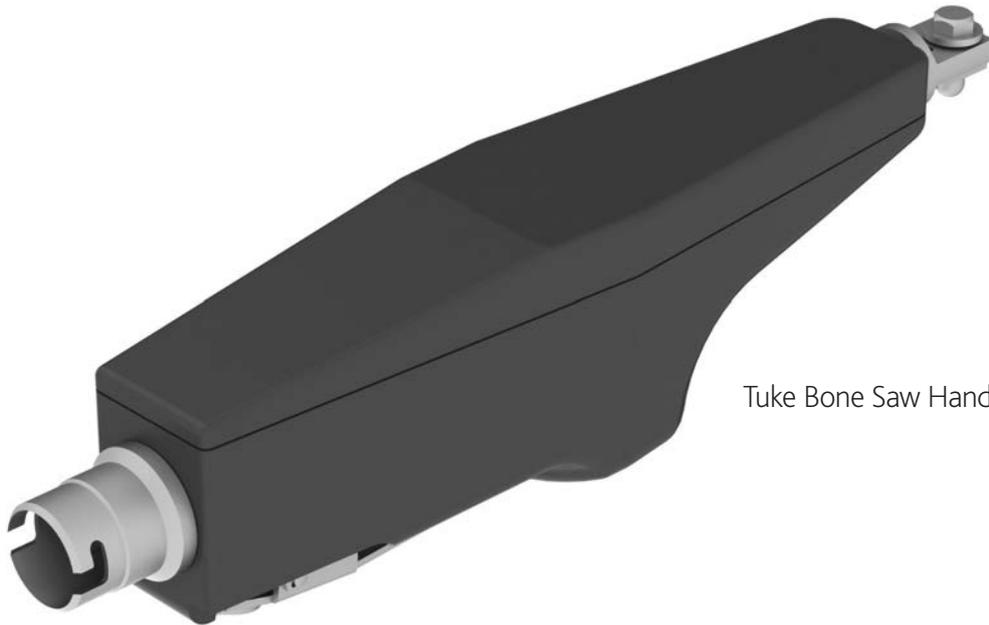
Compressed air hoses must not be sterilised coupled together as this will destroy them.

During the sterilisation process, the hoses must not be pressed together and must at all times be protected from any direct contact with hot metal.

After sterilisation, the Tuke Saw™ and its instruments should not be used until they have cooled down to an ambient temperature. The cooling-down process should not be accelerated.

If the Tuke Saw™ does not start up immediately, move the mounted saw blade around by hand.

Before surgery, check to ensure that the Tuke Saw™ is functioning properly.



Tuke Bone Saw Hand Unit 258200

Double Air Hose (MA7/SCHRADER) 258205



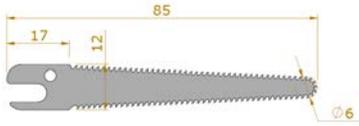
Hex Spanner 258102



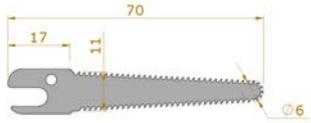
Washer Cap 258203

7 Tuke Saw™ blades and brushes

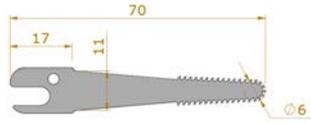
DESCRIPTION	THICKNESS - PART NO.
CANCELLOUS BONE (Large)	0.813mm - 258001 1.000mm - 258051



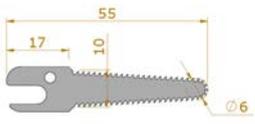
CANCELLOUS BONE (Medium)	0.813mm - 258002 1.000mm - 258052
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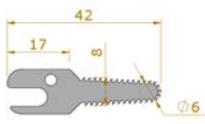
CANCELLOUS BONE (Medium)	0.813mm - 258003 1.000mm - 258053
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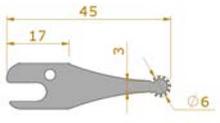
CANCELLOUS BONE (Small)	0.610mm - 258004
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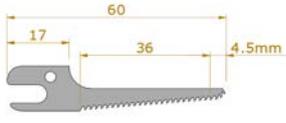
CANCELLOUS BONE (Extra Small)	0.457mm - 258005
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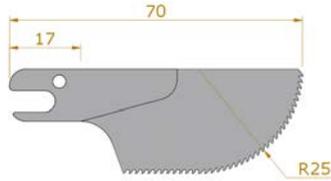
CANCELLOUS BONE (Very Fine)	0.457mm - 258006
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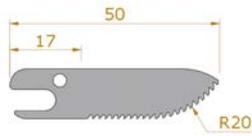
FRETSAW BLADE	1.220mm - 258007
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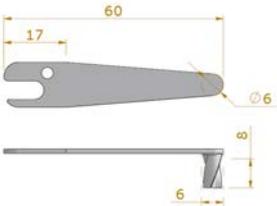
DESCRIPTION	THICKNESS - PART NO.
CORTICAL BONE (Large)	0.229mm - 258008



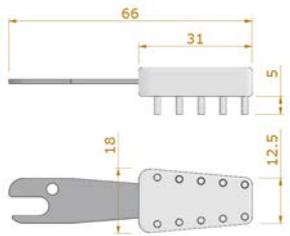
CORTICAL BONE (Small)	0.229mm - 258009
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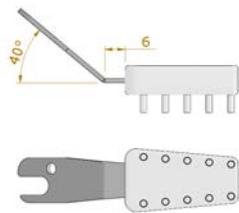
MILLING CUTTER	258010
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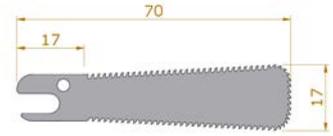
BRUSH	258011
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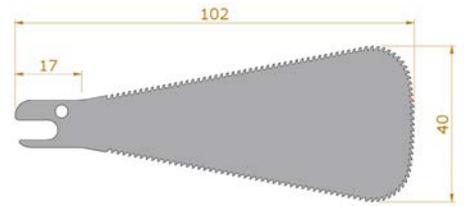
ANGLED BRUSH	258012
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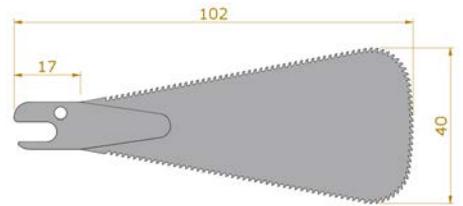
DESCRIPTION	THICKNESS - PART NO.
LARGE AREAS (Small)	0.813mm - 258013 1.000mm - 258063 1.200mm - 258074



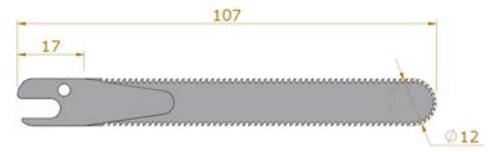
LARGE AREAS (Large)	0.813mm - 258014 1.000mm - 258064 1.200mm - 258075
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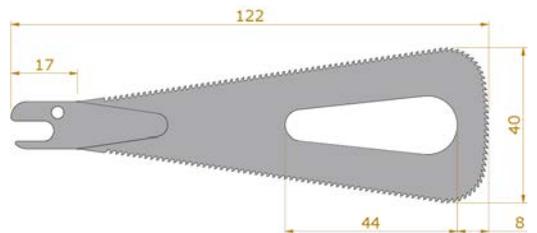
LARGE AREAS (Cancellous Large)	0.813mm - 258015 1.000mm - 258065
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CANCELLOUS (Extra Long)	0.813mm - 258016 1.000mm - 258066
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CANCELLOUS (Extra Large)	0.813mm - 258017 1.000mm - 258067
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CE0088 **TGA** Health Safety Regulation
ARTIC126807

The Tuke Saw™ System
is available in the United States

MatOrtho Limited | 13 Mole Business Park | Randalls Road | Leatherhead | Surrey | KT22 7BA | United Kingdom.
T: +44 (0)1372 224 200 | info@MatOrtho.com | For more information visit: www.MatOrtho.com

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