Instructions of use: The instruments are supplied in NON STERILE condition. Clean and Sterilize before first use and each subsequent use. Remove eventual deposits of organic residue and other corrosive substances by using specifically adapted products, in the concentrations and times indicated by the manufacturer. It is necessary to implement periodical verification of the perfect operation of the sterilization apparatus, autoclave and other system used by the customer. Time and temperature standards for Autoclave (Steam Sterilization) and Chemiclave: 5 - 15 min. / 132º-135ºC (270º-275ºF). Instruments must be cleaned, bagged individually or bagged/wrapped in a tray setup, and then sterilized. A chemical/autoclave indicator device should be included in the wrapping. Hinged instruments must be processed open and unlocked. Do not combine different metals (chrome, stainless, titanium, etc.). Instrument sterilization cannot substitute cleaning. TC instruments (Tungsten carbide) should never be exposed to chemical substances. Do not use ultrasonic cleaning for TC instruments, sharp and delicate instruments. Cutting instruments must be kept sharp (sharpening stones improves shelf life). Check scissors and cutting instruments for proper alignment and sharpness (latex glove test, teflon testing stick). Lubricate hinged instruments (prevents rust, corrosion and still joints). A correctly maintained instrument can have a life cycle of 5 years. Non-Conformity to these fundamental rules can damage the instrument beyond repair and will cancel any BMT product guarantee with respect to repair or refund claims. The warranty does not cover general maintenance (ex: sharpening, spring/screw/Tungsten-Carbide insert replacement). BMT instruments are subject to Directive 93/42/CEE and therefore are to be sold according to the applicable regional norms. For more information visit our website.
Cleaning, Maintenance and Sterilization of Surgical Instruments
Instructions and Methods of Use

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Maintenance and Sterilization Cycle

Surgical Instrument Spa Cycle

- Remove gross soil.
- Place the instruments in anhydrous-free disinfectant bath.
- Rinse in running water.
- Disassemble where possible.
- Soak in cleaning solution.
- Brush, operate moving parts.
- Rinse in running water and inspect.
- Place on absorbent paper.

- Soak in ultrasonic bath.
- Clean with brushes.
- Rinse in running water.
- Soak in disinfectant solution.
- Clean with brushes again.
- Rinse in running water.
- Dry (compressed air, wipes or oven).

- Visual inspection. Functional check.
- Use sharpening stones Arkansas or India with lubricating and sharpening oil (DB-OL).
- Evaluate the cutting edge with a teflon testing stick (repeat sharpening if necessary).
- Lubricate moving parts with high density lubricant (DB-OL).
- Use Cleanlact milk (anticorrosive and bacteriostatic detergent / anti-rust finish).

- Store in sterilization cassettes or containers.
- Single or double packaging.
- Use steam sterilization (autoclave) or chemical sterilization: 5-15 min.
  132º-135ºC (270º-275ºF)
- Dry heat sterilization is not recommended.

- Control environment.
- Control shelf life.
- Ready to use or storage.
Basic Information

About our instruments

All BMT instruments are handcrafted in Germany from grade 440 Rockwell surgical steel, in order to exceed surgeon specifications for ergonomics and duration. Stainless steel is mainly used for the production of all instruments that do not require sharpening, while carbon steel, a special alloy, retains characteristics that are more suitable for cut and less for corrosion. Due to the high quality of our surgical products, BMT is proud to offer a five-year guarantee covering all manufacturing defects. Each BMT instrument is produced and controlled with the utmost care and destined exclusively for professionals and for the use which they have been devised and realized. In order to ensure proper use of our instruments, we suggest you read the following instructions to ensure their maximum efficiency and duration.

First use

Before being sent to destination, all our instruments are inspected, lubricated, and individually packed. The instruments are supplied in a “non sterile” and imbued with a special liquid oily in cycles, parts and pivoting in those screwed. Therefore, before use, you must good wash the instruments using neutral detergent and/or degreasers suitable for steel, so as not to cause unpleasant complications with the instrument (red spots, induration pivoting shares, etc.). It is necessary to wash and cleanse each instrument carefully prior to each usage. After having used the instruments, brush off any excess particles using nylon bristles (never use steel bristles) and rinse them individually.

In the event of a potentially infected instrument, soak the instrument in a disinfectant detergent solution for at least 10 minutes. Cleaning in an ultrasound basin is not recommended for TC instruments (with tungsten carbide insertions) and instruments with cutting edges (scissors, bistouries, bone forceps, scalpels, etc.). They may chip, break or corrode. Cutting instruments of different materials (stainless steel, chromate, copper, aluminium, titanium) should always be cleaned and stored separately.

After the cleaning, make sure that all the instruments are perfectly dry. We recommend re-lubricating the instruments with surgically approved products only. Never use industrial oils or lubricants. After having cleaned, rinsed and lubricated the instruments the sterilizing phase can start.

Martensitic steel instruments

All BMT instruments are made up of high quality martensitic stainless steel, also known as surgical steel. Nevertheless, in case of exposure to the action of some particular chemical substances, or should these substances be used in wrong doses or exposures not be observed, instruments might be subject to loss of polish, corrosion or even to an alteration of their superficial physical properties. Surgical steel instruments shouldn’t be exposed to the prolonged action of chloride solutions. Moreover, instruments should never be exposed to the action of or kept in prolonged contact with chlorine solutions, hypochlorites, ferric chloride, hydrochloric acid and iodine.

TICInstruments (tungsten carbide inserts)

By using these special materials during tempering high HRC hardness degrees can be obtained, which allows achieving perfect grinding and extraordinary life of instruments. When compared with steel instruments, tungsten carbide (TC) instruments are more sensitive to chemicals and therefore require special care. TC instruments should never be exposed to any of the above mentioned chemical substances, nor to any other corrosive chemical.

In order to ensure perfect maintenance of TC instruments, you are recommended to follow three simple but important rules:

- Use solutions containing corrosion inhibitor for cleaning and sterilization.
- Do not use ultrasound devices for cleaning, as they might take off or splinter the TC insert.
- After cleaning, dry the instruments thoroughly before submitting them to sterilization.

Joint and hinge instruments

All joint and hinge instruments should always be kept well lubricated. Regular use of Cleanlact (DB-1L) concentrated anticorrosive–bacteriostatic detergent and high density lubricant (DB-0L), will prevent rust, corrosion and stiff joints and will ensure smooth operation. Joint and hinge instruments should always be sterilized in open position.
Rinsing and Cleaning Procedures

Rinsing Procedure
Immediately after surgery, rinse instruments under warm running water. Do not use hot water as this will coagulate proteinous substances.

Rinsing should remove all blood, body fluids and tissue. Dried soils may damage the instrument surface and make cleaning very difficult.

After rinsing, you can start any of the three cleaning techniques (*). For rinsing do not use hot water!

Cleaning Procedure

• Ultrasonic Cleaning
Using ultrasound combined with a special cleaning solution, it is the most effective cleaning method available. Recommended for regular instruments such as hand instruments and forceps. Ultrasonic cleaning is not recommended for instruments which are very delicate, which have sharp cutting edges (scissors, needle holders, bone forceps) and not 100% steel (rubber, mouth mirrors, titanium, TC-tungsten carbide inserts or diamond dusted tips, etc.). The ultrasonic vibrations can chip, break or corrode any welded parts. For the delicate instruments, use manual cleaning.

Steps to follow:
1 | Sort instruments carefully so as to include only instruments compatible with ultrasonic cleaning.
2 | Place instruments in open position.
3 | Make certain sharp edges are not touching other instruments.
4 | Do not combine different metals (chrome plated, stainless, copper, titanium, etc.)
5 | Change the solution frequently to avoid accumulation of micro organisms.
6 | After rinsing and before sterilization, inspect and dry the instruments thoroughly.

Advantages:
» Safer than hand scrubbing, cleans instruments very effectively, reduces the risk of contaminants spreading through splatter, allows for more efficient use of staff time.

Disadvantages:
» Remember to sort the instruments carefully and to change the cleaning solution.
» If the cement is not removed while it is still soft, ultrasonic cleaning will not remove hardened permanent cement.

• Manual Cleaning
We recommend ultrasonic cleaning as the best and most effective way to clean surgical instruments, but sharp or delicate or not 100% steel instruments should be cleaned manually.

Steps to follow:
1 | Use stiff plastic cleaning brushes (DB-11, DB-12, nylon, tooth brush, etc.) Do not use steel wool or wire brushes except specially recommended stainless steel wire brushes for instruments such as bone files, or on stained areas in knurled handles. In this case always treat instruments with the special “cleaning milk” Cleanlact so as to restore and protect the anti-rust coating.
2 | Brush delicate instruments carefully and, if possible, handle them separately from general instruments.
3 | Make sure all instrument surfaces are visibly clean and free from stains and tissue.
4 | After scrubbing, rinse instruments thoroughly under running water. While rinsing, open and close scissors, hemostats, needle holders and other hinged instruments to ensure the hinge areas are fully rinsed, inside and out.

Advantages:
» Effective if performed properly.

Disadvantages:
» Increases risk of operator injury.
» Labor-intensive.

• Automated Washer
This can also be a very effective cleaning method. Not all instruments are compatible with automated washers and restrictions vary according to the washer model.

Steps to follow:
It is necessary to see manufacturer’s instructions for detailed requirements.

Advantages and Disadvantages:
» Same as Ultrasound Cleaning.

(*) If cleaning procedure is not done immediately after rinsing, instruments should be submerged in a solution of water and neutral detergent (pH=7) - and not another- because if not rinsed off properly, low pH detergent will cause breakdown of stainless protective surface and black staining. High pH detergent will cause surface deposit of brown stain, which will also interfere with smooth operation of the instrument. We strongly recommend using a detergent containing a rust inhibitor.

Ultrasound Cleaning is the most effective cleaning method, but remember: it does not sterilize.
Sharpening and Lubricating Procedures

Sharpening Procedure

Why sharpen instruments?
Surgical instruments should be kept identical to their original design. Dental and surgical procedures are most effective when using sharp instruments as they reduce hand and wrist fatigue, improve tactile sensitivity and cutting action, save time, and minimize patient discomfort.

Instruments can be sharpened by using different types of stones: Arkansas (natural stones extracted from the mountains of Arkansas) and India (synthetic stones quarried from the finest Ozark novaculite deposits -silicon quartz).

- **Arkansas flat stone** (DB-96)
  Used to sharpen all cutting parts of surgical instruments. Whenever necessary to sharpen cutting parts (scissors, osteotomes, curettes, etc.).

- **Arkansas conical stone** (DB-299)
  Used to manually sharpen internal parts of curettes, scalers, gouges, rongeurs, etc. Whenever necessary to sharpen the internal parts of surgical instruments in areas that otherwise cannot be reached.

- **Arkansas rectangular stone** (DB-4)
  Used to sharpen all cutting parts of surgical instruments. Whenever necessary in routine sharpening and finishing of edge and toe of an instrument.

- **Arkansas wedge stone** (DB-6A)
  Used to manually sharpen internal parts of curettes and scalers. Routine sharpening and finishing.

- **India wedge stone** (DB-3)
  Used for sharpening of excessively dull instruments or those requiring re-contouring.

When to sharpen instruments?
Instruments should be sharpened lightly after each use; there are two ways to evaluate whether the cutting edge is dull and requires sharpening:

- **Visual**
  The cutting edge should be inspected regularly in a good light (and if possible, under magnification). If the cutting edge is blunt it will be rounded and reflect the light. A dull, non-reflective line indicates sharpness.

- **Teflon Testing Stick** (DB-15)
  If the blade of the instrument runs smoothly over the testing stick, then it is blunt. A sharp instrument will grab into the stick and removes small fragments of the plastic.

Care of Sharpening Stones
After use, wipe the stone with a clean cloth to remove metal particles. Then, clean the stone by scrubbing or using ultrasound to remove lubricant before sterilization. After sterilization, lubricate with the special oil (DB-OL) before each use. Be sure to use entire stone to prevent “grooving”.

How to sharpen instruments?
Generally, the instruments should be sharpened following this procedure:

1 | Place one drop of Lubricating and Sharpening Oil (DB-OL) on the arkansas/india stone. Lubrication improves the movement of the instrument blade over the stone; also, it prevents the metal particles from clogging the stone.
2 | Hold the instrument in one hand, while applying the stone to the lateral surface angled with the face of the blade.
3 | Position the stone to contact the heel of the blade and work toward the tip, keeping the stone in contact with the blade throughout the sharpening procedure.
4 | Move the stone up and down with short strokes, placing more pressure on the down stroke. (Do not move the instrument, keep the instrument still).
5 | Finish sharpening the instrument with a down stroke; this will prevent a rough edge from forming.
6 | Evaluate the sharpness with the teflon testing stick (DB-15). If the blade is still dull, re-evaluate the angle of the stone and repeat the sharpening procedure (steps 2-6)

Scalers and Curettes
- **Sickle Scaler Toe End**
  The sickle scaler has a pointed tip and, therefore, the stone is held straight as it nears the tip.

- **Curette Toe End**
  The curette has a rounded toe, so the position of the stone is adapted around the rounded cross-section. With both types of instrument, always finish on a down stroke to remove any flash of metal.

Lubricating Procedure
Immediately after surgery, rinse instruments under warm (not hot) running water. Rinsing should remove all blood, body fluids and tissue. Dried soils may damage the instrument surface and make cleaning very difficult. Do not use hot water as this will coagulate proteinous substances.

**Always** lubricate instruments before sterilization, immediately after the last rinse cycle. Lubricate all instruments which have any metal to metal action such as hemostats, scissors, retractors and needle holders using the high density lubricant (DB-OL).

Proper lubrication will make your instruments more resistant to corrosion, rusting and staining. In addition to corrosion and stain prevention, lubrication cuts down friction at the joints, keeping the action of the instrument smooth, delicate and light and extending the life of your instruments.

We also recommend the Cleanlact (DB-1L) solution which is very effective in maintaining the anti-rust finish of your instruments and which also acts as a lubricant (see our further section stain treatment).
Sterilization Procedures

Inspection

Before preparing for sterilization, all instruments should be inspected. Generally un-magnified visual inspection under good light conditions is sufficient. All parts of the instruments should be checked for visible soil and/or corrosion.

Packaging

Where appropriate the cleaned, disinfected, and checked medical devices should be assembled into the dedicated trays provided.

BMT cassettes/containers should be simple or double wrapped according to AAMI/CSR technique. (AAMI: Association for Advancement of Medical Instrumentation / CSR: central sterilization room)

The packaging for terminally sterilized medical devices should fulfill the following requirements:

> EN ISO 11607
> Suitable for autoclave sterilization (temperature resistance up to at least 141°C, sufficient steam permeability).
> Sufficient protection of the instruments as well as of the sterilization packagings to mechanical damage.

Sterilization Techniques

• Autoclave (Steam Sterilization)

Steam autoclave sterilization (moist heat) using a pre-vacuum (forced air removal) cycle is recommended. Instruments are treated with high pressure water steam. **Autoclaving is the preferred method of sterilization.**

Sterilizing agent: distilled water.

<table>
<thead>
<tr>
<th>Recommended standards for Time and Temperature*</th>
<th>Min.</th>
<th>Max.</th>
<th>5 min.</th>
<th>15 min.</th>
<th>122°C (250°F)</th>
<th>135°C (275°F)</th>
</tr>
</thead>
</table>

Advantages:

> Highly effective.
> Nontoxic.
> Inexpensive.
> Rapid heating.
> Rapid penetration of instruments.

Disadvantages:

> Items must be heat and moisture resistant.
> Needs good maintenance. (The autoclave is not working correctly if steam comes out of the lid or around the door).

(Star) Recommended times and temperatures may vary according to the nature and loading capacity of your equipment and do not take heating times into consideration. Always comply with the manufacturer’s instructions. The above mentioned recommendations concerning sterilization of instruments aim at the safeguard of both patient and operator. Remember that if these procedures are carried out correctly, this will enhance the quality of BMT instruments, as well as prolong their effectiveness over time.

• Chemiclave (Chemical Sterilization)

Instruments are treated with high pressure, with the help of chemical steams.

**Instruments must be dried before sterilization.**

Sterilizing agent: special chemical solutions.

<table>
<thead>
<tr>
<th>Recommended standards for Time and Temperature*</th>
<th>Min.</th>
<th>Max.</th>
<th>60 min.</th>
<th>90 min.</th>
<th>160°C (320°F)</th>
<th>170°C (340°F)</th>
</tr>
</thead>
</table>

Advantages:

> Minimal dulling, rusting and corroding of instruments.
> Unsaturated chemical vapor method is a low-humidity process.
> The heat-up time is shorter than for most steam sterilizers.
> Easy to operate, fill and purge / Minimal order.

Disadvantages:

> Needs adequate ventilation / It is flammable
> Vapo-Steril solution has formaldehyde in it, known to be a potential carcinogen.
> Needs to be mixed with water when disposed.

• Dry Heat Sterilization

Instruments sterilization takes place by means of hot air. Instruments must be dried before sterilization. At present, **dry heat sterilization is not recommended**, as it does not guarantee reliable sterilization and gradually causes damages.

Disadvantages:

> Low cost.
> Long exposure time is necessary.
> High temperatures gradually cause damages such as surface blackening, loss of polish and dullness.
> Specialized packaging is needed.

(Star) Recommended times and temperatures may vary according to the nature and loading capacity of your equipment and do not take heating times into consideration. Always comply with the manufacturer’s instructions. The above mentioned recommendations concerning sterilization of instruments aim at the safeguard of both patient and operator. Remember that if these procedures are carried out correctly, this will enhance the quality of BMT instruments, as well as prolong their effectiveness over time.

Instrument sterilization cannot substitute cleaning!

Some types of damages (corrosion, rust and spots) are transmitted to the instruments intact. Always check cutting edges for sharpness and damage.

Dry Heat Sterilization

is not recommended for surgical instruments. The autoclave is one of the best method of sterilization.
Instrument Protection

Instrument Care
Surgical instruments can be reused, unless indicated otherwise. The life time of instruments depends on the frequency of use, the care of the user and proper reprocessing methods. The most effective method of dealing with instrument problems is to prevent them from occurring. The use of “treated water”, careful preliminary cleaning, the use of neutralized PH solution, adherence to manufacturer’s instructions, and visual inspection, will help to keep instruments performing accurately free of troublesome stains. It is important to act quickly should a problem arise.

New Instruments
- New instruments must be processed before use.
- They must undergo the entire cleaning process.
- They are usually oiled in production and this must be removed prior to running them through a sterilizer (Do not take from packaging and go to the sterilizer).

Factors affecting instrument care
- Water
Regular tap water is not appropriate for instrument sterilization. High chloride and lime concentration and various other minerals can lead to staining or damage of the stainless steel. When water dries, chlorides will concentrate and cause pitting on the instrument. Fully Desalted Water avoids this problem.
- Corrosion
Certain compounds are highly corrosive to stainless steel and will cause serious damage despite the passivated protective surface. Instruments should never be exposed to:
  - Aqua regia
  - Ferric chloride
  - Hydrochloric acid
  - Iodine
  - Sulfuric acid
  (If instruments are inadvertently exposed to any of the substances, they should be rinsed immediately with copious amounts of water).

Stain and Rust Protection
It is common for instruments to become stained or spotted despite the best efforts. In nearly all cases these problems are the result of minerals deposited upon the surfaces of the instruments, as well as insufficient cleaning. Proper technique during cleaning and sterilizing procedures will prevent most staining occurrences.

Diagnosing spots and stains
The following identifies some of the various instrument-related may encounter:

- **Brown/Orange Stains**
  *Cause*: A result of high-pH detergents. Chlorhexidine usage or improper soaking of instruments. This color stain can also be caused by soaking in tap water.

- **Dark Brown Stains**
  *Cause*: Low-pH instrument solutions. The brownish-colored film may also be caused by a malfunctioning sterilizer. Similar localized stain spots can also be a result of baked-on blood.

- **Blush Black Stains**
  *Cause*: Reverse plating, when instruments of different metal (e.g. chrome and stainless steel) are ultrasonically processed together. This can occur when high quality instruments are mixed with lower end ones. Additionally, exposure to saline, blood, or potassium chloride will cause this blush black color. (similar to tarnish on silverware).

- **Black Stains**
  *Cause*: Contact with ammonia or a solution containing ammonia.

- **Light or Dark Spots**
  *Cause*: Water droplets drying on the instruments. With slow evaporation, the minerals sodium, calcium and magnesium left behind can cause this spotting.

- **Rust Deposits**
  *Cause*: Dried blood that has become baked on the serrated or hinged areas of surgical instruments. This organic material, once baked on, may appear dark in color. Also can be caused by soaking in tap water.

Removing Stains
Stains can be removed, whereas rust will leave permanent damage.
To determine if a brown or orange discoloration is a stain or rust, use the eraser test:
1. Rub a pencil eraser over the discoloration.
2. If the discoloration is removed with the eraser and the metal underneath is smooth and clean, this is a stain.
3. If a pit mark appears under the discoloration, this is corrosion or rust.

Warnings
- BMT’s product warranty against manufacturer defects automatically expires in the cases of improper care, maintenance and/or use.
- BMT usually does not define the maximum number of uses appropriate for re-usuable surgical instruments. The useful life of these devices depends on many factors including the method and duration of each use, and the handling between uses. Careful inspection and functional test of the device before use is the best method of determining the end of serviceable life for the medical device.
- New instruments must undergo the entire cleaning process before use. Do not take from packaging and go to the sterilizer.
- Avoid putting oxidized or rusty instruments in sterilizing or disinfectant solutions, as other instruments could be attacked.
- Used, damaged and oxidized tools should not be used because they are no longer able to perform their function. Please note that some types of damages (corrosion, rust and spots) are transmitted to the instruments intact.
- Sterilization does not replace the cleaning and maintaining of the instruments.
- Ultrasonic Cleaning does not sterilize.
- The tools provided by BMT are subject to Directive 93/42/EEC and therefore be discarded by the regional force.

TC Instruments (tungsten carbide) are more sensitive to chemicals and require special care. They should never be exposed to chemical substances or to any other corrosive chemicals.

New instruments must be processed before use. Do not take from packaging and go to the sterilizer.
Products for cleaning, maintenance and sterilization of surgical instruments

**Wedge Stones**
They combine flat surfaces with rounded edges to manually sharpen internal parts (straight and curved edges) of cutters and scissors.

- **India #6**
  - Medium grit
  - 100 x 45 mm
  - 4 x 1.8 in

- **Arkansas #6A**
  - Fine texture
  - 100 x 25 x 12 mm
  - 4 x 1 x 0.5 in

**Conical Stone**
A cone-shaped and cylindrical stone used to manually sharpen internal parts of cutters, scalers, gouges, v. etc. (in areas that otherwise cannot be reached).

- **Arkansas**: a natural stone extracted from the Arkansas mountains.
- **India**: a synthetic stone quarried from the finest Qarq novaculite - silicon quartz- deposits.

**Rectangular Stone**
A flat and rectangular stone used to sharpen all cutting parts of surgical instruments.

- **Necessary in routine sharpening and finishing of edge and toe of an instrument.**
- **Arkansas #4**
  - 100 x 25 x 12 mm
  - 4 x 1 x 0.5 in

- **Arkansas #299**
  - Ø 8 x 90 mm
  - Ø 0.3 x 3.5 in

**Flat Stone**
A flat and rectangular stone used to sharpen all cutting parts of scissors, osteotomes, cutters, etc. (whenever necessary).

- **Arkansas #8**
  - 100 x 50 x 13 mm
  - 4 x 2 x 0.5 in

- **Arkansas #6**
  - 100 x 25 x 12 mm
  - 4 x 1 x 0.5 in

**Ceramic Stone**
Ceramic stones are valued for their durability and the very keen edge they give in the finer grits. Will never pit or groove. Used for routine sharpening procedures. Autoclave safe.

**Ceramic: use only dry.**

(Do not use with oil, water or lubricants)

**Special Rubbers for metal**

- **50 x 40 x 20 mm / 2 x 1.6 x 0.8 in**
- An abrasive eraser specially designed for surgical instruments to remove stains, halos or persistent burnishing from all surgical instruments without damaging the instrument surface.

- **Necessary when routine cleaning does not remove all stains.**

**Ceramic stones are valued for their durability and the very keen edge they give in the finer grits.**

**Used for routine sharpening procedures.**

**Autoclave safe.**

**Special Brushes for metal**

- **For cleaning, maintenance and sterilization of surgical instruments.**
- **To ensure perfect function and fluid movement of all surgical instruments.**

**Brushes: Autoclavable**
Special brushes to clean surgical instruments.

**500 cc / 17 oz**

**Ceramic: use only dry.**

(Do not use with oil, water or lubricants)

**Teflon Testing Stick**
A hard plastic stick used to test the blade of an instrument to determine the sharpness of an instrument.

- **Must be used ALWAYS.**
- **If the blade of the instrument runs smoothly over the plastic stick, then it is blunt.**
- **A sharp instrument will grab into the stick and removes small fragments of the plastic.**

**Teflon Testing Stick**
Ø 8 x 100 mm / Ø 0.3 x 3.5 in

**Visit our web site: BMTsurgical.com for instructions and methods of use.**
## Conversion of Units

### Temperature / Celsius / Fahrenheit

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### Length / International System (SI) / English system (Imperial)

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<tr>
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### French Gauge System

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### American Wire Gauge

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### Standard Wire Gauge

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### Volume / Milliliters / Fluid Ounces / Cubic Centimeters

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<th>US fl oz</th>
<th>UK fl oz (frac.)</th>
<th>UK fl oz</th>
<th>cc (cm³)</th>
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<td>0.035195</td>
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<td>29.574</td>
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### Conversion Factors

- 1 yd = 3 ft 91¼440 cm
- 15/16 = 0.9375 23 8125
- 7/8 = 0.8750 22 2250
- 13/16 = 0.8125 20 6375
- 11/16 = 0.6875 17 4625
- 1 in = 2.54 cm
- 1 mm = 0.0394 in
- 1 cm = 10 mm 0.3937 in
- 1 m = 1000 mm 1.0936 yd

### Additional Information

- Temperature conversion chart for °C to °F
- Length conversion between SI and Imperial units
- French and American Wire Gauge standards
- Volume conversion between mL, US fl oz, UK fl oz, and cc (cm³)
### Conversion of Units

- **1 yd** = 3 ft = 91.44 cm
- **1 in** = 2.54 cm
- **1 cm** = 10 mm = 0.3937 in

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### Temperature Conversion

- **ºC**
- **16** = 60.96
- **14** = 57.20
- **12** = 53.60
- **11** = 51.10
- **10** = 48.20
- **8** = 30.60
- **4** = 10.16
- **3** = 7.62

### Imperial Units

- **in**
- **mm**

### Charrière Ø mm Ø in

- **212 (cm³)**
  - 0.0000 (4/0) = 1/32 = 0.035195
  - 0.0004 (1/0) = 3/32 = 0.039375
  - 0.0005 (1/0) = 7/32 = 0.046875
  - 0.0006 (1/0) = 1/8 = 0.05
  - 0.0007 (1/0) = 5/32 = 0.0625
  - 0.0008 (1/0) = 1/4 = 0.125
  - 0.0009 (1/8) = 9/32 = 0.28125
  - 0.0010 (1/8) = 1/8 = 0.125

### SWG Ø mm Ø in

- 7/0 = 0.5000 12.700
- 5/0 = 0.4320 10.973
- 4/0 = 0.4000 10.160
- 3/0 = 0.3720 9.449
- 0 = 0.3240 8.230
- 2 = 0.2760 7.010
- 5 = 0.2120 5.385
- 6 = 0.1920 4.877
- 8 = 0.1600 4.064
- 9 = 0.1440 3.658
- 10 = 0.1280 3.251
- 12 = 0.1040 2.642
- 13 = 0.0920 2.337
- 16 = 0.0640 1.626
- 17 = 0.0560 1.422
- 18 = 0.0480 1.219
- 19 = 0.0400 1.016
- 24 = 0.0220 0.559
- 26 = 0.0180 0.457
- 29 = 0.0140 0.345
- 30 = 0.0120 0.315
- 31 = 0.0120 0.295
- 33 = 0.0100 0.254
- 34 = 0.0090 0.234

### Dental

- **Dental Surgery**
- **General Dentistry**
- **Implantology**
- **Orthodontics**
- **Endodontics**
- **Periodontics**
- **Bone Regeneration**
- **Oral and Maxillofacial Surgery**

### Plastic Surgery

- **Reconstructive Surgery**
- **Cosmetic Surgery**
- **Blepharoplasty**
- **Breast Surgery**
- **Rhinoplasty**
- **Liposuction**
- **Rhytidectomy** | Facelift
- **Oral and Maxillofacial Surgery**

### General Surgery and Specialties

- **General Surgery**
- **Arthroscopy**
- **Gynecology**
- **Microsurgery**
- **Ophthalmology**
- **ENT | Otolaryngology**
- **Traumatology | Orthopedics**
- **Podiatry | Pedicure | Esthetics**

### Veterinärmedizin

- **Allgemeine Chirurgie**
- **Zahnärztliche Chirurgie**
- **Dermatologie**
- **Ophthalmologie**
- **HNO | Heilkunde**
- **Traumatologie | Orthopädie**
- **Vetär | Hunde | Katzen | Rinder | Horniere**
- **Reptilen | Exoten | Zoo- und Wildtierforsch**

### Vétérinaire

- **Chirurgie générale**
- **Chirurgie dentaire**
- **Dermatologie**
- **Ophthalmologie**
- **Otolaryngologie | Oto-rhino-laryngologie**
- **Traumatologie | Orthopédie**
- **DOCS | Chiens | Félins | Bovins | Equins**
- **Reptiles | Exotiques | Zoo et sauvages**

### Veterinaria

- **Chirurgia generale**
- **Chirurgia orale**
- **Dermatologia**
- **Oftalmologia**
- **Otolaringologia | Oto-rhino-laringologia**
- **Traumatologia | Ortopedia**
- **Aves | Caninos | Felinos | Bovinos | Equinos**
- **Reptiles | Exoticos | Zoológico y salvajes**

### Veterinary

- **General Surgery**
- **Dental Surgery**
- **Dermatology**
- **Ophthalmology**
- **ENT | Otolaryngology**
- **Traumatology | Orthopedics**
- **Birds | Canines | Felines | Bovines | Equines**
- **Reptiles | Exotics | Zoo and wildlife**
BMT Medizintechnik GmbH

Surgical Instruments

Our Mission

Establish a global presence as a leading designer and manufacturer of high quality handheld surgical instruments in the Dental, Plastic Surgery, General Surgery, Specialties and Veterinary fields.

Our goal will be achieved by offering excellent products and services; and by our commitment to exceed customer expectations.

About Us

BMT Medizintechnik GmbH (located in Tuttlingen, Germany) designs, manufactures and markets a complete product portfolio of over 10,000 surgical instruments.

Our brand has gained recognition in the European marketplace as a high quality premier brand and, in recent years, has made its mark in the North American marketplace where it is recognized for its exceptional quality.

What makes us different? Outstanding Quality!

BMT manufactures surgical instruments from martensitic stainless steels (AISI 421, 440, 440C2) which is the highest quality surgical steel available.

Our brand is built on outstanding product quality and service plus a 5-year warranty against manufacturing defects.

Industry Participation

As a leading global manufacturer of surgical instruments, BMT has major distributors located throughout Europe, North and South America, the Middle East and Asia offering our products to the medical practitioners. BMT maintains its leadership in innovation by working closely with its distributors and surgical practitioners to develop new products.

BMT is also in the forefront of product education by offering and participating in seminars and other educational events on proper instrument selection, usage and care.

BMT continues to establish itself as a premier surgical instrument company by attending and supporting leading conferences throughout the world.

Product and Quality Standards

BMT Medizintechnik GmbH products are registered and comply with European Conformity (CE), EN ISO 13485 International Standards, American FDA Standards (U.S. Food and Drug Administration), as well as the standards and regulations in other countries.

For more information visit our website.