stryker

Tornier Pyrocarbon
Humeral Head

Operative technique

This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustments when and as required.

Important

- The patient should be advised that the device cannot and does not replicate a normal healthy bone, that the device can break or become damaged as a result of strenuous activity or trauma and that the device has a finite expected service life.
- Removal or revision of the device may be required sometime in the future.
- Cleaning and sterilization information is provided in the applicable instructions for use.
- Non-sterile devices, including implants and instruments, must be cleaned and sterilized prior to use, in accordance with validated methods.
- Devices that are able to be disassembled should be disassembled prior to point-of-use processing. Additionally, devices with movable components that do not facilitate disassembly should be manually articulated during the point-of-use processing step in order to evacuate additional soils.
- Please remember that the compatibility of different product systems has not been tested unless specified otherwise in the product labeling.
- Consult Instructions for Use (https://ifu.stryker.com) for a complete list of potential adverse effects and adverse events, contraindications, warnings and precautions.
- The surgeon must advise patients of surgical risks, and make them aware of adverse effects and alternative treatments.
- An implant whose packaging is open or damaged or whose expiration date has passed must not be used. Every precaution must be taken to ensure sterility when opening the packaging of the implant and during implantation.

Tornier Pyrocarbon
Humeral Head

Table of contents

Introduction

Intended use

This system is intended to be used to partially replace the shoulder joint in primary treatment.

Indications for use

The Tornier Pyrocarbon Humeral Head associated with the Tornier Flex Stem is indicated for use as a replacement of deficient humeral head joints disabled by:

- Non-inflammatory degenerative joint diseases (osteoarthritis, avascular necrosis)
- Traumatic arthritis

The Tornier Pyrocarbon Humeral Head shoulder prosthesis combined with the Tornier Flex Stem are to be used only in patients with an intact or reconstructable rotator cuff and if the native glenoid surface is intact or sufficient, where they are intended to increase mobility, stability, and relieve pain.

Note:

The coated humeral stem is intended for cemented or cementless use. The non-coated humeral stem is for cemented use only.

Contraindications for use

Absolute contraindications for shoulder arthroplasty:

- Active local or systemic infection, sepsis, or osteomyelitis
- Insufficient bone stock to support implants in the humeral epiphysis
- Insufficient bone stock or excessive deformation of the native glenoid to allow normal functioning of the glenohumeral joint
- Poor bone quality leading to the risk of considerable migration of the prosthesis and/or to the risk of the fracture of the humerus or glenoid
- Material sensitivity documented or suspected

Relative contraindications related to shoulder arthroplasty:

- Patient not cooperative or patient suffering from neurological disorders and unable to follow the recommendations of the healthcare professional
- Metabolism disorders that could compromise bone formation
- Distant foci of infections that could spread to the site of the implant
- Rapid destruction of the joint, marked bone loss, or bone resorption apparent on the x-ray
- Known allergy or suspected allergy to the materials
- Pregnancy

Preoperative planning

Preoperative planning is performed utilizing x-ray templates on the frontal and sagittal views. Appropriate implant size and positioning is determined.

The use of a CT scan or MRI is recommended to better determine the orientation of the glenoid, the quality of glenoid bone stock, and to confirm the integrity of the rotator cuff.

X-rays are also used to determine the length of the humeral stem.

Caution:

The use of metallic devices (such as anchors, screws, plates, or sutures containing metal) is not recommended. If metallic devices are already implanted from a previous surgery, or are to be implanted, they must be remote from the Tornier Pyrocarbon Humeral Head to prevent any risk of contact even in case of postoperative migration or bone remodeling.

Anatomic humeral exposure

Delto-pectoral approach

An incision is made from the tip of the coracoid along the delto-pectoral groove, slightly lateral to the axillary fold.

The pectoralis major is identified. The deltoid and cephalic veins are retracted laterally to open the delto-pectoral groove. The coracoid process is identified. A hohmann retractor is positioned behind the coracoid. Care should be taken to preserve the origin and insertion of the deltoid.

Figure 1

The clavi-pectoral fascia is incised at the external border of the coraco-brachialis. The axillary nerve is then identified before opening the subscapularis. As the arm is externally rotated, the anterior and inferior capsule is released from the humerus to the glenoid.

With adequate releases, the humeral head is then dislocated into the delto-pectoral interval by abduction of the arm and progressive external rotation and extension.

In cases of severe restriction of external rotation (0° or less), it is recommended to release more of the upper pectoralis insertion.

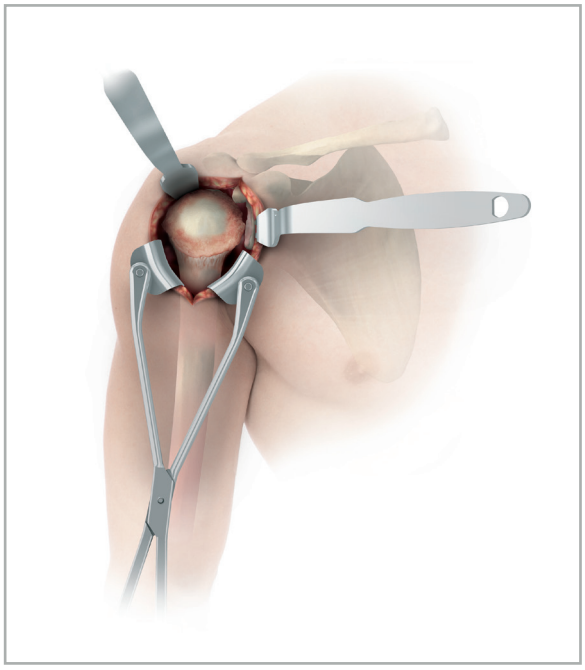


Figure 2

Humeral head preparation

With the humeral head dislocated, remove all osteophytes. This is done with rongeur or a curved osteotome, using a superiorly directed motion, to identify the exact capsular insertion at the anatomic neck.

Humeral head resection

The anatomic head resection may be made free hand or with the assistance of a cutting guide.

Free hand resection

To facilitate the resection, the cutting plane can be defined by:

- Marking the superior/lateral point (12 o'clock position), inferior/medial point (6 o'clock position) and the most anterior point (3 o'clock for a left shoulder and 9 o'clock for a right shoulder).
- Connecting these three points with a surgical pen or bovie will help identify the anatomic humeral neck prior to resection.
- Alternatively, the inclination guide can be utilized as a template to help determine the inclination of the anatomic neck and facilitate resection.

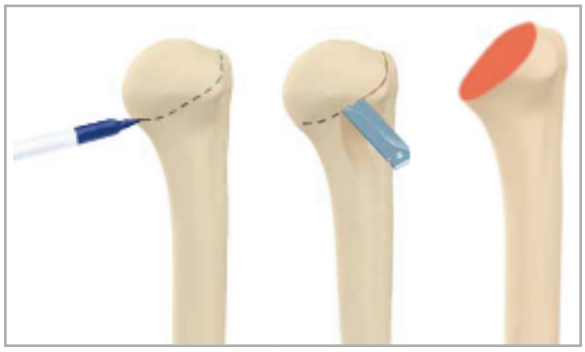


Figure 3

Guided resection

To utilize the guided resection, begin by placing the appropriately sized cut ring over the humerus. It is important that the cut ring be able to pass over the humerus without impingement. The top flat portion of the cut ring can then be aligned with the anatomic neck of the humerus.

It is important that one of the four laser marks on the top of the cut ring is directed towards the 12 o'clock (most superior/lateral) position of the humerus as this will provide a fixed reference point to assess humeral inclination and version in subsequent steps.

With the cut ring appropriately positioned, place the two 3mm x 75mm guide pins through the cut ring and into the humerus to secure the construct. It is recommended to place the lateral pin first as it will act as a hinge and can facilitate more precise medial alignment of the cut ring.

If desired, the version and inclination of the cut ring can be read prior to resection. This information can be useful as it allows one to maintain these two critical anatomic parameters during the subsequent steps.

To read the inclination, orient the angle indicator so that the side ("L" or "R") is visible that matches the operative side of the patient ("left" or "right"). Next, place the angle indicator over the tip of the two guide pins. To adjust the inclination of the angle indicator, pull down on the trigger and pivot the shaft of the angle indicator until it aligns with the shaft of the humerus. The inclination can then be read off of the proximal body of the angle indicator. Once the inclination is confirmed remove the angle indicator.

To read the version, orient the version indicator so that the side ("L" or "R") is visible that matches the operative side of the patient ("left" or "right"). Next, place the version indicator over the tip of the two guide pins and attach the version rod to the swiveling body located at the bottom of the version indicator. Rotate the version rod until it aligns with the patient's forearm and then advance the threads to lock it into place. The version of the cut ring can then be read off of the dial located on the version indicator. Once the version is confirmed remove the version indicator.

If adjustments are necessary, remove the pins and re-position the cut ring.

With the cut ring aligned at the anatomic neck, place the oscillating saw along the top flat portion of the cut ring and complete the head resection.

Figure 4

Figure 5

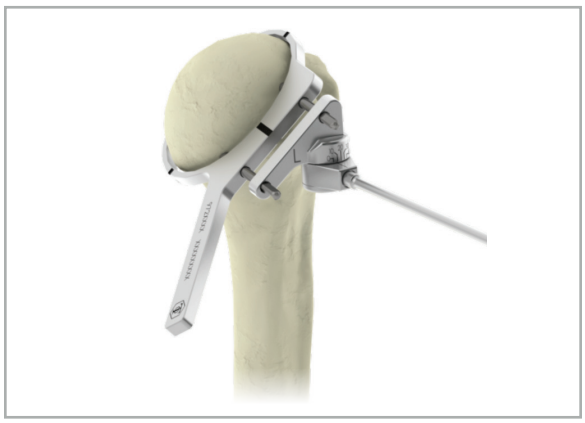


Figure 6

Distal preparation

Sizing the medullary canal

Using the starter awl, create a pilot hole in-line with the humeral canal at the hinge point of the resection.

The starter awl should be advanced until the large fluted diameter is just below the level of the resection, thus, providing a pilot hole for the first sounder.

Figure 7

Next, the sounders (size: 1-2, 3-4, 5-6, 7-8) are utilized to determine the upper size limit of the distal humerus. The sounders have been designed to compact bone which creates a dense bony bed for the final implant.

Each sounder is color coded to correspond with instrumentation to be utilized in subsequent steps. Version holes have been incorporated into the proximal shaft of each sounder and can be used to ensure the sounders are utilized at the version established during the resection.

Figure 8

To begin sounding, insert the sounders through the pilot hole starting with the size 1-2 and progressively increasing until contact is made with the cortical wall of the canal. It is important to orient the sounders so the oblong flats of the sounder align with the plane of the resection. These flats align the flutes of the sounders to the anatomic distal implant geometry, serve as a depth stop indicator, and identify the threshold for sizing.

Figure 9

When the sounder reaches the cortical wall and fits securely, stop and read the number closest to the resection. This number will indicate the largest size stem that can safely be implanted. If the sounder seats in between sizes, select the lower of the two numbers. It is important to leave the sounder in place at this time.

Figure 10

As an alternative to utilizing the proximal version guides, two holes have been provided on the side of each sounder at the level of the depth stops. The smooth end of the version rod can be placed through either of the two holes to act as a depth stop. The rod can also be useful in providing a visual reference to ensure that the sounders are placed in the same version as the resection.

Figure 11

Caution:

The sounders are not intended to cut cortical bone. As a result, a reaming motion should not be used when cortical contact is made.

Caution:

Do not impact the sounder.

Proximal preparation

Metaphyseal punch

Punches have been designed to score the proximal metaphyseal cancellous bone.

With the final sounder in place, select the corresponding punch template. As verification, check to ensure the color of the punch template matches that of the sounder.

Figure 12

Attach the punch template to the sounder via the axial slots and slide it down the sounder until the template rests flat on the resection. Place the corresponding punch into the template and impact the punch until it bottoms out on the template.

Figure 13

The scored bone must be removed by pulling the sounder, punch, and punch template vertically out of the proximal humerus.

Once the cancellous bone has been scored, remove the sounder and punch. Remove the scored bone with an osteotome or rongeur.

Figure 14

Metaphyseal compaction

Compactor overview

The Tornier Flex Shoulder System offers both short and long stems and therefore offers both short and long compactors.

Short stems are offered in three anatomic angles (A-127.5º, B-132.5º, C-137.5º) and the long stems are offered in the "B" or 132.5º angle.

Short and long compactors have been designed with a proximal body that pivots about the mid-point, allowing a single compactor to adjust to all three stem angles, streamlining the preparation process. The proximal body is locked into position via a set screw at the bottom of the taper that is manipulated with the 2.5mm locking inclination driver.

Figure 15

Figure 16

Assembling the compactor

When preparing for a long stem, it is recommended to lock the proximal body of the compactor at the "B" or 132.5 degree angle prior to impaction. This angle can be read off the back of the compactor.

When preparing for a short stem, it is recommended to loosen the proximal body of the compactor so that it pivots freely prior to impaction. This is a necessary step in determining the angle of the final implant.

To begin the compacting process, select the inserter handle and slide the depth stop onto the handle via the vertical slots located near the bottom of the handle. The depth stop has a positive locking feature that will automatically "click" and lock into the handle as it rides down the slots.

The inserter handle has optional version holes designed to accept the version rod to assist in orienting the compactors to the previously determined version. If utilized, be sure the version rod is placed on the side of the inserter handle that corresponds with the operative side of the patient (left or right). It is recommended to remove the version rod prior to extraction.

When possible, select the compactor three sizes below the final sounder reading and compact sequentially until satisfactory fixation is achieved. Satisfactory fixation can be assessed by a slight torque motion of the inserter handle. The compactor should not move within the humerus during this test.

To assemble the compactor to the inserter handle, ensure the handle of the inserter handle is in the fully unlocked position and place the clamp feet of the inserter handle into the medial and lateral slots on the compactor. Next, squeeze and lock the handle to secure the assembly.

Note:

In certain anatomy, satisfactory fixation may be achieved prior to reaching the size indicated by the sounder. Satisfactory fixation can be assessed by a slight torque motion of the inserter handle. The compactor should not move within the humerus during this test. Should the compactor rotate during this test, fixation should then be considered unsatisfactory.

Figure 17

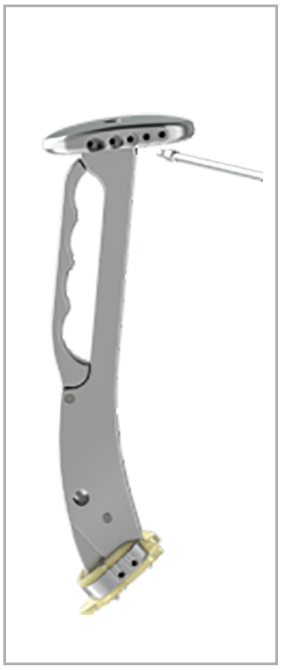


Figure 18

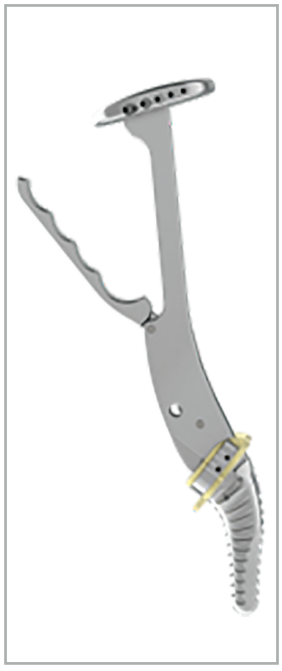


Figure 19

Figure 20

Compacting

Place the tip of the compactor into the pilot hole created by the sounders and orient the assembly so the bottom of the depth stop is parallel to the resection plane. This will ensure the version created with the resection is maintained during the compacting step. Alternatively, the optional version rod described above could be utilized in reference to the forearm to orient the compactor to the desired version.

Advance the compactor until the depth stop rests flush on the resected surface of the humerus. Continue with progressive compaction until the satisfactory fit described above is achieved.

Note:

Metaphyseal compaction for cemented stems: When implanting a cemented stem, please note that the stems are undersized to the compactors.

When using sets YKAD231 or YKAD230, the resulting average cement mantle is 0.7mm.

When using set YKAD230S, the resulting average cement mantle is 1.4mm.

Figure 21

Figure 22

Locking the compactor inclination

If preparing for a long stem, loosen the handle of the inserter handle and leave the compactor inside the humerus as the trial implant. It may be advisable to re-tighten the set screw prior to removing the handle.

If preparing for an anatomic implant, ensure the depth stop is flush on the resected humerus and the inserter handle ceases to toggle. Then pass the 2.5mm locking inclination driver through the hole in the distal end of the inserter handle and lock the inclination angle via the set screw in the bottom of the compactor taper. The angle will be read off the back of the proximal body in a subsequent step after the compactor is removed. Once the angle is locked into place, loosen the handle of the inserter handle and leave the compactor inside the humerus as the trial implant.

Note:

It is important not to use a compactor larger than the size measured by the sounder to avoid risk of humeral fracture.

Figure 23

Head trial and final implantation

Surface planning

With the final compactor in place, a surface planer can be utilized to ensure a flat resection true to the implant.

Select the surface planer size that corresponds with the final compactor. Place the plastic tip of the surface planer into the taper of the compactor.

Prior to engaging power, it is important to assess the location of the rotator cuff, if present, to ensure that it will not be damaged while planning. Depending upon the position of the taper within the humerus, it may be advisable to upsize or downsize the surface planer to obtain ideal coverage.

To plane, engage the power prior to advancing the cutting teeth to the resection. Take care to ensure the surface planer is aligned with the taper of the compactor and not pushed off the axis. Slowly advance the surface planer axially into the taper until it reaches the built in stop, taking care not to rock or wobble the surface planer. Please note the surface planer can also be utilized on the final implant if desired.

Figure 24

Figure 25

Trial humeral head selection

The humeral heads attach to the stem via a Morse taper and have unique advantages that are described in detail below.

Tornier Flex anatomic approach

Tornier Flex Humeral Heads were designed for surgeons who prefer to replace the diseased humeral head based on normal (non-arthritic) anatomic parameters.

Head size	Offset
39mm x 14mm	1.5mm / 3.5mm
41mm x 15mm	1.5mm / 3.5mm
43mm x 16mm	1.5mm / 3.5mm
46mm x 17mm	1.5mm / 4mm
48mm x 18mm	1.5mm / 4mm
50mm x 16mm	1.5mm / 4mm
50mm x 19mm	1.5mm / 4mm
52mm x 19mm	1.5mm / 4mm
52mm x 23mm	1.5mm / 4mm
54mm x 23mm	1.5mm / 4mm

Figure 26

Trialing humeral head components

The initial size of the humeral head trial can be determined by placing the resected head onto the humeral head sizer or by mimicking the resected head (except in the case of severe deformity). This is accomplished by placing the resected head against a trial head and determining which diameter and thickness most closely represents the resected head.

Note:

In the case of severe deformity of the native humeral head, preoperative radiographic templating may be utilized to determine the optimally sized humeral implant.

The Tornier Pyrocarbon Humeral Head offers both low and high offset humeral head trials. To determine which offset to begin with, evaluate the position of the compactor relative to the center of the resection.

A compactor located centrally within the resection will most likely require a low offset humeral head trial where as a compactor further from the center will most likely require a high offset humeral head trial.

Select the humeral head trial of the determined resection diameter, height and offset. Then, insert the tips of the trial clamp into the holes located on the sides of the trial.

Place the Tornier Pyrocarbon Trial Spacer on the taper of the selected humeral head trial. Make sure to seat the trial spacer until it is flush on the bottom of the humeral head trial.

Place the male taper of the humeral head trial into the female taper of the compactor. Utilizing the trial clamp, rotate the trial until the best coverage is achieved or until it is determined that a different size or offset is necessary.

Once the size, offset, and rotation are established, insert the 3.5mm retaining driver into the screw of the humeral head trial and advance the screw to lock the trial securely into position.

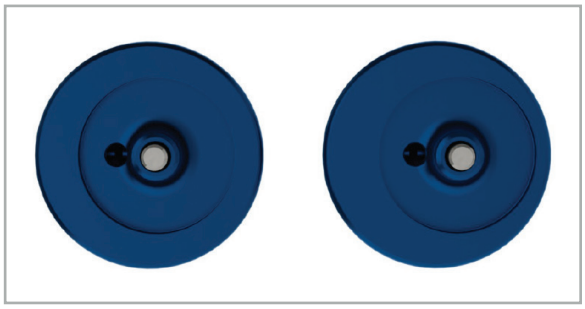


Figure 27

Figure 28

Figure 29

Figure 30

Trial reduction

Reduce the humeral head trial into the glenoid.

After the shoulder joint is reduced, posterior force on the humeral head should allow for subluxation of 50% of the width of the joint.

If less than 50% subluxation is possible, remove the humeral head trial and replace it with the next smaller humeral head trial. If direct posterior force dislocates the humeral head trial, remove the trial and replace it with the next largest humeral head trial.

Mobility testing

The arm is abducted to 90° and internally rotated; 60° of internal rotation should be obtained.

If less than 60° of internal rotation is demonstrated, further capsular release of the inferior humeral neck and glenoid may be necessary for optimal function.

Removing the trial construct

Once the humeral head size, offset, and rotation have been confirmed, dislocate the shoulder and remove the trial construct. It is important to leave the trial construct assembled and remove it as one piece as this will provide information necessary for assembling the final implant.

To remove the trial construct, thread the tip of the trial slaphammer (with handle all the way at the bottom to stabilize the tip) into the threads located on the top of the humeral head trial. It is important to not over-tighten the threads.

Next, slide the handle of the trial slaphammer away from the humeral head trial. This will free the pivoting joint, allowing the handle to move in any direction. Orient the handle in a superior position and with incremental backslaps, remove the trial construct.

After removing the trial construct, unthread the trial slaphammer and note the angle indicator (A, B, C angle) located on the proximal, lateral aspect of the compactor. This will determine which angle should be selected for the final stem.

To determine the rotation of the humeral head, orient the trial construct so the bottom of the humeral head trial is visible. A clock-like face with numbers ranging from 1-12 is marked on the bottom of the humeral head trial. Take note of the number that falls closest to the lateral most edge of the compactor. This number will determine the position of the final humeral head as it relates to the notch on the lateral edge of the final stem.

Figure 31

Figure 32

Figure 33

Final implantation

Tornier Flex PTC Stem

Note:

To avoid repeated impactions onto the Tornier Pyrocarbon Humeral Head, the definitive uncemented stem is first impacted into the humerus. The Tornier Pyrocarbon Humeral Head will then be impacted onto the stem.

Caution:

Handling the Tornier Pyrocarbon Humeral Head with metal forceps is not recommended.

Attach the definitive humeral stem (respecting the size and angle measured on the trial) to the inserter handle.

Insert the stem into the prepared humerus taking care to maintain the established retroversion. Then, impact the stem until it is flush with the cut humerus.

Once the final stem is in place, the manual planer can be used to ensure the stem is perfectly flush to the bone.

To use, assemble the T-handle from the Tornier Flex instrumentation with the correct Tornier Pyrocarbon Humeral Head manual planer reamer. Place the reamer tip (blue part) into the taper of the stem.

The manual planer is asymmetric. In order to protect the trans-osseous sutures for subscapularis reinsertion, the manual planer is used backwards and forwards.

Note:

The surgeon should inspect the implant tapers and articular surfaces for debris or blemishes before assembly. The tapers should be clean and dry for assembly. The humeral head should be assembled to the definitive stem with clean gloves.

Figure 34

Figure 35

Humeral stem size	Manual planer
1/2/3	Small
4/5/6	Medium
7/8	Large

Orient the selected size Tornier Pyrocarbon Humeral Head onto the stem with the previously determined rotation. If necessary, adjust the head to achieve the best coverage. Apply pressure to temporarily hold the humeral head in this position.

Note:

Make sure to check the spring impactor before and after each surgery to ensure proper functioning. Never impact the Tornier Pyrocarbon Humeral Head using the Tornier Flex impactor.

Tornier Pyrocarbon Humeral Head impaction

Prior to attaching the impactor tip and silicon tip onto the spring impactor, a visual check needs to be made to verify the proper elasticity of the spring impactor.

To check the elasticity of the spring impactor, hold the spring impactor with the handle facing down, the handle should not fall under its own weight and should stay in touch at the bottom of the sleeve. Make sure to visualize the contact between the hammer and the bottom of the sleeve via the fluid evacuation holes near the tip of the spring impactor.

Use the specific Tornier Pyrocarbon Humeral Head impactor in order to impact the Tornier Pyrocarbon Humeral Head onto the stem (see chart below for reference).

Choose the correct silicon tip that corresponds to the Tornier Pyrocarbon Humeral Head size.

Choose the impactor tip support that corresponds to the chosen silicon tip.

To assemble, screw the impactor tip support to the spring impactor handle. Next, place the appropriate silicon tip into the impactor tip support.

Note:

Confirm the silicon tip is fully seated into the spring impactor before impacting the final Tornier Pyrocarbon Humeral Head. This will ensure that the proper force is being applied when impacting the final Tornier Pyrocarbon Humeral Head onto the final Tornier Flex Stem implant.

Note:

Make sure the specific Tornier Pyrocarbon Humeral Head impactor is perfectly centered and in full contact with the Tornier Pyrocarbon Humeral Head before impaction.

The spring impactor is made of a spring that is activated by the handle. It provides a precise amount of energy thus controlling the force of impaction. It is necessary to activate and release the spring impactor three times to achieve adequate fixation.

Figure 36

Figure 37

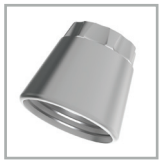


Figure 38

Figure 39

Figure 40

Tornier Pyrocarbon Humeral Head size	Silicon tip	Impactor tip support
39mm x 14mm	39	39-43
41mm x 15mm	41	39-43
43mm x 16mm	43	39-43
46mm x 17mm	46	46-54
48mm x 18mm	48	46-54
50mm x 16mm	50/52/54	46-54
50mm x 19mm	50/52/54	46-54
52mm x 19mm	50/52/54	46-54
52mm x 23mm	50/52/54	46-54
54mm x 23mm	50/52/54	46-54

Tornier Flex Cemented Stem

The final implants can be assembled on the back table using the specific impactor with the silicon tip that corresponds to the Tornier Pyrocarbon Humeral Head size.

Note:

Do not impact the Tornier Pyrocarbon Humeral Head onto the stem with the Tornier Flex impactor. Make sure the Tornier Pyrocarbon Humeral Head impactor is perfectly centered and fully in contact with the Tornier Pyrocarbon Humeral Head before impaction. The full implant is introduced manually into the humeral diaphysis with no impaction.

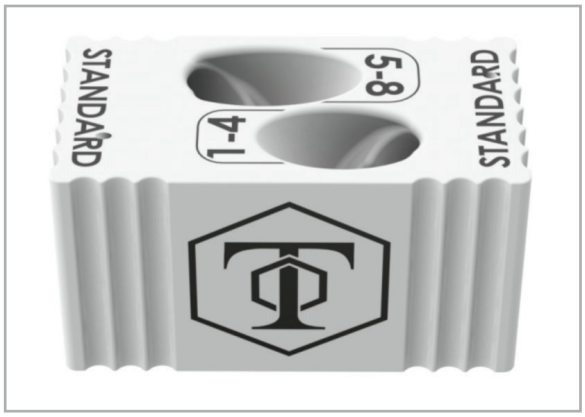


Figure 41

Back table assembly

Place the chosen definitive humeral stem (respecting the size and angle measured on the compactor) into the appropriate slot of the impaction stand.

The standard stem slots are located on one side of the impaction block and the long stem slots are located directly opposite the standard stem slots. Each side of the impaction block is then divided into two sections depending on size (1mm-4mm, 5mm-8mm).

With the definitive stem in hand, orient the selected size humeral head to the previously determined rotation and apply pressure to temporarily hold the hold the Tornier Pyrocarbon Humeral Head in this position. Next, place the implant assembly into the appropriate slot of the impaction block. To assemble the Tornier Pyrocarbon Humeral Head, follow the steps outlined in the Tornier Pyrocarbon Humeral Head impaction section above.

To implant an Tornier Flex Cemented Stem, irrigate and dry the humeral canal, then insert a cement restrictor. Inject cement into the medullary canal using a standard cementing technique and insert the stem into the humeral canal. Advance the stem until it is flush against the resection.

Remove any excess cement and wait for the cement to harden.

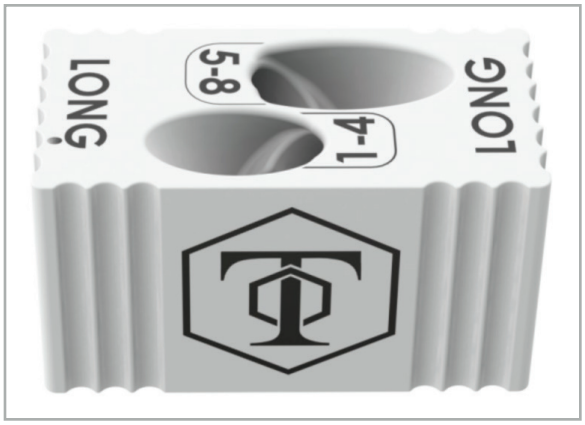


Figure 42

Note:

When implanting a PTC stem, note that the proximal stems are larger than he compactors.

When using sets YKAD231 or YKAD230, the resulting diametric press-fit is 2mm.

When using set YKAD230S, the resulting diametric press-fit is 1mm. When implanting a cemented stem, note that the stems are undersized to the compactors.

When using sets YKAD231 or YKAD230, the resulting average cement mantle is 0.7mm.

When using set YKAD230S, the resulting average cement mantle is 1.4mm. The decision to use cement or a press-fit technique is based upon individual surgeon preference.

Testing and closure

After the joint has been washed and the prosthesis reduced, the stability and mobility of the shoulder are tested.

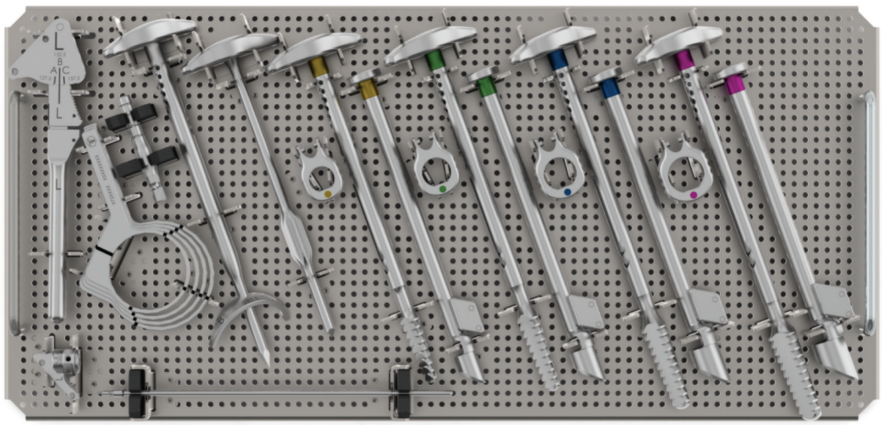
The joint is closed by reinsertion of the subscapularis to the coraco-humeral ligament, and to the subscapular remnant, allowing slight slipping of the subscapularis upwards.

Caution:

Do not use sutures containing metal.

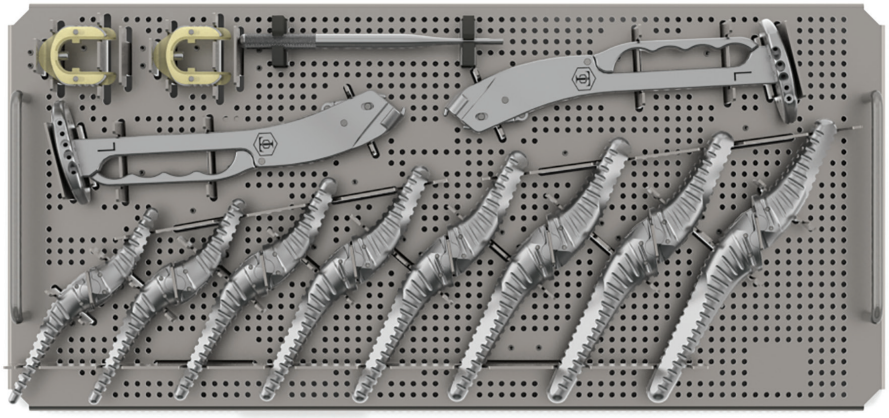
The wound is closed in planes over an aspiration drain. Postoperatively, the arm is immobilized in a simple sling.

Appendix: components



Tornier Flex Humeral Instruments YKAD230, 230S, 231 (top tray)

Reference	Description
MWF004	Version indicator
MWF100	Inclination indicator
9722885	Pin driver
9722926	Small cut ring
9722927	Medium cut ring
9722928	Large cut ring
9722929	X-large cut ring
MWF113	Retroversion rod
MWF011	Reverse cut guide
MWF101	Starter awl
MWF021	Sounder size 1mm-2mm
MWF023	Sounder size 3mm-4mm
MWF025	Sounder size 5mm-6mm
MWF027	Sounder size 7mm-8mm
MWF031	Punch size 1mm-2mm
MWF033	Punch size 3mm-4mm
MWF035	Punch size 5mm-6mm
MWF037	Punch size 7mm-8mm
MWF041	Punch template size 1mm-2mm
MWF043	Punch template size 3mm-4mm
MWF045	Punch template size 5mm-6mm
MWF047	Punch template size 7mm-8mm

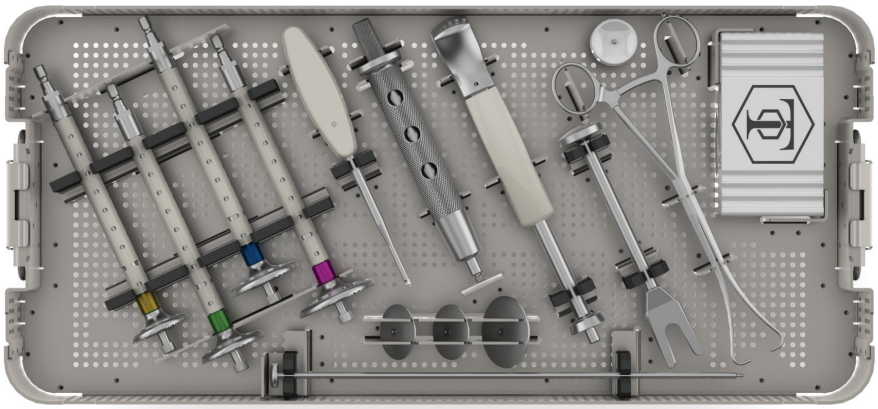


Tornier Flex Humeral Instruments YKAD231/230 (middle tray)

Reference	Description
MWF601	Standard stem compactor size 1
MWF602	Standard stem compactor size 2
MWF603	Standard stem compactor size 3
MWF604	Standard stem compactor size 4
MWF605	Standard stem compactor size 5
MWF606	Standard stem compactor size 6
MWF607	Standard stem compactor size 7
MWF608	Standard stem compactor size 8
MWF611	Long stem compactor size 1
MWF612	Long stem compactor size 2
MWF613	Long stem compactor size 3
MWF614	Long stem compactor size 4
MWF615	Long stem compactor size 5
MWF616	Long stem compactor size 6
MWF617	Long stem compactor size 7
MWF618	Long stem compactor size 8
MWF102	2.5mm inclination locking driver
MWF103	Inserter handle
MWF106	Inserter depth stop

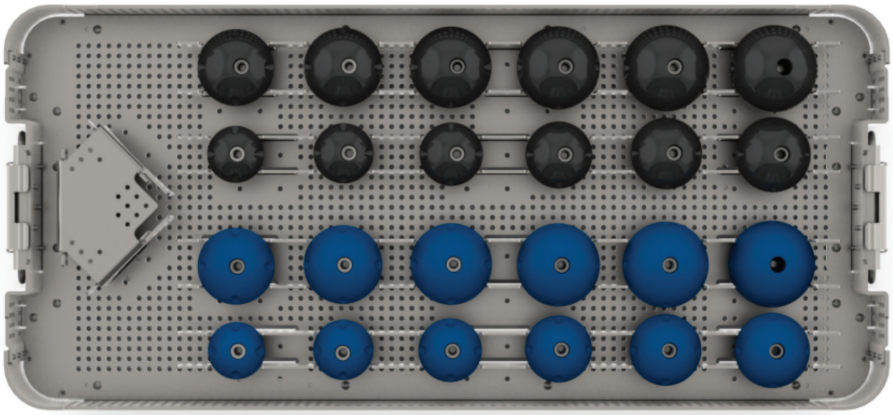
YKAD230S (bottom tray)

Reference	Description
MWF601S	Standard (+) compactor size 1
MWF602S	Standard (+) compactor size 2
MWF603S	Standard (+) compactor size 3
MWF604S	Standard (+) compactor size 4
MWF605S	Standard (+) compactor size 5
MWF606S	Standard (+) compactor size 6
MWF607S	Standard (+) compactor size 7
MWF608S	Standard (+) compactor size 8
MWF611S	Long (+) compactor size 1
MWF612S	Long (+) compactor size 2
MWF613S	Long (+) compactor size 3
MWF614S	Long (+) compactor size 4
MWF615S	Long (+) compactor size 5
MWF616S	Long (+) compactor size 6
MWF617S	Long (+) compactor size 7
MWF618S	Long (+) compactor size 8
MWF102	2.5mm inclination locking driver
MWF103	Inserter handle
MWF106	Inserter depth stop



Tornier Flex Humeral Instruments YKAD 231/232 (bottom tray)

Reference	Description
MWF051	Cut protector 35mm
MWF053	Cut protector 40mm
MWF055	Cut protector 45mm
MWF061	Calcar planer size 1-2
MWF063	Calcar planer size 3-4
MWF065	Calcar planer size 5-6
MWF067	Calcar planer size 7-8
MWF107	Impaction block
MWF108	Head distractor
MWF109	3.5mm retaining driver
MWF110	Trial slaphammer
MWF221	Impaction handle
MWF222	Head / tray impactor tip
MWF124	Trial clamp
MBO101	Cement restrictor

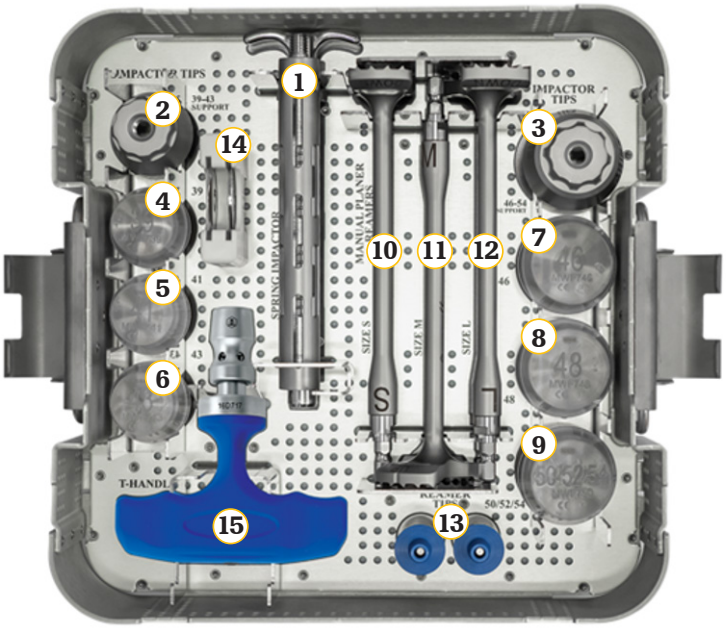


Tornier Flex Humeral Head Trials (YKAD233)

Reference	Description	Diameter	Height	Offset
MWF200	Humeral head sizer	N/A	N/A	N/A
**MWF237S	Humeral head trial	37mm	13.5mm	1.5mm
MWF239S	Humeral head trial	39mm	14mm	1.5mm
MWF241S	Humeral head trial	41mm	15mm	1.5mm
MWF243SS	Humeral head trial	43mm	16mm	1.5mm
MWF246S	Humeral head trial	46mm	17mm	1.5mm
MWF248S	Humeral head trial	48mm	18mm	1.5mm
MWF250S	Humeral head trial	50mm	16mm	1.5mm
MWF251S	Humeral head trial	50mm	19mm	1.5mm
MWF252S	Humeral head trial	52mm	19mm	1.5mm
MWF253S	Humeral head trial	52mm	23mm	1.5mm
*MWF254S	Humeral head trial	54mm	23mm	1.5mm
*MWF255S	Humeral head trial	54mm	27mm	1.5mm
**MWF337S	Humeral head trial	37mm	13.5mm	3.5mm
MWF339S	Humeral head trial	39mm	14mm	3.5mm
MWF341S	Humeral head trial	41mm	15mm	3.5mm
MWF343S	Humeral head trial	43mm	16mm	3.5mm
MWF346S	Humeral head trial	46mm	17mm	4mm
MWF348S	Humeral head trial	48mm	18mm	4mm
MWF350S	Humeral head trial	50mm	16mm	4mm
MWF351S	Humeral head trial	50mm	19mm	4mm
MWF352S	Humeral head trial	52mm	19mm	4mm
MWF353S	Humeral head trial	52mm	23mm	4mm
*MWF354S	Humeral head trial	54mm	23mm	4mm
*MWF355S	Humeral head trial	54mm	27mm	4mm

*Available by special request only.

**Size 37mm humeral heads are not available in Pyrocarbon.



Tornier Pyrocarbon Humeral Head Instrumentation (YKAD238L)

No.	Reference	Description
1	*MWF724	Spring impactor
2	MWF720	Impactor tip support 39mm, 41mm, 43mm
3	MWF721	Impactor tip support 46mm, 48mm, 50mm, 54mm
4	MWF739	Tornier Pyrocarbon humeral head impactor tip 39mm
5	MWF741	Tornier Pyrocarbon humeral head impactor tip 41mm
6	MWF743	Tornier Pyrocarbon humeral head impactor tip 43mm
7	MWF746	Tornier Pyrocarbon humeral head impactor tip 46mm
8	MWF748	Tornier Pyrocarbon humeral head impactor tip 48mm
9	MWF750	Tornier Pyrocarbon head impactor tip 50mm, 52mm, 54mm
10	MWF725	Manual planer reamer: small
11	MWF726	Manual planer reamer: medium
12	MWF727	Manual planer reamer: large
13	MWF728	Reamer tip
14	MWF763	Tornier Pyrocarbon humeral head trial spacer
15	MWB337	T-handle (optional)
	NCR238	Lid
	YRAD238L	Box

*Instrument to be assembled/disassembled according to instructions.

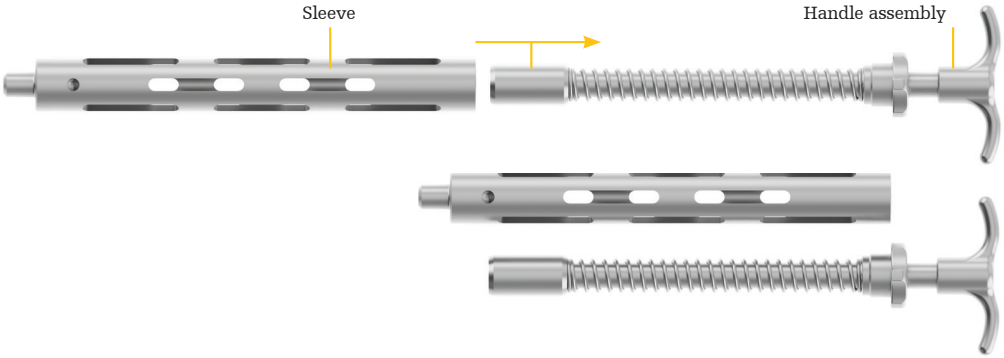
Spring impactor disassembly and assembly instructions

Reference	Description
YKAD238L	Instrument set
MWF724	Spring impactor (includes handle MWF724Z1 and sleeve MWF724Z2)

Disassembly

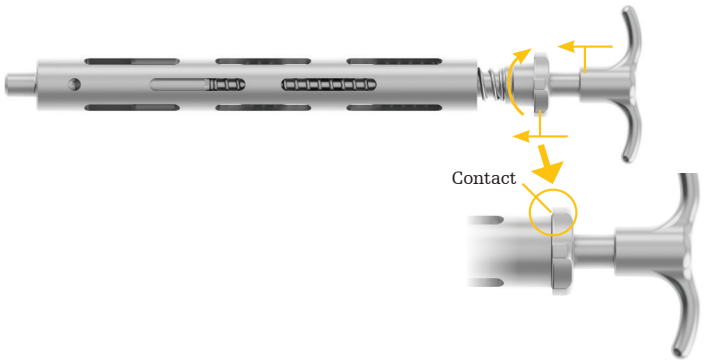
1. Fully unscrew the locknut.

2. Remove the handle assembly by sliding it out of the spring impactor sleeve.



Assembly

1. Insert the “handle” assembly into the sleeve and screw the locknut until it is in contact with the sleeve.



Tornier Flex: Standard PTC humeral stems

Reference	Description	Size	Angle	Length
DWF601A	Standard PTC humeral stem	1A	127.5°	66mm
DWF601B	Standard PTC humeral stem	1B	132.5°	66mm
DWF601C	Standard PTC humeral stem	1C	137.5°	66mm
DWF602A	Standard PTC humeral stem	2A	127.5°	70mm
DWF602B	Standard PTC humeral stem	2B	132.5°	70mm
DWF602C	Standard PTC humeral stem	2C	137.5°	70mm
DWF603A	Standard PTC humeral stem	3A	127.5°	74mm
DWF603B	Standard PTC humeral stem	3B	132.5°	74mm
DWF603C	Standard PTC humeral stem	3C	137.5°	74mm
DWF604A	Standard PTC humeral stem	4A	127.5°	78mm
DWF604B	Standard PTC humeral stem	4B	132.5°	78mm
DWF604C	Standard PTC humeral stem	4C	137.5°	78mm
DWF605A	Standard PTC humeral stem	5A	127.5°	82mm
DWF605B	Standard PTC humeral stem	5B	132.5°	82mm
DWF605C	Standard PTC humeral stem	5C	137.5°	82mm
DWF606A	Standard PTC humeral stem	6A	127.5°	86mm
DWF606B	Standard PTC humeral stem	6B	132.5°	86mm
DWF606C	Standard PTC humeral stem	6C	137.5°	86mm
DWF607A	Standard PTC humeral stem	7A	127.5°	90mm
DWF607B	Standard PTC humeral stem	7B	132.5°	90mm
DWF607C	Standard PTC humeral stem	7C	137.5°	90mm
DWF608A	Standard PTC humeral stem	8A	127.5°	94mm
DWF608B	Standard PTC humeral stem	8B	132.5°	94mm
DWF608C	Standard PTC humeral stem	8C	137.5°	94mm

Tornier Flex: Long PTC humeral stems

Reference	Description	Size	Angle	Length
DWF611B	Long PTC humeral stem	1B	132.5°	88mm
DWF612B	Long PTC humeral stem	2B	132.5°	93mm
DWF613B	Long PTC humeral stem	3B	132.5°	98mm
DWF614B	Long PTC humeral stem	4B	132.5°	104mm
DWF615B	Long PTC humeral stem	5B	132.5°	109mm
DWF616B	Long PTC humeral stem	6B	132.5°	115mm
DWF617B	Long PTC humeral stem	7B	132.5°	120mm
DWF618B	Long PTC humeral stem	8B	132.5°	125mm

Tornier Flex: Standard cemented humeral stems

Reference	Description	Size	Angle	Length
DWF702A	Standard cemented humeral stem	2A	127.5°	66mm
DWF702B	Standard cemented humeral stem	2B	132.5°	66mm
DWF702C	Standard cemented humeral stem	2C	137.5°	66mm
DWF704A	Standard cemented humeral stem	4A	127.5°	74mm
DWF704B	Standard cemented humeral stem	4B	132.5°	74mm
DWF704C	Standard cemented humeral stem	4C	137.5°	74mm
DWF706A	Standard cemented humeral stem	6A	127.5°	82mm
DWF706B	Standard cemented humeral stem	6B	132.5°	82mm
DWF706C	Standard cemented humeral stem	6C	137.5°	82mm
DWF708A	Standard cemented humeral stem	8A	127.5°	90mm
DWF708B	Standard cemented humeral stem	8B	132.5°	90mm
DWF708C	Standard cemented humeral stem	8C	137.5°	90mm

Tornier Flex: Long cemented humeral stems

Reference	Description	Size	Angle	Length
DWF712B	Long cemented humeral stem	2B	132.5°	88mm
DWF714B	Long cemented humeral stem	4B	132.5°	98mm
DWF716B	Long cemented humeral stem	6B	132.5°	109mm
DWF718B	Long cemented humeral stem	8B	132.5°	120mm

Tornier Pyrocarbon Humeral Head

Reference number	Description
DWH039	Tornier Pyrocarbon Humeral Head Dia 39 H 14mm Ecc 1.5
DWH041	Tornier Pyrocarbon Humeral Head Dia 41 H 15mm Ecc 1.5
DWH043	Tornier Pyrocarbon Humeral Head Dia 43 H 16mm Ecc 1.5
DWH046	Tornier Pyrocarbon Humeral Head Dia 46 H 17mm Ecc 1.5
DWH048	Tornier Pyrocarbon Humeral Head Dia 48 H 18mm Ecc 1.5
DWH050	Tornier Pyrocarbon Humeral Head Dia 50 H 16mm Ecc 1.5
DWH051	Tornier Pyrocarbon Humeral Head Dia 50 H 19mm Ecc 1.5
DWH052	Tornier Pyrocarbon Humeral Head Dia 52 H 19mm Ecc 1.5
DWH053	Tornier Pyrocarbon Humeral Head Dia 52 H 23mm Ecc 1.5
*DWH054	Tornier Pyrocarbon Humeral Head Dia 54 H 23mm Ecc 1.5
DWH139	Tornier Pyrocarbon Humeral Head Dia 39 H 14mm Ecc 3.5
DWH141	Tornier Pyrocarbon Humeral Head Dia 41 H 15mm Ecc 3.5
DWH143	Tornier Pyrocarbon Humeral Head Dia 43 H 16mm Ecc 3.5
DWH146	Tornier Pyrocarbon Humeral Head Dia 46 H 17mm Ecc 4
DWH148	Tornier Pyrocarbon Humeral Head Dia 48 H 18mm Ecc 4
DWH150	Tornier Pyrocarbon Humeral Head Dia 50 H 16mm Ecc 4
DWH151	Tornier Pyrocarbon Humeral Head Dia 50 H 19mm Ecc 4
DWH152	Tornier Pyrocarbon Humeral Head Dia 52 H 19mm Ecc 4
DWH153	Tornier Pyrocarbon Humeral Head Dia 52 H 23mm Ecc 4
*DWH154	Tornier Pyrocarbon Humeral Head Dia 54 H 23mm Ecc 4

*Available by special request only.

Notes

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Manufacturer:

Tornier, Inc.
10801 Nesbitt Avenue South
Bloomington, MN 55437
t: 888 867 6437
t: 952 426 7600

stryker.com